

DESKTOP PUBLISHING OPERATOR

NSQF LEVEL - 3

TRADE THEORY

SECTOR: IT & ITES

(As per revised syllabus July 2022 - 1200 of hrs)



Directorate General of Training

DIRECTORATE GENERAL OF TRAINING
MINISTRY OF SKILL DEVELOPMENT & ENTREPRENEURSHIP
GOVERNMENT OF INDIA



**NATIONAL INSTRUCTIONAL
MEDIA INSTITUTE, CHENNAI**

Post Box No. 3142, CTI Campus, Guindy, Chennai - 600 032

Sector : IT & ITES

Duration : 1 Year

Trades : Desktop Publishing Operator Theory - NSQF Level - 3 (Revised 2022)

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FOREWORD

The Government of India has set an ambitious target of imparting skills to 30 crores people, one out of every four Indians, by 2020 to help them secure jobs as part of the National Skills Development Policy. Industrial Training Institutes (ITIs) play a vital role in this process especially in terms of providing skilled manpower. Keeping this in mind, and for providing the current industry relevant skill training to Trainees, ITI syllabus has been recently updated with the help of Media Development Committee members of various stakeholders viz. Industries, Entrepreneurs, Academicians and representatives from ITIs.

The National Instructional Media Institute (NIMI), Chennai, has now come up with instructional material to suit the revised curriculum for **Desktop Publishing Operator - Trade Theory- NSQF Level - 3 (Revised 2022) in IT & ITES Sector under Annual pattern**. The NSQF Level - 3 (Revised 2022) Trade Theory will help the trainees to get an international equivalency standard where their skill proficiency and competency will be duly recognized across the globe and this will also increase the scope of recognition of prior learning. NSQF Level - 3 (Revised 2022) trainees will also get the opportunities to promote life long learning and skill development. I have no doubt that with NSQF Level - 3 (Revised 2022) the trainers and trainees of ITIs, and all stakeholders will derive maximum benefits from these Instructional Media Packages IMPs and that NIMI's effort will go a long way in improving the quality of Vocational training in the country.

The Executive Director & Staff of NIMI and members of Media Development Committee deserve appreciation for their contribution in bringing out this publication.

Jai Hind

Directorate General of Training
Ministry of Skill Development & Entrepreneurship
Government of India.

New Delhi - 110 001

PREFACE

The National Instructional Media Institute (NIMI) was established in 1986 at Chennai by then Directorate General of Employment and Training (D.G.E & T), Ministry of Labour and Employment, (now under Directorate General of Training, Ministry of Skill Development and Entrepreneurship) Government of India, with technical assistance from the Govt. of Federal Republic of Germany. The prime objective of this Institute is to develop and provide instructional materials for various trades as per the prescribed syllabi under the Craftsman and Apprenticeship Training Schemes.

The instructional materials are created keeping in mind, the main objective of Vocational Training under NCVT/NAC in India, which is to help an individual to master skills to do a job. The instructional materials are generated in the form of Instructional Media Packages (IMPs). An IMP consists of Theory book, Practical book, Test and Assignment book, Instructor Guide, Audio Visual Aid (Wall charts and Transparencies) and other support materials.

The trade practical book consists of series of exercises to be completed by the trainees in the workshop. These exercises are designed to ensure that all the skills in the prescribed syllabus are covered. The trade theory book provides related theoretical knowledge required to enable the trainee to do a job. The test and assignments will enable the instructor to give assignments for the evaluation of the performance of a trainee. The wall charts and transparencies are unique, as they not only help the instructor to effectively present a topic but also help him to assess the trainee's understanding. The instructor guide enables the instructor to plan his schedule of instruction, plan the raw material requirements, day to day lessons and demonstrations.

IMPs also deals with the complex skills required to be developed for effective team work. Necessary care has also been taken to include important skill areas of allied trades as prescribed in the syllabus.

The availability of a complete Instructional Media Package in an institute helps both the trainer and management to impart effective training.

The IMPs are the outcome of collective efforts of the staff members of NIMI and the members of the Media Development Committees specially drawn from Public and Private sector industries, various training institutes under the Directorate General of Training (DGT), Government and Private ITIs.

NIMI would like to take this opportunity to convey sincere thanks to the Directors of Employment & Training of various State Governments, Training Departments of Industries both in the Public and Private sectors, Officers of DGT and DGT field institutes, proof readers, individual media developers and coordinators, but for whose active support NIMI would not have been able to bring out this materials.

Chennai - 600 032

EXECUTIVE DIRECTOR

ACKNOWLEDGEMENT

National Instructional Media Institute (NIMI) sincerely acknowledges with thanks for the co-operation and contribution extended by the following Media Developers and their sponsoring organisation to bring out this IMP (**Trade Theory**) for the trade of **Desktop Publishing Operator - NSQF Level - 3** (Revised 2022) under the **IT & ITES** Sector for ITIs.

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NIMI records its appreciation of the Data Entry, CAD, DTP Operators for their excellent and devoted services in the process of development of this Instructional Material.

NIMI also acknowledges with thanks, the invaluable efforts rendered by all other staff who have contributed for the development of this Instructional Material.

NIMI is grateful to all others who have directly or indirectly helped in developing this IMP.

INTRODUCTION

TRADE PRACTICAL

The trade practical manual is intended to be used in practical workshop. It consists of a series of practical exercises to be completed by the trainees during the course. These exercises are designed to ensure that all the skills in compliance with NSQF LEVEL - 3 (Revised 2022) syllabus are covered.

The manual is divided into Twelve modules.

Module 1	Computer Fundamentals
Module 2	Windows Accessories
Module 3	MS - Office
Module 4	Networking Concept
Module 5	Printer and Scanner
Module 6	Adobe Indesign
Module 7	Adobe Illustrator
Module 8	Adobe Photoshop
Module 9	CorelDraw
Module 10	Cloud Computing
Module 11	Publishing Content
Module 12	Publish Content in Bilingual

The skill training in the shop floor is planned through a series of practical exercises centered around some practical project. However, there are few instances where the individual exercise does not form a part of project.

While developing the practical manual, a sincere effort was made to prepare each exercise which will be easy to understand and carry out even by below average trainee. However the development team accept that there is a scope for further improvement. NIMI looks forward to the suggestions from the experienced training faculty for improving the manual.

TRADE THEORY

The manual of trade theory consists of theoretical information for the Course of the **Desktop Publishing Operator** Trade Theory NSQF Level - 3 (Revised 2022) in **IT & ITES**. The contents are sequenced according to the practical exercise contained in NSQF LEVEL -3 syllabus on Trade Theory attempt has been made to relate the theoretical aspects with the skill covered in each exercise to the extent possible. This correlation is maintained to help the trainees to develop the perceptual capabilities for performing the skills.

The trade theory has to be taught and learnt along with the corresponding exercise contained in the manual on trade practical. The indications about the corresponding practical exercises are given in every sheet of this manual.

It will be preferable to teach/learn trade theory connected to each exercise at least one class before performing the related skills in the shop floor. The trade theory is to be treated as an integrated part of each exercise.

The material is not for the purpose of self-learning and should be considered as supplementary to class room instruction.

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LEARNING / ASSESSABLE OUTCOME

On completion of this book you shall be able to

S.No.	Learning Outcome	Ex.No
1	Install and setup operating system and related software in a computer following safety precautions. (NOS:SSC/N3022)	1.1.01 - 1.1.05
2	Create, format, edit text file, document file and BMP file by using different Accessories of Windows. (NOS:SSC/N3022)	1.2.06 - 1.2.08
3	Create, edit, format and enhance document, work with spreadsheet application and design presentation. (NOS:SSC/N3022)	1.3.09 - 1.3.36
4	Familiarize with the Networking concept including sharing of different resources, use of Internet, accessing/ browsing, downloading and e-mailing and practice network security. (NOS:SSC/N3022)	1.4.37 - 1.4.48
5	Install and setup scanner and scan the documents and images. (NOS:SSC/N9489)	1.5.49 - 1.5.54
6	Create, edit, format and develop page combining text and graphics using page makeup Adobe InDesign application software. (NOS:SSC/N2702)	1.6.55 - 1.6.62
7	Create Illustrations and Graphics using Adobe Illustrator. (NOS:SSC/N9490)	1.7.63 - 1.7.69
8	Create, format, edit and develop images using Adobe Photoshop software. (NOS:SSC/N9491)	1.8.70 - 1.8.83
9	Draw, edit, format and develop graphics design using Corel draw application software. (NOS:SSC/N9492)	1.9.84 - 1.9.94
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SYLLABUS

Duration	Reference Learning Outcome	Professional Skills (Trade Practical) with Indicative hours	Professional Knowledge (Trade Theory)
Professional Skill 40 Hrs; Professional Knowledge 12 Hrs	Install and set up operating system and related software in a computer following safety precautions. (NOS:SSC/N3022)	1. Identify different parts of computer and attached different input and output devices with the system. (7 hrs) 2. Install and configure Windows OS and application software. (11 hrs) 3. Manipulate folder/files. Use printer, scanner and their peripheral devices. (7 hrs) 4. Identify different icons of Windows and use the icons to operate the machine. (7 hrs) 5. Customize Windows by using control panel. (8 hrs)	Fundamentals of computers Safe working practices, Safety rules and safety signs. Types and working of fire extinguishers. Scope of the DTPO trade. Introduction to computer components, Introduction to computer system, Concepts of hardware and software. Function of motherboard components and various processors. Various Input/ Output devices in use and their features. (12 hrs)
Professional Skill 40 Hrs; Professional Knowledge 12 Hrs	Create, format, edit text file, document file and BMP file by using different Accessories of Windows. (NOS:SSC/N3022)	6. Practice to create text file by Notepad and edit file by using different menu under notepad. (7 hrs) 7. Practice to create Document file in Wordpad, and edit and format file by using different tools available under Wordpad. (14 hrs) 8. Practice to create basic symbols by using MS Paint and format the drawing by using different tools available. (19 hrs)	Introduction to different basic Accessories under MS Window. Introduction of the basic features of document file. Discuss the difference between document file and text file. Give the basic idea about image file including BMP and other format. (12 hrs)
Professional Skill 86 Hrs; Professional Knowledge 22 Hrs	Create, edit, format and enhance document, work with spreadsheet application and design presentation. (NOS:SSC/N3022)	MS WORD (45 Hrs) 9. Practice typing using open source typing tutor. (4 hrs) 10. Open MS Word and familiarize with basic word components. (2 hrs) 11. Practice creating, saving and renaming word documents. (2 hrs) 12. Use templates to create New Word document. (2 hrs) 13. Edit document using basic character formatting and paragraph formatting tools. Create font style and color scheme (2 hrs) 14. Practice to create and format Tables including Table Formatting Tool. (3 hrs) 15. Practice to create page layout including insert column by using Page Formatting. (2 hrs)	MS Office Introduction of Typing tutor Software and its different options to improve typing speed, understand about typing software, typing Tutor tools. State what is MS Office, brief what is MS Word and starting steps, explain various screen blocks of MS Word, explain procedures to create, save, print a document. Explain how to create a new document, save and print. Explain the concept of font style and color scheme State how to edit, format text and document styles brief using tables inside word document with data, explain how to create styles in a document and save for future use, brief the mail merge processing. Features & Functions of Microsoft Excel, formulas and Functions. Move Around in Excel 2010. conditional Formatting,

	16. Use Auto Correct tool and customize Auto correct option. (2 hrs) 17. Insert Header/Footer, symbols, Equations, Page Number, Foot Note, End Note, Citation, pictures including Clip arts. (2 hrs) 18. Format Header/Footer, Picture by using respective formatting tool. (2 hrs) 19. Enhance document by adding Page/ Paragraph border, shading and enhancement features like include pictures within document in proper place. (3 hrs) 20. Use hyperlink, bookmark, cross reference within document and also establish link with other formatted file. (2 hrs) 21. Use spell check, grammar, translate, synonyms, thesaurus. (2 hrs) 22. Use mail merge tool. Use conditional Mail Merge, External Data Source. Practice Letters, Label & Envelop printing using Mail Merge. (3 hrs) 23. Practice to create, record and execute Macro. (2 hrs) 24. Practice of using shortcut keys in Word Processor. (2 hrs) 25. Practice on editing bilingual software. (8 hrs) MS Excel. (23 hrs) 26. Perform sorting, formatting, pattern recognition. (4 hrs) 27. Use Toolbar and Translator Option. (3 hrs) 28. Use Data file for exercises. (4 hrs) 29. Perform Locking cells + dropdown menu. (4 hrs) 30. Perform Conditional formatting, Freeze Panes, Filter function, AND function, IF function, Nested IF function (8 hrs) MS Powerpoint (18 hrs) 31. Fundamental Tools- the PowerPoint ribbon (2 hrs) 32. Formatting Text in PowerPoint (3 hrs) 33. Insert Objects in a PowerPoint Presentation (2 hrs) 34. How to Create, Edit, Resize and Format PowerPoint Tables (3 hrs) 35. PowerPoint Animations and slide	link Excel Spreadsheet Data. Introduction to Power Point and its advantages. Creation of slide shows Fine tuning of presentations (22 hrs)
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		transition (4 hrs) 36. Action buttons and rehearse timing. (4 hrs)	
Professional Skill 62 Hrs; Professional Knowledge 16 Hrs	Familiarize with the Networking concept including sharing of different resources, use of Internet, accessing/ browsing, downloading and e-mailing and practice network security. (NOS:SSC/N3022)	37. Install network printer.(4 hrs) 38. Use of file and printer sharing in peer-to-peer connection.(7 hrs) 39. Browse the Internet for information (use at least 3 popular browsers).(4 hrs) 40. Practice to create and use e-mail for communication with attachment, priority setting, address book. (11 hrs) 41. Communicate with text, video chatting and social networking sites. (4 hrs) 42. Use online dictionary, translation software, storage space, share files with e-mail links. (4 hrs) 43. Download manager, download & upload YouTube files, google map & earth etc. (3 hrs) 44. Update windows & other software. (4 hrs) 45. Configure Outlook, mail service in mobile phones. Use tools like Skype, Google etc. (11 hrs) 46. Download different Publishing file and install it in local machine. (3 hrs) 47. Download different type of suitable image and insert within publication. (3 hrs) 48. Practice and follow Network & WiFi Security protocols. (4 Hrs)	Introduction to Computer Networks Necessity and advantages. Client Server and peer to peer networking concepts. Network topologies. Introduction to LAN, WAN and MAN. Network components, viz. Modem, Hub, Switch, Router, Bridge, Gateway etc., Network Cables, Wireless networks and Bluetooth technology. Introduction to www, Concept of internet, web browsers, internet servers and search engines. Concepts of Domain naming Systems and email communication. Introduction to video chatting tools and social networking concepts. Concept on various network security protocols. (16 hrs)
Professional Skill 18 Hrs; Professional Knowledge 8 Hrs	Install and setup scanner and scan the documents and images. (NOS:SSC/N9489)	49. Scan the file and save to the desired destination on the computer. (2 hrs) 50. Load photo paper into the main input tray. (3 hrs) 51. Print the photo, Page setup. (3 hrs) 52. Different setting of printer. (3 hrs) 53. Size or Paper Size menu in Advanced Options or on the Features tab. (4 hrs) 54. Some newer printers options. (3 hrs)	Scanner How to scan on a Windows computer Different setting of scanner How to print from a USB or wirelessly-connected HP printer Different setting of printer Sending and receiving fax, multifunction printers Modify the fax settings. (8 hrs)
Professional Skill 86 Hrs;	Create, edit, format and develop page combining text and graphics using	55. Manage workspaces, windows, Status bar, and panels in Adobe InDesign. (7 hrs)	Adobe InDesign List the benefits of using Adobe InDesign. Classify the features of Adobe PageMaker. Explain

Professional Knowledge 20 Hrs	page makeup Adobe InDesign application software. (NOS:SSC/N2702)	56. Set up pages and layouts in InDesign. (7 hrs) 57. Modify Paragraph and Character text styles, using the Find/Change dialog box. (11 hrs) 58. Perform basic Table functions in InDesign (creating, selecting, editing, inserting, deleting, navigating, moving, copying, etc.). (12 hrs) 59. Operate major InDesign tools, font style and color scheme (Pencil tool, Corner Options dialog box, Live Corners tool, Gradient tool, and the Gradient Panel). (12 hrs) 60. Compare various coloring techniques in InDesign (using imported graphics, Eyedropper tool, Swatches panel, spot and process colors, Blend Colors and Modes). (12 hrs) 61. Perform export functions in InDesign. (12 hrs) 62. Use print functions in InDesign. (12 hrs)	the concept of font style and color scheme Compare the features of Adobe InDesign and Adobe PageMaker. Compare the features of different Adobe InDesign versions. (20 hrs)
Professional Skill 62 Hrs; Professional Knowledge 24 Hrs	Create Illustrations and Graphics using Adobe Illustrator. (NOS:SSC/N9490)	63. Design logos. (7 hrs) 64. Create vector illustrations. (7 hrs) 65. Turn photographs into vector artwork. (7 hrs) 66. Develop a Professional Iconic Logo Designs. (7 hrs) 67. Develop a Professional Typographic Logo Design. (8 hrs) 68. Develop Professional Vintage Logo Designs. (8 hrs) 69. Designing vector graphics, typefaces, or layouts. (18 hrs)	Adobe Illustrator Summarize the system requirements for installing and working with formatting software. List the benefits of using Adobe Illustrator. Compare the features of different Adobe InDesign versions. Adobe Illustrator includes Logo Design, Graphic design, Photoshop, Illustration, Vector Graphics, Character design and User experience design. (24 hrs)
Professional Skill 130 Hrs; Professional Knowledge 36 Hrs	Create, format, edit and develop images using Adobe Photoshop software. (NOS:SSC/N9491)	70. Apply photo editing/ inserting features in Photoshop. (4 hrs) 71. Practice the use of tools panel (Selection tools, Crop and slice tools, measuring tools, font style and color scheme, retouching tools, painting tools, Drawing and type tools, Navigation tools and advanced tools in latest version. (20 hrs) 72. Practice the process of setting up Layers, duplicating Layer Masks and Photoshop layers. (4 hrs) 73. Apply Layer Comps, Layer Styles, Layers panel, Patch tool, and	Adobe Photoshop Discuss the benefits of using Adobe Photoshop and CorelDraw. Classify the features of CorelDraw and Adobe Photoshop. Compare the features of various Adobe Photoshop and CorelDraw versions. Explain the concept of font style and color scheme. Introduction of tools panel (Selection tools, Crop and slice tools, measuring tools, Retouching tools, Painting tools, Drawing and type tools, Navigation tools. Introduction to Menu bar, Arrange, layout, Effects, Bitmap etc. Create, format, edit and develop images using Photoshop Software. (36 hrs)

		Place command to modify background and layers. (4 hrs) 74. Practice creating samples from all visible layers and changing transparency preferences. (7 hrs) 75. Practice to use of Menu bar, Arrange, layout, Effects, Bitmap etc (18 hrs) 76. Select various Interface options (Colour Theme, Auto-Show Hidden Panels, Show Tool Tips, Enable Text Drop Shadows, and Show Transformation Values). (8 hrs) 77. Use various tips and tricks in Photoshop (w.r.t Frames, interactive zoom feature, layer mask, and Switch lasso). (8 hrs) 78. Practice creating, zooming, adjusting, and panning operations on Photoshop images, using Rulers, Guides, and Grids. (8 hrs) 79. Compare different Palettes for adjusting colour. (8 hrs) 80. Manipulate different shapes. (8 hrs) 81. Operate Photoshop tools (Magic Wand, Lasso tools, Warp, Symbol Sprayer, Dodge, Burn, Sponge, Clone Stamp, etc.). (11 hrs) 82. Practice editing Selections (adding, subtracting, inversing, and drawing Selections) and deselecting objects in Photoshop. (11 hrs) 83. Perform layer style operations (working with pre-set and custom layer styles and creating images using the Layer Masking) in Photoshop. (11 hrs)	
Professional Skill 130 Hrs ; Professional Knowledge 36 Hrs	Draw, edit, format and develop graphics design using Corel draw application software. (NOS:SSC/N9492)	84. Manage workspaces, windows, toolbars, and the toolbox in CorelDraw. (8 hrs) 85. Perform basic CorelDraw functions related to Lines, Shapes, Curves, and Outlines. (12 hrs) 86. Compare basic CorelDraw operations related to Objects and Nodes. (11 hrs) 87. Demonstrate basic CorelDraw operations related to Colour management, filling of objects, Transparency, and Special Effects. (11 hrs)	CorelDraw Compare Formatting and Design operations. List the system requirements for installing and working with CorelDraw software. Discuss the benefits of using CorelDraw. Compare the features of various CorelDraw versions. Introduction to tools panel (Pick tools, shape tools, zoom tools, curve tools, smart drawing tools, rectangle tools, ellipse tools, object tools, shape tools, text tools, interactive tools, eyedropper tools, outline tools, fill tools, interactive fill tools and advanced tools in latest version). Difference between Vector and Bitmap images, CMYK, RGB, and

		88. Practice the use tools panel and color scheme (Pick tools, shape tools, zoom tools, curve tools, smart drawing tools, rectangle tools, ellipse tools, object tools, shape tools, text tools, interactive tools, eyedropper tools, outline tools, fill tools, interactive fill tools and advanced tools in latest version). (32 hrs) 89. Apply basic Text functions (adding, manipulating, and formatting text, managing fonts in various languages, etc.) in CorelDraw. (11 hrs) 90. Practice the setting of orientation, paper size, toolbar, property bar, status bar, standard bar. (11 hrs) 91. Use basic Template and Style functions in CorelDraw. (11 hrs) 92. Practice basic CorelDraw operations on various files and file formats (importing, exporting, optimizing, size reduction, etc.). (12 hrs) 93. Prepare CorelDraw files for print service providers. (11 hrs)	Pantone colours. Introduction to orientation, paper size, toolbar, property bar, status bar, standard bar. (36 hrs)
Professional Skill 62 Hrs ; Professional Knowledge 18 Hrs	Online cloud storage and backup. (NOS:SSC/N9493)	94. Create instance on cloud on amazon/azure/google. (7 Hrs) 95. Create bucket/ storage space on cloud (amazon / azure / google). (7 Hrs) 96. Install apache server & IIS server, configure apache server and IIS server. (7 Hrs) 97. Perform Domain registration, panel management. (7 Hrs) 98. Perform Domain-registration of any domain name. (8 Hrs.) 99. Configure domain name to hosting accounts. (19 Hrs.) 100. Host your webpages. (8 Hrs.)	Introduction to cloud computing. What is Cloud servers and types of cloud server? Introduction of Cloud storage and it types (amazon, google drive & MS azure storage/OneDrive). Definition, function and features of Web servers, Types of web servers apache, IIS etc. What is Hosting, procedure of web hosting. Online tools- google forms, google sheets, google drive Google class room, Moodle, Chamilo, Open edX, Totara Learn, Canvas. (18 Hrs)
Professional Skill 62 Hrs ; Professional Knowledge 18 Hrs	Establish Requirements for Publishing Content. (NOS:SSC/N9494)	101. Solve requirement-related issues by contacting key people in Publishing, Preproduction, and Production teams. (7 hrs) 102. Summaries the consequences of publishing incorrect versions of content. (3 hrs) 103. Determine, if you have the correct versions of all content	Requirement of publishing content Categories content that requires publishing. Classify all requirements of the publication content. Different kinds of publishing contents, Types of Printing technology. (Letterpress, Offset lithography, Screen printing, Gravure printing, Flexography printing) Digital printing Technology Discuss issues, if any, concerning requirements. Summaries the

		for publications. (7 hrs) 104. Demonstrate methods of establishing publication requirements. (7 hrs) 105. Perform recommended techniques of establishing requirements in standard templates and formats. (8 hrs) 106. Report issues, as per priority, to appropriate people. (8 hrs) 107. Compare correct and incorrect versions of content. (7 hrs) 108. Assess the risks associated with establishing requirements incorrectly or inadequately. (8 hrs) 109. Analyse scenarios that may arise, if incorrect versions of content are published. (7 hrs)	consequences of publishing incorrect versions of content. (18 Hrs)
Professional Skill 62 Hrs; Professional Knowledge 16 Hrs	Publish Contents using bilingual software. (NOS:SSC/N9495)	110. Use standard templates and tools while converting content into draft publications. (3 hrs) 111. Practice escalating design-related issues to the supervisor. (3 hrs) 112. Solve design-related issues by incorporating the requester's/user's feedback/inputs. (3 hrs) 113. Design and format content as per established requirements. (7 hrs) 114. Modify designed and formatted content as per client's review. (8 hrs) 115. Convert designed, formatted, and validated content, into draft publication, after incorporating feedback from the Quality Assurance team (Pre-press department). (7 hrs) 116. Demonstrate standard methods for publishing content. (8 hrs) 117. Produce publication outputs in specific formats required by production teams. (8 hrs) 118. Combine the latest publications to update the organisation's database. (8 hrs) 119. Comply with the industrial standards while publishing content. (7 hrs)	Publishing contents in Bilingual software Summaries the need for publishing content. Classify the media recommended for publishing content. Compare various methods of publishing content. Prepare a list of publishing requirements obtained from the requester. Tools for Creating & Managing Multilingual Content – email, ftp, notepad, Unicode fonts, MS office, pdf reader/creator, adobe creative cloud, translation memory, wordpress and social media What is Binding, Types of binding and process. (Sewn binding- A strong, durable binding where inside pages are sewn together in sections. Glued binding. Also known as Perfect binding PUR-glued, Lay-flat binding, Spiral, Wire-o. Saddle-stitched, the process of assembling and securing written or printed pages within a cover.) (18 hrs)

Fundamentals of computer

Objectives: At the end of this lesson you shall be able to

- **define and classify computers**
- **list the advantages and limitations of computers**
- **list the applications of computer**
- **describe the voltages and currents in the computer.**

Computer - Definitions

A computer is an electronic machine, operating under the control of instructions stored in its own memory that can accept data (input), manipulate the data according to specified rules (process), produce results (output), and store the results for future use.

Technically, a computer is a programmable machine. This means it can execute a list of programmed instructions and respond to new instructions that it is given.

History of Computer

Charles babbage's machine

The working principles of today's computers were provided by an English mathematician Charles Babbage around 1833's invented a machine called the "Analytical Engine". A machine which could calculate and print tables of functions using limited techniques.

The Analytical Engine had four parts. A mill, which was the section which did the calculations, essentially the CPU; the store, where the information was kept recorded, essentially the memory; the reader, which would allow data to be entered using punched cards, essentially the keyboard, and the printer.

Hence, Charles Babbage is considered as the "Father of the Computer" as in fig-1.

The generations of computers are characterized by a major technological development that fundamentally changed the way computers operate, resulting in increasingly smaller, cheaper, more powerful and more efficient and reliable devices. The various generations of computers are listed below:

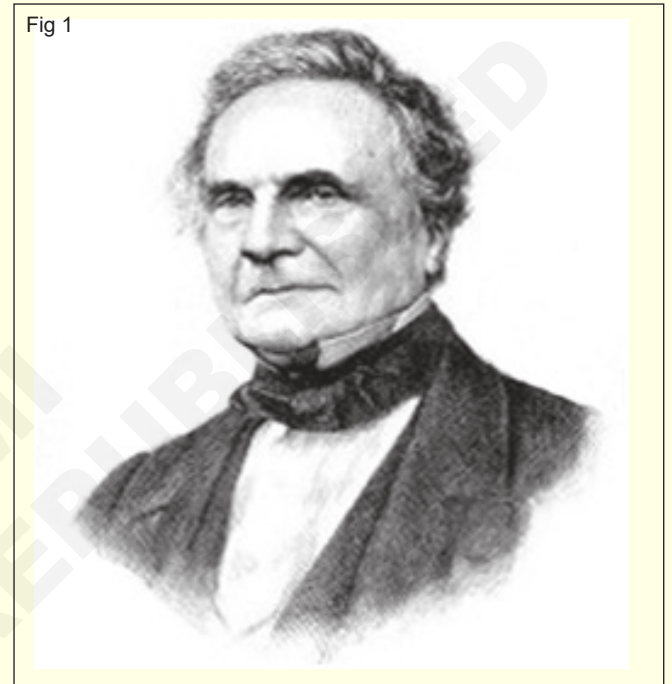
First Generation (1946-1954): In 1946 the digital computer using **electronic valves** (Vacuum tubes) are known as first generation computers. The first '**computer**' to use electronic valves i.e. vacuum tubes. The high cost of vacuum tubes prevented their use for main memory. They stored information in the form of propagating sound waves.

The vacuum tube consumes a lot of power. These computers were large in size and writing programs on them was difficult. Some of the computers of this generation were:

Mark I :The IBM Automatic Sequence Controlled Calculator (ASCC), called the Mark I by **Harvard**

University, was an **electro-mechanical computer**. Mark I is the first machine to successfully perform a long

Fig 1



services of **arithmetic and logical operation**. Mark I is the **First Generation Computer**.

ENIAC: It was the first electronic computer built in 1946 at University of Pennsylvania, USA by John Eckert and John Mauchly. It was named Electronic Numerical Integrator and Calculator (ENIAC). The ENIAC was 30-50 feet long, weighed 30 tons, contained 18,000 vacuum tubes, 70,000 resistors, 10,000 capacitors and required 150,000 watts of electricity. Today computer is many times as powerful as ENIAC, still size is very small.

EDVAC: It stands for **Electronic Discrete Variable Automatic Computer** and was developed in 1950. The concept of storing data and instructions inside the computer was introduced here. This allowed much faster operation since the computer had rapid access to both data and instructions. The EDVAC was a with automatic addition, subtraction, multiplication, programmed division and automatic checking with an ultrasonic serial memory.

EDSAC: It stands for Electronic Delay Storage Automatic Computer and was developed by M.V. Wilkes at Cambridge University in 1949. The EDSAC is the first stored-program computer. The EDSAC

performed computations in the three millisecond range. It performed arithmetic and logical operations without human intervention.

This machine marked the beginning of the computer age.

UNIVAC-1: It stands for Universal Automatic computer and it was the First commercial computer developed by United States In 1951. The machine was 25 feet by 50 feet in length, contained 5,600 tubes, 18,000 crystal diodes, and 300 relays. It utilized serial circuitry, 2.25 MHz bit rate, and had an internal storage capacity 1,000 words or 12,000 characters.

The UNIVAC was used for **general purpose computing** with large amounts of input and output. The UNIVAC was also the first computer to come equipped with a magnetic tape unit and was the **first computer to use buffer memory**.

Limitations of First Generation Computer

Followings are the major drawbacks of First generation computers.

- They used valves or vacuum tubes as their main electronic component.
- They were large in size, slow in processing and had less storage capacity.
- They consumed lots of electricity and produced lots of heat.
- Their computing capabilities were limited.
- They were not so accurate and reliable.
- They used machine level language for programming.
- They were very expensive.

Second Generation (1955-1964): The second-generation computer used **transistors** for CPU components and **ferrite cores for main memory&magnetic disks** for secondary memory. They used high-level languages such as **FORTRAN (1956), ALGOL (1960) & COBOL (1960 - 1961)**. Input Output (I/O)processor was included to control I/O operations.

Manufacturing cost was also very low. Thus the size of the computer got reduced considerably.

It is in the second generation that the concept of Central Processing Unit (CPU), memory, programming language and input and output units were developed. Some of the second generation computers are IBM 1620, IBM 1401, CDC 3600.

Features

- Transistors were used instead of Vacuum Tube.
- Processing speed is faster than First Generation Computers (Micro Second)
- Smaller in Size (51 square feet)
- The input and output devices were faster.

Third Generation (1964-1977): By the development

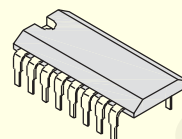
of a small chip consisting of the capacity of the **300 transistors**. These Integrated Circuits (IC)s are popularly known as **Chips**.

A single IC has many transistors, registers and capacitors built on a single thin slice of silicon. So it is quite obvious that the size of the computer got further reduced. Some of the computers developed during this period were **IBM-360, ICL-1900, IBM-370, and VAX-750**. Higher level language such as **BASIC (Beginners All purpose Symbolic Instruction Code)** was developed during this period.

Computers of this generation were small in size, low cost, large memory and processing speed is very high. Very soon ICs were replaced by **LSI (Large Scale Integration)**, which consisted about 100 components.

An IC containing about 100 components is called LSI

Fig 2



as in (Fig 2).

- They used Integrated Circuit (IC) chips in place of the transistors.
- Semi conductor memory devices were used.
- The size was greatly reduced, the speed of processing was high, and they were more accurate and reliable.
- Large Scale Integration (LSI) and Very Large Scale Integration (VLSI) were also developed.
- The mini computers were introduced in this generation.
- They used high level language for programming.

Fourth Generation (1978 - present): An IC containing about 100 components is called LSI (Large Scale Integration) and the one, which has more than 1000 such components, is called as VLSI (Very Large Scale Integration).

It uses large scale Integrated Circuits (LSIC) built on a single silicon chip called microprocessors. Due to the development of microprocessor it is possible to place computer's central processing unit (CPU) on single chip. These computers are called microcomputers.

Later very large scale Integrated Circuits (VLSIC) replaced LSICs. Thus the computer which was occupying a very large room in earlier days can now be placed on a table. Main memory used fast semiconductors chips up to 4 M bits size. Some of the Fourth generation computers are IBM PC, Apple-Macintosh, etc.

Hard disks were used as secondary memory. Keyboards, dot matrix printers etc. were developed. Operating System (OS)-such as MS-DOS, UNIX, Apple's Macintosh were available. Object oriented language, C++ etc were developed.

Features

- They used Microprocessor (VLSI) as their main switching element.
- They are also called as micro computers or personal computers.
- Their size varies from desktop to laptop or palmtop.
- They have very high speed of processing; they are 100% accurate, reliable, diligent and versatile.
- They have very large storage capacity.

Fifth Generation (PRESENT AND FUTURE): 5th generation computers use ULSI (Ultra-Large Scale Integration) chips. Millions of transistors are placed in a single IC in ULSI chips.

64 bit microprocessors have been developed during this period.. Memory chips and flash memory up to 1 GB, hard disks up to 600 GB & optical disks up to 50 GB have been developed (Fig).

Fifth generation computing devices, based on Artificial Intelligence, are still in development, though there are some applications, such as voice recognition, that are being used today.

Artificial Intelligence is the branch of computer science concerned with making computers behave like humans. The term was coined in 1956 by John McCarthy at the Massachusetts Institute of Technology. Artificial

Fig 3



intelligence includes:

- **Games Playing:** Programming computers to play games such as chess and checkers
- **Expert Systems:** Programming computers to make decisions in real-life situations (for example, some expert systems help doctors diagnose diseases based on symptoms)
- **Natural Language:** Programming computers to understand natural human languages
- **Neural Networks:** Systems that simulate intelligence by attempting to reproduce the types of physical connections that occur in animal brains
- **Robotics:** programming computers to see and hear and react to other sensory stimuli

Table - 1

GENERATION	ELECTRONIC COMPONENT	ADVANTAGES	DISADVANTAGES
First	Vaccum tube	Helped in calculation and computational work	• Big size • Very costly • Slow speed • Low accuracy • Low storage • High power requirements • High heat generation • High failure rate • Used machine language • No operating system
Second	Transistor	• Smaller size • Less cost • Better speed • Low power consumpt and less heat generation • Better storage capacity • Better accuracy and more reliability	• Need air conditioning • Constant maintenance • No operating systems • Later stage computers used assembly languages
Third	Integrated Circuits(IC) small & medium scale	• Better in all aspects compared to I & II • Used operating systems and high level language	• Initial problem withmanufac turers • No insight obtained into internal working
	VLSI or Microprocessor	• Low cost • Excellent speed and reliability • Computers close to man	Less powerful than main frame computers

Fifth (Knowledge Information Processing Systems)	ULSI or Bio-Chips	• Very cheap • Super speeds • Very high storage capacity • Highly sophisticated OS • posses intelligence and decision making ability	New low level language needed
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Classification of computers

Computers are classified according to the following criteria:

- Principle of Operation
- Computing Power, Memory Capacity and cost
- Technological Development
- Principle of operation
- Analog computer
- Digital Computer
- Hybrid Computer

Analog Computer

It is a computer that measures continuously changing physical quantities such as current, temperature, pressure etc. and converts them into quantities which can be used as data for computation. As these computers deal with continuously varying quantities they will give only approximate results. Its output is usually displayed on a meter or scale. Analog computer has low memory and fewer functions. These are used for engineering and scientific applications.

- Thermometer
- Speedometer
- Analog clock

Digital Computer

A digital computer works with digital data. Digital computer uses binary number system. Binary number system consists of only two digits '0' and '1'. A digital computer represents data in digital signals. A '0' represents OFF and a '1' represents ON. Digital computer performs arithmetic and logical operations on data. It gives output in digital form.

Digital computers are very fast. These computers can store results. They have large Memory (that is data storing capacity). Today most of the computers used in offices and homes are Digital computers.

The digital computers are further divided into the following two groups:

- Special purpose computers
- General purpose computers

Special Purpose Computers: It is a computer designed to solve specific type of problem. The computers used in ships and aircrafts, etc.

General Purpose computers: It is a computer designed to solve a wide variety of problems, A General purpose Computer can store different programs and process them.

The differences between analog and digital computers are listed in table 2

Table - 2

Analog Computers	Digital Computers
• Analog Computers Work on continuous values. • Analog Computers have low memory. • Analog computers have Slow speed. • Analog computers are less reliable. • Analog computers used in engineering • Analog computers are used to calculate / measure analog quantities like speed and temperature. • Analog computers provide less accurate results. • Normally Analog Computers are specific purpose • Normally Analog Computers are specific purpose • Examples of Analog computers are: thermometer, analog clock, speedometer etc.	• Digital computers Work on discrete values. • Digital computers have a very large memory • Digital computers have fast speed. • Digital computers are more reliable. • Digital computers are used in all fields of life.science and medical fields. • Digital computers are used to calculate mathematical and logical operations. It can solve addition, subtraction, division, multiplication and other mathematical and statistical operations. • Digital computers provide 100% accurate results. • Digital Computers are general purpose • Digital Computers are general purpose • Examples of digital computers are: Personal Computer, laptops, smart phones etc.

Hybrid Computer (Fig 4)

A hybrid computer is a combination of both analog and digital computer. Hybrid computer can handle both analog and digital data. A hybrid computer combines the best characteristics of both the analog and digital computer. It can accept data in both analog and digital form.

Applications

Hybrid computer devices are used in hospitals that may calculate patient's heart function, temperature and blood pressure etc. This calculation may be converted into numbers and shown in digital form. For example, The Vital Signs Monitoring unit also called (VSM) in short. It has Blood Pressure monitor, ECG monitor, respiratory monitor, and is also used for monitoring anesthesia.

Fig 4



- Hybrid computers are also used in spaceships and missile system.
- Hybrid Computer Machines are generally used in scientific applications
- Hybrid computers are used for controlling industrial processes.

Computers are classified on the basis of computing power, memory capacity and cost.

- Microcomputer or Personal Computer.
- Mini Computer.
- Mainframe Computer.
- Super Computer.

Micro Computers

Micro computer is also called personal computer. It was introduced in 1970. Examples of personal computers are

PC and Apple Macintosh. The major types of personal computers are desktop computer and portable computer.

Desktop Computer

These computers can easily fit on a table or desktop, hence the name. These computers come in two models or casings. In Desktop model, the system unit is placed on the desktop or table. Monitor is placed on the system unit. In Tower model, both monitor and system unit are placed on the table as in (Fig 5).

Fig 5



Portable computer

Portable is a personal computer that can be carried from one place to other easily. Notebook computer and handheld computer (smart phone) are examples of portable computers. Notebook computer is also called laptop computer. Laptop computers are very small in size and can be placed easily on lap.

Lap top computer or notebook computer

The laptop computer or notebook computer will be as shown in Fig 6 and 7. It is also called as tower model computer.

Palmtop Computer/Digital Diary /Notebook /PDAs:

A handheld computer (like smart phone) is also portable. Hand held computer is known as palmtop computer.

Fig 6

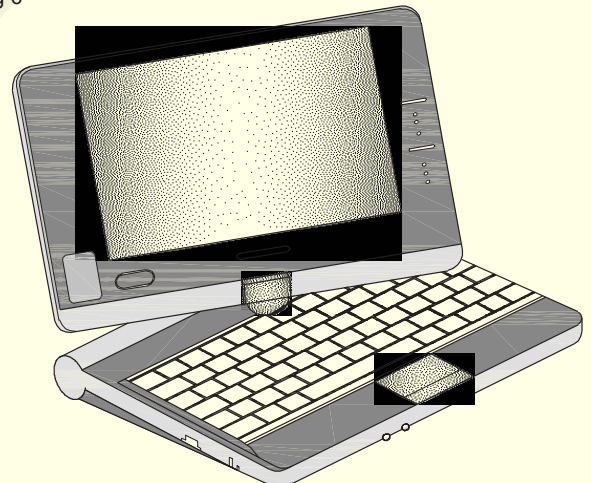


Fig 7



Palmtops have no keyboard but the screen serves both as an input and output device. It easily fits in the hand of the user.

Uses of Micro Computer

The PC is the most common type of computer used in the office. It is now widely used in many homes. These are also used for business and engineering application.

Mini Computer

Mini computers were introduced in the 1960s. Minicomputer is larger and more powerful computer than personal computer. It can execute five million instructions per second. It generally consists of two or more process ors.

Minicomputer can serve up to 4000 connected users simultaneously. It is normally accessed by users via personal computer or terminal. A device with a monitor and keyboard is called terminal. It is also known as dumb terminal. It has no processing power and cannot work as stand-alone computer.

Uses of Mini Computer

Mini computers are often used by small and medium-sized companies to provide centralized store of information.

Mainframe Computer

Mainframe computers were introduced in 1975. A mainframe computer is a very large computer in size. It is processors. It is designed to perform multiple tasks for multiple users at the same time. Mainframe computers can serve up to 50,000 users at the same time.

The users access a mainframe computer through terminal or personal computer. A typical mainframe computer can execute 16 million instructions per second. Some of the main computers models are

- NEC 610
- DEC 10

Uses of Mainframe Computer

Mainframe computers are used primarily by corporate and governmental organizations for critical applications, bulk data processing such as senses, industry and consumer statistics, and transaction processing.

Super computer

Super computers were introduced in 1980s. Super computer is the fastest computer. Super computer is the biggest in size and the most expensive in price than any other computers.

It is the most sophisticated, complex and advanced computer. It has a very large storage capacity. It can process trillions of instructions in one second. Super Computer is the fastest and most powerful computer of a time. Supercomputers are very expensive. Supercomputers are used for highly calculation-intensive tasks. Super computers are also used for specialized applications that require immense amounts of mathematical calculations.

Applications of Super Computer

- Weather forecasting,
- Animated graphics like in Hollywood movies,
- Fluid dynamic calculations
- Nuclear energy research
- Space science
- Weapon and missile design
- Petroleum exploration, and etc.

The main difference between a supercomputer and a mainframe is that a supercomputer channels all its power into executing a single program as fast as possible, whereas a mainframe uses its power to execute many programs concurrently. The modern super computer consists of thousands of microprocessors. Super computer uses high-speed facilities such as satellite for online processing.

Advantages of computers

- A computer has a very high processing speed with high reliability.
- Large volume of information can be stored in the memory any particular data/program can be retrieved immediately.
- Solution to a complicated problem is possible at a very high speed.
- Processing of large volume of data saves a lot of clerical work which reduces the processing cost.
- Computers perform operations efficiently at environments where presence of human being is not possible such as furnace, poisonous atmosphere, vacuum, unmanned satellite, etc.

Limitation of computers

- High initial cost.
- Input information has to be prepared in the form of statements called program which requires a considerable amount of knowledge.
- usage of computers will be economical only when there is clerical data processing for large volume of data and are repetitive in nature
- It is a merely a machine it cannot correct errors on its own.

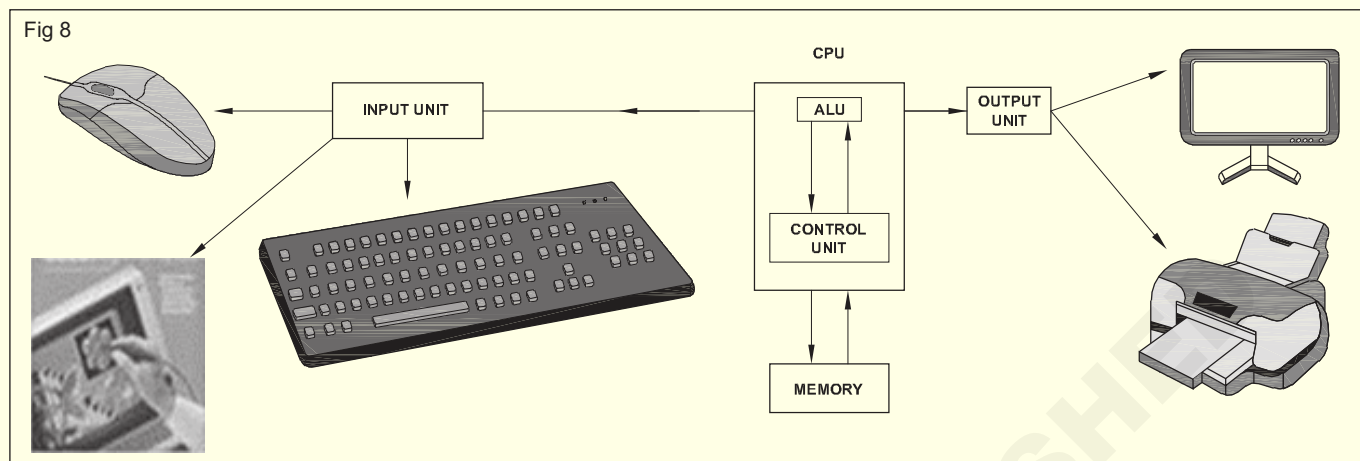
Functions of Computers

All computers are made up of following basic units as shown in Fig 8. They are as follows:-

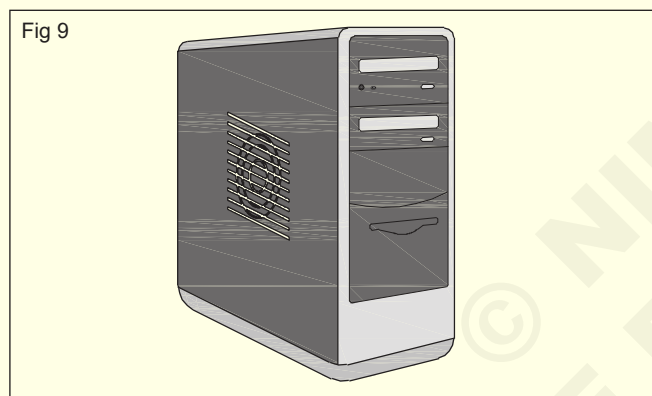
- Input Unit
- Central processing Unit (CPU)
 - a) Arithmetic Logic Unit(ALU)
 - b) Control Unit (CU)
- Memory
- Output Unit

Input Unit

Computers need to receive data and instruction in order to solve any problem. Therefore we need to input the data and instructions into the computers. The input unit consists of one or more input devices. Keyboard is the one of the most commonly used input device.



Central Processing Unit (CPU) (Fig 8)



The central processing unit (CPU) is the electronic brain of the computer as in Fig 9. The CPU in a personal computer is usually a single chip. It organizes and carries out instructions that come from either the user or from the software. The processor is made up of many components. CPU performs the following functions:

- It performs all calculations.
- It takes all decisions.
- It controls all units of the computer.

Two typical components of a CPU are the following:

The arithmetic logic unit (ALU), which performs arithmetic and logical operations.

The control unit (CU), which extracts instructions from memory and decodes and executes them, calling on the ALU when necessary.

Memory

Memory refers to the physical device used to store the program or data on the temporary or permanent basis for use in a computer or other digital electronic device.

Input devices perform the following functions.

- Accept the data and instructions from the outside world.
- Convert it to a form that the computer can understand.
- Supply the converted data to the computer system for further processing.

There are two types of memory in computer.

- Primary Memory
- Secondary Memory

Output Unit

Output unit receive the informations from the processing unit and provide the results in human readable form.

Output Devices

The some of the output devices are

- Monitor
- Printer
- Plotter
- Speaker

Applications of computers

Science: Scientists have been using computers to develop theories and to analyse and test the data. The high speed and accuracy of the computer allow different scientific analyses to be carried out. They can be used to generate detailed studies of how earthquakes affect buildings or pollution affects weather pattern. Satellite-based applications have not been possible without the use of computers. Moreover, it would not be possible to get the information of the solar system and the cosmos without computers.

Education: Computers have also revolutionized the whole process of education. Currently, the classrooms, libraries and museums are efficiently utilizing computers to make the education much more interesting. Unlike recorded television shows, computer-aided education (CAE) and computer-based training (CBT) packages are making learning much more interactive.

Medicine and Health Care: There has been an increasing use of computers in the field of medicine.

Now, doctors are using computers right from diagnosing the illness to monitoring a patient's status during complex surgery. By using automated imaging techniques, doctors are able to look inside a person's body and can study each organ in detail (e.g. CT scans or MRI scans), which was not possible few years ago. There are several examples of special-purpose computers that can operate within the human body such as cochlear implant, a special kind of hearing aid that makes it possible for deaf people to hear.

Engineering/Architecture/Manufacturing: The architects and engineers are extensively using computers in designing and drawings. Computers can create objects that can be viewed from all the three dimensions. By using techniques like virtual reality, architects can explore houses that have been designed but not built. The manufacturing factories are using computerized robotic arms to perform hazardous jobs. Besides, computer-aided manufacturing (CAM) can be used in designing the product, ordering the parts and planning production. Thus, computers help in coordinating the entire manufacturing process.

Entertainment: Computers are finding greater use in entertainment industry. They are used to control the images and sounds. The special effects, which mesmerize the audience, would not have been possible without the computers. In addition, computerized animation and colourful graphics have modernized the film industry.

Communication: E-mail or electronic mail is one of the communication media in which computer is used. Through e-mail, messages and reports are passed from one person to one or more persons with the aid of computer and telephone line. The advantage of this service is that while transferring the messages it saves time, avoids wastage of paper and so on. Moreover, the person who is receiving the messages can read the messages whenever he is free and can save it, reply it, forward it or delete it from the computer.

Business Application: This is one of the important uses of the computer. Initially, computers were used for batch-processing jobs, where one does not require the immediate response from the computer. Currently, computers are mainly used for real-time applications (like at the sales counter) that require immediate response from the computer. There are various concerns where computers are used such as in business forecasting, to prepare pay bills and personal records, in banking operations and data storage, in various types of life insurance business and as an aid to management. Businesses are also using the networking of computers, where a number of computers are connected together

to share the data and the information. Use of e-mail and the Internet has changed the ways of doing business.

Publishing: Computers have created a field known as desktop publishing (DTP). In DTP, with the help of computer and a laser printer one can perform the publishing job all by oneself. Many of the tasks requiring long manual hours such as making table of contents and index can be automatically performed using the computers and DTP software.

Banking: Computers are extensively used in the field of banking and finance. People can use the ATM (automated teller machine) services 24 hours a day to deposit and withdraw cash. When different branches of the bank are connected through computer networks, the inter branch transactions such as cheque and draft can be performed without any delay.

Railway Reservation System

Using this system, the user can perform following operations through online. (web site: www.irctc.co.in)

- search the train and its timings
- check seats and berth availability
- booking and cancelling tickets
- status of PNR (Passenger Name Record)

Telephone / Electricity Board Billing:

The users can do the following operations through online by using this system. (Web site: portal.bsnl.in - BSNL)

- Register the telephone / electricity board number
- Check and pay the bill amount
- Register the complaints

E-Governance

E-Governance implies technology driven governance. E-Governance is the application of Information and Communication Technology (ICT) for delivering government services, exchange of information communication transactions, integration of various stand-alone systems and services between Government-to-Citizens (G2C), Government-to-Business(G2B), Government-to-Government(G2G) as well as back office processes and interactions within the entire government frame work.

E-Governance covers all the sectors with a view to providing hassle free, transparent and efficient service to the common man (both in urban and rural areas).

Safety practice and signs

Objectives: At the end of this lesson you shall be able to

- **safe Practicing Workplace**
- **rules for workplace safety**
- **safety signs**
- **scope of DTPO Trade and lab safety**

Safe Practicing Workplace

The following features are helpful in implementing safe work practices at workplace:

- Induction training for new employees.
- Training on communication and teamwork during normal and emergency situation.
- Training on fire safety and emergency procedures.
- Training on hazard identification, risk control, use of personal protection equipment (PPE) and first aid.
- Observation of ergonomics to reduce injuries to workers.
- Use and maintenance of appropriate tools for work and keeping them in good working condition.
- Handling, application, labelling and storage of hazardous and non-hazardous materials so the workers are not exposed to danger.
- Housekeeping, cleaning and waste disposal considering environment safety and health (ESH).

Safe Practicing Workplace

- **Preventing workplace incidents is everyone's job, and your personal safety is your responsibility.**

Everyone has a role in making sure a workplace is safe, from the administrative assistant who gets the boxes of newly delivered office supplies unpacked promptly to the warehouse foreman who makes sure every person on the line gets a break. When you take charge of your own safety, it creates a safer place for all employees.

- **Dress appropriately, from clothing to footwear.**

Keeping arms and legs covered, avoiding dangling jewelry or ties, and wearing closed-toe shoes can go a long way in minimizing common workplace injuries and accidents. When and where applicable, always wear personal protective equipment (PPE), and inspect it for damage before and after use, so that it can be repaired or replaced promptly.

- **Keep work areas neat and tidy.**

At the beginning and end of each shift, clear away trash, pick up cords and cables, and put office supplies away. Gather any materials you'll need to complete your work. This will avoid losing things as well as having to bend or stretch unnecessarily,

trying to reach objects that are misplaced or out of reach.

- **Follow the rules.**

Don't cut corners or take unnecessary risks. Workplace safety rules are often developed in response to hazard and risk assessments. They are by nature designed to minimize the chances that an employee will be injured while carrying out assigned tasks.

- **Report workplace accidents or safety incidents.**

Always report incidents to your supervisor promptly so that the appropriate steps can be taken. These can include getting care for an injured employee, fixing the problem that caused the injury, or ensuring regulatory, state or federal reporting compliance.

- **Know and follow emergency procedures.**

In order to safely and effectively manage emergencies, it's imperative that all employees are trained in and follow emergency procedures. This helps safety coordinators and emergency services get a handle on a situation and determine the best way to bring it under control.

- **Lift, bend, and stretch with care to avoid injury.**

Musculoskeletal problems caused by poor technique when picking up boxes or stretching to reach objects is a common cause of workplace injury. If you're not sure how to best lift, bend or stretch at work, ask your supervisor or company safety officer.

- **Don't operate tools or machinery that you haven't been trained for.**

While some tools or equipment may seem pretty intuitive, it's always best to avoid using items unless you've been trained in proper handling. This is for your safety as well as the safety of those around you.

- **Avoid drugs and alcohol at work.**

Not only can drugs and alcohol affect your motor skills, they can also impair your judgment and ability to communicate. Even prescription drugs can have a serious effect on your ability to handle machinery and tools safely.

- **Take breaks appropriately.**

Being well-rested helps employees maintain

the focus and situational safety awareness that contribute to workplace safety. In some places, work breaks may be established according to contract; in others, it's on the employees to work out breaks among themselves.

Safety signs

- **Red**
 - Prohibition sign
 - Dangerous behaviour; stop; shutdown; evacuate
- **Yellow / Amber**
 - Warning sign
 - Be careful; take precautions; examine
- **Blue**
 - Mandatory sign
 - Specific behaviour or action; wear protective equipment
- **Green**
 - Emergency escape / First-aid sign

Fig 1

Shape	Meaning	Color	Examples
	Prohibition	Red	No smoking
	Mandatory	Blue	Wear seat belt
	Warning	Yellow	Caution: slippery floor
	Emergency escape	Green	First aid
	Fire	Red	Fire exit

- Doors; exits; escape routes; equipment and facilities

Scope DTPO Trade :

Scope and Opportunities

- DTP operators work includes publishing, graphic design, advertising, printing and reprographics companies. Some DTP operators are self-employed.
- There are opportunities in India but more opportunities abroad. In spite of high employment opportunities the job market is highly competitive.

Lifestyle & Social Status

- Its indoor job

- The money is good if you are known in the industry
- Work from home

Job Profile / Tasks

DTP Operator:

- Working to a design brief from the client or designer
- Using DTP software to design each page of the publication
- Selecting and formatting, the size and style of type, column width and spacing
- Selecting and checking colors
- Scanning and editing photographs and other images.

Desktop Publisher

- Do proof read to see if there are any errors and make necessary changes
- Operate desktop publishing software and equipment to design, and produce a print-ready copy
- Use monitors for visual presentation while working and instructing and feedback throughout process, for making necessary modifications
- Store copies of publications in every possible way to avoid misplacement

Skill Sets

- Have excellent computer skills and knowledge
- Be creative, with an eye for good design
- Be able to prioritize a varied workload
- Work well under pressure and to strict deadlines
- Enjoy doing artistic work.

Work Value

- Dedication
- Commitment
- responsibility

Current Job Scenario

Desktop publishers can earn up to Rs. 10000 per month. They may earn more than this depending on what kind of clients and projects they are working on.

Top Recruiters

- Hospital
- School
- other large and small businesses.

Introduction of computer

Objectives: At the end of this lesson you shall be able to

- **computer components**
- **introduction to Computer System**
- **concepts of Hardware and Software**

Computer Components

A computer device is made up of various elements which help in its effective functioning and processing. There are five basic components of the computer which help in making this processing of data easier and convenient.

- 1 Input Unit
- 2 Output Unit
- 3 Memory Unit
- 4 Control Unit
- 5 Arithmetical and Logical Unit

To have a better understanding of the Fundamentals of Computer.

The exterior of any computerised device may look different and may also have varied features, but the basic components remain the same for their functioning.

Input Unit

- A computer will only respond when a command is given to the device. These commands can be given using the input unit or the input devices.
- The data entered can be in the form of numbers, alphabet, images, etc. We enter the information using an input device, the processing units convert it into computer understandable languages and then the final output is received by a human-understandable language.

Output Unit

- When we command a computer to perform a task, it reverts for the action performed and gives us a result. This result is called output. There are various output devices connected to the computer. The most basic of which is a monitor. Whatever we write using a keyboard or click using a mouse, is all displayed on the monitor.
- Thus, the output unit gives us the final result once the entire processing is done within the mechanism of a device.
- To get a list of computer input and output devices and the function of the various I/O devices.

Memory Unit

- When we enter the data into the computer using an input device, the entered information immediately gets saved in the memory unit of the Central

Processing Unit (CPU). Because of the presence of some existing programming, the Memory Unit transmits the data further to the other parts of the CPU.

Control Unit

- This is the core unit which manages the entire functioning of the computer device. It is one of the most essential components of the computer system.
- The Control Unit collects the data entered using the input unit, leads it on for processing and once that is done, receives the output and presents it to the user. It can be said to be the centre of all processing actions taking place inside a computer device.
- Basically, the instructions taken, interpretation of entered data, issuing signals to execute the data and then finally retrieving the data is all done in the Control Unit.
- As the name suggests, all the mathematical calculations or arithmetic operations are performed in the Arithmetic and Logical Unit of the CPU.
- It can also perform actions like a comparison of data and decision-making actions. The ALU comprises circuits using which addition, subtraction, multiplication, division and other numerical based calculations can be performed.

Arithmetic and Logical Unit

- All these three units are elements of CPU and together help in the efficient working and processing of data. It is also known as the "Brain of Computer" and no action can be conducted by a device without the execution and permission of the Central Processing Unit.

Central Processing Unit (CPU)

The Central Processing Unit is the core of any computer devices. It comprises three major components of the computer which have been discussed above:

- Memory Unit
- Control Unit

Introduction to Computer System

Input-Process-Output Model

Computer input is called data and the output obtained after processing it, based on user's instructions is called information. Raw facts and figures which can

Fig 1

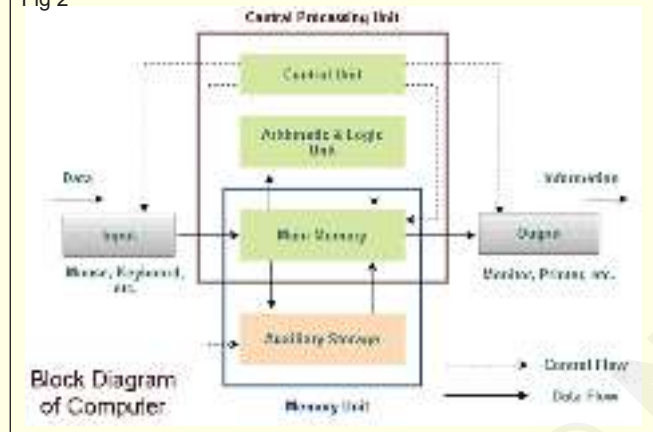


be processed using arithmetic and logical operations to obtain information are called data.

The processes that can be applied to data are of two types –

- **Arithmetic operations** – Examples include calculations like addition, subtraction, differentials, square root, etc.
- **Logical operations** – Examples include comparison operations like greater than, less than, equal to, opposite, etc.

Fig 2



The corresponding figure for an actual computer looks something like this –

The basic parts of a computer are as follows –

- **Input Unit** – Devices like keyboard and mouse that are used to input data and instructions to the computer are called input unit.
- **Output Unit** – Devices like printer and visual display unit that are used to provide information to the user in desired format are called output unit.
- **Control Unit** – As the name suggests, this unit controls all the functions of the computer. All devices or parts of computer interact through the control unit.
- **Arithmetic Logic Unit** – This is the brain of the computer where all arithmetic operations and logical operations take place.
- **Memory** – All input data, instructions and data interim to the processes are stored in the memory. Memory is of two types – **primary memory** and **secondary memory**. Primary memory resides within the CPU whereas secondary memory is external to it.

Control unit, arithmetic logic unit and memory are together called the **central processing unit** or **CPU**. Computer devices like keyboard, mouse, printer, etc. that we can see and touch are the **hardware** components of a computer. The set of instructions

or programs that make the computer function using these hardware parts are called **software**. We cannot see or touch software. Both hardware and software are necessary for working of a computer.

Characteristics of Computer

To understand why computers are such an important part of our lives, let us look at some of its characteristics –

- **Speed** – Typically, a computer can carry out 3-4 million instructions per second.
- **Accuracy** – Computers exhibit a very high degree of accuracy. Errors that may occur are usually due to inaccurate data, wrong instructions or bug in chips – all human errors.
- **Reliability** – Computers can carry out same type of work repeatedly without throwing up errors due to tiredness or boredom, which are very common among humans.
- **Versatility** – Computers can carry out a wide range of work from data entry and ticket booking to complex mathematical calculations and continuous astronomical observations. If you can input the necessary data with correct instructions, computer will do the processing.
- **Storage Capacity** – Computers can store a very large amount of data at a fraction of cost of traditional storage of files. Also, data is safe from normal wear and tear associated with paper.

Concepts of Hardware and Software

Hardware

The term hardware refers to mechanical device that makes up computer. Computer hardware consists of interconnected electronic devices that we can use to control computer's operation, input and output.

Fig 3



Examples of hardware are CPU, keyboard, mouse, hard disk, etc.

Hardware Components

Computer hardware is a collection of several components working together. Some parts are essential and others are added advantages. Computer hardware is made up of CPU and peripherals as shown in image

Fig 4

The diagram illustrates the components of a computer system. A central box contains the CPU and Memory. The CPU is at the top, and the Memory is at the bottom, consisting of RAM and CD. A double-headed arrow labeled 'Data' and 'Information' connects the CPU and Memory. To the left of the CPU box, there are four input devices: Keyboard, Mouse, Other input, and Other input. Arrows from these devices point to the CPU box. To the right of the CPU box, there are four output devices: Monitor, Printer, Speaker, and Other output. Arrows from the CPU box point to these devices.

Software

- System software
- Application software

System software operates directly on hardware devices of computer. It provides a platform to run an application. It provides and supports user functionality. Examples of system software include operating systems such as

Fig 5



The figure displays six logos arranged in two rows. The top row includes the Microsoft Windows XP logo (four colored panes), the Windows 2000 logo (four colored panes with a document icon), the Windows Vista logo (a circular globe with four colored panes), and the Apple logo (a silver apple with a bite taken out). The bottom row includes the Windows 7 logo (four colored panes) and the Linux logo (a black square with the word 'Linux' in white script).

Application Software

Fig 6



Sl.No.	Software	Hardware
1	It is a collection of programs to bring computer hardware system into operation.	It includes physical components of computer system.
2	It includes numbers, alphabets, alphanumeric symbols, identifiers, keywords, etc.	It consists of electronic components like ICs, diodes, registers, crystals, boards, insulators, etc.
3	Software products evolve by adding new features to existing programs to support hardware.	Hardware design is based on architectural decisions to make it work over a range of environmental conditions and time.
4	It will vary as per computer and its built-in functions and programming language.	It is mostly constructed for all types of computer systems.
5	It is designed and developed by experienced programmers in high-level language.	The hardware can understand only low-level language or machine language.
6	It is represented in any high-level language such as BASIC, COBOL, C, C++, JAVA, etc.	The hardware works only on binary codes 1's and 0's.
7	The software is categorized as operating system, utilities, language processor, application software, etc.	The hardware consists of input devices, output devices, memory, etc.

Booting

Starting a computer or a computer-embedded device is called booting. Booting takes place in two steps –

- Switching on power supply
- Loading operating system into computer's main memory
- Keeping all applications in a state of readiness in case needed by the user

The first program or set of instructions that run when the computer is switched on is called **BIOS** or **Basic Input Output System**. BIOS is a **firmware**, i.e. a piece of software permanently programmed into the hardware.

If a system is already running but needs to be restarted, it is called **rebooting**. Rebooting may be required if a software or hardware has been installed or system is unusually slow.

There are two types of booting –

Fig 7



- **Cold Booting / Hard Booting**– When the system is started by switching on the power supply it is called cold booting. The next step in cold booting is loading of BIOS.
- **Warm Booting / Soft Booting** – When the system is already running and needs to be restarted or rebooted, it is called warm booting. Warm booting is faster than cold booting because BIOS is not reloaded.

Function of motherboard and processors

Objectives: At the end of this lesson you shall be able to

- **functions of Motherboard Components**
- **various Processor**

Functions of Motherboard Components

Definition of the Motherboard :

- A motherboard is the main circuit board inside a computer that connects the different parts of a computer together. It has sockets for the CPU, RAM and expansion cards and it also hooks up to hard drives, disc drives and front panel ports with cables and wires.
- Motherboard is also known as a mainboard, planar board or logic board, system board, mobo or MB. It links all the individual parts of a computer together and also, allows the CPU to access and control these separate parts. Other than bridging internal components, the motherboard ports also allows you to connect external devices to the computer. Such external devices would include the monitor, speakers, headphones, microphone, keyboard, mouse, modem and other USB devices.

The functions of a computer motherboard are as follows:

- The motherboard acts as the central backbone of a computer on which other modular parts are installed such as the CPU, RAM and hard disks.
- The motherboard is also responsible to distribute power to the various components of the computer.
- They are also used in the coordination of the various devices in the computer and maintain an interface among them.

Motherboard Components and Connectors

- A typical Asus P5N32-E SLI motherboard with constituent components is given below: (Fig 1)

Fig 1



• **PCI SLOT (Peripheral Component Interconnect):**

PCI slots are used to Insert or install Add-on cards, such as LAN cards, Sound cards, Capture cards and TV tuner cards. There are usually anywhere from 1 to 6 PCI slots available on the motherboard (above board has 2 PCI slots.), they have decreased in number and are being replaced by the PCI Express 1x slots.

- **PCI-E 16x Slot :** the most common slot for Graphics cards, the PCI Express 16x slots provides 16 separate lanes or data transfer. These are the 16x speed versions, which are currently the fastest. PCI-E 16x allows up to 4 GB/s of peak bandwidth per direction, and up to 8 GB/s concurrent bandwidth.

- **PCI-E 1x Slot :** Single slot - In the PCIe 1.x generation, each lane (1x) carries 250 MB/s compared to 133 MB/s for the PCI slots. These can be used for expansion cards such as Sound Cards, or Ethernet Cards.

- **Northbridge:** This allows communication between the CPU and the system memory and PCI-E slots. It is a focal Point of Motherboard and It is also called as Memory Controller Hub.

- **ATX 12V 2X and 4 Pin Power Connection :** This is one of two power connections that supply power to the motherboard. This connection will come from your Power Supply.

- **CPU-Fan Connection:** This is where the CPU fan will connect. Using this connection over one of the power supply will allow the motherboard to control the speed of the fan, based on the CPU temperature.

- **Socket:** This is where the CPU will plug in. The orange bracket that is surrounding it is used for high end heat sinks. It helps to support the weight of the heat sink.

- **DIMM slots:** DIMM's are by far and away the most used memory types in today's computers. They vary in speeds and standards however and they need to match up to what your motherboard has been designed to take. The four standards of DIMM's being used at the moment are SDR (Single Data Rate), DDR (Double Data Rate), DDR2 and DDR3. The speeds of memory can vary between 66Mhz to 1600Mhz.

- **ATX Power Connector:** This is the second of two power connections. This is the main power connection for the motherboard, and comes from the Power Supply.

systems. The control unit and arithmetic logic unit are the two significant components of the processors.

The logic functions can be addition, multiplication, subtraction and division whereas the control unit manages the traffic flow which follows the operation or command according to the input instruction.

What is Processor

Definition – Processor is known as “**Microprocessor**“, and it looks like a small type of chip that is placed in the computers and other electronics components. Processor can manage all instructions such as arithmetical, logical, input/output (I/O) and other basic instructions, which are created by hardware or **operating system**. Its main job role is to obtain input from input devices and then produce the accurate result on the output devices. Now these days, more advanced processors are available in the market, which are capable to control trillions of instructions in per second.

CPU types

In Types of CPU, CPU is expanded as a central processing unit which is the main and central processor in the electronic circuitry located inside the system. It executes commands according to the computer program. It performs fundamental arithmetic logic, input and output operations, control circuits that follow the program fed in the computer. The term CPU is known as a processor which comprises of the control unit and process unit differentiating the core elements of a computer apart from the external devices like I/O circuitry and main memory. The trending CPU is now available in the form of microprocessors which comprises unit metal-dioxide-semiconductor in the integrated circuits. An integrated chip comprises CPU along with peripheral interfaces, memory chips, microcontrollers, and other systems on the chip. Few systems employ multiple core processor enclosed in a single socket termed as CPU cores.

Types of CPU

The CPU is a vital element that manages all the calculations and commands which are transferred to other components of the computer and its peripherals. The rapid speed of CPU obeys to command of the input program. The components are dependent and powerful when linked to the CPU. So it is necessary to choose the right one and program it accordingly. The leading manufacturers of CPU are AMD and Intel. In the past, the processors are employed to find the right and robust processor.

The Intel 486 is rapid than 386, but after introducing the Pentium processor, all the processors are named like Duron, Celeron, Pentium, and Athlon. The various types of the processor are built in different architecture like 64 bit and 32 bit with maximum speed and flexible capacity. The major types of CPU are classified as single-core, dual-core, Quad-core, Hexa core, Octa-core, and Deca core processor which is explained below.

Single-core CPU

It is the oldest type of CPU which is available and employed in most of the personal and official computers. The single-core CPU can execute only one command at a time and it is not efficient in multi-tasking. It signifies that there is a markable declination in performance if more than a single application is executed. If one operation is started, the second process should wait until the first one is finished. But if it is fed with multiple operations, the performance of the computer is drastically reduced. The performance of a single-core CPU is based on its clock speed by measuring its power.

Dual-core CPU

It is a single CPU that comprises of two strong cores and functions like dual CPU acting like one. Unlike the CPU with a single core, the processor must switch back and forth within a variable array of data streams and if or more thread is executed, the dual-core CPU manages the multitasking effectively. To utilize the dual-core CPU effectively, the running programs and operating system should have a unique code called simultaneous multi-threading technology embedded in it. Dual-core CPU is rapid than a single core but it is not robust as quad-core CPU.

Quad-core CPU

The quad-core CPU is a refined model of multiple core CPU features and design with four cores on a single CPU. Similar to dual-core CPU, that divides the workload in between the cores, and quad-core enables for effective multitasking. It doesn't signify any single operation which is four times faster rapid than others. Unless the applications and program executed on it by SMT code will fasten the speed and becomes unnoticeable. Such types of CPU are used in people who need to execute multiple different programs at the same time as gamers, series of supreme commander that is optimized in multiple core CPU.

Hexa Core processors

It is another multiple core processor which is available with six cores and can execute the task which works rapidly than the quad-core and dual-core processors. For users of the personal computer, the processors of Hexacore is simple and now the Intel is launched with Intel core i7 in 2010 with Hexa core processor. But here the users of smartphones use only quad-core and dual-core processors. Nowadays, smartphones are available with hexacore processors.

Octa-core processors

The dual-core is built with two cores, four cores are built-in quad-core, Hexa comes with six cores where the octa processors are developed with eight independent cores to execute an effective task that is efficient and even acts rapidly than quad-core processors. Trending octa-core processors comprises of a dual set of quad-core processors that divides different activities between the various types. Many times, the minimum powered core sets are employed to produce advanced tasks. If

there is any emergency or requirement, the rapid four sets of cores will be kicked in. In precise, the octa-core is perfectly defined with dual-code core and adjust it accordingly to give the effective performance.

Deca-core processor

The processor with double core comprises two cores, 4 cores are available with quad cores, six cores are available in hexacore processors. Deca-core is available with ten independent systems that are deployed to execute and manage the task that is successful than other processors that are developed until now. Owning a PC, or any device made with a deca-core processor is the best option. It is faster than other processors and very successful in multi-tasking. Deca-core processors are trending with its advanced features. Most of the smartphones are now available with Deca core processors with low-cost and never become outdated. Surely, most gadgets in the market are updated with new processors to give more useful purposes to people.

Mainstream processors of CPU

The mid-range processors are called mainstream processors which is comparatively larger and manages

high-performance tasks like video editing, 3D gaming, and other multimedia oriented applications. It is similar to budget-friendly processors that are implemented to execute the fundamental task in a cost-effective method. Such a CPU can be easily managed to operate office programs, photo editing, web browsing, and other basic tasks.

32-bit CPU

- This are the older processor .32-bit processor has a structure that can process instructions less efficiently
- 32-bit processor can handle less instruction at one time
- 32-bit processor can only handle 4GB of memory
- Even though a 32-bit processor can handle up to 4GB of memory, having that much memory on a 32-bit processor will not make it perform quicker.

64-bit CPU

- 64-bits is larger than 32-bits, that means that a 64-bit processor can handle more instructions in one load.
- 64-bit processor which can handle up to 17 billion GB) of memory or RAM.

Various input & output devices and there features

Objectives: At the end of this lesson you shall be able to

- various Input devices and their uses
- various output devices and their uses
- various memory

Various Input Devices and their uses

- Keyboard
- Mouse
- Joy Stick
- Light pen
- Track Ball
- Scanner
- Graphic Tablet
- Microphone
- Magnetic Ink Card Reader(MICR)
- Optical Character Reader(OCR)
- Bar Code Reader
- Optical Mark Reader(OMR)

Keyboard

Keyboard is the most common and very popular input device which helps to input data to the computer. The

The keys on the keyboard are as follows –

S.No	Keys & Description
1	Typing Keys These keys include the letter keys (A-Z) and digit keys (09) which generally give the same layout as that of typewriters.
2	Numeric Keypad It is used to enter the numeric data or cursor movement. Generally, it consists of a set of 17 keys that are laid out in the same configuration used by most adding machines and calculators.
3	Function Keys The twelve function keys are present on the keyboard which are arranged in a row at the top of the keyboard. Each function key has a unique meaning and is used for some specific purpose.
4	Control keys These keys provide cursor and screen control. It includes four directional arrow keys. Control keys also include Home, End, Insert, Delete, Page Up, Page Down, Control(Ctrl), Alternate(Alt), Escape(Esc).
5	Special Purpose Keys Keyboard also contains some special purpose keys such as Enter, Shift, Caps Lock, Num Lock, Space bar, Tab, and Print Screen.

Mouse

Mouse is the most popular pointing device. (Fig 2) It is a very famous cursor-control device having a small palm size box with a round ball at its base, which senses the movement of the mouse and sends corresponding

Fig 1



layout of the keyboard is like that of traditional (Fig 1) typewriter, although there are some additional keys provided for performing additional functions.

Keyboards are of two sizes 84 keys or 101/102 keys, but now keyboards with 104 keys or 108 keys are also available for Windows and Internet.

signals to the CPU when the mouse buttons are pressed. Generally, it has two buttons called the left and the right button and a wheel is present between the buttons. A mouse can be used to control the position of the cursor on the screen, but it cannot be used to enter text into the computer.

Fig 2



Advantages

- Easy to use
- Not very expensive
- Moves the cursor faster than the arrow keys of the keyboard.

Joystick

Joystick is also a pointing device, which is used to move the cursor position on a monitor screen. It is a stick having a spherical ball at its both lower and upper ends. The lower spherical ball moves in a socket. The joystick can be moved in all four directions. (Fig 3)
The function of the joystick is similar to that of a mouse.

Fig 3



It is mainly used in Computer Aided Designing (CAD) and playing computer games.

Light Pen

Light pen is a pointing device similar to a pen. It is used to select a displayed menu item or draw pictures on the monitor screen. It consists of a photocell and an optical system placed in a small tube. (Fig 4)

When the tip of a light pen is moved over the monitor screen and the pen button is pressed, its photocell

Fig 4



sensing element detects the screen location and sends the corresponding signal to the CPU.

Track Ball

Fig 5



Track ball is an input device that is mostly used in notebook or laptop computer, instead of a mouse. This is a ball which is half inserted and by moving fingers on the ball, the pointer can be moved. (Fig 5)

Since the whole device is not moved, a track ball requires less space than a mouse. A track ball comes in various shapes like a ball, a button, or a square.

Scanner

Fig 6



Scanner is an input device, which works more like a photocopy machine. It is used when some information is available on paper and it is to be transferred to the hard disk of the computer for further manipulation. (Fig 6)

Scanner captures images from the source which are then converted into a digital form that can be stored on the disk. These images can be edited before they are printed.

Fig 7



Digitizer

Digitizer is an input device which converts analog information into digital form (Fig 7). Digitizer can convert a signal from the television or camera into a series of numbers that could be stored in a computer. They can be used by the computer to create a picture of whatever the camera had been pointed at.

Digitizer is also known as Tablet or Graphics Tablet as it converts graphics and pictorial data into binary inputs. A graphic tablet as digitizer is used for fine works of drawing and image manipulation applications.

Fig 8



Microphone

Microphone is an input device to input sound that is then stored in a digital form. (Fig 8)

The microphone is used for various applications such as adding sound to a multimedia presentation or for mixing music.

Magnetic Ink Card Reader (MICR)

MICR input device is generally used in banks as there are large number of cheques to be processed every day

Fig 9



(Fig 9) The bank's code number and cheque number are printed on the cheques with a special type of ink that contains particles of magnetic material that are machine readable.

This reading process is called Magnetic Ink Character Recognition (MICR). The main advantages of MICR is that it is fast and less error prone.

Optical Character Reader (OCR)

OCR is an input device used to read a printed text. (Fig 10)

Fig 10



OCR scans the text optically, character by character, converts them into a machine readable code, and stores the text on the system memory.

Bar Code Readers

Bar Code Reader is a device used for reading bar coded data (data in the form of light and dark lines). Bar coded data is generally used in labelling goods, numbering the books, etc. It may be a handheld scanner or may be embedded in a stationary scanner. (Fig 11)

Fig 11



Bar Code Reader scans a bar code image, converts it into an alphanumeric value, which is then fed to the computer that the bar code reader is connected to.

Optical Mark Reader (OMR)

OMR is a special type of optical scanner used to recognize the type of mark made by pen or pencil. (Fig 12) It is used where one out of a few alternatives is to be selected and marked.

Fig 12



It is specially used for checking the answer sheets of examinations having multiple choice questions.

Following are some of the important output devices used in a computer.

- Monitors
- Graphic Plotter
- Printer

Various Output Devices and their uses

Monitors

Monitors, commonly called as Visual Display Unit (VDU), are the main output device of a computer. It forms images from tiny dots, called pixels that are arranged in a rectangular form. The sharpness of the image depends upon the number of pixels.

There are two kinds of viewing screen used for monitors.

- Cathode-Ray Tube (CRT)
- Flat-Panel Display

Cathode-Ray Tube (CRT) Monitor

The CRT display is made up of small picture elements called pixels. (Fig 13) The smaller the pixels, the better the image clarity or resolution. It takes more than one illuminated pixel to form a whole character, such as the letter 'e' in the word help.

Fig 13



A finite number of characters can be displayed on a screen at once. The screen can be divided into a series of character boxes - fixed location on the screen where a standard character can be placed. Most screens are capable of displaying 80 characters of data horizontally and 25 lines vertically.

There are some disadvantages of CRT –

- Large in Size
- High power consumption

Flat-Panel Display Monitor

The flat-panel display refers to a class of video devices that have reduced volume, weight and power requirement in comparison to the CRT. (Fig 14) You can hang them on walls or wear them on your wrists. Current uses of flat-panel displays include calculators, video games, monitors, laptop computer, and graphics display.

Printers

Printer is an output device, which is used to print information on paper.

There are two types of printers –

Fig 14



- Impact Printers
- Non-Impact Printers

Impact Printers

Impact printers print the characters by striking them on the ribbon, which is then pressed on the paper.

Characteristics of Impact Printers are the following –

- Very low consumable costs
- Very noisy
- Useful for bulk printing due to low cost
- There is physical contact with the paper to produce an image

These printers are of two types –

- Character printers
- Line printers

Character Printers

Character printers are the printers which print one character at a time.

These are further divided into two types:

- Dot Matrix Printer(DMP)
- Daisy Wheel

Dot Matrix Printer

In the market, one of the most popular printers is Dot Matrix Printer. (Fig 15) These printers are popular

Fig 15



because of their ease of printing and economical price.

Advantages

- Inexpensive
- Widely Used
- Other language characters can be printed

Disadvantages

- Slow Speed
- Poor Quality

Daisy Wheel

Head is lying on a wheel and pins corresponding to characters are like petals of Daisy (flower) (Fig 16) it is called Daisy Wheel Printer. These printers are generally

Fig 16



used for word-processing in offices that require a few letters to be sent here and there with very nice quality.

Advantages

- More reliable than DMP
- Better quality
- Fonts of character can be easily changed

Disadvantages

- Slower than DMP
- Noisy
- More expensive than DMP

Line Printers

Line printers are the printers which print one line at a time. (Fig 17)

These are of two types –

- Drum Printer
- Chain Printer

Drum Printer

This printer is like a drum in shape hence it is called drum printer. The surface of the drum is divided into a number of tracks. Total tracks are equal to the size of the paper, i.e. for a paper width of 132 characters, drum will have 132 tracks. A character set is embossed on the

Fig 17



track. Different character sets available in the market are 48 character set, 64 and 96 characters set. One rotation of drum prints one line. Drum printers are fast in speed and can print 300 to 2000 lines per minute.

Advantages

- Very high speed

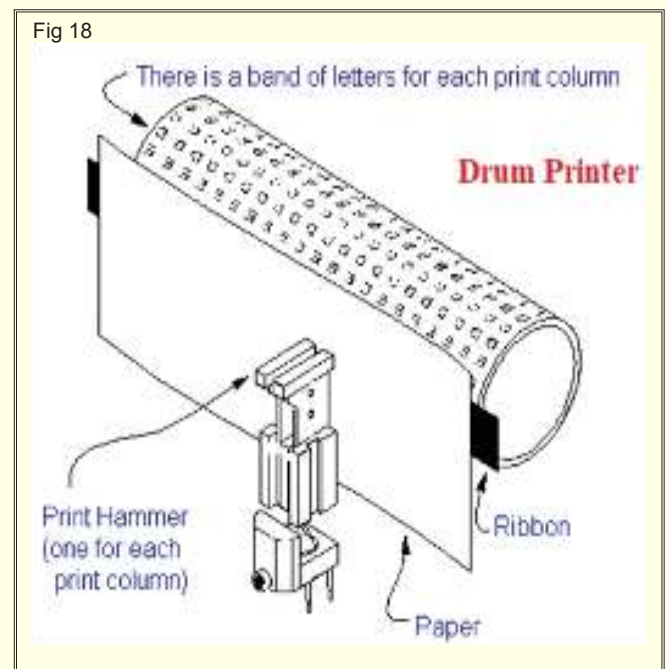
Disadvantages

- Very expensive
- Characters fonts cannot be changed

Chain Printer

In this printer, a chain of character sets is used, hence it is called Chain Printer. A standard character set may have 48, 64, or 96 characters. (Fig 18)

Fig 18



Advantages

- Character fonts can easily be changed.
- Different languages can be used with the same

printer.

Disadvantages

- Noisy

Non-impact Printers

Non-impact printers print the characters without using the ribbon. These printers print a complete page at a time, thus they are also called as Page Printers.

These printers are of two types –

- Laser Printers
- Inkjet Printers

Characteristics of Non-impact Printers

- Faster than impact printers
- They are not noisy
- High quality
- Supports many fonts and different character size

Laser Printers

These are non-impact page printers. They use laser lights to produce the dots needed to form the characters to be printed on a page. (Fig 19)

Fig 19



Advantages

- Very high speed
- Very high quality output
- Good graphics quality
- Supports many fonts and different character size

Disadvantages

- Expensive
- Cannot be used to produce multiple copies of a document in a single printing

Inkjet Printers

Inkjet printers are non-impact character printers based on a relatively new technology. (Fig 20) They print characters by spraying small drops of ink onto paper. Inkjet printers produce high quality output with presentable features.

Fig 20



They make less noise because no hammering is done and these have many styles of printing modes available. Color printing is also possible. Some models of Inkjet printers can produce multiple copies of printing also.

Advantages

- High quality printing
- More reliable

Disadvantages

- Expensive as the cost per page is high
- Slow as compared to laser printer

Various Memory

Memory :

Memory is the electronic holding place for the instructions and data a computer needs to reach quickly. It's where information is stored for immediate use. Memory is one of the basic functions of a computer, because without it, a computer would not be able to function properly.

Types of computer memory

In general, memory can be divided into primary and secondary memory.

Primary memory

Cache memory This temporary storage area, known as a cache, is more readily available to the processor than the computer's main memory source. It is also called CPU memory because it is typically integrated directly into the CPU chip or placed on a separate chip with a bus interconnect with the CPU.

- **RAM.** The term is based on the fact that any storage location can be accessed directly by the processor.
- **Dynamic RAM.** DRAM is a type of semiconductor memory that is typically used by the data or program code needed by a computer processor to function.
- **Static RAM.** SRAM retains data bits in its memory for as long as power is supplied to it. Unlike DRAM, which stores bits in cells consisting of a capacitor and a transistor, SRAM does not have to be periodically refreshed.

- **Double Data Rate SDRAM.** DDR SDRAM is SDRAM that can theoretically improve memory clock speed to at least 200 MHz.
- **Double Data Rate 4 Synchronous Dynamic RAM.** DDR4 RAM is a type of DRAM that has a high-bandwidth interface and is the successor to its previous DDR2 and DDR3 versions. DDR4 RAM allows for lower voltage requirements and higher module density. It is coupled with higher data rate transfer speeds and allows for dual in-line memory modules (DIMMS) up to 64 GB.
- **Rambus Dynamic RAM.** DRDRAM is a memory subsystem that promised to transfer up to 1.6 billion bytes per second. The subsystem consists of RAM, the RAM controller, the bus that connects RAM to the microprocessor and devices in the computer that use it.
- **Read-only memory.** ROM is a type of computer storage containing nonvolatile, permanent data that, normally, can only be read and not written to. ROM contains the programming that enables a computer to start up or regenerate each time it is turned on.
- **Programmable ROM.** PROM is ROM that can be modified once by a user. It enables a user to tailor a microcode program using a special machine called a PROM programmer.
- **Erasable PROM.** EPROM is programmable read-only memory PROM that can be erased and re-used. Erasure is caused by shining an intense ultraviolet light through a window designed into the memory chip.
- **Electrically erasable PROM.** EEPROM is a user-modifiable ROM that can be erased and reprogrammed repeatedly through the application of higher than normal electrical voltage. Unlike EPROM chips, EEPROMs do not need to be removed from the computer to be modified.
- **Virtual memory.** A memory management technique where secondary memory can be used as if it were a part of the main memory. Virtual memory uses

hardware and software to enable a computer to compensate for physical memory shortages by temporarily transferring data from RAM to disk storage.

Secondary Memory :

Hard Disk

A hard disk is a computer's permanent storage device. (Fig 21) It is a non-volatile disk that permanently stores data, programs, and files, and cannot lose stored data when the computer's power source is switched off. Typically, it is located internally on computer's motherboard that stores and retrieves data using one or more rigid fast rotating disk platters inside an air-sealed casing. It is a large storage device, found on every

Fig 22



computer or laptop for permanently storing installed software, music, text documentation, videos, operating system, and data until the user did not delete.

Floppy Disk

A floppy disk is a secondary storage system that consisting of thin, flexible magnetic coating disks for holding electronic data such as computer files. (Fig 22). It is also known as Floppy Diskette that comes in

Fig 21



Fig 23



three sizes like 8 inches, 5.5 inches and 3.5 inches. The stored data of a floppy disk can be accessed through the floppy disk drive. It is the oldest type of portable storage device, which can store data up to 1.44 MB. Since most programs were larger, that required multiple floppy

diskettes to store large amounts of data. Therefore, it is not used due to very low memory storage.

CD (Compact Disc)

A CD is an optical disk storage device, stands for Compact Disc. (Fig 23) It is a storage device used to store various data types like audio, videos, files, OS, Back-Up file, and any other information useful to a computer. The CD has a width of 1.2 mm and 1.2 mm thickness, which can store approximately 700 MB of data size. It uses laser light to read and write data from the CDs.

Types of CDs

- **CD-ROM (Compact Disc Read Only Memory):** It is mainly used for bulk size mass like audio CDs, software and computer games at the time of manufacture. Users can only read data, text, music, videos from the disc, but they cannot modify or burnt it.
- **CD-R (Compact Disc Recordable):** The type of Compact Disc used to write once by the user; after

Fig 24



that, it cannot be modified or erased.

- **CD-RW (Compact Disc Rewritable):** It is a rewritable CD disc, often used to write or delete the stored data.

DVD Drive/Disc

DVD is an optical disc storage device, stands for Digital Video Display or Digital Versatile Disc. (Fig 24) It has the same size as a CD but can store a larger amount of data than a compact disc. It was developed in 1995 by Sony, Panasonic, Toshiba and Philips four electronics companies. DVD drives are divided into three types, such as DVD ROM (Read Only Memory), DVD R (Recordable) and DVD RW (Rewritable or Erasable). It can store multiple data formats like audio, videos, images, software, operating system, etc. The storing capacity of data in DVD is 4.7 GB to 17 GB.

Blu Ray Disc (BD)

Blu Ray is an Optical disc storage device used to store a large amount of data or high definition of video recording and playing other media files. It uses laser technology to read the stored data of the Blu-ray Disc. It

can store more data at a greater density as compared to CD/ DVD. For example, compact discs allow us to store 700 MB of data, and in DVDs, it provides up to 8 GB of storage capacity, while Blu-ray Discs provide 28 GB of space to store data.

Pen Drive

Fig 25



Fig 26



A pen drive is a portable device used to permanently store data and is also known as a USB flash drive. (Fig 25) It is commonly used to store and transfer the data connected to a computer using a USB port. It does not have any moveable part to store the data; it uses an integrated circuit chip that stores the data. It allows the users to store and transfer data like audio, videos, images, etc. from one computer to any USB pen drive. The storing capacity of pen drives from 64 MB to 128 GB or more.

SD Card:

SD Card stands for Secure Digital Card. It is most often used in portable and mobile devices such as smartphones and digital cameras. (Fig 26) You can remove it from your device and see the things stored in it using a computer with a card reader.

There are many memory chips inside the SD card that store the data; it does not have moving parts. SD cards are not created equal, so they may differ from each other in terms of speed, physical sizes, and capacity. For example, standard SD cards, mini SD cards, and micro SD cards.

Windows accessories and difference document & text file

Objectives: At the end of this lesson you shall be able to

- windows operating system
- different basic accessories
- explain about wordpad
- difference between wordpad file and Notepad
- explain about paint Brush

Windows Operating System: An operating system is a **software programme required to manage and operate a computing device** like smartphones, tablets, computers, supercomputers, web servers, cars, network towers, smartwatches, etc. It is the operating system that eliminates the need to know coding language to interact with computing devices.

Main Components of Windows: The main components of the Windows Operating System are the following:

- Configuration and maintenance
- User interface
- Applications and utilities
- Windows Server components
- File systems
- Core components
- Services
- DirectX
- Networking
- Scripting and command-line
- Kernel
- NET Framework
- Security
- Deprecated components and apps
- APIs

When coming to GUI components, we have the following as the main components: (Fig 1)

• Desktop

It is the very first screen that you will see once the windows start. Here you will see "My Computer", "My Documents", "Start Menu", "Recycle Bin", and the shortcuts of any applications that you might have created.

Fig 1



• Taskbar

At the bottom, you will see a row which is known as the taskbar. It has the currently running applications, you can also pin applications that you frequently use by using an option Pin to Taskbar".

• Start Menu

This is located in the bottom left corner of Windows OS GUI. This is the place where the user can search for any setting and for any application for their use. Users can uninstall or repair applications from the control panel. The user can do a lot of activities just by searching through the start menu.

• My Computer

When you double click on "My Computer" menu, it will let you navigate between your different computer drives and the control panel tools. You can see and manage the contents that are inside your drive.

• Recycle Bin

When you delete an item from any of your drives by making use of "delete" button or even by simply clicking right clicking and selecting "delete" option, it is not deleted completely, instead, it is moved to "Recycle Bin" folder of Windows. You can recover your content if you have deleted it by mistake from here or if you choose to delete the items from here, it will get deleted permanently. Should you wish to delete the item in first go itself without moving it to recycle bin, you can use the key "Shift+Del"

Features of Windows

The main Features of Windows:

- **Windows Search:** We can have numerous files and contents located on our system and sometimes we may run out of memory about the exact location of our file. Windows Search is a search function included with Windows that allows the user to search their entire computer
- **Windows File Transfer:** We may have the need to transfer in or transfer out the files and contents from our machine to other devices such as other computers or mobiles and tablets. We can do this by using an Easy Transfer Cable, CDs or DVDs, a USB flash drive, wireless Bluetooth, a network folder, or an external hard disk.

- **Windows Updates:** Windows includes an automatic update feature with the intended purpose of keeping its operating system safe and up-to-date.
- **Windows taskbar:** At the bottom most part of your windows, you will see a row which is known as the taskbar. It has the currently running applications, you can also pin applications that you frequently use by using an option Pin to Taskbar". The taskbar is the main navigation tool for Windows
- **Remote Desktop Connection:** This feature of windows allows you to connect to another system and work remotely on another system.

Advantages and Disadvantages of Windows

Now we are going to explore the advantages and disadvantages of Windows.

Advantages

- Desktop as well as tablet-friendly OS
- Switch between applications is very easy
- Not much technical knowledge is required to operate windows
- Windows OS is the dominant OS and enjoys more than 90% of Market share
- MS OS have a great support community and it also has the largest number of applications
- Microsoft provides a powerful set of Enterprise focused Operating System, Applications and the services making it the most dominant player in the OS market.
- More gaming

Disadvantages

There are privacy and security concerns and incidents and they are widespread. Linux OS is by far most secure OS ever built.

- Cost for upgrade
- Windows OS attracts a large number of virus programs due to its largest market share and easy to breach paradigm
- Windows OS is not that much of touch-friendly.

Different Basic Accessories

Window accessories:-

Window Accessories Group is a very important part of the window, very important tools are available inside Window Accessories, which we can use according to our need. Inside the Window Accessories Group, a list of many facilities is displayed so that we can do Simple Type. Can apply some special characters, can calculate Mathematics, can manage the performance of your computer, although there are many tools inside the Window Accessories Group, but some important tools are as follows.

- Character Map

- Calculator
- Notepad
- word pad
- Remote Desktop Connection
- Paint
- Math input panel
- snipping tool
- disk clean up
- disk defragment

Character Map:-

- There is such a facility in Character Map Window Accessories, using which we can know which key or key combination has been determined in which font. It contains all those keys/fonts which are not given on the keyboard.
- Start button→ All program→ Window accessories→ Character Map

Calculator:-

- We use this tool available in Window Accessories to do arithmetic and scientific calculations. To run the calculator, a normal calculator is displayed on the screen, which we run with the help of a mouse so that we can do Mathematical Sums very easily. This is an important tool of our Windows
- Start button→ All program→ Window accessories→ calculator

Note Pad:-

- Note Pad is the Window's Text Editor Program, we use it to create a text file in the window, the extension (.txt) of the file created inside it is that there is some limit to the text in this text editor. This is a very important tool for Windows accessories.
- Start button→ All programs→ Window accessories→ notepad

Word Pad:-

- Word Pad is also called a Word Processor, it is also a text editor program, it is an advanced form of note pad. You can change the size of the font in it, we can fix the date and time, it is an important tool of Window Accessories.
- Start button→ All program→ Window accessories→ word pad

Remote Desktop Connection:-

- Remote Desktop Connection In this, we can get help by connecting remotely to the person sitting far away, that is, the person sitting far away can operate our computer, in this, we can connect from one computer to another computer and take any help or help anyone. Is
- Start button→ All program→ Window accessories→

remote desktop connection

Paint:-

- The Paint Tool present in the Window Accessories Group is very important, with the help of this tool we can make pictures, sketches and maps etc. In this, with the help of many tools, we can paint a good type.
- Start button→ All program→ Window accessories→ paint

Math input panel:-

- Math input panel is a part of window accessories. Math input panel has come into use from windows. It is used to convert any word or character to any Digit of Math. For example, if we made 's' on Friends-math input panel, then it will convert to '5'. Any word is made with the help of mouse on the Math input panel.
- Start button→ All program→ Window accessories→ Math input panel

Snipping Tool:-

- Snipping tool is also an important tool of Window Accessories, with the help of this we can take Screen short (SS) of any object of the screen, with the help of this tool we can take Screen short in the same way as we take in our phone.
- Start button→ All program→ Window accessories→ snipping tool

Disk cleanup:-

- Disk cleanup is one of the most important tools of window accessories, with the help of this we can clean many things like junk files, cookies from our PC, due to this the performance of our computer becomes faster.
- Start button→ All program→ Window accessories→ System tool→ disk cleanup

Disk defragment:-

- Disk defragment is a tool of window accessories, it is used to arrange the saved file or folder in the hard disk, it is used to eliminate the free space on the disk drive and organize the file & folder.
- Start button→ All program→ Window accessories→ System tool→ defragment

Explain About Wordpad

Like many word processors, WordPad allows users to create, format, save and print documents. WordPad comes with most PC operating systems, starting with Windows 95. While WordPad does not have the power of more sophisticated word processors such as Word, it does have enough power to create basic documents. With the release of Windows 7, WordPad has been overhauled and includes several new features.

User Interface

WordPad in Windows 7 uses the updated Microsoft user interface called the Ribbon. This toolbar runs across the top of the WordPad screen and separates commands by tabs and groups. Previous versions of WordPad used the standard drop-down menu toolbar.

Formatting Options

Previous versions of WordPad had a limited ability to format text. In the updated WordPad, select the text you want to change and click the "Home" tab. In the Font group, select a different font, type size or color. You can also add bullets, highlighting and change text alignment. You can change the margins of your document by clicking the "WordPad Menu" button and selecting "Page Setup."

Graphics

You can now add graphics to a WordPad document. In the Home tab, go to the Insert group. Click on "Picture" to add a photograph or another saved image to a document. To add a Paint drawing (another operating system tool), click on "Paint Drawing."

Search and Replace

WordPad does not contain a spell check, thesaurus or grammar assistance. It can search and replace text by clicking on the Home tab and going to the Editing group. You can find words in the text by clicking "Find," or replace them by clicking "Replace." As with most word processors, you can cut, copy and paste text around a document.

View

Another new feature in WordPad is zoom. In previous versions, if you wanted to see a close-up view of a document, you had to print it out. In Windows 7's WordPad, you can view the document up close or from far away by clicking on the "View" tab and then clicking one of the options in the Zoom group to increase or decrease the document view. You can also add the status bar to WordPad in the View tab area so you can get more information about a document or change the word wrap settings.

File Formats

WordPad can open and save files in the text (TXT), Rich Text Format (RTF), Word document (DOCX), and Open Document Text (ODT), according to Microsoft. Files opened from Word 2007 and 2010 may not appear the same in WordPad since it does not have all the capabilities of Word.

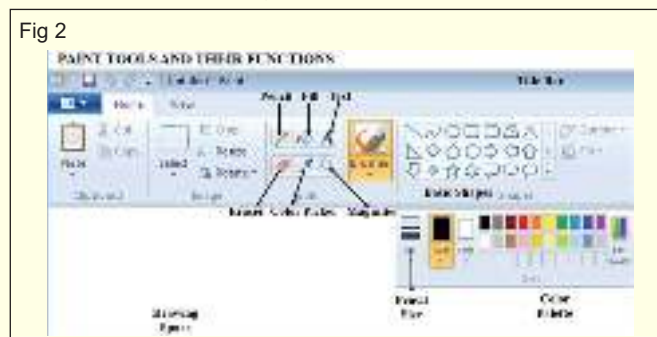
Difference between Wordpad file and Notepad

As per the names, it looks like they both are the same, but somehow they vary differences in their feature and functions as they both are included in the Microsoft Windows operating system.

Difference between WordPad and NotePad :

NotePad	WordPad
It is a simple and easy tool for basic plain text entry	It is simple and easier than MS Word
It can be used for doing a couple of different ways	It is an easy tool for doing simple tasks
It is made for to create the documents only	It is made for formatting and printing the documents
It is a text editor program	It is a word processor program
It is just a simple text editor that does not include any formatting options into it.	It helps in creating the documents which include graphics and various text formatting options into it
It is a text editor that is included with the windows operating system	It is also a text editor which is included with the windows operating system.
It was launched by Microsoft in the year 1983	It was launched by Microsoft along with Windows 95
Notepad is a text editor	WordPad is a basic word processor.
Notepad can only save text as it is better for creating webpages	It helps in saving the text with the basic formatting like font styles and sizes etc.
It can only save documents as .txt files only	It can be saved as .txt and .rtf Rich Text Format files both
Images and other graphics options are not added to this	Images and other graphic options can be added to this.
The files like Rich text formats Wordpad are cannot be opened into it	Any notepad file can be opened with this
It includes the options like files, edit, view, format, and helps options only into it	It includes more options which are easily available in it
It does not include any formatting options as no formatting of the text is done into it. It only focuses on creating the text files only.	It includes the formatting options into it like italic, bold, font style and size, etc.
It is a good choice for creating webpages or HTML documents and writing the basic computer programs also	It is a good choice for writing papers or creating documents that you want to print
It is also helpful for removing formatting from the text which is copied and which you wanted to paste somewhere else as a plain text	As it supports the bullets into it which is helpful for making lists
Just paste the text into Notepad, copy it again from Notepad, and you have completely unformatted text	You can use Wordpad to open an unformatted text document and add whatever formatting you want

Explain About Paint Brush: Microsoft Paint is a basic computer graphics program found on most personal computers using a Windows operating system. (Fig 2)



Images created within MS Paint are typically saved as GIF, Windows bitmap, PNG, TIFF or JPEG files. Originally, MS Paint only allowed users to create black and white images, but now users can paint in a full array of colors with simple, user friendly tools.

Select

- The "Select" tools look like a star or rectangle outlined with hashed lines. The star shape is the "Free-Form Select" tool that allows you to select part of a picture that is any shape. The button with the image of a rectangle lets you select a rectangular area within an image.

Eraser

- Under the star “Select” tool is the “Eraser” tool. This allows you to erase small areas of the image by dragging the mouse pointer over the part you wish to eliminate.

Fill Tool

- The “Fill Tool” looks like a jar that has paint spilling out of it. When you select an area of your image with the left mouse button, the foreground color will fill with a color. When you select an area of your image with the right mouse button, the background of the image will fill with a color.

Pick Color

- The button with the image of an eyedropper is the “Pick Color” tool. This allows you select an object whose color you want to copy and use the color elsewhere in the image.

Magnifier

- Next to the “Pick Color” button is the “Magnifier” button, which looks like a magnifying glass. Selecting this tool will allow you to zoom in an out of an image.

Pencil and Brush

- The button with an image of a pencil in it is the “Free-Form Line” tool. It allows you to draw lines by clicking and dragging your computer mouse.
- The image of the paintbrush next to the image of the pencil is the “Brush” tool. Use this to brush a thick

line on your image with different brush shapes.

Airbrush

- The “Airbrush” tool’s button has the image of a paint can in it. This tool allows you to “spray” an area of your image with a color of your choice.

Text

- The “Text” tool is next to the image of the paint can, and has the letter “A” on it. Use this to type text directly onto your picture.

Rectangle

- The “Rectangle” tool has an image of a rectangle drawn with a solid line on the button. Use this tool to draw rectangles in your picture.

Polygon

- The “Polygon” tool is next to the “Rectangle” tool. This tool allows you to make several lines at different angles to form the shape of a polygon.

Ellipse and Rounded Rectangle

- The bottom left tool with the shape of an oval in it is the “Ellipse” tool. Make circles and ovals by selecting this tool and dragging the computer mouse diagonally after clicking on a place in your image.
- Draw a rectangle with rounded corners by selecting the last tool in MS Paint. Use the “Rounded Rectangle” tool in the same manner you would the “Ellipse” tool.

Introduction of typing tutor

Objectives: At the end of this lesson you shall be able to

- explain of Typing Tutor
- different Option to Improve Typing Speed
- about Typing Tools

Typing Tutor :-

A typing tutor is a tool that is designed to help the user to enhance their typing skills. This can be done by taking lessons, playing games, or giving a typing test repeatedly.

Typing Tutor Software

There are many software available to help the user improve their typing skills by conducting many activities or tests. Some typing tutor software and their features are given below, out of which some are available for free, and some are paid.

Typing Master for Windows

Typing Master is a typing tutor for Windows to help develop your speed and accuracy. (Fig 1)

Fig 1



Typing Master – Features

Typing Master comes with multiple features and aims at doubling your typing speed.

- Customized exercises, more than 10 hours of content
- Step by step approach to professional keyboarding
- Train difficult words and keys
- Vision based learning
- Detailed and customized review of the performance
- Skill tests to monitor progress
- Games to have all the fun while learning
- Typing Meter to measure and analyze typing habits
- Typing analysis widget

Different Option to Improve Typing Speed

- The **Introduction** and **Beginner** courses helps to learn the position of keys on the keyboard. After completing this course, you will know which finger to use to hit each key without looking at the keyboard. The course also covers upper-case letters, special symbols, and the numeric pad.
- The Experienced course helps to improve your typing speed by memorizing frequently used syllables and words.
- The Advanced course helps you to perfect the skills acquired by typing an actual text.
- The Testing course tests your touch typing skills.

Tools: Typing Master 10 typing tutor provides excellent tools to thoroughly test your typing skills - and prove them to others. You can complete tests up to 30 minutes long and choose from a variety of texts with different levels of difficulty.

You can complete the test as many times as you like and view detailed results for each test round. Then just choose your best result and print out a detailed test diploma to prove your skills.

Advanced Test Library

Set freely your test duration and choose from a large number of test texts.

Real-Life Test Environment

Intelligent progress highlight, text wrapping and ability to correct errors provide a fluent typing experience.

Detailed Results: See your test results immediately, view your difficult keys and see what kind of typing errors you made. All your results are automatically saved.

Printable Test Certificate: Select your best test result and print out a detailed test certificate to prove your typing skills.

Typing Analysis Widget: Analyze your typing while working and train weaknesses with customized exercises.

Complete Touch Typing Courses: Learn to touch type by completing over 10 hours of interactive study material.

Customized Review: While training Typing Master detects those problem areas that need extra practice and creates additional tailor made exercises for them.

Typing Games

Play our fun typing games to see how far your typing skills will take you.

Introduction MS - office create, save and print in MS word

Objectives: At the end of this lesson you shall be able to

- **explain MS Office**
- **brief MS Word**
- **about typing tools**

Introduction to MS Office: Microsoft Office (or simply Office) is a family of server software, and services developed by Microsoft. It was first announced by Bill Gates on August 1, 1988, in Las Vegas. The first version of Office contained Microsoft Word, Microsoft Excel, and Microsoft PowerPoint. Over the years, Office applications have grown substantially closer with shared features such as a common spell checker, data integration etc. Office is produced in several versions targeted towards different end-users and computing environments. The original, and most widely used version, is the desktop version, available for PCs running the Windows, Linux and Mac OS operating systems.

Microsoft Office is a suite of desktop productivity applications that is designed specifically to be used for office or business use. It is a proprietary product of Microsoft Corporation and was first released in 1990. Microsoft Office is available in 35 different languages and is supported by Windows, Mac and most Linux variants. It mainly consists of Word, Excel, PowerPoint, Access, OneNote, Outlook and Publisher applications.

Microsoft Office was primarily created to automate the manual office work with a collection of purpose-built applications.

Each of the applications in Microsoft Office serves as specific knowledge or office domain such as:

- 1 Microsoft Word: Helps users in creating text documents.
- 2 Microsoft Excel: Creates simple to complex data/numerical spreadsheets.
- 3 Microsoft PowerPoint: Stand-alone application for creating professional multimedia presentations.
- 4 Microsoft Access: Database management application.
- 5 Microsoft Publisher: Introductory application for creating and publishing marketing materials.
- 6 Microsoft OneNote: Alternate to a paper notebook, it enables an user to neatly organize their notes.

Important Features of Ms-Word: Ms-Word not only supports word processing features but also DTP features. Some of the important features of Ms-Word are listed below:

- i Using word you can create the document and edit them later, as and when required, by adding more text, modifying the existing text, deleting/moving some part of it.

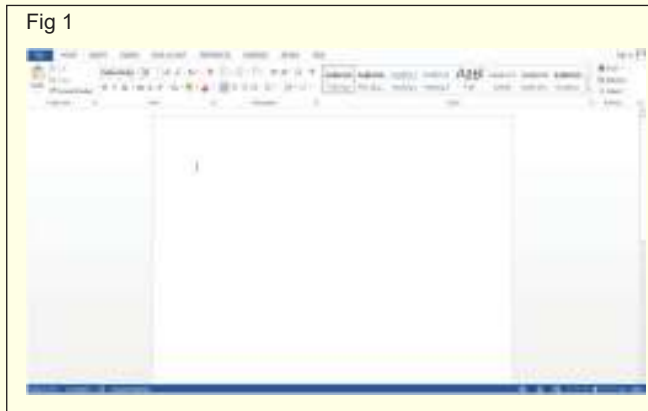
- ii Changing the size of the margins can reformat complete document or part of text.
- iii Font size and type of fonts can also be changed. Page numbers and Header and Footer can be included.
- iv Spelling can be checked and correction can be made automatically in the entire document. Word count and other statistics can be generated.
- v Text can be formatted in column style as we see in the newspaper. Text boxes can be made.
- vi Tables can be made and included in the text.
- vii Word also allows the user to mix the graphical pictures with the text. Graphical pictures can either be created in word itself or can be imported from outside like from Clip Art Gallery.
- viii Word also has the facility of macros. Macros can be either attached to some function/special keys or to a tool bar or to a menu.
- ix It also provides online help of any option.

MS Word: Follow these simple steps to open MS Word on your personal computer:

Start → All Programs → MS Office → MS Word.

Uses of MS Word: MS Word enables users to do write-ups, create documents, resumes, contracts, etc. (Fig 1)

Fig 1



This is one of the most commonly used programs under the Office suite.

Fig 2



Features of MS Word

Now let us read more about the features and components of an MS Word doc file in detail.

The image given below shows the different elements and categories which are available in MS Word doc: (Fig 2)

- **Home**

This has options like font colour, font size, font style, alignment, bullets, line spacing, etc. All the basic elements which one may need to edit their document is available under the Home option.

- **Insert**

Tables, shapes, images, charts, graphs, header, footer, page number, etc. can all be entered in the document. They are included in the “Insert” category.

- **Design**

The template or the design in which you want your document to be created can be selected under the Design tab. Choosing an appropriate tab will enhance the appearance of your document.

- **Page Layout**

Under the Page Layout tab comes options like margins, orientation, columns, lines, indentation, spacing, etc.

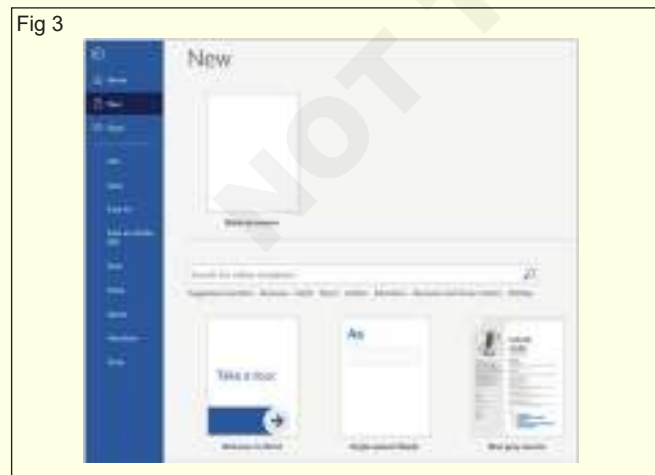
- **References**

This tab is the most useful for those who are creating a thesis or writing books or lengthy documents. Options like citation, footnote, table of contents, caption, bibliography, etc. can be found under this tab.

- **Review**

Spell check, grammar, Thesaurus, word count, language, translation, comments, etc. can all be tracked under the review tab. This acts as an advantage for those who get their documents reviewed on MS Word.

Apart from all the above-mentioned features, the page can be set in different views and layouts, which can be added and optimised using the View tab on the Word document. Margins and scales are also available for the benefit of the users.



Create a document

- 1 On the File tab, click **New**

- 2 Select blank document. (Fig 3)

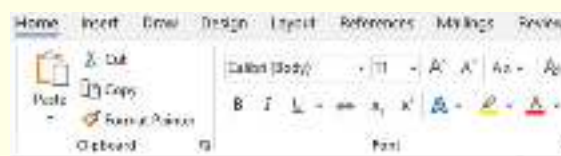
Add and format text

- Place the cursor and type some text.
- To format, select the text and then select an option: Bold, Italic, Bullets, Numbering, and more.(Fig 4)

Add Pictures, Shapes, SmartArt, Chart, and more

- Select the **Insert** tab.
- Select what you want to add:

Fig 4



- **Tables** - select **Table**, hover over the size you want, and select it.
- **Pictures** - select **Pictures**, browse for pictures from your computer, select a stock image, or even search Bing.
- **Shapes** - select **Shapes**, and choose a shape from the drop-down.
- **Icons** - select Icons, pick the one you want, and select **Insert**.
- **3D Models** - select **3D Models**, choose from a file or online source, go to the image you want, and select **Insert**.
- **SmartArt** - select **SmartArt**, choose a **SmartArt Graphic**, and select **OK**.
- **Chart** - select **Chart**, select the chart you want, and select **OK**.
- **Screenshot** - select **Screenshot** and select one from the drop-down.

Save a document

Step 1: Start a new document in Word and type your text.

Step 2: Click File in the top left-hand corner of the screen.(Fig 5)

Fig 5

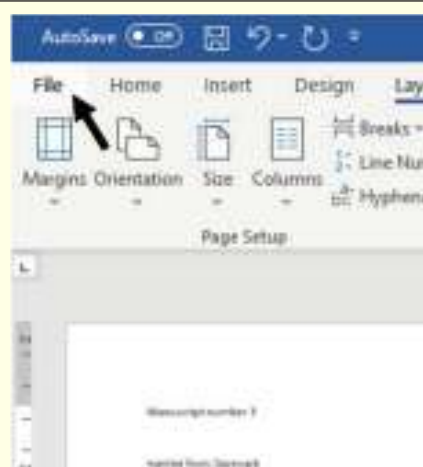


Fig 6

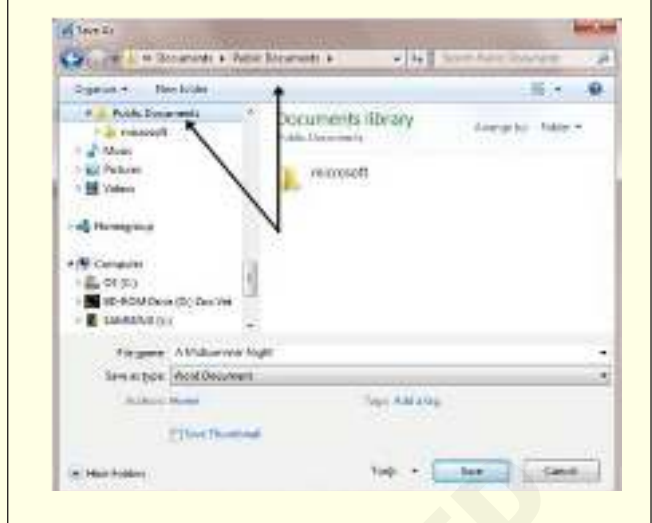


Step 3: From the menu, choose Save.(Fig 6)

Step 4:

A 'Save' dialogue box will come up. At the top and at the left-hand side in the list of folder options, it will show the folder where you'll be saving the document. (Fig 7) If you wish to change this folder, navigate through the folders on the left-hand side of the dialogue box to choose the one where you want to save your document.

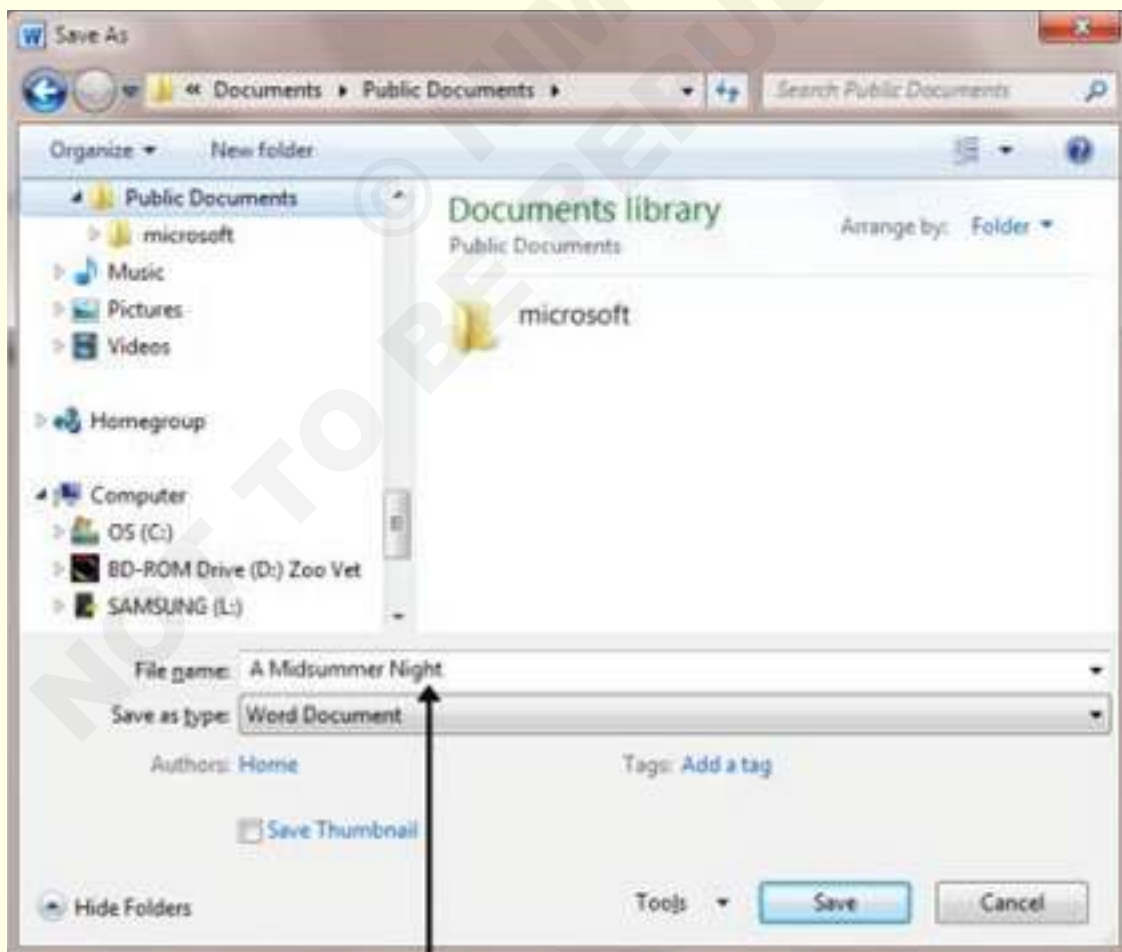
Fig 7



Step 5:

Word will automatically give your document a name, based on the first few words of your text. If you don't like the one given, once you have chosen the destination folder, type a name for your document in the 'File name' box. Come up with a name that is concise but will allow you to find the document easily again. (Fig 8)

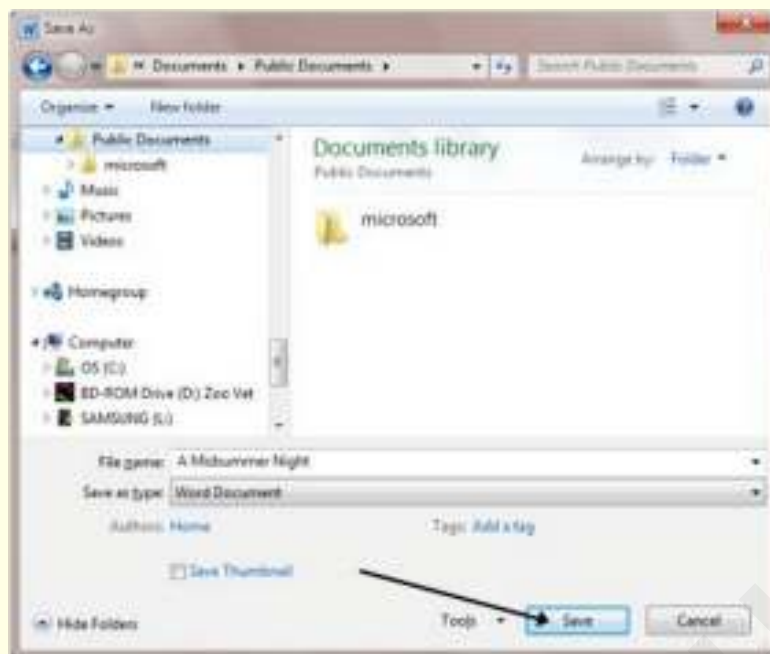
Fig 8



Step 6:

Once you have typed in the name of your document, click **Save**.

Fig 9



Step 7: Your document will now have a name, which will be shown at the very top of your document screen. If you make changes to your document and then save them after it has been saved originally, the dialogue box will not come up again. It will just save your changes without any visual notification being shown.

Step 8: The 'Save As' menu – the link to which is on the left-hand side of the 'File' dialogue box, beneath 'Save' – is used to save an existing document under another name. This is helpful if you've made changes to your document and then want to save the changes, but also keep the original document in its original format and under its original name. (Fig 9)

Print a Document

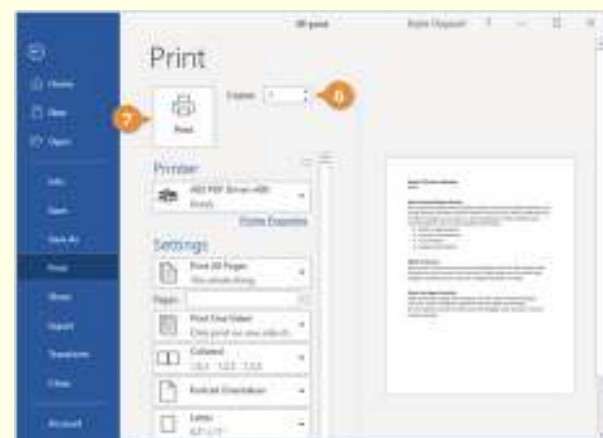
- Click the File tab.
- Click Print. (Fig 10)
- Examine the print preview on the right side of the screen to ensure the document appears correct.
- Select the correct printer by clicking the Printer list arrow and selecting it from the list.
- Adjust the printer settings using the options below the printer, described in the following table.
- Set the number of copies in the Copies text field.
- Click Print. (Fig 11)

The document is sent to the printer.

Fig 10



Fig 11



Formatting character, paragraph and mail merge.

Objectives: At the end of this lesson you shall be able to

- explain the concept of font
- edit and format text
- create a style
- table and formatting
- mail merge option

Concept of Font

Change the Font

Changing a font itself will have the greatest effect on the appearance of text.

- Select the text you want to change.
- Click the Font list arrow on the Home tab.

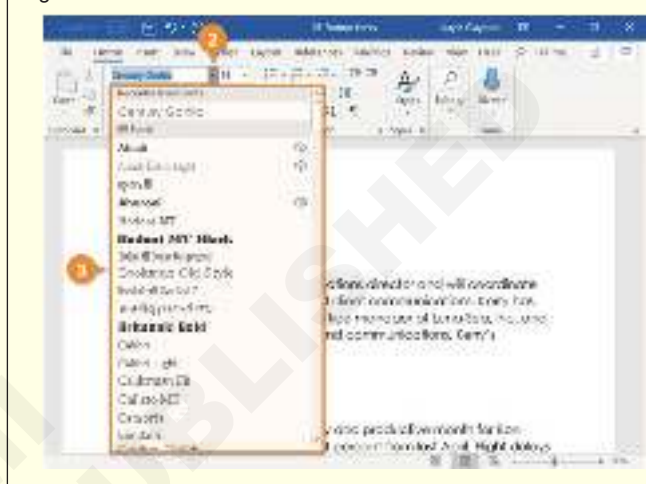
You can also click the Font list arrow on the Mini Toolbar that appears when text is selected. (Fig 1)

- Select a new font from the list.

The text is now set in the selected font.

When changing fonts, be sure to choose the right font for the tone of your document. Don't use casual script fonts in a professional document, and also avoid using too many fonts at once.

Fig 1



Font Type	Examples	Description
Serif	Times New Roman, Garamond, Cambria, Georgia, Palatino	Serifs are small details at the ends of some letter strokes, meant to improve legibility. Suitable for both header and body text.
Sans Serif	Arial, Calibri, Helvetica, Verdana, Trebuchet MS	Sans serif fonts lack the small details at ends of letter strokes, leading to a plainer look. Suitable for both header and body text.
Script	Brush Script, Zapfino, Lucida Handwriting	These fonts are meant to mimic handwriting, either calligraphic or casual. Useful in very specific designs, but unsuitable for body text and most headers.
Monospace	Courier New, Consolas, American Typewriter	All letters and symbols use the exact same amount of space. Useful when displaying computer code, or when precise horizontal alignment between lines is important.

Change the Font Size

Changing the font size helps differentiate between titles, headers, and body text.

- Select the text.
- Click the Font Size list arrow on the Home tab. (Fig 2)
- Select a font size.

The font size changes.

Click the **Increase Font Size** or **Decrease Font Size** buttons to increase or decrease by one point at a time. (Fig 2)

Font size is measured in points (pt) that are 1/72 of an inch. The larger the number of points, the larger the font.

Change the Font Color

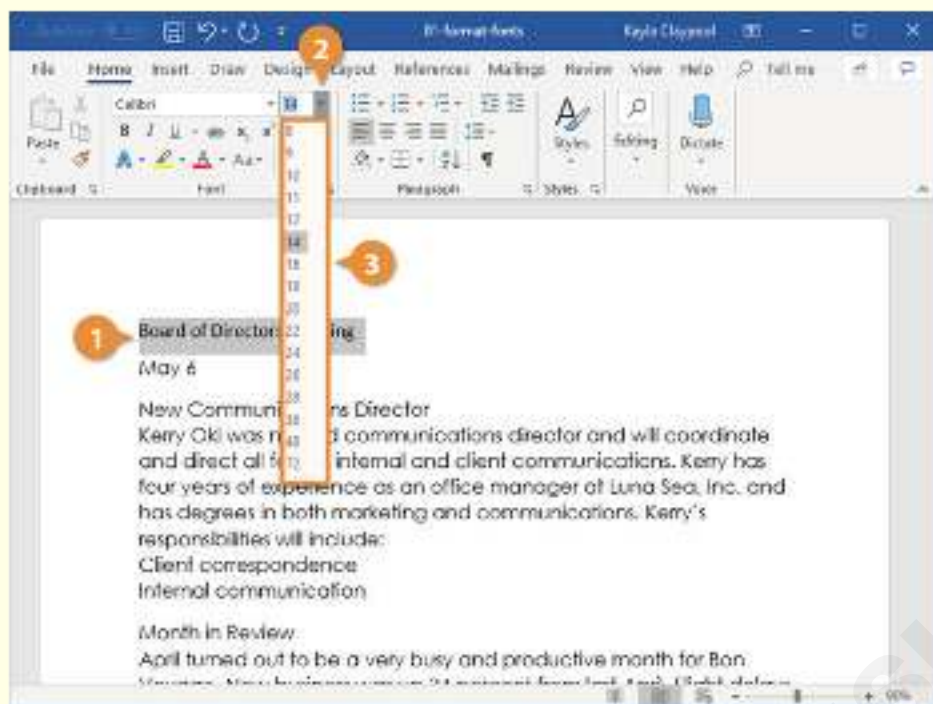
You may need to change font color to make text stand out, comply with brand standards, or add visual appeal.

- Select the text you want to change.
- Click the Font Color list arrow.

You can also click the **Font Color** list arrow on the Mini Toolbar. (Fig 3)

- Select a new color.

Fig 2



If you don't like any of the available theme colors, select **More Colors** to display the Colors dialog box. (Fig 3)

Fig 3



Apply Bold, Italic, or an Underline

In addition to changing font type, size, and color, you can also enhance the text further by using other features in the Font group like bold, italic, or underline.

- Select the text you want to change.
- Select Bold, Italics, or Underline. (Fig 4)

Shortcuts:

- To bold: **Ctrl + B**
- To italicize: **Ctrl + I**
- To underline: **Ctrl + U**

The effect is applied.

Fig 4



Change the Case

If you want to change the case of a block of text, you don't need to retype the whole thing. You can easily change the case of selected text with the Change Case menu.

With the text selected, click the Change Case button. (Fig 5)

- **Select a case option:**
- Sentence case
- lowercase
- UPPERCASE
- Capitalize Each Word
- tOGGLE cASE

Clear Formatting

If you change your mind and want to remove all formatting from text, you can easily clear all formatting at once.

- With the text selected, click Clear All Formatting.

Creating a new Style from an example

If you've already got some text formatted just the way you want it, you can use it to create a new Style. The easiest way is to select the text you want the Style to emulate, right-click and select Styles, then select Create a Style: (Fig 7)

The extra formatting is removed, and the text is reset to the default style.

Fig 5

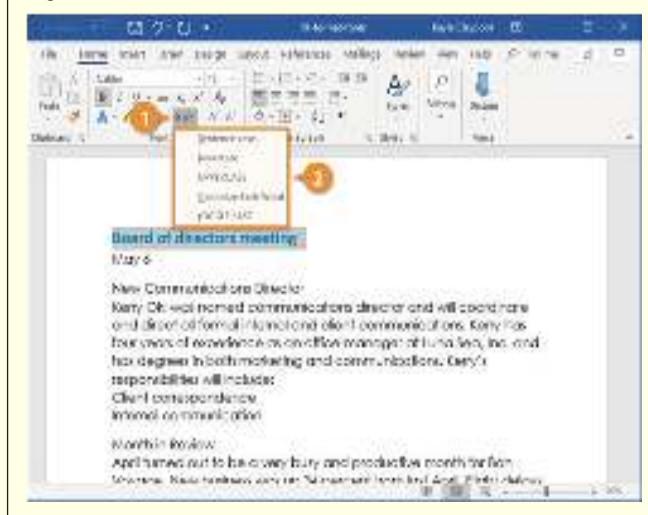


Fig 6

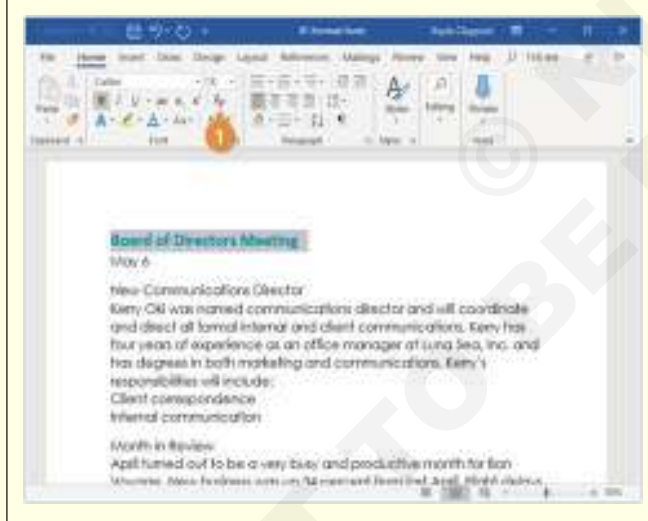


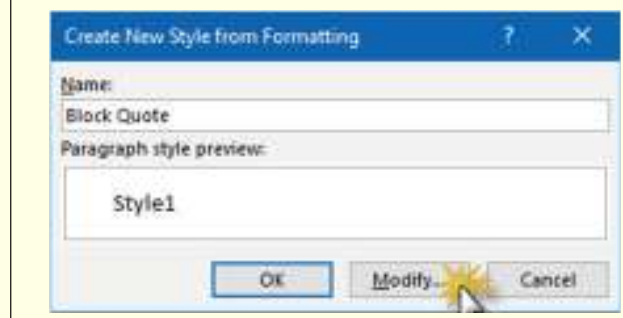
Fig 7



You'll get this dialog box:

You could simply click OK here, but I want to modify the style so, click modify option. (Fig 8)

Fig 8



We get the dialog box (Fig 9) change the paragraph & character styles and style name and then click ok button.

Fig 9



Insert Table in MS Word

Table is a versatile tool of MS Word. It allows you to organize your information, i.e. you can align text, present numerical data and create forms and calendar. The steps to insert table are given below;

- Place the cursor where you want to insert the table
- Select the Insert tab (Fig 10)
- In Tables group click the Table command
- It displays different options to insert the table
- Select the desired option to insert the table

Convert Text to Table

- Select the text
- Select the Insert tab
- In Tables group click the Table command
- Select the 'Convert Text to Table' option; (Fig 11)
- It displays a dialog box

Fig 10

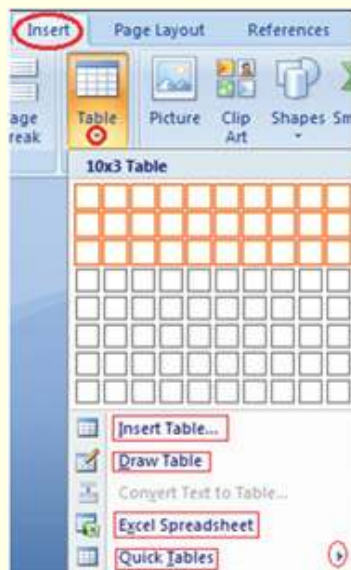
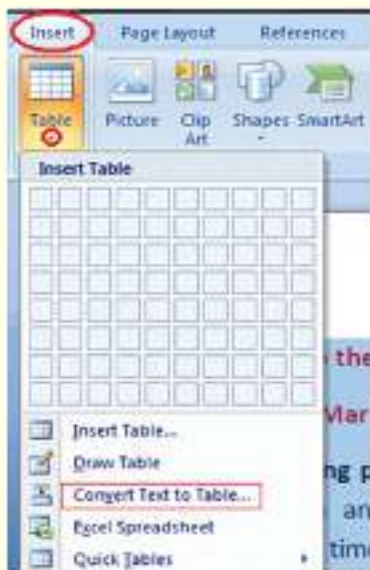
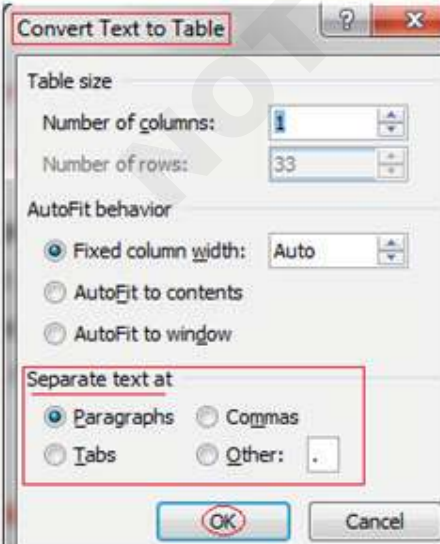


Fig 11



- In 'Separate text at' section select the desired option (Fig 12)
- Click OK, the text will convert to a table

Fig 12



Add Row in Table

If you want to increase or add a new row in your table, you can follow the steps given below;

- Place the cursor in a row above or below which you want to add row
- Right click the mouse
- A menu appears
- Place the arrow over Insert option
- It will display a menu. (Fig 13)
- As required select 'Insert Rows Above' or 'Insert

Fig 13



Rows Below'

Add Column in Table

If you want to increase or add a new column in your table, you can follow these steps;

- Place the cursor in the column adjacent to which you want to add the column
- Right click the mouse
- It displays a menu (Fig 14)
- Place the arrow over Insert option

Fig 14



- It shows a list of commands
- As required select 'Insert Columns to the Right' or 'Insert Columns to the Left'

Delete Column or Row in Table

The table command also allows you to delete a column

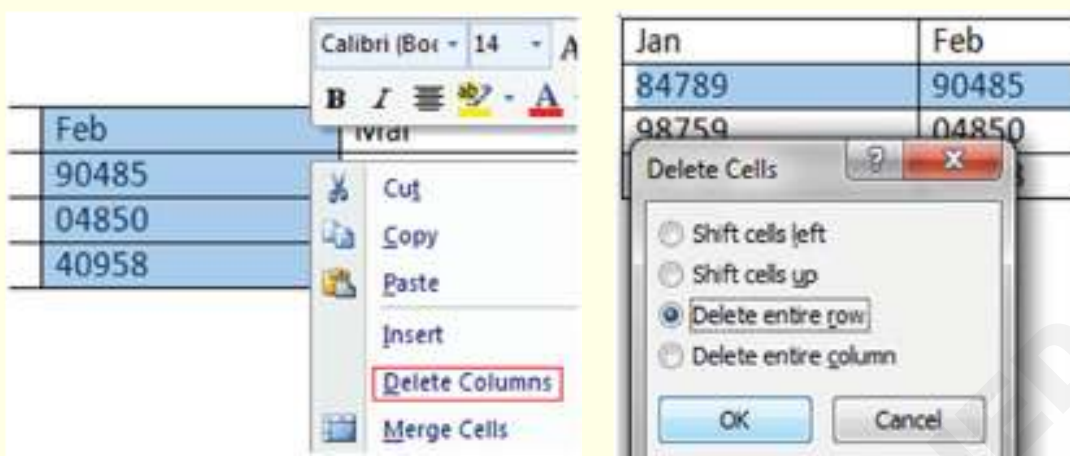
or row in your table. You can delete the unwanted columns or rows by following these steps;

- Select the column or row of the table
- Right click the mouse

- A menu appears. (Fig 15)
- As required select 'Delete Columns' or 'Delete Rows'

Modify Table

Fig 15



Word allows you to customize tables as per your requirement. You can modify your table in different ways, i.e. you can choose a table style, table design, draw borders. The steps to modify a table are given below;

- Select the table
- Two new tabs Design and Layout appear on the

Ribbon

- On Design tab you will see three groups of commands to modify table; Table Style Options, Table Styles and Draw Borders; (Fig 16)
- Layout tab has six groups of commands to format table; (Fig 17)

Fig 16



Mail Merge

Fig 17



Similar documents containing similar text to be sent to a number of persons. These documents also have a typical common layout. Invitation letters sent to guests have a more-or-less common content and layout. Only the names of the recipients are different in these letters. One obvious way to generate such letters is to type all of them individually, putting the same amount of effort again and again. Another solution could be to copy the same block of text again and again onto the new letters. The names and addresses etc., which are different from

each letter, can be entered separately in the documents. Though this method saves a lot of effort, it still requires proper caution. There should be a way where these kinds of documents can be prepared automatically. This task can be easily automated if we use the mail merge feature of a word processor. So, it is time we learnt the mail-merge feature of the word.

Components of mail merge:

The three main components of the merging process are the main document, the data source, and the merged document.

- The main document contains the main body of your letter, field names, and merges instructions. The basic information within the main document remains equivalent.
- The data source (or Recipients' list) stores the knowledge that changes for every document. This information is inserted in the main document one by one. An example of the data source is a name and address list from which the program gets what you want to include in the main document.
- The merged document contains the main text from the main document and data from a data source.

Steps for mail merge

Step 1:

- Open MS Word and click on the command sequence: Mailings tab → Start mail merge group → Select recipients button → Type new List. (Fig 17)
- A dialog namely **"New Address List"** will pop up(as shown in the below image). Type here the desired data under the given headings. To add a new record, click on the "New Entry" button at the bottom of the dialog and click OK when you are done. (Fig 18)

Step 2: Prepare Master Letter

The second step is to prepare our master letter for use

Fig 18

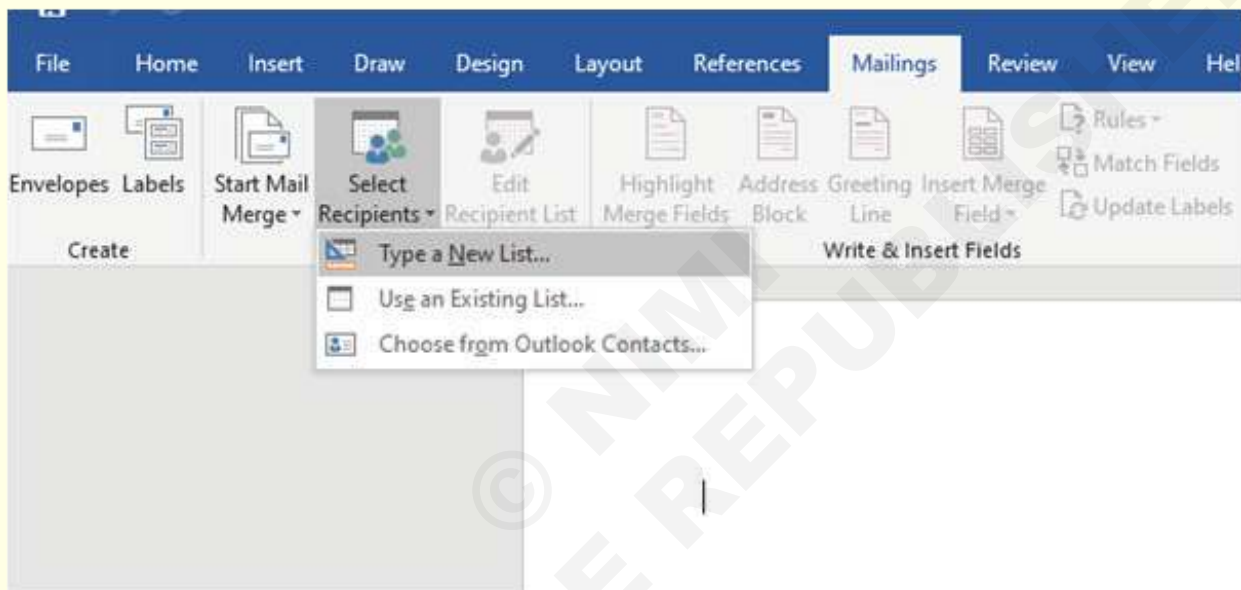
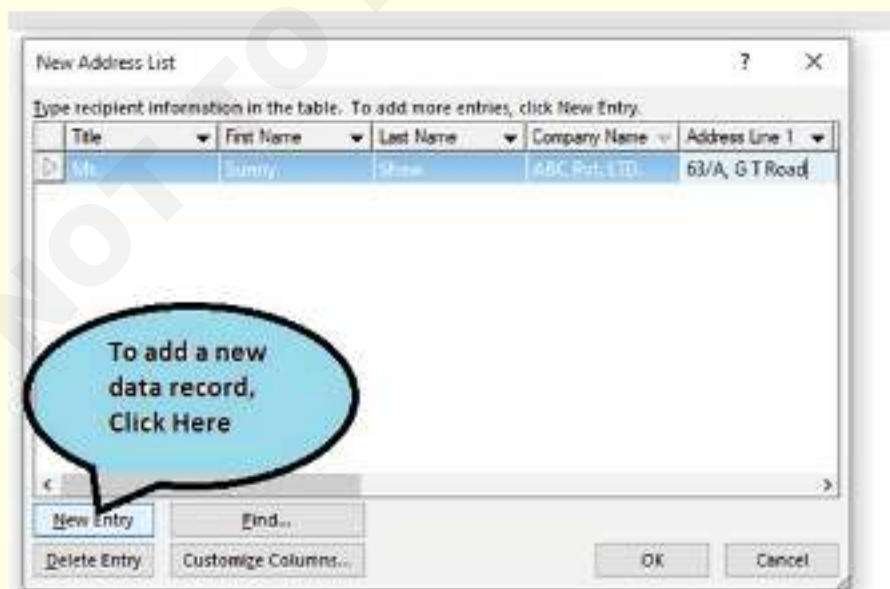


Fig 19



in the mail merge. Before we enter all the letter text we'd like to link this Word file to our list of names.

- Create a blank word document.
- Click Mailings tab → Start Mail Merge group → Start Mail Merge → Letters command. (Fig 19)
- Then click the Mailings tab → Start Mail Merge group → Select Recipients button → Use Existing

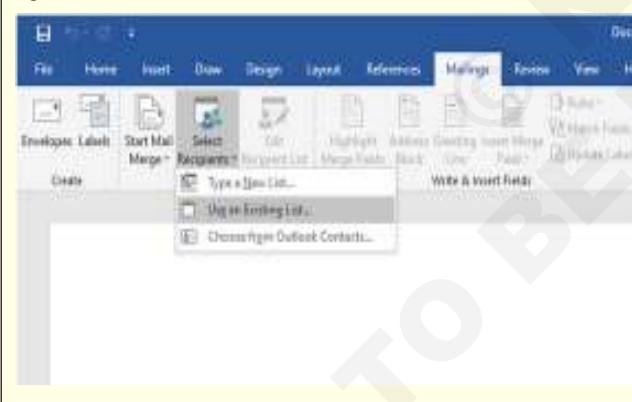
Fig 20



List command. (Fig 20)

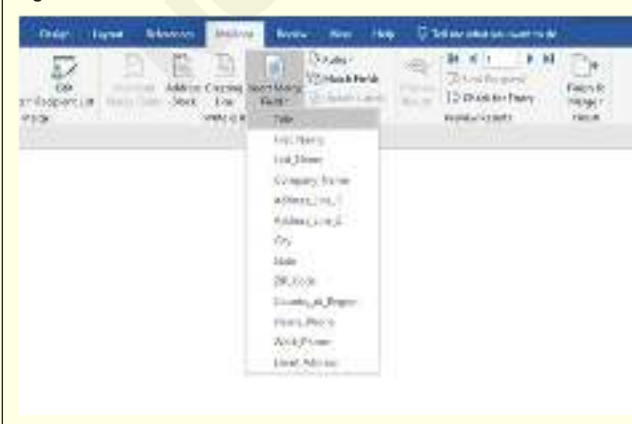
- Now we can start typing the letter.
- Now we would like to add the name and address and other details for the people on the list.
- Mailings tab → Write & Insert Field group → Insert Merge Field button. (Fig 21)

Fig 21



- A pop-down will appear showing all the table headings, so choose Title and press the spacebar to

Fig 22



create a space. (Fig 22)

Then do this again and choose FirstName, followed by a

Fig 23



space (i.e., press only spacebar key and no other key); then choose LastName but this time press the Enter key to create a new line. Then repeat the steps to choose the Address field, and press enter key.

Step 3:

Before we actually carry out the merge, we must first preview what the merged letters will look like.

- Mailings tab → Preview Results group → Preview Results button. (Fig 23)
- Once we are happy with the preview, you can carry out the actual mail merge.

Fig 24



- To do this you click the Mailings tab → Finish group → Finish & Merge button and choose Edit Individual Documents.
- In the Merge to New Document panel, click All to create a separate letter for each person on the Names list. (Fig 24) Word then creates a fresh document with as many pages as there are names on your list, and every page contains a wonderfully merged letter with all the correct individuals' details. (Fig 25)

We can save this with an appropriate name such as ABC. docs (Fig 26)

Fig 25

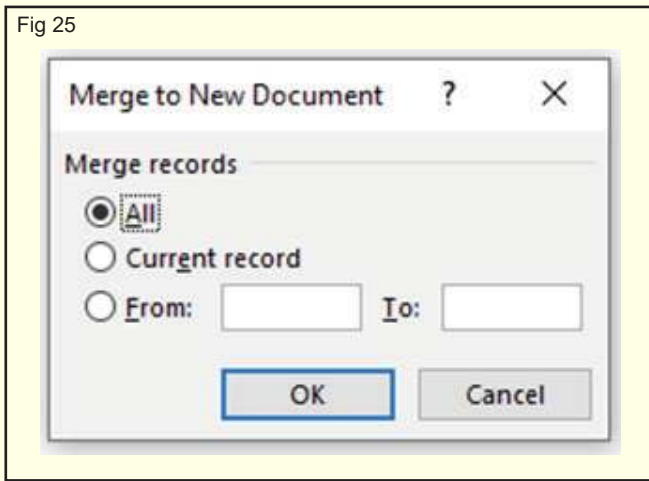
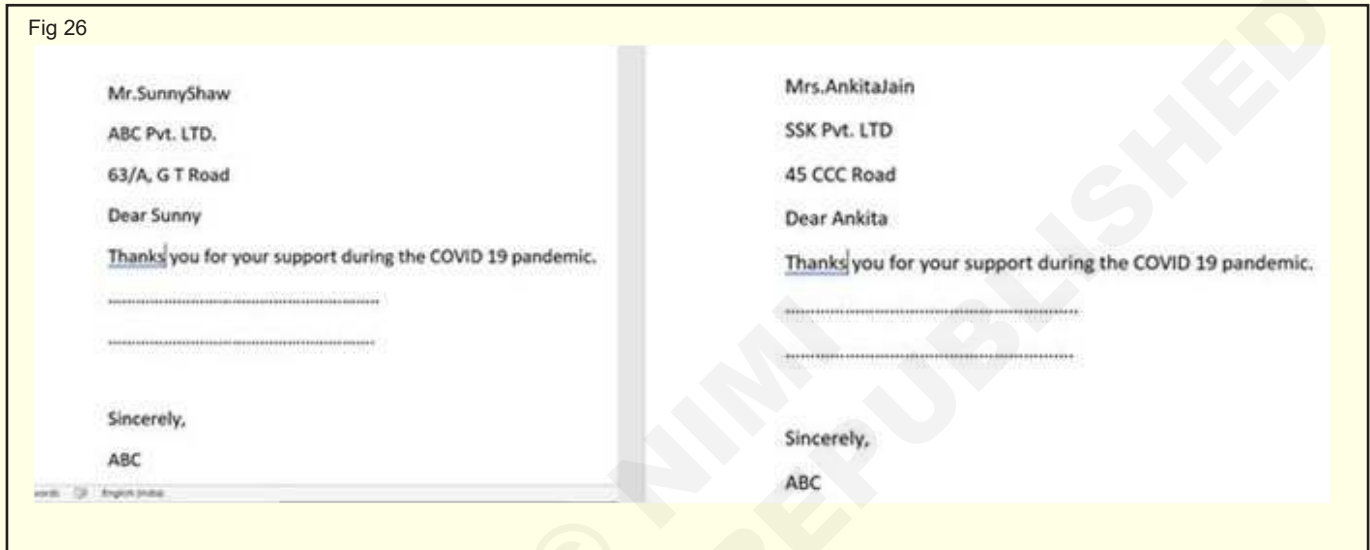


Fig 26



M.S Excel - Using formulas.

Objectives: At the end of this lesson you shall be able to

- explain MS excel
- features & functions
- conditional formatting
- link Spreadsheet Data

An Introduction to MS Excel

MS Excel is a commonly used Microsoft Office application. It is a spreadsheet program which is used to save and analyse numerical data.

In computer terms, Excel is a spreadsheet application in Microsoft Office Pack. It is one of the most using Applications in business industries. We can store any kind of the data in the spreadsheets in the Excel Range or Excel Cells. We can also insert Images, Shapes, Charts, Pivot Tables in the Excel Sheets to understand the data.

What is MS Excel?

MS Excel is a spreadsheet program where one can record data in the form of tables. It is easy to analyse data in an Excel spreadsheet. The image given below

represents how an Excel spreadsheet looks like:

Open MS Excel

To open MS Excel on your computer, follow the steps given below:

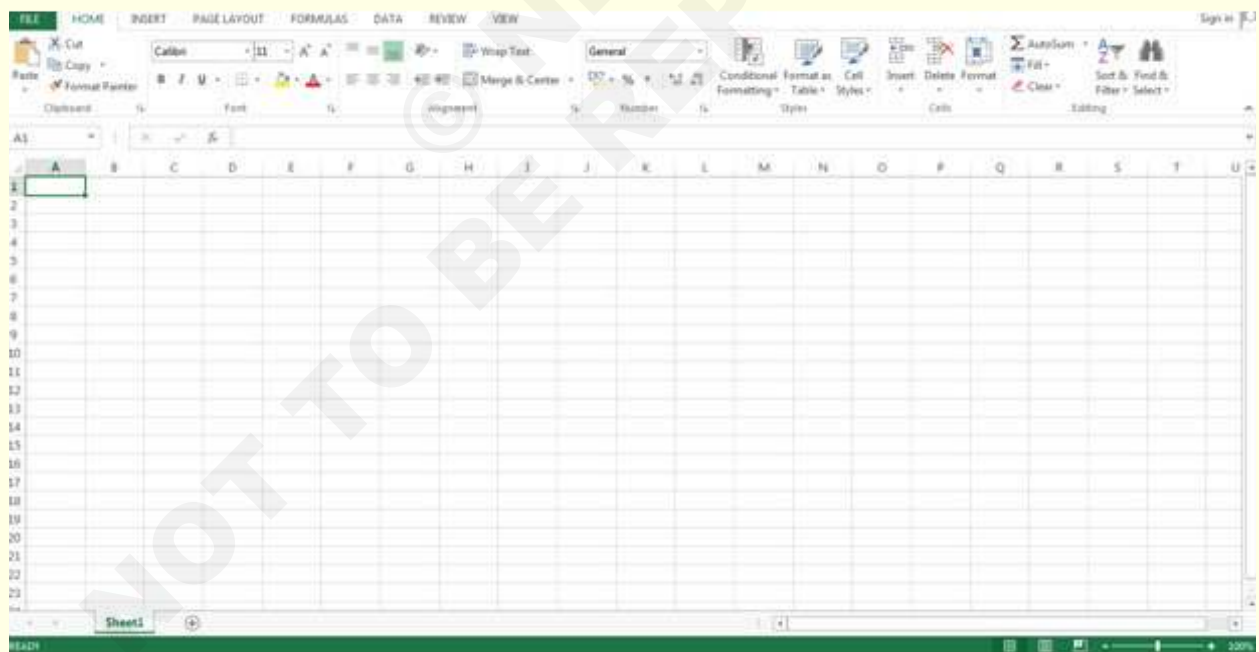
- Click on Start
- Then All Programs
- Next step is to click on MS Office
- Then finally, choose the MS-Excel option

Alternatively, you can also click on the Start button and type MS Excel in the search option available.

Cell :-

A spreadsheet is in the form of a table comprising rows and columns. The rectangular box at the intersection

Fig 1



point between rows and columns forms a cell. Given below is an image of a cell:

Cell Address

The cell address is the name by which a cell can be addressed. For example, if row 5 is interested in column H, then the cell address is H5.

Excel terminology and components

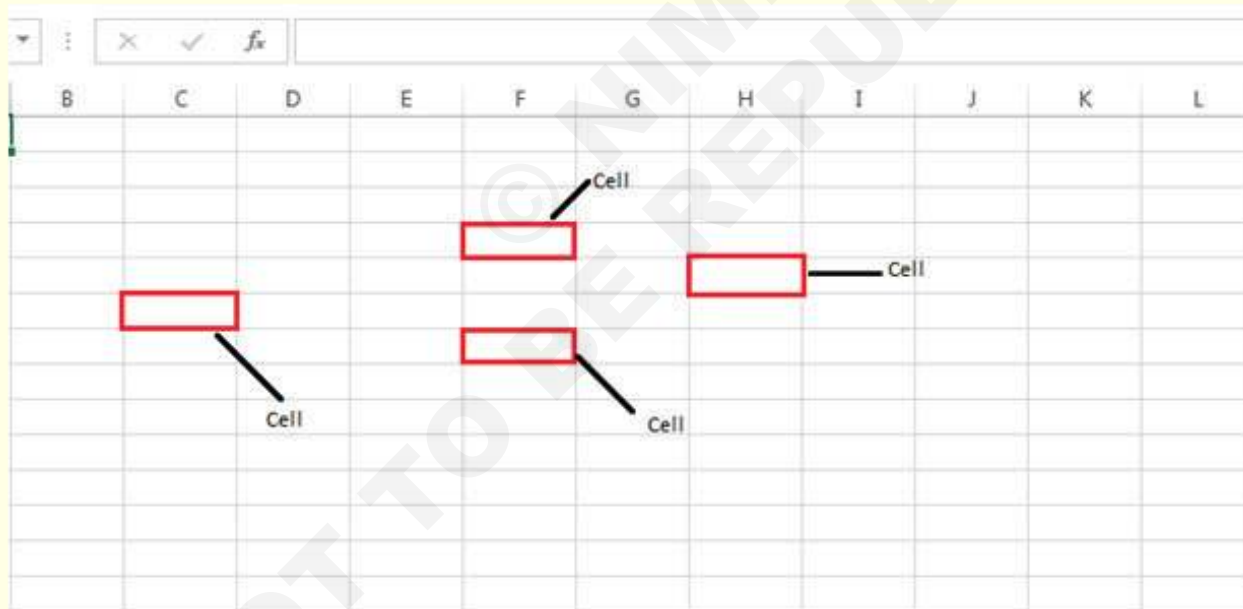
Excel has its own terminology for its components, which

new users may not immediately find understandable. Some of these terms and components include the following:

- **Cell.** A user enters data into a cell, which is the intersection of a column and row.
- **Cell reference.** This is the set of coordinates where a cell is located. Rows are horizontal and numbered whereas columns are vertical and assigned a letter.

- **Active cell.** This is the currently selected cell, outlined by a green box.
- **Workbook.** This is an Excel file that contains one or more worksheets
- **Worksheet.** These are the different documents nested within a Workbook.
- **Worksheet tab.** These are the tabs at the bottom left of the spreadsheet.
- **Column and row headings.** These are the numbered and lettered cells located just outside of the columns and rows. Selecting a header highlights the entire row or column.
- **Formula.** Formulas are mathematical equations, cell references or functions that can be placed inside a cell to produce a value. Formulas must start with an equal “=” sign.
- **Formula bar.** This is the long input bar that is used to enter values or formulas in cells. It is located at the top of the worksheet, next to the “fx” label.
- **Address bar.** This bar located to the left of the formula bar shows the number and letter coordinates of an active cell.
- **Filter.** These are rules a user can employ to select what rows in a worksheet to display. This option is located on the top right of the home bar under “Sort & Filter.” An auto filter option can be selected to show rows that match specific values.
- **AutoFill.** This feature enables users to copy data to more than one cell automatically. With two or more cells in a series, a user can select both cells and drag the bottom right corner down to autofill the rest of the cells.
- **AutoSum.** This feature enables users to add multiple values. Users can select the cells they want to add and press the Alt and Equal keys. There is also a button to enable this feature on the top right of the home page, above “Fill” and to the left of “Sort & Filter.”
- **PivotTable.** This data summarization tool sorts and calculates data automatically. This is located under the insert tab on the far left.
- **PivotChart.** This chart acts as a visual aid to the PivotTable, providing graph representations of the data. It is located under the middle of the insert page, next to maps.

Fig 2



- **Source data.** This is the information that is used to create a PivotTable.

Menus of MS Excel

Various editing and formatting can be done on an Excel spreadsheet. Discussed below are the various features of MS Excel.

The image below shows the composition of features in MS Excel:

- **Home**
- Comprises options like font size, font styles, font colour, background colour, alignment, formatting

options and styles, insertion and deletion of cells and editing options

Insert

- Comprises options like table format and style, inserting images and figures, adding graphs, charts and sparklines, header and footer option, equation and symbols

Page Layout

- Themes, orientation and page setup options are available under the page layout option

Formulas

- Since tables with a large amount of data can be created in MS excel, under this feature, you can add formulas to your table and get quicker solutions

Data

- Adding external data (from the web), filtering options and data tools are available under this category

Review

- Proofreading can be done for an excel sheet (like spell check) in the review category and a reader can add comments in this part

View

- Different views in which we want the spreadsheet to be displayed can be edited here. Options to zoom in and out and pane arrangement are available under this category

Fig 3



For those willing to learn more about MS Excel, can refer to the video given below and understand every small aspect of this program in detail.

Features of MS Excel

MS Excel is widely used for various purposes because the data is easy to save, and information can be added and removed without any discomfort and less hard work.

Given below are a few important benefits of using MS Excel:

- **Easy To Store Data:** Since there is no limit to the amount of information that can be saved in a spreadsheet, MS Excel is widely used to save data or to analyse data. Filtering information in Excel is easy and convenient.
- **Easy To Recover Data:** If the information is written on a piece of paper, finding it may take longer, however, this is not the case with excel spreadsheets. Finding and recovering data is easy.
- **Application of Mathematical Formulas:** Doing calculations has become easier and less time-taking with the formulas option in MS excel

- **More Secure:** These spreadsheets can be password secured in a laptop or personal computer and the probability of losing them is way lesser in comparison to data written in registers or piece of paper.

- **Data at One Place:** Earlier, data was to be kept in different files and registers when the paperwork was done. Now, this has become convenient as more than one worksheet can be added in a single MS Excel file.

- **Neater and Clearer Visibility of Information:** When the data is saved in the form of a table, analysing it becomes easier. Thus, information is a spreadsheet that is more readable and understandable.

Conditional Formatting

Conditional formatting is a feature in Microsoft Excel that allows you to apply specific formatting to your cells according to certain criteria. It enables you to make sense of your data and spot significant trends.

Highlight Cells Using Conditional Formatting :-

highlighting the cells that have a value greater than 350.
Execute the following steps:

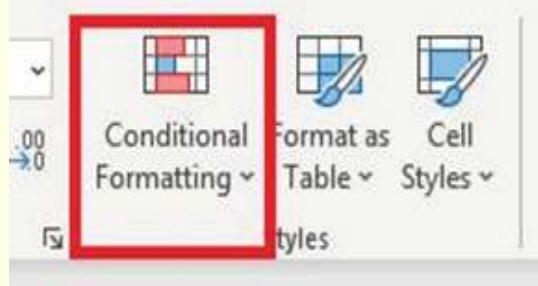
- Select the range of cells you want to apply the highlight. (Fig 4)

Fig 4

Bills	Jan-16	Feb-16	Mar-16	Total	Percent
Rent	\$ 1,200.00	\$ 1,200.00	\$ 1,200.00	\$ 3,600.00	45.28%
Car	300.00	300.00	300.00	900.00	11.32%
Credit Cards	250.00	350.00	450.00	1,050.00	13.21%
Food	300.00	400.00	500.00	1,200.00	15.09%
Phone	400.00	400.00	400.00	1,200.00	15.09%
Total	\$ 2,450.00	\$ 2,650.00	\$ 2,850.00	\$ 7,950.00	100.00%

- On the Home tab, under Styles Group, click Conditional Formatting. (Fig 5)

Fig 5



- Click Highlight Cells Rules > Greater Than (Fig 6)

Fig 6



- Enter the desired value and select the formatting style. (Fig 7)

Fig 7



- Click OK

Result: (Fig 8)

Fig 8

Bills	Jan-16	Feb-16	Mar-16	Total
Rent	\$ 1,200.00	\$ 1,200.00	\$ 1,200.00	\$ 3,600.00
Car	300.00	300.00	300.00	900.00
Credit Cards	250.00	350.00	450.00	1,050.00
Food	300.00	400.00	500.00	1,200.00
Phone	400.00	400.00	400.00	1,200.00

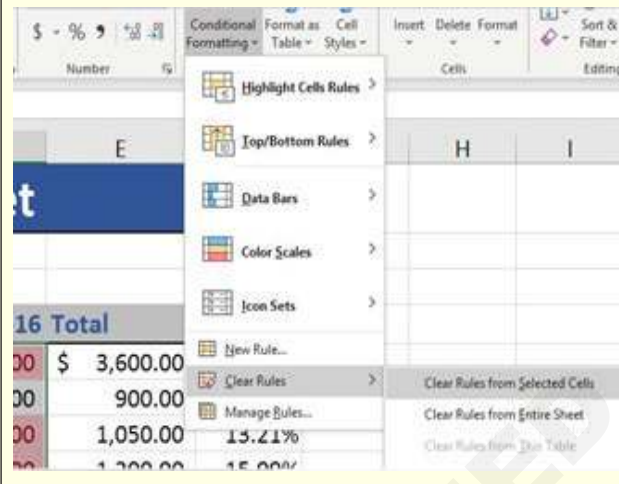
Clear Formatting

To clear the formatting rules, follow these steps:

- Select the range of cells where conditional formatting is applied.
- Go to Home tab > Styles Group > Conditional Formatting

- Click Clear Rules > Clear Rules from Selected Cells (Fig 9)

Fig 9



Conditional Formatting With Formulas

Formulas that apply conditional formatting must evaluate in true or false.

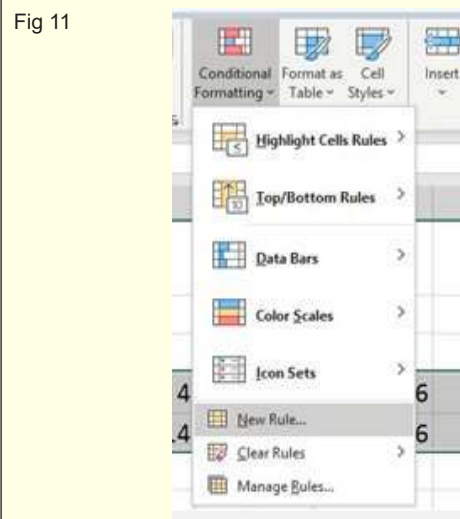
- Select the range of cells where you want to apply conditional formatting. (Fig 10)

Fig 10

Inventory Status Check	
Enter Product Code Here:	AX25
Warehouse 1 Inventory:	95
Warehouse 2 Inventory:	
Warehouse 3 Inventory:	85

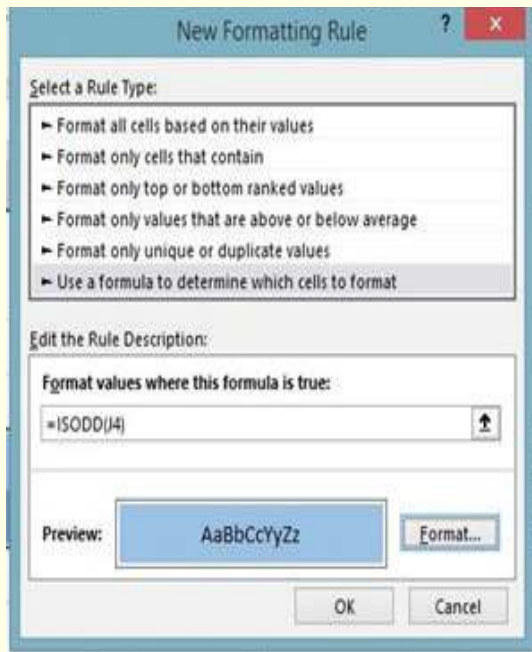
- On the Home tab, under Styles Group, click Conditional Formatting.
- Click New Rule. (Fig 11)

Fig 11



- Select 'Use a formula to determine which cells to format'.
- Enter the formula. (Fig 12)

Fig 12



- Select a formatting style and click OK.

Result: (Fig 13)

Fig 13

1	2	3	4	5	6	7	8	9
11	12	13	14	15	16	17	18	19

Highlight Bottom Items

Conditional Formatting can also be used to fetch the top and bottom items in your sheet. Suppose you want to get the five lowest pay rates among the given pay rates. Execute the following steps to do that:

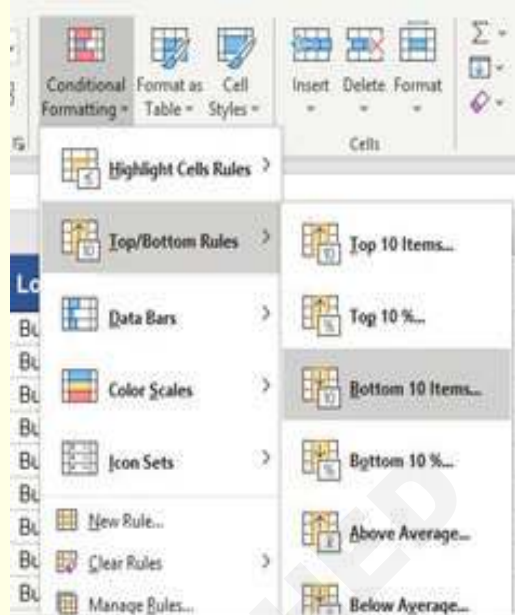
- Select the range of cells where you want to apply conditional formatting. (Fig 14)

Fig 14

Pay Rate	
\$	11.25
\$	12.25
\$	14.55
\$	11.25
\$	10.20
\$	12.25
\$	9.95
\$	12.30
\$	13.25
\$	10.20
\$	12.20
\$	14.25
\$	11.50
\$	10.35
\$	10.15
\$	12.25
\$	13.25
\$	9.50

- On the Home tab, under Styles Group, click Conditional Formatting.
- Click Top/Bottom rules > Bottom 10 Items (Fig 15)

Fig 15



- Mention the number of lowest records you want to highlight. (Fig 16)

Fig 16



- Click OK. (Fig 17)

Fig 17

Pay Rate	
\$	11.25
\$	12.25
\$	14.55
\$	11.25
\$	10.20
\$	12.25
\$	9.95
\$	12.30
\$	13.25
\$	10.20
\$	12.20
\$	14.25
\$	11.50
\$	10.35
\$	10.15
\$	12.25
\$	13.25
\$	9.50

Find Duplicate Values in Range of Cells

You can highlight the duplicate values in a range of cells using conditional formatting. To implement that, follow these steps:

- Select the range of cells. (Fig 18)

Fig 18

1	4	5	7	99	42	61
16	27	91	87	23	45	87
5	74	2	5	9	10	75
11	62	55	99	23	45	80

- On the Home tab, go to Styles Group > Conditional Formatting.
- Select Highlight Cells Rules > Duplicate values. (Fig 19)



Result: (Fig 20)

Fig 20

1	4	5	7	99	42	61
16	27	91	87	23	45	87
5	74	2	5	9	10	75
11	62	55	99	23	45	80

Data Bars in Conditional Formatting

Data bars in Excel are used to visualize the range of cells. The longer bar represents a higher value. To add the data bars, follow these steps:

- Select the range of cells. (Fig 21)

Fig 21

1
16
5
11
4
27
74
62
5
91
2
55

- On the Home tab, go to Conditional Formatting > Data Bars and select a subtype. (Fig 22)



Result: (Fig 23)

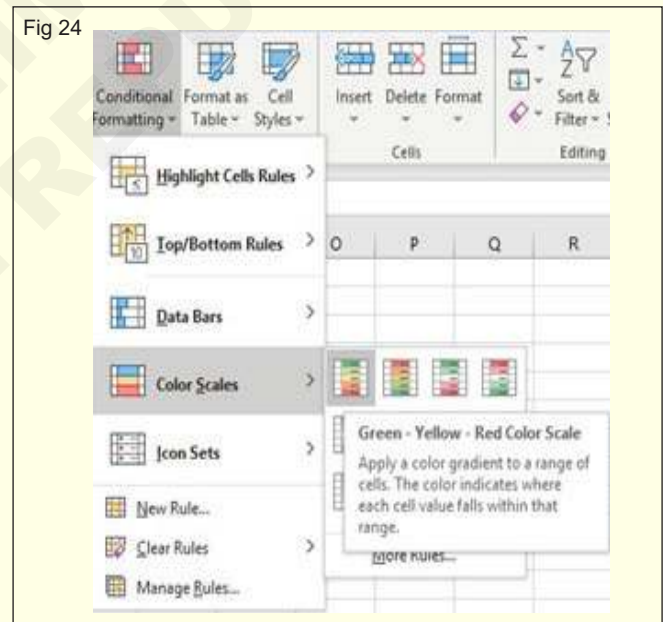
Fig 23

1
16
5
11
4
27
74
62
5
91
2
55

Color Scales in Conditional Formatting

Color Scales in Excel make the visualization of values in a range of cells very easy. To add a color scale, follow these steps:

- Select the range of cells.
- On the Home tab, go to Styles Group > Conditional Formatting.
- Click Color Scales and select a subtype. (Fig 24)



Result: (Fig 25)

Fig 25

3
5
6
13
15
18
23
35
48
54
78

- The red color represents the minimum value in the range.
- The yellow color represents the median value.
- The green color represents the maximum value.
- All the other values are colored proportionally.

Icon Sets in Conditional Formatting

Excel Conditional Formatting icon sets are used to visualize the data with the help of shapes, arrows, check marks, and other objects. To add an icon sets, follow these steps:

- Select the range of cells.
- On the Home tab, go to Styles Group > Conditional Formatting.
- Click Icon Sets and select a subtype. (Fig 26)

Fig 26



Result: (Fig 27)

Fig 27



Powerpoint Presentation

Objectives: At the end of this lesson you shall be able to

- **Explain MS PowerPoint**
- **Features in PowerPoint**
- **Create New Presentation**
- **Fine tuning of Presentations**

Power Point

Microsoft PowerPoint is a powerful slide show presentation program. It is a standard component of the company's Microsoft Office suite software, and is bundled together with Word, Excel, and other office productivity tools. The program uses slides to convey information rich in multimedia. The term slide refers to the old slide projector, which this software effectively replaces.

What can you do with PowerPoint

PowerPoint gives you the ability to share your presentation with others in real time on the web. You would supply the user with a link to the presentation. After selecting the link, the user(s) will be able to follow you and your presentation online.

- Custom animation
- Add photos, videos and sound effects
- Save as a webpage
- Print presentations as handouts
- Embed YouTube videos

Advantages

- **Quick and easy:** the basic features are easy to master and can make you appear to be organized, even if you are not.
- **Simple bullet points:** it can reduce complicated messages to simple bullet points. Bullet points are a good basis for a presentation and remind the speaker of main points and the organization of the message.
- **Easy to create a colorful, attractive design:** using the standard templates and themes, you can create something visually appealing, even if you do not have much knowledge of basic graphic design principles.
- **Easy to modify:** when compared to other visual aids such as charts, posters, or objects, it is easy to modify.
- **Easily re-order presentation:** with a simple drag and drop or using key strokes, you can move slides to re-order the presentation.
- **Audience Size:** PowerPoint slides are generally easier to see by a large audience when projected than other visual aids.
- **Easy to present:** you can easily advance the slides in the presentation one after another with a simple

key stroke while still maintaining eye contact with the audience.

- **No need for Handouts:** they look good visually and can be easily read if you have a projector and screen that is large enough for the entire room.

Create a presentation

- Open PowerPoint.
- In the left pane, select New. (Fig 1)
- Select an option:
- To create a presentation from scratch, select Blank Presentation.

Fig 1

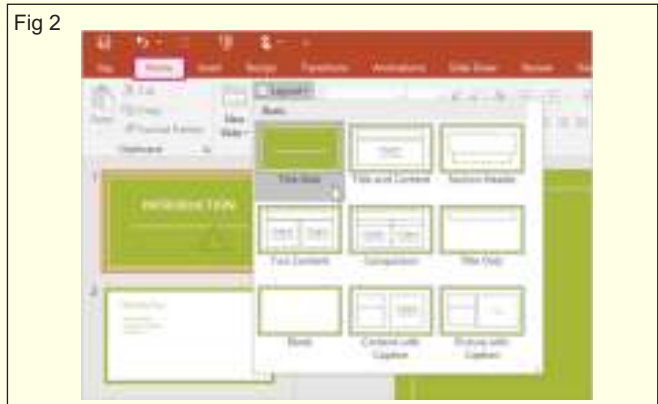


- To use a prepared design, select one of the templates.
- To see tips for using PowerPoint, select Take a Tour, and then select Create, .

Add a slide

- In the thumbnails on the left pane, select the slide you want your new slide to follow.
- In the Home tab, in the Slides section, select New Slide.

Fig 2

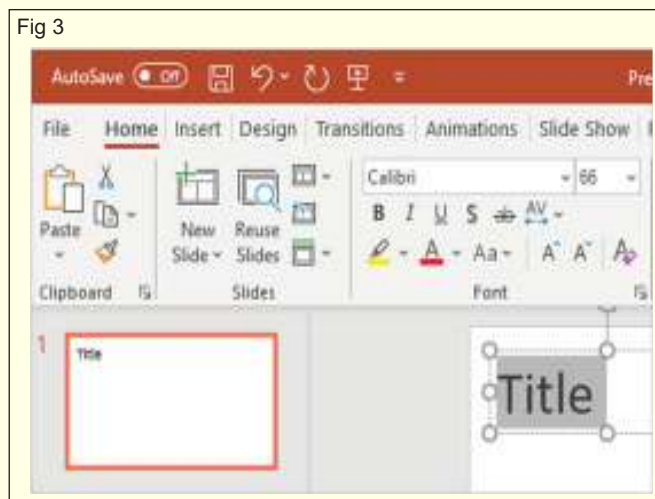


- In the Slides section, select Layout, (Fig 2) and then select the layout you want from the menu

Add and format text

- Place the cursor inside a text box, and then type something. (Fig 3)
- Select the text, and then select one or more options from the **Font** section of the **Home** tab, such as **Font**, **Increase Font Size**, **Decrease Font Size**, **Bold**, **Italic**, **Underline**, etc.

Fig 3



- To create bulleted or numbered lists, select the text, and then select **Bullets** or **Numbering**.

Add a picture, shape, and more

- Go to the Insert tab.
- To add a picture:
- In the **Images** section, select **Pictures**.
- In the **Insert Picture From** menu, select the source you want.
- Browse for the picture you want, select it, and then select **Insert**.
- To add illustrations:
- In the **Illustrations** section, select **Shapes**, **Icons**, **3D Models**, **SmartArt**, or **Chart**.
- In the dialog box that opens when you click one of the illustration types, select the item you want and follow the prompts to insert it.

Fonts:

Use a good font, like Arial as opposed to Times New Roman - it's easier to read on screen and will speed up your fine-tuning process. Use fewer types of font all through the PPT to make your own viewing of it easier. Other types of fonts which are commonly used in presentations these days are the Sans-Serif fonts like Calibri, Arial, and Verdana. Another commonly used Serif font favored by designers is Georgia.

Colors:

Time and again, we keep hearing that colors play an important role in presentations. You go wrong in picking

right colors, your whole presentation will end up being a mess. Play it safe, go with brand colors and do not mix them up with default colors. Did you know that choosing the right colors for your presentation, can make or break a deal for you?

Alignment:

Aligning shapes in your slides is another quick way to polish your presentation. If there are multiple shapes in

Fig 4



a slide, make sure (i) to align, maybe aligning them top, bottom or just the way you want and (ii) distribute them equally either horizontal or vertical. (Fig 4)

Indentation:

If there are bullet points, the line spacing and font sizes of the first and second bullet **should not be** the same.

Fig 5

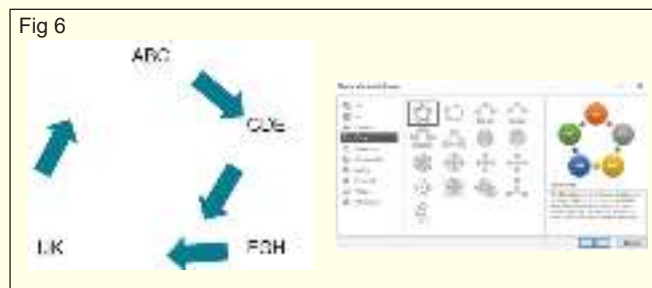


The bigger the font size, more is the spacing. Use the Indentation and Spacing precise measurement to get the required spacing [Click on the text > Paragraph > Indentation and Spacing] (Fig 5)

Usage of SmartArt:

If there is a need for a diagram or a flow chart, you

Fig 6



can simply insert SmartArt graphics from the Insert tab (Fig 6) and choose the graphic that best fits your need. But do beware...we do not recommend you do this often. Not a professional practice to use SmartArt in your presentation.

If there is a need for inserting images in a slide, make sure to keep it simple. Pick up images that align with the content to make it look visually appealing. An image, as we all know it, speaks a thousand words. But...it is also essential to know how to pick the right image for your presentations to convey the right message.

Fig 7

The screenshot shows the Windows Start menu with a grid of application icons. The icons are organized into three main sections: 'All Programs' (top), 'Favorites' (middle), and 'Recently Used' (bottom). The 'All Programs' section includes icons for Internet Explorer, Outlook, Word, Excel, PowerPoint, Access, Publisher, OneNote, and various Microsoft Office applications. The 'Favorites' section includes icons for Internet Explorer, Outlook, Word, Excel, PowerPoint, Access, Publisher, OneNote, and various Microsoft Office applications. The 'Recently Used' section includes icons for Internet Explorer, Outlook, Word, Excel, PowerPoint, Access, Publisher, OneNote, and various Microsoft Office applications.

So, when you are running out of time, rushing to a meeting, do not worry.

FINE TUNING PRENTATION of MS PowerPoint

There are multiple features that are available in MS PowerPoint which can customise and optimise a presentation.

Multiple options and layouts are available based on

Fig 8

The screenshot shows the Microsoft PowerPoint interface with the 'Design' tab selected. The 'Office Theme' is highlighted, and the 'File Info' option is also visible. The 'File Info' option is highlighted with a red box. The 'Office Theme' is highlighted with a red box. The 'File Info' option is highlighted with a red box. The 'Office Theme' is highlighted with a red box. The 'File Info' option is highlighted with a red box.

which a presentation can be created. This option is available under the “Home” section and one can select from the multiple layout options provided. (Fig 8)

Fig 9



Under the “Insert” category, multiple options are available where one can choose what feature they want to insert in their presentation. This may include images, audio, video, header, footer, symbols, shapes, etc. (Fig 9)

MS PowerPoint has various themes using which background colour and designs or textures can be added to a slide. This makes the presentation more colourful and attracts the attention of the people looking at it.

This feature can be added using the “Design” category

Fig 10



mentioned on the homepage of MS PowerPoint. Although there are existing design templates available, in case someone wants to add some new texture or colour, the option to customise the design is also available. (Fig 10) Apart from this, slide designs can also be downloaded online.

Refer to the below for slide design:

During the slide show, the slides appear on the screen one after the other. In case, one wants to add some animations to the way in which a slide presents itself, they can refer to the “Animations” category.

Fig 11



The different animation styles available on PowerPoint are: (Fig 11)

Apart from all these options; font size, font style, font colour, word art, date and time, etc. can also be added to a PPT.

Uses of PowerPoint Presentation

PowerPoint presentations are useful for both personal and professional usage. Given below are a few of the major fields where PPT is extremely useful:

- **Education** – With e-learning and smart classes being chosen as a common mode of education today, PowerPoint presentations can help in making education more interactive and attract students towards the modified version of studying
- **Marketing** – In the field of marketing, PowerPoint presentations can be extremely important. Using graphs and charts, numbers can be shown more evidently and clearly which may be ignored by the viewer if being read
- **Business** – To invite investors or to show the increase or decrease in profits, MS PowerPoint can be used
- **Creating Resumes** – Digital resumes can be formed using MS PowerPoint. Different patterns, photograph, etc. can be added to the resume
- **Depicting Growth** – Since both graphics and text can be added in a presentation, depicting the growth of a company, business, student's marks, etc. is easier using PPT

Network concepts, toologies and network components

Objectives: At the end of this lesson you shall be able to

- necessity and advantages
- client server and peer to peer networking concepts
- network topologies
- Introduction to LAN, WAN and MAN
- Network components

Necessity and advantages

What is Computer Network

A **computer network** is a set of devices (often referred to as nodes) connected by communication links. A node can be a computer, printer, or any other device capable of sending or receiving data from the other node/device through the network.

Computer Network Criteria

- Performance
- Reliability
- Security

Performance

It can be measured in many ways and depends on the number of factors

- Number of users
- Type of transmission medium
- Response time
- Transit time
- Hardware
- Software

Reliability

- Frequency of failure
- The recovery time of a network after a failure.
- Catastrophe

Security

As data is being travelled from node to node through the network to reach its final destination, during that time it can be tampered or can be stolen so the security of information is the top priority.

Network security issues include protecting data from the following

- Unauthorized access
- Viruses

Advantages of Computer Network

There are many advantages of computer network and benefits of computer networking, some of them are File sharing, Resource sharing, Better connectivity and communications is briefly explained below.

- **File sharing:** Fundamental goals of a computer network is to allow file sharing and remote file access.

Server-Client model: Client-server model is a distributed application framework. The server is a master system which stores the data and provides the processing service. A client is a user system which accesses the data from the server and can perform processing in its system or in a server system.

Resource sharing: All the resources such as printers, modems, scanners and fax machines etc can be shared by all the system in a computer network.

Better connectivity and communications: A computer network allows all the user or computers at a different location to communicate easily, widely used example is email, video conference etc.

Need of computer network

Computer networks have become invaluable to organizations as well as individuals. Some of its main uses are **Internet access, eCommerce, Entertainment, VoIP** is briefly explained below.

- **Internet access:** We can easily access information all because of the internet which provides a variety of information and communication facilities, using standardized communication protocols.

eCommerce: also known as electronic commerce, refers to buying or selling product, service etc through the internet. It has been one of the world most profitable business in the world which is only possible of a computer network.

Entertainment: It includes games, online video streaming and many other which is only possible because of the computer network.

VoIP: Through Voice over Internet protocol, telephone calls are made digitally using Internet Protocols instead of the regular analog phone lines.

Disadvantages of Computer Network

There are many **disadvantages of computer network** of computer networking.

- **Lack of data security and privacy** due to the huge number of the user accessing the internet from every corner of the earth, handling data is a challenging task

and data can be stolen which violate the privacy of the user.

Presence of computer viruses and the malware:

A virus can easily spread through an interconnected workstation or over the internet which can damage or steal the data from the computer system in a computer network.

Client server and peer to peer networking concepts

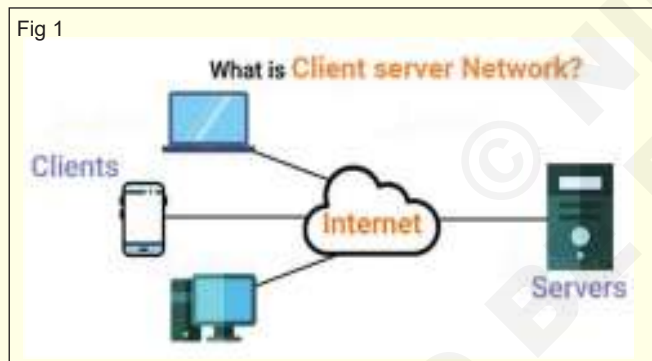
What is Client Server Network?

Definition

A client server architecture is a computing model wherein the server hosts, delivers, and manages most of the resources and services requested by the client. (Fig 1)

It is also known as the networking computing model or client server network as all requests and services are delivered over a network. The client server architecture or model has another(other) system(s) connected over a network where resources are shared among the different computers.

Recognized as one of the most weirdly used networking models, the client server network model, generally, includes many clients or workstations interconnected in a network with a central server. While the server acts as a powerful system that stores all the data on it, the



client functions as a machine that requests specific information from the server.

Client Server Network Example

One of the most popular examples of the client server architecture is the World Wide Web consortium. In this, internet users, people like us, act as clients requesting information from the servers, and the servers respond with the specifically requested information.

Advantages

Some of the advantages of the client server network are as follows:

- As a centralized network, the client-server network has complete leverage to control the processes and activities within the network.
- It gives flexibility to users to access files residing in the central storage from anywhere.
- It provides a good user interface and ease of

handling files.

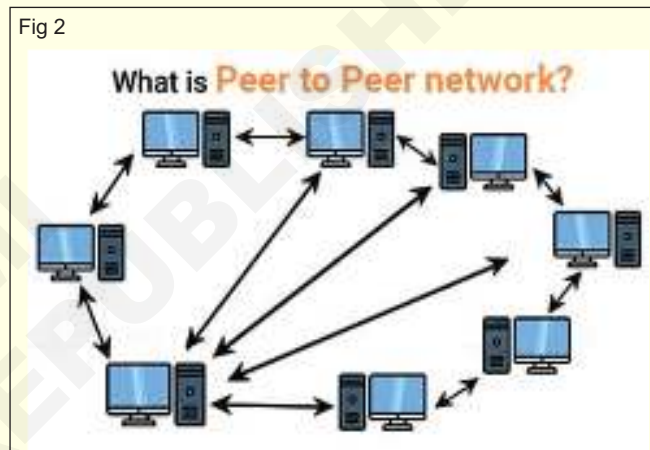
- Resources can be easily shared over the client-server network.

What is Peer-to-Peer network?

Definition

Peer-to-peer network involves two or more computers that pool various peripheral resources such as printers and DVD players. (Fig 2) Such shared resources are available on every computer in the network. In a peer-to-peer network, each computer behaves as the client as well as the server, and it communicates with the other computers directly.

This type of network is preferably used by SMBs that work without the need of a central server. All connected computers of the system work as nodes and allow seamless file sharing. Such a network is easy to set up and only needs a Wi-Fi connection or an Ethernet cable



for its setup.

Peer-to-Peer Network Example

Torrent is one of the most popular examples of peer-to-peer networks. In this type of network, all computers are connected to the internet where resources shared by any one computer can be downloaded by others.

Another widely used example of peer-to-peer network is the local area network (LAN,) which is usually preferred by small offices for the purpose of resource sharing.

Advantages

Some of the major advantages of peer-to-peer network are as follows:

- Each device connected to the peer-to-peer network provides and receives resources from other nodes in the network.
- Resources are shared seamlessly between different devices.
- Being a part of a peer-to-peer network, resources, such as printers, are easily shared between the nodes in the network.
- The setup of a peer-to-peer network is easily established with the help of specialized software.

- Peer-to-peer network has high reliability as even in case of a server malfunction, other systems continue to operate.

Now that you have a good understanding of both the topics, let us now learn some of the key **differences between peer-to-peer network and client server network**.

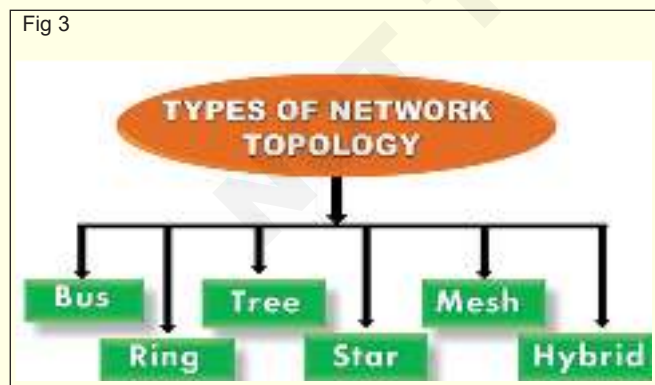
Difference Between Peer-to-Peer Network and Client Server Network

Parameters	Client Server Network	Peer-to-Peer Network
Data	It has a centralized server to store all data.	Each peer in the network has its own data.
Service	When the client sends a request asking for specific information, the server responds with a service.	Each node in this network can make a request and also respond for the services.
Focus	It primarily focuses on information sharing.	Its primary focus is on connectivity.
Differentiation	This network has a dedicated server and a specific client.	There is no differentiation between client and server. Each node acts as a client as well as a server.
Stability	It is a more stable network and is easily scalable. Hence, it is preferred by large organizations.	The stability of this network is reduced if more peers are added. Hence, it is generally preferred by SMBs.
Security	It is a secured network because the server can authenticate a client's access to any part of the network.	As the number of peers increases, the network becomes less secure and the vulnerability of the network increases.
Performance	The performance remains unaffected with the increase in clients because the server does the heavy lifting.	In case of a large peer-to-peer network, performance is likely to reduce because the resources are shared.
Cost	It is costlier to set up as compared to a peer-to-peer network.	It is not very expensive to set up.

Network topologies

Topology defines the structure of the network of how all the components are interconnected to each other. There are two types of topology: physical and logical topology.

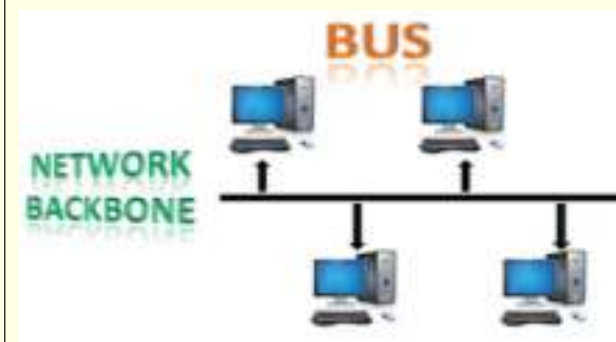
Physical topology is the geometric representation of all the nodes in a network. (Fig 3)



Bus Topology

- The bus topology is designed in such a way that all the stations are connected through a single cable known as a backbone cable. (Fig 4)

Fig 4



- Each node is either connected to the backbone cable by drop cable or directly connected to the backbone cable.
- When a node wants to send a message over the network, it puts a message over the network. All the stations available in the network will receive the message whether it has been addressed or not.
- The backbone cable is considered as a “**single lane**” through which the message is broadcast to all

the stations.

- The most common access method of the bus topologies is **CSMA** (Carrier Sense Multiple Access).

Advantages of Bus topology:

- **Low-cost cable:** In bus topology, nodes are directly connected to the cable without passing through a hub. Therefore, the initial cost of installation is low.
- **Moderate data speeds:** Coaxial or twisted pair cables are mainly used in bus-based networks that support up to 10 Mbps.
- **Familiar technology:** Bus topology is a familiar technology as the installation and troubleshooting techniques are well known, and hardware components are easily available.
- **Limited failure:** A failure in one node will not have any effect on other nodes.

Disadvantages of Bus topology:

- **Extensive cabling:** A bus topology is quite simpler, but still it requires a lot of cabling.
- **Difficult troubleshooting:** It requires specialized test equipment to determine the cable faults. If any fault occurs in the cable, then it would disrupt the communication for all the nodes.
- **Signal interference:** If two nodes send the messages simultaneously, then the signals of both the nodes collide with each other.
- **Reconfiguration difficult:** Adding new devices to the network would slow down the network.
- **Attenuation:** Attenuation is a loss of signal leads to communication issues. Repeaters are used to regenerate the signal.

Ring Topology

Fig 5



- Ring topology is like a bus topology, but with connected ends. (Fig 5)
- The node that receives the message from the previous computer will retransmit to the next node.
- The data flows in one direction, i.e., it is unidirectional.
- The data flows in a single loop continuously known

as an endless loop.

- It has no terminated ends, i.e., each node is connected to other node and having no termination point.
- The data in a ring topology flow in a clockwise direction.

Advantages of Ring topology:

- **Network Management:** Faulty devices can be removed from the network without bringing the network down.
- **Product availability:** Many hardware and software tools for network operation and monitoring are available.
- **Cost:** Twisted pair cabling is inexpensive and easily available. Therefore, the installation cost is very low.
- **Reliable:** It is a more reliable network because the communication system is not dependent on the single host computer.

Disadvantages of Ring topology:

- **Difficult troubleshooting:** It requires specialized test equipment to determine the cable faults. If any fault occurs in the cable, then it would disrupt the communication for all the nodes.
- **Failure:** The breakdown in one station leads to the failure of the overall network.
- **Reconfiguration difficult:** Adding new devices to the network would slow down the network.
- **Delay:** Communication delay is directly proportional to the number of nodes. Adding new devices increases the communication delay.

Fig 6



Star Topology

- Star topology is an arrangement of the network in which every node is connected to the central hub, switch or a central computer. (Fig 6)
- The central computer is known as a **server**, and the peripheral devices attached to the server are known as **clients**.

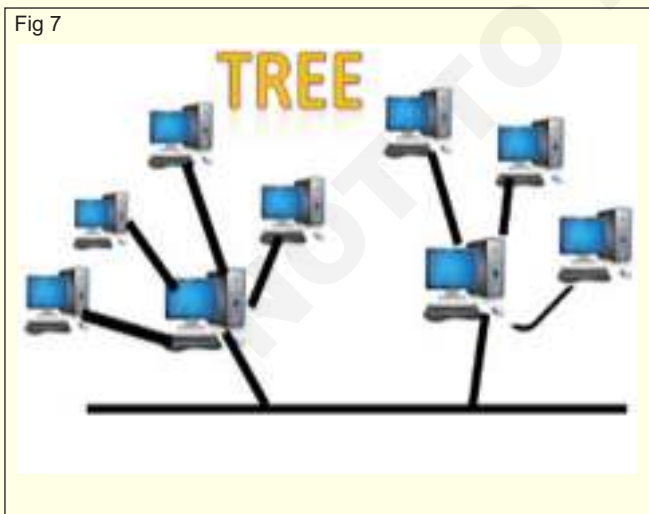
- Coaxial cable or RJ-45 cables are used to connect the computers.
- Hubs or Switches are mainly used as connection devices in a **physical star topology**.
- Star topology is the most popular topology in network implementation.

Advantages of Star topology

- **Efficient troubleshooting:** Troubleshooting is quite efficient in a star topology as compared to bus topology. In a bus topology, the manager has to inspect the kilometers of cable. In a star topology, all the stations are connected to the centralized network. Therefore, the network administrator has to go to the single station to troubleshoot the problem.
- **Network control:** Complex network control features can be easily implemented in the star topology. Any changes made in the star topology are automatically accommodated.
- **Limited failure:** As each station is connected to the central hub with its own cable, therefore failure in one cable will not affect the entire network.
- **Familiar technology:** Star topology is a familiar technology as its tools are cost-effective.
- **Easily expandable:** It is easily expandable as new stations can be added to the open ports on the hub.
- **Cost effective:** Star topology networks are cost-effective as it uses inexpensive coaxial cable.
- **High data speeds:** It supports a bandwidth of approx 100Mbps. Ethernet 100BaseT is one of the most popular Star topology networks.

Disadvantages of star topology

- **Cost effective:** Star topology networks are cost-effective as it uses inexpensive coaxial cable.



- **High data speeds:** It supports a bandwidth of approx 100Mbps. Ethernet 100BaseT is one of the most popular Star topology networks.
- **A Central point of failure:** If the central hub or

switch goes down, then all the connected nodes will not be able to communicate with each other. (Fig 7)

- **Cable:** Sometimes cable routing becomes difficult when a significant amount of routing is required.

Tree topology

- Tree topology combines the characteristics of bus topology and star topology.
- A tree topology is a type of structure in which all the computers are connected with each other in hierarchical fashion.
- The top-most node in tree topology is known as a root node, and all other nodes are the descendants of the root node.
- There is only one path exists between two nodes for the data transmission. Thus, it forms a parent-child hierarchy.

Advantages of Tree topology

- **Support for broadband transmission:** Tree topology is mainly used to provide broadband transmission, i.e., signals are sent over long distances without being attenuated.
- **Easily expandable:** We can add the new device to the existing network. Therefore, we can say that tree topology is easily expandable.
- **Easily manageable:** In tree topology, the whole network is divided into segments known as star networks which can be easily managed and maintained.
- **Error detection:** Error detection and error correction are very easy in a tree topology.
- **Limited failure:** The breakdown in one station does not affect the entire network.
- **Point-to-point wiring:** It has point-to-point wiring for individual segments.

Disadvantages of Tree topology

- **Difficult troubleshooting:** If any fault occurs in the node, then it becomes difficult to troubleshoot the problem.
- **High cost:** Devices required for broadband transmission are very costly.
- **Failure:** A tree topology mainly relies on main bus cable and failure in main bus cable will damage the overall network.
- **Reconfiguration difficult:** If new devices are added, then it becomes difficult to reconfigure.

Mesh topology

- Mesh technology is an arrangement of the network in which computers are interconnected with each other through various redundant connections.(Fig 8)
- There are multiple paths from one computer to another computer.

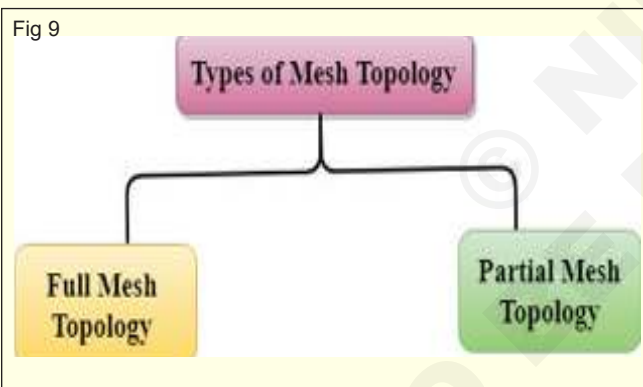
Fig 8



- It does not contain the switch, hub or any central computer which acts as a central point of communication.
- The Internet is an example of the mesh topology.
- Mesh topology is mainly used for WAN implementations where communication failures are a critical concern.
- Mesh topology is mainly used for wireless networks.

Where n is the number of nodes that represents the network. (Fig 9)

Advantages of Mesh topology:



Reliable: The mesh topology networks are very reliable as if any link breakdown will not affect the communication between connected computers.

Fast Communication: Communication is very fast between the nodes.

Easier Reconfiguration: Adding new devices would not disrupt the communication between other devices.

Disadvantages of Mesh topology

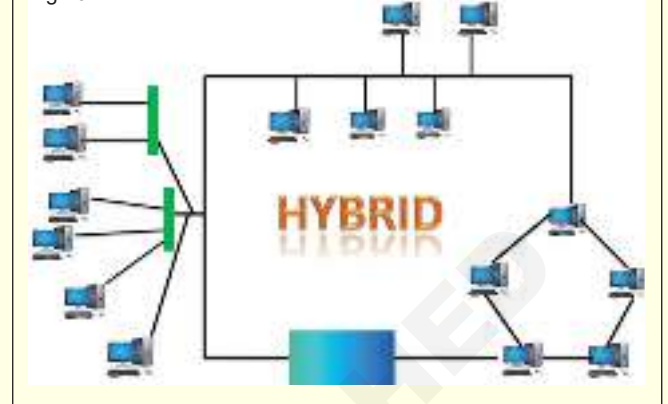
- **Cost:** A mesh topology contains a large number of connected devices such as a router and more transmission media than other topologies.
- **Management:** Mesh topology networks are very large and very difficult to maintain and manage. If the network is not monitored carefully, then the communication link failure goes undetected.
- **Efficiency:** In this topology, redundant connections

are high that reduces the efficiency of the network.

Hybrid Topology

- The combination of various different topologies is known as **Hybrid topology**. (Fig 10)
- A Hybrid topology is a connection between different

Fig 10



links and nodes to transfer the data.

- When two or more different topologies are combined together is termed as Hybrid topology and if similar topologies are connected with each other will not result in Hybrid topology. For example, if there exist a ring topology in one branch of ICICI bank and bus topology in another branch of ICICI bank, connecting these two topologies will result in Hybrid topology.

Advantages of Hybrid Topology

- **Reliable:** If a fault occurs in any part of the network will not affect the functioning of the rest of the network.
- **Scalable:** Size of the network can be easily expanded by adding new devices without affecting the functionality of the existing network.
- **Flexible:** This topology is very flexible as it can be designed according to the requirements of the organization.
- **Effective:** Hybrid topology is very effective as it can be designed in such a way that the strength of the network is maximized and weakness of the network is minimized.

Disadvantages of Hybrid topology

- **Complex design:** The major drawback of the Hybrid topology is the design of the Hybrid network. It is very difficult to design the architecture of the Hybrid network.
- **Costly Hub:** The Hubs used in the Hybrid topology are very expensive as these hubs are different from usual Hubs used in other topologies.
- **Costly infrastructure:** The infrastructure cost is very high as a hybrid network requires a lot of cabling, network devices, etc.

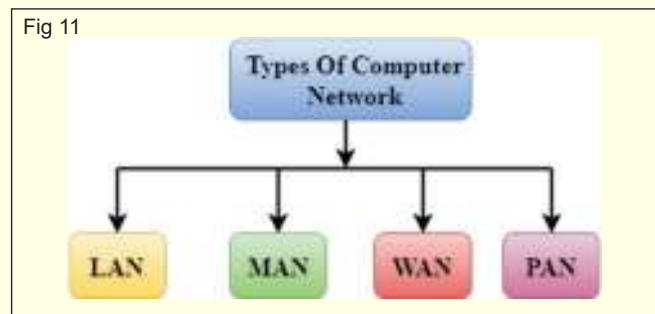
Introduction to LAN, WAN and MAN

A computer network is a group of computers linked to each other that enables the computer to communicate with another computer and share their resources, data, and applications.

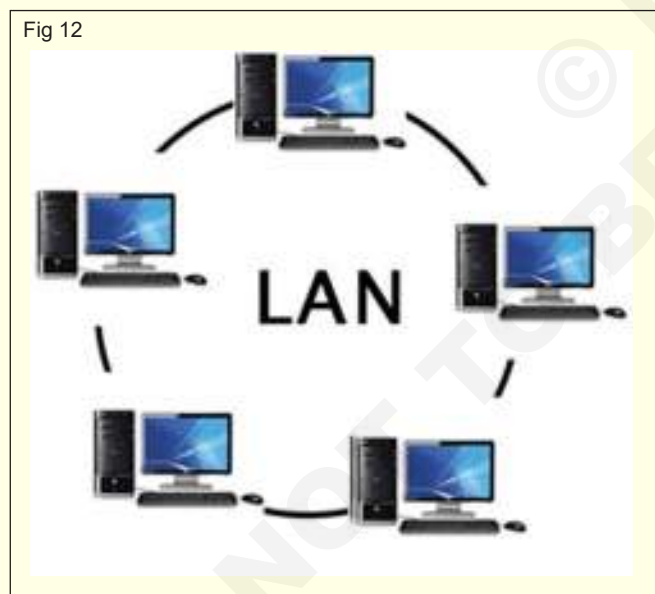
A computer network can be categorized by their size. A **computer network** is mainly of **four types**: (Fig 11)

- LAN(Local Area Network)
- PAN(Personal Area Network)
- MAN(Metropolitan Area Network)
- WAN(Wide Area Network)

LAN(Local Area Network)



- Local Area Network is a group of computers connected to each other in a small area such as building, office. (Fig 12)
- LAN is used for connecting two or more personal



computers through a communication medium such as twisted pair, coaxial cable, etc.

- It is less costly as it is built with inexpensive hardware such as hubs, network adapters, and ethernet cables.
- The data is transferred at an extremely faster rate in Local Area Network.
- Local Area Network provides higher security.

PAN(Personal Area Network)

- Personal Area Network is a network arranged within an individual person, typically within a range of 10 meters. (Fig 13)
- Personal Area Network is used for connecting the computer devices of personal use is known as

Fig 13



Personal Area Network.

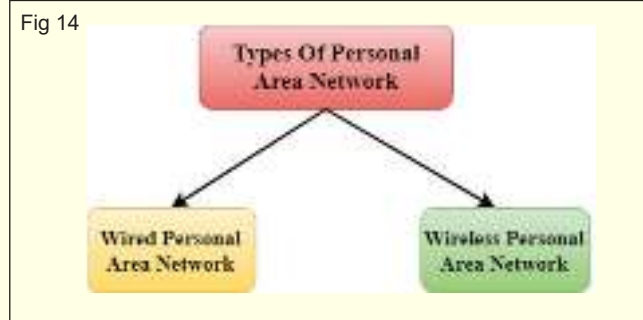
- **Thomas Zimmerman** was the first research scientist to bring the idea of the Personal Area Network.
- Personal Area Network covers an area of **30 feet**.
- Personal computer devices that are used to develop the personal area network are the laptop, mobile phones, media player and play stations.

There are two types of Personal Area Network:

- Wired Personal Area Network
- Wireless Personal Area Network

Wireless Personal Area Network: Wireless Personal Area Network is developed by simply using wireless technologies such as WiFi, Bluetooth. It is a low range network. (Fig 14)

Wired Personal Area Network: Wired Personal Area Network is created by using the USB.



Examples Of Personal Area Network:

- **Body Area Network:** Body Area Network is a network that moves with a person. For example, a mobile network moves with a person. Suppose a person establishes a network connection and then creates a connection with another device to share the information.
- **Offline Network:** An offline network can be created

inside the home, so it is also known as a home network. A home network is designed to integrate the devices such as printers, computer, television but they are not connected to the internet.

- **Small Home Office:** It is used to connect a variety of devices to the internet and to a corporate network using a VPN

MAN(Metropolitan Area Network)

- A metropolitan area network is a network that covers a larger geographic area by interconnecting a different LAN to form a larger network. (Fig 15)
- Government agencies use MAN to connect to the citizens and private industries.
- In MAN, various LANs are connected to each other through a telephone exchange line.
- The most widely used protocols in MAN are RS-232, Frame Relay, ATM, ISDN, OC-3, ADSL, etc.
- It has a higher range than Local Area Network(LAN).

Uses of Metropolitan Area Network:

- MAN is used in communication between the banks in a city.

Fig 15

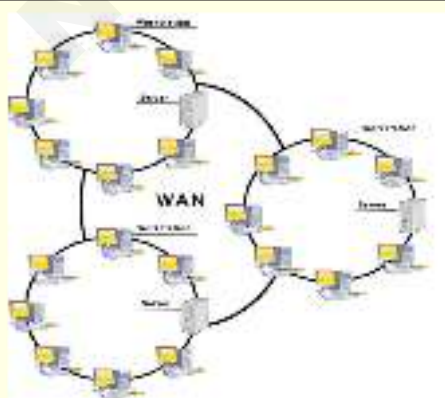


- It can be used in an Airline Reservation.
- It can be used in a college within a city.
- It can also be used for communication in the military.

WAN(Wide Area Network)

- A Wide Area Network is a network that extends over a large geographical area such as states or countries. (Fig 16)
- A Wide Area Network is quite bigger network than the LAN.
- A Wide Area Network is not limited to a single

Fig 16



location, but it spans over a large geographical area through a telephone line, fibre optic cable or satellite links.

- The internet is one of the biggest WAN in the world.
- A Wide Area Network is widely used in the field of Business, government, and education.

Examples of Wide Area Network:

- **Mobile Broadband:** A 4G network is widely used across a region or country.
- **Last mile:** A telecom company is used to provide the internet services to the customers in hundreds of cities by connecting their home with fiber.
- **Private network:** A bank provides a private network that connects the 44 offices. This network is made by using the telephone leased line provided by the telecom company.

Advantages of Wide Area Network:

Following are the advantages of the Wide Area Network:

- **Geographical area:** A Wide Area Network provides a large geographical area. Suppose if the branch of our office is in a different city then we can connect with them through WAN. The internet provides a leased line through which we can connect with another branch.
- **Centralized data:** In case of WAN network, data is centralized. Therefore, we do not need to buy the emails, files or back up servers.
- **Get updated files:** Software companies work on the live server. Therefore, the programmers get the updated files within seconds.
- **Exchange messages:** In a WAN network, messages are transmitted fast. The web application like Facebook, Whatsapp, Skype allows you to communicate with friends.
- **Sharing of software and resources:** In WAN network, we can share the software and other resources like a hard drive, RAM.
- **Global business:** We can do the business over the internet globally.
- **High bandwidth:** If we use the leased lines for our company then this gives the high bandwidth. The high bandwidth increases the data transfer rate which in turn increases the productivity of our company.

Disadvantages of Wide Area Network:

The following are the disadvantages of the Wide Area Network:

- **Security issue:** A WAN network has more security issues as compared to LAN and MAN network as all the technologies are combined together that creates the security problem.
- **Needs Firewall & antivirus software:** The data is

transferred on the internet which can be changed or hacked by the hackers, so the firewall needs to be used. Some people can inject the virus in our system so antivirus is needed to protect from such a virus.

- **High Setup cost:** An installation cost of the WAN network is high as it involves the purchasing of routers, switches.
- **Troubleshooting problems:** It covers a large area so fixing the problem is difficult.

Internet work

- An internetwork is defined as two or more computer network LANs or WAN or computer network segments are connected using devices, and they are configured by a local addressing scheme. This process is known as internet working.
- An inter connection between public, private, commercial, industrial, or government computer networks can also be defined as internet working.
- An internet working uses the internet protocol.
- The reference model used for internet working is Open System Inter connection (OSI).

Types of Internet work:

- **Extranet:** An extranet is a communication network based on the internet protocol such as **Transmission Control protocol** and **internet protocol**. It is used for information sharing. The access to the extranet is restricted to only those users who have login credentials. An extranet is the lowest level of internetworking. It can be categorized as **MAN**, **WAN** or other computer networks. An extranet cannot have a single **LAN**, atleast it must have one connection to the external network.
- **Intranet:** An intranet is a private network based on the internet protocol such as **Transmission Control protocol** and **internet protocol**. An intranet belongs to an organization which is only accessible by the **organization's employee** or members. The main aim of the intranet is to share the information and resources among the organization employees. An intranet provides the facility to work in groups and for teleconferences.

Intranet advantages:

- **Communication:** It provides a cheap and easy communication. An employee of the organization can communicate with another employee through email, chat.
- **Time-saving:** Information on the intranet is shared in real time, so it is time-saving.
- **Collaboration:** Collaboration is one of the most important advantage of the intranet. The information is distributed among the employees of the organization and can only be accessed by the authorized user.

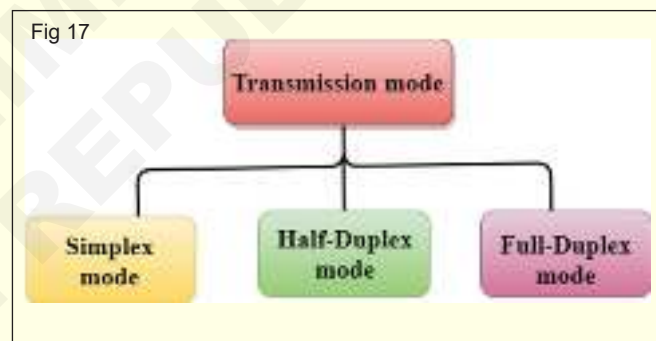
- **Platform independency:** It is a neutral architecture as the computer can be connected to another device with different architecture.
- **Cost effective:** People can see the data and documents by using the browser and distributes the duplicate copies over the intranet. This leads to a reduction in the cost.

Transmission modes

- The way in which data is transmitted from one device to another device is known as transmission mode.
- The transmission mode is also known as the communication mode.
- Each communication channel has a direction associated with it, and transmission media provide the direction. Therefore, the transmission mode is also known as a directional mode.
- The transmission mode is defined in the physical layer.

The Transmission mode is divided into three categories: (Fig 17)

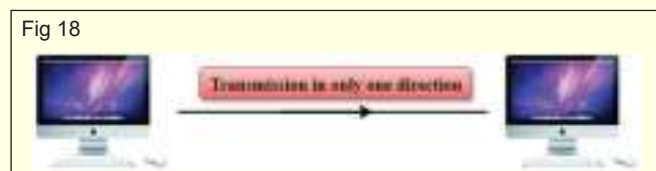
- Simplex mode
- Half-duplex mode



- Full-duplex mode

Simplex mode

- In Simplex mode, the communication is unidirectional, i.e., the data flow in one direction. (Fig 18)
- A device can only send the data but cannot receive it or it can receive the data but cannot send the data.



- This transmission mode is not very popular as mainly communications require the two-way exchange of data. The simplex mode is used in the business field as in sales that do not require any corresponding reply.
- The radio station is a simplex channel as it transmits the signal to the listeners but never allows them to transmit back.

- Keyboard and Monitor are the examples of the simplex mode as a keyboard can only accept the data from the user and monitor can only be used to display the data on the screen.
- The main advantage of the simplex mode is that the full capacity of the communication channel can be utilized during transmission.

Advantage of Simplex mode:

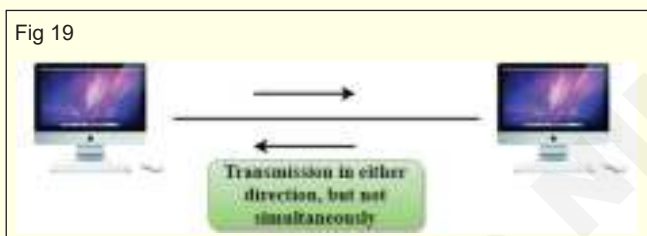
- In simplex mode, the station can utilize the entire bandwidth of the communication channel, so that more data can be transmitted at a time.

Disadvantage of Simplex mode:

- Communication is unidirectional, so it has no inter-communication between devices.

Half-Duplex mode

- In a Half-duplex channel, direction can be reversed, i.e., the station can transmit and receive the data as well. (Fig 19)
- Messages flow in both the directions, but not at the same time.
- The entire bandwidth of the communication channel



is utilized in one direction at a time.

- In half-duplex mode, it is possible to perform the error detection, and if any error occurs, then the receiver requests the sender to retransmit the data.
- A **Walkie-talkie** is an example of the Half-duplex
- The most common example of the full-duplex mode is a telephone network. When two people are communicating

mode. In Walkie-talkie, one party speaks, and another party listens. After a pause, the other speaks and first party listens. Speaking simultaneously will create the distorted sound which cannot be understood.

Advantage of Half-duplex mode:

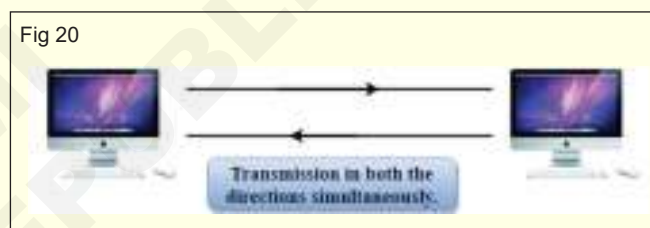
- In half-duplex mode, both the devices can send and receive the data and also can utilize the entire bandwidth of the communication channel during the transmission of data.

Disadvantage of Half-Duplex mode:

- In half-duplex mode, when one device is sending the data, then another has to wait, this causes the delay in sending the data at the right time.

Full-duplex mode

- In Full duplex mode, the communication is bi-directional, i.e., the data flow in both the directions. (Fig 20)
- Both the stations can send and receive the message simultaneously.
- Full-duplex mode has two simplex channels. One



channel has traffic moving in one direction, and another channel has traffic flowing in the opposite direction.

Differences b/w Simplex, Half-duplex and Full-duplex mode

Basis for comparison	Simplex mode	Half-duplex mode	Full-duplex mode
Direction of communication	In simplex mode, the communication is unidirectional.	In half-duplex mode, the communication is bidirectional, but one at a time.	In full-duplex mode, the communication is bidirectional.
Send/Receive	A device can only send the data but cannot receive it or it can only receive the data but cannot send it.	Both the devices can send and receive the data, but one at a time.	Both the devices can send and receive the data simultaneously.
Performance	The performance of half-duplex mode is better than the simplex mode.	The performance of full-duplex mode is better than the half-duplex mode.	The Full-duplex mode has better performance among simplex and half-duplex mode as it doubles the utilization of the capacity of the communication channel.
Example	Examples of Simplex mode are radio, keyboard, and monitor.	Example of half-duplex is Walkie-Talkies.	Example of the Full-duplex mode is a telephone network.

with each other by a telephone line, both can talk and listen at the same time.

Advantage of Full-duplex mode:

- Both the stations can send and receive the data at the same time.

Disadvantage of Full-duplex mode:

- If there is no dedicated path exists between the devices, then the capacity of the communication channel is divided into two parts.

Network components

Modem

- A modem is a hardware device that allows the computer to connect to the internet over the existing telephone line. (Fig 21)
- A modem is not integrated with the motherboard

Fig 21



rather than it is installed on the PCI slot found on the motherboard.

- It stands for Modulator/Demodulator. It converts the digital data into an analog signal over the telephone lines.

Based on the differences in speed and transmission rate, a modem can be classified in the following categories:

- Standard PC modem or Dial-up modem
- Cellular Modem
- Cable modem

Hub

A Hub is a hardware device that divides the network

Fig 22



connection among multiple devices. When computer requests for some information from a network, it first sends the request to the Hub through cable. Hub will broadcast this request to the entire network. All the

devices will check whether the request belongs to them or not. If not, the request will be dropped. (Fig 22)

The process used by the Hub consumes more bandwidth and limits the amount of communication. Nowadays, the use of hub is obsolete, and it is replaced by more advanced computer network components such as Switches, Routers.

Fig 23



Switch

A switch is a hardware device that connects multiple devices on a computer network. (Fig 23) A Switch contains more advanced features than Hub. The Switch contains the updated table that decides where the data is transmitted or not. Switch delivers the message to the correct destination based on the physical address present in the incoming message. A Switch does not broadcast the message to the entire network like the Hub. It determines the device to whom the message is to be transmitted. Therefore, we can say that switch provides a direct connection between the source and destination. It increases the speed of the network.

Fig 24



Router

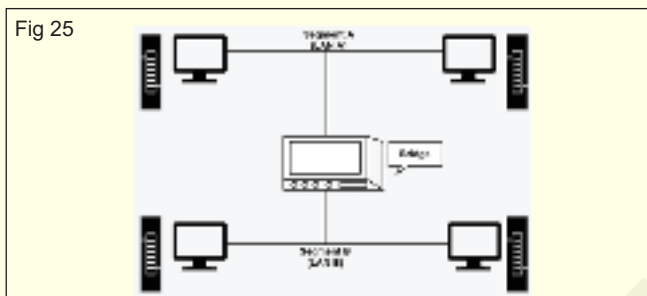
- A router is a hardware device which is used to connect a LAN with an internet connection. It is used to receive, analyze and forward the incoming packets to another network. (Fig 24)
- A router works in a Layer 3 (Network layer) of the OSI Reference model.
- A router forwards the packet based on the information available in the routing table.
- It determines the best path from the available paths

for the transmission of the packet.

Advantages Of Router:

- **Security:** The information which is transmitted to the network will traverse the entire cable, but the only specified device which has been addressed can read the data.
- **Reliability:** If the server has stopped functioning, the network goes down, but no other networks are affected that are served by the router.
- **Performance:** Router enhances the overall performance of the network. Suppose there are 24 workstations in a network generates a same amount of traffic. This increases the traffic load on the network. Router splits the single network into two networks of 12 workstations each, reduces the traffic load by half.

Fig 25



Bridge

• Network range

Bridges are used to connect two sub networks that use interchangeable protocols. It combines two LANs to form an extended LAN. The main difference between the bridge and repeater is that the bridge has a penetrating efficiency.

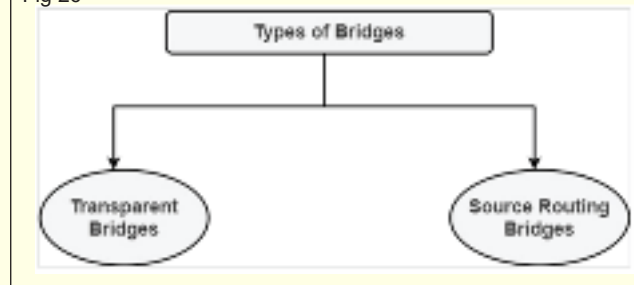
Working of Bridges

A bridge accepts all the packets and amplifies all of them to the other side. (Fig 25) The bridges are intelligent devices that allow the passing of only selective packets from them. A bridge only passes those packets addressed from a node in one network to another node in the other network.

A bridge performs in the following aspect –

- A bridge receives all the packets or frame from both LAN (segment) A and B.
- A bridge builds a table of addresses from which it can identify that the packets are sent from which LAN (or segment) to which LAN.
- The bridge reads the send and discards all packets from LAN A sent to a computer on LAN A and that packets from LAN A send to a computer on LAN B are retransmitted to LAN B.
- The packets from LAN B are considered in the same method.

Fig 26



Types of Bridges

There are generally two types of bridges which are as follows – (Fig 26)

Transparent Bridges

It is also called learning bridges. Bridge construct its table of terminal addresses on its own as it implements connecting two LANs. It facilitates the source location to create its table. It is self-updating. It is a plug and plays bridge.

Source Routing Bridge

This sending terminal means the bridges that the frames should stay. This type of bridge is used to prevent looping problem.

Uses of Bridges

The main uses of bridges are –

- Bridges are used to divide large busy networks into multiple smaller and interconnected networks to improve performance.
- Bridges also can increase the physical size of a network.
- Bridges are also used to connect a LAN segment through a synchronous modem relation to another LAN segment at a remote area.

Gateway

A gateway is a network node that forms a passage between two networks operating with different transmission protocols. (Fig 27) It acts as the entry – exit point for a network since all traffic that flows across the networks should pass through the gateway. Only the internal traffic between the nodes of a LAN does not pass through the gateway.

Features of Gateways

- Gateway is located at the boundary of a network and manages all data that inflows or outflows from that network.
- It forms a passage between two different networks operating with different transmission protocols.
- A gateway operates as a protocol converter, providing compatibility between the different protocols used in the two different networks.
- The feature that differentiates a gateway from other network devices is that it can operate at any layer of

Fig 27



the OSI model.

- It also stores information about the routing paths of the communicating networks.
- When used in enterprise scenario, a gateway node may be supplemented as proxy server or firewall.
- A gateway is generally implemented as a node with multiple NICs (network interface cards) connected to different networks. However, it can also be configured using software.
- It uses packet switching technique to transmit data across the networks.

Types of Gateways

On basis of direction of data flow, gateways are broadly divided into two categories –

- **Unidirectional Gateways** – They allow data to flow in only one direction. Changes made in the source node are replicated in the destination node, but not vice versa. They can be used as archiving tools.
- **Bidirectional Gateways** – They allow data to flow in both directions. They can be used as synchronization tools.

On basis of functionalities, there can be a variety of gateways, the prominent among them are as follows –

- **Network Gateway** – This is the most common type of gateway that provides as interface between two dissimilar networks operating with different protocols. Whenever the term gateway is mentioned without specifying the type, it indicates a network gateway.
- **Cloud Storage Gateway** – It is a network node or server that translates storage requests with different cloud storage service API calls, such as SOAP (Simple Object Access Protocol) or REST (Representational State Transfer). It facilitates integration of private cloud storage into applications without necessitating transfer of the applications into any public cloud,

thus simplifying data communication.

- **Internet-To-Orbit Gateway (I2O)** – It connects devices on the Internet to satellites and spacecraft orbiting the earth. Two prominent I2O gateways are Project HERMES and Global Educational Network for Satellite Operations (GENSO).
- **IoT Gateway** – IoT gateways assimilates sensor data from IoT (Internet of Things) devices in the field and translates between sensor protocols before sending it to the cloud network. They connect IoT devices, cloud network and user applications.
- **VoIP Trunk Gateway** – It facilitates data transmission between plain old telephone service (POTS) devices like landline phones and fax machines, with VoIP (voice over Internet Protocol) network.

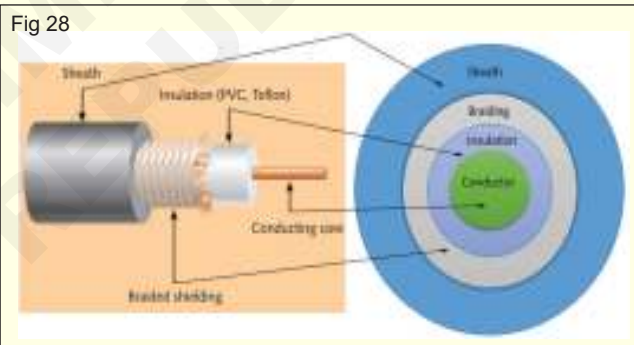
Network Cable Types and Specifications

To connect two or more computers or networking devices in a network, network cables are used. There are three types of network cables; coaxial, twisted-pair, and fiber-optic.

Coaxial cable

This cable contains a conductor, insulator, braiding, and sheath. The sheath covers the braiding, the braiding

Fig 28



covers the insulation, and the insulation covers the conductor.

The following image shows these components. (Fig 28)

Sheath

This is the outer layer of the coaxial cable. It protects the cable from physical damage.

Braided shield

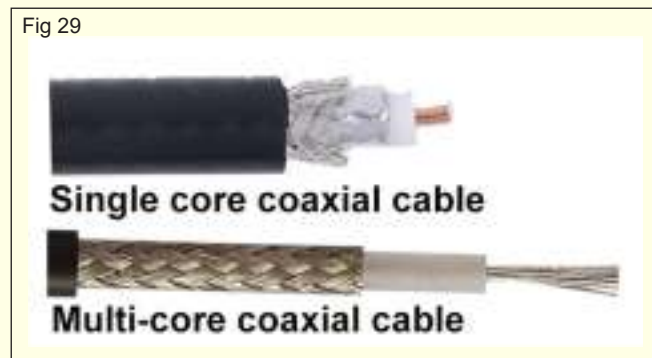
This shield protects signals from external interference and noise. This shield is built from the same metal that is used to build the core.

Insulation

Insulation protects the core. It also keeps the core separate from the braided shield. Since both the core and the braided shield use the same metal, without this layer, they will touch each other and create a short-circuit in the wire.

Conductor

The conductor carries electromagnetic signals. Based on conductor a coaxial cable can be categorized into two types; single-core coaxial cable and multi-core coaxial cable.



A **single-core** coaxial cable uses a single central metal (usually copper) conductor, while a **multi-core** coaxial cable uses multiple thin strands of metal wires. The following image shows both types of cable. (Fig 29)

Coaxial cables in computer networks

The coaxial cables were not primarily developed for the computer network. These cables were developed for general purposes. They were in use even before computer networks came into existence. They are still used even their use in computer networks has been completely discontinued.

At the beginning of computer networking, when there were no dedicated media cables available for computer networks, network administrators began using coaxial cables to build computer networks.

Because of its low cost and long durability, coaxial cables were used in computer networking for nearly two decades (the 80s and 90s). Coaxial cables are no longer used to build any type of computer network.

Specifications of coaxial cables

Coaxial cables have been in use for the last four decades. During these years, based on several factors such as the thickness of the sheath, the metal of the conductor, and the material used in insulation, hundreds of specifications have been created to specify the characteristics of coaxial cables.

- Coaxial cable uses RG rating to measure the materials used in shielding and conducting cores.
- RG stands for the Radio Guide. Coaxial cable mainly uses radio frequencies in transmission.
- Impedance is the resistance that controls the signals. It is expressed in the ohms.
- AWG stands for American Wire Gauge. It is used to measure the size of the core. The larger the AWG size, the smaller the diameter of the core wire.

Twisted-pair cables

The twisted-pair cable was primarily developed for computer networks. This cable is also known as **Ethernet cable**. Almost all modern LAN computer

networks use this cable.

This cable consists of color-coded pairs of insulated copper wires. Every two wires are twisted around each other to form pair. Usually, there are four pairs. Each pair has one solid color and one stripped color wire. Solid colors are blue, brown, green, and orange. In stripped color, the solid color is mixed with the white color.

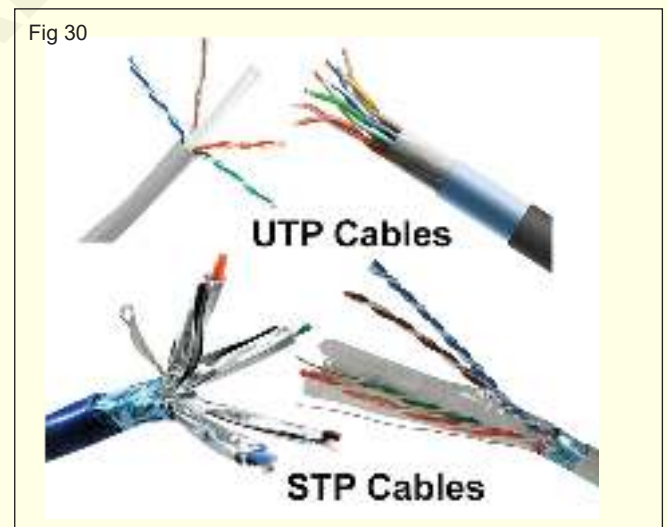
Based on how pairs are stripped in the plastic sheath, there are two types of twisted-pair cable; UTP and STP. (Fig 30)

In the **UTP (Unshielded twisted-pair) cable**, all pairs are wrapped in a single plastic sheath.

In the STP (Shielded twisted-pair) cable, each pair is wrapped with an additional metal shield, then all pairs are wrapped in a single outer plastic sheath.

Similarities and differences between STP and UTP cables

- Both STP and UTP can transmit data at 10Mbps, 100Mbps, 1Gbps, and 10Gbps.
- Since the STP cable contains more materials, it is more expensive than the UTP cable.
- Both cables use the same RJ-45 (registered jack) modular connectors.
- Both cables can accommodate a maximum of 1024 nodes in each segment.
- The STP provides more noise and EMI resistance than the UTP cable.



- The maximum segment length for both cables is 100 meters or 328 feet.

The following image shows both types of twisted-pair cables.

To learn how twisted-pair cables are used in the LAN network, you can check the following tutorial.

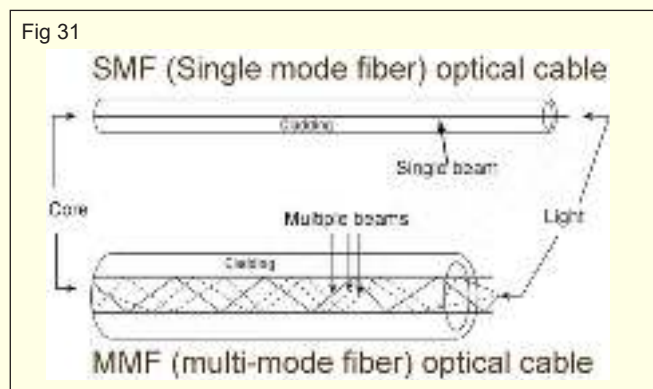
Fiber optic cable

This cable consists of a core, cladding, buffer, and jacket. The core is made from thin strands of glass or

plastic that can carry data over a long distance. The core is wrapped in the cladding; the cladding is wrapped in the buffer, and the buffer is wrapped in the jacket.

- Core carries the data signals in the form of light.
- Cladding reflects light back to the core.
- Buffer protects the light from leaking.
- The jacket protects the cable from physical damage.

Fiber optic cable is completely immune to EMI and RFI. This cable can transmit data over a long distance at the highest speed. It can transmit data up to 40 kilometers at the speed of 100Gbps.



Fiber optic uses light to send data. It reflects light from one endpoint to another. Based on how many beams of light are transmitted at a given time, there are two types of fiber optical cable; SMF and MMF. (Fig 31)

SMF (Single-mode fiber) optical cable

This cable carries only a single beam of light. This is more reliable and supports much higher bandwidth and longer distances than the MMF cable. This cable uses a laser as the light source and transmits 1300 or 1550 nano-meter wavelengths of light.

MMF (multi-mode fiber) optical cable

This cable carries multiple beams of light. Because of multiple beams, this cable carries much more data than the SMF cable. This cable is used for shorter distances. This cable uses an LED as the light source and transmits 850 or 1300 nano-meter wavelengths of light.

Wireless

Wireless connection to internet is very common these days. Often an external modem is connected to the Internet and other devices connect to it wirelessly. This eliminated the need for last mile or first mile wiring. There are two ways of connecting to the Internet wirelessly – Wi-Fi and WiMAX.

Wi-Fi

Wi-Fi is the acronym for wireless fidelity. Wi-Fi technology is used to achieve connection to the Internet without a direct cable between device and Internet Service Provider. Wi-Fi enabled device and wireless router are required for setting up a Wi-Fi connection. These are some characteristics of wireless Internet connection – (Fig 32)

Fig 32

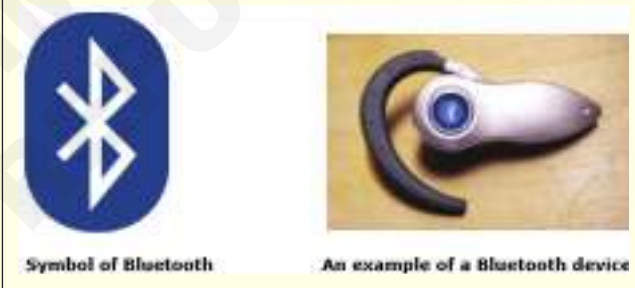


- Range of 100 yards
- Insecure connection
- Throughput of 10-12 Mbps

If a PC or laptop does not have Wi-Fi capacity, it can be added using a Wi-Fi card.

The physical area of the network which provides Internet access through Wi-Fi is called **Wi-Fi hotspot**. **Hotspots**

Fig 33



can be set up at home, office or any public space like airport, railway stations, etc. Hotspots themselves are connected to the network through wires.

Bluetooth

Bluetooth wireless technology is a short range communications technology intended to replace the cables connecting portable unit and maintaining high levels of security. (Fig 33) Bluetooth technology is based on **Ad-hoc technology** also known as **Ad-hoc Pico nets**, which is a local area network with a very limited coverage.

History of Bluetooth

WLAN technology enables device connectivity to infrastructure based services through a wireless carrier provider. **Bluetooth** specification details the entire protocol stack. Bluetooth employs Radio Frequency (RF) for communication. It makes use of **frequency modulation** to generate radio waves in the **ISM** band.

The usage of Bluetooth has widely increased for its special features.

- Bluetooth offers a uniform structure for a wide range of devices to connect and communicate with each other.
- Bluetooth technology has achieved global acceptance such that any Bluetooth enabled device, almost everywhere in the world, can be connected with Bluetooth enabled devices.
- Low power consumption of Bluetooth technology and an offered range of up to ten meters has paved the way for several usage models.
- Bluetooth offers interactive conference by establishing an adhoc network of laptops.
- Bluetooth usage model includes cordless computer, intercom, cordless phone and mobile phones.

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Concept of internet and social networking concepts

Objectives: At the end of this lesson you shall be able to

- introduction to WWW and concept of internet
- explain web browser, internet server and search engine
- define concept of domain naming system and e-mail communication
- explain video chatting tool and social networking concept
- define Various network security protocols

Introduction of World Wide Web

WWW (World Wide Web) is part of the internet that contains linked text, image sound, and video documents. It is also define as an information space where documents and other web resources are identified by URLs, interlinked by hypertext links, and can be accessed via the Internet.

The World Wide Web or Web is basically a collection of information that is linked together from points all over the world. It is also abbreviated as WWW.

- World wide web provides flexibility, portability, and user-friendly features.
- It mainly consists of a worldwide collection of electronic documents (i.e, Web Pages).
- It is basically a way of exchanging information between computers on the Internet.
- The WWW is mainly the network of pages consists of images, text, and sounds on the Internet which can be simply viewed on the browser by using the browser software.
- It was invented by Tim Berners-Lee.

Brief History of WWW

- In 1989, London born Timothy Berners-Lee came up with the idea of the web as a way to share
- Files with others. The idea for the web came while Berners-Lee was working for the European Organization for Nuclear Research (CERN). Scientists by trade, Berners-Lee and others inside CERN were looking for ways to transmit information between each other electronically. To do so, they created a set of tools including a language (html), a browser and other utilities which allowed them to establish communication.
- The first web browser was invented in 1990 by Sir Tim Berners-Lee. His browser was called WorldWideWeb and later renamed Nexus. Many others were soon developed, with Marc Andreessen's 1993 Mosaic (later called Netscape). Today, the major web browsers are Chrome, Safari, Internet Explorer, Firefox, and Edge
- The internet was first introduced into Nigeria in the year 1995. It was in reality a project work by RINAF (Regional Information Society Network for Africa).

It was backed up financially by UNESCO. Several workshops were organised in order to educate the Nigerian populace. the first test running was conducted in Obafemi Awolowo University in 1995. By the late 1990's the "internet " became a known term among the citizens of Nigeria.

Basic Terminologies of WWW

- **Websites:** A collection of related web pages
- **Webpage:** A webpage is a document or information resource on the World Wide Web which can be accessed using a web browser.
- **Web servers:** web servers are computers that stores and disseminate web pages
- **Web Browser:** A web browser (commonly referred to as a browser) is a software application for retrieving, presenting, and traversing (moving through) information resources on the World Wide
- **Web address:** A web address, also known as a URL (uniform resource locator), is an Internet or intranet name that points to a location where a file, directory or website page is hosted.
- **Hyperlink:** A link from a hypertext file or document to another location or file, typically activated by clicking on a highlighted word or image on the screen.
- **Homepage (Main page):** The introductory page of a website, typically serving as a table of contents for the site.
- **Internet Protocol:** The Internet Protocol (IP) is the method by which data is sent from one computer to another on the Internet or other network.

Protocols

- The two general protocols of WWW are:
- HTTP (Hypertext Transfer Protocol) is the set of rules for transferring files (text, graphic images sound, video and other multimedia files) on the world wide web.
- HTML (Hypertext Markup Language) is a computer language used to build web pages.

Other protocols Include:

- a TCP: Transmission Control Protocol
- b UDP: User Data-gram Protocol

- c SMTP: Simple Mail Transfer Protocol
- d FTP: File Transfer Protocol
- e POP: Post Office Protocol
- f ICMP: Internet Control Protocol

Benefits of WWW

- 1 Availability of mainly free information
- 2 Facilitates rapid and interactive communication
- 3 It is accessible from anywhere
- 4 Facilitates the exchange of huge volume of data

Basic Internet Concepts

Internet

The Internet is a global network of networks connecting millions of users worldwide via many computer networks using a simple standard common addressing system and basic communications protocol called TCP/IP (Transmission Control Protocol/Internet Protocol). This allows messages sent over the Internet to be broken into small pieces, called packets, which travel over many different routes between source and destination computers.

Clients and Servers

Internet resources -- information and services -- are provided through host computers, known as servers. The server is the computer system that contains information such as electronic mail, database information, or text files. As a customer, or client, you access those resources via client programs (applications) which use TCP/IP to deliver the information to your screen in the appropriate format for your computer.

One important kind of client program is called a browser, which is used to search through information provided by a specific type of server. A browser helps you view and navigate through information on the Internet. Today's most popular browsers, including Mosaic(R), Netscape(TM) Navigator, and the Microsoft Internet Explorer offer a graphical interface to the World Wide Web.

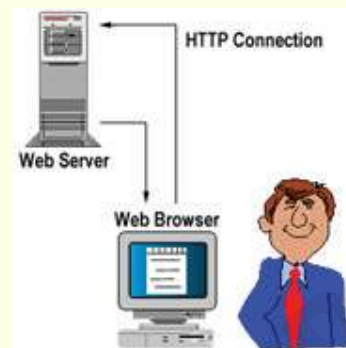
Client/Server Operation

A client/server system works something like this:

- A big hunk of computer (called a server) sits in some office somewhere with a bunch of files that people might want access to. This computer runs a software package that listens all day long to requests over the wires.
- The "server software" will then access the server hardware, find the requested file, send it back over the wires to the "client" who requested it, and then wait for another request from the same or another client.
- Usually, the "client" is actually a software program, like Netscape Navigator, that is being operated by a person who is the one who really wants to see

the file. The client software however, deals with all the underlying client/server protocol stuff and then displays the document (that usually means interpreting HTML, but we'll get there in just a bit) to

Fig 1



the human user.

- The whole process looks something like the figure below

Hypertext Documents

The WWW makes extensive use of hypertext documents which contain

- Multimedia data such as text, images, sounds, video clips etc.
- Links to other documents (situated anywhere on the web).

HTTP

- The client/server protocol used to exchange hypertext documents is called HTTP (HyperText Transport Protocol). The main thing you need to know is that HTTP is a language spoken between your web browser (client software) and a web server (server software) so that they can communicate with each other and exchange files. (Fig 1)
- HTTP is a "request-response" type protocol that specifies that a client will open a connection to a server then send a request using a very specific format. The server will then respond and close the connection.

HTML

- Hypertext documents are represented using a specialised markup language called HTML (HyperText Markup Language).
- HTML can be easily integrated with various backend languages such as PHP, Node.js.
- HTML is one of the most popular and widely used languages that contains numerous resources and has a big community.
- HTML has a flat learning curve and it can be easily run on all web browsers.

- HTML is one of the most simple markup languages that you can work with.
- HTML is open-source and completely free.
- The web standard for HTML is maintained by World Wide Web Consortium (W3C).

Web Browser

Web Browser is an application software that allows us to view and explore information on the web. User can request for any web page by just entering a URL into address bar.

Web browser can show text, audio, video, animation and more. It is the responsibility of a web browser to interpret text and commands contained in the web page.

Earlier the web browsers were text-based while now a days graphical-based or voice-based web browsers are also available. Following are the most common web browser available today

Browser	Vendor
Internet Explorer	Microsoft
Google Chrome	Google
Mozilla Firefox	Mozilla
Netsca Navigator	Netcape Communica tions Corp.
Opera	Opera Software
Safari	Apple
Sea Monkey	Mozilla Foun dation
K-meleon	K-meleon

Internet Server

Internet Server means a single server computer used by Customer which enables access to the Licensed Software by individuals using an Intranet or the Internet, having a minimum configuration as set out in hardware specifications previously described to Customer as applicable to the Licensed Software to be installed and used upon it.

Web Server

A web server is software and hardware that uses HTTP (Hypertext Transfer Protocol) and other protocols to respond to client requests made over the World Wide Web. The main job of a web server is to display website content through storing, processing and delivering webpages to users. Besides HTTP, web servers also support SMTP (Simple Mail Transfer Protocol) and FTP (File Transfer Protocol), used for email, file transfer and storage.

Web server hardware is connected to the internet and allows data to be exchanged with other connected devices, while web server software controls how a user

accesses hosted files. The web server process is an example of the client/server model. All computers that host websites must have web server software.

Web servers are used in web hosting, or the hosting of data for websites and web-based applications -- or web applications.

How do web servers work?

Web server software is accessed through the domain names of websites and ensures the delivery of the site's content to the requesting user. The software side is also comprised of several components, with at least an HTTP server. The HTTP server is able to understand HTTP and URLs. As hardware, a web server is a computer that stores web server software and other files related to a website, such as HTML documents, images and JavaScript files.

When a web browser, like Google Chrome or Firefox, needs a file that's hosted on a web server, the browser will request the file by HTTP. When the request is received by the web server, the HTTP server will accept the request, find the content and send it back to the browser through HTTP.

More specifically, when a browser requests a page from a web server, the process will follow a series of steps. First, a person will specify a URL in a web browser's address bar. The web browser will then obtain the IP address of the domain name -- either translating the URL through DNS (Domain Name System) or by searching in its cache. This will bring the browser to a web server. The browser will then request the specific file from the web server by an HTTP request. The web server will respond, sending the browser the requested page, again, through HTTP. If the requested page does not exist or if something goes wrong, the web server will respond with an error message. The browser will then be able to display the webpage.

Multiple domains also can be hosted on one web server.

Examples of web server uses

Web servers often come as part of a larger package of internet- and intranet-related programs that are used for:

- sending and receiving emails;
- downloading requests for File Transfer Protocol (FTP) files; and
- building and publishing webpages.

Many basic web servers will also support server-side scripting, which is used to employ scripts on a web server that can customize the response to the client. Server-side scripting runs on the server machine and typically has a broad feature set, which includes database access. The server-side scripting process will also use Active Server Pages (ASP), Hypertext Preprocessor (PHP) and other scripting languages. This process also allows HTML documents to be created dynamically.

Dynamic vs. static web servers

A web server can be used to serve either static or dynamic content. Static refers to the content being shown as is, while dynamic content can be updated and changed. A static web server will consist of a computer and HTTP software. It is considered static because the server will send hosted files as is to a browser.

Dynamic web browsers will consist of a web server and other software such as an application server and database. It is considered dynamic because the application server can be used to update any hosted files before they are sent to a browser. The web server can generate content when it is requested from the database. Though this process is more flexible, it is also more complicated.

Common and top web server software on the market

There are a number of common web servers available, some including:

- **Apache HTTP Server-** Developed by Apache Software Foundation, it is a free and open source web server for Windows, Mac OS X, Unix, Linux, Solaris and other operating systems; it needs the Apache license.
- **Microsoft Internet Information Services (IIS)-** Developed by Microsoft for Microsoft platforms; it is not open sourced, but widely used.
- **Nginx-** A popular open source web server for administrators because of its light resource utilization and scalability. It can handle many concurrent sessions due to its event-driven architecture. Nginx also can be used as a proxy server and load balancer.
- **Lighttpd-** A free web server that comes with the FreeBSD operating system. It is seen as fast and secure, while consuming less CPU power.
- **Sun Java System Web Server-** A free web server from Sun Microsystems that can run on Windows, Linux and Unix. It is well-equipped to handle medium to large websites.

Search Engine

A search engine is software accessed on the Internet that searches a database of information according to the user's query. The engine provides a list of results that best match what the user is trying to find. Today, there are many different search engines available on the Internet, each with its own abilities and features. The first search engine ever developed is considered Archie, which was used to search for FTP files, and the first text-based search engine is considered Veronica. Currently, the most popular and well-known search engine is Google. Other popular search engines include AOL, Ask.com, Baidu, Bing, DuckDuckGo, and Yahoo.

Best search engine?

There isn't one search engine that is better than all the others. Many people could argue that Google's search engine is the best, and it is the most popular and well-

known. It's so popular that people often use it as a verb when telling someone to search for their question.

Microsoft's Bing search engine is also popular and used by many people. Bing does an excellent job of finding information and answering questions. Bing is also what powers the search in Windows 10 and the Yahoo search engine.

Users concerned with privacy, enjoy using Duck Duck

Fig 2



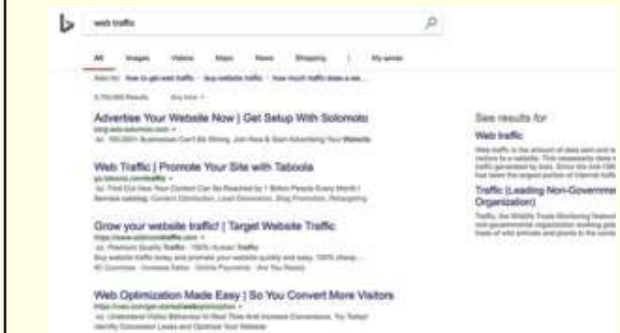
Go. This search engine makes its users anonymous and is an excellent solution for users concerned with how much information Google and Bing collect on their users.

Google

With over 80% of the search market share, Google is undoubtedly the most popular search engine. Additionally, Google captures almost 95% of mobile traffic. The large traffic potential makes Google a viable option when aiming to capture organic or paid search the downside, of course, is almost everyone is competing for the same traffic.

Also keep in mind Google's algorithm, like featured

Fig 3



snippets, aims to fulfill users' needs directly on Google, so they don't need to click any links. These features , and Google's popularity, might make it hard for you to capture the website traffic you want. (Fig 2)

Bing

Bing, Google's biggest contender, rakes in 15% of U.S. searches and also powers Yahoo, the U.S.'s third biggest

search engine. Bing's search pages look remarkably similar to Google's, with the same categories and a

- .com: this is the top-level domain (TLD), also known as a domain name extension

There are also sub-domains, such as our documentation website docs.ovh.com. The sub-domain here is "docs".

E-Mail Communication

Email

Electronic mail, commonly shortened to "email," is a communication method that uses electronic devices to deliver messages across computer networks. "Email" refers to both the delivery system and individual messages that are sent and received.

Email has existed in some form since the 1970s, when programmer Ray Tomlinson created a way to transmit messages between computer systems on the Advanced Research Projects Agency Network (ARPANET). Modern forms of email became available for widespread public use with the development of email client software (e.g. Outlook) and web browsers, the latter of which enables users to send and receive messages over the Internet using web-based email clients (e.g. Gmail).

Today, email is one of the most popular methods of digital communication. Its prevalence and security vulnerabilities also make it an appealing vehicle for cyber attacks like phishing, domain spoofing, and business email compromise (BEC).

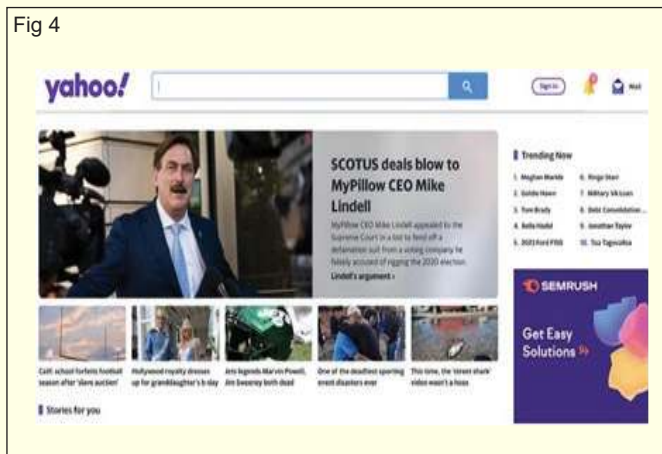
Email work

Email messages are sent from software programs and web browsers, collectively referred to as email 'clients.' Individual messages are routed through multiple servers before they reach the recipient's email server, similar to the way a traditional letter might travel through several post offices before it reaches its recipient's mailbox.

Once an email message has been sent, it follows several steps to its final destination:

- 1 The sender's mail server, also called a Mail Transfer Agent (MTA), initiates a Simple Mail Transfer Protocol (SMTP) connection.
- 2 The SMTP checks the email envelope data — the text that tells the server where to send a message — for the recipient's email address, then uses the Domain Name System (DNS) to translate the domain name into an IP address.
- 3 The SMTP looks for a mail exchange (MX) server associated with the recipient's domain name. If one exists, the email is forwarded to the recipient's mail server.
- 4 The email is stored on the recipient's mail server and may be accessed via the Post Office Protocol (POP)* or Internet Message Access Protocol (IMAP). These two protocols function slightly differently: POP downloads the email to the recipient's device and deletes it from the mail server, while IMAP stores the email within the email client, allowing the recipient to access it from any connected device.

Fig 4



similar white background, with blue links and green URLs. However, Bing additionally offers "Rewards", a program that gives you points when you search or shop on the engine, and then allows you to redeem those points for gift cards, nonprofit donations, and more. (Fig 3)

Yahoo

Admittedly not the sleekest search engine interface, Yahoo! still manages to capture third place in our list, with just under 3% of the worldwide market share. Yahoo! is powered by Bing, so search results are incredibly similar between the two search engines. However, it's still an important search engine in its own right, with over 600 million total monthly users. (Fig 4)

Domain name

A domain name refers to your website address. This is what users type in a browser's search bar to directly access your website. A domain name is unique and cannot be shared between different sites. For example: ovhcloud.com

Each website is identified by a unique set of numbers, called an IP address. Your computer uses these numbers to connect to the server where the website data is located. When visitors enter a domain name in their search bar, it sends a request to a set of Domain Name System (DNS) servers. The DNS then responds with the IP address of the website's hosting server, making it accessible. Domain names were created because IP addresses are too complicated to remember. So, for internet users to access a website, it needs to be given a name.

The structure of a domain name

Explanation of its structure. Let's take the domain name of the OVHcloud website as an example: www.ovhcloud.com

- www: this refers to the third-level domain (World Wide Web).
- ovhcloud: refers to the second-level domain; this is the name of the site.

To continue the postal system analogy, imagine Alice writes a thank-you note to Bob. She hands the letter to the mail carrier (MTA), who brings it to the post office to be sorted. At the post office, a processing clerk (SMTP) verifies the address written on the envelope. If the address appears to be written correctly and corresponds to a location that can receive mail (MX server), another mail carrier delivers the letter to Bob's mailbox. After picking up the mail, Bob might keep the note in his desk drawer, where he can only access it at that location (POP) or put it in his pocket to read at any location (IMAP).

Video Chat Tool

Video chat is a one-on-one visual communication between two Internet users. Skype popularized video chats. It lets any two people around the globe to place a video call to each other. For this, all they need is a computer, the Skype application, and a good Internet connection.

Targeting the enterprise world in 2010, Skype introduced a feature that allows five people to take part in a video call. Video chat uses technology to conduct live video as well as audio interaction among users at different locations. Generally, video chats are performed by means of computers, smartphones, or tablets.

Although video chat mainly refers to point-to-point interaction, as with the case of FaceTime and Skype, it can also be used for multipoint (one-to-many) interactions; one typical example is Google Hangouts.

Even though video chat is frequently used interchangeably with videoconferencing, there is significant overlap between the two terms. Generally videoconferencing means multi-point, video-audio interaction set up in a business environment, with three or more participants taking part.

Best Free Video Conferencing Platforms

- 1 Zoom
- 2 Google Hangouts
- 3 Dialpad Meetings
- 4 TrueConf Online
- 5 Skype
- 6 FreeConference
- 7 Lifesize Go
- 8 Slack Video Calls
- 9 Facebook Live
- 10 YouTube Live

1 Zoom

Zoom is ideal for anyone who works remotely or has remote team members. Zoom is also a popular favorite among virtual educators. Zoom allows for simple, easy setup meetings or regular meetings in your personal meeting room. Quickly create and share a private meeting link with an individual or team

and connect remote team members through video.

Features:

- Host up to 100 participants
- 1-1 and group meetings
- Unlimited meetings
- HD video and audio
- Screen sharing
- Scheduled meetings
- Private and group chat
- Host controls

2 Google Hangouts

Google Hangouts is a simple way to connect with Google contacts (or those outside of your network) and can be used for personal or business reasons. Use this tool for individual conversations, team meetings, recorded demos, and more.

Features:

- Up to 25 video participants
- Video, audio, and messenger conversations
- Video meeting recordings
- Join calls using Google Calendar
- Screen sharing

3 Dialpad Meetings

The free version of Dialpad Meetings is ideal for teams of 10 or less. The free version limits your video call duration to 45 minutes, so it's ideal for shorter meetings. Since it allows unlimited video conferences, you can use this video conferencing tool for recurring meetings, like 1-1s or monthly team debriefs.

Features:

- Up to 10 participants
- Unlimited conferences
- Call recording
- HD Audio
- Screen and document sharing
- Mobile apps

4 TrueConf Online

TrueConf offers a free plan with up to three participants in video calls. This solution is great for small teams or individuals who need a simple tool to host video calls or collaborate with small groups. The collaboration features like remote desktop control are helpful for those in support who may need to help a client solve a problem.

Features:

- Up to three participants on team calls

- HD video
- Collaboration tools (screen sharing, remote desktop control, recorded calls, file transfer, and shared virtual whiteboard)

5 Skype

The free version of Skype works well for small teams with less than 10 total members. It is a good tool if you need a simple way to video chat from your computer, phone, or tablet and tend to have smaller group meetings or 1-1 conversations. Skype also offers a tool called Skype in the Classroom specifically designed for online education.

Features:

- Up to 10 people on video calls
- HD video calling
- Screen sharing
- Video call recording
- Interactive video chats
- Location sharing

6 FreeConference

FreeConference ideal for smaller teams or meetings with five or fewer participants. One major perk of this video conferencing tool is its ease of use -- no downloads are required to start using it. Plus, moderator controls allow the individual who's running the video conference to keep the meeting on track.

Features:

- Up to 5 online meeting participants
- Screen sharing
- Document sharing
- Moderator controls
- Text chat

7 Lifesize Go

Lifesize Go can be used by remote employees, remote freelancers, or those working with clients who rarely host larger group meetings. While they have plans that include solutions for bigger teams, the free version offers a nice amount of features for individuals and small group conversations.

Features:

- Up to 8 participants
- No restrictions on meeting length
- Screen sharing

8 Slack Video Calls

Slack users can take advantage of the call feature by simply using the command /call or clicking the phone icon at the top of the conversation with another Slack user. This is an easy way to make calls right from Slack if you need to ask a teammate a quick question.

You can also Slack with up to 15 people if you start a call from a channel, enabling the rest of the channel's members to join. This tool is good for teams looking for a supplementary video calling solution for small teams.

Features:

- Group calls of up to 15 people
- Individual calls
- Messenger

9 Facebook Live

Facebook Live is a great fit for businesses, influencers, or individuals who are looking to broadcast demos, videos, or showcase their company culture while streaming live. Your followers on Facebook can comment and chat live, you can select a custom audience for the video, and you can schedule videos ahead of time to gain excitement.

Features:

- Broadcasts up to four hours
- Advanced scheduling
- Custom audiences

10 YouTube Live

YouTube Live, like Facebook Live, is a platform for demonstrating a product with live Q&A, hosting an educational session to teach your audience while screen sharing or using a whiteboard, or hosting a live conversation with members of your team.

Features:

- Three stream quality options (normal latency, low-latency, ultra-low latency)
- Added delay
- Live questions from the audience
- Private live streams (people can only access with the link)
- Advanced scheduling
- Live automatic captions
- Location tags

Social Networking

The term social networking refers to the use of internet-based social media sites to stay connected with friends, family, colleagues, or customers. Social networking can have a social purpose, a business purpose, or both, through sites like Facebook, Twitter, Instagram, and Pinterest.

Social Networking Works

Social networking involves the development and maintenance of personal and business relationships using technology. This is done through the use of social networking sites, such as Facebook, Instagram, and Twitter.

These sites allow people and corporations to connect with one another so they can develop relationships and share information, ideas, and messages.

Social Networking Platforms

Facebook

Facebook is a social network that offers users the opportunity to connect with people, businesses, and organizations. They can post updates and respond to the posts of others. They can share photographs and links to online content. Users can chat live, and upload and share video.

Users can also communicate directly with each other via Facebook Messenger. They can join groups with like interests, and be notified of friends' activities and pages they elect to follow.

Facebook was designed to be open and social. However, while the platform encourages publicly available content, it also has privacy controls that can restrict access to, for instance, friends.

Instagram

Instagram is a social network that focuses on sharing visual media like photos and videos. It's similar to Facebook in that users create a profile and have a news feed. It allows users to upload media that can be edited with filters and organized by hashtags and geographical tagging. Posts can be shared publicly or with followers.

Users can browse other users' content, view trending content, and follow other users. They can add others' content to their personal feed. Over time, Instagram has added new features, such as Instagram Stories, Instagram Reels, and access to shopping. Like Facebook, Instagram encourages users to keep their content publicly accessible but it also lets them set access to approved followers only.

Instagram has its own direct messaging feature. In addition, Facebook Messenger has been incorporated by Instagram so users can direct message Facebook contacts while in Instagram.

Twitter

Twitter is a social network that allows people to communicate with short messages called tweets. Tweets are limited by the social platform to 280 characters. Users post tweets that may be useful, interesting, or even inflammatory for readers.

Others use Twitter to find people and companies posting appealing, important, or newsworthy content. Once users discover others who pique their interest, they can follow them and receive their ongoing stream of tweets in their feeds.

Tweeting is sometimes referred to as microblogging. It's distinguished by users' ability to scan and distribute content quickly, conveniently, and easily. This may account for its popularity with those who want (or need) to get lots of messages out to the world and those who want to follow such socialistas (or vital sources of crucial

information).

Pinterest

Pinterest is a social networking site that promotes image saving and sharing using a virtual pinboard. It's an innovative platform that facilitates the cataloguing and organizing of meaningful information for individuals.

With Pinterest, account holders find images by browsing the web or Pinterest itself. They then pin (or save) those images to an online pinboard. Multiple pinboards can be set up and organized, based on a topic.

Once they've created and built their boards to catalogue ideas and interests, users can access them whenever they want. Clicking on the image reveals related information.

As with other social networks, Pinterest users have a feed that exhibits images according to their interests. They can interact by "liking" images, following each other, and posting comments. There's also a feature that provides for private messaging.

Introduction to Internet Security Protocols

In today's computer network world, internet security has achieved great importance. Since internet technology is vast and encompasses many years, there are various aspects associated with internet security. Various security mechanisms exist for specialized internet services like email, electronic commerce, and payment, wireless internet, etc. To provide the security to this internet various protocols have been used like SSL (Secure Socket Layer), TLS (Transport Layer Security), etc.

Various Internet Security Protocols

1 SSL Protocol

SSL Protocol stands for Secure Socket Layer protocol, which is an internet security protocol used for exchanging the information between a web browser and a web server in a secure manner. It provides two basic security services like authentication and confidentiality. SSL protocol has become the world's most popular web security mechanism, all major web browsers support SSL. Secure socket layer protocol is considered as an additional layer in TCP/IP protocol suite. It is located between the application layer and the transport layer. SSL has three sub protocols namely Handshake Protocol, Record Protocol, and Alert Protocol.

OpenSSL is an open source implementation of the Secure Socket Layer protocol. OpenSSL is subject to four remotely exploitable buffer overflow. Buffer overflow vulnerabilities allow attackers to execute arbitrary code on the target computer with a privilege level of OpenSSL process as well as providing opportunities for launching a denial of service attack.

2 TLS Protocol

TLS stands for Transport Layer Security, which is an internet security protocol. TLS is an IETF

standardization initiative whose goal is to come out with an internet standard version of SSL. To standardized SSL, Netscape handed the protocol to IETF. The idea and implementation are quite similar. Transport layer security protocol uses a pseudo random function to create a master secret. TLS also has three sub protocols same as SSL protocol – Handshake Protocol, Record Protocol, and Alert Protocol. In Handshake Protocol some details are changed, Record Protocol uses HMAC, Alert protocol newly added features like record overflow, Unknown CA, Decryption failed, Decode error, Access denied, Export restrictions, Protocol version, insufficient security, internal error. Transport layer security is defined in RFC 2246.

3 SHTTP

SHTTP stands for Secure HyperText Transfer Protocol, is a set of security mechanism defined for protecting internet traffic. It also includes data entry forms and internet based transaction. Services provided by SHTTP are quite similar to SSL protocol. Secure HyperText Transfer Protocol works at the application layer, and therefore tightly coupled with HTTP. SHTTP supports both authentication and encryption of HTTP traffic between the client and the server. Encryption and digital signature format used in SHTTP have the origins in the PEM (Privacy Enhanced Mail) protocol. SHTTP works at the level of an individual message. It can encrypt and sign an individual message.

4 SET Protocol

SET Protocol stands for Secure Electronic Transaction protocol is an open encryption and security mechanism designed for protecting the eCommerce transaction over the internet. SET is not a payment system, it is a security protocol used over the internet for secure transaction.

The SET protocol provides the following services

- SET provides authentication by using digital certificates.
- It provides a secure communication channel among all parties involved in an eCommerce transaction.
- It ensures confidentiality because the information is only available for parties involved in a transaction and that too only when and where required. (Fig 5)

The SET protocol includes the following participants

- Cardholder: It is an authorized holder of payment card such as visa card, Master card.
- Merchant: It is a specific person or organization who wants to sell goods and services to the cardholder.
- Issuer: It is a financial institution which provides payment card to the cardholder.

- Acquirer: It is a financial institution which has a relationship with merchants for processing payment card Authorization and payments.
- Payment Gateway: It acts as an interface between SET and existing card payment networks for payment Authorization.
- Certification Authority: It is an authority that is trusted to provide a public key certificate to cardholder, merchant, and payment gateways.

5 PEM Protocol

PEM Protocol stands for privacy enhanced mail, used for email security over the internet. If we adopted by IAB (Internet Architecture Board) to provide secure electronic mail communication over the internet. It was initially developed by the IRTF (Internet Research Task Force) PSRG (Privacy Security Research Group). Then they handed over the PEM to the IETF (Internet Engineering Task Force) PEM working group Privacy Enhanced Mail protocol is described in four specific documents RFC 1421, RFC 1422, RFC 1423, and RFC 1424. It supports cryptographic functions namely encryption, nonrepudiation, and message integrity.

6 PGP Protocol

PGP Protocol stands for Pretty Good Privacy, which we developed by Phil Zimmerman. PGP protocol is easy to use and free including its source code documentation. It also supports the basic requirements of cryptography. However, for those organizations that require support, a low-cost commercial version Of PGP protocol is available from an organization called viacrypt. PGP protocol becomes extremely popular and more widely used as compared to PEM protocol. PGP protocol support cryptography like encryption, Non-repudiation, and message integrity.

We use different types of media to find out news, learn new things, and entertain ourselves. With the advance in technology, we can choose the type of media we want to use, no matter the time or place.

So, we can hear the radio while driving to work, we can watch our favorite show on our phone, and we can find out any information and news on our laptop or mobile device, thanks to the Internet. Who knows where technology can lead us in the future.

For project communication, you have email and FTP. For multilingual content creation, you have Notepad, Unicode Fonts, Microsoft Office, PDF Reader/Creator and Adobe Creative Cloud. If you can live without one tool, it's the TMS, since your translation vendor should be using one on their end. WordPress and Social Media to publish your multilingual content and share it with your multicultural audience. (Fig 6)

Fig 5

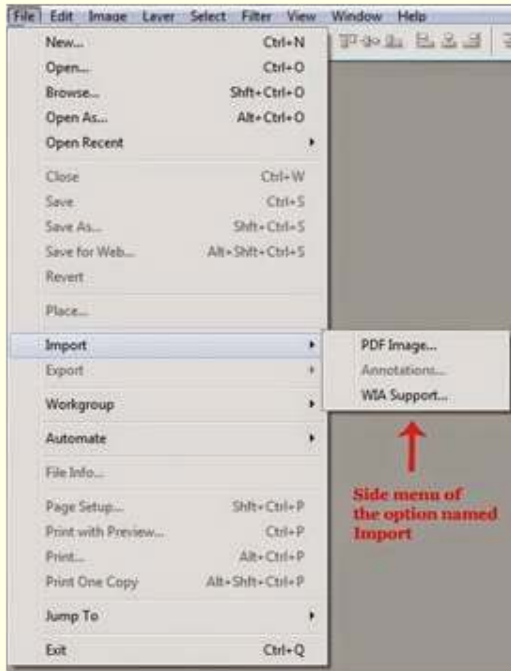


Fig 6



Types of scanner and setting

Objectives: At the end of this lesson you shall be able to

- introduction Scanner and types of scanner
- how to scan on a windows computer
- different setting of scanner

Introduction Scanner :

The scanners are computer input devices, which are used to scan documents, images, and text files. The documents which are scanned are converted into a digital format that can be further viewed and updated with the help of computer and editing software.

- The scanners are computer devices that are used to convert hard copy into a soft copy that can be later modified and viewed using a computer, laptop, and mobile.
- To modify these soft copy special editing software are used like Photoshop and adobe reader.
- The scanner is a device that is designed and developed to scan photographs, posters, magazines, documents, text files, etc. and save them in a computer hard disk drive for further usage.
- The scanner grants permission to the computer system for printing documents that are converted into digital format.
- The scanner is self-sufficient in scanning black | white as well as colour images.

Different Types of Scanner

- Drum Scanner
- Handheld Scanner
- Flatbed Scanner
- Optical Character Recognition
- Magnetic Ink Character Recognition
- Image Scanner
- Light Pen
- Barcode Reader

Fig 1



Drum Scanners

- They are renowned for the good quality scanning of documents and images. They are widely used in publications and the printing press. (Fig 1)
- The drum scanners consist of a photomultiplier tube {PMT} which is responsible and used for scanning images and documents.
- This photomultiplier tube {PMT} is highly sensitive to light.
- The drum scanner scan images in high resolutions all the small details included in the documents and images are scanned in the process.
- The image is kept on the glass tube where glass tubes revolve around the image to scan the document from all angles.
- There is a sensor mounted in the centre of the cylinder. This sensor divides the light coming from the document into 3 beams.
- After this, each beam is passed through a color filter to the photomultiplier tube. After coming here, the light is converted into an electrical signal.

Handheld Scanner

- The handheld scanners or hand scanners are small and compact in size devices; they are one of the

Fig 2



popular input devices of the computer systems. (Fig 2)

- They are capable of scanning any size of products, they are less weighted therefore can be used accordingly.
- They are also considered as small manual scanning devices that is generally used with hands for manual scanning.
- They are used while gently scrolling over the image or barcode to capture the complete details related to

the product such as product manufacturing details, price, expiry date and batch number.

- They are primarily used in malls and libraries. The handheld or hand scanners are similar to flatbed

Fig 3



scanners.

Flatbed Scanner

- They are the most famous and popular scanners and therefore widely used and accepted. They are also known as desktop scanners or personal computer scanners. (Fig 3)
- They are primarily and extensively used in homes and small offices.
- Flatbed scanners have a large glass surface and a lid.
- These scanners work best with flat objects such as photos and paper, but you can also place large

Fig 4



objects such as open books on the scanner bed.

- Some models of flatbed scanners come with built-in all-in-one devices that function as printers, scanners, copy machines, and fax machines.

Optical Character Recognition

- The OCR stands for optical character recognition. (Fig 4)
- OCR is a mechanical device that can convert images, pictures, documents, or manually written

content into readable form.

Fig 5



- These scanned documents are later provided to the system for further processing like modification and updates using editing software like Photoshop and adobe reader.

Magnetic Ink Character Recognition

- MICR stands for magnetic ink character recognition. (Fig 5)
- MICR is an input device of a computer system that is generally used in the banking sector where numerous cheques are handled and processed every day.
- The cheques contain important and sensitive information printed on them like cheque number,

Fig 6



account number, name of the account holder, and bank id codes.

- The MICR devices are capable of reading this information and comparing and cross check previously stored detail in the banking database.

Image Scanner

- The image scanner is a digital device also an input device of the computer that is used to scan images, pictures, printed text, documents and objects and later convert it into a digital image. (Fig 6)
- Image scanners are used in a variety of domestic and industrial applications such as design, reverse engineering, orthotics, gaming and testing.

Light Pen

- The light pen is a computer input device similar to a

Fig 7



pen used to read bar codes, also capable of pointing at the object and characters on the monitor screen. (Fig 7)

- The light pen helps users modify changes in the drawings. It is also considered a handheld light-sensitive device known as a "Pointing Device".
- They are also called "Electronic Pen".
- It is a pointing device that can be used as a computer mouse to point, select, and drag elements on the computer screen.
- It is typically used as a part of **CAD (Computer-Aided Design)**, where the client selects something on the screen.
- Modern light pens are available in wireless technology. Due to the contemporary development

Fig 8



in technology, they have easily replaced their counterparts.

- They are plug-and-play devices that do not need driver's files to install and use.

Barcode Reader

- These barcodes are scanned with the help of a barcode scanner or barcode reader to check the

details regarding the price, item no, batch code, etc. (Fig 8)

- This barcode reader or barcode scanner is attached to the computer system. After scanning, the complete details of the item can be fetched on the computer for quick access with database administration.
- The barcode is nothing but black and white color parallel lines attached to any product, and a laser barcode reader is used to fetch the details inside the barcode.
- The barcode is scanned with the help and assistant of an optical barcode reader.
- The Optical barcode reader or barcode scanners are an input device of a computer system used for standardized identifications.
- The information is in dim lines with alphanumeric values that differ in width and height.
- A standard barcode scanner uses laser shaft technology.
- The Laser bar is relocated adjoining the bar lines of the standardized identifications when the Laser pillar moves, and it gets reflected light from the scanner tags.
- A touchy light detector discovers the reflected bar.
- The barcode scanner is connected to the computer system where alphanumeric values are stored in computer memory, such as a computer hard disk drive.

5 Uses of Scanner Devices

- The scanners are used to scan documents to the computer for further modifications and use.
- The documents are converted in digital format which can later be shared via Google drives, emails, or upload online on other websites.
- In modern competitive exams the answers can be scanned with the help of optical card reader.
- The OMR [Optical Mark Reader] is an input device of a computer that is primarily utilized in the examination for solving multiple-choice questions.
- The OMR converts these solved questions into machine-readable form.
- They are extensively used in libraries where scanners scan all important information related .
- They are used in malls, all the product sensitive information can be capture using them like product cost, manufacturing date, expiry date, batch number, etc.
- All in one scanner are available in the markets which are capable of scanning, printing.
- The modern scanners can be connected to the computer system using Wi-Fi, Bluetooth, Infrared, LAN, USB cables, TWAIN, parallel port, SCSI, etc.
- They are widely used as the qualities of scan documents are never compromised.

Disadvantages of Scanners Computer Devices

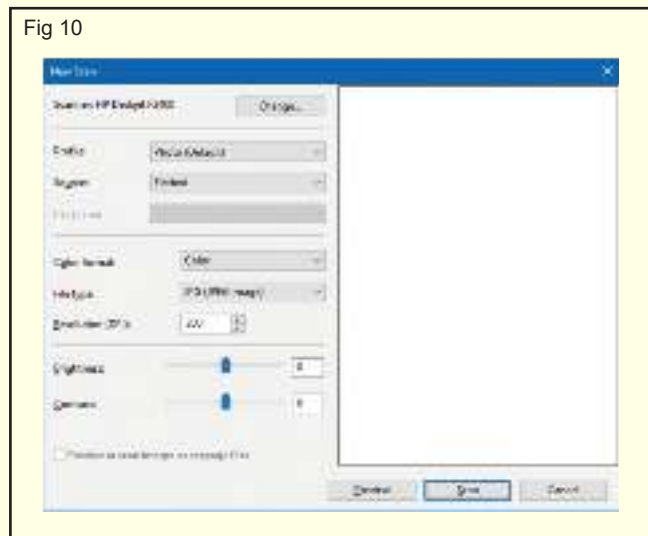
- The major disadvantages of scanners are they are expensive and latest model are not readily available in market.
- The scanned sizes of documents are huge and hence eat lot of space in hard disk drive.
- They are heavy on maintenance and a professional person is needed for repairing.
- Some scanners take time for scanning documents.
- Low quality scanners reduce the quality of scanned images.

Function of Scanners

S.No	Scanner	Description
1	Drum Scanners	They are considered to first use scanners. They use photomultiplier tubes for better performance and also for enhancing performance.
2	Handheld Scanner	The handheld scanners or hand scanners are small and compact in size devices; they are one of the popular input devices of the computer systems.
3	Flatbed Scanner	They are primarily and extensively used in homes and small offices.
4	Optical Character Recognition	OCR is a mechanical device that can convert images, pictures, documents, or manually written content into readable form.
5	Magnetic Ink Character Recognition	MICR is an input device of a computer system that is generally used in the banking sector where numerous cheques are handled and processed every day.
6	Image Scanner	Image scanners are used in a variety of domestic and industrial applications such as design, reverse engineering, orthotics, gaming and testing.
7	Light Pen	The light pen is a computer input device similar to a pen used to read bar codes, also capable of pointing at the object and characters on the monitor screen.
8	Barcode Reader	Barcodes are scanned with the help of a barcode scanner or barcode reader to check the details regarding the price, item no, batch code, etc.

How to scan on a windows computer

- Right-click your scanner or printer, then click Start Scan. (Fig 9)
- Users have several options on the screen which let you preview the document (Fig 10) choose a color format (color or black and white), adjust brightness, set the appropriate resolution, and even choose the format you want to save it in: JPEG, PDF, or PNG. If



you are satisfied with the results after reviewing the document, proceed to click Scan.

- Make your selections, Click Preview to ensure everything looks good then click **Scan**.

When ready, click Scan then review the scanned document. (Fig 11)

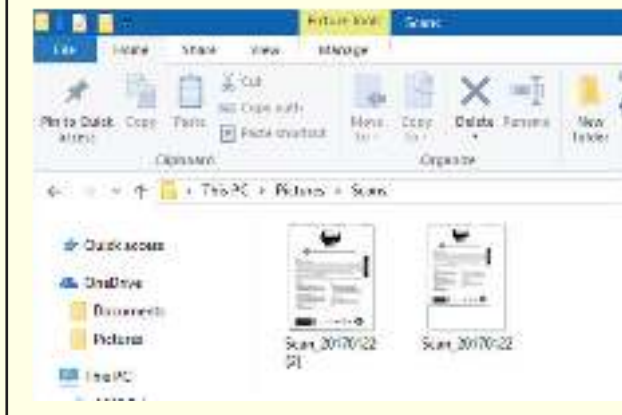
Fig 11



After giving your scanned document a Name, add a few tags to make it easier to search for later. Click Import.

Your scanned document can normally be found in Pictures within the scanned files folder. (Fig 12)

Fig 12



Different setting of scanner

Use the Scanner Settings screen to temporarily change a scanner's settings. If importing, use the Import Settings Screen that is displayed. (This screen is displayed when using a scan profile for Scan for ISIS. For Scan for Adrenaline settings, see "Scanner Properties Screen".) Settings you select remain until you select another profile, either the current profile or another one.

Display this screen by clicking the **Scanner Settings** toolbar button in the Batch Scanning screen.

Element	Description
Resolution	Select the resolution at which you want images scanned when this profile is used. The resolutions available depend on the selected scanner. Resolution is the fineness or coarseness, measured in dots per inch (dpi), of an image as it is scanned. A higher resolution results in a better image; however, more storage space is required for high resolution image files.
Page Size	Select the maximum page size of documents that will be scanned using this profile. Available page sizes depend on the selected scanner.
Dither	Dither is the process of simulating shades of gray by altering the size and arrangement of black pixels on an image.
Brightness Control	Select Auto if you want the scanner to automatically adjust the brightness (lightness) of images during scanning. To specify a particular brightness setting, select Manual and select a value using the slider. The black circle indicates darker values and the white circle indicates lighter values. (The higher the value, the lighter the scanned images.)
Contrast Control	Contrast is the range between the lightest and darkest shades in an image. A high contrast image has more gray shades between black and white; a low contrast image has fewer gray shades. Contrast determines how many gray shades are scanned. Select Auto if you want the scanner to automatically adjust the contrast of images during scanning. To specify a particular contrast setting, select Manual and select a value using the slider. The black circle indicates high contrast values and the white circle indicates low contrast values. (The higher the value, the less contrast in the scanned images.)
Advanced, More	Display additional advanced options. Advanced settings are specific to the selected scanner.

Various printer and fax and their settings

Objectives: At the end of this lesson you shall be able to

- introduction printer and types of printer
- how to print from a USB or wireless connected HP printer
- different setting of printer
- sending and receiving fax multifunction printer and modify the fax setting

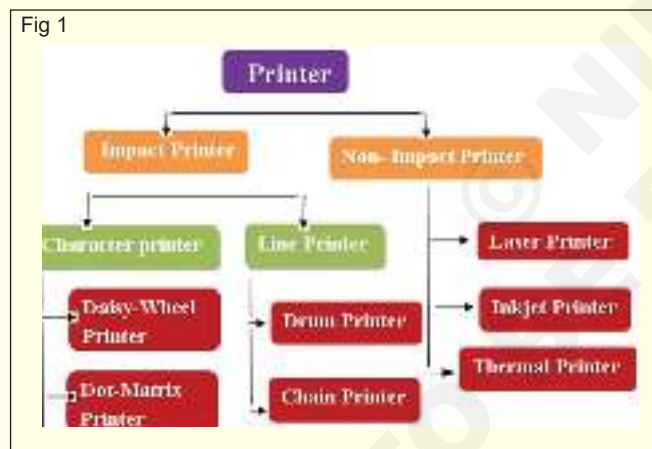
Introduction Printer

Printers are the most commonly used and popular output devices. They provide information in a permanent readable form. They produce printed output of results, programs and data. Prints text or image on paper called hard copy. The printing speed of a printer is measured in pages per minute (ppm). Printer resolution is often measured in dots per inch (dpi).

Types of Printers

Printers are classified into two categories according to printing technology (working): (Fig 1)

- Impact printer
- Non-Impact Printer



• IMPACT PRINTER

Impact printers use an Electro-mechanical mechanism. An impact printer refers to all those printers whose printing heads touch the paper. This mechanism uses hammers or pins to strike against a ribbon and paper to print the text or image.

Types of Impact Printers

Impact printers are of two Types:

- Character Printer
- Line Printer
- CHARACTER PRINTER

A Character printer prints a single character at a time. They are low speed printers. Their printing speed lies in the range of 10-600 character / second.

Types of Character printers

Character printers are generally of two types:-

- Daisy wheel Printer
- Dot Matrix Printer
- **DAISY-WHEEL PRINTERS**

These printers use a print wheel font, which is termed as daisy wheel. Each petal or hammer of Daisy-Wheel has a character raised on it. A motor spins the wheel at a rapid rate. When the desired character spins to the

Fig 2



correct position, a print hammer strikes it to produce the output. (Fig 2)

The speed of these Daisy-Wheel Printers normally ranged between 10-75 characters per second. The noise levels of these printers are high. These printers are most commonly used in electronic typewriter.

Advantages of a Daisy-Wheel Printer

- Can print letter quality characters.
- Gives fine quality output.

Disadvantages of a Daisy-Wheel Printer

- Printing speed is very slow
- Noisy
- Cannot print Graphics
- They are very costly.

• DOT MATRIX PRINTER

These printers print each character as a pattern of dots. The print head is made up of a matrix of tiny needles, typically 9 rows with 7 columns (9 * 7 matrix needles).

Fig 3



These shapes of each character are formed in the form of tiny dots. (Fig 3)

The printing quality of a dot matrix printer is inferior to a daisy wheel printer. But the printing speed of a Dot Matrix Printer is range from 40 to 600 characters per second. Dot Matrix Printers are less expensive than daisy – wheel printer.

Advantages of a dot matrix printer

Dot matrix printer over letter – quality printer is that dot – matrix printer can print characters in different shape, size and fonts.

- Dot matrix printer uses continuous paper rather than requiring individual sheet.
- Dot matrix printer is fast and cheap.

Fig 4



- Dot matrix printer can print charts and graphics.

Disadvantages of a dot matrix printer

- Dot matrix printers are noisy.
- Dot matrix printers do not produce high quality.

• LINE PRINTERS

Line printers are impact printers used with mini and mainframe computers.(Fig 4) For producing large volume outputs. These printers print one line of the text at a time that is why known as line printer. Its printing speed lies in the range of 300-3000 lines per minute (LPM). Actually line printer prints only one character at a time but because of its printing speed, observer observes that it prints a whole line at a time.

Types of Line Printers

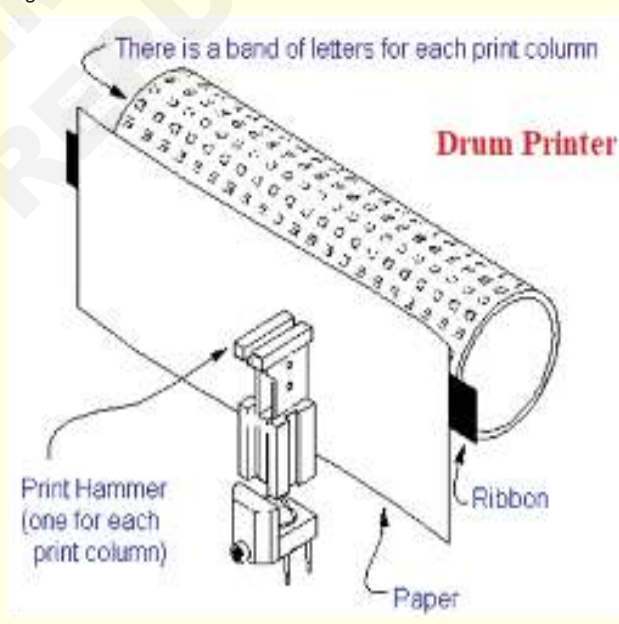
Line Printers are of two types

- Drum Printer
- Chain Printer

• DRUM PRINTER

The drum printer consists of a cylindrical drum. Asset of characters are embossed on its surface to print. (Fig 5) A set of print hammers is associated with each character. As the drum rotates, the hammer wait for

Fig 5

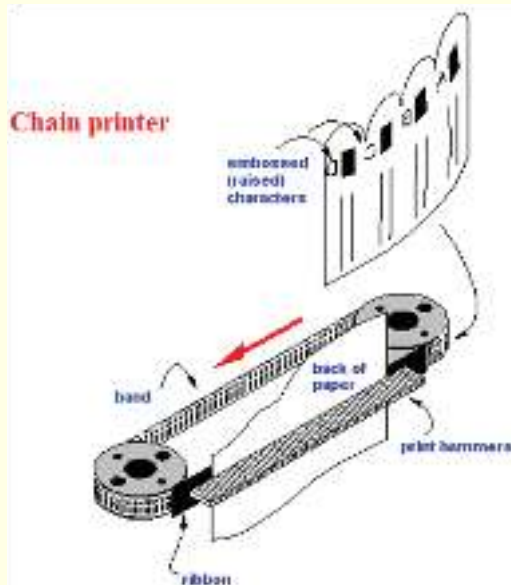


desired character and is activated when character appear in front of hammer. The hammer is placed behind the paper. There hammers strike the paper along with ribbon (ribbon is placed between hammer and drum) against the embossed character on the surface one revolution of drum is needed to print a line. As the line is printed the paper moves upward to print next line.

• CHAIN PRINTER

A chain containing characters is used for printing. (Fig 6) The chain knows as print chain rotates very rapidly.

Fig 6



With each link of the chain is character font. Magnetically driven hammers are there in each print position and all the characters which are to be printed are received by the printer through processor. When the desired character comes in the print position the hammers strike the ribbon and paper against the character thus it prints one line at a time. It is very noisy and its speed ranges from 400-24000 line per minute (LPM).

• NON -IMPACT PRINTER

These printer uses ink and special electrical machines for producing outputs. Non – impact printers are all those printers whose printing heads do not touch paper. A non impact printer forms characters and image on a piece of paper without actually striking the paper.

Types of Non -Impact Printers

- Laser printer
- Inkjet printer
- Thermal printer

Fig 7



• LASER PRINTERS

They print one page at a time thus laser printer is also referred as Page Printer. (Fig 7) A laser printer uses electronics, lasers, xerography and other techniques, which is called electro photographic technique.

A laser beam is directed across the surface of a light or photosensitive drum. An image is produced, with the use of raster scan principal, in the form of tiny dots. The laser exposed areas attract toner (or ink power). There after the drum transfers the toner to the paper. The paper then moves to a fusing station where the toner is permanently fused on the paper with heat or pressure. After this the drum is discharged and cleaned and ready for processing the next page.

Advantages of Laser Printers

- Very high speed.
- Low noise level
- Low maintenance requirement.
- Very high quality output on ordinary paper.
- Good graphics quality (300 dpi to 1200 dpi) and excellent graphics capabilities.
- Supports many fonts and different character size.
- Color printing possible

Disadvantages of Laser Printers

- Very Expensive.
- Require periodic maintenance.

• INKJET PRINTERS

Inkjet printer is non impact character printer (Fig 8). It uses the dot matrix approach to print to print text and graphics. However the dots are formed by tiny droplets

Fig 8



of ink. They print characters by spraying small drops of ink onto paper. For spraying drops nozzles are used. Special type of ink having high iron content is used for forming drops. Droplets of ink are electrically charged after leaving a nozzle when it passes through a valve. The droplets are then guided to the proper position on the paper by electrically charged horizontally and vertically deflection plates.

These printers can print 40-300 CPS (character/sec.) and can produce multi-color printouts.

Advantages of Ink jet Printers

- High quality text and graphics.
- Produces no noise

Disadvantages of Thermal Printers

- Its speed is slow than other impact printer and no-impact printers.
- Its image quality is also lower than other printer [low dpi (dot per inch) , bout 180 dpi].
- Ink cartridge is costly.

Fig 9

Thermal Printer



• THERMAL PRINTER

This type of printer uses a special heat sensitive paper. These papers have a special heat sensitive coating. When a spot on the special paper is heated, it becomes dark. A character is printed with a matrix of dots. The heating element is heated by electric current. We can also say the heat sensitive paper as chemically treated paper. In this type of printer neither the ink nor the ribbon is involved. (Fig 9)

To print a character the printing head is moved first to the correct character position. Then the heating elements of desired character are turned on. After a short time they are turned off. There after the print head is moved to the next character. Such printers have a speed of about 200 characters per second.

Advantages of Thermal Printers

- Low noise
- Can produce high quality color output.

Disadvantages of Thermal Printers

- Expensive

Fig 10



- Slow Speed
- Required special paper

2D and 3D Printers

- Printers are one of the common computer peripheral devices that can be classified into two categories that are **2D and 3D printers**. (Fig 10) The 2D printers are used to print text and graphics on a paper, and 3D printers are used to create three dimensional physical objects.
- One of the best enhancements in the history of printing technology is the 3d printer, which was developed by **Chuck Hull** in **1984**. It produces 3D objects and items by using **quality resin**. It uses materials like plastics, polymers, metal alloys, or even food ingredients.

3D printer

Generally, the design of an object starts in a computer-aided design (CAD) software system where its prototype is created. Then, the computer-aided design system sends this prototype to the printer in STL (stereolithography) file format. The printer then starts the process of recreating the object layer-by-layer after reading the prototype in cross-sections. The below image is a blueprint of 3d printer that is known as Flash Forge.

Advantages of 3D printer:

- The main advantage of a 3D printer is that it allows users to print objects in 3D.
- It has the ability of full customization.
- It is easy to access and cost-effective.
- It prints the documents with better quality.
- It provides users unlimited shapes and geometry.

Disadvantages of 3D printer:

- Its initial and resin costs are high.
- 3D printing is still developing technology.
- It consumes high energy around 50 to 100 more than injection molding.
- It includes limited materials
- The 3D printers are slow as they are limitless for mass customization.

Print from a USB or wireless connected HP printer

- Select the file you want to print and open the file so it appears on your computer screen.
- Press the **Ctrl + P** buttons on your keyboard at the same time.
- Once the printing pop-up menu appears on your computer screen, select the printer you intend to send the job to.
- If the printer is not connected, get help setting it up through the HP Printers - USB Printer Setup

(Windows).

- For wireless printer setup and connection, get help connecting the printer wirelessly.
- If needed, modify your print settings. This step is optional.

Fig 11



- Click the Print button on screen to send the job into the printer print queue and wait for the job to complete.

Different setting of printer

- Open the Print dialog box. (Fig 11)
- Select **Printer Settings** from the drop-down list, and select the **Basic settings** tab.
- Click **Automatic**, then choose the resolution from the Resolution drop-down list.

Using the predefined settings

The predefined settings are provided to help you optimize print settings for a particular kind of printout, such as presentation documents or images taken by a video or digital camera.

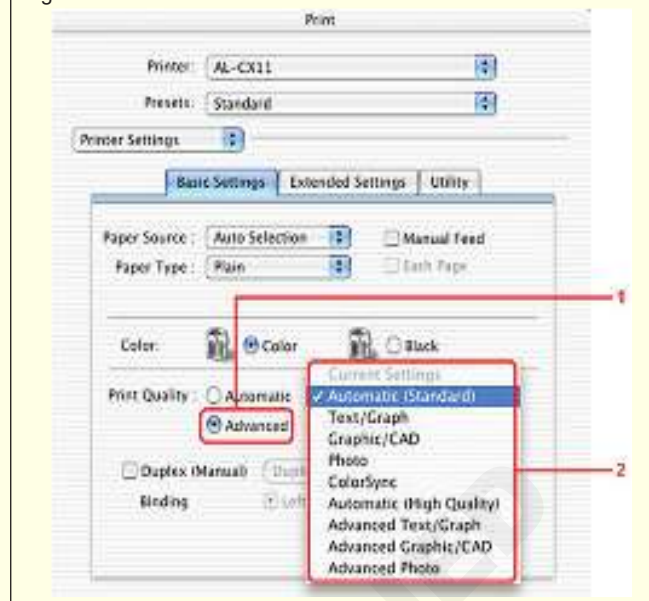
Follow the steps below to use the predefined settings.

- Open the Print dialog box.
- Select **Printer Settings** from the drop-down list, and select the **Basic settings** tab. • S e l e c t **Advanced**. You will find the predefined settings in the list on the right of **Automatic**.
- Select the most appropriate setting from the list according to the type of document or image you want to print. (Fig 12)

When you choose a predefined setting, other settings such as Printing Mode, Resolution, Screen, and Color Management are set automatically. **Automatic (Standard)**

Suitable for regular printing, especially photos.

Fig 12



Text/Graph

Suitable for printing documents that include text and graphs, such as presentation documents.

Graphic/CAD

Suitable for printing graphs and charts.

Photo

Suitable for printing photos.

ColorSync

Automatically adjusts printout colors to match colors on your screen.

Automatic (High Quality)

Suitable for regular printing that gives priority to high-quality printing.

Advanced Text/Graph

Suitable for printing high-quality presentation documents that include text and graphs.

Advanced Graphic/CAD

Suitable for printing high-quality graphs, charts, and photos.

Advanced Photo

Suitable for printing high-quality scanned photos and digitally-captured images. (Fig 13)

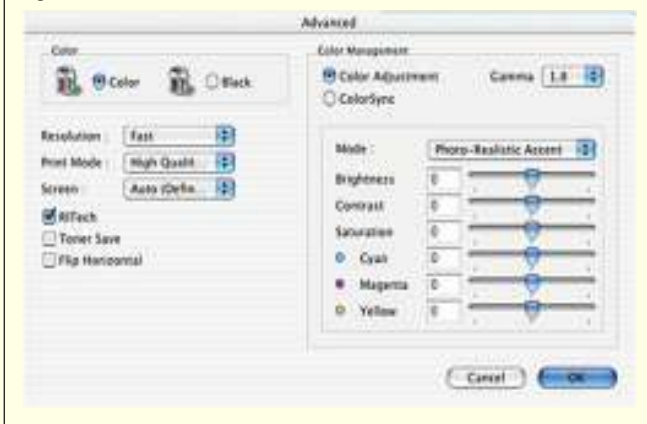
Customizing print settings

Your printer provides for customized print settings if you need more control over the printout.

Follow the steps below to customize your print settings.

- Open the Basic Settings dialog box.
- Click **Advanced**, then click **More Settings**. The following dialog box appears.
- Open the Basic Settings dialog box.

Fig 13



- Click **Advanced**, then click **More Settings**. The following dialog box appears.
- Choose **Color** or **Black** as the Color setting
- Choose desired printing resolution from **Fast** (300 dpi) or **Fine** (600 dpi).
- Click **OK** to apply the settings and return to the Basic Settings dialog box.

Fig 14



Modifying the print layout

You can print either two or four pages onto a single page and to specify the printing order, automatically resizing each page to fit the specified paper size by using Layout printing. You can also choose to print documents surrounded by a frame. (Fig 14)

- Open the Print dialog box.
- Select **Layout** from the drop-down list.
- Select the number of pages you want to print on one sheet of paper from the drop-down list.
- Click **Print** to start printing.

Duplex printing

Duplex printing prints on both sides of the paper. You can do duplex printing manually. When printing for binding, the binding edge can be specified as required to produce the desired page order.

Doing duplex printing manually

- Open the Print dialog box.

Fig 15

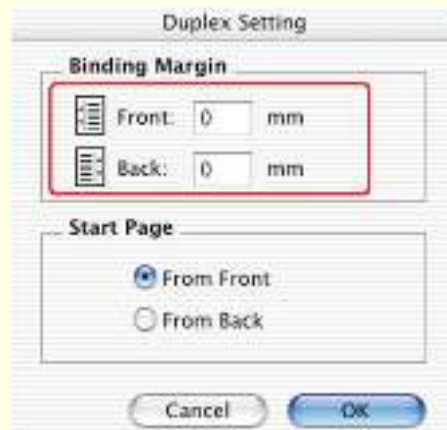
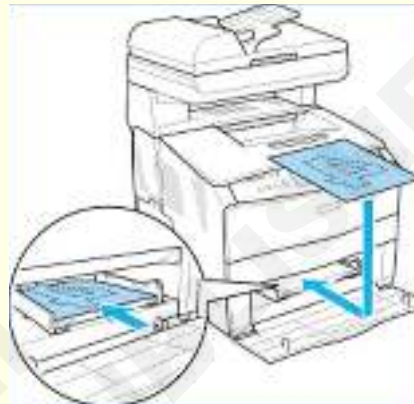


Fig 16



- Select **Printer Settings** from the drop-down list, and select the **Basic settings** tab.
- Select the **Duplex (Manual)** check box, then click the **Duplex Settings** button. (Fig 15)
- Select a Binding position from **Left**, **Top**, or **Right**.
- Specify the Binding Margin for the front and back sides of the paper.

Select whether the front or back side of the paper is to be printed as the Start Page. (Fig 16)

- Click **Print** to start printing.

After printing on one side, reload the paper into the MP tray with the printed surface face-down as shown below. Then press the **B&W Start** or **Color Start** button.

Note: When loading the paper, straighten it well. If curled paper is loaded, it may not be fed correctly.

Sending and receiving fax multifunction printer and modify the fax setting

Multifunction printer

A multifunction printer (also known as an MFP) is a piece of office equipment or machinery that serves the primary purpose of copying and printing documents. Over time, multifunction printers have been referred to as photocopiers, copiers, Xerox machines, and a host of other names.

A true multifunction printer also scans, emails, faxes, and can even browse the internet and print straight from

the display panel, similar to a computer.

Most multifunction printers also include finishing options such as stapling, folding, booklet making, and hole punching.

Advantages of a Multifunction Printer

Energy Efficiency

One significant advantage of purchasing a multifunction printer is the fact that many efficiently use power. They enter **energy-saving mode** when not in use.

Office Space Efficiency

An office can **replace 3-4 normal printers with one multifunction printer**. These printers function so fast and efficiently that numerous teams and departments can use a single machine.

Workplace Efficiency

Having **one device that can print, scan, copy, and fax** streamlines business operations, especially because multifunction printers complete all these print jobs fast.

A **variety of finishing options** such as stapling and folding mean that projects can get completed faster without the need for manual finishing or having to wait on an external printing company to finish the job.

Multifunction printers also let businesses streamline processes by enabling remote printing needs. By printing from a wireless or mobile device, print jobs can be completed with ease.

Cost Efficiency

Multifunction printers can save your company money in a few ways.

Their energy efficiency not only helps the environment but also reduces the strain to your company's **monthly electricity bill**. Additionally, since these printers can replace the need for multiple printers in the office, **reduced overall maintenance** is needed, which lowers service costs. Multifunction printers make it easier to digitize documents.

Use a Fax Machine

Sending and receiving documents with a fax machine is fairly easy, but if you've never had to use one before, it can be a little confusing. (Fig 17)

Set Up a Fax Machine

- First, you need to make sure your fax machine is set up and ready to go.
- Follow these steps to do so:
- Plug the fax machine into a power source
- Connect the phone line
- Load toner or ink
- Make sure the fax machine has paper
- Turn the fax machine on
- To check the phone line connection, pick up the fax machine's phone and check for a dial tone. If you hear a dial tone, you should be good to go. If your fax machine doesn't have a phone, connect an external phone to check for a dial tone.

- Once everything is set up, you can run a test to make sure your fax machine is ready to send and receive documents. Simply call the fax number, and if the fax machine picks up, you're ready to get started.

Send a Fax

Follow these steps to send a fax:

- Enter the document you want to fax into the document feeder. If you have multiple documents, put them in the order that you want them to be sent
- Dial the fax number for the receiving fax machine
- Select Fax or Send to send the fax
- After sending the fax, you should receive a confirmation page
- Remove your documents

Receive a Fax

Receiving a fax is simple and only requires you to make sure your fax machine is prepared to receive and print documents.

- Make sure your fax machine is set up and operable
- Ensure the fax machine has enough ink/toner and paper
- The fax machine phone will ring. Don't pick it up — the fax machine will automatically receive and print the document(s)

While the sender should receive a confirmation from their fax machine that the fax was successfully transmitted, it's always a good idea to contact them personally to confirm receipt.

Modify the fax setting

There are various user-selectable options available for setting up the Fax system on the machine. To modify the Fax Setup options:

- Press the [Fax] button on the Control Panel. "Ready to Fax" will be displayed on the Display Screen.
- Press the [Menu] button until "Fax Setup" is displayed.
- Press the [OK] button.
- Press the [Left] or [Right] arrow button until "Sending" or "Receiving" is displayed.

Fig 17



- Press the [OK] button.
 - Press the [Left] or [Right] arrow button until the required menu item is displayed.
 - Press the [OK] button.
 - Press the [Left] or [Right] arrow button until the required status is displayed, or enter the value for the selected option.
- Press the [OK] button.
 - If necessary, repeat steps 6 through 9.
 - Press the [Stop / Clear] button to return to Ready mode.

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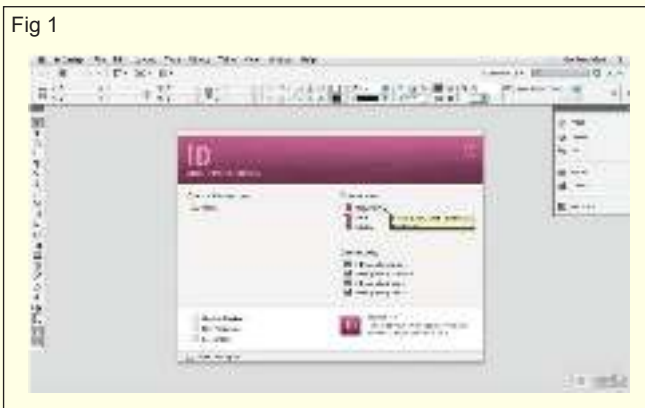
Features and benefits of Adobe Indesign & Pagemaker

Objectives: At the end of this lesson you shall be able to

- **benefits of Adobe Indesign**
- **features of Adobe Pagemaker**
- **explain font style and color**

Indesign

Fig 1



InDesign is software for creating and editing page designing and layout arrangement tool used for arranging the contents in making posters, brochures, magazines, newspapers, books, presentations, and eBooks. It can also publish illustrations, graphs, tables, and other professional usages. High quality for both print and on-screen delivery was actually developed for the original magazine market; further, it has become the no1 application in the world for interactive developers, photographers, and designers to use anywhere to place content and images in any format. It integrates with the rest of the Adobe tools such as Photoshop, Illustrator and flashes professional users from any profession can design, preview, review and produce content quickly and efficiently. InDesign also works with word processors such as MS Word, Adobe InCopy to import text. Any designer can make interactive designs by using animation pre-sets and media options in InDesign CS6. (Fig 1)

Benefits of Adobe Indesign

1 Adobe Indesign offers the Best output project features .

- The features that InDesign CC offers to see a design layout from start to finish are incredibly robust. Considering its output for any given project, Multiple Platforms Usage allows you to design a document with horizontal and vertical variants in layout by using the Layout> Alternate Layout tool or the Pages panel menu. Liquid Layouts also allow designers to layout content for different page sizes and device platforms.

2 Adobe Indesign produces greater quality content for print and digital.

- Any designer will tell you the quality of content is phenomenal in InDesign. When it comes to fine-tuning your file's text and graphics, the softwares editing capabilities are as low as a .001 degree precision. Not to mention the user control offered within any page and the manipulation of its typography, colors and styling.

3 Adobe Indesign makes collaboration and sharing assets with your team easy.

- CC libraries, saved on the Cloud, makes it easy for your teammates to create and share photos, color schemes, icons, logos, type styles and more! Any team member with Adobe CC can open and edit files (with your permission of course). This is a huge time-saver and will increase your productivity.

4 Adobe Indesign saves you time.

- Here's just a couple features in InDesign that will speed up your workflow so you can deliver quicker.
- Layers—Allowing you to organize your project by element will keep everything organized in your doc and allow you to quickly switch to the piece you are working with.
- Pages/Master Pages—Allows you to create and save a page style to reference later and reuse again.
- Style Groups— Use styles again too by making use of paragraph, character, object and text style groups to save and reuse throughout your document.

5 Adobe Indesign comes with full support.

- As an Adobe Member, the support available to you is extensive. You may feel
- The Support Community also is an online forum where you can ask questions, find your answers, learn from experts and share your knowledge.

6 Other Adobe software can be used in conjunction with Indesign.

- Adobe InDesign shares a direct integration with other Adobe programs, like Adobe Bridge (creative asset manager), Adobe Photoshop or Illustrator. If you are searching, creating and editing images, they are linked within Indesign and you can quickly toggle back and forth between the programs while working. Another bonus is the built-in connection to Typekit, Adobe's full free font library. Easily manipulate text using the font export formatting option.

7 You join the Adobe community.

- Adobe really is a family. Once you become an Adobe member you can try any other CC programs on a trial basis. This allows you to explore other top Adobe products, including Adobe Photoshop CC, Adobe Illustrator or Adobe Premiere Pro. You also can get access to their stock photo site, Adobe Stock, or Spark Post, which gives you unlimited social and branding templates. Adobe Help supplies you with tutorials and templates for all of its software.

8 Adobe InDesign is the Industry standard choice and Trusted by professionals.

- Learn and use the #1 software by the world's leading design company. Visual Persuasion offers expert instruction from industry professionals who live and breathe Adobe software. We offer a wide array of classes including Adobe's most popular applications, one of which is InDesign CC.

Features of Adobe Pagemaker

- Set up a single file for multiple versions of a publication, add annotations, and experiment with layouts by placing objects on different layers. By placing text and graphics on separate layers, you can control which objects are visible and work faster by turning off the graphics layer.
- Automatically reposition, resize, and reflow text blocks, frames, and graphics when you change columns, orientation, or master pages.
- Quickly lay out your publication by creating frames to hold text or graphics.
- Create a wide variety of documents up to 999 pages each.
- Set typography to professional standards with point-size- dependent tracking, kerning in 0.001-em increments, and expanded and condensed type.
- Specify and apply different page designs, such as margins, column guides, and backgrounds within a single publication.
- Speed text processing with a built-in word processor, spelling checker, and search-and-replace feature.
- Reliably track changes to imported text and graphics files.
- Crop text, graphics, and images easily into polygons, ovals, and rectangles.
- Easily lay out text and data in rows and columns - and now include color in your tables.
- Enjoy maximum flexibility with support for Adobe PostScript(R), PCL, and QuickDraw printers. Includes Print Fit view and printer styles, plus the ability to print nonconsecutive pages and reader's spreads and to designate selected objects as nonprinting.
- Streamline workflow with new template designs,

instantly define grids with an enhanced Grid Manager Plug-in, impose pages using the Build Booklet plug-in, and generate an automatic table of contents or index across multiple publications.

- Draw free-form polygons and lines, and edit points on existing polygons.
- Automatically align and distribute objects. Combine multiple elements into a unit with a single keystroke, and move or resize an element without having to separate it from the rest of the group. Easily maintain the relationships of layout elements with object locking.
- Quickly move between pages with new Go Back and Go Forward commands

Explain Font Style

How to choose a font

When choosing a font for a site, you should follow these guidelines:

use no more than four fonts on one page;

- use sans-serif fonts for main text as serifs make reading difficult on the screen;
- use serif fonts in the printed texts since readers associate them with reliability and respectability;
- use the Monospace family fonts for program code examples, instructions, or typewritten text;
- using custom fonts, such as Script and Fantasy, to design headlines and accents to attract attention
- for headings and calls to action use larger font sizes than plain text.

Examples of fonts in graphic design

• Craft fonts

Fonts on your website are a part of your brand; think about your brand first, define its properties and qualities.

In this example, you can see a package of ice cream where the producer wants to highlight

Fig 2



the naturalness of their product. (Fig 2) Fonts with imitation of embossed letters, calligraphy, something hand-made, home-made, warm in the

atmosphere are excellent for this purpose:

Fig 3



- **Handwritten fonts**

Brand fonts which imitate handwriting are perceived as kind, open-hearted, and responsive; in this

Fig 4



example, you can see the dog food (Fig 3)

- These fonts are also good for children's brands as well as for any brands where it is important to express care and responsiveness. These alternative fonts set the informal style well. (Fig 4)

You can see other free fonts for a website on the [special Google portal](#) or its analogs.

Fig 5



- **Serif**

Serif fonts are great if you want to show commitment to tradition and company stability. (Fig 5) These fonts animate the brand with a combination of vibrant graphics or colors:

Colour Concepts :-

Primary Colors

Primary colors are those you can't create by combining two or more other colors together. They're a lot like prime numbers, which can't be created by multiplying two other numbers together.

There are three primary colors:

- Red
- Yellow
- Blue
- Think of primary colors as your parent colors, anchoring your design in a general color scheme. Any one or combination of these colors can give your brand guardrails when you move to explore other shades, tones, and tints (we'll talk about those in just a minute).
- When designing or even painting with primary colors, don't feel restricted to just the three primary colors listed above. Orange isn't a primary color, for example, but brands can certainly use orange as their dominant color (as we at HubSpot know this quite well).
- Knowing which primary colors create orange is your ticket to identifying colors that might go well with orange — given the right shade, tone, or tint. This brings us to our next type of color ...

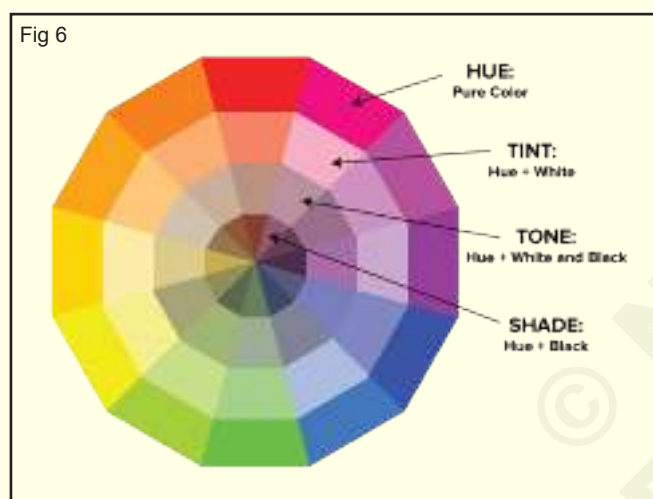
Secondary Colors

- Secondary colors are the colors that are formed by combining any two of the three primary colors listed above. Check out the color theory model above — see how each secondary color is supported by two of the three primary colors?
- There are three secondary colors: **orange**, **purple**, and **green**. You can create each one using two of the three primary colors. Here are the general rules of secondary color creation:
- Red + Yellow = Orange
- Blue + Red = Purple
- Yellow + Blue = Green
- Keep in mind that the color mixtures above only work if you use the purest form of each primary color. This pure form is known as a color's hue, and you'll see how these hues compare to the variants underneath each color in the color wheel below.

Tertiary Colors

- Tertiary colors are created when you mix a primary color with a secondary color.
- From here, color gets a little more complicated, and if you want to learn how the experts choose color in their design, you've got to first understand all the other components of color.

- The most important component of tertiary colors is that not every primary color can match with a secondary color to create a tertiary color. For example, red can't mix in harmony with green, and blue can't mix in harmony with orange -- both mixtures would result in a slightly brown color (unless of course, that's what you're looking for).
- Instead, tertiary colors are created when a primary color mixes with a secondary color that comes next to it on the color wheel below. There are six tertiary colors that fit this requirement:
 - Red + Purple = **Red-Purple** (magenta)
 - Red + Orange = **Red-Orange** (vermillion)
 - Blue + Purple = **Blue-Purple** (violet)
 - Blue + Green = **Blue-Green** (teal)
 - Yellow + Orange = **Yellow-Orange** (amber)
 - Yellow + Green = **Yellow-Green** (chartreuse)



The Color Theory Wheel

A circle graph that charts each primary, secondary, and tertiary color (Fig 6) as well as their respective hues, tints, tones, and shades. Visualizing colors in this way helps you choose color schemes by showing you how each color relates to the color that comes next to it on a rainbow color scale. (As you probably know, the colors of a rainbow, in order, are **red, orange, yellow, green, blue, indigo, and violet.**)

When choosing colors for a color scheme, the color wheel gives you opportunities to create brighter, lighter, softer, and darker colors by mixing white, black, and gray with the original colors. These mixes create the color variants.

Hue

- Hue is pretty much synonymous with what we actually mean when we said the word "color." All of the primary and secondary colors, for instance, are "hues."
- Hues are important to remember when combining two primary colors to create a secondary color. If you

don't use the hues of the two primary colors you're mixing together, you won't generate the hue of the secondary color. This is because a hue has the fewest other colors inside it. By mixing two primary colors that carry other tints, tones, and shades inside them, you're technically adding more than two colors to the mixture — making your final color dependent on the compatibility of more than two colors.

- If you were to mix the hues of red and blue together, for instance, you'd get purple, right? But mix a tint of red with the hue of blue, and you'll get a slightly tinted purple in return.

Shade

- You may recognize the term "shade" because it's used quite often to refer to light and dark versions of the same hue. But actually, a shade is technically the color that you get when you add black to any given hue. The various "shades" just refer to how much black you're adding.

Tint

- A tint is the opposite of a shade, but people don't often distinguish between a color's shade and a color's tint. You get a different tint when you add white to a color. So, a color can have a range of both shades and tints.

Tone (or Saturation)

- You can also add both white and black to a color to create a tone. Tone and saturation essentially mean the same thing, but most people will use saturation if they're talking about colors being created for digital images. Tone will be used more often for painting.
- With the basics covered, let's dive into something a little more complicated — like additive and subtractive color theory.

Additive & Subtractive Color Theory

- If you've ever played around with color on any computer program, you've probably seen a module that listed RGB or CMYK colors with some numbers next to the letters.

CMYK

- CMYK stands for Cyan, Magenta, Yellow, Key (Black). Those also happen to be the colors listed



on your ink cartridges for your printer. That's no coincidence. (Fig 7)

- CMYK is the subtractive color model. It's called that because you have to subtract colors to get to white. That means the opposite is true — the more colors you add, the closer you get to black.
- Think about printing on a piece of paper. When you first put a sheet in the printer, you're typically printing on a white piece of paper. By adding color, you're blocking the white wavelengths from getting through.
- Then, let's say you were to put that printed piece of paper back into the printer, and print something on it again. You'll notice the areas that have been printed on twice will have colors closer to black.
- I find it easier to think about CMYK in terms of its corresponding numbers. CMYK works on a scale of 0 to 100. If C=100, M=100, Y=100, and K=100, you end up with black. But, if all four colors equal 0, you end up with true white.

RGB

- RGB color models, on the other hand, are designed for electronic displays, including computers.
- RGB stands for Red, Green, Blue, and is based on the additive color model of light waves. (Fig 8) This means, the more color you add, the closer you get to white. For computers, RGB is created using scales

from 0 to 255. So, black would be R=0, G=0, and B=0. White would be R=255, G=255, and B=255.

- When you're creating color on a computer, your color module will usually list both RGB and CMYK numbers. In practice, you can use either one to find colors, and the other color model will adjust accordingly.
- You can always convert the design to CMYK and make adjustments should you ever need it for printed materials.

Fig 8



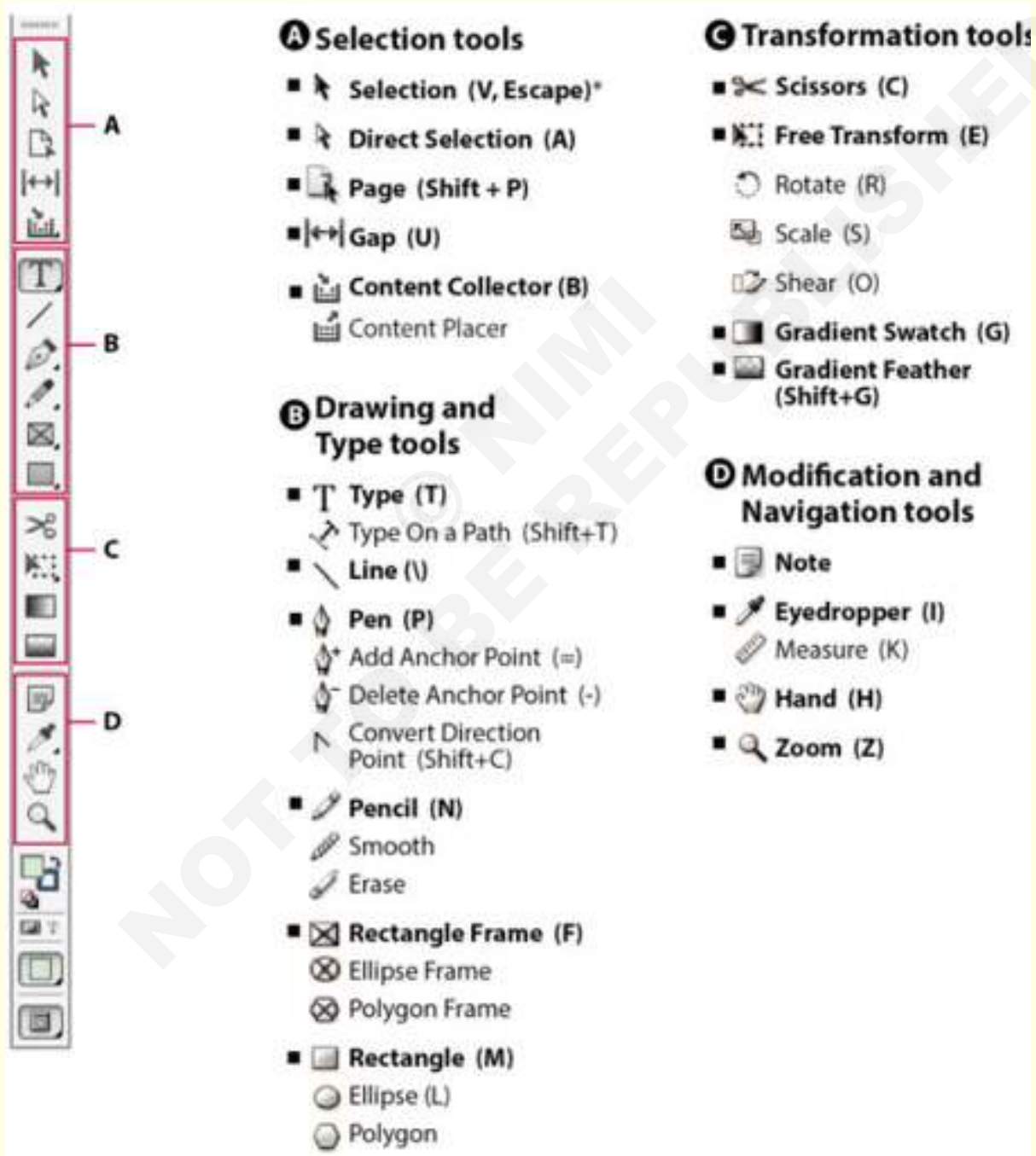
Indesign tools and versions

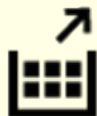
Objectives: At the end of this lesson you shall be able to

- explain Indesign tools
- compare Adobe Indesign and Adobe Pagemaker
- compare Adobe Indesign versions

Indesign Toolbar

Fig 1



S.No	Tool Pic	Funtion of the Tool
1	SELECTION TOOL 	Just like with Photoshop, the Selection Tool is your basic pointer tool. Select an entire object or text box and move it around, delete it, etc.
2	DIRECT SELECTION TOOL 	Also like Photoshop, the Direct Selection Tool only selects one anchor point on an object. So, if you wanted to move one specific anchor point, you'd use this tool. I typically use this in conjunction with the Add Anchor Point Tool.
3	PAGE TOOL 	The Page Tool allows you to select an entire page and rearrange it or resize it on your work space.
4	GAP TOOL 	The Gap Tool is used when you want to change the distribution of two objects while keeping the white space between them the same.
5	CONTENT COLLECTOR TOOL 	The Content Collector Tool allows you to collect multiple pieces of content that you want to place either in the same document or in another InDesign document.
6	CONTENT PLACER TOOL 	Once you've collected your objects with the Content Collector Tool, you'll use the Content Placer Tool to place those objects either in the same document or in a different InDesign document.
7	TYPE TOOL 	This is your basic type tool. Click and drag to create a rectangular text box and type away!
8	TYPE ON A PATH TOOL 	The Type on a Path Tool, on the other hand, types around an object.
9	LINE TOOL 	This tool creates a line.
10	PEN TOOL 	The Pen Tool is draw by clicking on the point where you want to start, and before unclicking, hold and drag the cursor to make a curve. Then you click on the next point where you'd like to continue your shape, hold and drag the cursor, etc.

S.No	Tool Pic	Funtion of the Tool
11	ADD ANCHOR POINT TOOL 	The Add Anchor Point Tool is used to add anchor points to an object.
12	DELETE ANCHOR POINT TOOL 	The Delete Anchor Point Tool is super helpful for perfecting shapes.
13	CONVERT DIRECTION POINT TOOL 	The Convert Direction Point Tool is only used for changing the curve level of a specific anchor point.
14	PENCIL TOOL 	The Pencil Tool is used to create a freehand shape.
15	SMOOTH TOOL 	The Smooth Tool is used in conjunction with the Pencil Tool to smooth out any bumps that might have occurred in your vector object.
16	ERASER TOOL 	The Erase Tool is used to erase parts of an object or line.
17	RECTANGLE FRAME TOOL 	The Frame Tools function just like regular object tools, but they're specially formatted to have photos placed in them and need to distinguish which objects are meant to have photos placed in them and which ones aren't. Otherwise, regular object in them.
18	ELLIPSE FRAME TOOL 	Just like the Rectangle Frame Tool, but it's in the shape of an ellipse.
19	POLYGON FRAME TOOL 	Just like the Rectangle Frame Tool, but it has however many sides you want.

S.No	Tool Pic	Funtion of the Tool
20	RECTANGLE TOOL 	This tool draws a rectangular box. To create a square, hold the Shift button as you click and drag.
21	ELLIPSE TOOL 	This tool draws an oval box. To create a circle, hold the Shift button as you click and drag.
22	POLYGON TOOL 	To create a box with as many sides as you'd like the dimensions you'd as how many sides.
23	SCISSORS TOOL 	The Scissors Tool cuts a path or an object.
24	FREE TRANSFORM TOOL 	This tool lets you take any object or text box and transform it freely, scaling and rotating.
25	ROTATE TOOL 	This tool is used to rotate objects and text boxes.
26	SCALE TOOL 	The Scale Tool allows you to scale an object or text box.
27	SHEAR TOOL 	The Shear Tool allows you to distort your object by making it a parallelogram.
28	GRADIENT SWATCH TOOL 	The Gradient Swatch Tool creates a gradient!
29	GRADIENT FEATHER TOOL 	Just like the Gradient Feather, Tool creates a gradient it ends in transparency.

S.No	Tool Pic	Funtion of the Tool
30	NOTE TOOL 	The note tool is super helpful if you've got multiple people working on the same file.
31	COLOR THEME TOOL 	The Color Theme Tool is super helpful if you're working on a style guide for your blog or business.
32	EYEDROPPER TOOL 	The eyedropper tool is super helpful for grabbing whatever color you want from the image and making it the foreground color.
33	MEASURE TOOL 	The measure tool is used to (surprise!) measure the image.
34	HAND TOOL 	This tool allows you to click and drag your artboard around.
35	ZOOM TOOL 	This tool allows you to zoom in or out of your artboard.
36	COLOR PALETTE 	The Color Palette is where you determine your object or text's fill and stroke colors.

Compare Adobe Indesign and Adobe Pagemaker

PageMaker is a free desktop publishing software which is considered the leading desktop publishing software for producing quality, professional-looking and interactive content on the Internet.

InDesign company is an all-inclusive desktop publishing program designed for making brochures, flyers, publications, books, and other promotional materials. Projects created with InDesign can be both printed and viewed on a computer screen.

PageMaker & InDesign Features:

PAGEMAKER	INDESIGN
Tagged PDF support	Alternative text forms
Customized templates	HTML export

High-resolution stock images	Creation of templates
Data Merge feature	Access to Creative Cloud library
Integration with Adobe's programs	Text organization tools

Introduction to Indesign version

InDesign versions can be explain as updated and modified format of older software of InDesign and each version of this software came time to time with their new and improved features as well as working quality. These modification might be in user interface of this software for making it more user friendly or in tools of tool panel for making them more handy or and other important features of this software. It was developed on August 31, 1991 by

Adobe system and since its initial release Adobe made many changes for improving its working ability so we have number of versions of it.

List of InDesign version

- Discuss some of its version for understanding about them starting from latest to previously launched one. Its initial version was InDesign 1.0 which was launched on August 31, 1999 and you will have all versions in the sequence InDesign 1.0, InDesign 1.0J, InDesign 1.5, InDesign 2.0, and so on.

We will discuss some of its version for understanding about them starting from latest to previously launched one. Its initial version was InDesign 1.0 which was launched on August 31, 1999 and you will have all versions in the sequence InDesign 1.0, InDesign 1.0J, InDesign 1.5, InDesign 2.0, and so on.

InDesign is the successor to Adobe PageMaker, which Adobe acquired by buying Aldus Corporation in late 1994. (Freehand, Aldus's competitor to Adobe Illustrator, was licensed from Altsys, the maker of Fontographer.) By 1998 PageMaker had lost much of professional market to the comparatively feature-rich QuarkXPress version 3.3, released in 1992, and version 4.0, released in 1996. In 1999, Quark announced its offer to buy Adobe[3] and to divest the combined company of PageMaker to avoid problems under United States antitrust law. Adobe rebuffed Quark's offer and continued to develop a new desktop publishing application. Aldus had begun developing a successor to PageMaker, which was code-named "Shuksan". Later, Adobe code-named the project "K2", and Adobe released InDesign 1.0 in 1999.

Adobe launched InDesign in the United Kingdom through a series of promotional presentations in hotels. The marketing concentrated on new software architecture—a small central software kernel (about 2Mb) to which add-ons would be bolted as the program's functionality expanded in later versions. However, the Postscript printer driver for InDesign 1.0 was an external app that tended to acquire frequent corruption problems, requiring periodic reinstallation. Copies of InDesign 1.5 were usually given away when it was found that a host of bugs had to be corrected. By InDesign 2.0, the temperamental printer driver was embedded in the main software. The 'kernel' architecture was never mentioned again.

InDesign was the first native Mac OS X windows (available on almost all devices) publishing (DTP) software. With the third major version, InDesign CS, Adobe increased InDesign's distribution by bundling it with Adobe Photoshop, Adobe Illustrator, and Adobe Acrobat in Adobe Creative Suite.

InDesign exports documents in Adobe's Portable Document Format (PDF) and supports multiple languages. It was the first DTP application to support Unicode character sets, advanced typography with OpenType fonts, advanced transparency

features, layout styles, optical margin alignment, and cross-platform scripting with JavaScript.

Later versions of the software introduced new file formats. To support the new features, especially typographic, introduced with InDesign CS, both the program and its document format are not backward-compatible. Instead, InDesign CS2 introduced the INX (.inx) format, an XML-based document representation, to allow backwards compatibility with future versions. InDesign CS versions updated with the 3.1 April 2005 update can read InDesign CS2-saved files exported to the .inx format. The InDesign Interchange format does not support versions earlier than InDesign CS. With InDesign CS4, Adobe replaced INX with InDesign Markup Language (IDML), another XML-based document representation.[4]

Adobe worked on the provision of a 'Drag and Drop' feature and this became available after 2004 but was restricted to dropping graphics and images, not text. Adobe developed InDesign CS3 (and Creative Suite 3) as universal binary software compatible with native Intel and PowerPC Macs in 2007, two years after the announced 2005 schedule, inconveniencing early adopters of Intel-based Macs. Adobe CEO Bruce Chizen had announced that "Adobe will be first with a complete line of universal applications".[5] The CS2 Mac version had code tightly integrated to the PPC architecture, and not natively compatible with the Intel processors in Apple's new machines, so porting the products to another platform was more difficult than had been anticipated. Adobe developed the CS3 application integrating Macromedia products (2005), rather than recompiling CS2 and simultaneously developing CS3. By this time 'Drag and Drop' of type was made available.

InDesign 2020 (15.1)

- It was released on June 2020 with lots of minor and major updates for having best result in its performance. Share for Review was its very powerful feature and you can find this option in the menu bar of InDesign user interface. The advantage of this feature is that it sends a document itself to web the author for multiple reviews by reviewers directly from InDesign and you need not to use export and import steps of traditional PDF review workflow. Reviewers of the content can give their feedback on the content although it is on productions stages and can get updated versions without going through any new link. Not only had this feature when you go and try it you will also see lots of improvement in previously used tools and their features.
- These were some series of latest versions of InDesign software and i explained all important facts and features of these versions so that you can have idea about them.

InDesign 2020 (15.1.1)

- In this version the issue of crashing of InDesign application while placing of PNG file in the document through PDF export has been resolved. Error

showing after using of 'Share for Review' option during PDF export was also problem with previous one but this version also got rid of it. Text variable, footnote/endnote markers, page numbers replaced with 'ss with World Ready Composers' features which enhanced its working ability.

InDesign 2020 (15.1.2)

- It has improved performance during working with two INDD documents which have same fonts in their document font folder respectively. There is no such issue that hangs InDesign during recover of damaged document and after that user can work with different project without facing stress in their work and enjoy their working. It got rid from crashing itself when we try to quit it after auto-activation of Font not only this but also during rendering, during launching of proxy environment, while working with EPS file, while PDF exporting it prevent itself from crashing. Launching problem of Script Editor when editing script for Apple script was one of the major issues of previous version but it becomes easy in this version.

InDesign 2020 (15.1.3)

- Many issue of previous version of 2020 InDesign are fixed in this version and the issue was 15.1.2 version of InDesign 2020 crashes during opening of some type of scenarios and file, it quits automatically during launching of proxy environment, it also crashes during renaming of any folder when we work with User Library Fonts folder and some other important issue are fixed. It has improved visibility of cursor during working with Light and Medium light interface which was big problem for its user in previous version. It also has solution for the problem of showing error after Inserting HTML code on object and previewing of it and after fixing this issue it adds plus point in its scripting techniques.

InDesign 2021 (16.0.1)

- Various improvement are done in this version for fixing issue of previous version in different part of InDesign such as Slider on media panel is now enable for making your work easy with this panel and you can drag it even through there is no media file available, same as 'Place a Video or Audio button' of same panel is also enabled for working with video or audio when you launched InDesign even no document is open and Total time duration option of media file appears is made disable in Media panel. You will also find that there is original file folder for old converted and OpenASCopy documents which protect your file for being damage.

InDesign 2021 (16.0.2)

- It was launched with improved User experience features for Mac OS and in this improvement it offers bigger size of icon for Mac OS BigSur.

InDesign 2021 (16.1)

- This is the latest version of InDesign and launched by Adobe systems in January 2021 which named as InDesign 16.1. You will have number of new features and solution for many issues in this version. It has many new features such as Content reviewing with text annotations that means it has review tools which can highlight text, insert text and strike through any text during working on any project, Locating colors in your document another new feature and with this feature you can locate any unused color from your document and replace it with other in very smooth manner, subject detection and text warping can do in more specific way by using feature that offers by Adobe Sensei without using Photoshop paths or Alpha channel, It use HSB value for setting color value in it without using RGB translation and many other new features you will find in it when you go with it.

Adobe Illustrator install and working formatting

Objectives: At the end of this lesson you shall be able to

- **introduction to Adobe Illustrator**
- **how to Install Adobe Illustrator**
- **working with formatting**

Introduction to Adobe Illustrator

One of the most famous and popular vector graphics programs marketed and developed by Adobe Corporation is Adobe Illustrator. The program comes with a creative cloud and also can be downloaded as a single program from the Adobe website. The program is compatible with Windows and Mac Operating Systems.

The following are the minimum system requirements to install Adobe Illustrator on the Windows Operating system.

- RAM of the System needs to be a minimum of 2GB for 32 Bits and 4GB for 64 bits
- The processor recommended is Multicore Intel Processor with 32bit or 64-bit support. An AMD Athlon 64 processor will also work for installing Adobe Illustrator.
- An Operating System with Windows 7 with Service pack 1 installed.
- The resolution of the monitor must be 1024 X 768 minimum.
- Minimum 2GB of Hard disk is required for the program installation. A Graphics Card is also recommended before installation
- An OpenGL 4.x is also recommended for the smooth working of the program.

Install Adobe Illustrator

Below are the steps to install Adobe Illustrator in your system. Please check the minimum requirement before downloading the software, as if the system does not comply with the minimum requirements, the product will not be downloaded.

- To download and install Adobe Illustrator visit the official website of adobe, i.e. <https://www.adobe.com/in/>; we need to go to the Creativity & Design Section and click on "VIEW ALL PLANS AND PRICING" (Fig 1) (Fig 2)
- A page will open, which will display the various categories available for Individuals, Business, Students and Teachers and Students and Universities. The page has different subscription plans for every category. For Individuals, the company offers a Photography Plan, A single App Plan, and an All Apps Plan with different pricing. Similarly, for Business purposes, it gives All Apps

Plan and Single App Plan. For students and teachers, they offer a Photography Plan and an All Apps Plan. For Universities, Adobe offers an All Apps Plan and a Single App Plan.(Fig 3) The user can choose any program through any medium and purchase the License for the same.

Fig 1



Fig 2



Fig 3



- To download Adobe Illustrator, click on Single App and then use the Illustrator Option for a monthly plan and click on Buy Now.(Fig 4)

Fig 4



- As soon as the user clicks on the BUY Now Option, you will be asked the Email Id, and you have to "Continue with the Payment."(Fig 5)
- When the Payment is successful, the browser will download a Setup (Fig 6)

Fig 5

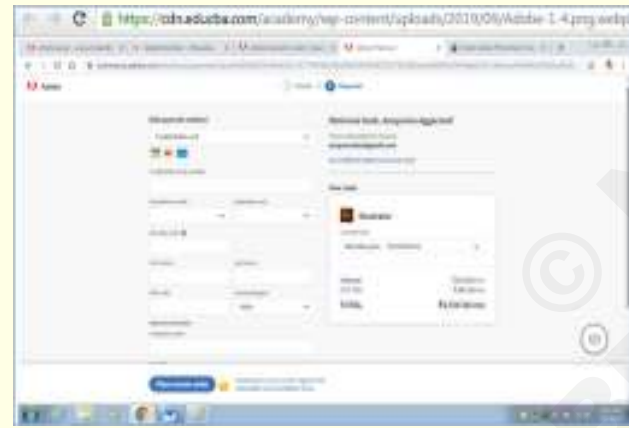
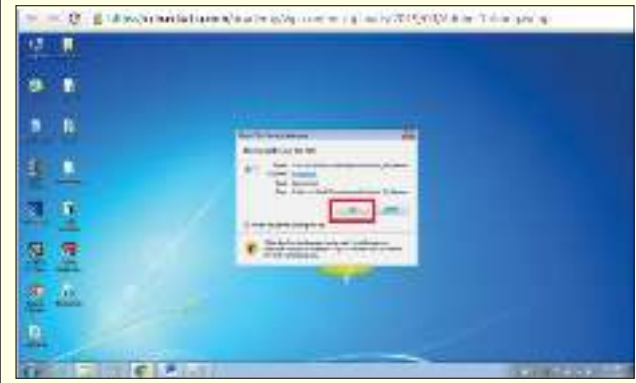


Fig 6



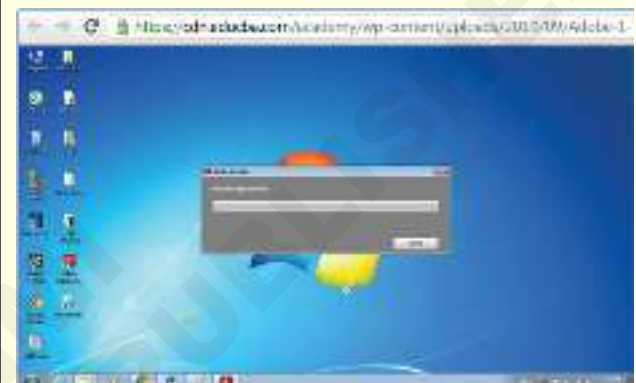
- When the Setup has been downloaded, double click on the setup and a dialog box will appear. Click on the Run Command from the Dialog box. (Fig 7)

Fig 7



- This will start the installation process for installing Adobe Illustrator (Fig 8)

Fig 8



- After the Setup is completed, a dialog box will appear. This dialog box shows two commands Install and Try. If the user has already purchased the program, he needs to click on the Install Option, while if the user has not yet purchased the program, click on the Try Option. (Fig 9)

Fig 9



- When you click on the INSTALL option, a dialog box will appear that will ask the user to enter the required Email Id.(Fig 10) Click on Sign In for the Installation
- Now, Click on ACCEPT Option for the procedure to process.(Fig 11)

Fig 10



Fig 11



- After this, a dialog box will appear that will ask you the required storage location and a language before Installation. Adobe Illustrator is available in Deutsch, Italiano, Polish, Nederlands, English, and many other languages to modify from. To modify the Default Location, you can click on the same and change it. (Fig 12) After this, click on Install, and the Installation will Begin.

Fig 12

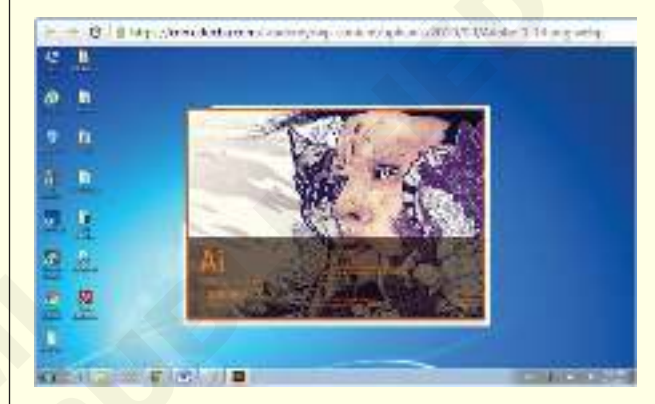


- The system will check the minimum requirements and will process the installation.(Fig 13)
- After the installation is complete, the program will start to run (Fig 14)

Fig 13



Fig 14



- Finally, Adobe Illustrator will be installed in your system, Use the program to draw and create vector graphics and artworks.

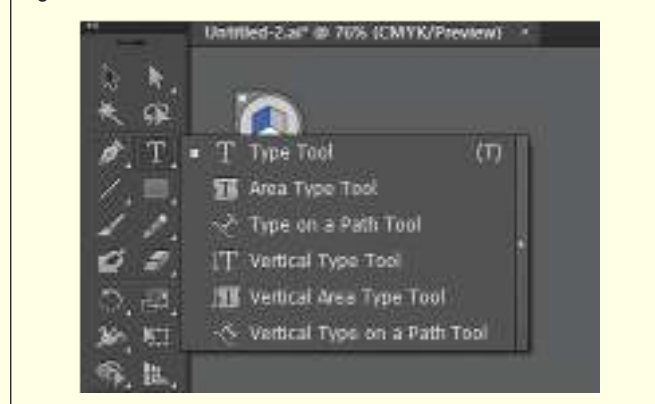
Working with formatting

- The point type is a vertical or horizontal line of text that begins where we click and expands as we enter characters. Space will shrink or grow according to our edits.

Step 1:

Go to the Tools palette and select the Type tool or the Vertical Type tool.(Fig 15)

Fig 15



Step 2:

Now, you have to set the text-formatting option in the control panel, which is optional.(Fig 16)

Fig 16



Step 3:

Go to your artwork and click from where you want to begin your line.

Step 4:

Enter the text in the textbox and press enter to begin a new line within the same type object.

Step 5:

After you finished entering the text, click on the Selection tool in the Tools panel to select the type object.

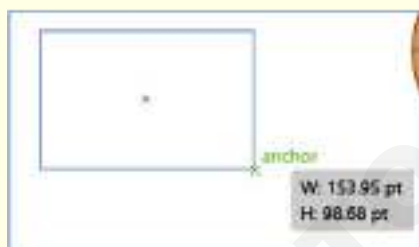
Entering text in an Area type

- The area type uses the boundaries of an object to control the flow of character, either horizontally or vertically. When the entered text reaches a limit, it automatically wraps to fit inside the defined area.

Step 1:

First, you have to define the bounding area. Go to the Tools panel and select and drag the Type tool or the Vertical Type tool diagonally.(Fig 17)

Fig 17



Step 2:

After that, draw an object that you want to use the bounding area.

Step 3:

You can now set the formatting of the text, which is optional.

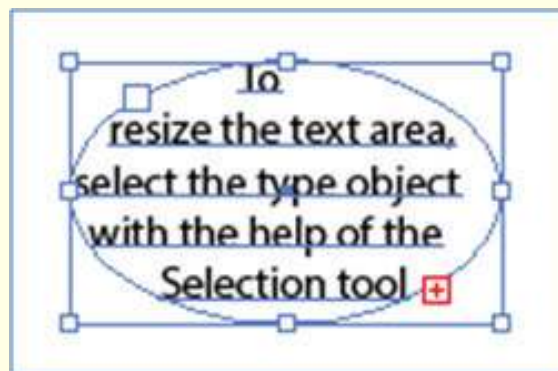
Step 4:

Now, enter the text and press Enter.

Step 5:

To select the type object, click on the Selection tool after entering the text. (Fig 18)

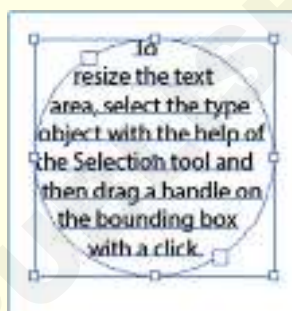
Fig 18



Resize a text area

- To resize the text area, select the type object with the help of the Selection tool and then drag a handle on the bounding box with a click.(Fig 19)

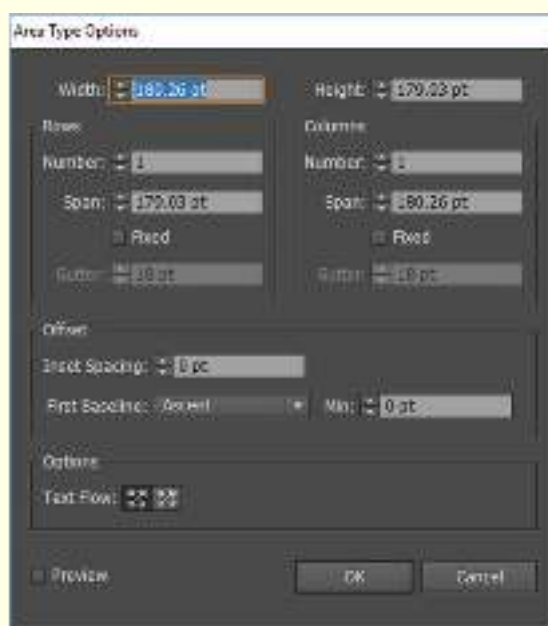
Fig 19



Change the margin around a text area

- To change the margin of the text area, Select the area type object and choose the Type in the Area type option.(Fig 20) Click OK after specifying the value for Inset Spacing.

Fig 20



Create rows and Columns of text

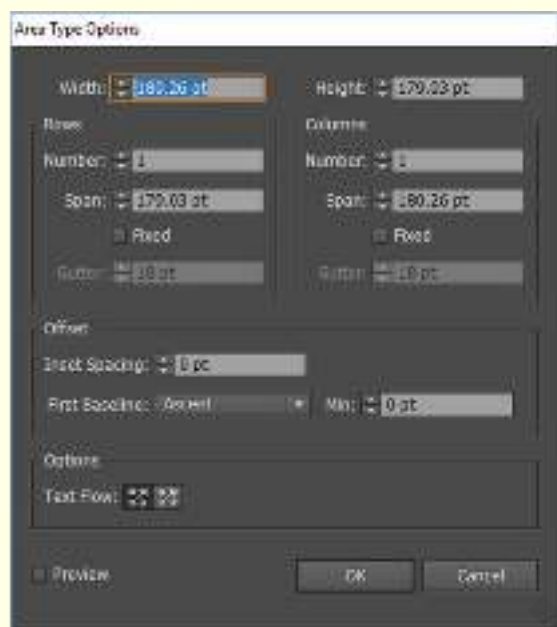
Step 1:

Go to the artboard and select the area type object on the artboard.

Step 2:

Choose the Type and then select the Area Type Option.(Fig 21)

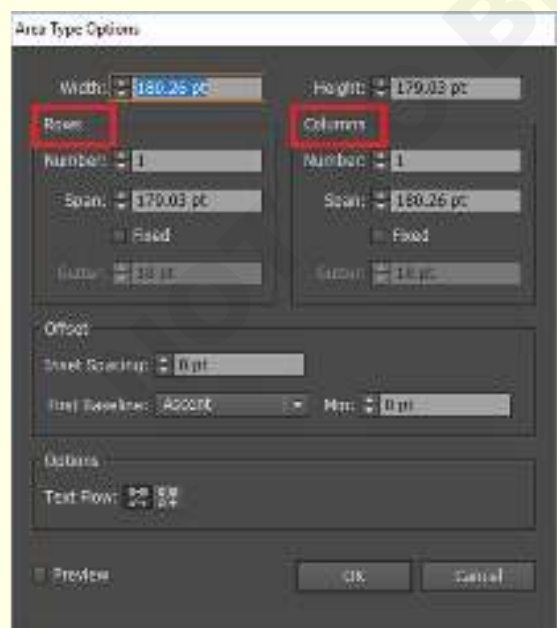
Fig 21



Step 3:

Set the following option in the rows and column section of the dialogue box.(Fig 22)

Fig 22



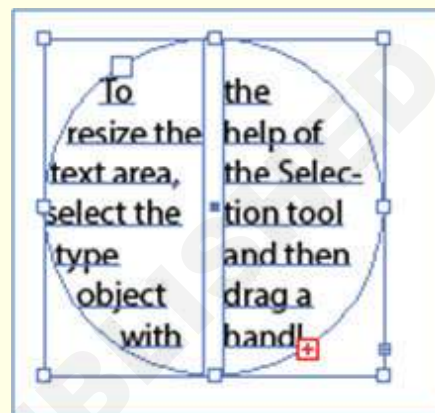
- **Number:** This option can be used to specify the number of rows and columns we want inside the object.

- **Span:** The span is used to specify the height of individual rows and the width of different columns.
- **Fixed:** It can be used to fix the size of the rows and columns.
- **Gutter:** it can be set to specify the distance between rows and columns.

Step 4:

A new option dialogue box will appear, select the Text Flow option to determine the way text flows between rows and columns.(Fig 23)

Fig 23



Step 5:

Finally, hit the OK button.

How to thread text between objects in Illustrator

- Linked type object can be used to thread text from one object to the other. All the area type object contains the in port and an out port that allows us to link to other objects and create a linked copy of the type object. You can see an arrow in the image below that indicates that the object is linked to another object. The out port can be indicated by a red plus sign.

Step 1:

Go to the Tools panel and select the selection tool to choose an area type object.

Step 2:

After that, click on the in-port or out-port of the selected type object. When you click on it, the pointer will change to the loaded text icon.(Fig 24)

Step 3:

Now, position your pointer to the type object on the artboard.

Step 4: Finally, click on the path to link the objects.(Fig 25)

Fig 24

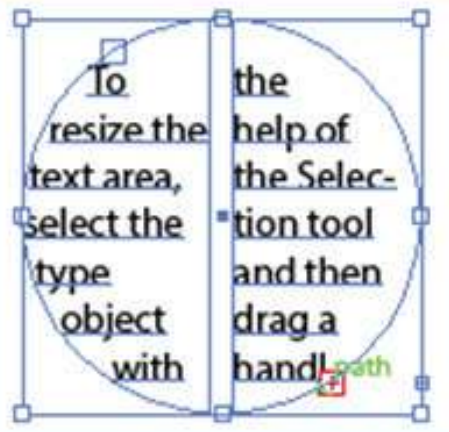
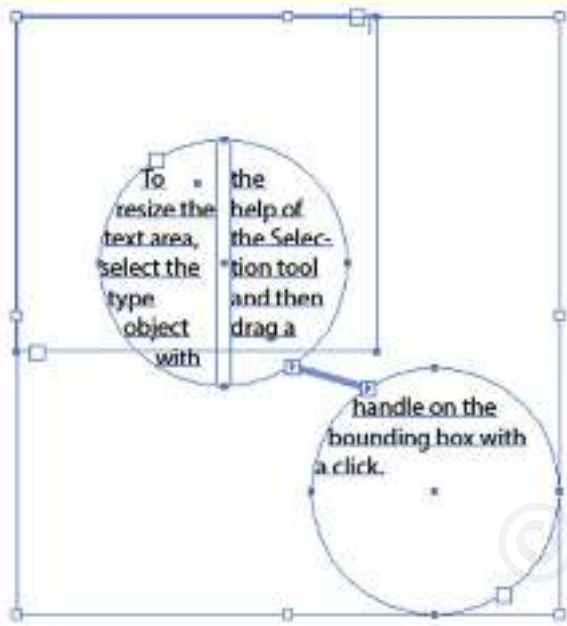


Fig 25



Removing thread

Step 1:

Open the artboard on which you want to remove the threads.

Step 2:

Select the linked type object on the artboard.

Step 3:

Double-click on the port of either end of the thread to break the thread between two objects.

Step 4:

If you want to remove all the threads, then choose the type object and click on the thread text. After that, click on Remove Threading.

Step 5:

The thread will be removed and the text stays in place.

Wrap text in Illustrator

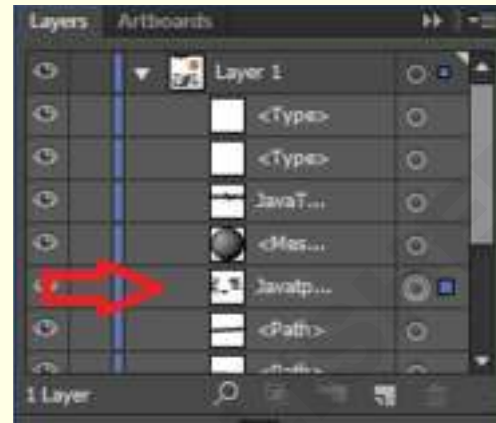
- We can wrap the texts around any objects, imported image, or the objects we draw in Adobe Illustrator.

Step 1:

You need to make sure that these conditions are true for the object type you want to wrap:

- It should be the area type.
- It should be in the same layer as the wrapped object.
- It should be located directly under the wrapped object in the layer's hierarchy.(Fig 26)

Fig 26



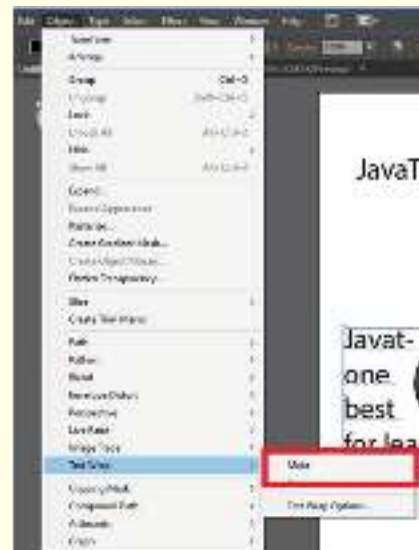
Step 2:

Select the object around which you want the text to be wrapped.

Step 3:

After selecting the object, click on the Text Wrap.(Fig 27)

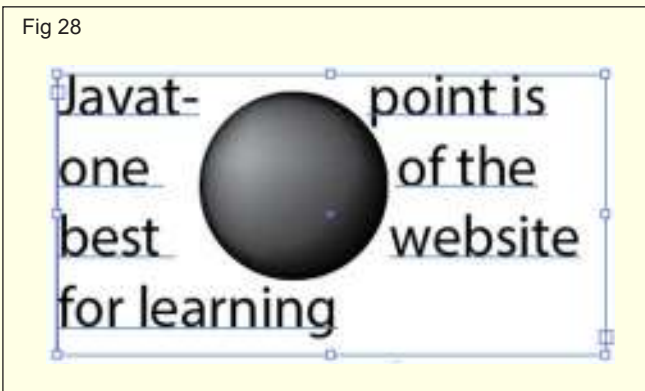
Fig 27



Step 4:

Finally, click on Make. (Fig 28)

Fig 28



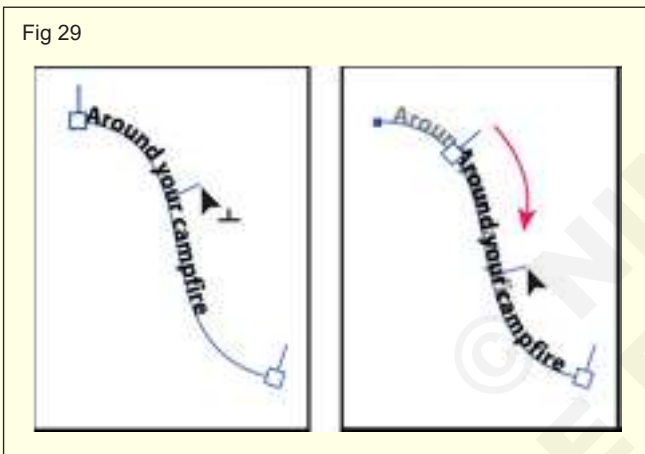
Type on a Path in Illustrator

Move or flip text along a path

Step 1:

Open the artboard and select the type object. When you choose the object type, a bracket will appear at the beginning of the Type, at the end of the path, or the midpoint between the start and end brackets. (Fig 29)

Fig 29



Step 2:

Now, move your pointer over the Type's center bracket until a small icon appear next to the pointer.

Step 3:

Drag the center bracket along the path to move text. While doing this, hold the control button to prevent the Type from flipping to the other side of the path.

Apply path type effects in Illustrator

The path type effect allows us to distort the orientation of characters on a path.

Step 1:

Open the artboard and create a type object and select it.(Fig 30)

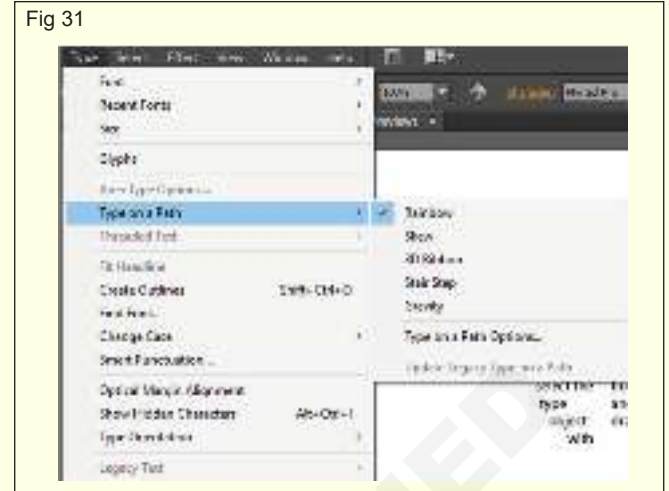
Fig 30



Step 2:

Choose the Type, a dropdown menu will appear.(Fig 31)

Fig 31



Step 3:

Select Type On A Path, a sub-menu will appear.

Step 4:

Select an effect from the effects available in the sub-menu. (Fig 32)

Fig 32



Adjusting the vertical alignment

Step 1:

Open the artboard and select the type object.

Step 2:

Choose the Type, a menu will appear.

Step 3:

Choose the "Type On A Path" option from the menu.

Step 4:

Now, select Type On A Path Option from the sub-menu.(Fig 33)

Step 5:

From the options, choose one from the Align To Path menu to specify the way of aligning all the characters to the path. Following are the choices you can see:

- Ascender: It can be used to align the texts along the font's top edge.
- Descender: It can be used to align the texts along

the font's bottom edge.

- Center: It can be used to align the texts at the point halfway between the font's ascender and descender.
- Baseline: It can be used to align the texts along the baseline.

Fig 33



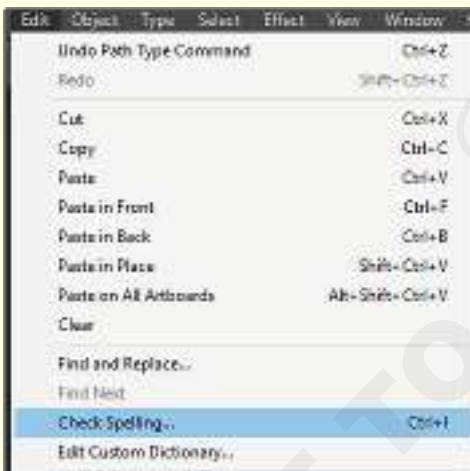
Spelling and Language dictionaries

Steps to check spelling

Step 1:

Go to the edit menu and click on Check Spelling. (Fig 34)

Fig 34



Step 2:

Click the arrow icon at the bottom of the appeared dialogue box to set the option for finding and ignoring words. (Fig 35)

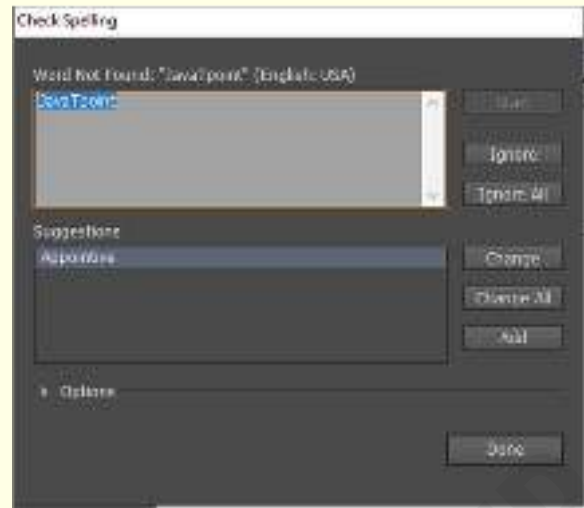
Step 3:

Click on the start button to begin checking the spelling.

Step 4:

Click on Ignore or Ignore All to continue to spell-checking without changing any word, or you can select a word from the suggestions list.

Fig 35



Step 5:

When the Illustrator has finished the spell check, click on the Done button on the bottom of the dialogue box.

Fonts

- The complete set of characters is known as fonts- it consists of letters, numbers, and symbols.(Fig 36) All the characters share the common weight, width, and style, such as 13-pt Times New Roman Bold

Fig 36



Typeface:

It is the collection of fonts that are designed to use overall appearance together, such as Adobe Garamond.

Typestyle:

it is a variant version of an individual font in a font family, Such as a Roman or Plain member of a font family is the best font. It includes type styles such as regular, bold, semibold, italic, and bold italic.

Previewing Fonts

- We can see the sample of the font style in the Font menu in the Character Panel. Following are the icons that are used to indicate different kinds of fonts:

- OpenType
- Type 1
- TrueType
- Multiple Master
- Composite

Find and replace fonts

Step 1:

Go to the artboard and choose the Type and then click on Find Fonts

Step 2:

After that, select the font that you want to find in the top section of the dialogue box.

Step 3:

On the appeared dialogue box, select a replacement font in the bottom section.

Step 4:

Click on the Change button to change only one occurrence of the selected font.

Step 5:

To find and replace a different font, repeat steps 2 through 4.

Step 6:

To close the dialogue box, click on the done button.

Change capitalization styles

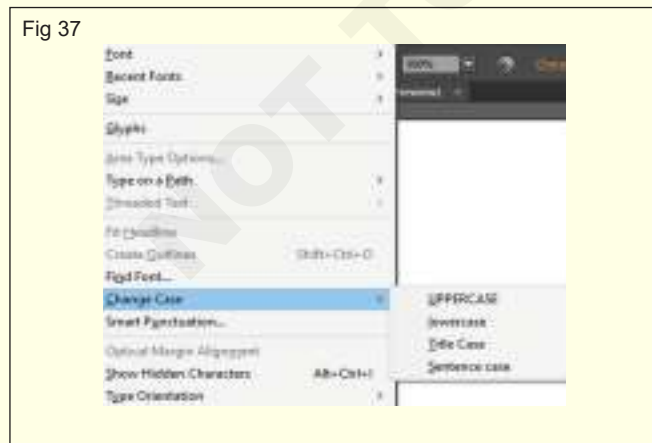
Step 1:

Select the character that you want to change the capitalization of.

Step 2:

After that, Go to the type menu then Change the Case submenu. (Fig 37)

Select any of the following from the appeared list.



- **UPPERCASE:** It will change all the characters to the uppercase.
- **Lowercase:** It will change all the characters to the lowercase.

- **Title Case:** It will capitalize the first letter of each word.
- **Sentence Case:** It can be used to capitalize the first letter of each sentence.

Creating superscript or subscripts in Illustrator

- It is the reduced-size text that is raised or lowered concerning a font's baseline. Adobe Illustrator applies a predefined baseline shift value and types of size when we create superscript or subscript.

Step 1:

To create superscript or subscripts in regular fonts, select the Type you want to change.

Step 2:

Choose the Superscript and subscript inside the Character panel menu.(Fig 38)



To create in OpenType fonts

Step 1:

Open the artboard and select the character you want to change to superscript/subscript.

Step 2:

After that, select the open type font from the font menu.

Step 3:

From the available option from the pop-up menu, choose one.

- **Default position:** It will use the default position for the current font.
- **Superscript/Superior:** It can be used for the raised character.
- **Subscript/Inferior:** It can be used for the lowered character.
- **Numerator:** It can be used to use the character as a fraction numerator.
- **Denominator:** It can be used to use the character as a fraction denominator.

Features of Illustrator

Objectives: At the end of this lesson you shall be able to

- **benefits of Adobe Illustrator**

Benefits of Adobe Illustrator

Adobe Illustrators is a vector-based creative program designed for those involved with graphic design. Instead of using bitmap images to store data, this program used algorithms to draw shapes. That is why the vector graphics created within Illustrator can be scaled to any size without losing their quality or overall resolution.

Because of this unique design, Adobe Illustrator is used to make everything from business logos to detailed illustrations to animated concepts. It can print layouts, create stunning website graphics, and give users complete control over their typography.

There are several additional features available to customize the graphics being created through the program as well.

First designed in 1986, here are some of the advantages and disadvantages to consider when using Adobe Illustrator.

Advantages of Adobe Illustrator

It provides a helpful user interface.

- With Adobe Illustrator, you have an extra level of flexibility when working to customize your overall workspace. Your interface allows for custom viewing. There is an option to enable space saving as well. These processes allow you to work on your project in whatever way is most comfortable, while maintaining complete control over all the available options.

It allows for in-panel editing.

- You also save a bunch of time when working with Adobe Illustrator thanks to its option for in-panel editing. You also have the use of multiple artboards simultaneously. That allows you to work on multiple images in a similar fashion all at once, which makes you much more productive than the other programs which force you to work on one image at a time.

It is completely scalable.

- You have zero resolution issues when working with Adobe Illustrator. Because the graphics are based on mathematics equations instead of stored pixels, you're always given sharp, crisp lines that are print-ready in any dimension. You never lose resolution when you're working with graphics through this program, which means you have much more versatility when designing multimedia for various purposes.

It creates files in manageable sizes.

- You're not stuck with enormous files that are difficult to transfer when creating something with Adobe Illustrator. Compared to similar platforms, Illustrator creates files that are relatively small. You can share them quite easily, mail them as an attachment, or use them without absorbing a majority of your computing resources. You don't waste a bunch of time syncing your massive files to the cloud either to share them through a service like Dropbox either.

It works on almost any computer system.

- Although Adobe Illustrator doesn't work well on mobile devices, it does an exceptional job on almost any computer system. You can use it on Windows PCs or on Apple products. It will even work adequately on older computers, even from the early 2000s, if you are using an older top-of-the-line option. That means most people are going to be able to access the benefits of this platform if they have their system's operating system up-to-date.

It creates print graphics and web graphics.

- You can create print-ready graphics with ease thanks to Adobe Illustrator. You are also able to create web graphics with this platform. It works in any screen resolution, offering a tool set that is constantly updated, which allows you to create professional vector graphics with relative ease.

Disadvantages of Adobe Illustrator

It offers a steep learning curve.

- For those familiar with vector-based graphics, Adobe Illustrator will feel like an intuitive program that is ready to meet your needs. For everyone else, there must be a time window granted to train on the various features the platform offers. There are several video tutorials available from Adobe that can help you begin the learning process. For beginners, however, it may take up to 6 months to begin being comfortable with this program.

It requires patience.

- If you're planning to create something that is fun, inventive, and does not require an aspect of realism, then Adobe Illustrator can help you put something together in no time at all. If you want to create something that feels realistic to others, then you'll need to give yourself plenty of time to work on the project. To create a drawing that feels realistic, you must have a keen eye for detail and be able to

recognize elements of the image that Illustrator will not recognize as being out of place.

It has pricing limitations on the Teams edition.

- If you just want to use Illustrator at home, then you can access this platform for just \$19.99 per month, plus tax in some locations. If you're using the Creative Cloud from a business perspective, then the minimum cost for Illustrator is \$69.99 per month, plus tax in some locations. The individual subscriptions can be separated to allow for an a la carte experience for users who only need to use one program. That is not possible from a Teams perspective. You're going to pay 3 times more for the service.

It offers limited support for raster graphics.

- Adobe Illustrator is an exception product for those who are working with vector graphics. If you're using bitmap images with the dot-matrix data structures of pixels, then you'll find that this platform offers very little in the way of support. You are able to vectorize your raster images to make use of the toolbox offered by Illustrator, though that loses some of the information of the graphics and may create undesired results.

It requires a lot of space.

- If you're using a lower resolution display, then you'll find that the updated user interface for Adobe Illustrator will take up a lot of space. At the same time, the image tracing it uses is still heavily reliant on a confusing set of settings, which makes it difficult for some users to get up and running right away. The image tracing gives you better results once you learn how to maximize it, but not every user will figure out how to make it work.

It feels a lot like Photoshop.

- With the updated version of Illustrator, the interface feels very similar to Photoshop. Adobe has integrated the darker interface to accommodate 64-bit work, which is a definite advantage. The design, however, makes one feel like you're using other Adobe products and the workflows are completely different.
- These Adobe Illustrator pros and cons offer vector artists an excellent opportunity to create something wonderful for a price that is relatively fair. Although there are some business limitations to the pricing structure, and beginners may find Illustrator to be too expensive for their taste, the results produced by

Adobe Illustrator features and versions

Objectives: At the end of this lesson you shall be able to

- compare the features of different Adobe Indesign Versions.

What is Adobe Illustrator

- Illustrator is a vector graphic software developed by Adobe Inc. Its development began in 1985 with the initial plan to release for Apple Macintosh. The latest version of the software is Illustrator CC 2019, which is part of Adobe's Creative Cloud and offered to users on monthly/annual subscription packages over the internet.
- Now coming to the interface, on launching Illustrator, you are welcomed with numerous artboard sizes to choose from for print, web, film & video art & illustration based on your needs. You also have the option to create a custom-sized artboard. Once you choose an artboard of your preference, you will be moved to the drawing board, where all the action comes live.
- Here you can make use of various tools and panels for modifying the designs of your drawings. The sharing and exporting settings in Illustrator are also effortless. In addition to the usual options to export, Illustrator lets you upload your creations to the creative cloud folder. This is in addition to email sharing and publishing on the Behance website.
- Later if you feel like refining your artwork using other Adobe software like InDesign or Photoshop, you can easily do that too. Anything created using Illustrator can be resized without losing its clarity or causing

pixelation. It can be used to create small logowork to large billboards. This quality of retaining the quality of the artwork makes Illustrator the preferred software to create logos.

- Popular Course in this category

What is Adobe InDesign

- InDesign is an application used in the desktop publishing industry, which Adobe launched in 1999. It replaced the PageMaker, which was acquired by. InDesign CC 2019 is the current version, which is a part of Adobe CC. InDesign is the preferred software for designing newspapers, magazines, books, posters and digital publications like e-books.
- It is great in dealing with designs that contain a huge quantity of texts. Another important feature of InDesign is that it allows the users to set master page templates for a seamless design layout across the pages. The numbering system is also automated with the options to modify, copy, and swap into multiple pages.

Below are the top 6 comparisons between Illustrator vs InDesign:

- Illustrator has an advantage over InDesign when it comes to working on single-page projects. Even though InDesign too is good for single-page designs, what

Fig 1

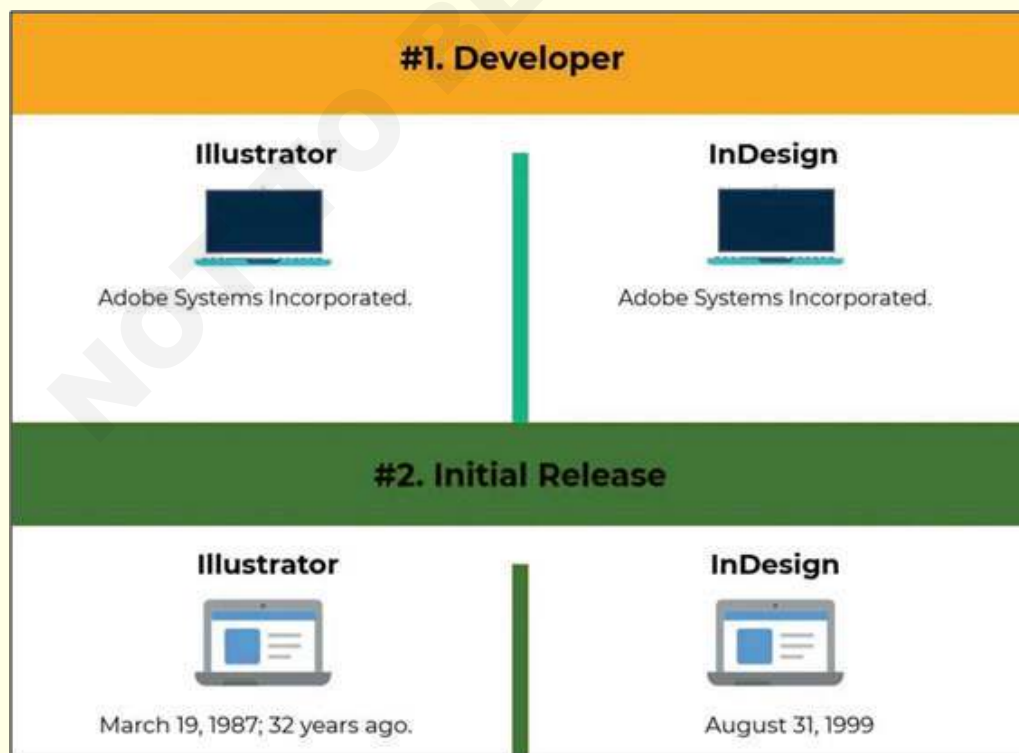


Fig 2

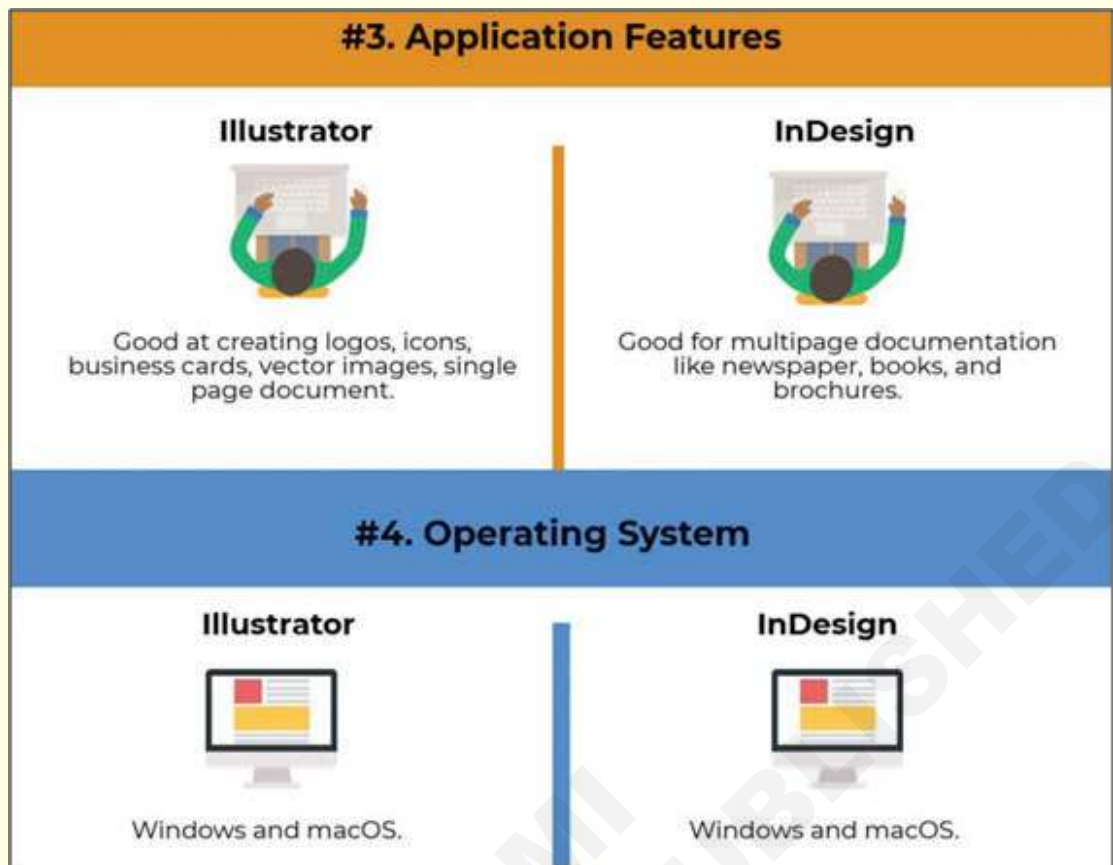
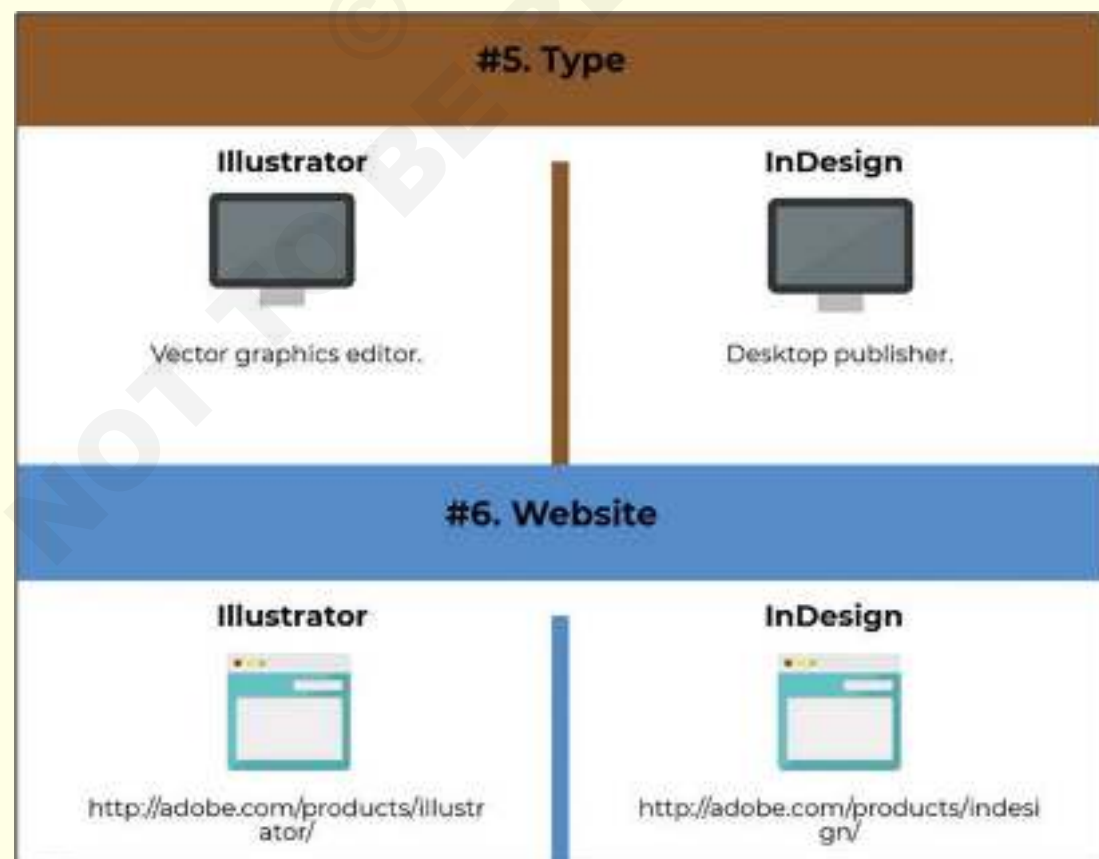


Fig 3



sets Illustrator apart is that it offers better control over modifying images and fonts. As a result, you can use Illustrator to design logos, visiting cards, posters, vector images, icons, flyers, cover images, infographics, etc.

- While speaking of multi-page projects, however, InDesign takes the cake. Working is easier in InDesign with many useful features such as the Master Page option. Using this feature, you can edit multiple pages rather than each individual page to make a change. Another interesting function is the auto-numbering of pages which makes work even more organized. However, you can add multiple artboards in Illustrator for making multi-page designs easier to work on.

Ease of Designing

- Illustrator is more advanced and offers superior features for creating design elements. In addition, the artboard in Illustrator is optimized well for the users with

plenty of workplace in offer. The drawback of Illustrator is in its inability to edit images as per your requirement.

- In InDesign to you will find some basic drawing tools like pencil, shape, and lines. In addition, if you want to enhance a page created in InDesign, you can easily import artworks from Illustrator. This is very helpful for working on multi-page projects.

Creating Logos and Design Manipulation

- Illustrator is the most popular software for creating logos as it allows resizing an artwork any number of times without losing its original quality. Therefore logos created in illustrator can be adjusted to different placements and dimensions. Also, by utilizing the typesetting feature, you can alter text according to your liking. However, using InDesign, you can create amazing typographic logos by manipulating the fonts. It also lets you make vector designs with the help of tools.

Illustrator vs InDesign Comparison Table

Basis of Comparison	Illustrator	InDesign
Developer	Adobe Systems Incorporated	Adobe Systems Incorporated
Initial Release	March 19, 1987; 32 years ago	August 31, 1999
Application Features	Good at creating logos, icons, business cards, vector images, single-page document	Good for multipage documentation like newspapers, books, and brochures
Operating System	Windows and macOS	Windows and macOS
Type	Vector graphics editor	Desktop publisher
Website	http://adobe.com/products/illustrator/	http://adobe.com/products/indesign/

Adobe Illustrator various design format

Objectives: At the end of this lesson you shall be able to

- what is logo design in Illustrator
- graphic design
- vector graphics
- character design

• What is Logo Design in Illustrator

Logo design is a very important part of a company's identity. It should be used to distinguish the company from its competitors and to convey the message that the company is different and better than other companies in the market.

• some of the advantages of designing a logo

We will start off with the basics of designing a logo in Illustrator. There are many ways to design logos in Illustrator, however, we will focus on using the text tools and layer to create our designs. Some basic styles for creating logos and how you can use them for different purposes.

• Adobe Illustrator be used for logo design

With Adobe Illustrator, you can create a logo that stands out. Illustrator gives you the freedom to follow your imagination by providing you with all of the tools you'll need to handle any logo design you can think of.

• Different types of logos

A logo is a symbol that represents the product or services of an organization. It is used to identify the product, service or company. A logo can be in different forms and formats.

• Logos designed in Illustrator

Due to a vector's mathematical makeup, each path, line or curve looks precise at any size. These complex shapes and lines can be produced exclusively in vector-based programs, such as Adobe Illustrator or Sketch.

• Industries do illustrated logos particularly suit?

Illustrated logos are a strong statement, and they are definitely more common in particular industries. Generally speaking they suit companies who have a more informal identity, or a slightly quirky personality – but if one of your USPs is how different you are from the competition then an illustrative logo design will really help you to say that.

There are also many different styles of illustration – some are very cartoony and informal, others are more sophisticated. There will be a style that suits your company perfectly too.

Sectors that are well suited to illustrative logo design:

- Children's industries – from nurseries to toy factories, illustration can convey the friendly and personal feel that are so necessary for connecting with the target market.
- Cars
- Fashion – generally the more sophisticated end of the illustration spectrum, using artwork to create brand identity and style
- Entertainment
- Food
- Pet care
- fitness

Examples of illustrations we've done for logo designs: (Fig 1)

Fig 1



Need to know if you want an illustrated logo design

While illustrated logos certainly have their benefits they can be restricting too. If you wish to have your logo printed into equipment an illustration might make that difficult as the complexity of the drawing might not transfer onto another medium. However, you can get around this by finalising two different versions of your logo.

- **Graphic Design :**

The elements and principles of graphic design include line, color, shape, space, texture, typography, scale, dominance and emphasis, and balance. Together, they work to create visually appealing work that conveys a message.

- **Line**

Lines are present in nearly every design, whether they are straight, curved, thin, thick, dashed, long, or short. Lines connect any two points. They are useful for dividing space as well as directing the viewer's attention in a specific direction.

- **Color**

Color is perhaps the most important and obvious element of a design. It can create impact right away, and it is noticed by everyone, even those without a design background. Colors can be used in backgrounds or within other elements like lines, shapes, or typography. Colors create emotions and moods. For example, red can represent passion and green can represent nature.

- **Shape**

Shape, also known as form, is the combination of lines. Shapes can be circles, squares, rectangles, triangles, or other abstract forms. Most designs include at least one shape. Similar to color, shapes have different associations. A circle may be used to represent unity, whereas a square could represent structure. The color, style, background, and texture of a shape can all influence the viewer's perception.

- **Space**

White or negative space is crucial in design because it enhances readability for the human eye. Good designs will utilize space to give other elements room to breathe.

- **Texture**

Textures are becoming more commonly used, replacing single-color backgrounds. Textures can include paper, stone, concrete, brick, and fabric. They may be subtle or obvious and be used sparingly or liberally. Textures can be helpful to create a three-dimensional appearance.

- **Typography**

When working with text, Graphic Designers need to consider the relationship between how text looks and what it says. Typography is the art of arranging

text in legible and engaging ways. Different moods or emotions can be expressed through different type choices. Good typography should create a strong visual hierarchy, provide balance and set the right tone.

- **Scale**

The scale and size of objects, shapes, and other elements can make certain parts of a design more dynamic. Scale can be used to create a visual hierarchy. Using scale, Graphic Designers can create focal points and highlight important areas.

- **Dominance and emphasis**

Dominance and emphasis create a focal point in a design. It helps with the design flow and can guide the viewer to other parts of the design.

- **Balance**

Graphic Designers need to consider how design elements are distributed. Balanced designs offer stability, while unbalanced designs can be dynamic. Balance is achieved through shapes, colors, textures, lines, and other elements.

- **Harmony**

Harmony is one of the main goals of graphic design. In a good design, every element needs to work together and complement each other. However, if everything is the same, a design can become monotonous. Designs need to strike a fine balance between harmony and contrast

Vector Graphics

Vector graphics are comprised of paths, which are defined by a start and end point, along with other points, curves, and angles along the way. A path can be a line, a square, a triangle, or a curvy shape. These paths can be used to create simple drawings or complex diagrams. Paths are even used to define the characters of specific typefaces.

Because vector-based images are not made up of a specific number of dots, they can be scaled to a larger size and not lose any image quality. If you blow up a raster graphic, it will look blocky, or "pixelated." When you blow up a vector graphic, the edges of each object within the graphic stay smooth and clean. This makes vector graphics ideal for logos, which can be small enough to appear on a business card, but can also be scaled to fill a billboard. Common types of vector graphics include Adobe Illustrator, Macromedia Freehand, and EPS files. Many Flash animations also use vector graphics, since they scale better and typically take up less space than bitmap images.

File extensions: .AI, .EPS, .SVG, .DRW

Usage of Vector files

- Graphic artists, illustrators and designers use vector graphics for a variety of reasons, including the

following:

- **Scalability.** Vector formats are good for projects that require scalable graphics, including scalable type and text. For example, company and brand logos are displayed at different sizes; they show up in the corner of a mobile application or on a roadside billboard. A logo created with vector graphics can be scaled up or down without loss of quality or creating a large file.

It was the scalability feature of vector graphics that resulted in its return, after falling out of favor to raster graphics in the 1980s. Vector graphics were originally used in computer displays in the 1960s and 1970s. World Wide Web Consortium worked on Vector Markup Language, which evolved into the Scalable Vector Graphics open source language that contains vector and raster elements.

- **App and web development.** Vector graphics are useful in application and web development because web apps and the graphics they contain must work with various screen sizes and device types. For instance, Amazon WorkLink is a mobile app that enables a fully interactive representation of corporate data on an employee's mobile device.
- **Animation.** Animated images are also usually created as vector files, which provide for cleaner and smoother images.
- **Computer-aided design (CAD).** CAD programs frequently use vector files for manufacturing, engineering and design because of their scalability and ease when it comes to editing the mathematical formulas.

Raster Graphics

Most images you see on your computer screen are raster graphics. Pictures found on the Web and photos you import from your digital camera are raster graphics. They are made up of grid of pixels, commonly referred to as a bitmap. The larger the image, the more disk space the image file will take up. For example, a 640 x 480 image requires information to be stored for 307,200 pixels, while a 3072 x 2048 image (from a 6.3 Megapixel digital camera) needs to store information for a whopping 6,291,456 pixels.

Since raster graphics need to store so much information, large bitmaps require large file sizes. Fortunately, there are several image compression algorithms that have been developed to help reduce these file sizes. JPEG and GIF are the most common compressed image formats on the Web, but several other types of image compression are available.

Raster graphics can typically be scaled down with no loss of quality, but enlarging a bitmap image causes it to look blocky and "pixelated." For this reason, vector graphics are often used for certain images, such as company logos, which need to be scaled to different sizes.

File extensions: .BMP, .TIF, .GIF, .JPG

Usage of Raster file

Also known as bitmap, raster files work best when you need to store and display high-quality photographs. Most photos come in the raster file format, whether they're print or digital.

With software like Adobe Photoshop, you can edit individual pixels within a raster file to change the appearance of a photograph. However, each raster image is limited to its individual dimensions and number of pixels, which affects its size and resolution. Increasing the size of an image with too few pixels can cause pixelation, which isn't usually desirable. That's why illustrations or logos that need to be used across a variety of sizes often come in vector form.

Vector vs Raster

- A raster graphics image maps bits directly to a display

Fig 2



space, also called a bitmap. Raster graphics are made up of a fixed number of pixels, which makes them less scalable than vector graphics. At a certain point, when the raster image is enlarged enough, the edges become ragged, and it appears pixelated -- i.e., when the pixels become visible. Raster graphics cannot be scaled up without sacrificing image quality.

- Vector and raster images can look different. This is because vector graphics must have a separate shape for each color shade, while raster images can have every pixel be a different color, showing subtle color gradations and depth more clearly. At larger sizes, the edges of raster images become ragged and the images pixelate. Vector images are more scalable.
- There is also a one-to-one relationship between each pixel and the memory raster graphics occupies on a computer. Computers must store information for every pixel of a raster image, whereas vector images only store the series of points that need to be connected by lines, curves, etc. Consequently, vector files are usually smaller than raster files. Vector image files are easier to modify than raster

image files for this reason.

- Vector and raster images can be converted into one another with the right software. Adobe Illustrator and Adobe Photoshop are examples of software that enable users to convert one image format to the other.

- Raster files are particularly good for portraying color depth, as each pixel can be a different color. And there are more pixels that can be unique colors than vectors that can be unique colors. This makes raster file formats good for editing digital photographs.
- Certain file types can include vector and raster elements -- PDF and SVG files are two examples.

Raster	Vector
Comprised of pixels, arranged to form an image	Comprised of paths, dictated by mathematical formulas
Constrained by resolution and dimensions	Infinitely scalable
Capable of rich, complex color blends	Difficult to blend colors without rasterizing
Large file sizes (but can be compressed)	Small file sizes
File types include .jpg, .gif, .png, .tif, .bmp, .psd; plus .eps and .pdf when created by raster programs	File types include .ai, .cdr, .svg; plus .eps and .pdf when created by vector programs
Raster software includes Photoshop and GIMP	Vector software includes Illustrator, CorelDraw, and Inkscape
Perfect for “painting”	Perfect for “drawing”
Capable of detailed editing	Less detailed, but offers precise paths

Character Design = Large

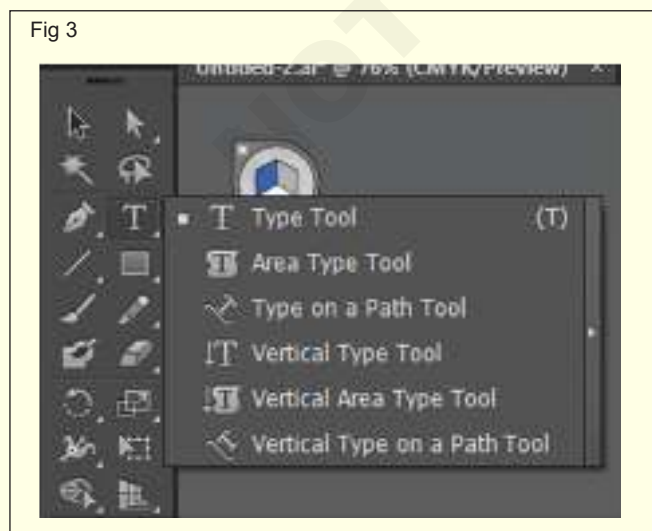
Adobe Illustrator has six different type tools: Type, Area Type, Type on a Path, Vertical type Vertical Area Type, and Vertical Type on a Path. There are three tools for horizontal type, which goes across the screen. Then, there are three tools for vertical type that goes top to bottom on the screen. This article will teach you how to work with type in Illustrator.

The Type Tools

The Type tools are located in the toolbox. You will find them here,



You can click and hold on the Type tool to see all the type tools grouped with it.(Fig 3)

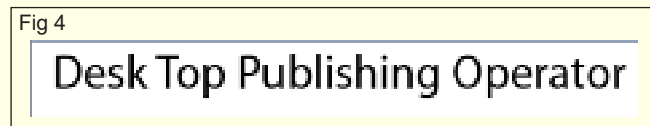


Type creates type that is not associated with a path. With it, you can type along the edge of an open path or inside a closed path.

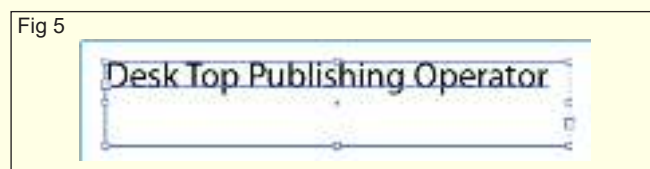
- **Area Type** creates type that is inside an open or closed path.
- **Type on a Path** will create type along the outer edge of an open or closed path.
- **Vertical Type** works like the Type tool except the type is vertical.
- **Vertical Type Area** works like the Area Type tool except that it is vertical.
- **Vertical Type on a Path** works like the Type on a Path tool except it is vertical.

Create Type with the Type Tool

Let us use the Type tool to start with. Click on a blank area on an artboard. You will see a flashing vertical line, just as you would in word processing programs. This means that you can start typing.(Fig 4)



Once you are finished typing, you can use the Selection tool to move the text to another location if you want. Simply click on the text. A bounding box will appear around it.(Fig 5)

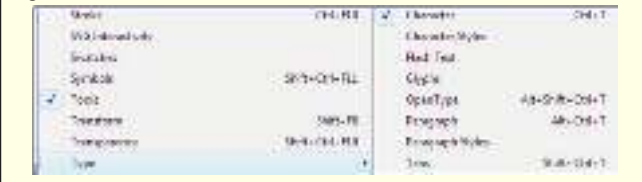


Now, the text above is small. Before we learn about the other type tools, let us learn how to format text in Illustrator.

Formatting Text

To format our text, we are going to use the Type panel. Go to Window>Type. You will then see these menu options.(Fig 6)

Fig 6



Let us go through these one by one to learn how to format our text. First, let us select Character.

Fonts and Font Sizes

Here is where we can change the type of font. Myriad Pro is the font type that we are using. However, we can change that to a different font. Perhaps Times New Roman.

Let us change the font in our type.

First, drag your mouse over the type to select it.(Fig 7)

Fig 7



You should still be using the Type tool for this

Now, go to the Character panel and select a new type of font.

We have selected Myriad Pro. (Fig 8)

Fig 8



We are also going to change the size to 31, which you will learn about momentarily. (Fig 9)

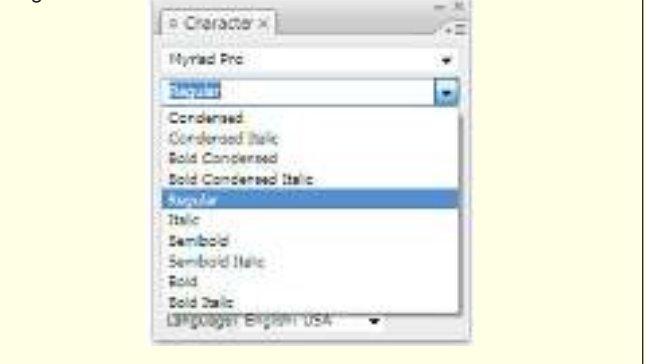
Fig 9



The font is now changed. Click in another area of the art board to deselect the text.

Next, we can change the font style, as shown below. We can change the type to bold, italics, or back to regular.(Fig 10)

Fig 10



In the bottom part of the Character panel, we can change the font size. It is currently 12 pt. We can also change the spacing between lines of type, or the leading. Right now, it is 14.4 pt.(Fig 11)

Fig 11



Then, we can change the kernel (bottom box on the left). The kernel is the space between characters. We can also change the tracking (bottom box on the right). The tracking is the adjustment of space for groups of characters or blocks of text.

Working with Glyphs

Glyphs are hieroglyphic characters or symbols, such as the @ sign. To work with glyphs in Illustrator, go to Window>Type>Glyphs.

Fig 12



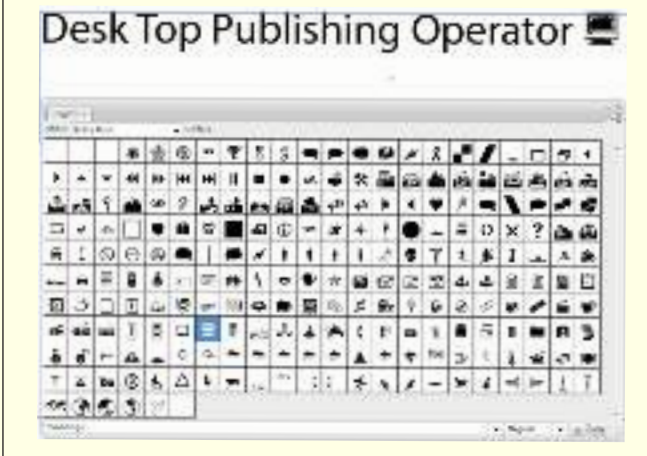
You can then see the Glyphs that you can use.(Fig 12) Scroll down within the panel to look at all of them. You can also set the font type and style for your glyphs or scroll in or out to get a closer look at the glyphs shown in the panel by using these buttons.

Click on the place in your document where you want to insert a glyph.

Double click on the glyph (in the panel) to insert it.(Fig 13)

We added an exclamation point from the Glyphs panel.

Fig 13



Type on a Path Tool

The Type on a Path tool allows you to type on a path. Select the Type on a Path tool, (Fig 14)

Fig 14



The Vertical Type on a Path tool (Fig 15)

Works the same way, except that the text is vertical.

Fig 15



Remember, to edit text, select it with the Selection tool.

Text Effects

• Extrude & Bevel

Step 1:

Select the Text Tool (type tool) from the left-hand side toolbar. (Fig 16)

Step 2:

Type the text that you want. Here we select Educba as our text. Select the font size to be 40pt and font type as "myriad pro." (Fig 17)

Step 3:

Select the text with the Selection tool and then select the effect from the menu bar at the top of the screen. (Fig 18)

Step 4:

Click on 3D and select Extrude & Bevel effect. (Fig 19)

Fig 16

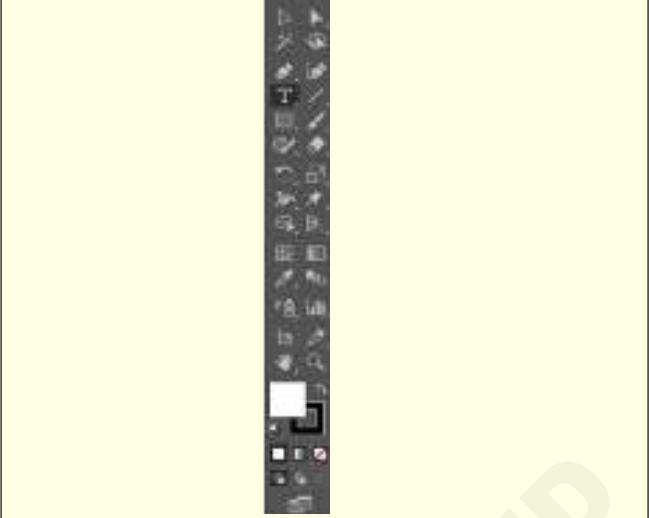


Fig 17



Fig 18



Fig 19



Step 5:

You will get a dialog box once you click on extrude & bevel. In the dialog box, choose the position as Off-Axis Front, Extrude Depth as 50 pt.(Fig 20)

Fig 20

**Step 6:**

You will see the Final text with the effect as follows.(Fig 21)

Fig 21



You can try other positions with a different axis, different depths, and angles.

- **Pucker & Bloat Effect**

Repeat steps 1 to 3 from the previous effect (3D).

Step 4:

Click on distort & transform and select pucker & bloat.(Fig 22)

Fig 22

**Step 5:**

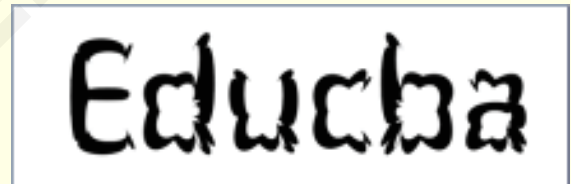
Upon clicking pucker & bloat, you will get a dialog box. Select the value as 15% and click on OK.(Fig 23)

Fig 23

**Step 6:**

The final text will look like this: (Fig 24)

Fig 24



Photoshop & coreldraw features & versions

Objectives: At the end of this lesson you shall be able to

- discuss the benefit of Photoshop and CorelDraw
- classify the features of Photoshop and CorelDraw
- photoshop vs Coreldraw Latest Version Features

Discuss the benefit of Photoshop and CorelDraw

Adobe Photoshop :

Photoshop is one of the most elegantly designed and feature-rich image-editing software program developed by Adobe Systems for Mac and Windows operating systems. It is an excellent application specially designed to take your image editing and motion graphics skills to a higher level. It is mostly used by graphics designers and professional photographers alike.

The software is based on raster graphics system meaning it is used to interpret data in pixels. Raster means pixel which is a dot matrix data structure which is basically a sequence of horizontal lines called pixels.

CorelDraw :

CorelDraw is a window based graphics design software program developed and marketed by Corel Corporation. It is basically a vector graphics editor which creates and edits digital images through a sequence of commands or mathematical equations.

It is mostly used to create vector-based images and illustrations and to design logos, business cards, pamphlets, barcodes, etc.

Use of CorelDraw and Photoshop

To successfully work with vector images without the use of pixels, you will need CorelDraw which specializes in vector art. It is mainly used by creative professional to create and edit vector-based illustrations and images such as designing logos, arranging print layouts, and retouch photographs. It is commonly used to create

logos, business cards, hoardings, banners, pamphlets, etc.

All the creative effects are done in Photoshop allowing you to work with images layer by layer for detailed effects and manipulation of images. It also allows users to crop, resize, and correct colors on digital photographs to the precise needs and requirements.

CorelDraw vs. Photoshop: Comparison Chart
image editing, such as creating high-quality graphics, infographics, touchups, presentations, or even creating banners. Photoshop is still one of the best software programs to edit images.

CorelDraw, on the contrary, is vector-based graphics software meaning it uses mathematical equations to create graphics and artwork. It doesn't understand the idea of pixels.

Use of CorelDraw and Photoshop

To successfully work with vector images without the use of pixels, you will need CorelDraw which specializes in vector art. It is mainly used by creative professional to create and edit vector-based illustrations and images such as designing logos, arranging print layouts, and retouch photographs. It is commonly used to create logos, business cards, hoardings, banners, pamphlets, etc.

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CorelDraw vs. Photoshop: Comparison Chart

Sr.no	Adobe Photoshop	Corel Draw
1	This software is pixel-based and creates raster images that are used by professionals.	This software is vector-based and creates images using a mathematical equation.
2	It is developed by Adobe, and it's the extended version of it.	It is developed by Corel Corporation, so it's Corel's graphics suite.
3	It reads a pixel from the image following layers which are used for detailed manipulation of images.	This software converts the images to vectored form as it doesn't understand the concept of pixels.
4	This software is mainly used for editing, cropping, resizing, manipulating, and giving special effects to the images.	It is used for illustration and for creating business cards, barcodes, pamphlets, banners, logos, etc.
5	This is expensive than Corel draw by some amount.	The price of this is a bit lower than Photoshop.

6	Adobe Photoshop is nearly the world's leading software for the design and development of images.	Its graphics suite 2017 is industry-acclaimed design software used for quantity-based work.
7	This is available in English, Dutch, Turkish and Swedish languages.	It is available in English, China, Germany, Spain, Japan, France, Italy, Dutch, Portugal, and polish languages.
8	In this, only one page can be formed, not like Corel Draw.	This software allows you to make multiple pages in a single file format.
9	In this, we can't put the barcode in between the image editing.	While editing the image, we can insert the barcode in between.
10	Most images for web presentation are used from this software.	Mostly the images for banner printing are used from this software because once the image has been converted to vector for it doesn't give a blurry look.

Classify the features of Photoshop and CorelDraw

Raster image :

- Raster images, also known as bitmaps, are comprised of individual **pixels of color**. Each color pixel contributes to the overall image.
- Raster images might be compared to pointillist paintings, which are composed with a series of individually-colored dots of paint.
- Raster images are capable of rendering complex, multi-colored visuals, including soft color gradients. Digital cameras create raster images, and all the photographs you see in print and online are raster images.
- There are different types of raster files: JPG, GIF, and PNG are examples.
- Raster images are ideal for photo editing and creating digital paintings in programs such as Photoshop and GIMP, and they can be compressed for storage and web optimized images.
- How you can use a given raster image depends on its size and quality. Quality is often dictated by how many pixels are contained in an inch, expressed

as pixels-per-inch or ppi; as well as the overall dimensions of the image,(Fig 1) also expressed as pixels.

Vector image :

- Raster graphics, which are comprised of **colored pixels** arranged to display an image, vector graphics are made up of paths, each with a mathematical formula (vector) that tells the path how it is shaped and what color it is bordered with or filled by.
- Since mathematical formulas dictate how the image is rendered, vector images retain their appearance regardless of size. They can be scaled infinitely. Vector images can be created and edited in programs such as Illustrator, CorelDraw, and InkScape.
- Though vectors can be used to imitate photographs, they're best-suited for designs that use simple, solid colors. Vector images are comprised of shapes, and each shape has its own color; thus, vectors cannot achieve the color gradients, shadows, and shading that raster images. Vector graphics are comprised of line art, sometimes called wireframes, that are filled with color.

Fig 1



Raster	Vector
Raster images are also known as Bitmap images and are made up of small dots known as pixels.	Vector images are made up of lines, fills, and curves.
In Raster, pixels of the same colour or different colour are placed close to each other so that the human eye perceives them as pictures but not as dots.	Vector images are collections of elements such as lines, rectangles, circles, and square. Each vector element has its own coordinates and can be resized.
Raster image knows the colour of each pixel.	The vector consists of instructions on where to place its components.
Raster has only two colours, black or white. With an increase in complexity, it can contain more colours.	Vectors use mathematical formulas in describing colours, shapes, and placement.
Graphic Raster formats include JPEG, GIF, PNG, XBM, TIFF, PCX, and bitmap fonts.	Vector formats include EPS, PICT, WMF, PostScript, TrueType. The last two are created by CAD and GIS applications.
Raster has simple output, as long as RIP or printer has required memory.	Vectors are small files that contain information on Bezier curves that form the drawing.
Raster images have a wide range of colour gradations and less scalable than Vector images.	Vector images are much more scalable than Raster images.
When the user paints a raster image, it looks similar to dipping brush in paint and painting images.	When the user paints a vector image, only the outline of the shape is painted. Similar to creating an image with different tiles of different shapes and sizes.
On enlarging a raster image without a change in pixel count, the image looks blurry. Enlarging file with increasing in pixel count, which may produce better results comparatively.	On enlarging a vector image, mathematical formulas remain the same, scalable to any size.
Raster programs are best suitable for photo editing, the creation of a continuous toned image with soft colour.	Vectors are best suitable for drawings, creating logos, illustrations, and technical drawings
A huge dimension and fair detailed image produce a large size of the image.	Vectors are resolution dependent, can be printed at any size or resolution.
Difficult to print raster images using limited spot colours.	In vector, the numbers of colours can be increased or decreased for printing.
The conversion of raster to vector is time-consuming and based on complexity.	A vector image can be easily converted to a bitmap image.
Some of the raster programs include photo editing, Photoshop, GIMP, paint shop.	Vector programs include Illustrator, Inkscape, CorelDraw.
Raster has high processing speed, used from badges to posters.	In vector, data volume depends upon the actual value of the object.
A kind of Raster file can be easily converted to another.	Vectors are difficult to modify or display if not opened in programs that understand vector.
File formats extension for raster:	File format extension for Vector:
.tif .tiff: Tagged Image File Format	.eps: Encapsulated PostScript
.jpg .jpeg: Joint Photographic Experts Group	.ai: Adobe Illustrator Artwork
.psd: Photoshop Document	.cdr: CorelDraw
.gif: Graphics Interchange Format	.svg: Scalable Vector Graphics
.png: Portable Network Graphics	.pdf: Portable Document Format

Coreldraw and Photoshop Features :

CORELDRAW	PHOTOSHOP
LiveSketch tool	Stroke Smoothing
Enhanced vector previews, handles, and nodes	Brushes from Kyle T. Webster
Prominent interactive sliders	Better Brush Organization
Custom node shapes	Color and Luminance Range Masking
Touch-friendly GU interface	Access Lightroom Photos
Powerful stylus enhancements	Quickly Share Creations
Import legacy workspaces	Quick Share Menu
Font _ltering and search	Variable Fonts
Corel Font manager	Curvature Pen Tool
Multi-monitor	Custom Path Color and Width
Healing clone tools	Properties Panel
Copy Curve Segments	Paste as Plain Text
Gaussian blur feature	360 Panorama Workflow

Photoshop vs Coreldraw Latest Version Features

Photoshop Latest Version Features :

Replace Sky

- This new feature uses an Adobe Sensei, an Artificial Intelligence, that automatically determines the sky in the image, selects it, and replaces it using the Sky Replacement window's presets.(Fig 2)

Fig 2



- To use this feature, choose **Edit > Sky Replacement**.
- You can also quickly select the sky in just two clicks by choosing **Select > Sky**.

Pattern Preview

- Open a file that you want to make into a pattern. Then, choose **View > Pattern Preview**. This view option allows you to see the pattern as a whole and zoom in/out to a greater perspective.
- To save the pattern, choose **Edit > Define Pattern >** and enter a name.

Neural Filters: Smooth Skin

- Photoshop's Artificial Intelligence (AI), Adobe Sensei, has a new trick up its sleeve that smoothens skins without using the Blur tool. (Fig 3)

- Choose **Filter > Neural Filters >** click on the **Skin Smoothing** to toggle on.

Fig 3



Neural Filters: Smart Portrait

- One of them is the Smart Portrait, which allows you to change a portrait's expressions with its Happiness, Surprise, and Anger sliders.
- It allows you to change your subject's appearance by altering the Age, Gaze, Hair Thickness, Head Direction, and Light Direction.
- A true game-changer for portrait retouching!
- It is important to note that the Smart Portrait filter processes itself using the Cloud.(Fig 4)

Fig 4



Neural Filters: Colorize

- Beta Filters, you'll also discover the new Colorize feature that colorizes black and white or sepia photos.
- Colorize uses the same Artificial Intelligence (AI) technology, called Adobe Sensei, that studies your document and applies the appropriate colors to breathe life into it.(Fig 5)

Fig 5



Smart Object Reset Transform

- When you want to reset the distortions applied on your Smart Object, you will no longer need to press the undo command repetitively.
- In this new update, right-click on the **Smart Object** > **Reset Transform** to remove any transformations you previously applied.(Fig 6)

Fig 6



Select and Mask New Features

- The Select and Mask workspace has been helpful for creatives in being able to create accurate masks of subjects with intricate details.

Photoshop 2021 Plugins Panel

- The Menu has a new addition in the form of Plugins.
- Upon selecting Plugins panel and selecting Discover Plugins, you will indeed discover useful plugins that can simplify or improve your workflow found in the vast collection of plugins available on the Creative Cloud.
- **Live Shapes**
- Line tool is now easier to work with by only having two anchor points and an adjustable appearance that you can change anytime, similar to the tool in Adobe Illustrator.
- This option is also available for the Polygon tool, which now allows you to make rounded edges.(Fig 7)

Fig 7



Discovery Panel

- The new Discover panel replaces the former search bar as it allows you to use it for different purposes.
- First, it allows you to search for tools you can't find.
- Then, Photoshop will give you directions by highlighting the tool with an arrow.
- Second, when you search for themes such as Retouching, it shows you a list of tools related to that particular workflow.

Photoshop 2021 Cloud Document Version History

- A Photoshop Cloud Document allows you to work on a document with the files saved on the Cloud instead of your computer.
- With the Version History update, you can see the different versions of the document done at different times, change the names, and open both versions on different tabs.

Technology Preview

- One Technology Preview is the Content-Aware Tracing tool that helps define and enhance the details in your image.
- This also leads to creating better Vector Masks or Vector Paths.

Coreldraw Latest Version Features :

Advanced illustration

New precision layout capabilities and the Draw in Perspective feature, CorelDRAW Graphics Suite 2021 makes complicated workflows simple.

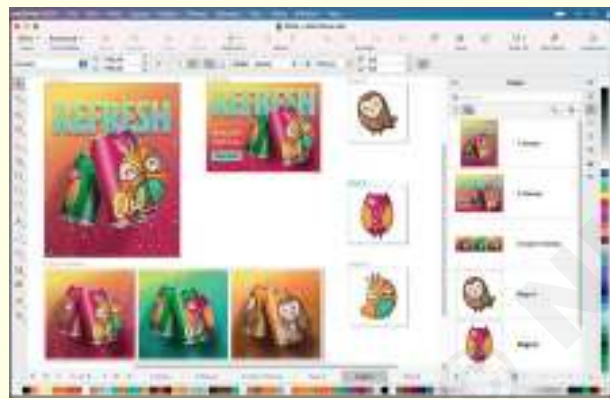
Perspective drawing:

- Draw objects or illustrated scenes in perspective, faster and easier than ever. Choose from 1, 2, or 3-point perspective, draw or add an existing group of objects on a shared perspective plane, and move and edit objects freely without losing perspective.

Flexible design space

- Multipage view: View, manage, and edit all of your project's digital assets in one view. Move objects across pages fluidly, compare designs side-by-side, and freely move pages around to arrange them as you wish. (Fig 8)

Fig 8



- Multi-asset export: When you're done designing, you can create a customised list of page and object items to export with one click.
- Symbols workflow enhancements: An enhanced Symbols workflow saves you time by enabling you to quickly search for symbols within large libraries and identify them easier among other objects.

Progressive image editing

- Powerful new photo editing features in PHOTO-PAINT and CorelDRAW 2021 are purpose-built to enhance images in fewer steps.

- **Enhanced colour replacement:** The new Replace Colors tool has been rebuilt from the ground up to provide a faster, easier route to flawless photos.
- **Reimagined adjustments workflow:** Take the

Fig 9



totally transformed Adjustments workflow in Corel PHOTO-PAINT for a spin to apply critical image adjustments non-destructively, in real-time, and in context, with the Local Adjustment Mode making it simple to target a filter to a specific image area.

- **HEIF file format support:** You can now enjoy support for the standard photo format used on iPhone in both PHOTO-PAINT and CorelDRAW 2021.

Next generation collaboration(Fig 9)

- Stay connected with colleagues and clients and gather real-time comments and annotations from one or many contributors from within your shared CorelDRAW design file.(Fig 9)
- **Live Comments:** The new Live Comments feature allows you to comment on and annotate a document in CorelDRAW.app with all feedback instantly appearing in the working file in CorelDRAW 2021.
- **Dashboard:** An in-built new project dashboard acts as your collaboration hub, simplifying the storing, organising, and sharing of cloud files.

Concept of colour & font style

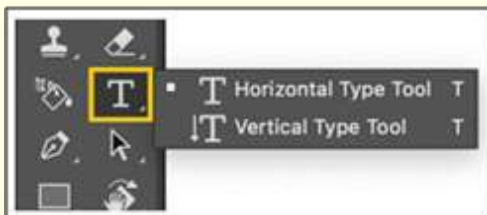
Objectives: At the end of this lesson you shall be able to

- concept of font style
- concept of color schemes

Concept of font style

- Open a photo or Photoshop document (PSD).
- From the toolbar, select the Type tool or simply press 'T' to quickly select it. (Fig 1) The Horizontal Type Tool with which you can add text horizontally is selected by default. If you want to add text vertically, click the Type tool again and select Vertical Type Tool from the context menu.

Fig 1



- Do you want to add a few words like a heading or title? Click anywhere on the canvas to type it. (Fig 2) In Photoshop, this is called **point text**.

The other type of text in Photoshop is called **paragraph text**. (Fig 3) As the name suggests, this is used when you want to type a paragraph. Click and drag the cursor on the canvas to create a bounding box in which you

can type your paragraph. This helps you efficiently edit and align the paragraph later.

- Type your text. To save your changes, click in the options bar or press Esc and you're good to go! (Fig 4)

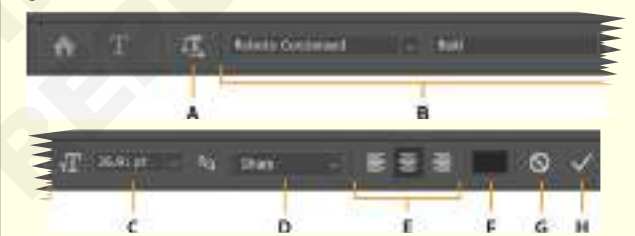
Fig 4



The options bar in Windows

- Change horizontal text to vertical text and vice-versa
B. Change font style C. Change font size D. Change pixelation of text edge (anti-aliasing) E. Change text alignment F. Change text color G. Cancel changes H. Save changes. (Fig 5)

Fig 5



- You can also use the Character panel and the Paragraph panel to further edit your text.

Create custom Styles

The easiest way to customize or create custom Styles is to break down (into its individual components) an existing Style. Because it's unlikely that we have the same Styles installed on our systems, let's use a Style from the Default palette.

Fig 6



Fig 2

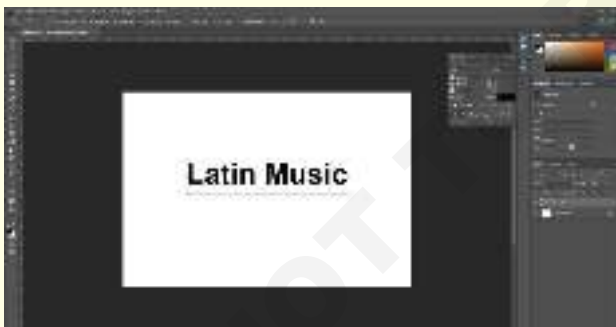


Fig 3



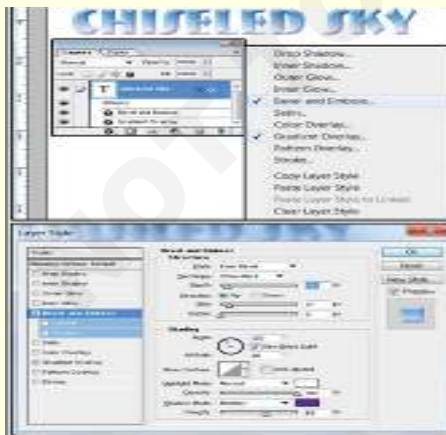
- Type the words **Chiseled Sky** on your canvas and select a thick, heavy font such as Artica Display, Arial Bold, Bremen Blk-BT, or Swiss Heavy.(Fig 6)

Fig 7



- From your Styles palette, choose the Style called Chiseled Sky (it's blue and white, and the 13th Style from the top).(Fig 7)
- Switch over to the Layers palette and notice that the Layer titled "Chiseled Sky" shows the Layer Style Effects attached to this Layer. Right-click the Layer name (Chiseled Sky), and the Layer/Style submenu pops up.
- Click Blending Options, and the Layer Style menu opens on the default Blending Options menu.
- You can also right-click the word EFFECTS, and when the Layer Style Effects submenu opens, click one of the "checked" Blending Options such as Bevel and Emboss. Next, the Layer Style menu opens, featuring the Bevel and Emboss section.
- Notice how the Bevel and Emboss section is defined.

Fig 8



Under Style you can choose from Outer Bevel, Inner Bevel, Emboss, Pillow Emboss, or Stroke Emboss. (Fig 8)

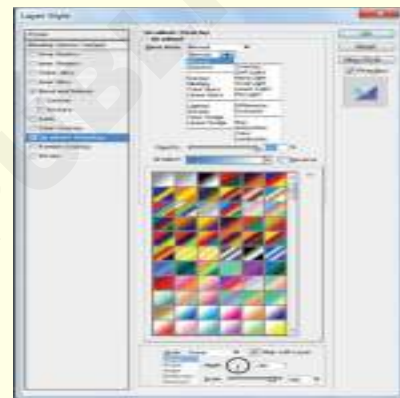
- Under Technique, you can choose from Smooth, Chisel Hard, or Chisel Soft, and then determine

the Depth of the chiseled effect (which modifies the length of shading) by moving the slide bar between 1 and 1000. Notice the Preview box on the right side. Push the slider all the way to 1000 and notice how the chiseled effect changes.

- Experiment with the Direction Up/Down (select Down), experiment with the Size from 1 to 250 (select 200), which changes the depth size of the Bevel and the Soften feature (from 1 to 16), which changes the Bevel from a chiseled look to a puffy, pillow look.
- Next, select the Gradient Overlay. Click the arrow next to Blend Mode and experiment with different Blending options. Adjust the Opacity based on the Brightness/Contrast of each Blend Mode.
- Click the Gradient arrow and experiment with several different Gradients to change the Style completely. Next, choose Style, Angle, and Scale.

Be sure to save your new Style with a unique name:
Just click the New Style button and enter a Style name.

Fig 9



- Add some Inner or Drop Shadows, experiment with the Inner and Outer Glow effects, try adding a Stroke with a Pattern, or a Pattern with a Satin or Color Overlay. You can use any image (photos, illustrations, graphic designs, positives, negatives, etc.) that you can imagine for Patterns. (Fig 9)

Each of the Style Blending Options and Effects has hundreds, even thousands of options. When combined, the number of different Styles for text and for objects are infinite.

Apply Styles

- Enter some text on your Photoshop canvas. For this exercise, enter several words in separate layers, such as, in this example, Christmas, Summer, Winter, Autumn, Spring, etc.
- Select (click) the first Layer in the Layers palette: Merry. Then choose a Style from the Styles palette.
- Select a different Style for each word/layer to show a range of different Styles.

Color Modes

Color modes are the settings designers use to show colors consistently across devices and materials. Commonly used modes are LAB, RGB, CMYK, index, grayscale and bitmap, which differ in quality and file size. Designers pick modes to optimize images and ensure these appear identically across media for brand consistency.

Achieving Color Consistency and More in Screen and Print

The designs we create appear on many devices and materials, and how we manipulate color greatly depends on the medium we use. This is due to differences in color spaces (i.e., the specific organization of colors), and the two processes for producing color, namely:

- **Additive** – involving the blending of light. We “create” white by mixing all the colors at full intensity; black is the total absence of color.
- **Subtractive** – involving the mixing of physical substances (e.g., ink, paint). Each dot/splotch covers the medium (e.g., paper). A classic example of mixing all paint colors is that curious dark grey-brown hue.

You may have seen how printed-out colors can look different from those on-screen. This phenomenon happens because the printer’s colors (using the subtractive process) didn’t replicate the screen’s (using the additive). Such inconsistencies can be easy to correct if you choose the right color mode.

- **LAB**
- **RGB**
- **CMYK**
- **Index**
- **Greyscale**
- **Bitmap**

Illustration comparing LAB (Infinite Colors), RGB (Millions of Colors), CMYK (4 Printed Colors), Index



(256 Colors), Greyscale (256 Shades of Grays) and Bitmap (2 Colors). (Fig 10)

How to Pick the Right Mode for the Context

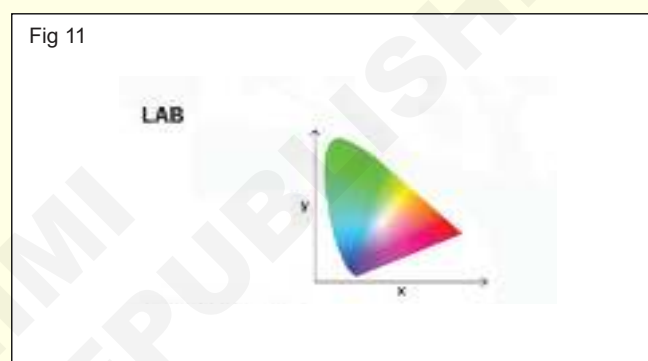
LAB – Also called CIELab, this mode is based on how

humans perceive color. It comprises one channel for lightness (L, ranging from the values 0–100) and two for color (A—the Green-Red Axis channel—and B, the Blue-Yellow Axis channel, ranging from +127 to -128). LAB color is device-independent, making it easy to achieve exactly the same color across different types of media so your (e.g.) digital logo appears identically on a mug, banner, etc. However, LAB’s large file sizes can delay load times. (Fig 11) Uses:

- **Branded Products** (e.g., T-shirts, banners)
- **Color Reference**
- **Photography**
- **Improving images with a natural and vibrant look**

The LAB color mode, shown in graph form.

RGB – This color mode uses the additive process. It



comprises Red, Green and Blue hues that combine to create extensive color variations. (Fig 12) RGB exists exclusively in digital formats (e.g., mobile screens). Although RGB is present across most electronic devices, the color elements vary across systems and models. So, an image can display differently on-screen from brand to brand.

Uses:

- **Web & App Design**
- **Digital Design**
- **Social Media**

The RGB color mode — think of monitors.

CMYK – This subtractive color mode comprises Cyan,

Magenta, Yellow and Key (Black), which combine to produce a range of hues. (Fig 13) This four-color process works for most printers. Printed images are essentially a series of layered four-color dots (measured in dots per inch) that create different hues and gradations. Although CMYK is a standard color model, the exact range of colors represented can vary, depending on the press and printing conditions.

Uses:

- Stationery (e.g., business cards)
- Advertising (e.g., posters, flyers, brochures)
- Product Packaging

Tip – Use CMYK mode when preparing an image to be printed with process colors, as image conversion from RGB to CMYK creates a color separation. If you start with an RGB image, it's best to edit first in RGB and then convert to CMYK afterwards.

The CMYK color mode — think of printers.

Index – This mode produces 8 bit image files with up to



256 colors. Like RGB, this color mode is exclusively for digital formats, on-screen. (Fig 14) When you convert an image to index color, a color table gets built to store and index the image's colors. If a color in the original image doesn't appear in the table, the software chooses the closest one or uses a dither effect to simulate the color

Uses:

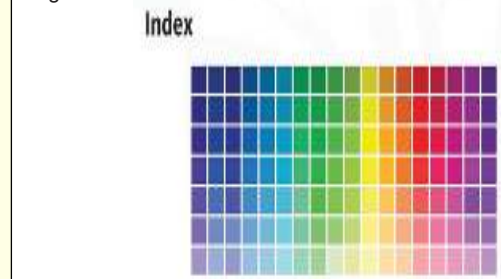
- Websites
- Digital Presentations
- Mobile Applications

While its color palette is limited, index color can reduce file size yet maintain the desired visual quality for digital presentations, websites and mobile applications. So, this mode is ideal for image optimization. For extensive editing, it's best to convert temporarily to RGB mode.

The Index color mode.

Greyscale – This black-and-white-looking mode actually comprises various shades of grey within an image. (Fig 15) You can use it in print and digital formats. In digital, each image pixel has a value ranging from 0 (black) to 255 (white). In print, the values range from 0% (white) to 100% (black), representing the amount of black ink

Fig 14



used.

Uses:

- Digital formats, to express a certain tone in your designs
- Print formats, to lower costs and minimize ink usage

The Greyscale color mode.

Bitmap – A.k.a. line art, this mode comprises black and white pixels, with no colors or shades of grey. (Fig 16) In digital formats, black and white values represent an image's pixels, while black ink dots and the white of the paper represent the overall image in print formats.

Uses:

- Print and digital formats, to create a line drawing or hand-drawn sketch, or make vintage effects.

While jagged-edged on-screen, bitmap images usually print smoothly with high resolution.

Fig 15



Fig 16



Photoshop tools

Objectives: At the end of this lesson you shall be able to

- introduction of tools panel

Introduction of tools panel

Photoshop's toolbar is located along the left of the screen: (Fig 1)

Fig 1



Choosing a single or double column toolbar

By default, the toolbar appears as a long, single column. But it can be expanded into a shorter, double column by clicking the double arrows at the top. Click the **double arrows** again to return to a single column toolbar:(Fig 2)

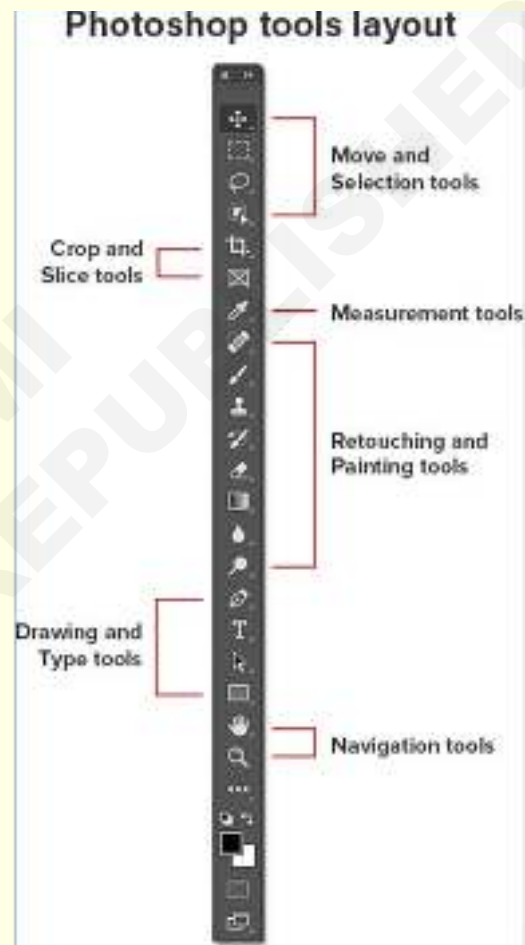
Fig 2



The tools layout

Photoshop's toolbar is organized. While it may seem like the tools are listed randomly, there's actually a logical order to it, with related tools grouped together.(Fig 3)

Fig 3



The toolbar's hidden tools

Each tool in the toolbar is represented by an icon, and there are many more tools available than what we see.

A small **arrow** in the bottom right corner of a tool icon means that there are more tools hiding behind it in that same spot:(Fig 4)

Fig 4



Most of the spots in the toolbar hold more than one tool.

To view the additional tools, **click and hold** on the icon. Or **right-click** (Win) / **Control-click** (Mac) on the icon. A fly-out menu will open listing the other tools that are available.

For example, if I click and hold on the Rectangular Marquee Tool icon, the fly-out menu tells me that along with that tool, the Elliptical Marquee Tool, the Single Row Marquee Tool and the Single Column Marquee Tool are also grouped in with it. (Fig 5)

To choose one of the additional tools, click on its name in the list. I'll choose the Elliptical Marquee Tool:

Fig 5



Choosing a hidden tool from the fly-out menu.

The default tool

The tool that's initially displayed in each spot in the toolbar is known as the **default tool**. For example, the

Rectangular Marquee Tool is the default tool for the second spot from the top. But Photoshop won't always display the default tool. Instead, it will display the last tool you selected.

Notice that after choosing the Elliptical Marquee Tool from the fly-out menu, the Rectangular Marquee Tool is no longer displayed in the toolbar. The Elliptical Marquee Tool has taken its place. (Fig 6 & 7)

Selecting the Rectangular Marquee Tool from behind the Elliptical Marquee Tool.

Move and Selection tools

Fig 6



Fig 7



S.No	Tool Pic	Funtion of the Tool
1	 Move Tool * (V)	The Move Tool is used to move layers, selections and guides within a Photoshop document. Enable "Auto-Select" to automatically select the layer or group you click on.
2	 Artboard Tool (V)	The Artboard Tool allows you to easily design multiple web or UX (user experience) layouts for different devices or screen sizes.
3	 Rectangular Marquee Tool * (M)	The Rectangular Marquee Tool draws rectangular selection outlines. Press and hold Shift as you drag to draw a square selection.
4	 Elliptical Marquee Tool (M)	The Elliptical Marquee Tool draws elliptical selection outlines. Press and hold Shift to draw a selection in a perfect circle.
5	 Single Row Marquee Tool	The Single Row Marquee Tool in Photoshop selects a single row of pixels in the image from left to right.
6	 Single Column Marquee Tool	Use the Single Column Marquee Tool to select a single column of pixels from top to bottom.
7	 Lasso Tool * (L)	With the Lasso Tool, you can draw a freeform selection outline around an object.
8	 Polygonal Lasso Tool (L)	Click around an object with the Polygonal Lasso Tool to surround it with a polygonal, straight-edged selection outline.
9	 Magnetic Lasso Tool (L)	The Magnetic Lasso Tool snaps the selection outline to the edges of the object as you move your mouse cursor around it.
10	 Object Selection Tool * (W)	The Object Selection Tool lets you select an object just by dragging a rough selection outline around it.

S.No	Tool Pic	Funtion of the Tool
11	 Quick Selection Tool (W)	The Quick Selection Tool lets you easily select an object simply by painting over it with a brush. Enable "Auto-Enhance" in the Options Bar for better quality selections.
12	 Magic Wand Tool (W)	Photoshop's Magic Wand Tool selects areas of similar color with a single click. The "Tolerance" value in the Options Bar sets the range of colors that will be selected.

Crop and Slice tools

13	 Crop Tool * (C)	Use the Crop Tool in Photoshop to crop an image and remove unwanted areas. Uncheck "Delete Cropped Pixels" in the Options Bar to crop an image non-destructively.
14	 Perspective Crop Tool (C)	Use the Perspective Crop Tool to both crop an image and fix common distortion or perspective problems.
15	 Slice Tool (C)	The Slice Tool divides an image or layout into smaller sections (slices) which can be exported and optimized separately.
16	 Slice Select Tool (C)	Use the Slice Select Tool to select individual slices created with the Slice Tool.
17	 Frame Tool * (K)	New as of Photoshop CC 2019, the Frame Tool lets you place images into rectangular or elliptical shapes.

Measurement tools

18	 Eyedropper Tool * (I)	Photoshop's Eyedropper Tool samples colors in an image. Increase "Sample Size" in the Options Bar for a better representation of the sampled area's color.
19	 3D Material Eyedropper Tool (I)	Use the 3D Material Eyedropper Tool to sample material from a 3D model in Photoshop.

S.No	Tool Pic	Funtion of the Tool
20	 Color Sampler Tool (I)	The Color Sampler Tool displays color values for the selected (sampled) area in an image. Up to four areas can be sampled at a time. View the color information in Photoshop's Info panel.
21	 Ruler Tool (I)	The Ruler Tool measures distances, locations and angles. Great for positioning images and elements exactly where you want them.
22	 Note Tool (I)	The Note Tool allows you to attach text-based notes to your Photoshop document, either for yourself or for others working on the same project. Notes are saved as part of the .PSD file.
23	 Count Tool (I)	Use the Count Tool to manually count the number of objects in an image, or to have Photoshop automatically count multiple selected areas in the image.
Retouching and Painting tools		
24	 Spot Healing Brush Tool * (J)	The Spot Healing Brush in Photoshop quickly removes blemishes and other minor problem areas in an image. Use a brush size slightly larger than the blemish for best results.
25	 Healing Brush Tool (J)	The Healing Brush lets you repair larger problem areas in an image by painting over them. Hold Alt (Win) / Option (Mac) and click to sample good texture, then paint over the problem area to repair it.
26	 Patch Tool (J)	With the Patch Tool, draw a freeform selection outline around a problem area. Then repair it by dragging the selection outline over an area of good texture.
27	 Content-Aware Move Tool (J)	Use the Content-Aware Move Tool to select and move part of an image to a different area. Photoshop automatically fills in the hole in the original spot using elements from the surrounding areas.
28	 Red Eye Tool (J)	The Red Eye Tool removes common red eye problems in a photo resulting from camera flash.
29	 Clone Stamp Tool * (S)	The Clone Stamp Tool is the most basic of Photoshop's retouching tools. It samples pixels from one area of the image and paints them over pixels in another area.

S.No	Tool Pic	Funtion of the Tool
30	 Pattern Stamp Tool (S)	Use the Pattern Stamp Tool to paint a pattern over the image.
31	 Eraser Tool * (E)	The Eraser Tool in Photoshop permanently erases pixels on a layer. It can also be used to paint in a previous history state.
32	 Background Eraser Tool (E)	The Background Eraser Tool erases areas of similar color in an image by painting over them.
33	 Magic Eraser Tool (E)	The Magic Eraser Tool is similar to the Magic Wand Tool in that it selects areas of similar color with a single click. But the Magic Eraser Tool then permanently deletes those areas.
34	 Blur Tool *	The Blur Tool blurs and softens areas you paint over with the tool.
35	 Sharpen Tool	The Sharpen Tool sharpens areas you paint over.
36	 Smudge Tool	The Smudge Tool in Photoshop smudges and smears the areas you paint over. It can also be used to create a finger painting effect.
37	 Dodge Tool * (O)	Paint over areas in the image with the Dodge Tool to lighten them.
38	 Burn Tool (O)	The Burn Tool will darken the areas you paint over.
39	 Sponge Tool (O)	Paint over areas with the Sponge Tool to increase or decrease color saturation.

S.No	Tool Pic	Funtion of the Tool
Painting tools		
40	 Brush Tool * (B)	The Brush Tool is Photoshop's primary painting tool. Use it to paint brush strokes on a layer or on a layer mask.
41	 Pencil Tool (B)	The Pencil Tool is another of Photoshop's painting tools. But while the Brush Tool can paint soft-edge brush strokes, the Pencil Tool always paints with hard edges.
42	 Color Replacement Tool (B)	Use the Color Replacement Tool in Photoshop to easily replace the color of an object with a different color.
43	 Mixer Brush Tool (B)	Unlike the standard Brush Tool, the Mixer Brush in Photoshop can simulate elements of real painting such as mixing and combining colors, and paint wetness.
44	 History Brush Tool * (Y)	The History Brush Tool paints a snapshot from an earlier step (history state) into the current version of the image. Choose the previous state from the History panel.
45	 Art History Brush Tool (Y)	The Art History Brush also paints a snapshot from an earlier history state into the image, but does so using stylized brush strokes.
46	 Gradient Tool * (G)	Photoshop's Gradient Tool draws gradual blends between multiple colors. The Gradient Editor lets you create and customize your own gradients.
47	 Paint Bucket Tool (G)	The Paint Bucket Tool fills an area of similar color with your Foreground color or a pattern. The "Tolerance" value determines the range of colors that will be affected around the area where you clicked.
48	 3D Material Drop Tool (G)	Used in 3D modeling, the 3D Material Drop Tool lets you sample a material from one area and then drop it into another area of your model, mesh or 3D layer.

S.No	Tool Pic	Funtion of the Tool
Drawing and Type tools		
49	 Pen Tool * (P)	Photoshop's Pen Tool allows you to draw extremely precise paths, vector shapes or selections.
50	 Freeform Pen Tool (P)	The Freeform Pen Tool allows you to draw freehand paths or shapes. Anchor points are automatically added to the path as you draw.
51	 Curvature Pen Tool (P)	The Curvature Pen Tool is an easier, simplified version of the Pen Tool. New as of Photoshop CC 2018.
52	 Add Anchor Point Tool	Use the Add Anchor Point Tool to add additional anchor points along a path.
53	 Delete Anchor Point Tool	Click on an existing anchor point along a path with the Delete Anchor Point Tool to remove the point.
54	 Convert Point Tool	On a path, click on a smooth anchor point with the Convert Point Tool to convert it to a corner point. Click a corner point to convert it to a smooth point.
55	 Horizontal Type Tool * (T)	Known simply as the Type Tool in Photoshop, use the Horizontal Type Tool to add standard type to your document.
56	 Vertical Type Tool (T)	The Vertical Type Tool adds type vertically from top to bottom.
57	 Vertical Type Mask Tool (T)	Rather than adding editable text to your document, the Vertical Type Mask Tool creates a selection outline in the shape of vertical type.
58	 Horizontal Type Mask Tool (T)	Like the Vertical Mask Type Tool, the Horizontal Type Mask Tool creates a selection outline in the shape of type. However, the type is added horizontally rather than vertically.

S.No	Tool Pic	Funtion of the Tool
59	 Path Selection Tool * (A)	Use the Path Selection Tool (the black arrow) in Photoshop to select and move an entire path at once.
60	 Direct Selection Tool (A)	Use the Direct Selection Tool (the white arrow) to select and move an individual path segment, anchor point or direction handle.
61	 Rectangle Tool * (U)	The Rectangle Tool draws rectangular vector shapes, paths or pixel shapes, with sharp or rounded corners. Press and hold Shift as you drag to force the shape into a perfect square.
62	 Ellipse Tool (U)	The Ellipse Tool draws elliptical vector shapes, paths or pixel shapes. Press and hold Shift as you drag to draw a perfect circle.
63	 Triangle Tool (U)	The Triangle Tool draws triangle shapes. Hold Shift to draw an equilateral triangle, or use the Radius option to round the corners.
64	 Polygon Tool (U)	The Polygon Tool draws polygonal shapes with any number of sides. Use the Star Ratio option to turn polygons into stars.
65	 Line Tool (U)	The Line Tool draws straight lines or arrows. Use the Stroke color and weight to control the appearance of the line.
Navigation tools		
66	 Custom Shape Tool (U)	Photoshop's Custom Shape Tool lets you select and draw custom shapes. Choose from Photoshop's hundreds of built-in custom shapes or create your own.
67	 Hand Tool * (H)	The Hand Tool lets us click and drag an image around on the screen to view different areas when zoomed in.
68	 Rotate View Tool (R)	Use the Rotate View Tool in Photoshop to rotate the canvas so you can view and edit the image from different angles.
69	 Zoom Tool * (Z)	Click on the image with the Zoom Tool to zoom in on a specific area. Press and hold Alt (Win) / Option (Mac) and click with the Zoom Tool to zoom out.

Photoshop menu bar

Objectives: At the end of this lesson you shall be able to

- Introduction of menu bar

Introduction to menu bar

One of the basic elements of Adobe Photoshop is the menu bar, located at the very top of the program. The menu bar is used to open and save files, adjust the canvas size, access some of the editing tools, open and close various windows, and more.

File, Edit, Image, Layer, Select, Filter, Analysis, 3D, View, Window, and Help. Each of those main menus has additional submenus for related options.

You can access most of what's available in the menu bar in other ways, too, like via keyboard shortcuts, right-click menus, or with separate menus located within other windows like Tools, Layers, Timeline, etc. For some options, however, you have to use the menu bar.

These instructions apply to Adobe Photoshop CS5 and later. Some menus and items may be different in other versions.

Fig 1



File

The File menu in Photoshop is much like the File menu in other programs. It's the primary method for making new files, opening existing ones, saving files, and printing.

For example, if you've just opened Photoshop and you want to import a PNG or JPG file, you can use the File menu to select Open to browse for the picture you want to use. Advanced open operations are supported.

The Open Recent option under the File menu contains a list of the 10 most recently opened files. So long as you haven't moved the original file elsewhere, you can use that option to quickly re-open a file without having to go through the normal "open, select, browse" procedure.

It's also the File menu that lets you convert a video into frames so that you can edit each frame or turn a video into a GIF.

Edit

Fig 2



With the Edit menu, you can modify objects on the canvas, menu items, shortcuts, and more.

For example, you can do simple things like undo or redo a recent action, as well as cut, copy, and paste. Those are common actions, so you'll find yourself using those menu options often, or at least learning their keyboard shortcuts.

The Edit menu is also one place where you deal with text, so you can find and replace words and phrases throughout a document. It's also where you'll find the options to **Fill** selections or add a **Stroke** along a selected path.

Also here are tools for transforming objects. If you have an image you want to warp, rotate, scale, distort, or flip, use the **Edit > Transform** submenu to find those options. The **Free Transform** tool is located here as well, letting you adjust the height, width, and orientation.

The Edit menu is how you open **Preset Manager** to view brushes, gradients, swatches, custom shapes, and load your own custom ABR brushes.

This menu is used to locate existing keyboard shortcuts and define new ones, too, and to change general preferences for how Photoshop works and to show/hide which items are visible on the menu bar.

Image

Fig 3



Many options related to changing images in Photoshop are available under the **Image** menu. The first submenu let you change the **mode** of the whole canvas, between modes like RGB color, grayscale, CMYK color, multichannel, duotone, and more.

Next is a submenu called **Adjustments** that lets you access various tools for changing an image's brightness, contrast, levels, exposure, vibrance, hue/saturation, and color balance. Also here are the **Photo Filter**, **Channel Mixer**, and **Color Lookup** tools, among others.

Auto Tone, **Auto Contrast**, and **Auto Color** are options that will make changes to how an image looks without menus or sliders.

Some important canvas manipulation tools are in the Image menu, called **Image Size** and **Canvas Size**. You'd use the Canvas Size option to change the width and height of the whole working area to make it the exact size it needs to be or to shrink or grow the canvas.

Crop and **Trim** are two other notable tools in this menu. The first resizes the canvas by manually selecting which areas should be deleted. The second is for automating the resize by removing transparent pixels (or pixels of a specific color) from any edge of the canvas.

Layer

Fig 4



The Layer menu is where you can create new layers, duplicate existing ones, delete and rename layers, and much more.

Also in this menu are options for creating layer masks, adjustment layers, and fill layers. A fill layer, for example, is a new layer pre-populated with a specific color, pattern, or gradient, which you get to choose when you click it.

You can also use the Layer menu to create and edit Smart Objects, as well as export their contents to a file or replace their contents with that of another Smart Object.

Other options in the Layer menu let you group and hide layers, lock layers, arrange layers behind or in front of other ones, link and merge layers, and flatten the image to automatically merge all the layers.

Select

Fig 5



Options pertaining to selections are stored in Photoshop's Select menu. You can select everything on the canvas, select all the layers, and deselect everything from this menu. A couple related and useful tools let you invert the selection and re-select a prior selection.(Fig 5)

A Refine Edge tool is in the Select menu. You use it to change the edge of a selection. You can adjust the smooth, feather, contrast, and shift edge settings to define specific selection details.

Grow automatically increases a selection to nearby pixels to effectively increase the overall selection area. Keep clicking it to get a broader selection.

Use **Save Selection** and **Load Selection** to re-select something later. You can save a new selection and then load it when you need to re-apply it.

Filter

Fig 6



Adobe Photoshop filters are contained in the Filter menu. It's here that you can open **Filter Gallery** to preview artistic, brushstroke, distort, sketch, texture, and other built-in filters. (Fig 6)

This menu also contains filters for blur, noise, pixelate, render, and sharpen. To save or load a custom Photoshop filter, go to **Filter > Other > Custom** and use the **Load** button to locate the ACF file, or the **Save** button to make a new ACF file.

3D

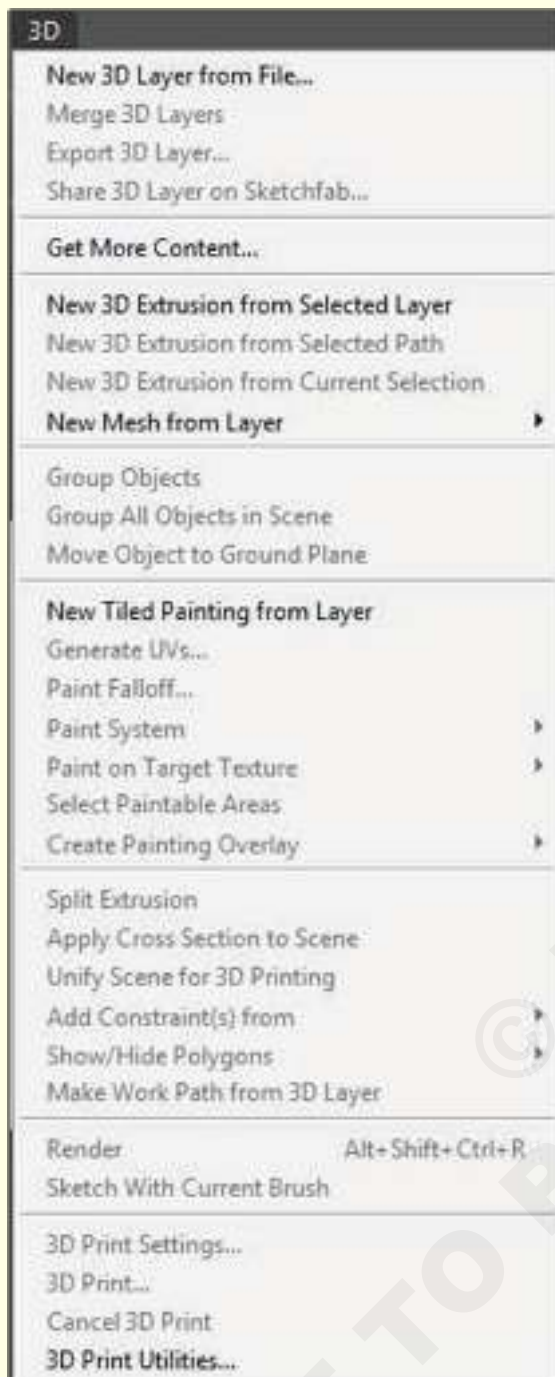
Photoshop isn't just for flat images anymore. Newer versions of the software let you create and edit 3D objects for both modeling and printing purposes.(Fig 7)

The 3D menu houses the tools you need to modify 3D files and make them look as good as possible. If you don't have one to start from, you can create 3D objects from layers you've already made.

View

The View menu includes tools related to how you see things in Photoshop. You can enable a ruler, create

Fig 7



guides that you can follow for precise positioning, and change over to full-screen mode.

Some common options in Photoshop's View menu are for zooming. These settings include zooming in and out, auto-fitting the canvas to the same size as the screen, showing the actual pixel size, and displaying the print size.

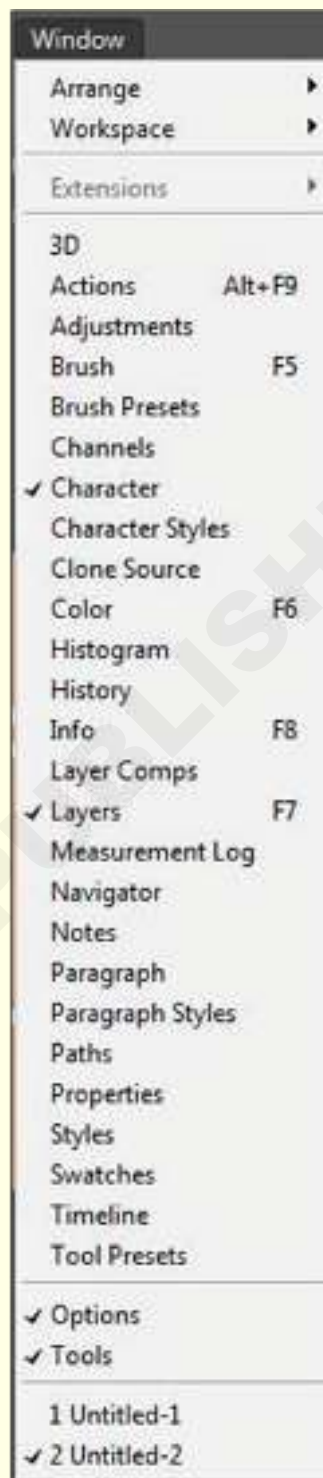
Other things you can show or hide from the View menu include selection edges, target paths, notes, layer edges, edit pins, guides, slices, mesh, pixel grid, and brush preview.

Window

Photoshop's Window menu serves two purposes: hiding

and showing windows and arranging the workspace

Fig 8



however you like. Since not all available windows are visible all the time, use the Window menu to selectively show or hide them as you need them.

Use the Window menu to toggle all sorts of windows as visible or hidden. **Actions, Adjustments, Brush, Channels, Color, History, Layers, Notes, Paths, Timeline,** and **Tools** are a few examples. You won't always need them during your projects, so it's a good idea to hide them to keep your view from cluttering.

Use the Arrange and Workspace submenus to adjust where the windows are positioned. You can also drag and drop windows anywhere you like, even outside of Photoshop's main window, but these menus have some pre-set options for positioning windows in places that are supposed to be easier for certain tasks, like for painting and typography.

Help

The Help menu marks the end of Photoshop's menu bar. You can see the version of Photoshop you're running, get online help, access the Photoshop Support Center, learn more about the installed plug-ins, register Photoshop with Adobe, and more.

Fig 9



Photoshop create and formatting document

Objectives: At the end of this lesson you shall be able to

- Create a new document
- Formatting the document
- Edit and development images

Create a new document

- Launch Photoshop.
- Do one of the following:
 - Select **File > New** (or) Ctrl+N
 - Click **New** or **Start New** in the **Start** workspace.
 - Right-click the tab for an open document and choose **New Document** from the in-context menu.(Fig 1)

Fig 1

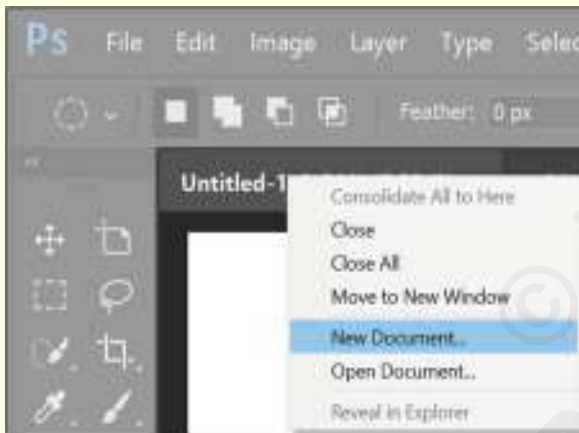


Fig 2



Create documents using presets

- In the **New Document** dialog box, click a category tab: **Photo**, **Print**, **Art & Illustration**, **Web**, **Mobile**, and **Film & Video**.
- Select a preset.
- Optionally, change the settings for the selected preset in the **Preset Details** pane on the right.

- Click **Create**. Photoshop opens a new document based on the preset.

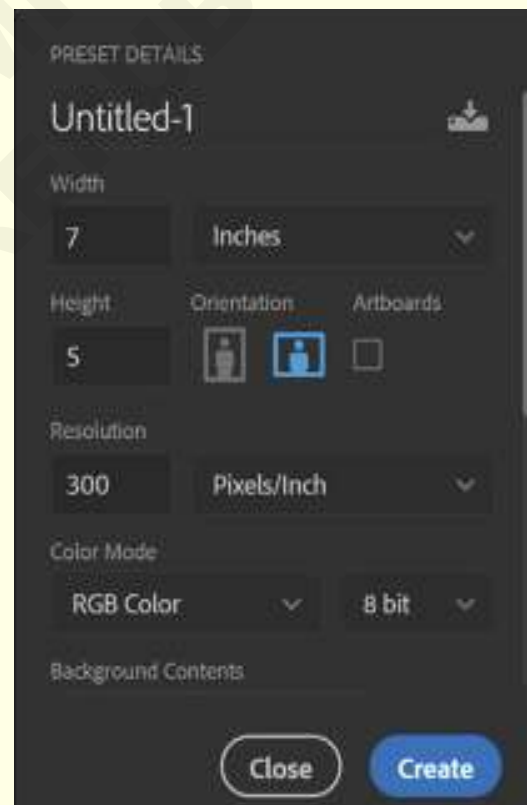
Modify presets

Before opening a document using the preset, you can modify its settings in the right pane.(Fig 3)

- **Specify the following options for the selected preset:**

Width and Height: Specify the size of the document. Select the unit from the pop-up menu.

Fig 3



Orientation: Specify a page orientation for the document: Landscape or Portrait.

Artboards: Select this option if you want your document to have artboards. Photoshop adds an artboard while creating the document.

Color Mode: Specify a color mode for the document. Changing the color mode converts the default contents

of the selected new document profile to a new color.

Resolution: Specify the fineness of detail in a bitmap image measured in pixels/inch or pixels/centimetre.

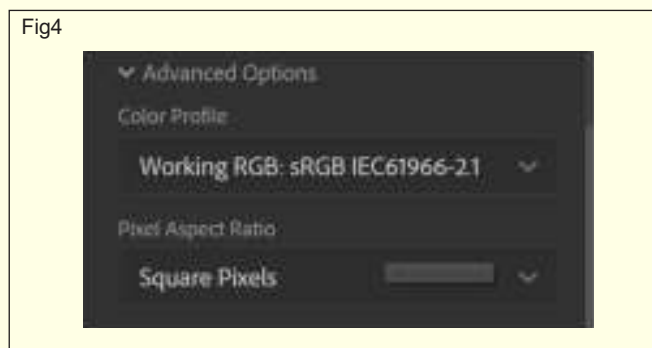
Background contents: Specify a background color for the document.

- To specify the following extra options, click Advanced Options.(Fig 4)

Color Profile: Specify the color profile for your document from a wide range of options.

Pixel Aspect Ratio: Specify the ratio of width to height of a single pixel in a frame.

- Click **Create** to open a document with the preset settings.



Formatting the document

- **JPEG**
- JPEG stands for Joint Photographic Experts Group, and its extension is widely written as .jpg. This most used image file format is used to store photos all over the world, and is generally a default file format for saving images. In fact, most of the images you find online will download as .jpg files.



- JPEG files come in different quality levels like low, medium and high. Low quality JPEGs are more compressed than high quality versions. So, if you need a high quality image, you'll need to choose a less compressed JPEG option.
- Most commonly, JPEG images are great for sharing on social media, via email and on websites. These files are relatively small, so they take up less space on your memory cards and computer storage. Beware, though, that saving images as JPEGs can compromise the quality of that image.

When to Use JPEG Image Format:

- Complex images with a lot of different colors, like photographs
- To compress highly detailed images
- For print
- **PNG**
- PNG stands for Portable Network Graphics. It's an important file format that helps a lot in photo editing. You can use PNGs for completely transparent backgrounds or drop shadows (partial transparency) for the great effects.
- This image format will not sacrifice the quality and



details of the photos, but that means that they are typically larger in size than JPEGs. Thus, PNGs are best for small images like logos.

When to Use PNG Image Format:

- Images with transparency
- Small images, like logos
- Online
- To retain the quality of a detailed image, provided that you have storage for a larger file size
- **GIF**
- GIF stands for Graphics Interchange Format, and it's quite similar to PNG in terms of its image quality preservation. With GIF image files, you can also create short animations for web.
- This image format has a smaller color range, so it's not suitable for all photos. Like PNG, GIF images can be transparent. But, unlike PNG, GIF doesn't support partial transparency, which means you can't use them to preserve shadow effects in your photos.

When to Use GIF Image Format:

- For simple images with few colors, like icons
- For animated images
- **PSD**
- PSD stands for Photoshop Document. When you save an image from Adobe Photoshop, the program's default is to save that photo as a PSD file.
- This file format is not suitable for web, nor is it suitable

Fig 7



for clients because it isn't versatile. However, it is

Fig 8



one of the best image formats for maintaining the quality of your image over a long period of time.

- You should save your edited images as PSDs, especially if you intend to revisit them in Photoshop for additional retouching. You'll need to make sure that your layers are not merged before you save your PSD file, or you'll lose some of your editing capabilities.

When to Use PSD Image Format:

- To save images you may edit again in the future
- To retain the quality and detail of images you want to print
- **TIFF**
- TIFF stands for Tagged Image File Format, and it is known as the most used file format by photographers and designers. Images stored as TIFF files are best for post-processing, because they are not compressed at all.

Fig 9



- With TIFF files, you can create all kinds of digital images. You can use TIFFs with any photo editing software to perfect your photos, and you can re-save TIFFs as any other file format. Although TIFF files take up more space on your devices, they provide you a lot of flexibility.

When to Use TIFF Image Format:

- For images you want to store without losing details
- For images you need to print

Edit and development images

- **Make Non-Destructive Edits With Photoshop Layers**

One of the most powerful editing tools in Photoshop (PS) are layers. Layers are like sheets of paper that are stacked one on top of the other. There is a panel dedicated to layers.

When you open a photo in PS, you will just have the Background layer. This corresponds to the original photo. (Fig 10)

In Photoshop, if you work directly on your background picture, any change you do modifies the pixels of the original photo.

Setting up and editing through layers will allow you to edit your photo in a non-destructive way. This means that you can come back to the original one at any time.

Fig 10



This is the best way to edit photos.

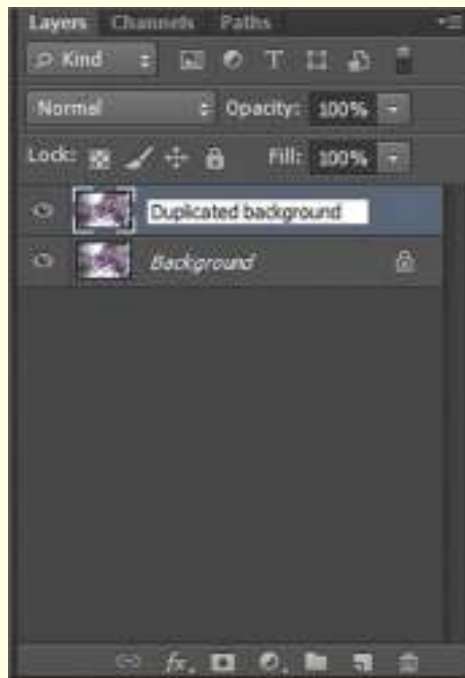
My first recommendation is to extra protect your original by always creating a first layer that simply duplicates it by pressing Ctrl+J (Cmd+J for mac users).

Then you can start adding other layers on top with your modifications.

Layers add a lot of flexibility to the workflow because you can:

- reorganise them (by click and dragging them);
 - rename them by clicking on the layer's name;
- (Fig 11)
- modulate their intensity by adjusting their Opacity (using the Opacity slide);
 - activate and deactivate them to check their effect (clicking on the eye icon);

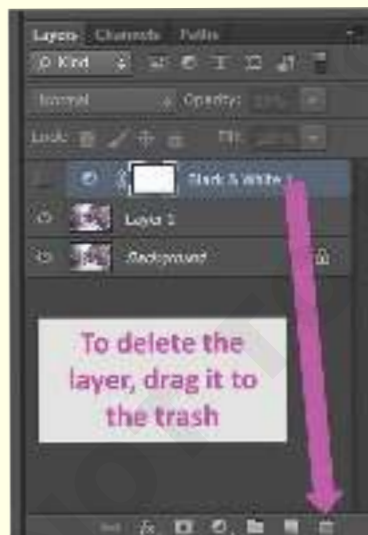
Fig 11



- and delete them (dragging them to the trash icon).
- **Edit Pictures Using Adjustment Layers**

An adjustment layer is an editing tool that allows you to do different types of modifications to your images. You can add them in two ways.

Fig 12



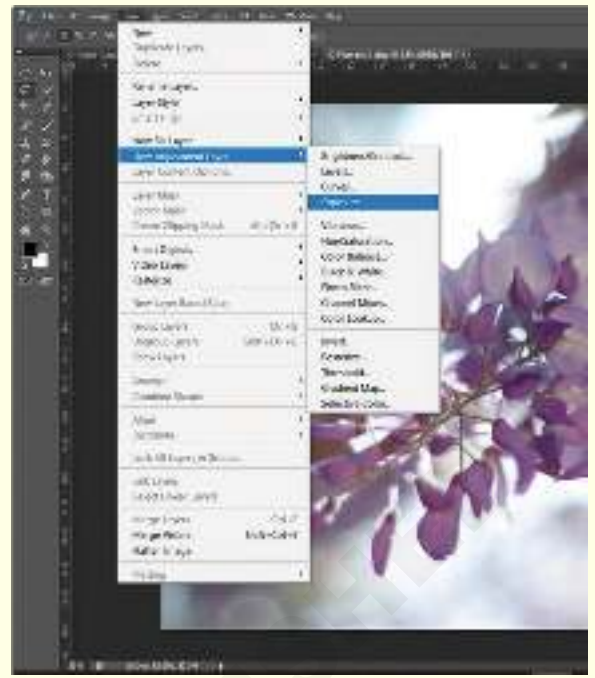
Click on the icon in the layer panel and then choose one of the adjustment layer options.

Or go to Layer>New adjustment layer and select one of the options. (Fig 13)

The adjustment layer will appear on top of the previous ones you have. You can modify the adjustment using its properties panel. The changes will affect all the layers below. (Fig 14)

Some suitable options that affect the tonal range or the

Fig 13



colour of your photo are Exposure, Curves, Vibrance or Hue/Saturation.

- **Select Areas of Your Images With the Marquee and Lasso Tools**

Fig 14



You can select areas of your images in several different ways. For selecting areas with specific shapes, you can use the Marquee tool.

There is a rectangular shaped one. After right-clicking on the icon, you can select the Elliptical shape or even a single row/column Marquee tool.

Another way of selecting areas is by using the Lasso Tool. With this feature, you can select a free area in your images.

With the Basic one (Lasso Tool) you can select areas by freehand. The Polygonal Lasso allows you to create edges by clicking on points. The Magnetic option is great to select along edges.

A great feature for selecting big uniform areas is the Magic Wand Tool. It is under the Quick Selection Tool, so you need to right-click and select it from the menu.

And if you want to remove any selection, you just need to press Ctrl+D (or Cmd+D in a Mac).

- **Use Masks to Edit Just a Portion of Your Photo**

Masks are automatically added with the adjustment curves. The mask is the white square next to the adjustment layer icon.

When working with masks, you play with the colours white and black. White means that the pixel is active, so it is affected by the adjustment layer modifications.

Black means that you mask it, meaning that the pixel is not affected by the adjustment layer.

There is also another way to create a mask. First, select the area you want to mask and while the selection is active, create the adjustment layer.

Photoshop will automatically create the mask with the selection.

Learn to Straighten a Crooked Photo

Straightening a crooked photo in Photoshop is easy. First, you need to use the Measure tool. If you don't see it in your palette, it might be hidden under the Eyedropper tool.(Fig 15)

To select it you need to right-click on the Eyedropper icon. A little menu appears with the other photo editing tools hidden behind.

We need to find in our photo a line that was supposed to be straight. It might be the horizon, a wall, a table. It will depend on the content of your image. Now we need to draw a line along with it.

Click on one side of the line and drag over the line until you reach to the end and then click again.

Photoshop measures the angle of this line in reference to the rest of the image. You can see the result in the Options Bar Menu.(Fig 16)

Now select Image>Rotate Canvas>Arbitrary and write the angle you obtained. (Fig 17)

Photoshop automatically fills with the obtained

measurements the options in the Rotate Canvas Menu. Just check that they are correct and press OK.

Fig 15

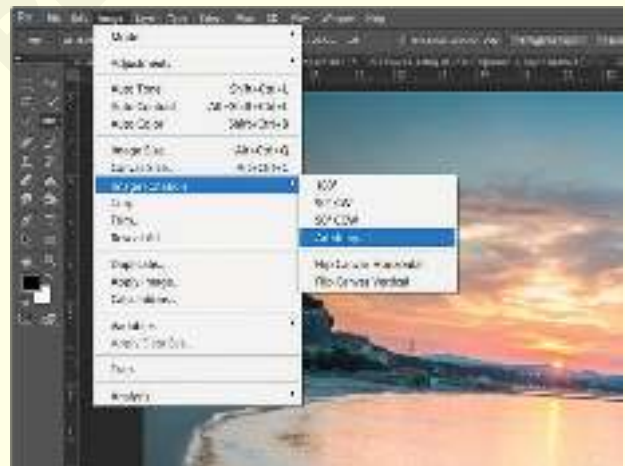


Fig 16



When you straighten an image, it is common that you get some white canvas around.

Fig 17



You can get rid of it by cropping the image with the Crop Tool.

Click on one corner of the image and drag until you get the area you want to keep.

Then press Enter/Return to crop.

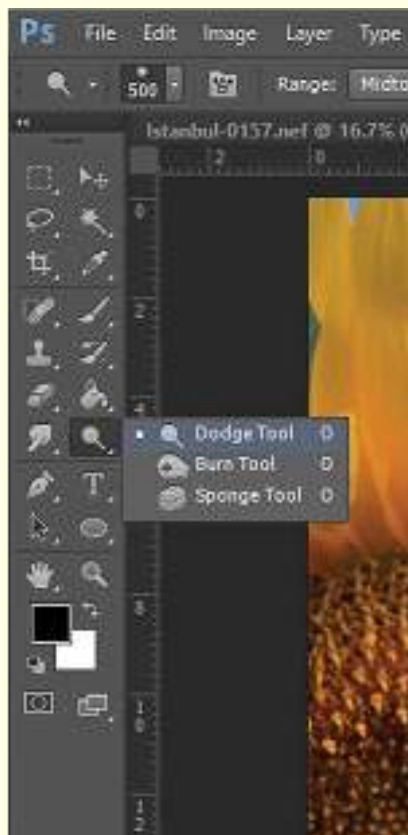
- **Lighten and Darken Just Certain Parts of Your Image**

You can use the Dodge tool for making portions of the images lighter. This is handy when you don't like the exposure you got straight from the camera.(Fig 18)

The Burn Tool is hidden under the Dodge Tool. It works exactly the same, but it is darkening the image instead of lightening it.

Remove Unwanted Objects With Content-Aware

Fig 18



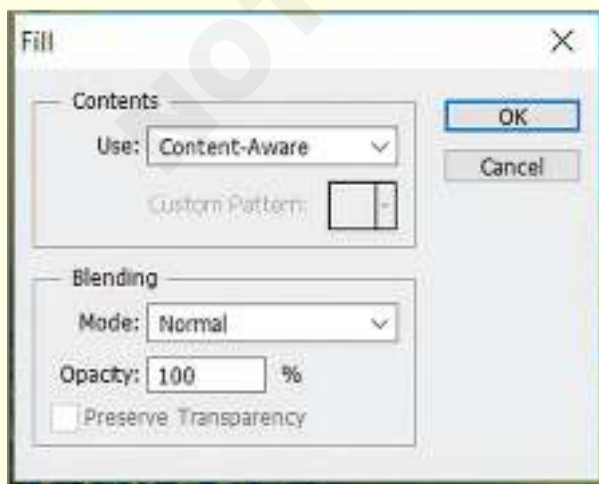
There are different ways to Photoshop images to remove unwanted objects.

Start by selecting the area with unwanted objects with any selecting tool.

Once selected, right-click and choose 'Fill'.

A panel appears, and I select "Content-Aware" and "Normal" in Blending. I keep the Opacity at 100.(Fig 19)

Fig 19



Photoshop is going to fill the area with the content it decides on after searching surrounding areas. And most of the times it does a pretty good job.

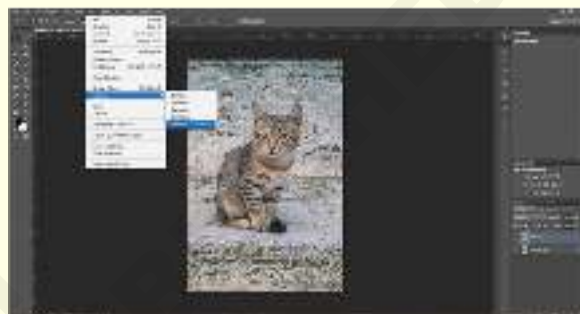
• Add a Vignette to Drive Attention to the Centre of the Images

Vignette means darkening the corners of a photo. It drives the viewer's attention to the centre of the image. You don't have to add a vignette to all your images, but in some cases, it provides a nice result.

Select the central area of your image. You are selecting the part that won't have the vignette. Use the Elliptical marquee to do it.

Feather the selection to create a gradual darkening effect. Go to Select>Modify>Feather.(Fig 20)

Fig 20



In the Feather Selection menu, you need to write a feather radius. It will depend on the image size, and you might need some trial and error. In my case, a radius of 200 pixels worked fine.(Fig 21)

Fig 21



Photoshop will blur those pixels, making them blend with the background in a more natural way.

Now you need to invert the selection going to Select>Inverse.

Then add a curves adjustment layer and play around until you get the vignetting effect you like.(Fig 22)

• Save Photos in PSD to Keep All Your Changes

A very important part of photo editing is saving your file. If you want to keep editing later, you can save it as a Photoshop file (psd). This file will keep all your edits and layers.

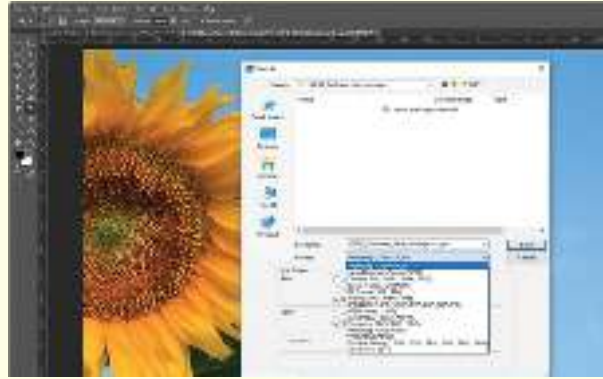
Keep in mind that it has a huge file size. Go to File>Save and select PSD from all the options.(Fig 23)

Use this option if you want to keep all the quality of the Photoshop file. If you want a smaller file, you can save your image as TIFF. That is another of the options in the "Save as" menu.

Fig 22



Fig 23



Formatting and system requirement of coreldraw

Objectives: At the end of this lesson you shall be able to

- **compare formatting and design operations**
- **list of system requirements for coreldraw installing**

Compare formatting and design operations

Formatting is how your manuscript looks and reads. Things like font size, page color, word count, page number, line spacing, paragraph breaks—everything that goes into the visual appearance.

- **Use A Standard Font (Times New Roman or Arial)**

The most common print font is the serif font Times New Roman. The most common web font is the non-serif font Arial. They both work great. Don't use anything else for your manuscript.

- **Black Text on White Background**

It's possible to change the defaults on your word processor to something other than black text on a white background. If you want to do that while you write, cool—just switch it back to the regular defaults for submission.

- **12 Point Type**

The type size is how big the letters are. 12 point is usually the default in a word processor because it's easy to read for most people.

- **8.5 x 11 Page Size**

This is a default page size on most word processors.

- **One Inch Margins**

One inch margins on the border of the document is the standard format. This means the right margins are one inch, the left margins are one inch, etc.

This used to be a very important formatting convention when manuscripts were submitted as printed documents. That doesn't happen much anymore, so this is not important. If you keep the word processor defaults, you'll be fine.

- **Left Justified Alignment**

Left justified means that left hand text is aligned, while the end of the right hand text is jagged. It looks like this:

Again, that is the default on most word processors.

The thing to avoid is Fully Justified, where each line looks the same length, like this:

Your final book may be formatted that way, but do not format your manuscript like that.

- **One Space After Periods**

You should have a single space after a period, not two spaces.

If you're under 40 and confused why I would even

mention this, it's because you learned how to type on computers. Many of us olds learned typing on manual typewriters, and the convention for those was to hit the space bar twice and add the extra space to have two spaces after a period.

- **Double-spaced Text Lines**

Most editors, regardless of the type of editor they are, prefer to edit manuscripts that are double-spaced. Double-spacing means there is an extra line between each line of text. It looks like this:

- **Paragraph Classic Style: indented with no line space**

There are two ways to format paragraphs, you can choose the one you like. Just don't mix and match in the same manuscript.

Classic style is paragraphs with an indent at the beginning, and no space between new paragraphs. It tends to be used in novel manuscripts and short stories.

- **Paragraph Modern Style: no indents with line space**

Modern style is no indents at the beginning of paragraphs, and a space between paragraphs. It tends to be used in non-fiction. It looks like this:

- **Page Breaks Between Chapters**

When you finish one chapter and start a new chapter, don't just hit the return key until you get to a new page. Instead, use the "page break" function. What that does is insert a new page, without inserting a bunch of hard returns and space into the manuscript.

- **Number Your Pages**

Editors love to see page numbers. This is for many reasons, most of which I don't think apply in a modern world with a search function, but they still insist on them, so it's easier to just add page numbers.

- **Send Your Entire Manuscript as One Document**

You're welcome to write in as many documents as you need. That's common practice to put each chapter in its own document.

As long as, before you submit for editing, combine them all into one document. There is no quicker way to enrage your editor than send them a folder with 15 chapters all in different documents.

- **Use Style Function To Format Headings**

When you want to make a chapter title or chapter

number or any sort of heading stand out, the best way to do it is to make it a larger or bolder font, right?

Yes, but there is a right and wrong way to do that.

The wrong way is to manually do it. This means changing the font size, or underlining it, or italicize it, by itself. Doing this can get it to “look” right, but you are risking being inconsistent, and making the later formatting very hard on the interior designer.

The correct way is to use what is called the “style function.” What this does is associate the correct heading (H1, H2, H3, etc), which makes everything consistent and easier for the interior designer. But really, it makes sure your book look the way you want.

- **Proper Title Page Layout**

There are many acceptable ways to layout a Title Page. Generally speaking the Title Page is the first page of the manuscript, and needs to include the book title, the sub-title, the word count, your contact information (including email and phone number). You can also have a physical address as well. This should all be on the first page.

Here is an example of the format we recommend:

List of system requirements for coreldraw installing

- Windows 11 or Windows 10 (Version 21H1 or later), 64-bit, with latest Updates
- Intel Core i3/5/7/9 or AMD Ryzen 3/5/7/9/ Threadripper, EPYC
- OpenCL 1.2-enabled video card with 3+ GB VRAM
- 8 GB RAM
- 9 GB hard disk space for application and installation files
- Mouse, tablet or multi-touch screen
- 1280 x 720 screen resolution at 100% (96 dpi)
- Internet connection is required to install and authenticate CoreIDRAW Technical Suite and access some of the included software components, online features and content

Various versions of coreldraw and features

Objectives: At the end of this lesson you shall be able to

- **discuss the benefits of using coreldraw**
- **var ious coreldraw versions**

Discuss the benefits of using coreldraw

Coreldraw

Coreldraw is a vector graphics designing software that is offered by Corel Corporation. It is a multiple functional software that is us ed by a number of graphic designers for their graphics professional work.

Benefits of Coreldraw

- Coreldraw is Vector graphics editor and designer software so it offers us a number of exciting tools that make the working of CorelDRAW software easy. Coreldraw offers some geometrical shapes as a tool that helps you in exploring your idea in your own way without any limitations. You can make professional logos, brochures, business cards, and other advertising elements with the bits of help of these tools and can give them different looks according to the requirement of your client.
- You will have some artistic tools in features of Coreldraw software which will help you in designing very complex and eye-catching drawings with different types of logical ideas.
- Coreldraw offers you the different types of brushes that help you in creating a detailed image with a realistic look.
- In Coreldraw, we have a Layer system also just as Illustrator and Photoshop software which helps in working with different layers of an image without damaging originally of the individual layer.
- Corel Corporation designed Coreldraw in this way so that it can work with its other design-oriented software that is Corel Photo-Paint.
- You can also design a 3d object or logo in Coreldraw software as a vector image with the help of its exciting tools and features which will add plus point to your designing works.
- Coreldraw software is also used for making an image of PNG and CDR file format which makes that image usable for other designing software.
- You can use Coreldraw software for creating QR codes, and generation of page layouts with some special effects for a particular theme.
- In Coreldraw we have Text Tool also which offers you designing of different types of Text logos, helps in write designer matter of magazines as well as you can make typographical works in Coreldraw software.

- Coreldraw software is generally working for printable projects. So you can use it for print-oriented work with its high-level adjustment features for printed items.

Various CorelDraw Versions

Coreldraw Version 1 (1989)

This first version Of CorelDraw required IBM PC 286 with 640K RAM, and a hard disk DOS 3.0 graphic card & tablets. It was used to add some effect to 2D &3D design with AutoCAD import and export effect.

Coreldraw Version 2 (1991)

This allows you to merge text with graphic effects and allow you to print them. You can also blend, and envelope objects or shapes. The extrusion tool helps for distorting objects or models that introduce the concept of blending two artworks or objects into one.

Coreldraw Version 3 (1992)

It was a bundled version that has Corel Photo-Paint, CorelShow, Mosaic, CorelTrace, and CorlChart. All of these software offers the option of maintaining graphic charts and screen presentation creation which supports Windows 3.1 devices.

Coreldraw Version 4 (1993)

This Coreldraw best version has photo paint for bitmap editing and CorelSHOW for creating on-screen presentations. It is one of the common choices of product in this CorelDRAW version list. The CorelMOVE for animation and the Mosaic with CorelTRACE help you to get done amazing artwork. Its multiple capabilities, envelope tool, and clone tool help for elastic node editing.

Coreldraw X3

It is equipped with the double click crop tool with that you can crop vector images at the same time. The Chamfer, Fillet, Emboss tool, and Image adjustment lab. Performances are fascinating. Its Trace became integrated inside DRAW's PowerTRACE.

Coreldraw X4

This best version of CorelDRAW introduces the concept of sharing, table tool, Independent page layer, and live text formatt ing. This support for Raw camera files makes it a multi-feature editing app. This CorelDraw version supported devices Windows XP, Vista, 7, and 8.

Coreldraw X5

It is one of the best choices of product in this CorelDRAW all version list. Corel CONNECT introduced it with an in-built content organizer. It allows you color consistency in every platform with PANTONE color profiles. The Pixel mode of CorelDRAW GraphicsSuite X5 let users create realistic graphics. It supports Windows 7, Vista, and XP in 32 and 64-bit editions with up to 512GB RAM.

Coreldraw X6

CorelDRAW Graphics Suite X6 was developed for designing large sizes of files. Its styles help you to design any art with consistency if you are working to create multiple drawings, documents, & text. Through this, you can create a layout for a huge project. It supports Windows 7 or higher devices and requires 1GB of space.

Coreldraw X7

In this CorelDRAW version list, this version comes under one of the revolutionary art editing apps. CorelDRAW X7 Graphic Suite has an easy use and a customizable user interface. You have control over the text, colors, transition, and every other editing tool. Corel PHOTO-PAINT supports PSD files that make it easy to get access to the designing files from anywhere. The RAW file supports more than 300 types of cameras. The digital assets provide users with more than 10000 ClipArt images, 200 photos, and 600 templates. This supports Windows 7, 8, & 8.1 which requires a minimum of 2GB RAM.

Coreldraw X8

CorelDRAW Graphics Suite X8 supports 4K displays that create designed stuff clearly like comics characters, logos, and web graphics. It was quite an advanced editing app amongst other CorelDRAW version list. This supports Windows 7 to 10 which require 2GB RAM and 1GB of hard disk space.

Coreldraw Graphic Suite (2017)

This latest version let you design in real-time with a live sketching option. It is easy to use on any pen-enabled device like a tablet. Live sketch and AI program help you to make your design more perfect. You can use its premium plugins and extension.

Coreldraw Graphic Suite (2018)

This version improves the speed and workflow of designers. An additional option for creating photo collages available you can build mosaic tiles with Photococktail that transform into amazing collages. This was quite a multi-function art and editing app in the CorelDRAW version list.

Coreldraw Graphic Suite (2019)

This has a non-destructive effect which makes it easy to apply or modify the bitmaps effect. The new form of template is easy to control and download easily. This supports CDR, PDF, PNG, JPEG, and SVG by this you can share your files from any device. Other previous features were also upgraded in this version of **Coreldraw**.

Coreldraw Graphic Suite (2020)

It is the upgraded version that is advanced in the form of vector illustration, layout, and photo editing, on Windows, Mac, or the Web. This was the favorite editing and art app of users in the CorelDRAW best version list. The one-click image enhancements that make the latest in machine learning offer you 10 times faster performance. You can get the

Coreldraw Graphic Suite (2021)

This CorelDraw version list updated its image-editing and pixel-based design program font variety and management tools. The victor to bitmap tracing and more than 7000 clipart, more than 1000 digital photos, more than 150 templates, and 1000 plus true type with open type fonts. It is still in use as the CorelDRAW latest version. The CorelDRAW Graphic Suite promo code help to let you get this product with a great discount.

Coreldraw Graphic Suite (2022)

The **Coreldraw** Graphic Suite 2022 is the most recent app version launched by Corel Corporation. The latest Corel DRAW version list has new adjusted presets, multiple view pages, and a face. This offers a multi-asset export option. It has a user-friendly interface that let you customize shortcut keys.

Basics of coreldraw and various tools and uses

Objectives: At the end of this lesson you shall be able to

- explain coreldraw
- coreldraw tools and uses

Introduction Coreldraw :-

CorelDraw is a software program for editing vector graphics

Vector graphics are created in graphics packages and consist of objects. Each object can be edited separately, meaning that the shape, colour, size and position can be changed.

Developed by Ottawa-based software company, Corel, CorelDraw, styled CorelDRAW, allows users to do things like add special effects such as borders to images, in addition to allowing for contrast adjustment, colour balancing and more.

One of the handy features of the software is that it can also work with multiple layers and multiple pages.

Use of Corel Draw

It is used for designing different artwork like poster, logo, cards any vector related graphics. We discuss its uses below:

Make a poster in Coreldraw

Designing a poster in Corel is a bit different technique than any other thing because there are fewer rules which are to be followed.

Here we would learn how to create a background in the image below; (Fig 1) it shows how to add images, text, and logo.

- **Create a basic shape for regular need**

The basic shapes we need in our daily life like big

Fig 1



emoji's, sketches of cartoons for making stickers, the sticker of an animal, a sticker of an automobile, etc. Basic shapes are much easier to draw in the CorelDraw; we just have to drag and drop some shapes like circle, rectangle, ellipse, line, ovule, etc. So we can say that with the uses of CorelDraw, it

is easy to draw basic shapes. (Fig 2) Either we can import images for our needs. (Fig 3)

Fig 2



Fig 3



- **We can use it to make a small invitation card.**

We can use Coreldraw to make small basic invitation cards at home as well as if we know how to make basic shapes. It is very useful for us as we don't have to go to any shop for it. (Fig 4)

Fig 4



• Converting Bitmap to Objects

Converting from BITMAP to object is a bit complicated work, but Corel provides an easier way of doing it as Corel has a good collection of tools through which converting makes easier.

We just have to the right click on Bitmap and select what we want to do (Fig 5)

- The quick race is a command that will convert from Bitmap to Vector object.
- Centerline trace is a command that tries to extract the centreline of your Bitmap and removes the rest.
- Outline trace is a command that tries to extract the outline of a Bitmap.

• Using CorelDraw with Other Programs

CorelDraw is designed to work with the other software's as well. The other software that the Coral Corporation designs is "Coral Photo Paint", which can be incorporated with Coral Draw. As the Graphics designed can be edited and recreated with Coral Paint.

Fig 5



When we save the graphic, it can be saved in other formats that are compatible with the other software. It can be saved in formats like PNG, CDR, Jpeg etc. These images saved can be opened in Adobe Illustrator as well. These all the saved formats makes a bond with other designers to make alterations in design on the device in an easier way.

Coreldraw Tools and uses (Fig 6)

- **Pick Tool = To select, resize, and rotate toward the image object. (Fig 7)**

Fig 6

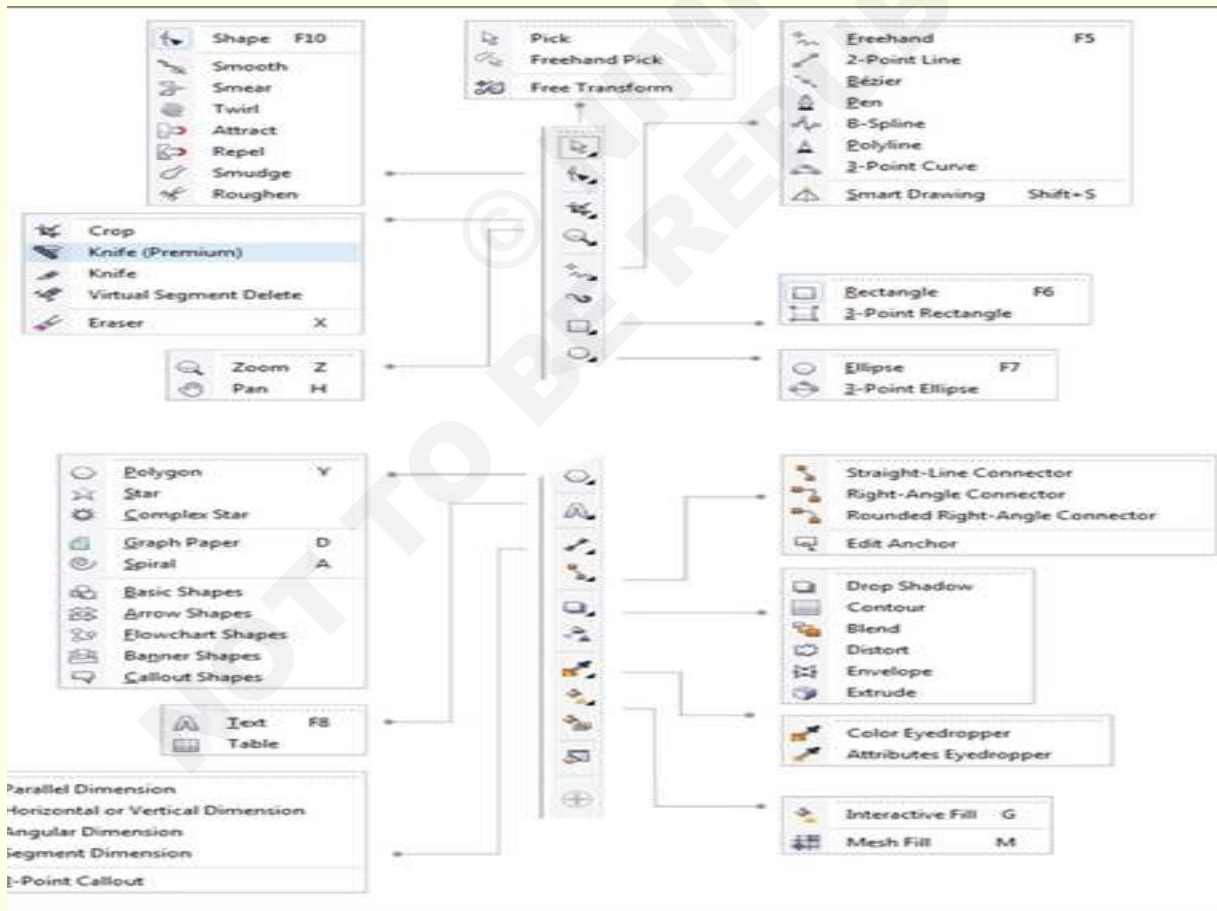
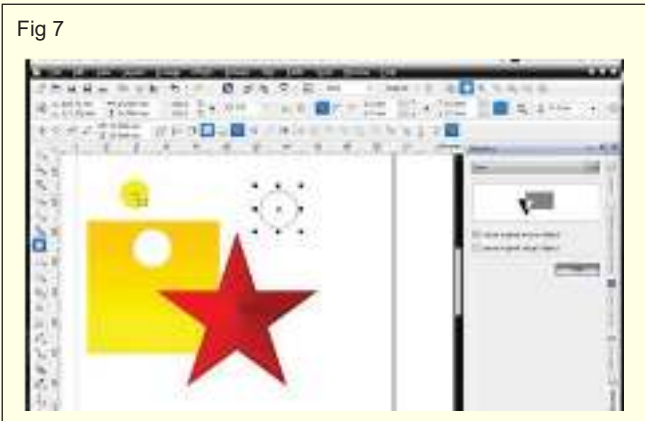
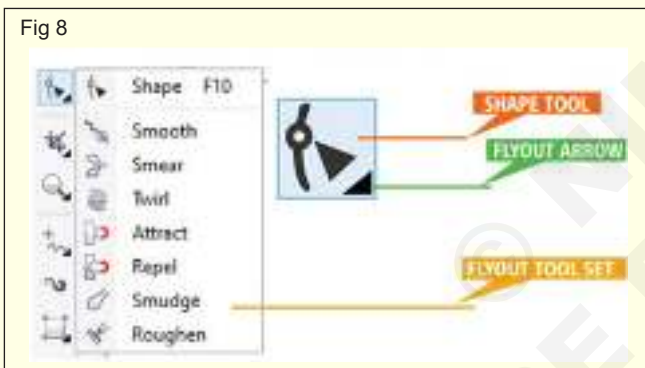


Fig 7



- **Shape Edit (Fig 8)**
- **Shape** : Editing an image object shape.
- **Smudge Brush** : Alter / distort the overall picture with attractive shorelines.
- **Roughen Brush** : Alter / distort the overall outline shape drawing by attractive shorelines.
- **Free Transform Tools** : Transform image objects using rotation (rotation)free, rotation angle, and resize, and also tilt the image shape.

Fig 8



Crop Tool (Fig 9)

- **Crop** : Eliminate the unwanted parts in the object.

Fig 9



- **Knife** : Alter / distort the overall picture with attractive shorelines.
- **Erase** : Remove the area in the picture.
- **Virtual Segment Delete** : Delete an object that is part of the intersection (the intersection).

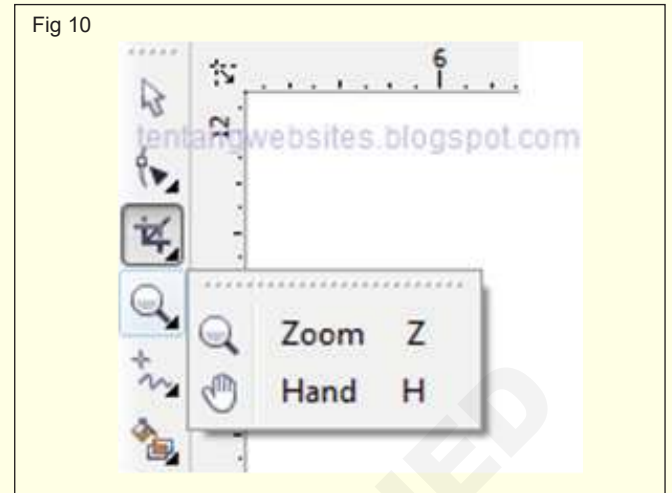
Zoom (Fig 10)

- **Zoom** : Change the magnification of the image in the

image window

- **Hand** : Adjusts the images that appear in the image window

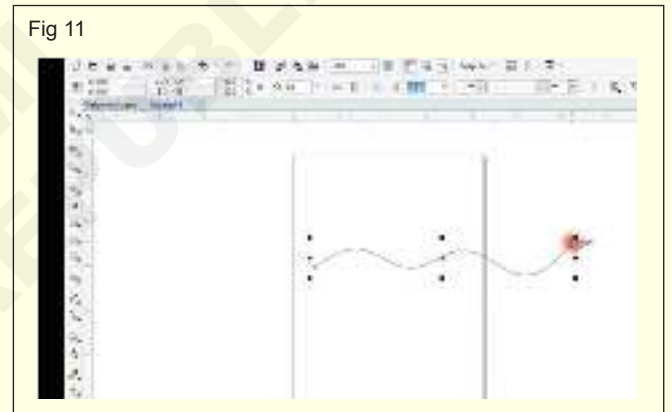
Fig 10



Curve (Fig 11)

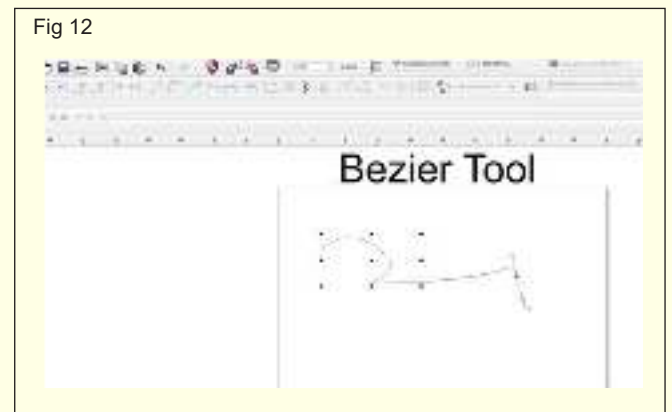
- **Freehand** : Draw segments or curves in the form of a single line

Fig 11



- **Bezier** : Drawing curves in the form of a single line per point (node) (Fig 12)

Fig 12



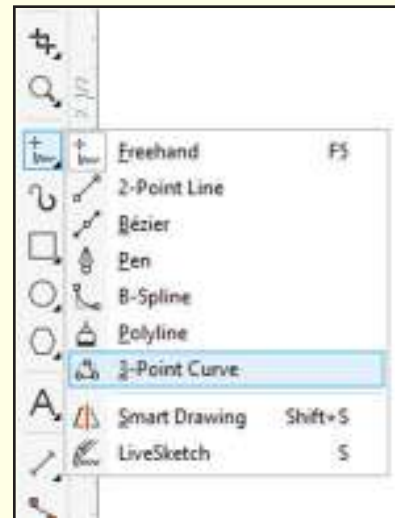
- **Artistic Media Tool** : Bring up the generator function form (pen), such as brush (brush effect with a particular pattern of outward appearance), sprayer (spray paint effects), calligraphic (calligraphy pen effects), and Pressure (pen effects techniques that will form the curved edge without lines). (Fig 13)

Fig 13



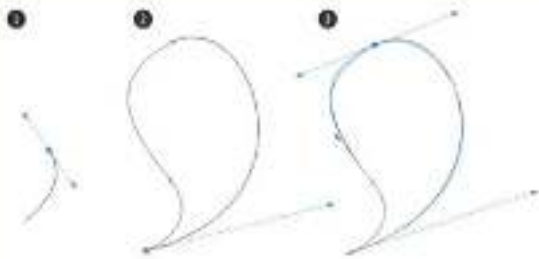
- **Pen** : Drawing curves in a segment point to point (node).(Fig 14)

Fig 17



- **Smart Tools**
- **Smart Fill** : To create objects of an area then fill with color or texture.(Fig 18),(Fig 19,20)

Fig 14



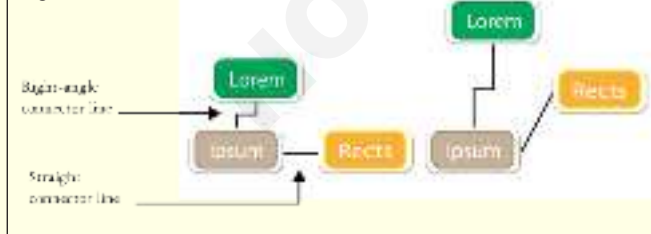
- **Polyline** : Drawing lines and curves in preview mode.(Fig 15)

Fig 15



- **Interactive Connector** : Combining the two objects with a line. (Fig 16)

Fig 16



- **3 Point Curve** : Draw a curve by specifying the start and end point, then the center of the curve. (Fig 17)
- **Dimension** : Draw a vertical line, horizontal, angular, and oblique.

Fig 18



Fig 19

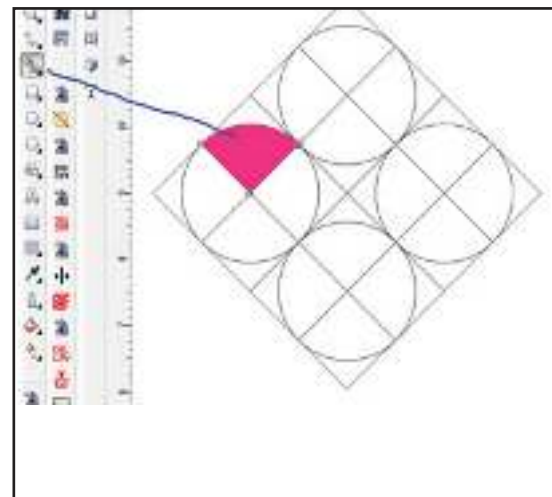
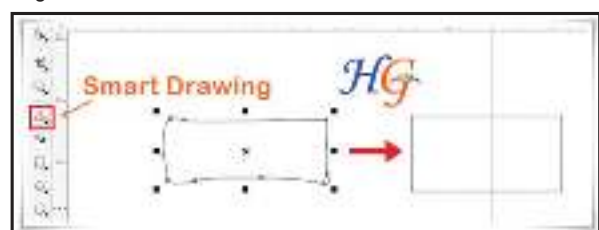


Fig 20

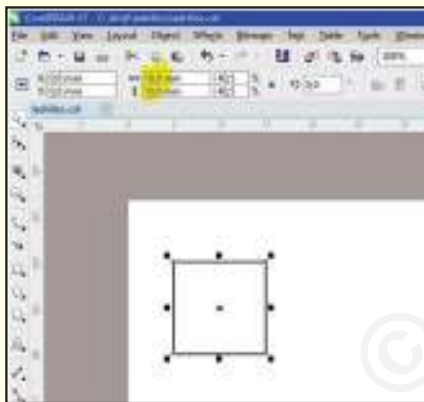


- **Smart Drawing** : To change your pointer graffiti images to form the basis of its form or shape that is more subtle.
- **Rectangle**
- **Rectangle** : To establish terms and boxes.(Fig 21 &22)

Fig 21

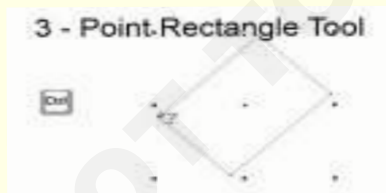


Fig 22



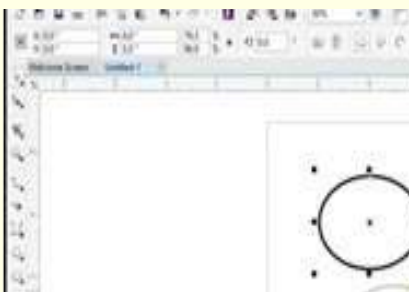
- **3 Point Rectangle** : To establish terms and arrange boxes with point to point. (Fig 23)

Fig 23



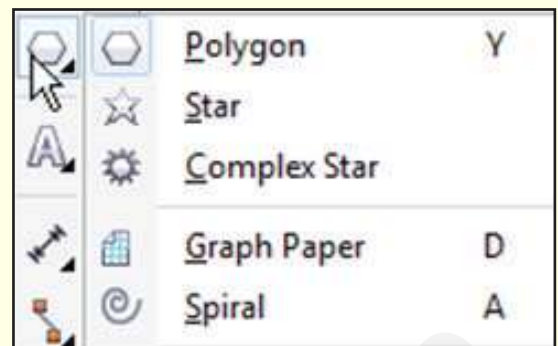
- **Ellipse**
- **Ellipse** : To draw an ellipse to a circle. (Fig 24)

Fig 24



- **Object Tools:**
- **Polygon** : To form a polygon and star symmetrically (Fig 25)

Fig 25



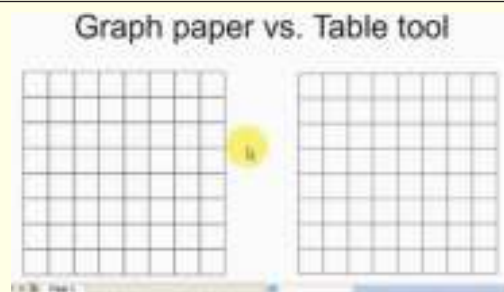
- **Star** : To form stars.
- **Complex Star** : To form stars with more complex shapes with intersection angles. (Fig 26)

Fig 26



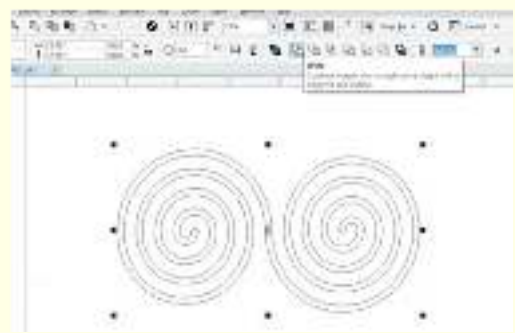
- **Graph Paper** : To establish a similar arrangement of tables or boxes such as engineering drawings on paper.(Fig 27)

Fig 27



- **Spiral** : To form a spiral (per) is symmetrical and logarithmic.(Fig 28)

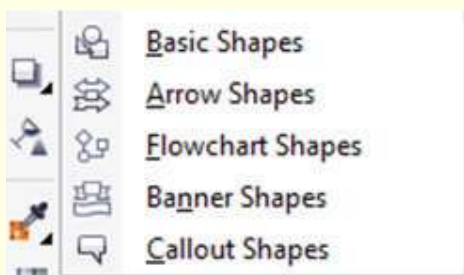
Fig 28



- **Perfect Shapes**

Click Shapes tool in Tool Box (Fig 29)

Fig 29



- **Basic Shapes** : A variety of forms so as octagonal, smiley face, until the triangle.(Fig 30)

Fig 30



- **Arrow Shapes** : To facilitate drawing arrows with various forms of variation form, direction, and number of arrowheads.(Fig 31)

Fig 31

Arrow Shapes



- **Flowchart Shapes** : To facilitate drawing flowchart shapes (chart).(Fig 32)

Fig 32

Flowchart Shapes



- **Banner Shapes** : To make it easier to draw shapes and symbols tape explosion.(Fig 33)

Fig 33

Banner Shapes



- **Callout** : To make it easier to draw and label the speech bubble shape. (Fig 34)

Fig 34

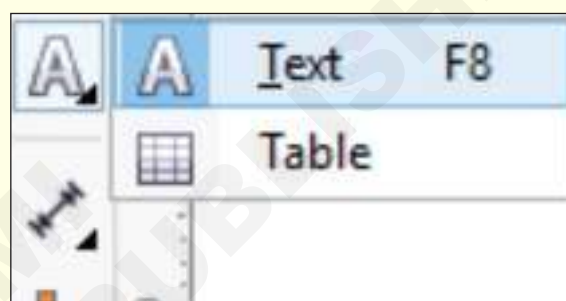
Callout Shapes



- **Text Tool** :

To make the text directly in the drawing area that serves as both an artistic and caption text.(Fig 35)

Fig 35



- **Interactive Tools**

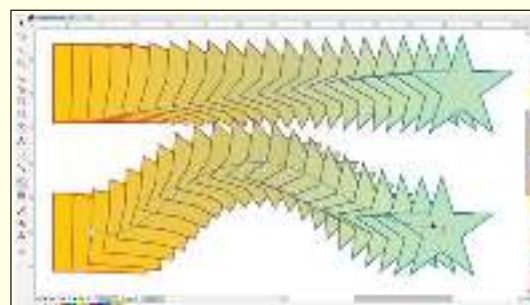
Click the interactive Tool in Tool Box (Fig 36)

Fig 36



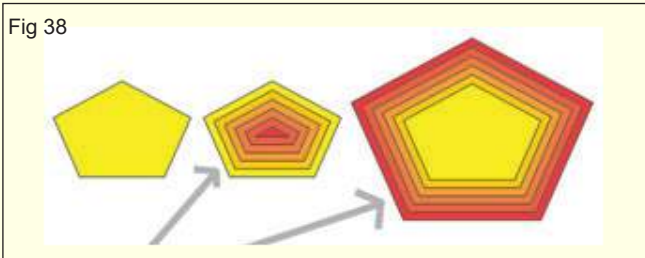
- **Interactive Blend** : To establish terms and boxes (Fig 37)

Fig 37



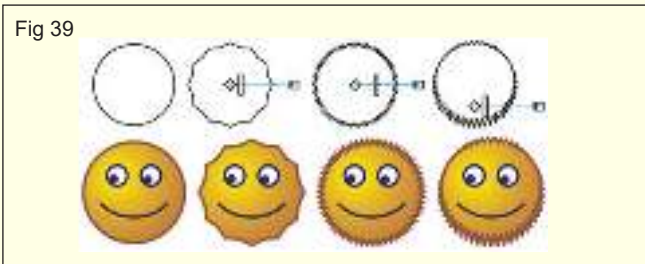
- **Interactive Contour** : To establish terms and arrange boxes with point to point (Fig 38)

Fig 38



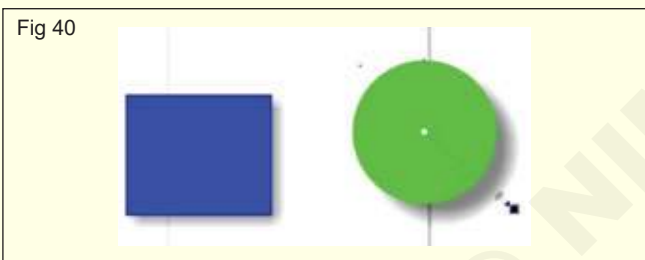
- **Interactive Distortion** : To distort objects in push / pull, zipper, and twister. (Fig 39)

Fig 39



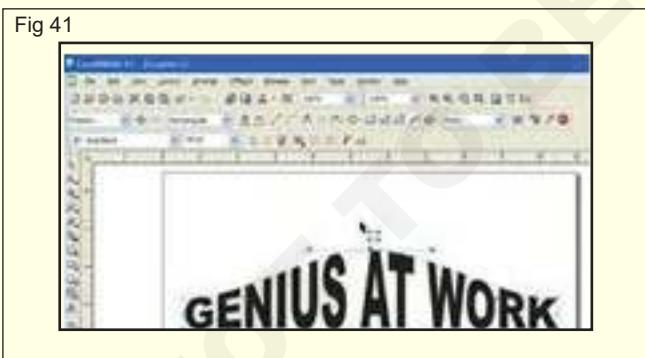
- **Interactive Drop Shadow** :To insert an object into the shadow (Fig 40)

Fig 40



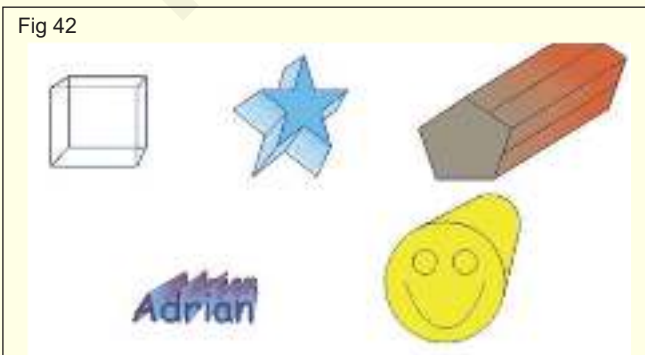
- **Interactive Envelope** : To change the shape of the object by dragging a point (node) on the outline (Fig 41)

Fig 41



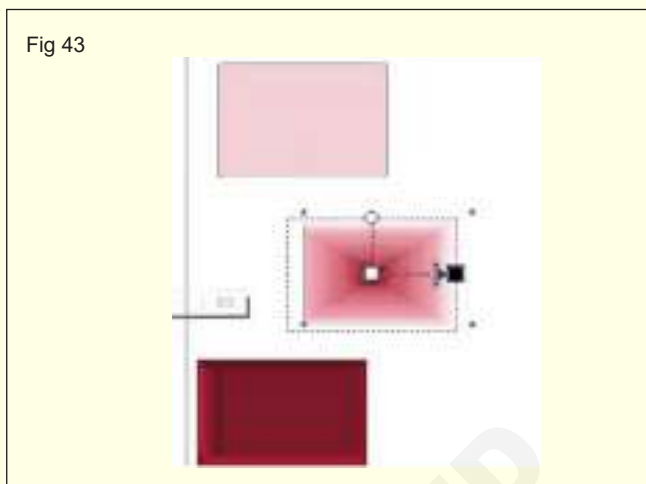
- **Interactive Extrude** : To form the illusion of depth on the object. (Fig 42)

Fig 42



- **Interactive Transparency** : To insert a transparent effect on the object. (Fig 43)

Fig 43



- **Eyedropper**
- **Eyedropper** : To select and copy the relevant properties of an object, such as color (fill in the object), lines, line thickness, size, and effects(Fig44&45)

Fig 44

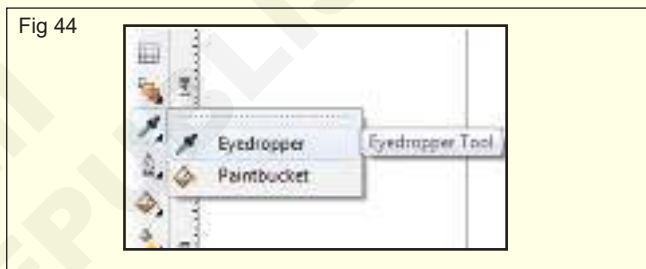
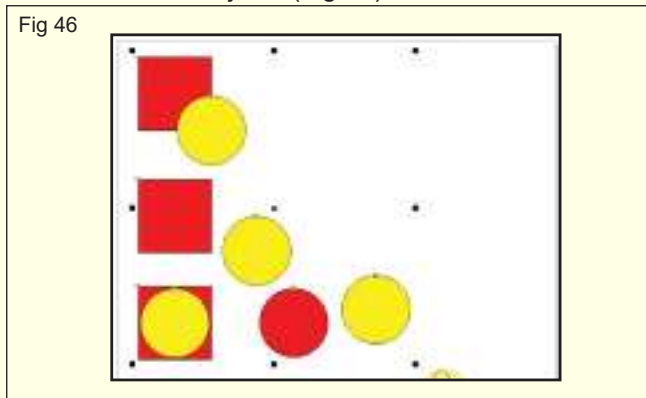


Fig 45



- **Paintbucket** : To implement the related property of an object, such as color (fill in the object), lines, line thickness, size, and effects; taken by the eyedropper tool, to other objects.(Fig 46)

Fig 46



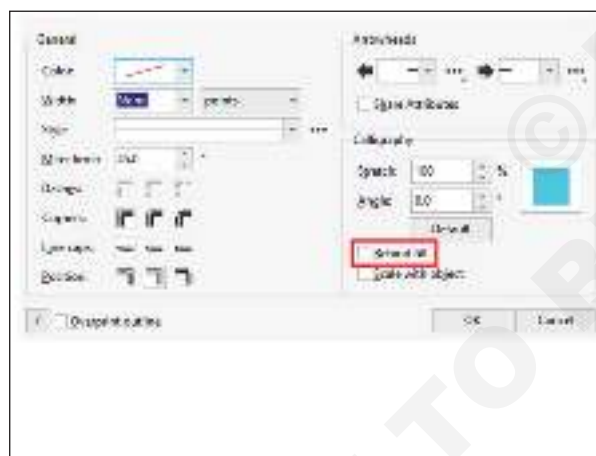
- **Outline** (Fig 47)

Fig 47



- **Outline Pen Dialog** : To access the outline pen dialog box (Fig 48)

Fig 48



- **Outline Color Dialog** : To access the color settings dialog box outline
- **No Outline** : To eliminate the outline of an object.
- **½ Point Outline** : To establish the thickness of ½ point line
- **1 Point Outline** : To form a line thickness of 1 point
- **2 Point Outline** : To form the 2 point line thickness.
- **8 Point Outline** : To form the line thickness 8 points.
- **16 Point Outline** : To form the 16 point line thickness.
- **24 Point Outline** : To form a 24-point line thickness.
- **Color Docker Window** : To open the docker for setting color and object outline.

- **Fill Tools**

- **Fill Color Dialog** : To access the settings dialog box of paint (charger interior of the object) of an object (Fig 49)
- **Fountain Fill Dialog** : To access the dialog box filler color and gradation to the object. (Fig 50)

Fig 49

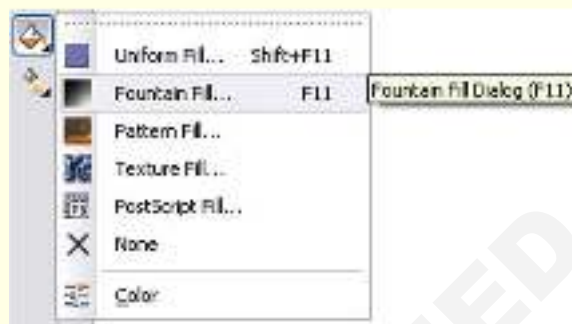
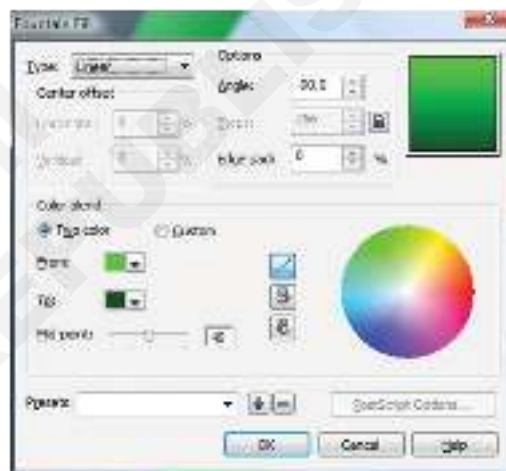


Fig 50



- **Pattern Fill Dialog** : To access the dialog box filler patterns into objects.
- **Texture Fill Dialog** : To access the dialog box filler into the texture object.
- **Post Script Fill Dialog** : To access the dialog box filler image post-script to the object.
- **No Dialog** : To eliminate the filler element of an object
- **Color Docker Window** : To open the docker for setting color and object outline.
- **Interactive Fill** : To fill a variety of fill (filler objects) into an object.(Fig 51 &52)
- **Mesh Fill** : To apply network lines on an object may be useful (Fig 53)

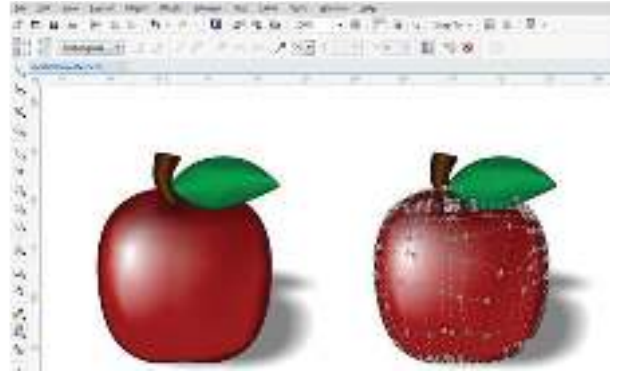
Fig 51



Fig 52



Fig 53



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Vector & Bitmap, and colour pattern

Objectives: At the end of this lesson you shall be able to

- difference between Vector and Bitmap
- explain CMYK, RGB and Pantone Colours

Bitmap

A Bitmap is a type of graphic that consists of small elements called pixels. Bitmap graphics are also called raster images.

The pixels hold some color and when they are arranged together, they form an image. Whenever you look at some screen, you see tiny dots called pixels.

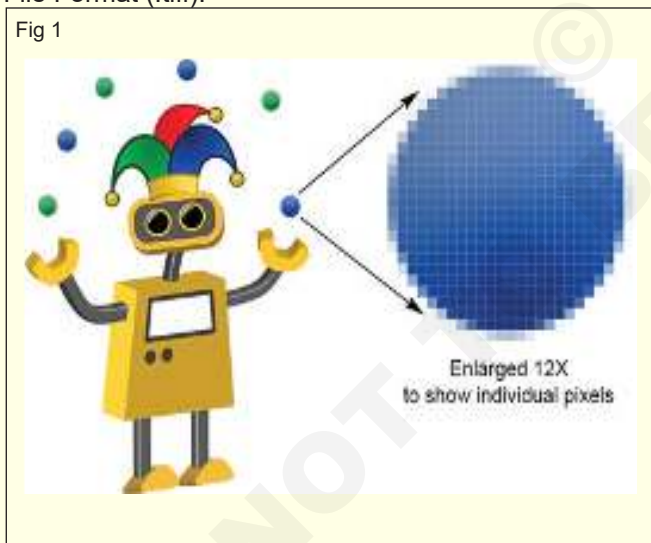
Bitmap graphics are resolution-dependent. That means, if you scale them too much, you can lose the image quality.

If you zoom out the picture too much, you can see the blurry edges, and the image becomes jagged.(Fig 1)

So it is advised that you do not scale bitmap images too much. Only slight resizing is possible. The term to define the resolution of a picture is dots per inch (dpi).

Photographs are bitmap or raster images. Some of the most popular bitmap formats are Photographic Expert Group (.jpg), Graphics Interchange Format (.gif), Portable Network Graphics (.png), and Tagged Image File Format (.tiff).

Fig 1



The outputs of printers and scanners are also bitmap. The input-output devices like digital cameras, monitors, etc produce bitmap images.

The software that is most widely used for editing photographs in Adobe Photoshop.

Vector

A vector graphic is a type of graphic that uses geometric shapes like lines, curves, circles, and polygons to compose an image. The mathematical formulas establish those points on the grid.(Fig 2)

Vector graphics are not resolution-dependent. That means, it is possible to scale them without worrying about the picture quality because the mathematical formulas redraw the image at that required scale.

This feature has a certain advantage over other types of graphics. That is why vector graphics are quite popular all over the world. They appear smooth at any resolution.

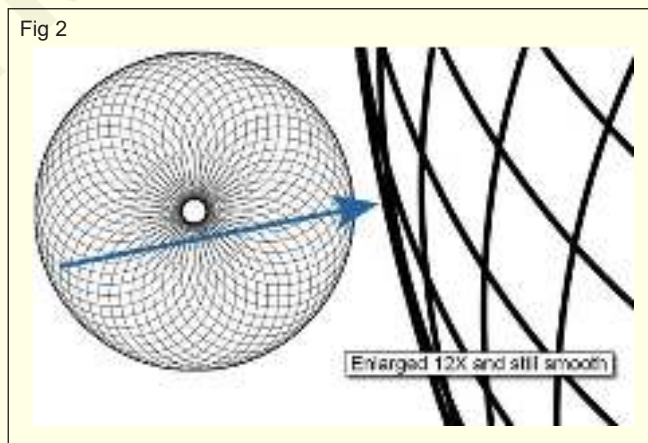
The most commonly used vector formats are Adobe Illustrator File (.ai), Scalable Vector Graphics (.svg) and Encapsulated PostScript (.esp).

The software used worldwide to make and edit vector graphics are Adobe Illustrator, Corel Draw, Adobe InDesign, and also CAD Systems. Logos, clip arts, posters, and abstract images are all vector graphics.

In the world of graphic design, vector graphics are used almost anywhere. Due to their scalable feature, the logo can be put on a billboard and it would still have solid colors and consistency.

Animations also require vector graphics because of the resolution independency. The animation industry makes billions every year so vector graphics are always in demand.

Fig 2



Main Differences Between Bitmap and Vector

Some of the features that differentiate between Bitmap and Vector are given below:

- A bitmap is a type of graphics that are made up of small elements called pixels while a vector is a type of graphics that is made up of lines and curves.
- The commonly used formats for bitmap are .jpg, .gif, .png, .psd, .tiff while the commonly used vector graphics are .ai, .svg, .ps, .eps, .svf.
- The basic element of bitmap images is pixels whereas the basic element of vector graphics is

geometric shapes.

- Resizing a bitmap graphic affects the quality of the picture while resizing a vector graphic does not affect its quality.
- Bitmap graphics are mostly photographs while vector graphics are mostly logos, icons, and clip arts.
- Bitmap images can be edited through Adobe Photoshop while vector graphics can be edited through Adobe Illustrator.
- Bitmap images are comparatively larger than vector images. Vector images have a smaller file size as compared to bitmap images.

CMYK

CMYK stands for Cyan, Magenta, Yellow and Key. In laymen terms, you can think of this as blue, red, yellow and black. The CMYK color model is also called “process color” or “four color”, and it is a **subtractive color model**, which means as the colors overlap, the light wavelengths are absorbed and what you see is the

Fig 3



visible spectrum of wavelengths that weren't absorbed. (Fig 3)

If you don't care to know the science, just know CMYK uses a mixture Cyan, Magenta and Yellow create the

Fig 4



whole range of colors. Within CMYK you can adjust the levels of each color by percentages to produce different colors. (Fig 4)

When using CMYK in graphic design, you're digitally assigning a value for each C, M, Y and K to produce

the desired color. The printing process then mixes those exact values to produce the color in print.

An important thing to understand about CMYK is halftoning. The print process actually overlays tiny dots of C, tiny dots of M, Y and K over each other to produce, what seems to the human eye, a solid tone. Though up close you can see it is indeed pixelated. Rather needing, say 20 inks, you can provide all 20 colors with just the four CMYK values. What's more, halftones allow for nice gradients and transparencies.

RGB

Opposite of CMYK is RGB, and this stands for Red, Green Blue. RGB is an **additive color model**, which

Fig 5



means it adds the color's light wavelengths together to produce new colors. (Fig 5)

RGB is used for digital and electronic coloring — so TV, HTML (websites), digital cameras and so forth are best suited for RGB color mode.

RGB is a device-dependent color. This means different devices may display the RGB values differently.

Pantone

Fig 6



Pantone; also known as, Pantone Matching System or PMS is actually a company that has created a proprietary color space mostly used in printing. Pantone is the standard in color matching and standardization.

(Fig 6)

Pantone uses the CMYK method to produce what's called a spot color; also known as solid color.

Here's the deal, CMYK can look really different from screen to screen, and it can look even more different in real life print. Pantone set out to solve this problem by producing physical swatches of all the colors and assigning a numeric value to them (i.e. Pantone 103, or Pantone 365C)

Pantone has dozens of physical swatch books and digital books to match so you can use the Pantone colors in your digital artwork.

As well, Pantone comes in **coated** and **uncoated**, which literally refers to the paper the ink is printing on. So when you're designing for print, be sure to take the material into consideration for choosing which PMS book you'll be needing.

Printing in Pantone will always produce sharp, consistent colors

When to use CMYK vs. RGB vs Pantone

CMYK

- Collateral print
- Home printing
- When budget is a concern

RGB

- Digital

Pantone

- Screen printing
- Textile/product manufacturing
- When color accuracy is important

Coreldraw Screen and page setup

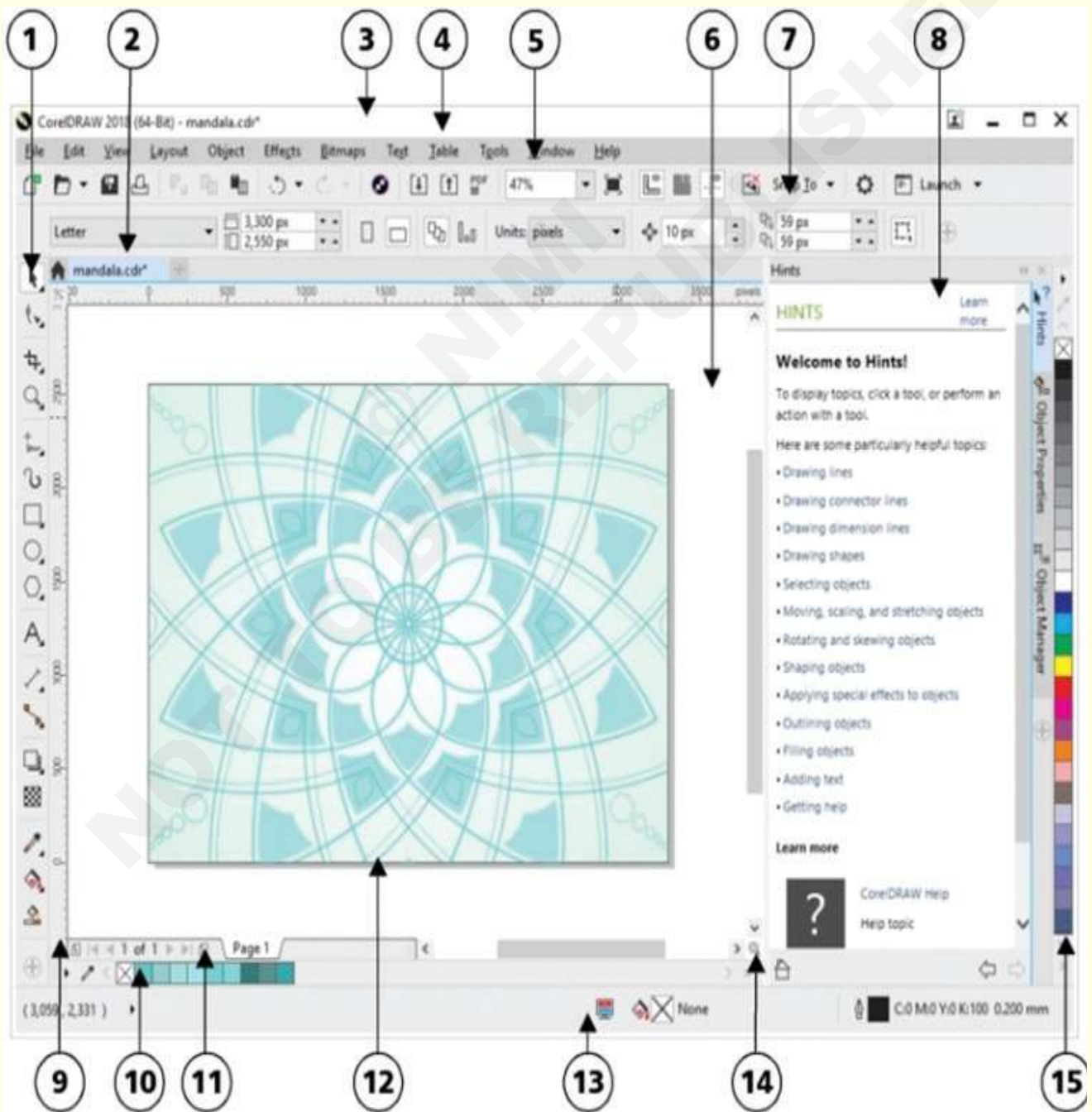
Objectives: At the end of this lesson you shall be able to

- CorelDraw Basic Screen and Parts
- CorelDraw Page Setup

Basic Screen in Coreldraw

- Coreldraw, the application window opens containing a drawing window. Although more than one drawing window can be opened, you can apply commands to the active drawing window only.
- The Coreldraw application window appears below (Fig 1)

Fig 1



Part	Description
1. Toolbox	A docked bar with tools for creating, filling, and modifying objects in the drawing
2. Document tab	A tab displays for each open document to allow you to quickly move between documents
3. Title bar	The area displaying the title of the currently selected drawing
4. Menu bar	The area containing pull-down menu options
5. Toolbar	A detachable bar that contains shortcuts to menu and other commands
6. Drawing window	The area outside the drawing page bordered by the scroll bars and application controls
7. Property bar	A detachable bar with commands that relate to the active tool or object. For example, when the text tool is active, the text property bar displays commands that create and edit text.
8. Docker	A window containing available commands and settings relevant to a specific tool or task
9. Rulers	Horizontal and vertical borders that are used to determine the size and position of objects in a drawing
10. Document palette	A dockable bar that contains color swatches for the current document
11. Document navigator	The area at the bottom left of the application window that contains controls for moving between pages and adding pages
12. Drawing page	The rectangular area inside the drawing window. It is the printable area of your work area.
13. Status bar	An area at the bottom of the application window that contains information about object properties such as type, size, color, fill, and resolution. The status bar also shows the current cursor position.
14. Navigator	A button at the lower-right corner that opens a smaller display to help you move around a drawing
15. Color palette	A dockable bar that contains color swatches

Coreldraw Document Setup

It's important to learn how to get your document set up properly from the beginning, to help your design process flow smoothly.

Set a Page Size and Orientation

- Click **Layout** ► **Page setup**.

The Options dialog box appears with the Page size page displayed.

- Perform a task from the following table.

Dialog Box Option	Do the following
Choose a preset page size	Choose a paper type from the Size list box.
Match the page size and orientation to the printer settings	Click Get page size from printer.
Specify a custom page size	Type values in the Width and Height boxes.
Set the page orientation	Click the Landscape or the Portrait button.
Set the page size and orientation for an individual page in a multipage document	Make sure the page you want to change is displayed in the drawing window, choose a page size and orientation, and enable the Apply changes to current page only check box.
Display the page border	Enable the Show page border check box.
Add a frame around the page	Click the Add page frame button.
Choose a rendering resolution for the document	Choose a resolution from the Rendering resolution list box. This option is available only when the Unit of measurement is set to Pixels.
Set a bleed limit	Enable the Show bleed area check box, and type a value in the Bleed box.

Introduction to cloud computing

Objectives: At the end of this lesson you shall be able to

- **cloud servers and types of cloud server**
- **introduction of Cloud storage and its types**

Cloud servers and types of cloud server

What is a cloud server?

A cloud server is a compute server that has been virtualized, making its resources accessible to users remotely over a network. Cloud servers are intended to provide the same functions, support the same operating systems (OSes) and applications, and offer similar performance characteristics as traditional physical servers that run in a local data center. Cloud servers are often referred to as virtual servers, virtual private servers or virtual platforms.

Cloud servers are an important part of cloud technology. Widespread adoption of server virtualization has largely contributed to the rise and continued growth of cloud computing. Cloud servers power every type of cloud computing delivery model, from infrastructure as a service (IaaS) to platform as a service (PaaS) and software as a service (SaaS).

How do cloud servers work?

Cloud servers work by virtualizing physical servers to make them accessible to users from remote locations. Server virtualization is often, but not always, done through the use of a hypervisor. The compute resources of the physical servers are then used to create and power virtual servers, which are also known as cloud servers. These virtual servers can then be accessed by organizations through a working internet connection from any physical location.

In a public cloud computing model, cloud vendors provide access to these virtual servers and storage resources in exchange for fees that are typically structured as a pay-as-you-go subscription model. Cloud computing delivery models that include only virtual servers, storage and networking are called IaaS. PaaS products provide customers a cloud computing environment with software and hardware tools for application development, which are powered by cloud servers, storage and networking resources. In the SaaS model, the vendor delivers a complete, fully managed software product to paying customers through the cloud. SaaS applications rely on cloud servers for compute resources.

Although private cloud servers work similarly, these physical servers are part of a company's private, owned infrastructure.

Types of cloud servers

An enterprise can choose from several types of cloud servers. Three primary models include:

Public cloud servers. The most common expression of a cloud server is a virtual machine (VM) -- or compute "instance" -- that a public cloud provider hosts on its own infrastructure and delivers to users across the internet using a web-based interface or console. This model is known as IaaS. Examples of cloud servers include Amazon Elastic Compute Cloud (EC2) instances, Microsoft Azure instances and Google Compute Engine instances.

Private cloud servers. A cloud server may also be a compute instance within an on-premises private cloud. In this case, an enterprise delivers the cloud server to internal users across a local area network (LAN) and, in some cases, also to external users across the internet. The primary difference between a hosted public cloud server and a private cloud server is that the latter exists within an organization's own infrastructure, whereas a public cloud server is owned and operated outside of the organization. Hybrid clouds may include public or private cloud servers.

Dedicated cloud servers. In addition to virtual cloud servers, cloud providers can supply physical cloud servers, also known as bare-metal servers, which essentially dedicate a cloud provider's physical server to a user. These dedicated cloud servers -- also called dedicated instances -- are typically used when an organization must deploy a custom virtualization layer or mitigate the performance and security concerns that often accompany a multi-tenant cloud server.

A comparison between private, hybrid and public cloud computing delivery models.

Cloud servers are available in a wide range of compute options, with varying processor and memory resources. This enables an organization to select an instance type that best fits the needs of a specific workload. For example, a smaller Amazon EC2 instance might offer one virtual CPU and 2 GB of memory, while a larger Amazon EC2 instance provides 96 virtual CPUs and 384 GB of memory. In addition, it is possible to find cloud server instances that are tailored to unique workload requirements, such as compute-optimized instances that include more processors relative to the amount of memory.

While it's common for traditional physical servers to include some storage, most public cloud servers do not include storage resources. Instead, cloud providers typically offer storage as a separate cloud service, such as Amazon Simple Storage Service (Amazon S3) and Google Cloud Storage. An organization provisions and

associates storage instances with cloud servers to hold content, such as VM images and application data.

Benefits of cloud servers

The choice to use a cloud server will depend on the needs of the organization and its specific application and workload requirements. Some potential benefits include:

Ease of use. An administrator can provision a server in a matter of minutes. With a public cloud server, an organization does not need to worry about server installation, maintenance or other tasks that come with owning a physical server.

Globalization. Public cloud servers can globalize workloads. With a traditional centralized data center, admins can still access workloads globally, but network latency and disruptions can reduce performance for geographically distant users. By hosting duplicate instances of a workload in different global regions, organizations can benefit from faster and often more reliable access.

Cost and flexibility. Public cloud servers follow a pay-as-you-go pricing model. Compared to a physical server and its maintenance costs, this can save an organization money, particularly for workloads that only need to run temporarily or are used infrequently. Cloud servers are often used for temporary workloads, such as software development and testing, as well as for workloads where resources need to be scaled up or down based on demand. However, depending on the amount of use, the long-term and full-time cost of cloud servers can become more expensive than owning the server outright. Furthermore, a full breakdown of cloud computing expenses is important to avoid hidden costs.

A comparison between cloud servers and physical on-premises servers.

Challenges of cloud servers

The choice to use a cloud server may also pose some potential disadvantages for organizations.

Regulation and governance. Regulatory obligations and corporate governance standards may prohibit organizations from using cloud servers and storing data in different geographic locations.

Performance. Because cloud servers are typically multi-tenant environments, and an admin has no direct control over those servers' physical location, a VM may be adversely impacted by excessive storage or network demands of other cloud servers on the same hardware. This is often referred to as the "noisy neighbor" issue. Dedicated or bare-metal cloud servers can help an organization avoid this problem.

Outages and resilience. Cloud servers are subject to periodic and unpredictable service outages, usually due to a fault within the provider's environment or an unexpected network disruption. For this reason, and because a user has no control over a cloud provider's infrastructure, some organizations choose to keep

mission-critical workloads within their local data center rather than in the public cloud. Also, there is no inherent high availability or redundancy in public clouds. Users that require greater availability for a workload must deliberately build that availability into the workload.

Considerations

When organizations are evaluating the use of cloud servers to satisfy their compute needs, there are a few key considerations.

- **Virtual cloud servers vs. physical servers.**

While virtual cloud servers can be convenient, easy to manage and budget-friendly, their use is indicated more for highly variable workloads than data-intensive workloads. Generally, physical servers are more customizable and powerful than virtual servers.

- **Types of virtualization.**

Though hypervisor-assisted virtualization is the most common, there are other types of server virtualization, such as hardware, hardware-assisted, paravirtualization and OS-level.

- **Security.**

Security remains a major concern for cloud technology. Providers should leave no stone unturned when it comes to ensuring they have the right security options in place for protecting their virtual servers.

When considering any type of cloud service, organizations should examine the specific cloud servers the provider uses -- such as the type, configuration and virtualization technology. While use of cloud servers for computing tasks can offer customers many specific benefits compared to physical servers, certain use cases can favor traditional on-premises servers.

Introduction of Cloud storage and its types

While creating a site backup it is very important for the website's security to store backups in a secure location. That is where the Cloud Storage comes in. Unfortunately, many businesses rely on outdated storage solutions (such as local servers), which may cause loss of vital data.

What is cloud storage?

Cloud storage is a service which lets you store data by transferring it over the Internet or another network to an offsite storage system maintained by a third party. There are hundreds of different cloud storage systems which include personal storage which holds and/or backs up emails, pictures, videos and other personal files of an individual, to enterprise storage which lets businesses use cloud storage as a commercially-supported remote backup solution where the company can securely transfer and store data files or share them between locations.

Storage systems are typically scalable to suit an individual's or organisation's data storage needs,

accessible from any location and are application-agnostic for accessibility from any device. Businesses can select from three main models: a public cloud storage service which is suitable for unstructured data, a private cloud storage service which can be protected behind a company firewall for more control over data and a hybrid cloud storage service which blends public and private cloud services together for increased flexibility.

What is Cloud Storage

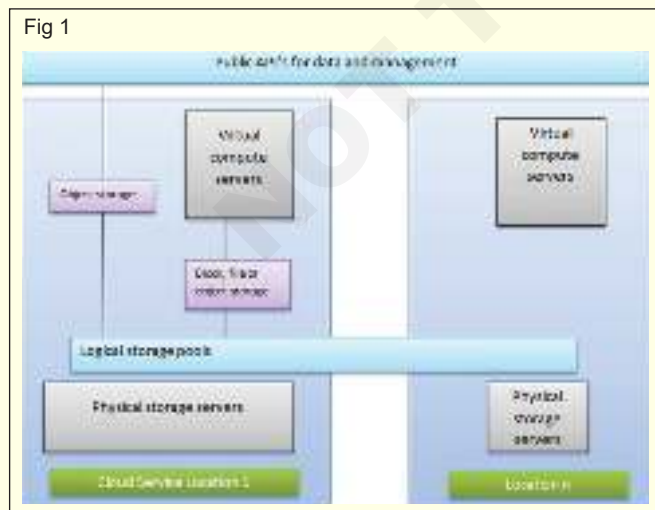
Cloud storage is a digital storage solution which utilizes multiple servers to store data in logical pools. The organizations buy the storage capacity from the providers to store user, organization, or application data. In past few years, the cloud storage has grown in popularity and has become a direct challenger to local storage, mainly due to the benefits it provides:

- **Security:**
The backups are located across multiple servers and are better protected from data loss or hacking.
- **Accessibility:**
The data stored is accessible online regardless of location.
- **Amazon S3:**
It enables file storage to multiple servers and offers file encryption wherein we can share the data publicly.
- **Google Cloud:**
It offers unlimited storage space. It also has the ability to resume the file transfer after a failure.

History of Cloud Storage

Cloud computing was invented by Joseph Carl Robnett Licklider in the 1960s with his work on ARPANET that connects people and data from anywhere at any time.

In 2006, Amazon Web Services introduced storage device AWS S3. In 2009, Google released their application systems like Google Docs and Google



sheets. Hence, the cloud has been around and functional for quite some time.(Fig 1)

Cloud storage is based on virtualized infrastructure and is like cloud computing in terms of accessible interfaces, scalability and metered resources. A cloud-storage service is utilized from an off-premises service (Amazon S3).

It refers to a hosted object storage service, but the term has broadened to include other types of data storage that are now available as a service, like block storage.

Object storage services like Amazon S3, Oracle Cloud-Storage and Microsoft Azure Storage, Object Storage Software like Open Stack Swift are all examples of storage that can be hosted and deployed with cloud-storage characteristics.

Types of Cloud Storage

There are four types of Cloud-Storage as detailed below:

Personal Cloud Storage

It is a subset of public cloud-storage that stores individual's data in the cloud and provides the individual with access to the data from anywhere. It also provides data syncing and data sharing across multiple devices. An example of personal cloud-storage is Apple iCloud.

Public Cloud Storage

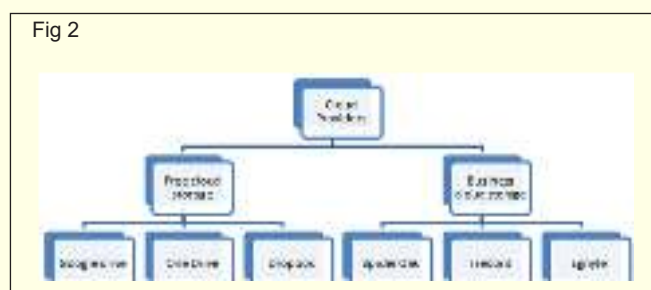
It is where the enterprise and storage service provider are separate and there aren't any cloud resources stored in the enterprise's data center. The cloud-storage provider fully manages enterprise's public cloud storage.

Private Cloud Storage

The enterprise and cloud-storage provider are integrated in the enterprise's data center. Private cloud storage helps in resolving the potential for security and performance concerns while still offering the advantages of cloud-storage.

Hybrid Cloud Storage

It is a combination of public and private cloud-storage where critical data are stored in enterprise's private



cloud while other data is stored in public cloud.

Cloud Storage Providers

Consumers and businesses continue to reduce their need to rely on local storage by placing files and applications in the cloud. (Fig 2)One has to choose a provider who will offer the maximum amount of low-cost storage and bandwidth, while still keeping your data safe.

Free Cloud Storage

Below is the list of some top rated Cloud Storage providers:

Google Drive

Google is one of the giants in cloud-storage.(Fig 3) It offers

Free Data Storage up to 15GB – Google Drive is one of the most generous cloud offerings. Google storage space is also shared with other Google services including Gmail and Google Photos. Mobile apps are also available for easy access for iOS and Android users.

Fig 3



- Backup and Sync Desktop App – It lets you to synchronize files from PC to the cloud.
- G Suite Tools – Includes online office tools for word processing, spreadsheets and presentations which make sharing files with others effortless.

Fig 4



One Drive

One Drive is particularly for Microsoft Windows users. (Fig 4) It allows 5GB of free data storage. It has a great integration with Microsoft products. The files can be edited without downloading. File sharing in One Drive is possible with other users even if they aren't One Drive users.

Dropbox

It has a great storage support for third-party apps with web interface that remains streamlined and easy-to-use.(Fig 5)

Fig 5



Dropbox has 2GB of storage space for new users. However there are other ways for boosting this space without paying, such as inviting friends (500MB for referral), completing getting started guide (250MB), etc.

There are desktop apps for Windows, Linux and Mac, and mobile apps including Android, iOS and even Kindle.

The web version lets you edit files without the need of downloading them.

Business Cloud Storage

The examples of Business Cloud-Storage are as follows:

Spider Oak

Founded in 2007, Spider Oak is a collaboration tool, file hosting and online backup service. (Fig 6)It allows users to access, synchronize and share data using a cloud-

Fig 6



based server.

The main focus in Spider Oak is on privacy and security. The tool has a very basic design which makes the admin console and all central device management very straightforward to use. It also includes drag and drop feature for organizing files.

Tresorit

Founded in 2011, Tresorit is a cloud storage provider based in Hungary and Switzerland.(Fig 7) It emphasizes on enhanced security and data encryption

Fig 7



for businesses and personal users.

It allows you to keep control of your files through 'zero-knowledge encryption' which means only you and the chosen few you decide to share with and see your data.

Egnyte

Founded in 2007, Egnyte provides software for enterprise file synchronization and sharing.(Fig 8) It

Fig 8



allows businesses to store their data locally and online.

It integrates with applications such as Office 365. This allows both remote and internal employees to access the files with ease.

Advantages of Cloud Storage

The advantages of Cloud Storage include:

- **File Accessibility** – The files can be accessed at any time from any place so long as you have Internet access.
- **Offsite Backup** – Cloud Storage provides organizations with offsite (remote) backups of data which in turn reduces costs.
- **Effective Use of Bandwidth** – Cloud storage uses the bandwidth effectively i.e. instead of sending files to recipients, a web link can be sent through email.
- **Security of Data** – Helps in protecting the data against ransomware or malware as it is secured and needs proper authentication to access the stored data.

Disadvantages of Cloud Storage

The disadvantages of Cloud Storage include:

- **Dependency on Internet Speed** – If the Internet connection is slow or unstable, we might have problems accessing or sharing the files.
- **Dependency on a Third Party** – A third party service provider (company) is responsible for the data stored and hence it becomes an important pre-requisite in selecting a vendor and to examine the security standards prior investing.
- **High Cost for Huge Data** – Organizations that require a large amount of storage may also find costs increase significantly even after the first few gigabytes of data stored.
- **No/ Minimal Control over Data Storage Framework** – Since the cloud storage framework is entirely managed and monitored by the service provider, the customer has minimal control over it.

Amazon Drive

Amazon Drive, formerly known as Amazon Cloud Drive, is a cloud storage application managed by Amazon. The service offers secure cloud storage, file backup, file sharing, and Photo printing. Using an Amazon account, the files and folders can be transferred and managed from multiple devices including web browsers, desktop applications, mobiles, and tablets. Amazon Drive also lets their U.S. users order photo prints and photo books using the Amazon Prints service.

Today, Amazon Drive offers free unlimited photo storage with an Amazon Prime subscription or a Fire Tablet device, and a paid limited storage service. Launched in major countries including the U.S., Canada, Germany, France, Italy, Spain, the U.K., Japan, and Australia, it also functions in Brazil and China as a free limited 5GB storage service.

Google Drive

Google Drive is a personal cloud storage service from Google that lets users store and synchronize digital content across computers, laptops and mobile devices, including Android-powered tablet and smartphone devices. Support for Apple devices is provided via GDrive, the Google Drive client for iPhone and iPad devices.

What is Azure Blob storage?

Azure Blob storage is Microsoft's object storage solution for the cloud. Blob storage is optimized for storing massive amounts of unstructured data. Unstructured data is data that doesn't adhere to a particular data model or definition, such as text or binary data.

About Blob storage

Blob storage is designed for:

- Serving images or documents directly to a browser.
- Storing files for distributed access.
- Streaming video and audio.
- Writing to log files.
- Storing data for backup and restore, disaster recovery, and archiving.
- Storing data for analysis by an on-premises or Azure-hosted service.

Users or client applications can access objects in Blob storage via HTTP/HTTPS, from anywhere in the world. Objects in Blob storage are accessible via the Azure Storage REST API, Azure PowerShell, Azure CLI, or an Azure Storage client library. Client libraries are available for different languages, including:

- .NET
- Java
- Node.js
- Python
- Go
- PHP
- Ruby

About Azure Data Lake Storage Gen2

Blob storage supports Azure Data Lake Storage Gen2, Microsoft's enterprise big data analytics solution for the cloud. Azure Data Lake Storage Gen2 offers a hierarchical file system as well as the advantages of Blob storage, including:

- Low-cost, tiered storage
- High availability
- Strong consistency
- Disaster recovery capabilities

Blob storage resources

Blob storage offers three types of resources:

- The storage account
- A container in the storage account
- A blob in a container

The following diagram shows the relationship between

these resources.(Fig 9)

Storage accounts

A storage account provides a unique namespace in Azure for your data. Every object that you store in Azure

Fig 9



Type of storage account	Performance tier	Usage
General-purpose v2	Standard	Standard storage account type for blobs, file shares, queues, and tables. Recommended for most scenarios using Blob Storage or one of the other Azure Storage services.
Block blob	Premium	Premium storage account type for block blobs and append blobs. Recommended for scenarios with high transaction rates or that use smaller objects or require consistently low storage latency.
Page blob	Premium	Premium storage account type for page blobs only.

Containers

A container organizes a set of blobs, similar to a directory in a file system. A storage account can include an unlimited number of containers, and a container can store an unlimited number of blobs.

Blobs

Azure Storage supports three types of blobs:

- Block blobs store text and binary data. Block blobs are made up of blocks of data that can be managed individually. Block blobs can store up to about 190.7 TiB.
- Append blobs are made up of blocks like block blobs, but are optimized for append operations. Append blobs are ideal for scenarios such as logging data from virtual machines.
- Page blobs store random access files up to 8 TiB in size. Page blobs store virtual hard drive (VHD) files and serve as disks for Azure virtual machines.

Move data to Blob storage

A number of solutions exist for migrating existing data to Blob storage:

- AzCopy is an easy-to-use command-line tool for Windows and Linux that copies data to and from Blob storage, across containers, or across storage accounts.
- The Azure Storage Data Movement library is a .NET library for moving data between Azure Storage

services. The AzCopy utility is built with the Data Movement library.

- Azure Data Factory supports copying data to and from Blob storage by using the account key, a shared access signature, a service principal, or managed identities for Azure resources.
- Blobfuse is a virtual file system driver for Azure Blob storage. You can use blobfuse to access your existing block blob data in your Storage account through the Linux file system.
- Azure Data Box service is available to transfer on-premises data to Blob storage when large datasets or network constraints make uploading data over the wire unrealistic. Depending on your data size, you can request Azure Data Box Disk, Azure Data Box, or Azure Data Box Heavy devices from Microsoft. You can then copy your data to those devices and ship them back to Microsoft to be uploaded into Blob storage.
- The Azure Import/Export service provides a way to import or export large amounts of data to and from your storage account using hard drives that you provide.

Cloud function and web hosting

Objectives: At the end of this lesson you shall be able to

- **function and Features of Web Server**
- **explain about Web Hosting and Procedure of Web Hosting**

Function and Features of Web Server

What is 'Web Server'

A web server is a computer that runs websites. It's a computer program that distributes web pages as they are requisitioned. The basic objective of the web server is to store, process and deliver web pages to the users. This intercommunication is done using Hypertext Transfer Protocol (HTTP). These web pages are mostly static content that includes HTML documents, images, style sheets, test etc. Apart from HTTP, a web server also supports SMTP (Simple Mail transfer Protocol) and FTP (File Transfer Protocol) protocol for emailing and for file transfer and storage.

Features of Web Server

- Virtual hosting.
- Support for large files.
- Bandwidth throttling to regulate network traffic and mitigate bandwidth congestion.
- Server-side scripting for the creation of dynamic web pages.
- Hardware comes with built-in reliability and is designed to suit business critical needs and budget constraints.

What is the function of a Web server?

The primary function of a web server is to store, process and deliver web pages to clients. The communication between client and server takes place using the Hypertext Transfer Protocol (HTTP).

Web servers are computers that deliver (serves up) Web pages. Every Web server has an IP address and possibly a domain name. For example, if you enter the URL <http://www.webopedia.com/index.html> in your browser, this sends a request to the Web server whose domain name is webopedia.com.

Web server and how it works?

A Web server is software or hardware that uses HTTP (Hypertext Transfer Protocol) and other protocols to respond to client requests made over the World Wide Web (WWW). Web server software controls how a user accesses hosted files. All computers that host Web sites must have Web server software.

Is Google a Web server?

Google Web Server (GWS) is a proprietary web server software that Google uses for its web infrastructure. In May, 2015, GWS was ranked as the fourth most popular web server on the internet after Apache,nginx and

Microsoft IIS, powering an estimated 7.95% of active websites.

Web Server

A program that uses HTTP for serving files that create web pages for users in response to their requests that are sent by the HTTP clients of their computer is called as a web server.

If any server delivers an XML document to another device, it can be a web server. In simple words, a web server is an Internet server that responds to HTTP requests for delivering content and services.

Let's take an example, if you are working on your computer, browsing your web and a message pop ups from your friend that "I had just read a great article at the following URL: <https://www.milesweb.com/blog>".

So, you will insert this URL into your browser and press enter. That's it!

The web server on which your website is based in the world doesn't matter at all as the page you have browsed immediately appears on your computer screen.

A web server is never disconnected from internet. Each of the web servers has a unique address that comprises of a series of four numbers between 0 and 255. These numbers are separated with a period.

With the web server, the hosting providers can manage multiple domains (users) on a single server.

A web hosting provider rents the space on a server or cluster of servers for people to create their online presence with a website.

Types of Web Servers

There are mainly four types of web servers – Apache, IIS, Nginx and LiteSpeed.

Apache Web Server

Apache web server (Fig 1) is one of the most popular



web servers developed by the Apache Software Foundation. Open source software, Apache supports almost all operating systems such as Linux, Windows, Unix FreeBSD, Mac OS X and more. Approximately, 60% of the machines run on Apache Web Server.

You can easily customize an apache web server due to its modular structure. Since it's an open source, your own modules can be added to the server when you want to make modifications to suit your requirements.

It is highly stable as compared to other web servers and the administrative issues on it can be resolved easily. It is possible to install Apache on multiple platforms successfully.

The Apache's latest versions offer you the flexibility to handle more requests when compared to its earlier versions.

IIS Web Server

A Microsoft product, IIS is a server that offers all the features such as Apache.(Fig 2) Since it's not an open source, adding personal modules as well as modifying

Fig 2



becomes a bit difficult.

It supports all the platforms that run Windows operating system. Additionally, you also get good customer support, if there is any issue.

Nginx Web Server

Nginx is the next open source web server after Apache. (Fig 3)It comprises of IMAP/POP3 proxy server. The significant features offered by Nginx are high performance, stability, simple configuration and low

Fig 3



resource usage.

No threads are used to handle the requests by Nginx, instead a highly scalable event-driven architecture that uses small and predictable amount of memory under load is utilized. It has become popular recently and hosts about 7.5% of all the domains globally. Many web hosting companies have started using this server.

LiteSpeed Web Server

A high-performance Apache drop-in replacement, LiteSpeed (LSWS) is the 4th popular web server on the

Fig 4



internet and is a commercial web server.(Fig 4)

When you upgrade your web server to LiteSpeed, you will experience improved performance that too with low operating cost.

This server is compatible with the most common Apache features such as .htaccess, mod_rewrite and mod_security.

It has the ability to load Apache configuration files directly and work as a drop in replacement Apache with almost all the hosting control panels. It can replace the Apache within 15 minutes without any downtime.

LSWS replaces all the Apache functions which other front-end proxy solutions can't do to simplify the use and make the transition from Apache smooth and easy.

Explain about Web Hosting and Procedure of Web Hosting

Web Hosting

Web Hosting is an online service that makes your website's content accessible on the internet. When you purchase a hosting plan, you are renting space on a physical server to store all the website's files and data.

Web hosts provide the technology and resources required for the effective and secure operation of your website. They are responsible for keeping the server up and running, implementing security measures, and ensuring that data such as texts, photos, and other files are transferred successfully to the visitors' browsers.

In this lesson, you will learn what web hosting is, how it works, and what are the different types of web hosting available.

How Does Web Hosting Work?

The server that hosts your website is a physical computer that runs continuously to make the site available for visitors all the time. Buying servers for web hosting will allow you to store all the data of your website in the those servers of your provider.

Once a user enters your domain name into their browser's address bar, the web host's server will transfer all the files necessary to load your website.

You can host a website yourself, but it requires extensive technical skills. Self-hosting entails setting up and configuring a web server from scratch, including the equipment, infrastructure, hardware, and software. Furthermore, you will also have to handle all the ongoing maintenance.

A web hosting service provider ensures that your website performs optimally and with better security protocols. In addition, it simplifies the many complex aspects of hosting a website – from software installation to technical support.

Types of Web Hosting Services

With numerous web hosting options available, it can be challenging to determine which one is best for your website.

Most web hosts offer different hosting packages for different types of customers – from business website owners to personal blog creators.

Ideally, you should start with the simplest hosting solution. Once your site gets more traffic, you can upgrade to a more advanced plan.

Let's take a look at some of the most popular types of hosting available.

Shared Hosting

With shared hosting, multiple users share the same server resources, including memory, processing power, and storage space.

Because of its simplicity and affordability, shared web hosting is an excellent solution for small businesses and personal websites that do not require advanced configuration or higher bandwidth. Hence, shared hosting is an excellent choice for beginners that need affordable hosting to start.

Pros

- Cost-effective, ideal for small-scale websites
- Technical expertise is not required
- Pre-configured server options
- No need to take care of maintenance and server administration

Cons

- Minimal access to server configuration
- Increased traffic on other websites can affect your website's speed

Virtual Private Server (VPS) Hosting

With this web hosting type, your website also shares a physical server with other users, but the web host creates a virtual partition for each user. Thus, a site hosted on a virtual private server get an allocated amount of resources.

VPS web hosting is a great option for medium-sized sites, eCommerce shops, and large blogs with a rapidly growing number of visitors.

Pros

- Dedicated server space
- Increased traffic on other websites has no impact on your site's performance
- Root access to the server
- High customizability

Cons

- Users need technical expertise to manage it
- Even though it's relatively affordable, some users may have to hire a developer to manage the virtual server, increasing the overall costs

Cloud Hosting

This web hosting solution uses several virtual servers to host sites. Thus, if one server experiences high traffic or a problem, the remaining ones will take over and maintain the website operating.

Since cloud hosting relies on a cluster of web servers to function, businesses with multiple websites and large-scale sites like eCommerce shops can benefit the most from it, as it provides little to no downtime.

Pros

- Reduced likelihood of downtime and hardware failure
- Uses load balancing to handle high traffic and prevent DDoS attacks
- Scalability – your website is not limited to the resources of a single server

Cons

- Root access is not always provided
- It is more expensive than VPS and shared hosting

WordPress Hosting

This type of CMS web hosting service provides a WordPress-optimized server environment to help your site load faster and minimize potential issues. However, other types of web hosting still work for websites based on this popular content management system (CMS).

Typically, the best WordPress hosting plans come with features such as pre-installed themes, plugins for core functions like caching and security, and other tools.

Pros

- Low cost and beginner-friendly
- Optimized performance for WordPress sites
- Customer support team trained in WordPress issues
- Pre-installed WordPress plugins and themes

Cons

- Not an ideal type of web hosting for non-WordPress websites

Dedicated Hosting

Dedicated hosting designates a physical server for each website. By going with dedicated hosting, you can configure the server, choose your desired operating system and software, and customize the entire hosting environment to your specifications.

Renting a dedicated server is just as powerful as having your own on-site server, but with the added benefit of getting professional support from your web host. Thus, dedicated hosting is ideal for large online businesses that deal with heavy traffic.

Pros

- Complete control over the server's configuration
- High reliability
- Root access to the server

Cons

- High cost, more oriented towards large businesses
- Technical and server management knowledge is required

Various online tools in cloud computing

Objectives: At the end of this lesson you shall be able to

- learn about online tools : Google Forms, Google Sheets and Google Drive

Learn about Online tools : Google Forms, Google Sheets and Google Drive

Google Forms

Google Forms is a survey administration software included as part of the free, web-based Google Docs Editors suite offered by Google. The service also includes Google Docs, Google Sheets, Google Slides, Google Drawings, Google Sites, and Google Keep. Google Forms is only available as a web application. The app allows users to create and edit surveys online while collaborating with other users in real-time. The collected information can be automatically entered into a spreadsheet.

Features of Google Form

The Google Forms service has undergone several updates over the years. Features include, but are not limited to, menu search, shuffle of questions for randomized order, limiting responses to once per person, shorter URLs, custom themes, automatically generating answer suggestions when creating forms, and an "Upload file" option for users answering questions that require them to share content or files from their computer or Google Drive.

In October 2014, Google introduced add-ons for Google Forms that enable third-party developers to add new features to surveys, while in July 2017, Google updated Forms to add several new features. "Intelligent response validation" is capable of detecting text input in form fields to identify what is written and ask the user to correct the information if wrongly input. Depending on file-sharing settings in Google Drive, users can request file uploads from individuals outside multi-option answers in a table. In Settings, users can make changes that affect all new forms, such as always collecting email addresses.

Google Forms features all of the collaboration and sharing features found in Docs, Sheets, Slides, Drawings, and Sites

Create your form

- Choose an option:
- From forms.google.com, click Blank or choose a template.
- From drive.google.com, click New scroll to Google Forms. Next to Google Forms, point to the Right arrow (Fig 1) and click Blank form, Blank quiz, or From a template.
- Name your form: In the top-left corner, click Untitled form or the template form name and enter a new name.

- (Optional) Do any of the following actions:
- Add a description: Under the form name, add your text.
- Add a header, change the theme and background

Fig 1

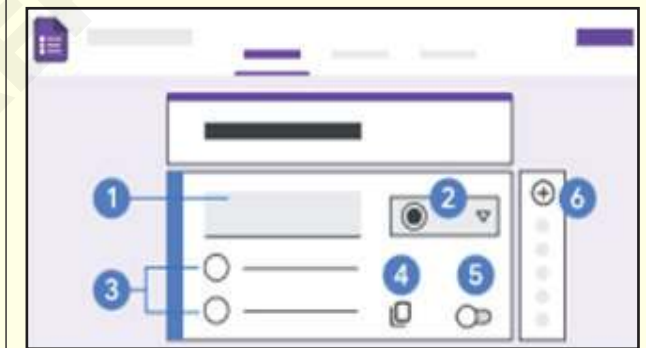


color, or font style: Click Customize Theme and then choose your options.

Add questions

If you're using a template, you can skip to Edit questions to edit your form.

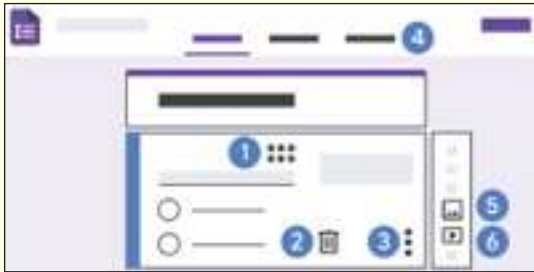
Fig 2



Note: Changes are automatically saved. To preview your changes any time, at the top right, click Preview

- Click Untitled Question and enter your question. You get suggestions based on your type of question. (Fig 2)
- (Optional) To change the question type, click the Down arrow and choose an option.
- Add response options (if applicable for your question type).
- To add a copy of the existing question, click Duplicate
- (Optional) To specify if people must answer the question, click Required.
- To add a new question, click Add question

Fig 3



Edit questions

You can add things like images and videos to a question at any time. You can also reorder and delete questions.

Select a question and do any of the following actions (Fig 3)

- Drag to reorder a question. You can also drag and reorder answers.
- Delete a question.
- Click More to:
- Add a description or hint.
- Shuffle the answer order.
- To shuffle the question order, click Settings. Next to Presentation, click the Down arrow turn on Shuffle question order.
- Add an image to a question. You can also add images to answers or forms.
- Add a YouTube video.

Choose settings and preview your form

Choose form settings

Decide who can access your form and whether to collect email addresses from people. By default, form sharing is limited to your organization and email collection is turned off.

- Open a form, and at the top of it, click Settings. (Fig 4)
- Next to Responses, click the Down arrow and choose from the following options:
- Collect email addresses—Collect respondents' email addresses.
- Send responders a copy of their response—Send copies of responses on request or automatically.
- Allow response editing—Let people change their answers after submitting them.

Fig 4



- Restrict to users in your organization and its trusted organizations —Limit your form's audience to your organization. Turn this setting off to distribute your form externally.
- Limit to 1 response—Allow people to complete your form only once.

Manage how you present form responses

- Open a form, and at the top of it, click Settings.
- Next to Presentation, click the Down arrow and choose from the following options:
- Confirmation message—You can customize the message people get after they submit the form.
- Show link to submit another response—Allow people to submit as many form responses as they like.
- View results summary—Let people see a summary of everyone's answers.

Important: After someone fills out your form, they get a link to the results. Response summaries show full text responses or charts for each question and are visible to anyone who can respond to the form.

- Disable autosave for all respondents—You can turn this setting off if you don't want respondents' drafts to automatically autosave. Drafts remain for 30 days from their last edit or until the form is complete.

Let people review and edit your form:

- At the top right, click More Add collaborators.
- Under Add editors, enter the email addresses of the people you want to share with.
- Click Send.

Whoever you invite can edit any part of your form, including responses and where they are saved.

Preview your form

While you're changing your form's settings, you can preview it to see what the changes look like. You'll also want to preview it when you're done.

- At the top right, click Preview .

The preview opens in a new window.

- To edit the form, click Edit or go back to your editing window.

Send your form

When you're ready to send out your form, you can send

Fig 5



it by email, copy and paste a link in a chat or email message, embed it on a website, or share a link on social media.

At the top right of the form, click Send.(Fig 5) If the form's audience is limited to your organization, check the Automatically collect respondent's (your organization) email box.

Choose how you want to send the form:

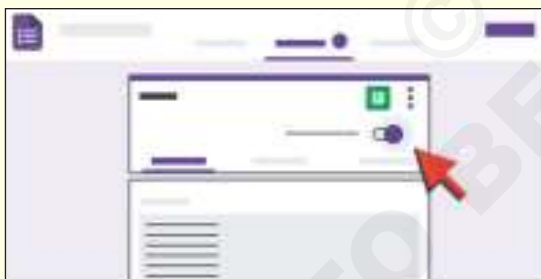
- Email—Click Email . Enter email addresses in the To field. You can customize the subject and message contents.
- Link—Click Link . You can shorten the URL. Click Copy and paste the link into a chat, conversation, or email.
- Website content—Click Embed . You can specify inline frame dimensions. Click Copy and paste the HTML into your website or blog
- Social media—Click one of the social media icons.

Pause or stop response collection

When you create a new form, response collection is automatically turned on. You can pause or stop it. For example, if you find a mistake after sending out a form, you can pause response collection until the error is fixed.

- In your form, click Responses.
- Turn off Accepting responses. It changes to Not accepting responses.(Fig 6)

Fig 6



- (Optional) Add a message that people see if they try to reply. If you're pausing response collection, you might add something like: "This form is currently paused. Please try again later."

See responses in Forms

Fig 7



You can see a summary of all responses or look at individual responses on the Response tab.(Fig 7)You can also view the form questions by clicking on the Question tab. To switch between individual responses, click the individual's email.

See responses in Sheets

To analyze your responses further, you can send them to a spreadsheet. The spreadsheet is linked to your form, so responses appear in real time.

Send responses to a new spreadsheet:

- In Forms, on the Responses tab, click More Select response destination.
- Select Create a new spreadsheet.
- (Optional) To change the name, enter a new one.
- Click Create.

Send responses to an existing spreadsheet:

- In Forms, on the Responses tab, click More Select response destination.
- Select Select existing spreadsheet Select.
- Select your spreadsheet and click Select.

Fig 8



To open your spreadsheet from Forms, next to More, click View responses in Sheets. The spreadsheet opens in a new window. To go back to Forms, click Form Show summary of responses or go back to the Forms window.

Stop sending responses to a spreadsheet:

- In Forms, on the Responses tab, click More Unlink form. (Fig 8)
- Click Unlink to confirm.

Download responses as a CSV file

To export responses for analysis in other programs, you can download them as a CSV file.

In Forms, on the Responses tab, click More Download responses (.csv).

Print a form and responses

- Open a form and go to the content you want to print.
- If you're printing questions or individual responses, at the top, click More Print.
- If you're printing a summary of responses, from your browser, click File Print.
- Choose your settings and then click Print.

Create a spreadsheet

To create a new spreadsheet:

- Open the Sheets home screen at sheets.google.com.
- Click New +. This will create and open your new spreadsheet.

Edit and format a spreadsheet

You can add, edit, or format text, numbers, or formulas in a spreadsheet.

Edit data in a cell

- Open a spreadsheet in Google Sheets.
- Click a cell that's empty, or double-click a cell that isn't empty.
- Start typing.
- Optional: To add another line within a cell, press **⌘** + Enter on a Mac or **Ctrl** + Enter on Windows.
- When you're done, press Enter.

Format one or more cells

- Open a spreadsheet in Google Sheets.
- Click a cell, then drag your mouse across nearby cells you want to select, or hold **⌘** on a Mac or **Ctrl** on Windows and click another cell.
- To format text or numbers in a cell, use the options in the toolbar at the top.

Format your data

Here are some options for formatting your cells or text. You can find these options above the document.

- Undo
- Redo
- Bold
- Italic
- Strikethrough
- Change font or font size
- Change text color
- Change cell fill color
- Single color
- Alternating colors
- Change cell borders
- Change border color
- Change border style
- Merge cells
- Change horizontal text alignment
- Change vertical text alignment
- Rotate text in a cell
- Wrap text in a cell

To format part of the text or content in a cell, double-click the cell, select what you want to format, then select a formatting option.

Align & resize objects

Move an object anywhere you want or change its size. Lines will appear that show what it lines up with, equal space between objects, and when one object is the same size as another.

Format numbers & dates in a cell

- Select the cell to be formatted.
- At the top, click Format Number.
- From the menu that appears, select the format option you want.
- If the format option you want isn't listed: At the bottom of the menu that appears, click custom options, such as "Custom date and time" and "Custom number format."

Add a theme

You can apply changes to the format of an entire spreadsheet with themes.

- Open a spreadsheet in Google Sheets.
- At the top, click Format Theme.
- Choose an available theme or click Customize to create your own.

Parts of your spreadsheet affected by theme

- Text font and color of grid text, charts, and pivot tables
- Hyperlink color of grid text
- Chart background color
- Color of series in charts
- Pivot table background

Import data sets & spreadsheets

On your computer, open a spreadsheet in Google Sheets.

- Open or create a sheet.
- At the top, click File Import.
- Choose a non-password-protected file in one of these file types:
- .xls (if newer than Microsoft® Office 95)
- .xlsx
- .xlsm
- .xlt
- .xltx
- .xltm
- .ods

- .csv
- .txt
- .tsv
- .tab

Select an import option. Not all file types have all six options:

- Create new spreadsheet: Create a spreadsheet from the imported data in a new browser tab.
- Insert new sheets: Adds new sheets with the imported data to your existing spreadsheet.
- Replace spreadsheet: Replace the open spreadsheet with the data in your imported file.
- Replace current sheet: Replace the current sheet's contents with the imported data.
- Append rows to current sheet: Adds the imported data to the current sheet after the last row with any data.
- Replace data starting at selected cell: Replace the data in a range of selected cells with the imported data.
- Optional: If you import a plain text file, like .csv or .txt, under "Separator character," you can pick what letter or symbol Google Sheets uses to separate cells.
- Detect automatically: This will automatically find ways to split your data set. For example, it can detect fixed-width-formatted files.
- Tab
- Comma
- Custom: Choose a custom character to split your data.
- Click Import.

Format numbers in a spreadsheet

You can format your data in several different ways in Google Sheets so that your spreadsheet and its contents are displayed how you want them.

Format numbers, dates, and currencies

To format or change the format of numbers, dates or currencies in a spreadsheet:

- On your computer, open a spreadsheet in Google Sheets.
- Select the range of cells you'd like to format or modify.
- Click Format > Number.
- Select the format to apply to the range of cells.

Custom formatting of numbers, dates, and currencies

You can apply custom formatting for currencies, dates, and numbers. For each of these, you can search in the

text boxes found in the formatting menus to find the format that works for your spreadsheet. If you don't find what you are looking for, you can now create your own custom formatting within the menus.

Custom date formatting

To apply a custom date or time format to your spreadsheet:

- On your computer, open a spreadsheet in Google Sheets.
- Highlight the data you want to format.
- Click Format > Number.
- Click Custom date and time.
- Search in the menu text box to select a format. You can also add your own custom date or time format into the text box.
- Click Apply.

If you want to add more detailed time or date values to your formatting, for example the hour or minute, click the down arrow in the right corner of the menu text box and select an additional value. You can adjust the specific formatting for these values by clicking on the arrows in the value and choosing an option. To delete a value from your formatting, click the value and select Delete.

Custom number formatting

To apply a custom number format to your spreadsheet:

- On your computer, open a spreadsheet in Google Sheets.
- Highlight the data you want to format.
- Click Format > Number.
- Click Custom number format.
- Search in the menu text box to select a format. You can also add your own custom number format into the text box.
- Click Apply.

Use Google Drive for desktop

About Drive for desktop

Drive for desktop is Google's desktop sync client that lets you easily manage and share content across all your devices and the cloud. This application enables you to access your files and folders in a familiar location.

You can use Drive for desktop to keep your files in sync between the cloud and your computer. Syncing is the process of downloading files from the cloud and uploading files from your computer's hard drive. After syncing, the files on your computer match the files in the cloud. If you edit, delete, or move a file in one location, the same change happens in the other location. That way, your files are always up to date and can be accessed from any device.

In Drive for desktop, you can manage how much local storage you use and where your content is located by configuring Drive to stream or mirror your files and folders.

Manage files in your Google Drive storage

Your storage is shared across Google Drive, Gmail, and Google Photos. When your account reaches its storage limit, you can't send or receive emails.

How to clear space

Clear space in Google Drive, Gmail, and Google Photos to make room for new items.

To delete your Google Drive files, move them to the trash. Files in trash will be automatically deleted after 30 days. You can restore files from your trash before the 30-day time window. You can also permanently delete them to empty your trash. If you delete, restore, or permanently delete multiple files or folders at once, it might take time for you to notice the changes.

Delete files by size in Google Drive

- Use a computer to see your files listed from largest to smallest.
- Put files you don't want in your Trash, then permanently delete them.
- Within 24 hours, deleted items will show in the available space in your Google Drive account.

Permanently delete large emails in Gmail

- In the Search box, type has:attachment larger:10M.
- Click Search.

Note: Replace "10" with a higher number to delete larger files.

- Select the emails you don't need, then click Delete. 
- On the left side of the page, click Menu  Trash.
- At the top, click Empty trash now.

Permanently delete emails in your Spam folder

- On the left, click Spam. If you don't see Spam, click More.
- At the top, click Delete all spam messages now. Or, select specific emails, then click Delete forever.

Move photos & videos to Trash

- On your computer, go to photos.google.com.
- Point to an item you want to move to Trash.
- At the top left, click Select .
- At the top right, click Delete  Move to trash.

Restore files you deleted

If you deleted something recently using Google Drive or the Google Drive desktop app, you might be able to restore the file yourself.

Restore from your Trash

- On a computer, go to drive.google.com/drive/trash.
- Tip: You can sort your trashed files by trashed date to find the oldest or newest files trashed.
- Right-click the file you want to recover.
- Click Restore.
- You can find restored files in their original location. If the original location no longer exists, look in "My Drive."

What it means to mirror or stream your files

Mirroring and streaming are two ways to sync your files. In both cases, any changes you make to your files on one device will be reflected everywhere.

With mirroring, your files are stored in the cloud and on your computer, which takes up hard drive space. You can access your files at any time, even when you don't have an internet connection or the Drive for desktop app running. You can access files through a folder on your computer.

With streaming, your files are stored in the cloud. Hard drive space is only used when you open files or make them available offline. Files that are not available offline can only be accessed when you're connected to the internet. All files, including those available offline, can be accessed only when the app is running. You can access files through a mounted drive on your computer.

Note: Recent versions of macOS may have a slightly different streaming behavior.

While you can choose whether to mirror or stream your My Drive files, other folders on your device can only be mirrored. Additionally, files from shared drives, other computers, and backed-up USB devices can only be streamed.

Options for syncing My Drive

You can stream or mirror My Drive, depending on your preferences.

Configure My Drive for streaming or mirroring

- Open Drive for desktop.
- Click Settings  Preferences.
- On the left, click Folders from Drive.
- Under "My Drive syncing options," select Stream files or Mirror files.

Switch from mirroring to streaming

When you switch from mirroring My Drive files to streaming My Drive files, the location of your files on your computer changes. The folder where you previously mirrored My Drive files will remain on your computer but will no longer sync. To avoid data loss, make sure that data has finished syncing before cleaning up these folders.

On Windows, you will need to quit Drive for desktop before removing the folder from your computer.

Switch from streaming to mirroring

When you switch from streaming to mirroring, My Drive will no longer appear in your Google Drive streaming location. (Shared drives, other computers, and backed-up USB devices will still appear.)

Your My Drive files will be downloaded to the folder you choose when configuring this option. If there are already files in the selected folder, the application will attempt to not duplicate files that match what's already in the cloud. Files that are not present in the cloud already will be uploaded.

Configure other folders on your computer

- Open Drive for desktop.
- Click Settings  Preferences.
- On the left, click Folders from your computer.
- From this menu, you can Add folders to sync with Drive and backup to Photos, and you can edit preferences of folders that are already synced.

Sync to Google Drive and back up to Google Photos

You can sync a folder with Google Drive or back it up to Google Photos.

- If you sync with Google Drive: Everything in the folder will be mirrored. All changes will be synced between your computer and Google Drive. You can access all your files from any device at drive.google.com or via the Google Drive app.
- If you back up to Google Photos: Only photos and videos will be uploaded. Changes will not be synced between your computer and Google Photos. You can view your photos and videos from any device at photos.google.com or via the Google Photos app.

Important: If you are storing photos and videos, we recommend only backing up to Google Photos. If you choose to store your files in both places, photos and videos in the folder get uploaded twice, which uses more of your Google account storage.

Upload files and folders to Google Drive

You can upload, view, share, and edit files with Google Drive. When you upload a file to Google Drive, it will take up space in your Drive, even if you upload to a folder owned by someone else.

Types of files

- Documents
- Images
- Audio
- Video

Upload files & folders

On your computer, you can upload from drive.google.com or your desktop. You can upload files into private or shared folders.

- On your computer, go to drive.google.com.

- At the top left, click New File Upload or Folder Upload.
- Choose the file or folder you want to upload.

Drag files into Google Drive

- On your computer, go to drive.google.com.
- Open or create a folder.
- To upload files and folders, drag them into the Google Drive folder.

Use Drive for desktop

- Install the application on your computer.
- On your computer, you'll see a folder called "Google Drive."
- Drag files or folders into that folder. They will upload to Drive and you will see them on drive.google.com.

Save from Print view

Important: Make sure you have the Save to Google Drive Extension installed.

- On your computer, open Chrome.
- Open the page, image, or file you want to print.
- On the top, click File Print.
- In the window, select Save to Drive or click See more Save to Drive.
- Click Print.

Convert documents into Google formats

If you want to upload files like Microsoft Word documents, you can change a setting to convert files.

Important: You can only change Google Drive settings from your computer.

- Using a computer, go to drive.google.com/drive/settings.
- Next to "Convert Uploads," check the box.

Upload files with the same name

If you upload a file with the same name, Google Drive will upload the file as a revision of the file already in Google Drive.

To keep both files:

- On your computer, go to drive.google.com.
- Upload a file.
- Click Keep as separate file.

Share files from Google Drive

You can share the files and folders that you store in Google Drive with anyone.

When you share from Google Drive, you can control whether people can edit, comment on, or only view the file. When you share content from Google Drive, the Google Drive program policies apply.

Share a single file

- On a computer, go to Google Drive, Docs, Sheets, or Slides.
- Click the file you want to share.
- Click Share or Share .

Share multiple files

- On a computer, go to drive.google.com.
- On your keyboard, hold Shift and select two or more files.
- At the top right, click Share .

Share with specific people

- Select the file you want to share.
- Click Share or Share .
- Under "Share with people and groups," enter the email address you want to share with.
- To change what people can do to your doc, on the right, click the Down arrow . Viewer, Commenter, or Editor.
- Choose to notify people.
- If you want to notify people that you shared a doc with them, check the box next to Notify people. If you notify people, each email address you enter will be

included in the email.

- If you don't want to notify people, uncheck the box.
- Click Share or Send.

Share a link to the file

You can send other people a link to your file so anyone with the link can use it. When you share a link to a file, your name and your email will be visible as the owner of the file.

- Select the file you want to share.
- Click Share or Share Get link.
- Under "Get Link", click the Down arrow .
- Choose who to share the file with.
- To decide what people can do with your file when you share it, select Viewer, Commenter, or Editor.
- Click Copy link Done.
- Copy and paste the link in an email or any place you want to share it.

Share a file publicly

- Select the file you want to share.
- Click Share or Share Get link.
- Under "Get Link," click Change to anyone with link.
- To decide what people can do with your public link when you share it, select Viewer, Commenter, or Editor.
- Click Done.
- Copy and paste the link in an email or any place you want to share it.

Types of online tools and use

Objectives: At the end of this lesson you shall be able to

- explain Online tools
- google class room, Moodle, Chamilo, Open edX, Totara Learn, Canvas

Google Classroom

Google Classroom is a free blended learning platform developed by Google for educational institutions that aims to simplify creating, distributing, and grading assignments. The primary purpose of Google Classroom is to streamline the process of sharing files between teachers and students as of 2021, approximately 150 million users use Google Classroom.

Google Classroom integrates a variety of other Google Applications for Education, such as Google Docs, Google Sheets, Google Slides, Gmail, and Google Calendar into a cohesive platform to manage student and teacher communication. Students can be invited to join a class through a private "class code" or be imported automatically from a school domain. Teachers can create, distribute and mark assignments all within the Google domain. Each class creates a separate folder in the respective user's Google Drive, where the student can submit work to be graded by a teacher. Assignments and due dates are added to Google Calendar, where each assignment can belong to a category or topic. Teachers can monitor each student's progress by reviewing revision history of a document, and after being graded, teachers can return work along with comments and grades.

Features of Google Classroom

Google Classroom integrates several Google Applications for Education (GAPPS) such as Google Drive, Google Docs, Google Sheets, Google Slides, Google Forms, Google Sites, Gmail to help educational institutions transition to a virtual, paperless system. Google Calendar was later added to help with assignment due dates, field trips, and class speakers. Students can be invited to classrooms through the institution's database, through a private code that can then be added in the student's user interface or automatically imported from a school domain. Each class created with Google Classroom creates a separate folder in the respective user's Google Drive, where the student can submit work to be graded by a teacher.

Assignments

Assignments are stored and graded on Google's suite of productivity applications that allow collaboration between the teacher and the student or between students. Instead of sharing documents that reside on the student's Google Drive with the teacher, files are hosted on the student's Drive and then submitted for grading. Teachers on Google Classroom have the option of creating Assignments in various templates and

formats with different accessibility options: "student can view file," "student can edit file," or "make a copy for each student". These assignments can be submitted for a grade and teacher feedback. Students can also choose to attach additional documents from their Drive to the assignment. Set assignments appear on the 'To do' list.

Grading

Google Classroom supports many different grading schemes. Teachers have the option to attach files to the assignment which students can view, edit, or get an individual copy. Students can create files and then attach them to the assignment if a copy of a file wasn't created by the teacher. Teachers have the option to monitor the progress of each student on the assignment where they can make comments and edit. Turned in assignments can be graded by the teacher and returned with comments to allow the student to revise the assignment and turn back in. Once turned in, assignments can only be edited by the teacher unless the teacher turns the assignment back.

Communication

Announcements can be posted by teachers to the class stream which can be commented on by students allowing for two-way communication between the teacher and students. Students can also post to the class stream but won't be as high a priority as an announcement by a teacher and can be moderated. Multiple types of media from Google products such as YouTube videos and Google Drive files can be attached to announcements and posts to share content. Gmail also provides email options for teachers to send emails to one or more students in the Google Classroom interface. Classroom can be accessed on the web or via the Android and iOS Classroom mobile apps.

Originality Report

Originality report was introduced in January 2020. It allows educators and students to see the parts and sections of the submitted work which contains the exact or similar wording to that of another source. For students, it highlights source materials and flags missing citation to assist the student in improving their writing. Teachers can also view the originality report, allowing them to verify the academic integrity of the student's submitted work. On G Suite for Education (free), teachers can turn on originality report for 3 assignments but have limited cloud storage. This restriction is lifted on G Suite Enterprise for Education (paid).

Archive Courses

Classroom allows instructors to archive courses at the end of a term or year. When a course is archived, it is removed from the homepage and placed in the Archived Classes area to help teachers keep their current classes organized. When a course is archived, teachers and students can view it, but won't be able to make any changes to it until it is restored.

Mobile Applications

Google Classroom mobile apps, introduced in January 2015, are available for iOS and Android devices. The applications let users take photos and attach them to their assignments, share files from other apps, and support offline access, easing accessibility for users.

Moodle

Moodle is a learning platform designed to provide educators, administrators and learners with a single robust, secure and integrated system to create personalised learning environments. You can download the software onto your own web server or ask one of our knowledgeable Moodle Partners to assist you.

Moodle experience

Every Learning Management System (LMS) has a paradigm, or approach, that shapes the user experience and encourages a certain kind of usage. An LMS might encourage very sequential learning by offering features that enforce a given order on each course. It might discourage student-to-student interaction by offering few features that support it, while encouraging solo learning by offering many opportunities for the student to interact with the course material. You will learn what Moodle can do and what kind of user experience your students and teachers will have, using Moodle. You will also learn about the Moodle philosophy, and how it shapes the user experience. With this information, you'll be ready to decide how to make the best use of Moodle's many features, and to plan your online learning site.

Install Moodle

Installing Moodle guides you through installing Moodle on your web server. It will help you estimate the amount of disk space, bandwidth, and memory that you will need for Moodle. This can help you to decide upon the right hosting service for your needs.

Configure your site

Most of the decisions you make while installing and configuring Moodle will affect the user experience. Not just students and teachers, but also course creators and site administrators are affected by these decisions. While Moodle's online help does a good job of telling you how to install and configure the software, it doesn't tell you how the settings that you choose affect the user experience. Configuring Your Site, covers the implications of these decisions, and helps you configure the site so that it behaves in the way you envision.

Create the framework for your learning site

Creating Categories and Courses, takes you through creating course categories, and then creating courses. Just as you chose site-wide settings during installation and configuration, you choose course-wide settings while creating each course. This chapter tells you the implications of the various course settings so that you can create the experience that you want for each course. It also shows you how to add teachers and students to the courses.

Make decisions about common settings

In Moodle, course material is either a resource or an activity. A resource is an item that the student views, listens to, reads, or downloads. An activity is an item that the student interacts with, or that enables the student to interact with the teacher or other students. In Resources, Activities, and Conditional Access you will learn about the settings that are common to all resources and activities, and how to add resources and activities to a course.

Add basic course material

In most online courses, the core material consists of web pages that the students view. These pages can contain text, graphics, movies, sound files, games, exercises— anything that can appear on the World Wide Web can appear on a Moodle web page. Adding Resources covers adding this kind of material, plus links to other websites, media files, labels, and directories of files. This chapter also helps you determine when to use each of these types of material.

Make your courses interactive

In this context, interactive means an interaction between the student and the teacher, or the student and an active web page. Student-to-student interaction is covered in a later chapter. This chapter covers activities that involve interaction between the student and an active web page, or between the student and the teacher. Interactive course material includes lessons that guide students through a defined path, based upon their answers to review question, and the assignments that are uploaded by the student and then graded by the teacher. Adding Assignments, Lessons, Feedback, and Choices, tells you how to create these interactions, and how each of them affects the student and teacher experience.

Evaluate your students

Evaluating Students with Quizzes, you'll learn how to evaluate the students' knowledge with a quiz. The chapter thoroughly covers creating quiz questions, sharing quiz questions with other courses, adding feedback to questions and quizzes, and more.

Make your course social

Social course material enables student-to-student interaction. Moodle enables you to add chats and forums to your courses. These types of interactions will be familiar to many students. __, Getting Social

with Chats and Forums shows you how to create and manage these social activities.

Add collaborative activities

Moodle enables students to work together to create new material. For example, you can create glossaries that are site-wide, and glossaries that are specific to a single course. Students can add to the glossaries. You can also allow students to contribute to and edit a wiki in class.

Moodle also offers a powerful workshop tool, which enables the students to view and evaluate each other's work.

Each of these interactions make the course more interesting, but also more complicated for the teacher to manage. The result is a course that encourages the students to contribute, share, and engage. Collaborating with Wikis and Glossaries, and Running a Workshop, help you rise to the challenge of managing your students' collaborative work.

Manage and extend your courses

Groups and Cohorts, shows you how to use groups to separate the students in a course. You will also learn how to use cohorts, or site-wide groups, to mass-enroll students into courses.

Every block adds functionality to your site or your course. Extending your Course by Adding Blocks, describes many of Moodle's blocks, helps you decide which ones will meet your goals, and tells you how to implement them. You can use blocks to display calendars, enable commenting, enable tagging, show navigation features, and much more.

Take the pulse of your course

Moodle offers several tools to help teachers administer and deliver courses. It keeps detailed access logs that enable the teachers to see exactly what content the students access, and when. It also enables the teachers to establish custom grading scales, which are available site-wide or for a single course. Student grades can be accessed online and can also be downloaded in a variety of formats (including spreadsheet). Finally, teachers can collaborate in special forums (bulletin boards) reserved just for them.

The Moodle philosophy

Moodle is designed to support a style of learning called social constructionism. This style of learning is interactive. The social constructionist philosophy believes that people learn best when they interact with the learning material, construct new material for others, and interact with other students about the material. The difference between a traditional philosophy and the social constructionist philosophy is the difference between a lecture and a discussion.

Moodle does not require you to use the social constructionist method for your courses. However, it best supports this method. For example, Moodle enables

you to add several kinds of static course material. This is the course material that a student reads but does not interact with, such as the following:

- Web pages
- Links to anything on the Web (including material on your Moodle site)
- A folder of files
- A label that displays any text or image

However, Moodle enables you to add even more kinds of interactive and social course material. This is the course material that a student interacts with, by answering questions, entering text, or uploading files, which includes the following:

- Assignment (uploading files to be reviewed by the teacher)
- Choice (a single question)
- Lesson (a conditional, branching activity)
- Quiz (an online test)

Moodle also offers activities in which the students interact with each other. These are used to create social course material, such the following:

- Chat (live online chat between students)
- Forum (you can have none or several online bulletin boards for each course)
- Glossary (students and/or teachers can contribute terms to site-wide glossaries)
- Wiki (this is a familiar tool for collaboration to most younger students and many older students)
- Workshop (these support peer review and feedback of the assignments that the students upload)

In addition, some of Moodle's add-on modules add even more types of interaction. For example, one add-on module enables the students and the teachers to schedule appointments with each other.

Chamilo

Chamilo is a free software (under GNU/GPL licensing) e-learning and content management system, aimed at improving access to education and knowledge globally. It is backed up by the Chamilo Association, which has goals including the promotion of the software, the maintenance of a clear communication channel and the building of a network of services providers and software contributors.

The Chamilo project aims at ensuring the availability and quality of education at a reduced cost, through the distribution of its software free of charge, the improvement of its interface for 3rd world countries devices portability and the provision of a free access public e-learning campus.

Main features of Chamilo LMS

- courses, users and training cycles (including SOAP web services to manage remotely)
- social network for learning
- multi-institutions mode (with central management portal)
- time-controlled exams
- international characters (UTF-8)
- automated generation of certificates
- tracking of users progress
- competence based training (CBT) integrated with Mozilla Open Badges
- multiple time zones
- proven support for more than 700,000 users (single portal on a single server)

Open edX

Open edX® was created by the joint efforts of Harvard University and MIT for the well-known learning platform edX. It is an open-source, learning management system (LMS) that empowers organizations worldwide to design customized and engaging online learning platforms. Open edX® enables companies to host MOOCs with useful features such as virtual classes and training programs.

The Open edX® project by edX caters to higher education institutions, government organizations, and enterprises of all sizes. The flexibility and diversity of Open edX® make online learning a breeze. Since it is open-source, it is constantly evolving and improving its offerings with the aid of a robust group of technology partners.

Open-source platform

Open-source platforms are software whose code is free to use and publicly available, and it can be modified and redistributed. The biggest advantage of an open-source learning management system is its flexibility to be customized according to the clients' needs. Open-source platforms are highly secured and provide the ownership of the data with high-quality services.

Currently using Open edX

Open edX® powers over 380 websites by providing an open-source learning management system. As discussed earlier, the platform is used by various educational institutions and organizations. The following type of users use Open edX®:

- Big giants like Google, Microsoft, LaaS, McKinsey use Open edX® for their employees' training and onboarding process.
- Top universities of North America, the Middle East, and China use Open edX® to provide engaging and interactive learning content to their students. Moreover, Open edX® helps them track the students' progress, and the open-source nature of it helps them modify the interface.

- Small and Medium-scale organizations use Open edX to meet their specific goals and objectives. They can be creative and innovative thanks to Open edX®.

Open edX better than others

Open edX® is the only last generation open-source platform that has complete features for online learning. One of the primary reasons for the success of Open edX® is the popularity of learning management systems in general.

Organizations are looking for a better alternative to their existing LMS system, and an open-source LMS is a perfect alternative as it provides much more powerful features. Moreover, organizations can leverage Open edX community xBlocks to enhance the functionality of their LMS. Open edX LTI tools can be used for communicating with external software, making Open edX better than many other platforms. Let's explore the possible reasons why Open edX® is used worldwide:

- **Adaptive Learning**
- **Rich Variety of Content**
- **Self-Paced Progress Dashboard**
- **Powerful Analytics**

Totara Learn LMS

Totara Learn, formerly known as Totara LMS, is a learning management system designed for businesses. As well as being a platform to host all your e-learning content on, it has a host of features that make it the quickest, easiest and most reliable way to train staff.

Main features of Totara Learn

Hierarchies

With Totara's Hierarchies you can set up any number of frameworks that best represent the structure of your business.

You can create the specific structures and relationships of job positions and different sections within your organisation.

Learning can then be mapped to individual job roles, management levels, departments, teams and groups.

Learning Plans

Totara Learn enables staff to complete their certifications online or even at home. This allows staff to complete compliance training and certification in their own time.

It will also prompt them when they need to complete specific courses as their certifications expire.

Team Management

Regular team performance check-ins help keep your teams working well. The competencies, goals and objectives features within Totara Learn enable you to plan development across your team.

This makes sure that individual development plans and

learning objectives fit with the goals of the wider team and the organisation, and that everyone is heading in the right direction.

Content Management

Totara Learn has a wide range of content authoring and management features, allowing you to create courses with a variety of learning content and activities.

Whether you're adding your own content directly, uploading SCORM or IMS-based courseware or importing content from an external repository, with Totara Learn you have the control.

Offline and Blended Learning

Totara Learn allows you to manage a range of face-to-face learning events from internal classroom sessions to external workshops or small conferences.

Assessment and Achievement

Totara Learn has a range of assessment options from a powerful inbuilt quiz engine to more formal assignment submissions.

Reporting

All of this is tied together with full graphical reporting allowing you to view almost any statistic you need. From completion rates and audience data through to evaluation responses.

All the reports are exportable and the report builder will help you fetch the data you need.

Performance Management

Staff evaluations can also be completed in Totara, giving your employees a simple way to self evaluate their performance with managers able to view this and add their own feedback.

Audience Management

Using Totara's audiences system, you can arrange staff into groups based on department or job role. This means you can create training courses for each audience. Then, members of that audience will be automatically assigned in that training.

Compliance Management

Totara Learn offers a range of tools to assign the right learning programs to the right people, automate recertification reminders and generate comprehensive reports on completions and non-compliance.

Benefits of using Totara Learn?

Engaged Learners

Learners can quickly and easily access all your content—videos, SCORM or AICC e-learning packages, webcasts, PDFs, question banks and more—alongside instructor-led training to deliver powerful blended learning experiences.

Shared Knowledge

Learners can be involved in informal learning using

chat, wikis and forums.

You can also add Totara Social to enable learners to collaboratively share invaluable knowledge and curate the best content for future learning programs.

Open Platform

You can tailor the LMS to your own requirements with no software licence fees and complete access to the source code.

Innovation Network

With Totara Learn you have access to the global Totara Partner network, and can tap into a wealth of expertise and value-added services.

This means there is always a partner available that best suits your organisation and can help you get the most out of your learning technology investment.

Canvas

Canvas is an HTML element which can be used to draw graphics via scripting (usually JavaScript). This can, for instance, be used to draw graphs, combine photos, or create simple (and not so simple) animations. The images on this page show examples of <canvas> implementations which will be created in this tutorial.

Canvas is a web-based learning management system, or LMS. It is used by learning institutions, educators, and students to access and manage online course learning materials and communicate about skill development and learning achievement.

Canvas includes a variety of customizable course creation and management tools, course and user analytics and statistics, and internal communication tools.

Institutions may provide users with a Canvas account, or individual users can try the free version by signing up for their own account.

Canvas Defined

Condensing something as robust as Canvas into a simple definition is quite a challenge but we'll try.

Canvas LMS is an open and reliable web-based software that allows institutions to manage digital learning, educators to create and present online learning materials and assess student learning, and students to engage in courses and receive feedback about skill development and learning achievement.

Additionally, while Canvas is primarily a web-based software, any user can access Canvas on a mobile device from the Canvas Teacher, Canvas Student, and Canvas Parent apps. Learn more about the Canvas mobile apps.

Basic Canvas Features

Canvas includes a variety of built-in course construction and management tools that can be customized to create unique and accessible teaching and learning experiences.

Instructional designers and instructors may create and share course content using Assignments, Discussions, Modules, Quizzes, and Pages. They may also choose to foster a collaborative learning experience using Collaborations, Conferences, and Groups. Depending on course settings, students can access these areas in Canvas to find learning materials and interact with other course users.

Canvas also allows institutions and instructors to add state and institutional learning outcomes to rubrics in order to measure and track student skill development and learning achievement. Additionally course creators can use the Course Import Tool to bulk-upload pre existing LMS course packages and/or course materials.

Instructors can provide students with comprehensive feedback on assignment and quiz submissions using SpeedGrader and manage grade reporting in the Canvas Gradebook. They can also facilitate real-time course interactions using Chat and communicate course news and updates with students using Announcements as well as the Calendar and Syllabus.

Instructors and admins can gain greater insight into student success and make informed instructional decisions using data provided in Canvas Analytics. Admins can also access SQL data about their Canvas user and usage details from Canvas Data Services.

Canvas also includes the Canvas App Center, where admins, designers, and instructors can enable a variety of External Apps (LTI Tools) and services. The ever-growing app library offers a wide array of interactive resources, content repositories, assessment tools, social media integrations, and other digital learning and teaching resources.

Additional Canvas Features

Institutions may choose to include additional Canvas features specifically designed to meet a variety of institutional, educational, and learning needs.

Canvas Catalog is a digital marketplace where students can register, enroll, and pay for courses.

Canvas Studio is an interactive video management platform that enhances student engagement and collaboration.

Canvas Commons is a learning object repository where teachers can store course content for their own use and for collaboration with colleagues both within and outside of their institution.

MasteryConnect allows designers and teachers to build, deploy, and manage formative and summative assessments across an institution. It provides schools with actionable data to improve teaching and learning.

Portfolium is an ePortfolio platform that integrates directly inside of Canvas. However, students also always have access to their Portfolium portfolios outside of Canvas even after they lose access to the LMS.

Canvas Users

Canvas includes the following six standard user roles: Admins, Designers, Instructors, Teacher Assistants, Students, and Observers. However, institutions may create any number of custom user roles with varied Canvas access.

A user's assigned role determines their Canvas access and interactions. For example, Canvas administrators may have access to create user accounts, add course enrollments, and manage institutional grading periods. Instructional designers may use Canvas to create and manage course content and review course analytics to identify areas for improvement in teaching and learning. School counselors may use Canvas to review student course progress and assess student achievement. Parents and guardians may use Canvas to review and communicate with instructors about student course progress, including assignment submissions and grades.

Requires publishing content

Objectives: At the end of this lesson you shall be able to

- **categories content that requires publishing**

The publishing process comprises:

- Acquisitions
- Editing
 - a. Structural editing
 - b. Content editing
 - c. Technical editing
- Design and typesetting
- Proofreading
- Printing
- Sales
- Marketing
- Publicity

As you can see, publishing is actually a complex and multi-stage process, so you won't be surprised to learn that it can take at least one year to complete. However, this time can be shortened if you have an existing relationship with a publisher or publishing company and some advance interest in your work. First-time authors will have a harder time making it through the first step, acquisitions, if they are relatively unknown. But once you have successfully published and sold one book, the length of the publishing process will be shorter for your next work.

First Steps: Acquisition and Editing

The first steps of the publishing process are acquisition and editing. Acquisition can occur in different ways, but generally authors send either a draft of their manuscript or a proposal to multiple publishers. If a publisher is interested in your work, he or she will call a meeting with their acquisitions team to discuss its pros and cons. The acquisitions team isn't just limited to editors. It includes people from sales, marketing, and publicity departments as well to evaluate how well your book will sell in the current market. If they like your proposal or your manuscript, they will offer you a contract. However, keep in mind that most major publishing houses won't read an unsolicited manuscript. For this reason, many aspiring authors seek out publication support services or agents to help them shop their work to potential publishers.

Once you have achieved a contract, either with the help of publication support services or on your own, and signed the contract, your book will begin its journey through the editing process. As shown above, the editing process can be broadly summarized in three steps:

structural editing, content editing, and technical editing. Structural editing focuses on the way your manuscript is organized and whether it makes sense. The publishing house editors or in-house publication support services will make suggestions for big changes, which you will be asked to review and accept or reject. After everyone is happy with the way your manuscript is organized, the publishing process moves on to content editing. This reviews your book for factual accuracy as well as flow, transitions, wording, and so on. An aggressive content editor will revise your work to make sure the style is consistent and the content is impeccable.

It is important to recognize that your editors may make some suggestions that you find difficult to understand or accept based on their knowledge of the current publishing market. While you have some control over what to accept, in reality, your editor has a lot of power as soon as you sign your contract. Remember to be flexible and keep the market in mind. Once you have accepted the major changes, a technical editor will review your work to make sure it is free of grammar, punctuation, and spelling errors. Once you have reviewed and accepted the changes, this part of the publishing process is over.

Next Steps: Design, Typesetting, Printing, Proofreading

Now the publisher or their in-house publication support services will work with you to make sure that your book will look great when it is printed. You will choose a cover design, a font, and someone will typeset the book for you so that it looks great. A test print will be made and then proofread to ensure there are no hidden errors that were not caught by the editing process. Once you have worked with the publisher to get a beautiful draft of your book in print, it is time to move on to the final steps of the publishing process.

Final Steps: Sales, Marketing, Publicity

Even the best-written books need marketing and publicity to make sure they end up in front of the readers who will be interested in them. Major publishers and publication support services engage in marketing and publicity of promising new books to ensure that sales are high, and your new book will be no exception. In today's world, marketing can include a vast number of methods. Your book may be marketed via ads in newspapers or journals, but you might also be asked to market it on podcasts, through interviews, and among well-known authors to get your name and the book out there. The publication support services offered by your publishing team will also hype you as they work with

their network of book distributors and convince them to acquire your book and sell it. Soon, your book will be printed and hit the shelves.

It is important to note that the steps for online journal publication are a bit different than those of book publishing. Online journals generally do their own publicity, sales, and marketing, and without a print version, design and typesetting are less involved processes as well. Most online journals offer publication

support services. However, if you are submitting a manuscript for online journal publication, you might need to seek out publication support or research publication solutions that are specifically tailored to academics. Regardless of whether you are writing a book or an article, knowing the stages of the publishing process can help you know what to expect and ease your way through.

© NIMI
NOT TO BE REPUBLISHED

Classify publishing content

Objectives: At the end of this the trainee shall be able to
• **classify all requirements of the publication content**

Content Production

Publishers have overall responsibility for content development and production. They may manage teams of editors and designers who review contributions, edit manuscripts and prepare layouts for printed or digital production, according to the Book Stewards. Publishers ensure that the team meets production schedules and releases work to the market on time.

• **Acquisition**

The process whereby an editor or publisher liaises with an agency or author, reads the manuscript/s and then subsequently makes a decision on whether to take a book on or not. Depending on the size of the publishing house, this can be a lengthy, involved, process or a relatively straightforward and speedy one. Contracts will be produced and exchanged. Again, this can be a bit of a lengthy back-and-forth process depending on the author and the publisher.

• **Editing**

Unless a manuscript (MS) is 100% print ready (and that happens incredibly rarely) it will be subject to various editing processes:

Structural editing This happens if the MS is rather “rough” and in need of major plot changes and rewriting in terms of a change in tense and/or point of view. It should also, broadly speaking, highlight repetition, weak writing and clunkiness etc.

Line editing - This is applied to a “finer” grade of MS i.e. one that is structurally sound but still needs to be edited line by line for plot, character and world consistency, flow, grammar and typos.

Copyediting - This is the last step of editing, whereby the publisher applies its own “house style” to the text i.e. makes changes to various words e.g. ‘t shirt’ to ‘t-shirt’; ‘realize’ to ‘realise’. Another example: if an American publishing house is publishing the work of a UK author, they will Americanize all the British spelling.

Proofreading - This is the last read-through of the text by another professional (a fresh set of eyes) that will weed out the typos that have, as yet, gone unnoticed by spellchecker, author and editor.

Its important that you dont skip this step

• **Typesetting**

Typesetting is, in effect, the process of getting an author’s MS from a Word document (or other word processing file) into a proper book layout. In practice, this will result in a PDF which is print ready and compatible with the

printer’s software. (The printers will go on to add some of their own magical jiggerypokery to turn the PDF into the final book layout. This is called imposition.) You wouldn’t be far off the mark in thinking that, surely, in the digital age, typesetting should be a straightforward process. However, turning a Word document (which can be full of strange, hidden formatting) into text that fits neatly into book-sized pages is not simply a one-click process. In general, the more messy the typesetting of a print (or e-) book, the less time a human has spent on it. A traditional publisher will want the typesetting to look as professional and stylish as possible, so they will employ either the in-house typesetter or an experienced freelancer to carry out this task. A typesetter will often be the person converting the MS into an ebook too. Nowadays, there is also the potential to add all kinds of metadata to a book so that various platforms and retailers can harvest information from it, which can, in turn, make the book more prominent.

• **Cover design**

Producing a professional-looking cover is no mean feat because within milliseconds of a reader picking up a book they will have come to various conclusions about the book: its production quality and, hence, an extrapolated judgement on the writing within. They will also immediately figure out the book’s genre/ what the book is about and who the book’s intended audience is and unless the author’s name is instantly recognizable the reader may well mutter: Never heard of them! All from the cover alone. Sometimes traditional publishing houses are mocked for their run-of-the-mill, unimaginative and slave-to-fashion book covers however, it would be contrarian to mock the effectiveness of the covers’ success in virtually instantaneously signalling to the would-be buyer-reader just exactly what the book is about. And in a time-strapped world, where buying decisions take place within seconds it’s crucial to quickly and effectively tell the reader just what the book is about. For most readers, a cover that doesn’t visually tell them anything useful about the writing inside isn’t an intriguing mystery to be solved by the purchasing and reading of the book, but merely an irritation; an instant disengagement and putting-down of the book. Particularly when there are so many other more visually decipherable and engaging covers that help the would-be purchaser/reader reach their buying choice more easily.

Traditional publishers (and professional self-publishers) understand the need for a cover that a,b and c) looks professional signals to the reader the genre of the book who its intended audience is (this can be to do with sex,

age, profession or academic specialism), and hence they give this important task to either an in-house or freelance cover designer who is experienced enough to understand the publisher's remit and can deliver. (The cover designer may, in addition, liaise with a specific artist if they have a certain image in mind for the cover).

Lastly, the publisher will curate the blurb on the back of the book, gather a couple of choice endorsements from well-known authors (most likely another one of their authors), and, of course, purchase the unique ISBN number (along with the ISBN's barcode) to go on the back cover of the book.

- **Liasing with printers**

Based on sales figures and past experience of publishing similar books by similar authors (similar in terms of their experience – debut novelist, mid-list author, bestselling sensation etc.) the publisher will make a calculated decision about the quantity of books to print in the first print run. Nowadays, with the advent of print-on-demand, it may seem as though there's no real need to print large quantities of books first time round, especially when many of them may remain unsold and unloved, taking up space in a distributor's warehouse and still costing the publisher in warehouse costs. But by lithographically printing a large quantity of books upfront, the unit cost of the book goes down and hence the potential profit margins (per book) go up. Sell virtually all of the many thousand you print and you've made a good profit. But sell only a fraction of those many thousand and you've lost money (or have it tied up in unsold stock, which is, essentially, dead money). So, to ensure the solvency of the publishing house it's crucial that they get this estimate right. Not printing enough books first time round can also be a problem because it takes time for a printer to print more books, and the time lag between a reader wanting a book (but it not being available in a shop) to getting more books out there may be long enough to discourage the reader and hence lose the sale. There's a fair amount of expertise necessary (as well as a goodly dollop of luck) for getting this decision as right as possible. Traditional publishers stand a better chance of getting this figure right and liaising with the printers to ensure that the print copies are ready and delivered in good time pre-publication date.

- **Marketing & publicity**

Traditional publishers usually plan on getting copies of books to journalists and literary reviewers for newspapers and magazines (also book bloggers and reviewers on Amazon etc.) 6 months pre-publication date. That's to give the reviewers enough time to read and review the book, and to ensure that those reviewers engaged by a magazine or newspaper get their copy in on time (traditional print-based media often have long lead times for set-in-stone print deadlines). Publishers also need to get information about the book to sales reps. who will be approaching book shops, retailers, libraries etc. with recommendations for "hot books". Generating

a "buzz" about a book pre-publication date can often make a huge, positive difference to those all-important sales in the first week of a book's publication. Closer to the publication date there will be author interviews to arrange, articles to write, and launches to organize (along with a barrage of canny social media marketing). Basically, a traditional publisher will have a marketing and publicity team with their fingers in a number of media "pies" to ensure that a) they successfully raise awareness about the book to the general public and b) the ensuing raised awareness results in sales of the book. Running a successful marketing campaign for a book is a huge amount of work, and like many things in life, the more money and time you invest in the endeavour, the greater the returns are.

- **Selling Rights**

By selling rights in other territories, and media (audio, translation, play, TV, film etc.) a publisher can generate extra income from a book, buoying the bank balance and helping them to stay solvent. This will also allow them to recoup costs for books that may not have as much potential commercial success in the mass market.

You can help them along by sharing your dream casting. They really appreciate that.

- **Running the Business**

In addition to all the above processes involved in producing a book – the core work of a publishing house – there will be the other generic business and day-to-day administrative tasks to accomplish that are necessary to keep the business complying with various legal and financial requirements e.g. managing staff, upkeep of office space, accounting, tax returns, data compliance etc. The bigger the publishing house, the more time these tasks will take up. However, even after publishing only a dozen or so titles within a few years a small press run by only one or two people will soon rack up enough admin to keep them permanently busy. Or permanently behind with the admin! There is also one other vital aspect to running a business: planning for the long-term, in terms of finances, as well as making important decisions about the direction the business is to go if it is to stay solvent.

To summarize: publishers add a huge amount of value to a book – meaning, in actuality, that books should cost a lot more than they do (more on that later) – and they don't charge their authors for the work. Instead, they look to sales of a book to generate income to keep the whole unlikely business afloat. Which is why they tend to focus on commercial books (aka potential bestsellers), with half an eye on literary fiction that will give them kudos come awards season (if these books bag any big awards they also have the potential to sell lots). Professional self-publishers will also ensure that their book has all the value added to it that a professional publisher would invest, but they have to pay for that investment themselves.

Types of printing technology

Objectives: At the end of this the trainee shall be able to

- **types of printing Technology**

There is a wide variety of technologies that are used to print magazines, books, newspapers, stationery, posters, packaging, and other print products. The main industrial printing processes are:

- **Letter Press**
- **Offset lithography**
- **Flexography**
- **Gravure**
- **Screen printing**

Additional printing techniques were developed for very specific applications. These include flock printing, letterpress, intaglio, pad printing, and thermography.

Fig 1



Why a certain job is better printed using one of these processes mentioned can be read on **this page about choosing a printing process.**

Letter Press

letterpress printing, (Fig 1) also called **Relief Printing**, or **Typographic Printing**, in commercial printing, process by which many copies of an image are produced by repeated direct impression of an inked, raised surface against sheets or a continuous roll of paper. Letterpress is the oldest of the traditional printing techniques and remained the only important one from the time of Gutenberg, about 1450, until the development of lithography late in the 18th century and, especially, offset lithography early in the 20th.

Originally the ink-bearing surface for printing a page of text was assembled from individual types by a typesetter or compositor, letter by letter and line by line. The first keyboard-actuated typesetting machines, the Linotype and the Monotype (qq.v.), were introduced in the 1890s. If only a small number of copies is to be made, printing can be done directly from the hand- or machine-set blocks of type assembled in forms, but for long press

runs, duplicates—stereotypes or electrotyping (qq.v.)—are made to prevent wear and damage of the expensive types.

Letterpress was originally carried out on platen presses, in which the paper is pressed against the flat, inked form by a flat platen; later, the platen was replaced by a roller in the flat-bed cylinder press; still later, the printing form was wrapped around one cylinder and the paper was passed between this cylinder and a second, creating a rotary press.

Several procedures have been developed for the production of line drawings or reproduction of photographs in the form of halftone pictures by letterpress. The most widely used method of preparing a printing plate for such matter is photoengraving.

Letterpress can produce work of high quality at high speed, but it requires much time to adjust the press for varying thicknesses of type, engravings, and plates. Because of the time needed to make letterpress plates and to prepare the press.

Offset

In offset lithography, a printing plate, which is most often made from aluminum, contains an image of the content that needs to be printed. When the plate is inked, only this image part holds ink. That inked image is subsequently transferred (or offset) from the plate to a rubber blanket and then to the printing surface. The process can be used to print on paper, cardboard, plastic, or other materials, but these have to have a flat surface.

Below is a picture (Fig 2) color sheetfed printing press. At the far end is the intake where individual sheets of

Fig 2



paper are automatically fed into the press. The 4 towers or printing units each print one color, typically black get printed first, followed by cyan, magenta, and yellow. The stack of printed sheets is visible on the front of the machine, underneath the press console & monitor which the press operator uses to control the press.

Fig 3



For higher volume work offset presses use rolls of paper. The picture below (Fig 3) shows such a much larger web press. It is so fast that the printed paper needs to be force dried. The black unit at the end of the press is an oven.

Offset is nowadays the most widely used printing technique for an extensive range of products such as books, newspapers, stationery, corrugated board, posters, etc.

There is a trend that printing promotional (Fig 4) material is gradually migrating to digital printing while some packaging printing is moving to flexo.

Fig 4

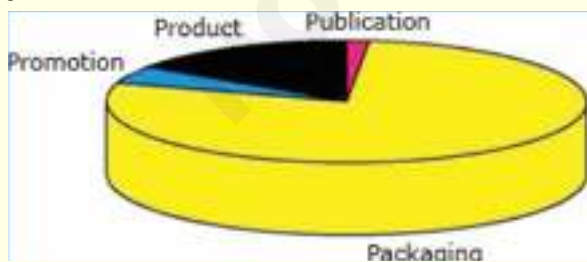


You can find more information on the page dedicated to **offset printing**.

Flexo

In flexography, the content that needs to be printed is on a relief of a printing plate, which is made from rubber.

Fig 5

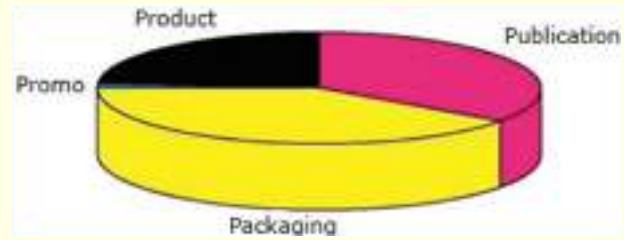


This plate is inked and that inked image is subsequently transferred to the printing surface. The process can be used to print on paper as well as plastics, metals, cellophane, and other materials. Flexo is mainly used for packaging and labels (Fig 5) and to a lesser extent

also for newspapers.

Some packaging printing is moving from flexo to digital.

Fig 6



Gravure

Also known as rotogravure, this is a technique in which an image is engraved into a printing cylinder. That cylinder is inked and this ink subsequently transfers to the paper. Gravure printing is used for high volume work such as newspapers, magazines, and packaging.

Gravure is gradually losing (Fig 6) market share to offset for publication printing and to flexo for packaging applications.

Screen printing

As its name implies, this printing technique relies on a screen, which is a woven piece of fabric. Certain areas of this mesh are coated with a non-permeable material. In the remaining open spaces, ink can be pushed through the mesh onto a substrate. The advantage of screen printing is that the surface of the recipient does not have to be flat and that the ink can adhere to a wide range of materials, such as paper, textiles, glass, ceramics, wood, and metal.

The image below (Fig 7) shows a screen printing press that is used to print t-shirts.

Fig 7



Increasingly screen printing is being replaced by digital printing.

- **Block printing** – This technique resembles potato printing, (Fig.8) which is a popular pastime for kids. A hand-carved wooden block is inked and pressed on the substrate. Additional blocks can be used to add more colors. Block printing is a slow and laborious process that is still used for printing on

Fig 8



fabric in oriental countries.

- **Flocking** – used to add a (colored) velvet-like texture to paper, textiles, etc.
- **Heat transfer printing** – A special paper is printed using inkjet (or another technique) and then this print is transferred to another surface using heat and pressure. The most well-known use case is iron-on decorations for t-shirts but the process is also used for industrial applications.
- **Intaglio** – nowadays mainly used for stamps and paper currency.

- **Letterpress** – This relief printing technique dominated the industry until the early 20th century. Nowadays it is mainly an artisanal process used for upscale business cards and wedding invitations, fine editions of books, limited-run art projects,...
- **Pad printing** – This is also called tampography. An image is transferred from an engraved printing plate onto a three-dimensional surface using a silicone pad. Pad printing is limited to small surfaces and used to print watch dials, gadgets, toys, car parts, etc.
- **Roller or cylinder printing** – Sometimes called machine printing, this is a gravure printing process used for printing on textiles.
- **Rotary screen printing** – This is a very fast printing technique in which ink pours out of the holes of a perforated cylindrical tube directly onto the substrate. This technique only lends itself for printing repetitive patterns and is used for printing wallpaper and textiles.
- **Thermography** – This is more of a finishing process than an actual printing process. It produces raised lettering on the printed side of the paper and is used for wedding invitations, letterheads, business cards.

Types of publishing content

Objectives: At the end of this the trainee shall be able to

- **different types of publishing content**

Traditional publishing.

Most traditional publishers require a formal submission from a literary agent who typically takes a percentage of your advance and sometimes also a cut of your royalties. Should a publisher choose to accept a manuscript, they acquire its rights (or ownership). At this point, they may or may not offer an advance payment to the author. Despite popular misconception, advances are typically only a few thousand dollars at most. While dreamy six-figure advances are not unheard of, they are extremely unlikely. In fact, it's becoming more common for publishers to not offer advances at all, or to delay payment until a certain sales value has been reached.

When it comes to royalty payments, less than 5% is typical. Many new authors' jaws drop when they learn average book sales for any book—traditional, self, or hybrid—is 250 copies in the first year and roughly 3,000 throughout its lifetime.

Lastly, in terms of editing and marketing, traditional publishers have full control. Some first-time authors may be surprised if their editor changes their book's direction, but the publisher does "own" the book, after all. And while some publishers may ask for input for your cover, their word is final. While it's not guaranteed your title will sit at the front of every Barnes and Noble in the country, it certainly could. (Keep in mind, publishers pay big money for those positions; popularity can be purchased!)

Self-publishing.

Though once heavily-stigmatized, self-publishing has recently grown in popularity, particularly with companies such as Amazon and Book baby offering their own services. Self-publishing is exactly what it sounds like; a self-published author is their own publisher and is responsible for securing and financing their own editing, design, marketing, and production. While this does have some great benefits to the author—100% royalties and full creative control—it also opens the author up to a greater number of risks. For example:

- **Errors.** Self-published books are infamous for containing typos. Some self-published books are never edited, while others are edited poorly. It's true that many self-publishing companies offer editing services, though oftentimes they are lack-luster or, in some cases, those

"editors" are actually computer systems. If choosing the self-publishing route, it's best to find an editor with credible references.

- **Unprofessional design or production.** Just because your Aunt Hilda likes to draw, doesn't mean she should design your cover. We often meet authors who self-published their first book and either designed their own cover, or paid a friend very little to design it for them. Truth be told, unprofessional design looks unprofessional and can block the sales of your book. People will judge your book by its cover, so be sure to leave your design and illustration to the professionals.

Hybrid publishing.

That brings us to the hybrid model—a cross between traditional and self-publishing. As with self-publishing, hybrid publishing requires a monetary investment, however, authors maintain 100% of the rights to their books and also have input into their editing, design, and marketing. A hybrid publisher ensures the final book is as polished and professional as possible. Not to be confused with "vanity publishing," many hybrids will not accept just any manuscript.

In a hybrid model, royalties are split between author and publisher. Warren Publishing authors receive anywhere from 100% (if sold from the author's personal book inventory), to 50% (if sold in a retail avenue) of royalties. Hybrid publishers provide professional editing and design services, and most will provide some level of marketing support.

At Warren, we describe ourselves as publishing "partners." It's our goal to create books that meet or exceed our authors' visions while positioning them to thrive in the marketplace. Our marketing efforts are custom-tailored to each book and we encourage our authors to help spread the word. Sales for our authors have ranged anywhere from several hundred books to hundreds of thousands, and Warren books can be found across the country and overseas.

These are the very basics, but we are always happy to chat with aspiring authors. If you are thinking about getting your book published or just considering your options, give us a call. We'd be happy to answer your questions.

Incorrect versions of publishing

Objectives: At the end of this the trainee shall be able to

- **incorrect versions of content**

Digital printing can be done in various ways. Two technologies dominate the industry:

- **Inkjet** – In an inkjet printer, the image that needs to be printed is created by small droplets of ink that are propelled from the nozzles of one or more print heads. Inkjet devices can print on a wide range of substrates such as paper, plastic, canvas, or even doors and floor tiles. Inkjet printing is used a lot for posters and signage. It is also economical for short-run publications such as photo books or small runs of books. In-line inkjet printers are sometimes combined with other types of presses to print variable data, such as the mailing addresses on direct mail pieces. The press shown (Fig 1) below is the HP Page Wide C500, meant for printing on corrugated board.



- **Xerography** – In xerographic printers, such as laser printers, the image that needs to be printed is formed by selectively applying a charge to a metal cylinder called a drum. The electrical charge is used to attract toner particles. These particles are transferred to the media that is being printed on. To make sure the toner is fixed properly, the substrate passes through a fuser that melts the toner into the medium. Laser printers are not only used in offices but also for small run printing of books, brochures, and other types of documents. These printers are also used for transactional printing (bills, bank documents, etc) and direct mail.

In 2009 both techniques jointly accounted for around 15% of the total volume of print.

Digital printing is increasingly utilized for print jobs that were previously printing using offset, flexo or screen printing.

- In short-run small format (A3 size) printing, digital is taking over from offset for both color and B&W printing. Quick printers and copy shops print digitally on presses from vendors like Xerox, HP, Canon, and Konica Minolta.(Fig 2)
- Labels are also increasingly being printed digitally.
- Billboard and point-of-sale or point-of-purchase jobs

Fig 2



are being done by wide-format inkjet devices.

- There is a wide range of small format printers used to print on phone cases, mugs, and other products.
- In book printing publishing companies start to rely more on print-on-demand. The Espresso Book Machine pictured below is well suited for that job.

Espresso Book Machine

There are a number of other digital printing processes that are geared towards specific niche markets:

- Dye-sublimation is a printing process in which heat is used to transfer a dye onto the substrate. Dye-sub printers are mainly used for printing on textiles, for proofing and for producing photographic prints. Some printers can print on a variety of materials such as paper, plastic, and fabric.
- In the direct thermal printing process heat is used to change the color of a special coating that has been applied to paper. This process is used in cash registers but also to add markings, such as serial numbers, to products. For this, a transparent ink is used that changes color when a laser applies heat to it.
- In the **thermal ink transfer printing** process heat is used to melt print off a ribbon and onto the substrate. It is used in some proofing devices but seems to be gradually disappearing off the market.

Concerning Requirements :

Speed

Quite often when looking to print promotional materials you will be faced with a very tight deadline to not only design the graphics but also print them. Turning this

around to meet a specified deadline can be a challenge and so the speed at which your printer can get this done and delivered is crucial.

Compared to other methods of print like the screen printing process, digital printing offers a quick turnaround time due to the lack of set up and manual intervention required.

Any good print provider will also be able to turn this around in a short amount of time, many within days and some within 24 hours. However, it is always best to check with your print provider, how long they need to get the job done.

Quality

Arguably the most important aspect of any print process is the quality of output. Digital printing guarantees a great standard, complete with full colour and gradation. Indeed, digital is favoured by many because of its perfect registration of colours. It remains the only method that provides this.

As a result, colours appear vibrant and clear, opening up all manner of design possibilities. Even white ink can be utilised.

Better still, it's very easy to apply the likes of glossy finishes or embossed effects, enhancing the design further.

Cost

Digital printing is a cost-effective option due largely to the lack of setup required. Preparation is greatly reduced given there is no need for printing plates or colour matching. This means everything happens in one, single process, lessening man hours. As a result, the price of digital printing projects is typically far cheaper than the screen printing equivalent.

Better For The Environment

Digital printing is better for the environment in that it uses less ink. That is to say ink is only ever injected into areas of the design requiring it – a stark contrast to traditional methods. This results in far less waste and a quicker clean-up operation generally.

Elsewhere digital printers are proven to produce less in the way of CO2 emissions. Some professional printers even choose to deploy polymer-based inks, which come without hazardous air pollutants (HAPS). Instead they consume less energy and emit fewer greenhouses gases, certainly compared to solvent-based inks or the UV-curable variety.

Finally, the ability to print short-runs allows customers to 'try before they buy'. The upshot of this is savings can be made on packaging for bulk orders that don't come out as planned.

Greater Choice

One of the clear advantages of digital printing is the fact substrates don't have to be held in place quite so firmly. Consequently, greater customisation can be realised in

the form of different materials.

Digital flat bed printers are known to print onto materials up to 50mm thick. This allows for applications others print processes simply could not entertain. In short, you can print onto just about any material. That's why digitally printed items range from posters to outdoor signage.

You Can Print in Lower Quantities

If you are looking to print in lower quantities, digital printing can be much more cost effective and offers the equivalent of a 'print on demand' service, which is ideal if you are looking to print just a couple of posters, 1 or 2 display boards or a small number of pull up banners.

As a result of the minimal set up process, there is rarely a minimum number of units required by printers and often, you won't be charged extra if you only want a couple of prints, or a short print run.

Improvements

Digital printing is ever evolving. The technology is greatly improved from its emergence in the early 1990s. Another 30 years from now, it will be capable of even more.

More Accurate Proofing

Getting to see an example of your design before committing to printing 100s of units is crucial and can make the difference between having a perfect design and making a mistake that will last forever, potentially costing your business money!

One of the beauties of digital printing is that you get picture perfect, accurate proofing before committing to print. The proof, which will often be presented as a PDF, will offer an opportunity to see the final design and give you a chance to review and identify any changes in design, typos or errors in judgement. All this can be done in the confidence that you haven't wasted your print budget. It's particularly helpful when producing business cards for instance.

A digital printing press also has the ability to produce each and every unit in a way that ensures each unit looks exactly the same.

Issues :

Limited Colour Matching Capability

Despite the constant improvements in digital printing, it can unfortunately still be difficult to match Pantone colours exactly when adopting this method. This is due to the differences in inks, rasterization techniques and toners with each printing machine, causing slight differences in colour finish when printed.

While quality prints are certainly achievable, digital printing cannot replicate metallic and fluorescent colours within design. This is far from ideal if you are looking to achieve something slightly more eye catching. If you are looking to print a design with fluorescent or metallic colours, screen printing would be a more suitable

method as it gives much greater flexibility in terms of full colour options.

Material Options

When large format print first entered the print arena limitations of materials were endless. These days with the huge improvements in ink and material technology it is possible to print successfully onto a host of materials ranging from woods, plastics, glass and PVC's. There are of course some material such as some polyesters and polycarbonate where screen print wins hands down for ink key. Custom apparel for example is better realised this way.

Durability

Digital printing offers a reasonable standard of durability particularly those who offer UV curable inks. Whilst it cannot be said that ink fade will never happen if the correct materials for the project are used as a rule a 3-4

years life can be expected on externally exposed items.

Summarize the consequences of publishing incorrect versions of content

In this tech-world, people first check the review of a product before investing their penny in it. Reviews are the credibility of a product. They affect the thought process of the customer and influence his/her decision in buying the product. Especially in books, no one wants to spend several hours reading a story which turns out bogus in the end. Readers crave good stories, they select their storybooks according to their interest in the genre. Once they find out their book, they go for the reviews! There are high chances of getting influenced by reviews and deciding not to buy that book in the end. Fake reviews growing globally and becoming the hard part to deal with. There are different softwares that produce high-quality fake reviews. Those reviews are hard to detect. Big online marketing platforms like Amazon also forced to deal with fake reviews.

Need for publishing content in media

Objectives: At the end of this lesson you shall be able to

- **different types of media**

The goal of media is to convey an advertising message to the audience through the most appropriate media channel for their product.

In general, you can classify media in three main categories.

Print Media

This type of news media used to be the only way of delivering information to the public. For the generations of the 80s and 90s, print media was the only media of entertain. People relied on newspapers and magazines to learn everything, from recipes and entertainment news to important information about the country or the world. Print media includes:

- **Newspapers** – printed and distributed on a daily or weekly basis. They include news related to sports, politics, technology, science, local news, national news, international news, birth notices, as well as entertainment news related to fashion, celebrities, and movies.
- **Magazines** – printed on a weekly, monthly, quarterly, or annual basis. It contains information about finance, food, lifestyle, fashion, sports, etc.
- **Books** – focused on a particular topic or subject, giving the reader a chance to spread their knowledge about their favorite topic.
- **Banners** – used to advertise a company's services and products, hung on easily-noticed sights to attract people's attention.
- **Billboards** – huge advertisements created with the help of computers. Their goal is to attract people passing by.
- **Brochures** – a type of booklet that includes everything about one company – its products, services, terms and conditions, contact details, address, etc. They are either distributed with the newspapers or hand over to people.
- **Flyers** – used mostly by small companies due to the low cost of advertising. They contain the basic information about a company, their name, logo, service or product, and contact information, and they are distributed in public areas.

Broadcasting Media

Broadcasting media includes videos, audios, or written content that provides important or entertaining information shared by different methods:

- **Television** – in the past, there were a few channels sharing various types of content, whereas now we have hundreds of TV channels to choose from. Each channel delivers a different type of content, so you

have a separate channel for news, drama, movies, sports, animation, nature, travel, politics, cartoon, and religion. It's the number one broadcasting media due to its reach to the audience.

- **Radio** – uses radio waves to transmit entertaining, informative, and educative content to the public. Due to its high reach to the audience, radio is widely used for advertising products and services. Radio is one of the oldest means of entertainment, and today people often hear it to find out the weather and traffic while commuting.
- **Movies** – film, motion picture, screenplay, moving picture, or movie has world-wide reachability. It's the best type of mass media to promote cultures and spread social awareness. Movies have always played a huge part in the entertainment world.

Internet Media

Nowadays, we are relying on the Internet to get the news a lot more often than traditional news sources. Websites provide information in the form of video, text, and audio. We can even choose the way we want to receive the news.

Types of Internet media include:

- **Social networks or websites** – including Facebook, Instagram, Twitter, YouTube, Tumblr, LinkedIn, Snapchat, Quora, Reddit, Pinterest, etc. They are user-friendly and widely used by people around the world. Although we can find any news here, they may be misleading because of the lack of regulations on the content shared.
- **Online forums** - an online place where we can comment, message, or discuss a particular topic. Forums allow us to share knowledge with other people with the same interest. That's why it's regarded as the best platform to seek support and assistance.
- **Podcast** – a series of audios focused on a particular topic or theme. We can listen to them on a computer or a mobile phone. It's a platform that allows anyone to share their knowledge and communicate with the world. You can browse some podcast hosting sites to see what fits your needs best.

We use different types of media to find - out news, learn new things, and entertain ourselves with the advance in technology, we can choose the type of media we want to use, no matter the time or place so we can hear the radio while driving to work, we can watch our favorite show on our phone, and we can find out any information and news on our laptop or mobile device, thanks to the internet who knows where technology can lead us in the future.

Method of publishing content

Objectives: At the end of this lesson you shall be able to

- **various methods of publishing content.**

Publication

Publication refers to distributing printed copies of a work for the public. This is a technical term, and it is important to Copyright legislation. The author is the initial owner of any work, and he/she has the exclusive right to publish that work. This includes publishing newspapers, magazines, journals and catalogues, which include visual, text or images. The author of a work has the freedom to decide whether to publish the work or not. If it's not published, it is identified as an unpublished work.

Types of Publication Based on Content

- Monograph – lengthy research publication that is written by a single person
- Brochure – also known as a leaflet or pamphlet. This is a document used for advertising
- Tract – a booklet based on political or religious views of a single person and distributed freely

Types of Publication Based on Material

- Newspaper – a publication of several pages printed with news, information, sports, and advertising. They are published and distributed daily, weekly, monthly or annually (Fig 1)

Fig 1



- Book – a collection of pages between two covers
- Booklet – a leaflet that is like a book
- Magazine – a book with front and back paper covers that has information on various topics and advertisements. Some magazines are published and distributed every week or every month
- Pamphlet – similar to a leaflet or booklet

- Journal- a newspaper or a similar publication
- Newsletter- a bulletin, pamphlet, leaflet or newspaper distributed to a specific audience
- Leaflet- a single sheet of paper printed on both sides
- Bulletin- brief information written on a flyer or inside another publication
- Broadside- a large single sheet one-sided printed paper that is designed to be plastered onto walls
- Flyer – also known as a handbill. A small sheet of paper printed on one side that is distributed free of charge

Journal

A journal is a scholarly publication that includes various articles written by professors, researchers, and other experts. They are also called **serials or periodicals**. Journals focus on a specific field and are aimed at the academic or technical audience.

Examples of Journals

- Medical journals
- Scientific journals
- Law journals
- Journals on humanities

Journals are generally on current topics and developments. All journal articles are based on original research and are peer-reviewed before publishing. They contain citations and a bibliography as well. Journals are published monthly, quarterly, or annually. They can be published online or in print, or both ways. They are usually sequentially numbered. Each journal copy is identified as an 'issue', and a collection of issues is a volume.

Types of Journal Articles

- Letters – short descriptions of important research findings
- Articles – usually, around 5-20 pages and they are complete descriptions of original research findings
- Research Notes – short descriptions that are less urgent when compared to letters and contain information on current research findings by a researcher
- Supplemental Articles – mostly consist of a large volume of details based on the results of current researches

- Review Articles – do not cover original research but include results of multiple articles on a particular field or topic, and give information about the subject and mentions journal references to the original research

Difference Between Publication and Journal

The key difference between publication and journal is that publications are for the general public while journals are for the academic or technical audience. In addition, publications are published daily, weekly, monthly, quarterly or annually, but journals are usually not published on a daily or weekly basis.

A publication is distributing printed copies of a work for the public. They are aimed at the general public and contain articles on almost any topic in various fields. A journal is a scholarly publication that includes various articles written by professors, researchers and other experts. They are also called serials or periodicals. They are sequentially numbered, and each journal is called an issue. Journals are based on original research findings and contain different types of journal articles such as letters, articles, research notes, supplemental articles and review articles.

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Tools for multilingual content

Objectives: At the end of this lesson you shall be able to

- **tools for creating and managing multilingual content.**

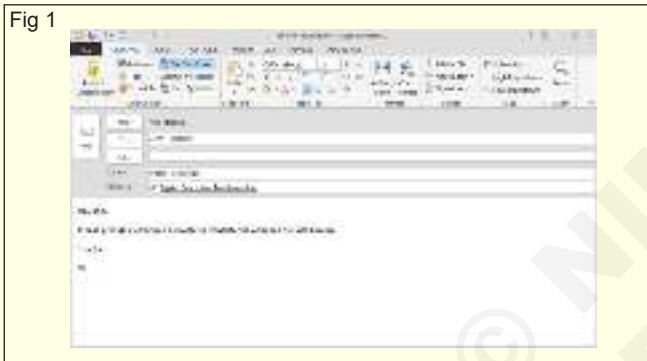
Multilingual means many languages. While content marketing is a marketing strategy used to attract and engage users through the promotion of content such as blog posts, articles, videos, podcasts, and more. Thus, multilingual content marketing is marketing content to consumers who speak different languages.

A list of the best tools for creating & managing multilingual content

- **Email**

You need to communicate with your translation vendor and email is by far the best way to do this. You can send your English content as an attachment and specify

Fig 1



all of the project details in the body of the email. Once translated, the content will be delivered back to you by email. (Fig 1)

This makes email by far the most essential tool you will need for creating and managing your multilingual content, as it allows you to communicate with your project team quickly and efficiently.

Outlook is a great email tool.

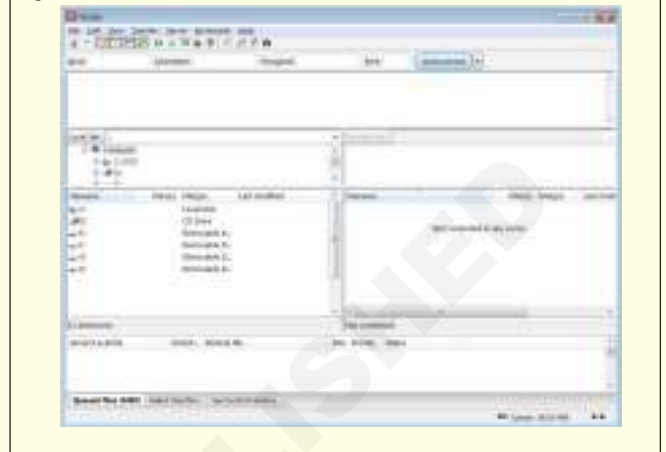
Additionally, written communication is vital for project record keeping. If a question ever comes up about project instructions or the project needs to be revisited for updating or revisions in the future, written communication is the best and clearest way to retrace the project's life cycle.

E mail is not meant for all communication. If you need to transmit files that are large in size or contain confidential information, email is not the best way to do it. Use FTP or secure email in such cases.

- **FTP**

FTP, also known as File Transfer Protocol, is a great way to transmit large files that cannot be sent by email due to size restrictions. It's also great for secure file transfer.

Fig 2



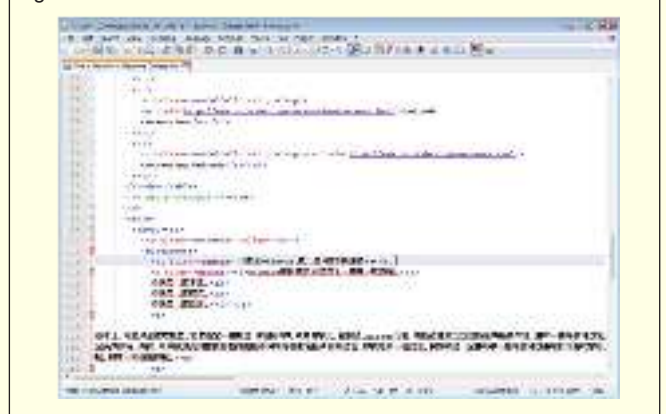
FileZilla FTP can be used to transmit files that are too large for email. (Fig 2)

Once you finish transmitting and receiving all the files via FTP, don't forget to delete them from the server. This will free up hard drive space for more files to be transmitted later.

- **Notepad**

Notepad is one of the simple tool that can open just about any file out there and display its contents. If you

Fig 3



just need to view and edit plain text without any fancy formatting, Notepad is the way to go. (Fig 3)

You can basically view and edit files in their raw form without worrying about losing markup. Very basic, easy to use and comes standard with almost every operating system out there.

- **Unicode Fonts**

If you're going create any multilingual content, stick with Unicode fonts. When you're creating content in English,

you probably won't think twice about the technical aspect of the fonts you're using.

Here is why it's important that you use Unicode fonts for multilingual content: Each font character has a unique number associated with it which conforms to an international standard for all systems. This makes it easy to distribute all sorts of content across different

Fig 4



platforms, programs and languages.

Microsoft Office

Almost all translators and language translation companies work with Word, Excel and PowerPoint. (Fig 4)

These applications are also designed with other languages in mind, so font compatibility and usage is rarely an issue.

Perhaps the most critical part of all is that the files you save in these applications can be edited.

It's much easier to translate content when you can easily edit it. If your content can't be edited (such as a scanned PDF file), it has to be recreated from scratch in an editable format, adding unnecessary costs to the project.

Word, Excel & PowerPoint can all be used to create and edit multilingual content.

• PDF Reader/Creator

Portable Document Format (PDF) files are used everywhere in business to present documents and other content in a quick and efficient matter. What makes PDF great is that, like Unicode fonts, it's cross-compatible across different platforms and operating systems.

PDF files are great for showcasing your multilingual documents once they're created. Content created in Word, if you save your multilingual content in PDF format, even readers who don't have a specific font installed on their computer can usually see the text displayed correctly, as it is generally preserved in PDF format. (Fig 5)

PDF is a good way to save costs as well. Instead of printing thousands of user manuals in different languages, you can now provide digital copies to your customers in PDF format.

• Adobe Creative Cloud

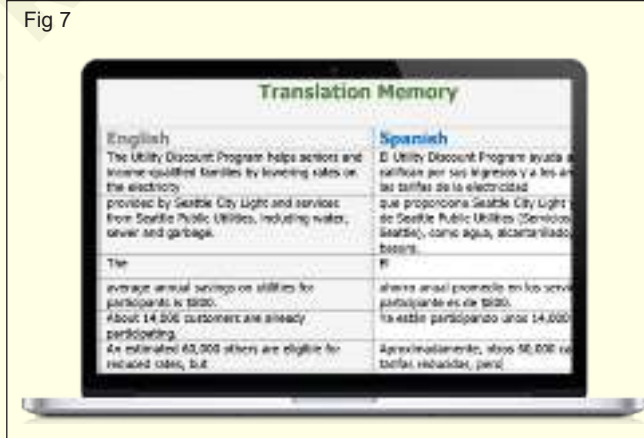
Fig 6



If you're thinking of creating great visual content and anything that requires advanced formatting, Adobe InDesign and Illustrator are a must. These two applications are now more accessible than ever before, through the Adobe Creative Cloud subscription.

A brochure that was translated into Japanese and

Fig 7



typeset in Adobe InDesign (Fig 6)

• Translation Memory

when you engage a translation vendor to work on your translation project, make sure using a TMS.

Translated content exported from memoQ TMS in a bilingual table. (Fig 7)

Since quality is important to you, a TMS is a must-have tool in your multilingual content creation process. It

Fig 5



tracks and leverages previously translated material, and helps to maintain quality and consistency throughout your content. Inconsistencies in translation can lead to customer confusion, and it goes downhill from there.

If you decide to implement a TMS in your organization's localization department, give **memoQ** a try. This tool is easy enough to use for beginners and has capabilities for most advanced users.



- **WordPress**

WordPress is by far the most popular content management system in the world. And it's one of the best ways to showcase your digital content on the web.

WordPress leverages the Unicode standard to make multilingual content creation as easy as possible.

This blog and website are both powered by WordPress. (Fig 8)

There are plenty of other great content management systems out there, such as Joomla and Drupal. From the ease-of-use perspective and ongoing support, WordPress is the way to go.

- **Social Media**

Your multilingual content won't do you any good if your target audience is not exposed to it. Social media is a great way to spread the word about your content and engage your audience. But before you use Facebook, Twitter or any other social networks, make sure they're right for you.

Don't waste your time promoting multilingual content on random social networks if you are not certain people will get your message. Communicating via social media with your audience is important, but must be done right.

Create dedicated social media communities for specific languages and cultures, like McDonald's did **here**. Be prepared to communicate with your customers in their languages.

For project communication, you have mail and FTP, for multilingual content creation, you have notepad, unicode fonts, microsoft office, PDF reader/creator and adobe creative cloud. If you can live without one tool. It's the TMS, since your transaction vendor should be using on their end. Publish your multilingual content using wordpress and social media.

Types of binding process

Objectives: At the end of this lesson you shall be able to

- **binding and types of binding and process**

A comparison of binding types for printed matter

Bookbinding turns loose pages and folded sheets into a usable print product. There is a varied selection of binding types and not all bindings are equally well-suited for a given project. Production costs, durability, page count and the application of a printed product are the most important criteria for choosing a binding type. To make sure you pick the right binding for your requirements, this article will look into the most popular binding techniques and highlight their advantages and disadvantages. This will enable you to easily determine the correct binding type for your next creative project.

Types of Binding

- Saddle stitch binding
- Perfect binding
- Glued fold binding
- Glued pad binding
- Thread sewn binding
- Spiral or wire binding
- Sewn Binding

Fig 1



Saddle stitch binding

Saddle stitching, also called stapled binding, is a very popular and easy binding method in which pages are folded, creased and stapled together. It is often used for the following products. (Fig 1)

- magazines
- different types of advertising material
- brochures
- catalogues

Saddle stitch binding refers to the bookbinding method in which folded sheets of paper are stapled together along the spine edge in one workflow. Usually, the wire is punched through the spine from the outside in two places and is bent flat on the inside. After it has been bound, the document is trimmed on three sides.

This binding method is both economical and quick. Moreover, it is highly durable and the pages open completely flat so that printed content is not lost in the gutter (the center of the printed product when opened).

Saddle stitch binding only works with page counts that can be divided by four; individual pages are not

Fig 2



possible. Fold-in pages on the cover or inside pages are the only exception.

Perfect binding

With this bookbinding technique, the pages of a printed product are glued together to produce a durable result. Perfect binding is ideal for

- sales catalogues
- magazines
- brochures with a high page count
- paperbacks
- advertising brochures

In perfect binding, sections of folded sheets are collated to form the inside of the printed product. Their spines are trimmed off and roughed up to improve bonding with the glue and the paper dust produced in this process is removed. Next, the glue is applied to the spine using rollers or nozzles and the wrap-around cover is pressed onto the still wet glue. Then the product is trimmed on three sides, and voilà, the perfect bound product is finished. This method uses either hot-melt or PUR adhesives. (Fig 2)

Book with PUR adhesive binding

Hot-melt adhesive, the more affordable solution, has limited durability and is therefore particularly well suited for simple and short-lived products.

Perfect binding with PUR adhesives cost more but are also more durable, making them ideal for long-lasting, superior prints and high page counts.

The spine must be at least several millimetres thick for perfect binding to be an option. Therefore, products with few pages and low paper weights are generally not eli-

Fig 3



gible. But it is possible to include single pages and different papers in the inside section.

Glued fold binding

A low-priced binding method, a glued fold is used for simple advertising products when durability is not a priority. The number of pages is limited and no cover can be added. Typical fold-glued products include. (Fig 3)

- leaflets with few pages
- advertising mail
- direct mail marketing
- inserts

Thin leaflet with a glued fold

This binding method uses glue that is applied to the crease lines. First the sheets are glued to each other, then folded and trimmed. Depending on the folding type, documents with eight, twelve and sixteen pages can be implemented via sheet-fed offset printing. We offset printing is suitable for longer print runs. The paper weight should range between 80 and 135 gsm. In addition to sheet-fed offset, this binding method is also used in web offset printing to produce cost-efficient print runs starting from about 50,000, usually via in line production (all steps of the manufacturing process take place on the same machine).

Glued pad binding

This pad binding technique is both simple and economical. It is often used to bind short-lived print material to allow tearing out individual pages. This makes glued pad binding ideal for the following products:

- notepads and writing pads
- carbonless copy paper
- writeable desk pads
- training documents
- coupons, vouchers and event tickets

Fig 4



Glued notepad to easily tear out pages

In glued pad binding, adhesive is applied to the spine only. First the sheets to be glued are trimmed. Assembling the individual sheets is only necessary if there are different designs within one pad and when offset printing is used. With digital printing, different designs are possible without collating the individual sheets. A stabilising chipboard backing and a cover can optionally be glued on the outside. To allow tearing out the sheets, low-tack adhesives are used. (Fig 4)

Different paper types may be combined within one pad: Uncoated papers are particularly well suited. High paper weights and too many pages can cause premature glue failure and result in loose pages.

Fig 5



Thread sewn binding

A very strong and durable binding, thread sewn binding uses thread to sew sheets together. However, this binding method is more complex and therefore more expensive, making it ideal for high-quality publications. Typical products which are thread sewn include. (Fig 5)

- illustrated books
- bibles
- art books
- fiction books
- catalogues

In thread sewn binding, individual sheets are folded first which are then assembled and sewn together. The resulting book block is glued on the spine and trimmed on three sides. Next the thread-sewn book block can be glued to the cover. Thread sewn binding allows a variety of covers (e.g. hard covers) to be implemented. The further processing thus depends on the type of cover.

A thread-sewn notebook

To add colour, you can choose the colours of the end-band or headband, bookmark and thread from a broad colour palette. Moreover, a wide selection of fabrics and materials is available for the cover and different paper stocks for the inside section. No other binding method is compatible with such a wide variety of different materials. Also, there are virtually no limits to the number of pages: More than 1,000 pages can be bound together with this long-lasting and stable binding technique.

Fig 6



Spiral binding

This binding method is also known as twin loop, double loop, double-o, duo-wire or simply wire binding. It utilizes a wire or pre-formed pairs of wire loops which are inserted through holes that have been punched through the book's cover and pages. Wire binding is very popular and is often used for the following products.(Fig 6)

- calendars
- cookbooks and music books
- training manuals
- writing pads
- sales documents
- brochures

In spiral binding, holes are punched through the book's cover and pages through which a wire or wire loops are inserted. The wire ends are folded in to prevent the sheets from getting loose.

Open notepad with wire-o binding

No other bookbinding method opens as conveniently. The pages open flat and can even be turned over completely. The maximum number of pages depends on the spiral diameter and on the paper weight. With sufficiently large spiral diameters and low paper weights, several hundred pages are no problem. Different print substrates and individual sheets can be mixed in a spiral bound document. The spirals are available in different colours and materials. There is a gap when opening the pages, causing designs that run across the spine to be broken up.

Sewn binding

Sewn binding is a method of book binding using what looks like a traditional sewing machine. The flat collated pages are sewn down the centre into the cover or case. This is then folded over to produce the finished book. Sewn binding has many advantages both practically and stylistically.(Fig 7)

Fig 7

