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PRACTICAL 8

Write python program to implement

a). Different types of plots using Numpy and Matplotlib

PROGRAM:

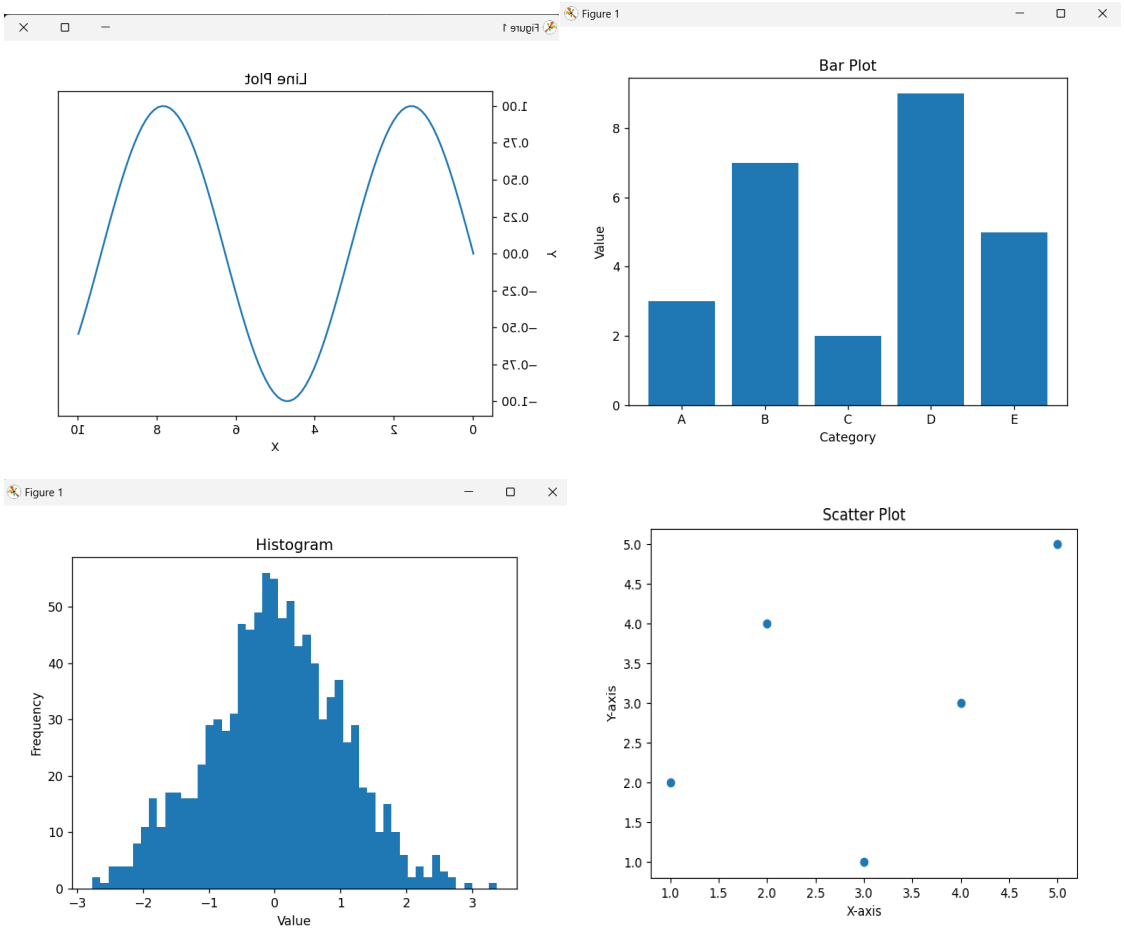
```
import numpy as np
import matplotlib.pyplot as plt

# Line Plot
x = np.linspace(0, 10, 100)
y = np.sin(x)
plt.plot(x, y)
plt.title("Line Plot")
plt.xlabel("X")
plt.ylabel("Y")
plt.show()

# Bar Plot
x = np.array(["A", "B", "C", "D", "E"])
y = np.array([3, 7, 2, 9, 5])
plt.bar(x, y)
plt.title("Bar Plot")
plt.xlabel("Category")
plt.ylabel("Value")
plt.show()

# Histogram
x = np.random.randn(1000)
plt.hist(x, bins=50)
plt.title("Histogram")
plt.xlabel("Value")
plt.ylabel("Frequency")
plt.show()
#scatter plot
x = [1, 2, 3, 4, 5]
y = [2, 4, 1, 3, 5]
plt.scatter(x, y)
plt.title('Scatter Plot Example')
plt.xlabel('X-axis')
plt.ylabel('Y-axis')
plt.show()
```

OUTPUT:



b) Basic operations using pandas like series, data frames, indexing, filtering, combining and merging data frames.

PROGRAM:

```
import pandas as pd

#Series
s = pd.Series([1, 3, 5, np.nan, 6, 8])
print(s)
#Data frame
df = pd.DataFrame({'A': [1, 2, 3], 'B': [4, 5, 6]})
print(df)
#Indexing
print(df['A'])
print(df.loc[0])
print(df.iloc[0])
#Filtering
print(df[df['A'] > 1])
print(df[df['B'].isin([4, 5])])
#Combining data frames
df1 = pd.DataFrame({'A': [1, 2, 3], 'B': [4, 5, 6]})
df2 = pd.DataFrame({'A': [4, 5, 6], 'B': [7, 8, 9]})
df_combined = pd.concat([df1, df2])
print(df_combined)
#Merging data frames
```

```
df1 = pd.DataFrame({'key': ['A', 'B', 'C', 'D'], 'value': [1, 2, 3, 4]})
df2 = pd.DataFrame({'key': ['B', 'D', 'E', 'F'], 'value': [5, 6, 7, 8]})
df_merged = pd.merge(df1, df2, on='key', how='inner')
print(df_merged)
```

OUTPUT:

```
0    1.0

1    3.0
2    5.0
3    NaN
4    6.0
5    8.0
dtype: float64

   A  B
0  1  4
1  2  5
2  3  6

0    1
1    2
2    3
Name: A, dtype: int64
A    1
B    4
Name: 0, dtype: int64
A    1
B    4
Name: 0, dtype: int64

   A  B
1  2  5
2  3  6
   A  B
0  1  4
1  2  5

   A  B
0  1  4
1  2  5
2  3  6
0  4  7
1  5  8
2  6  9

  key  value_x  value_y
0   B        2        5
1   D        4        6
```