

1. Draw a Line with Labels and Title

```
python
Copy code
import matplotlib.pyplot as plt

plt.plot([1, 2, 3], [2, 4, 1])
plt.xlabel('X Axis')
plt.ylabel('Y Axis')
plt.title('Sample Line Plot')
plt.show()
```

2. Draw a Line from Axis Values in a Text File

```
python
Copy code
import matplotlib.pyplot as plt

x, y = [], []
with open('test.txt', 'r') as file:
    for line in file:
        a, b = map(int, line.split())
        x.append(a)
        y.append(b)

plt.plot(x, y)
plt.xlabel('X Axis')
plt.ylabel('Y Axis')
plt.title('Line from Text File')
plt.show()
```

3. Draw Line Chart for Alphabet Inc. Financial Data

```
python
Copy code
import matplotlib.pyplot as plt
import csv

dates, close_prices = [], []

with open('financial_data.csv', 'r') as file:
    csv_reader = csv.DictReader(file)
    for row in csv_reader:
        dates.append(row['Date'])
        close_prices.append(float(row['Close']))

plt.plot(dates, close_prices, marker='o')
plt.xlabel('Date')
plt.ylabel('Close Price')
plt.title('Alphabet Inc. Financial Data')
plt.xticks(rotation=45)
plt.show()
```

4. Plot Multiple Lines with Legends

```
python
Copy code
import matplotlib.pyplot as plt

x = [1, 2, 3, 4]
y1 = [1, 4, 9, 16]
y2 = [1, 2, 3, 4]

plt.plot(x, y1, label='Squared')
plt.plot(x, y2, label='Linear')
plt.xlabel('X Axis')
plt.ylabel('Y Axis')
plt.title('Multiple Lines')
plt.legend()
plt.show()
```

5. Create and Display a Pandas Series

```
python
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import pandas as pd

data = list(map(int, input("Enter values for series: ").split()))
series = pd.Series(data)
print("Pandas Series:")
print(series)
```

6. Convert Pandas Series to List

```
python
Copy code
import pandas as pd

data = [1, 2, 3, 4, 5]
series = pd.Series(data)
data_list = series.tolist()
print("Python List:", data_list)
print("Type:", type(data_list))
```

7. Add, Subtract, Multiply, Divide Two Pandas Series

```
python
Copy code
import pandas as pd

data1 = list(map(int, input("Enter first series: ").split()))
data2 = list(map(int, input("Enter second series: ").split()))
series1 = pd.Series(data1)
series2 = pd.Series(data2)

print("Addition:", series1 + series2)
print("Subtraction:", series1 - series2)
print("Multiplication:", series1 * series2)
print("Division:", series1 / series2)
```

8. Compare Two Pandas Series

python

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```
import pandas as pd

data1 = list(map(int, input("Enter first series: ").split()))
data2 = list(map(int, input("Enter second series: ").split()))
series1 = pd.Series(data1)
series2 = pd.Series(data2)

print("Equal:", series1 == series2)
print("Greater:", series1 > series2)
print("Lesser:", series1 < series2)
```

9. Convert Dictionary to Pandas Series

python

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```
import pandas as pd

empno = int(input("Enter empno: "))
ename = input("Enter ename: ")
basic = float(input("Enter basic: "))
data = {'empno': empno, 'ename': ename, 'basic': basic}
series = pd.Series(data)
print("Pandas Series:")
print(series)
```

10. Convert NumPy Array to Pandas Series

python

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```
import numpy as np
import pandas as pd

data = list(map(int, input("Enter 5 elements: ").split()))
numpy_array = np.array(data)
series = pd.Series(numpy_array)
print("Pandas Series:")
print(series)
```

11. Simple Linear Regression and Error Estimation (Without sklearn)

python

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```
import numpy as np

# Input data
X = np.array([1, 2, 3, 4, 5, 6, 7])
Y = np.array([1.5, 3.8, 6.7, 9.0, 11.2, 13.6, 16])
```

```
# Calculate means
mean_X = np.mean(X)
mean_Y = np.mean(Y)

# Calculate coefficients (slope and intercept)
numerator = np.sum((X - mean_X) * (Y - mean_Y))
denominator = np.sum((X - mean_X) ** 2)
slope = numerator / denominator
intercept = mean_Y - slope * mean_X

# Predicted Y values
predicted_Y = slope * X + intercept

# Error estimation (Mean Squared Error)
errors = Y - predicted_Y
mse = np.mean(errors ** 2)

# Display results
print("Slope (m):", slope)
print("Intercept (b):", intercept)
print("Predicted Y:", predicted_Y)
print("Mean Squared Error:", mse)
```