IBM - Advanced Diploma on IT, Networking and Cloud Computing
CORE MODULE – 05 (PRACTICAL)

1. Calculate arithmetic mean, geometric mean and Harmonic mean in MS-Excel.
2. Calculate standard deviation and standard variance for set of data in MS-Excel.
3. Plot basic charts in MS-Excel over numeric data series.
4. Write a NumPy program to generate a random number between 0 and 1.
5. Write a NumPy program to create an element-wise comparison (greater, greater_equal, less and less_equal) of two given arrays.
6. Write a NumPy program to create an array of 10 zeros, 10 ones, and 10 fives.
7. Write a Pandas program to add, subtract, multiple and divide two Pandas Series. Sample Series: [2, 4, 6, 8, 10], [1, 3, 5, 7, 9]
8. Write a Pandas program to compare the elements of the two Pandas Series.
   Sample Series: [2, 4, 6, 8, 10], [1, 3, 5, 7, 10]
9. Write a Pandas program to create a dataframe from a dictionary and display it.
   Sample data: {'X':[78,85,96,80,86], 'Y':[84,94,89,83,86],'Z':[86,97,96,72,83]}
10. Write a Pandas program to select the 'name' and 'score' columns from the following DataFrame.
    Sample Python dictionary data and list labels:
    exam_data = {'name': ['Anastasia', 'Dima', 'Katherine', 'James', 'Emily', 'Michael', 'Matthew', 'Laura', 'Kevin', 'Jonas'],
    'score': [12.5, 9, 16.5, np.nan, 9, 20, 14.5, np.nan, 8, 19],
    'attempts': [1, 3, 2, 3, 2, 3, 1, 1, 2, 1],
    'qualify': ['yes', 'no', 'yes', 'no', 'no', 'yes', 'yes', 'no', 'no', 'yes']}
    labels = ['a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j']
11. Write a Python program to draw a scatter plot with empty circles taking a random distribution in X and Y and plotted against each other.
12. Write a Python programming to display a horizontal bar chart of the popularity of programming Languages.
    Sample data:
    Programming languages: Java, Python, PHP, JavaScript, C#, C++
    Popularity: 22.2, 17.6, 8.8, 8, 7.7, 6.7
13. Write a Python programming to create a pie chart with a title of the popularity of programming Languages.
    Sample data:
    Programming languages: Java, Python, PHP, JavaScript, C#, C++
    Popularity: 22.2, 17.6, 8.8, 8, 7.7, 6.7
14. Find out the prices of homes whose area is a) 3500 sq.ft., b) 5500 sq. ft. using Simple Linear Regression.
    Given: area=[2600,3000,3200,3600,4000], price=[550000,565000,610000,680000,725000]

15. Print the slope and intercept of the Simple Linear Regression model generated. Save the machine learning model to a file.
    Given: area=[2600,3000,3200,3600,4000], price=[550000,565000,610000,680000,725000]
16. Create a file named - "carprices.csv" having the following data with column headers:
    Given: mileage=[69000,35000,57000,22500,46000,59000,52000,72000,91000,67000],
    age=[6,3,5,2,4,5,5,6,8,6],
    sellprice=[18000,34000,26100,40000,31500,26750,32000,19300,12000,22000]
    Now, split the dataset in training(70%) and testing(30%) segments using sklearn.
17. Perform Logistic Regression classifier on Digits dataset available in sklearn and display the model score.
    Hint: from sklearn import datasets
        digits = datasets.load_digits()
18. Display the confusion matrix using matplotlib or seaborn library,generated after performing Logistic Regression classifier on Digits dataset available in sklearn and display the model score.
    Hint: from sklearn import datasets
        digits = datasets.load_digits()
19. Perform Random Forest classifier on Digits dataset available in sklearn and display the model score.
    Hint: from sklearn import datasets
        digits = datasets.load_digits()
20. Perform SVM classifier on IRIS dataset available in sklearn and display the model score using different 'gamma' and 'kernel' values.
    Hint: from sklearn import datasets
        iris = datasets.load_iris()
21. Perform KNN classifier on IRIS dataset available in sklearn and display the classification report using sklearn.
    Hint: from sklearn import datasets
        iris = datasets.load_iris()

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