Birla Institute of Technology & Science, Pilani

Work-Integrated Learning Programmes Division

MTech in Data Science & Engineering / Artificial Intelligence and Machine Learning

S1_2024-2025, DSECLPFDS/AIMLCPFDS

1. Write a Python program using Matplotlib to plot a simple line graph showing the relationship between two lists of data. The first list contains the numbers [1, 2, 3, 4, 5] and the second list contains the corresponding squares [1, 4, 9, 16, 25].
2. Create a Python program to plot a graph, add a title, and label the axes. Use the following data for the x and y axes:
   x-axis data: [1, 2, 3, 4, 5]
   y-axis data: [2, 4, 6, 8, 10]
3. Write a Python program using Matplotlib to create a scatter plot. Plot the following points:

   (1, 2), (2, 3), (3, 5), (4, 7), (5, 11)

4. Write a Python program to create a 1x2 grid of subplots. The first subplot should show a simple line plot with data [1, 2, 3, 4] and [10, 20, 30, 40]. The second subplot should display a bar plot with the same x-axis values and corresponding y-axis values [5, 10, 15, 20].

5. Write a Python program to find the maximum number in a list of numbers using a built-in function.
   Sample Input -> [10, 4, 45, 99, 12]
   Sample Output -> The maximum value is: 99

6. Create a Python program that defines a custom function to calculate the factorial of a number. The function should take one integer as an argument and return its factorial.
   Sample Input -> 5
   Sample Output -> The factorial of 5 is: 120

7. Write a Python program that reads the contents of a file and prints them. Use the read() method to read the file.

8. Write a Python program that checks if a file exists before performing operations like reading or writing.

9. Write a program to solve the below equations

- $2x+y=5$
- $x-y=1$

10. Write a program to integrate the function $f(x)=x^2$ from 0 to 1.
11. Write a program to find the inverse by inv() function and determinant det() function.
12. Write a program to apply a function to find square root for each element in the array.
13. Write a program to Perform Arithmetic Operations on Multi-Dimensional Arrays.
14. Create a python program to check the missing values in a dataset.
15. Write a python program to group and aggregate the data.