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In [1]: import pandas as pd
```

```
In [2]: import numpy as np
```

```
In [3]: import matplotlib.pyplot as plt
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```
In [10]: x = np.array([1, 2, 3, 4, 5])  
y = np.array([2, 4, 5, 4, 5])
```

```
In [25]: df = pd.DataFrame(data)
```

```
In [26]: df = pd.DataFrame({'X': x, 'Y': y})
```

```
In [27]: df
```

```
Out[27]:
```

	X	Y
0	1	2
1	2	4
2	3	5
3	4	4
4	5	5

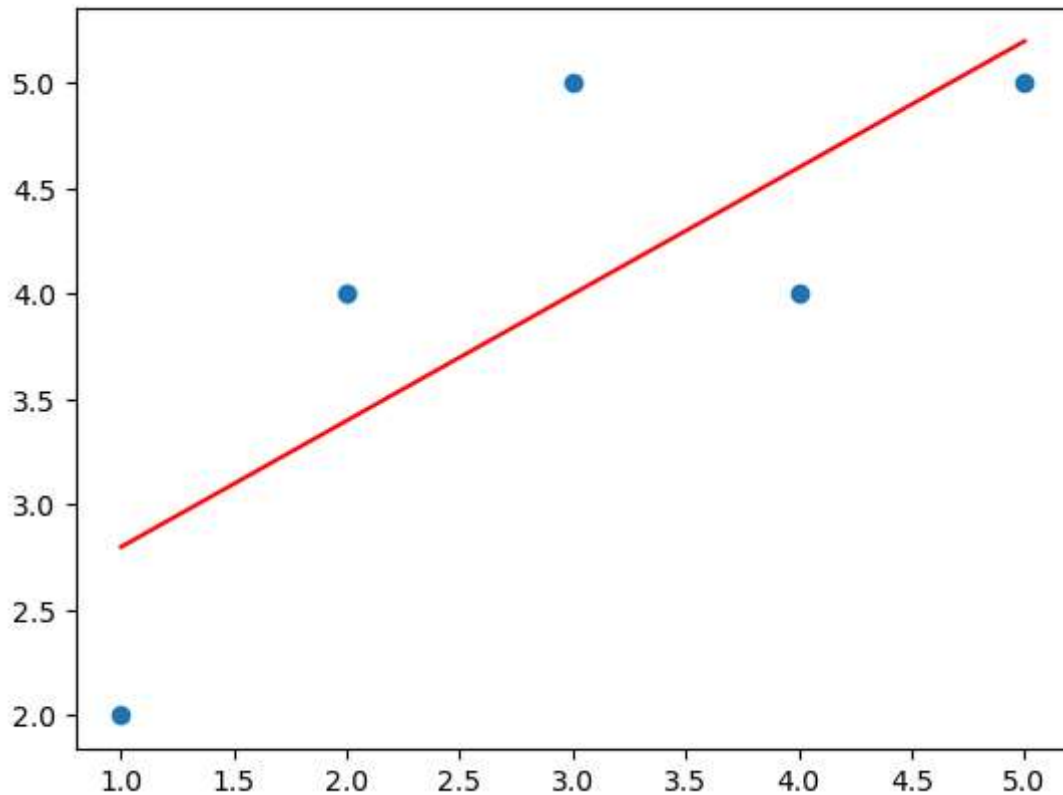
```
In [15]: m, b = np.polyfit(df['X'], df['Y'], 1)
```

```
In [16]: print("Slope (m):", m)  
print("Intercept (b):", b)
```

```
Slope (m): 0.6000000000000002  
Intercept (b): 2.1999999999999993
```

```
In [17]: y_pred = m * df['X'] + b
```

```
In [18]: plt.scatter(df['X'], df['Y'])  
plt.plot(df['X'], y_pred, color='red')  
plt.show()
```



```
In [19]: coefficients = np.polyfit(df['X'], df['Y'], 1)
```

```
In [20]: print("Coefficients:", coefficients)
```

Coefficients: [0.6 2.2]

```
In [21]: m = coefficients[0]
         b = coefficients[1]

         print("Slope (m):", m)
         print("Intercept (b):", b)
```

Slope (m): 0.6000000000000002
Intercept (b): 2.1999999999999993

```
In [22]: x_new = 6
         y_pred = m * x_new + b

         print("Predicted Y for X =", x_new, "is:", y_pred)
```

Predicted Y for X = 6 is: 5.800000000000001

```
In [23]: x_new = np.array([6, 7, 8])
         y_pred = m * x_new + b

         print("Predicted Y values:")
         print(y_pred)
```

Predicted Y values:
[5.8 6.4 7.]

```
In [24]: model = np.poly1d(np.polyfit(df['X'], df['Y'], 1))

# Predict
print(model(6))
```

5.800000000000001

```
In [28]: model = np.poly1d(np.polyfit(df['X'], df['Y'], 1))

df['y_pred'] = model(df['X'])

df
```

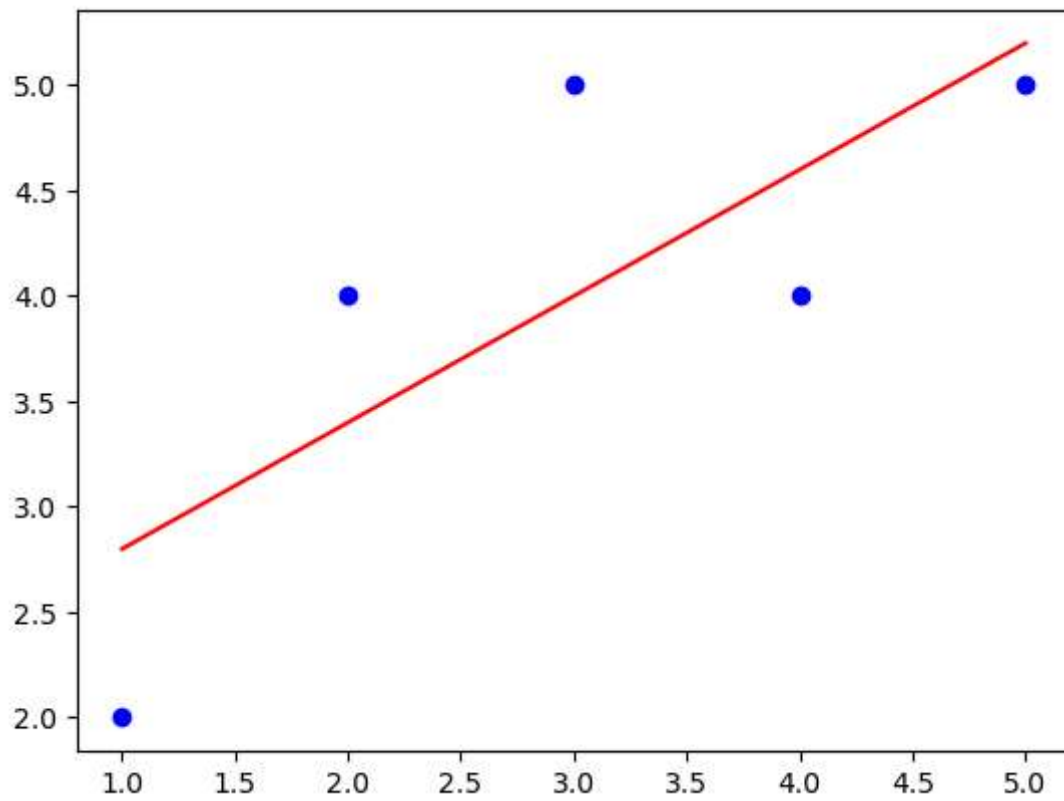
```
Out[28]:
```

	X	Y	y_pred
0	1	2	2.8
1	2	4	3.4
2	3	5	4.0
3	4	4	4.6
4	5	5	5.2

```
In [33]: r2 = np.corrcoef(df['X'], df['Y'])[0,1]**2
print("R-Squared:", r2)
```

R-Squared: 0.6000000000000001

```
In [34]: plt.scatter(df['X'], df['Y'], color='blue')
plt.plot(sorted(df['X']), sorted(df['y_pred']), color='red')
plt.show()
```



In []: