```
import seaborn as sns
import numpy as np
import pandas as pd
```

```
iris = sns.load_dataset('iris')
iris
```

	sepal_length	sepal_width	petal_length	petal_width	species
0	5.1	3.5	1.4	0.2	setosa
1	4.9	3.0	1.4	0.2	setosa
2	4.7	3.2	1.3	0.2	setosa
3	4.6	3.1	1.5	0.2	setosa
4	5.0	3.6	1.4	0.2	setosa
...	...	...	...	...	...
145	6.7	3.0	5.2	2.3	virginica
146	6.3	2.5	5.0	1.9	virginica
147	6.5	3.0	5.2	2.0	virginica
148	6.2	3.4	5.4	2.3	virginica
149	5.9	3.0	5.1	1.8	virginica

150 rows × 5 columns

```
iris = iris[['petal_length', 'petal_width']]
iris
```

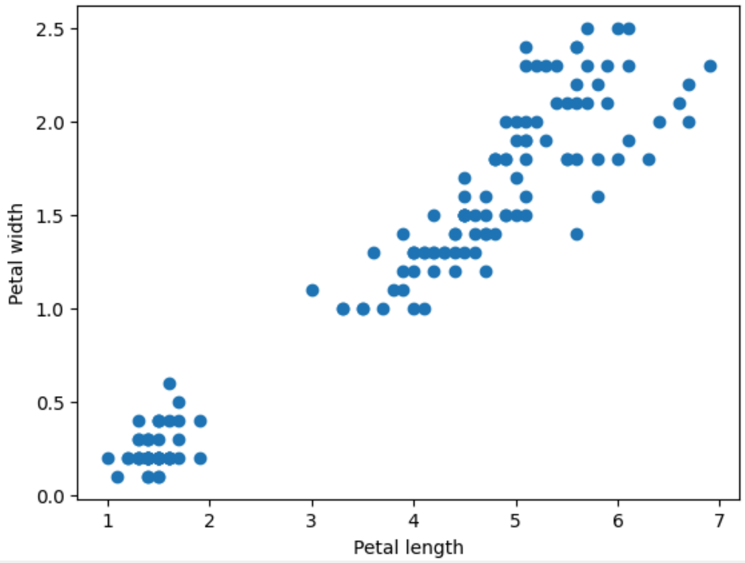
	petal_length	petal_width
0	1.4	0.2
1	1.4	0.2
2	1.3	0.2
3	1.5	0.2
4	1.4	0.2
...	...	...
145	5.2	2.3
146	5.0	1.9
147	5.2	2.0
148	5.4	2.3
149	5.1	1.8

150 rows × 2 columns

```
X = iris['petal_length']
Y = iris['petal_width']
```

```
import matplotlib.pyplot as plt
plt.scatter(X, Y)
plt.xlabel("Petal length")
plt.ylabel("Petal width")
```

```
Text(0, 0.5, 'Petal width')
```



```
from sklearn.model_selection import train_test_split
X_train, X_test, Y_train , Y_test = train_test_split(X, Y, test_size = 0.4, random_state=23)
X_train
```

	petal_length
77	5.0
29	1.6
92	4.0
23	1.7
128	5.6
...	...
39	1.5
91	4.6
31	1.5
40	1.3
83	5.1

90 rows × 1 columns

dtype: float64

```
X_train = np.array(X_train).reshape(-1, 1)
X_train
```

```
array([[5. ],
       [1.6],
       [4. ],
       [1.7],
       [5.6],
       [4. ],
       [4.8],
       [5.6],
       [5.1],
       [4.9],
       [1.4],
       [1.6],
       [5.6],
       [1.4],
       [1.6],
       [5.5],
       [5.1],
       [4. ],
       [1.4],
       [4.1],
       [5.3],
       [4.5],
       [5.8],
       [6.6],
       [4.3],
       [1.3],
       [4. ],
       [4.9],
       [4.9],
       [4. ],
       [1.5],
       [4.5],
       [4.5],
       [3.9],
       [5. ],
       [4.8],
       [3.8],
       [5.1],
       [6.3],
       [6.1],
       [1.2],
       [5.7],
       [3. ],
       [1.5],
       [5.9],
       [4.8],
       [1.4],
       [4.5],
       [4.2],
       [5.2],
       [1.3],
       [1. ],
       [3.5],
       [1.1],
       [4.7],
       [4.2],
       [1.2],
```

```
Start coding or generate with AI.
```

```
X_test = np.array(X_test).reshape(-1,1)
X_test
```

```
from sklearn.linear_model import LinearRegression
lr = LinearRegression()
lr.fit(X_train, Y_train)
```

```
▾ LinearRegression
LinearRegression()
```

```
c = lr.intercept_
c
```

```
-0.3511327422143746
```

```
m = lr.coef_
m
```

```
array([0.41684538])
```

```
y_pred_train = m*X_train + c
y_pred_train.flatten()
```

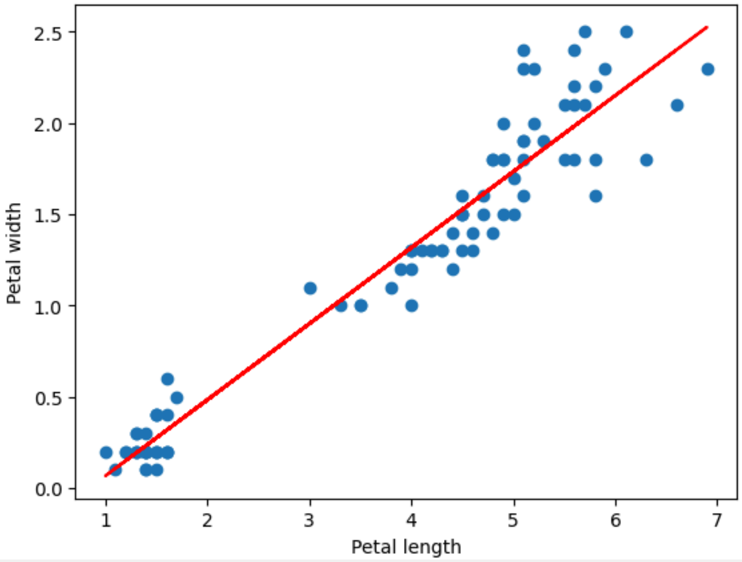
```
array([1.73309416, 0.31581987, 1.31624878, 0.3575044 , 1.98320139,
       1.31624878, 1.64972508, 1.98320139, 1.7747787 , 1.69140962,
       0.23245079, 0.31581987, 1.98320139, 0.23245079, 0.31581987,
       1.94151685, 1.7747787 , 1.31624878, 0.23245079, 1.35793332,
       1.85814777, 1.52467147, 2.06657046, 2.40004677, 1.44130239,
       0.19076625, 1.31624878, 1.69140962, 1.69140962, 1.31624878,
       0.27413533, 1.52467147, 1.52467147, 1.27456424, 1.73309416,
       1.64972508, 1.2328797 , 1.7747787 , 2.27499315, 2.19162408,
       0.14908171, 2.02488593, 0.8994034 , 0.27413533, 2.108255  ,
       1.64972508, 0.23245079, 1.52467147, 1.39961786, 1.81646324,
       0.19076625, 0.06571264, 1.10782609, 0.10739718, 1.60804055,
       1.39961786, 0.14908171, 2.06657046, 1.44130239, 1.52467147,
       0.31581987, 2.52510038, 1.56635601, 1.7747787 , 1.98320139,
       1.60804055, 0.27413533, 0.31581987, 1.94151685, 2.06657046,
       1.48298693, 0.19076625, 1.81646324, 1.02445701, 2.02488593,
       1.10782609, 0.19076625, 0.27413533, 0.27413533, 1.7747787 ,
       0.23245079, 0.23245079, 1.69140962, 0.23245079, 1.48298693,
       0.27413533, 1.56635601, 0.27413533, 0.19076625, 1.7747787 ])
```

```
y_pred_train1 = lr.predict(X_train)
y_pred_train1.flatten()
```

```
array([1.73309416, 0.31581987, 1.31624878, 0.3575044 , 1.98320139,
       1.31624878, 1.64972508, 1.98320139, 1.7747787 , 1.69140962,
       0.23245079, 0.31581987, 1.98320139, 0.23245079, 0.31581987,
       1.94151685, 1.7747787 , 1.31624878, 0.23245079, 1.35793332,
       1.85814777, 1.52467147, 2.06657046, 2.40004677, 1.44130239,
       0.19076625, 1.31624878, 1.69140962, 1.69140962, 1.31624878,
       0.27413533, 1.52467147, 1.52467147, 1.27456424, 1.73309416,
       1.64972508, 1.2328797 , 1.7747787 , 2.27499315, 2.19162408,
       0.14908171, 2.02488593, 0.8994034 , 0.27413533, 2.108255  ,
       1.64972508, 0.23245079, 1.52467147, 1.39961786, 1.81646324,
       0.19076625, 0.06571264, 1.10782609, 0.10739718, 1.60804055,
       1.39961786, 0.14908171, 2.06657046, 1.44130239, 1.52467147,
       0.31581987, 2.52510038, 1.56635601, 1.7747787 , 1.98320139,
       1.60804055, 0.27413533, 0.31581987, 1.94151685, 2.06657046,
       1.48298693, 0.19076625, 1.81646324, 1.02445701, 2.02488593,
       1.10782609, 0.19076625, 0.27413533, 0.27413533, 1.7747787 ,
       0.23245079, 0.23245079, 1.69140962, 0.23245079, 1.48298693,
       0.27413533, 1.56635601, 0.27413533, 0.19076625, 1.7747787 ])
```

```
import matplotlib.pyplot as plt
plt.scatter(X_train, Y_train)
plt.plot(X_train, y_pred_train1, color='red')
plt.xlabel("Petal length")
plt.ylabel("Petal width")
```

```
Text(0, 0.5, 'Petal width')
```

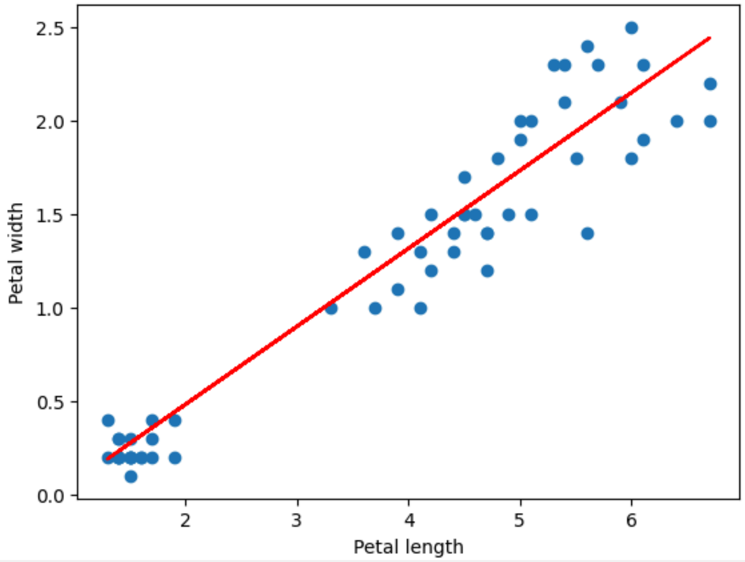


```
y_pred_test1 = lr.predict(X_test)
y_pred_test1.flatten()
```

```
array([1.89983231, 2.14993954, 1.35793332, 0.27413533, 1.73309416,
       1.69140962, 0.3575044 , 1.94151685, 0.3575044 , 1.14951063,
       1.60804055, 0.31581987, 2.108255  , 0.27413533, 0.27413533,
       1.7747787 , 1.52467147, 1.60804055, 2.19162408, 0.23245079,
       1.85814777, 0.23245079, 0.31581987, 0.19076625, 1.98320139,
       0.23245079, 0.44087348, 1.64972508, 1.48298693, 1.27456424,
       0.27413533, 1.27456424, 0.19076625, 2.44173131, 0.27413533,
       0.3575044 , 1.56635601, 1.02445701, 1.39961786, 2.14993954,
       2.02488593, 0.44087348, 1.19119517, 0.23245079, 1.48298693,
       1.73309416, 1.52467147, 2.31667769, 0.27413533, 1.35793332,
       2.19162408, 1.89983231, 0.23245079, 1.98320139, 1.52467147,
       1.60804055, 2.44173131, 1.39961786, 0.23245079, 1.7747787 ])
```

```
import matplotlib.pyplot as plt
plt.scatter(X_test, Y_test)
plt.plot(X_test, y_pred_test1, color='red')
plt.xlabel("Petal length")
plt.ylabel("Petal width")
```

```
Text(0, 0.5, 'Petal width')
```


Petal width
Petal length