**ASSIGNMENT-1**

**Q1.** Using NumPy, create a 3D array of shape (4, 4, 4) filled with random numbers between 1 and 100. Find the z score normalisation of each element of the array.

**Q2.** Using Pandas, filter the rows in the Iris dataset where the petal length is greater than 3.0, and display the filtered data

**Q3.** Using Matplotlib, plot a line graph showing the trend of a numerical dataset. Customize the plot with title, axis labels, and a legend.

**Q4.**Create a Pandas DataFrame with random values with at least 3 columns and perform the following operations: (i) Replace NaN values with the mean of the column. (ii) Sort the DataFrame based on any two columns.

**Q5.** Using NumPy, calculate the dot product of two matrices and find the determinant of the resulting matrix.

**Q6.** With Pandas, group a DataFrame by a categorical column and calculate the sum of another numerical column for each group.

**Q7**. Using Matplotlib, create a histogram to show the distribution of a numerical dataset. Customize the number of bins and add grid lines for better readability.

**Q8.** Using NumPy, create a 2D array and perform a slicing operation to extract a specific sub-array.

**Q9.** Using Pandas, perform a merge operation between two DataFrames based on a common column for dataset of your choice.

**Q10.** Using Matplotlib, create a scatter plot comparing two numerical variables in the dataset of your choice. Customize the plot by changing the color and shape of the data points.