ex4

December 8, 2023

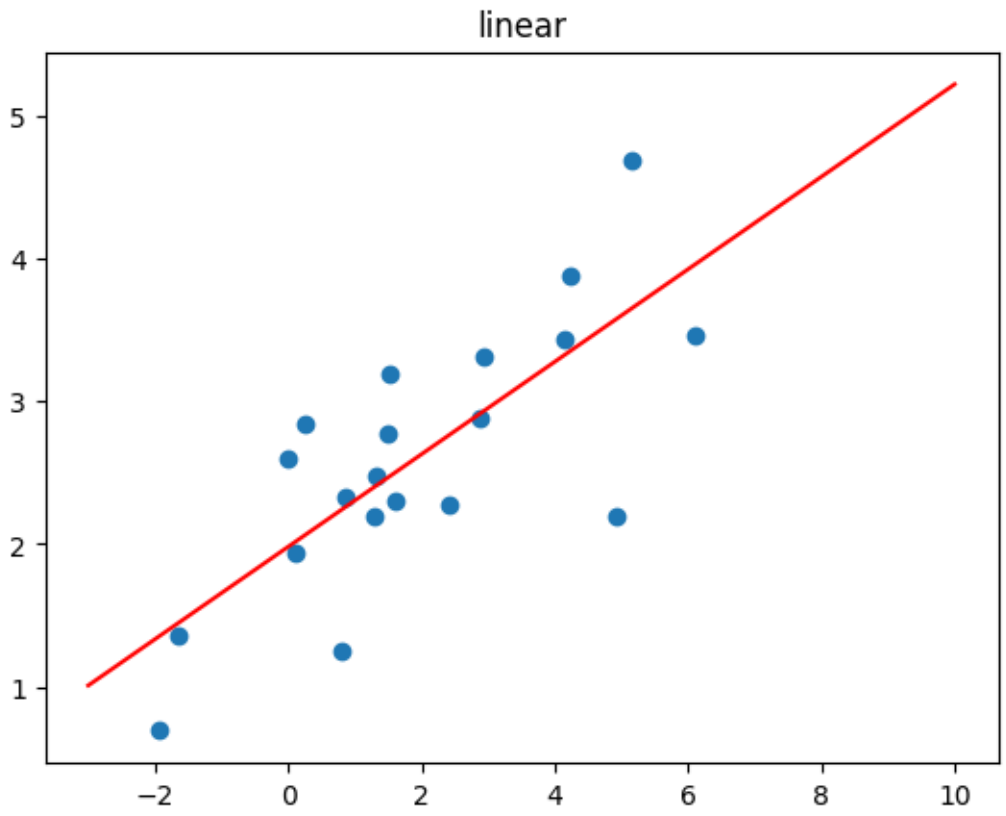
[ ]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

[ ]:
```
data = pd.read_csv("linreg_data.csv")[["X", "Y"]].values
x = data[:, 0]
X = np.vstack([np.ones_like(x), x]).T
y = data[:, 1]

Bs = np.linalg.inv(X.T@X) @ (X.T @ y)
lin = np.linspace(-3, 10, 100)
preds = np.vstack([np.ones_like(lin), lin]).T @ Bs

plt.scatter(x, y)
plt.plot(lin, preds, color="red")
plt.title("linear")
Bs
```

[ ]:
```
array([1.98091071, 0.32441823])
```

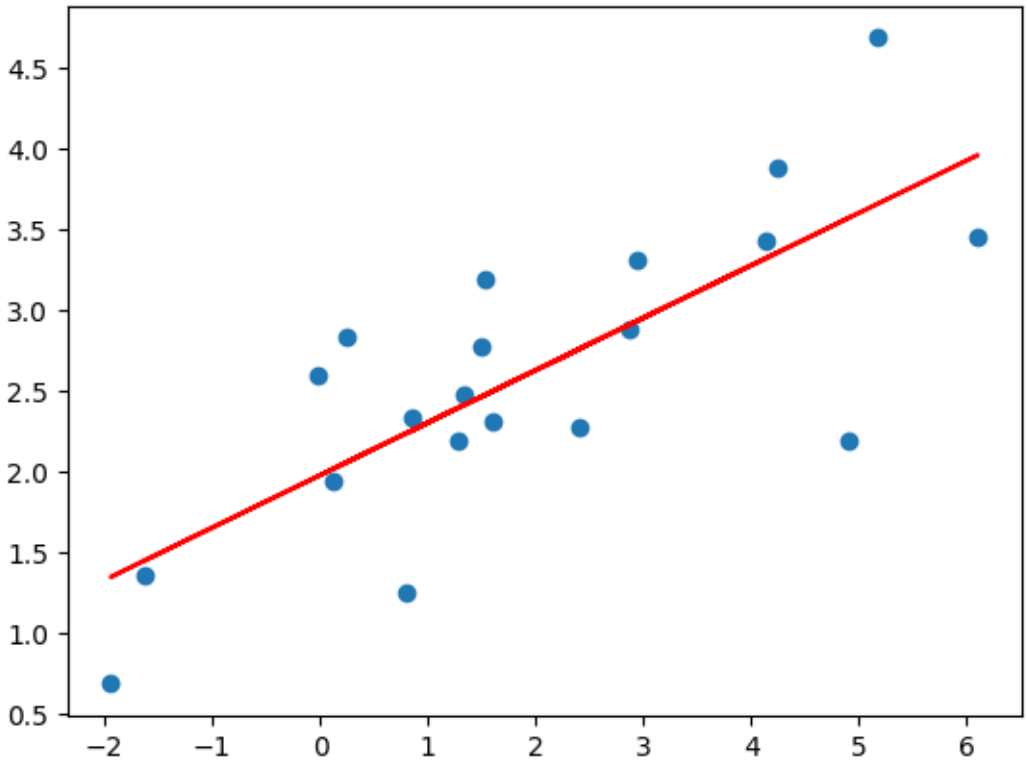


[ ]:
```
from scipy.stats import linregress

slope, intercept, r_value, p_value, std_err = linregress(x, y)

plt.scatter(x, y)
plt.plot(x, intercept + x * slope, color="red")
```

[ ]:
```
[<matplotlib.lines.Line2D at 0x17c32f5b0>]
```



[ ]:
```
Yx2 = intercept + 2 * slope
Yx2

#4. Replace observed values with regression function values
```

[ ]:
```
2.629747164010065
```