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

```python
In [2]:  adv_df = pd.read_csv('Advertising.csv', index_col=0)
```

```python
In [3]:  adv_df.head()
```

Out[3]:
	TV	radio	newspaper	sales
1	230.1	37.8	69.2	22.1
2	44.5	39.3	45.1	10.4
3	17.2	45.9	69.3	9.3
4	151.5	41.3	58.5	18.5
5	180.8	10.8	58.4	12.9

```python
In [8]:  adv_df.size
```

Out[8]: 800

```python
In [9]:  adv_df.shape
```

Out[9]: (200, 4)

```python
In [10]:  adv_df.columns
```

Out[10]: Index(['TV', 'radio', 'newspaper', 'sales'], dtype='object')

```python
In [11]:  x_features=adv_df[['newspaper','radio','TV']]
```

```python
In [12]:  x_features.head()
```

Out[12]:
	newspaper	radio	TV
1	69.2	37.8	230.1
2	45.1	39.3	44.5
3	69.3	45.9	17.2
4	58.5	41.3	151.5
5	58.4	10.8	180.8

```python
In [13]:  y_target=adv_df[['sales']]
```

```python
In [14]:  y_target.head()
```

Out[14]:
	sales
1	22.1
2	10.4
3	9.3
4	18.5
5	12.9

```python
In [16]:  x_features.shape
```

Out[16]: (200, 3)

```python
In [17]:  y_target.shape
```

Out[17]: (200, 1)

```python
In [18]:  from sklearn.model_selection import train_test_split
          x_train, x_test, y_train, y_test = train_test_split(x_features, y_target, random_state=1)
```

```python
In [19]:  print(x_train.shape)
          print(y_train.shape)
          print(x_test.shape)
          print(y_test.shape)

          (150, 3)
          (150, 1)
          (50, 3)
          (50, 1)
```

```python
In [20]:  from sklearn.linear_model import LinearRegression
          linreg = LinearRegression()
          linreg.fit(x_train,y_train)
```

Out[20]: LinearRegression()

```python
In [22]:  print(linreg.intercept_)
          print(linreg.coef_)

          [2.87696662]
          [[0.00345046 0.17915812 0.04656457]]
```

```python
In [23]:  y_pred=linreg.predict(x_test)
          y_pred
```

Out[23]: array([[21.70910292],
       [16.41055243],
       [7.60955058],
       [17.80769552],
       [18.6146359],
       [23.83573998],
       [16.32488681],
       [13.43225536],
       [9.17173403],
       [17.333853],
       [14.44479482],
       [9.83511973],
       [17.18797614],
       [16.73086831],
       [15.05529391],
       [15.61434433],
       [12.42541574],
       [17.17716376],
       [11.08827566],
       [18.00537501],
       [9.28438889],
       [12.98458458],
       [8.79950614],
       [10.42382499],
       [11.3846456],
       [14.98082512],
       [9.78853268],
       [19.39643187],
       [18.18099936],
       [17.12807566],
       [21.54670213],
       [14.69809481],
       [16.24641438],
       [12.32114579],
       [19.92422501],
       [15.32498602],
       [13.88726522],
       [10.03162255],
       [20.93105915],
       [7.44936831],
       [3.64695761],
       [7.22020178],
       [5.9962782],
       [18.43381853],
       [8.39408045],
       [14.08371047],
       [15.02195699],
       [20.35836418],
       [20.57036347],
       [19.60636679]])

```python
In [25]:  from sklearn import metrics
          import numpy as np
```

```python
In [26]:  print(np.sqrt(metrics.mean_squared_error(y_test,y_pred)))

          1.404651423032897
```

```python
In [29]:  print('True',y_test.values[0:10])
          print()
          print('Pred',y_pred[0:10])

          True [[23.8]
           [16.6]
           [ 9.5]
           [14.8]
           [17.6]
           [25.5]
           [16.9]
           [12.9]
           [10.5]
           [17.1]]

          Pred [[21.70910292]
           [16.41055243]
           [ 7.60955058]
           [17.80769552]
           [18.6146359 ]
           [23.83573998]
           [16.32488681]
           [13.43225536]
           [ 9.17173403]
           [17.333853  ]]
```

```python
In [ ]:
```