```
import pandas as pd
```

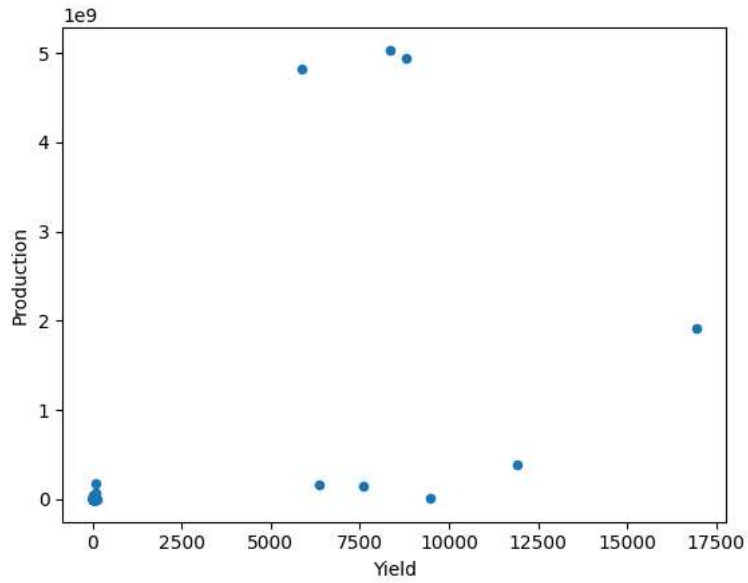
```
data = pd.read_csv("/content/crop_yield.csv")
print(data)
```

```
            Crop  CropYear       Season           State      Area  Production  \
0       Arecanut      2019  Kharif       Andhra Pradesh    1096.0       10418
1     Arhar/Tur       2019  Kharif       Andhra Pradesh  237647.0      114451
2     Arhar/Tur       2019  Rabi         Andhra Pradesh    5940.0        3747
3         Bajra       2019  Kharif       Andhra Pradesh   20484.0       47045
4         Bajra       2019  Rabi         Andhra Pradesh    4592.0       11322
...         ...        ...          ...              ...       ...         ...
1016  Sunflower       2019  Kharif          West Bengal    7842.0        9576
1017    Tobacco       2019  Whole Year      West Bengal   15151.0       20457
1018       Urad       2019  Kharif          West Bengal   66846.0       44876
1019       Urad       2019  Rabi            West Bengal    5502.0        5215
1020      Wheat       2019  Rabi            West Bengal  188308.0      509970

      AnnualRainfall   Fertilizer  Pesticide     Yield
0              899.2    188248.96     405.52  7.253333
1              899.2  40818248.72   87929.39  0.440000
2              899.2   1020254.40    2197.80  0.430000
3              899.2   3518331.84    7579.08  2.004545
4              899.2    788721.92    1699.04  2.480000
...              ...          ...        ...       ...
1016          1733.4   1346941.92    2901.54  1.114667
1017          1733.4   2602335.76    5605.87  1.510000
1018          1733.4  11481468.96   24733.02  0.640000
1019          1733.4    945023.52    2035.74  0.740000
1020          1733.4  32343782.08   69673.96  2.647619

[1021 rows x 10 columns]
```

```
data.head()
```

	Crop	CropYear	Season	State	Area	Production	AnnualRainfall	Fertilizer	Pesticide	Yield
0	Arecanut	2019	Kharif	Andhra Pradesh	1096.0	10418	899.2	188248.96	405.52	7.253333
1	Arhar/Tur	2019	Kharif	Andhra Pradesh	237647.0	114451	899.2	40818248.72	87929.39	0.440000
2	Arhar/Tur	2019	Rabi	Andhra Pradesh	5940.0	3747	899.2	1020254.40	2197.80	0.430000
3	Bajra	2019	Kharif	Andhra Pradesh	20484.0	47045	899.2	3518331.84	7579.08	2.004545
4	Bajra	2019	Rabi	Andhra Pradesh	4592.0	11322	899.2	788721.92	1699.04	2.480000

```
data.plot.scatter(x='Yield', y='Production');
```




```
data.shape
```

```
(1021, 10)
```

```
x=data['Production'].values.reshape(-1,1)
y=data['Yield'].values.reshape(-1,1)
```

```
x.shape
```

```
(1021, 1)
```

```
SEED = 40
```

```
from sklearn.model_selection import train_test_split
x_train, x_test, y_train, y_test = train_test_split(x, y, test_size = 0.2, random_state = 30)
```

```
print(x_train)
print(y_train)
```

```
[[       688]
 [      4210]
 [      1865]
 [   2701810]
 [     19444]
 [        57]
 [      2517]
 [     89432]
 [      1626]
 [     44950]
 [   1750601]
 [     21329]
 [       465]
 [      4620]
 [     36316]
 [    274809]
 [       460]
 [     22030]
 [  14869966]
 [ 390028000]
 [      4637]
 [    159883]
 [      1039]
 [     94770]
 [     83939]
 [         0]
 [      2098]
 [     33683]
 [     51278]
 [      1238]
 [      6653]
 [     68562]
 [    394898]
 [     13554]
 [     23400]
 [       342]
 [       919]
 [   2463000]
 [      6271]
 [      2193]
 [     10498]
 [       789]
 [      1000]
 [      3089]
 [        65]
 [     23420]
 [      3231]
 [    142367]
 [    378700]
 [     15842]
 [        22]
 [      2910]
 [      9576]
 [   3798058]
 [       704]
 [         0]
 [        48]
 [    887440]
```

```
from sklearn.linear_model import LinearRegression
regressor = LinearRegression()
```

```
regressor.fit(x_train, y_train)
```

```
LinearRegression
LinearRegression()
```

```
y_pred = regressor.predict(x_test)
```

```
df_preds = pd.DataFrame({'Actual': y_test.squeeze(), 'Predicted': y_pred.squeeze()})
print(df_preds)
```

```
          Actual  Predicted
0       2.808214  44.422271
1       0.384286  43.808815
2       0.871538  43.764482
3       0.737500  43.758782
4       2.274483  43.854323
..           ...        ...
200     1.791176  44.265723
201    81.091500  46.257603
202     0.758636  43.771808
203     2.268000  43.756299
204     3.610625  53.418543

[205 rows x 2 columns]
```

```
import numpy as np
from sklearn.metrics import mean_absolute_error, mean_squared_error
mae = mean_absolute_error(y_test, y_pred)
mse = mean_squared_error(y_test, y_pred)
rmse = np.sqrt(mse)
print(f'Mean absolute error: {mae:.2f}')
print(f'Mean squared error: {mse:.2f}')
print(f'Root mean squared error: {rmse:.2f}')
```

```
Mean absolute error: 108.62
Mean squared error: 925628.81
Root mean squared error: 962.10
```

```
import matplotlib.pyplot as plt
plt.figure(figsize=(12, 6))
plt.plot(x,y,'ro')
plt.plot(x_test,y_pred)
plt.title('Actual vs Predicted')
plt.xlabel('X')
plt.ylabel('y')
plt.show()
```