Q.No.1- How do you create a 2D NumPy array and calculate the sum of each row ?

```
import numpy as np
```

```
[2] array = np.array([[1, 2, 3], [4, 5, 6], [7, 8, 9]])
    row_sums = np.sum(array, axis=1)
    print("Row-wise sum:", row_sums)
```

```
Row-wise sum: [ 6 15 24]
```

Q.No.2- Write a Pandas script to find the mean of a sp.

```
[3] import pandas as pd
```

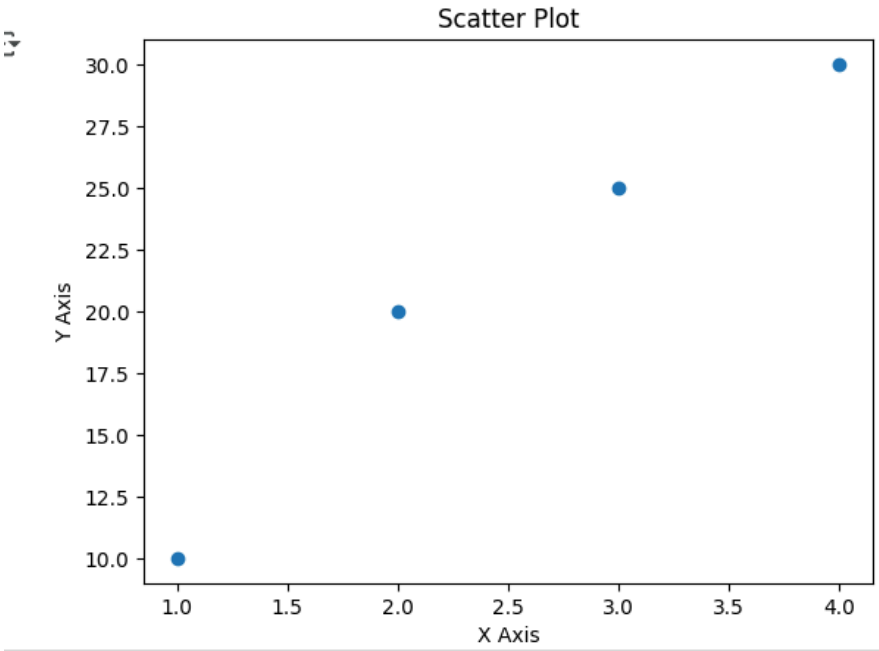
```
[4] df = pd.DataFrame({
        'A': [10, 20, 30],
        'B': [15, 25, 35]
    })
    mean_b = df['B'].mean()
    print("Mean of column B:", mean_b)
```

```
Mean of column B: 25.0
```

Q.No.3- Create a scatter plot using Matplotlib.

```
[5] import matplotlib.pyplot as plt
```

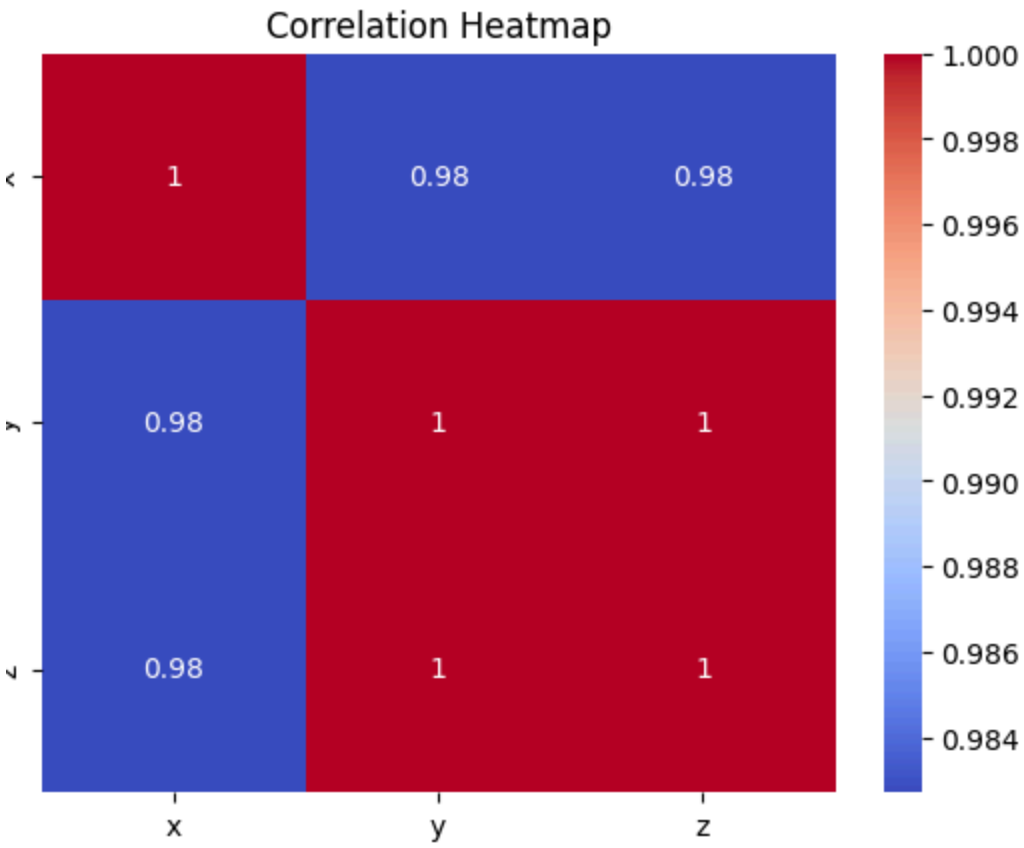
```
[6] x = [1, 2, 3, 4]
    y = [10, 20, 25, 30]
    plt.scatter(x, y)
    plt.title("Scatter Plot")
    plt.xlabel("X Axis")
    plt.ylabel("Y Axis")
    plt.show()
```



Q.No.4- How do you calculate the correlation matrix using ?

```
[7]  import seaborn as sns
     import pandas as pd
```

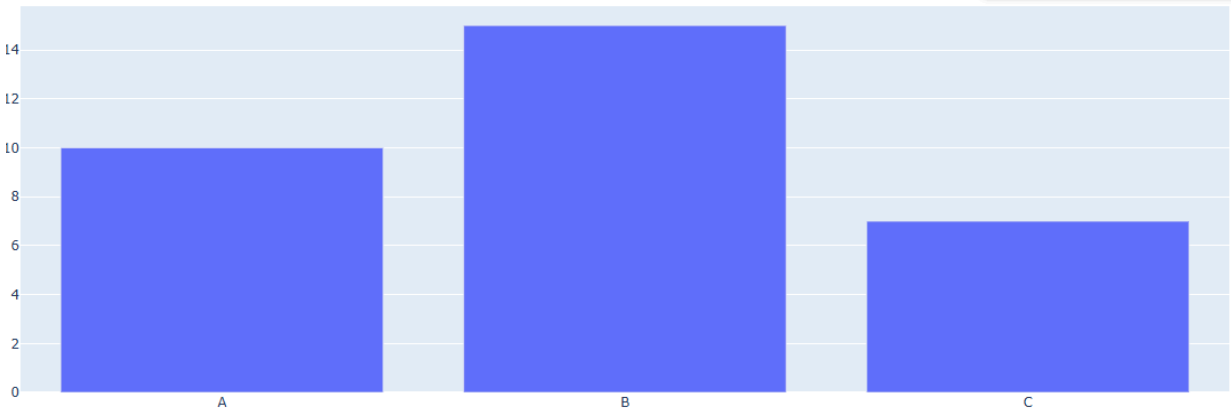
```
[8]  data = pd.DataFrame({
         'x': [1, 2, 3, 4],
         'y': [10, 20, 25, 30],
         'z': [2, 4, 5, 6]
     })
     corr = data.corr()
     sns.heatmap(corr, annot=True, cmap='coolwarm')
     plt.title("Correlation Heatmap")
     plt.show()
```



Q.No.5- Generate a bar plot using Plotly.

```
[9]  import plotly. express as px
```

```
[10] data = {'Category': ['A', 'B', 'C'], 'Values': [10, 15, 7]}
     fig = px.bar(data, x='Category', y='Values', title='Bar Plot Example')
     fig.show()
```



Q.No.6- Create a DataFrame and add a new column based on an existing column.

```
[11] df = pd.DataFrame({'A': [1, 2, 3]})
     df['B'] = df['A'] * 10
     print(df)
```

```
   A   B
0  1  10
1  2  20
2  3  30
```

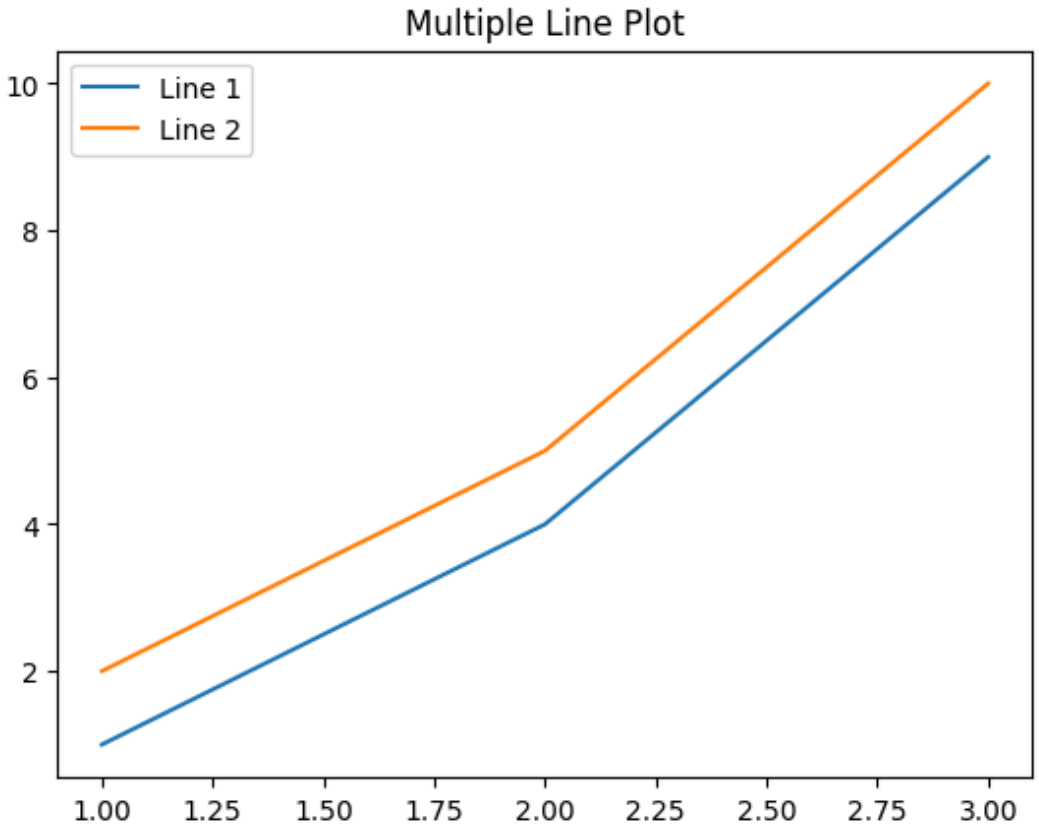
Q.No.7- Write a program to perform element-wise multiplication of two NumPy arrays.

```
[12] a = np.array([1, 2, 3])
     b = np.array([4, 5, 6])
     result = a * b
     print("Element-wise multiplication:", result)
```

```
Element-wise multiplication: [ 4 10 18]
```

Q.No.8- Create a line plot with multiple lines using Matplotlib.

```
[13] x = [1, 2, 3]
     y1 = [1, 4, 9]
     y2 = [2, 5, 10]
     plt.plot(x, y1, label='Line 1')
     plt.plot(x, y2, label='Line 2')
     plt.legend()
     plt.title("Multiple Line Plot")
     plt.show()
```



Q.No.9-Generate a Pandas DataFrame and filter rows where a column value is greater than a threshold.

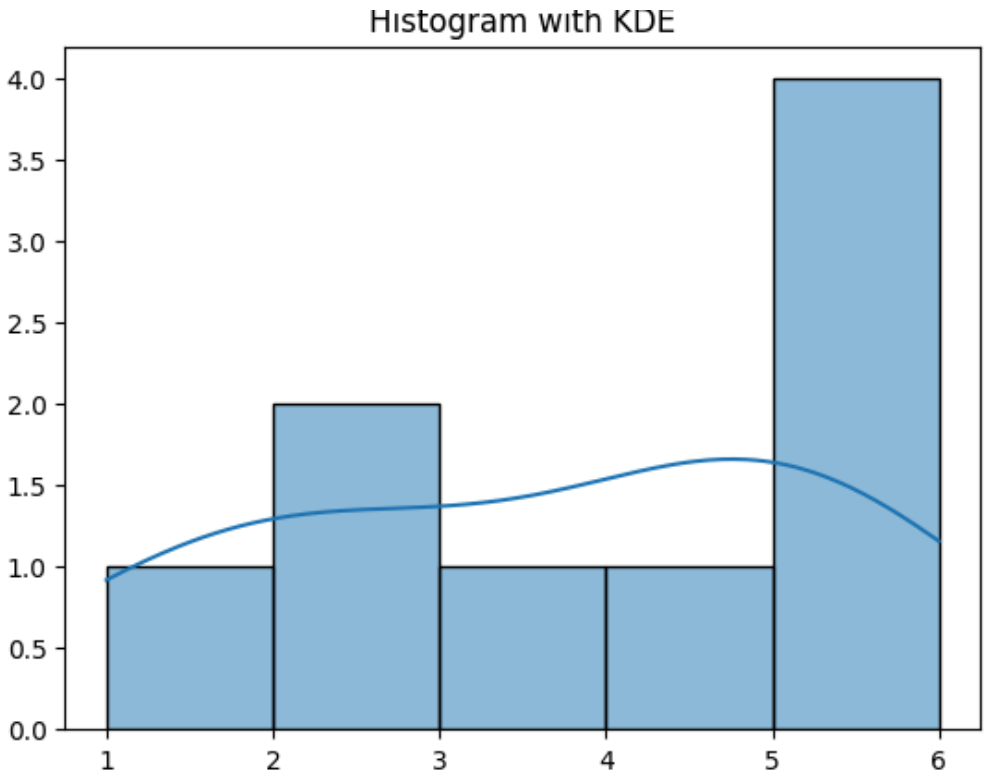
```
[14] df = pd.DataFrame({'A': [5, 10, 15, 20]})
     filtered_df = df[df['A'] > 10]
     print(filtered_df)
```

```
    A
2  15
3  20
```

Q.No.10- Create a histogram using Seaborn to visualize a distribution.

```
[15] import seaborn as sns
```

```
[16] data = [1, 2, 2, 3, 4, 5, 5, 5, 6]
     sns.histplot(data, kde=True)
     plt.title("Histogram with KDE")
     plt.show()
```



Q.No.11- Perform matrix multiplication using NumPy.

```
[17] a = np.array([[1, 2], [3, 4]])
     b = np.array([[5, 6], [7, 8]])
     result = np.dot(a, b)
     print("Matrix multiplication result:\n", result)
```

```
Matrix multiplication result:
 [[19 22]
 [43 50]]
```

Q.No.12- Use Pandas to load a CSV file and display its first.

```
[19] df = pd.read_csv("https://archive.ics.uci.edu/ml/machine-learning-databases/housing/housing.data"
     )
     print(df.head())
```

```
     0.00632  18.00   2.310  0  0.5380  6.5750  65.20  4.0900   1  296.0  15.30 396.90   4.98  24.00
0    0.02731   0.00   7.070  0  0.4690  6.4210  78...
1    0.02729   0.00   7.070  0  0.4690  7.1850  61...
2    0.03237   0.00   2.180  0  0.4580  6.9980  45...
3    0.06905   0.00   2.180  0  0.4580  7.1470  54...
4    0.02985   0.00   2.180  0  0.4580  6.4300  58...
```

Q.No.13- Create a 3D scatter plot using Plotly.

```
[20] import plotly.express as px
     import pandas as pd
```

```
[21] df = pd.DataFrame({
         'x': [1, 2, 3, 4],
         'y': [10, 15, 13, 17],
         'z': [5, 7, 6, 8]
     })
     fig = px.scatter_3d(df, x='x', y='y', z='z', title='3D Scatter Plot')
     fig.show()
```

3D Scatter Plot