

In [5]: ▶

```
1 import numpy as np
2 import pandas as pd
3 from sklearn.linear_model import LinearRegression
4
5 num_points = int(input("Enter the number of data points: "))
6
7 x = []
8 y = []
9
10 for i in range(num_points):
11     x_val = float(input(f"Enter x[{i + 1}]: "))
12     y_val = float(input(f"Enter y[{i + 1}]: "))
13     x.append(x_val)
14     y.append(y_val)
15
16 x = np.array(x)
17 y = np.array(y)
18
19 mean_x = np.mean(x)
20 mean_y = np.mean(y)
21
22 x_minus_mean_x = x - mean_x
23 y_minus_mean_y = y - mean_y
24 xy_minus_mean_x_mean_y = x_minus_mean_x * y_minus_mean_y
25 x_minus_mean_x_squared = (x - mean_x) ** 2
26
27 if len(x.shape) == 1:
28     x = x.reshape(-1, 1)
29
30 model = LinearRegression()
31 model.fit(x, y)
32
33 slope = model.coef_[0]
34 intercept = model.intercept_
35
36 result_df = pd.DataFrame({'x': x.flatten(), 'y': y,
37                           'x - mean(x)': x_minus_mean_x.flatten(),
38                           'y - mean(y)': y_minus_mean_y.flatten(),
39                           '(x - mean(x)) * (y - mean(y))': xy_minus_mean_x_mean_y.flatten(),
40                           '(x - mean(x))^2': x_minus_mean_x_squared.flatten()})
41 result_df['Predicted y'] = model.predict(x)
42
43 print(result_df)
44 print("Slope (Coefficient): %.2f" % slope)
45 print("Intercept: %.2f" % intercept)
46
```

```

Enter the number of data points: 2
Enter x[1]: 3
Enter y[1]: 4
Enter x[2]: 5
Enter y[2]: 6
      x    y  x - mean(x)  y - mean(y)  (x - mean(x)) * (y - mean(y))  \
0  3.0  4.0          -1.0          -1.0                  1.0
1  5.0  6.0           1.0           1.0                  1.0

      (x - mean(x))^2  Predicted y
0              1.0          4.0
1              1.0          6.0
Slope (Coefficient): 1.00
Intercept: 1.00

```

In []:

▶

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