

```
In [265]: 1 #Name---Ankit
          2 #Email-Id---mrankit1950@gmail.com
```

```
In [391]: 1 import numpy as np
          2 import pandas as pd
```

```
In [392]: 1 Price=pd.read_csv(r"C:\Users\ANKIT MALL-PC\Desktop\archive (13)\Advertisi
          2 Price
```

Out[392]:

	Unnamed: 0	TV	Radio	Newspaper	Sales
0	1	230.1	37.8	69.2	22.1
1	2	44.5	39.3	45.1	10.4
2	3	17.2	45.9	69.3	9.3
3	4	151.5	41.3	58.5	18.5
4	5	180.8	10.8	58.4	12.9
...
195	196	38.2	3.7	13.8	7.6
196	197	94.2	4.9	8.1	9.7
197	198	177.0	9.3	6.4	12.8
198	199	283.6	42.0	66.2	25.5
199	200	232.1	8.6	8.7	13.4

200 rows × 5 columns

```
In [393]: 1 Price.head()
```

Out[393]:

	Unnamed: 0	TV	Radio	Newspaper	Sales
0	1	230.1	37.8	69.2	22.1
1	2	44.5	39.3	45.1	10.4
2	3	17.2	45.9	69.3	9.3
3	4	151.5	41.3	58.5	18.5
4	5	180.8	10.8	58.4	12.9

In [394]: 1 Price.tail()

Out[394]:

	Unnamed: 0	TV	Radio	Newspaper	Sales
195	196	38.2	3.7	13.8	7.6
196	197	94.2	4.9	8.1	9.7
197	198	177.0	9.3	6.4	12.8
198	199	283.6	42.0	66.2	25.5
199	200	232.1	8.6	8.7	13.4

In [395]: 1 Price.shape

Out[395]: (200, 5)

In [396]: 1 Price.describe()

Out[396]:

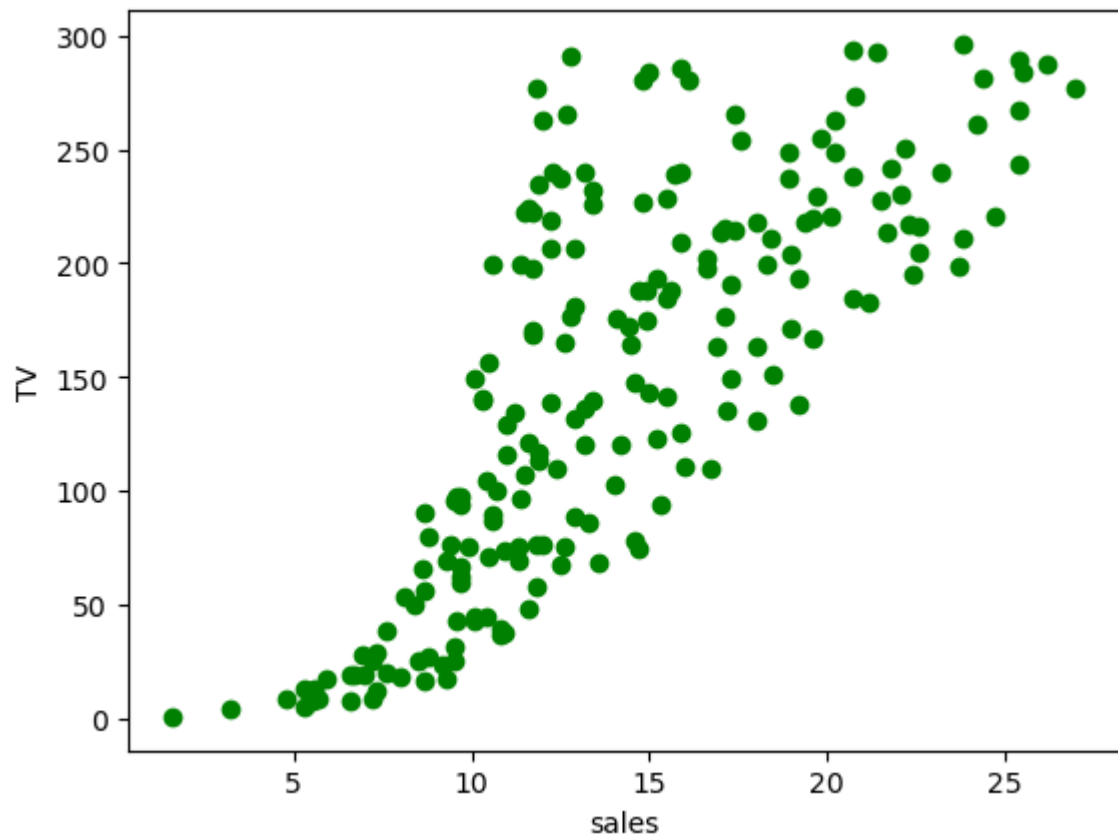
	Unnamed: 0	TV	Radio	Newspaper	Sales
count	200.000000	200.000000	200.000000	200.000000	200.000000
mean	100.500000	147.042500	23.264000	30.554000	14.022500
std	57.879185	85.854236	14.846809	21.778621	5.217457
min	1.000000	0.700000	0.000000	0.300000	1.600000
25%	50.750000	74.375000	9.975000	12.750000	10.375000
50%	100.500000	149.750000	22.900000	25.750000	12.900000
75%	150.250000	218.825000	36.525000	45.100000	17.400000
max	200.000000	296.400000	49.600000	114.000000	27.000000

In [397]: 1 Price.info()

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 200 entries, 0 to 199
Data columns (total 5 columns):
#   Column          Non-Null Count  Dtype
---  -
0   Unnamed: 0      200 non-null   int64
1   TV              200 non-null   float64
2   Radio           200 non-null   float64
3   Newspaper       200 non-null   float64
4   Sales           200 non-null   float64
dtypes: float64(4), int64(1)
memory usage: 7.9 KB
```

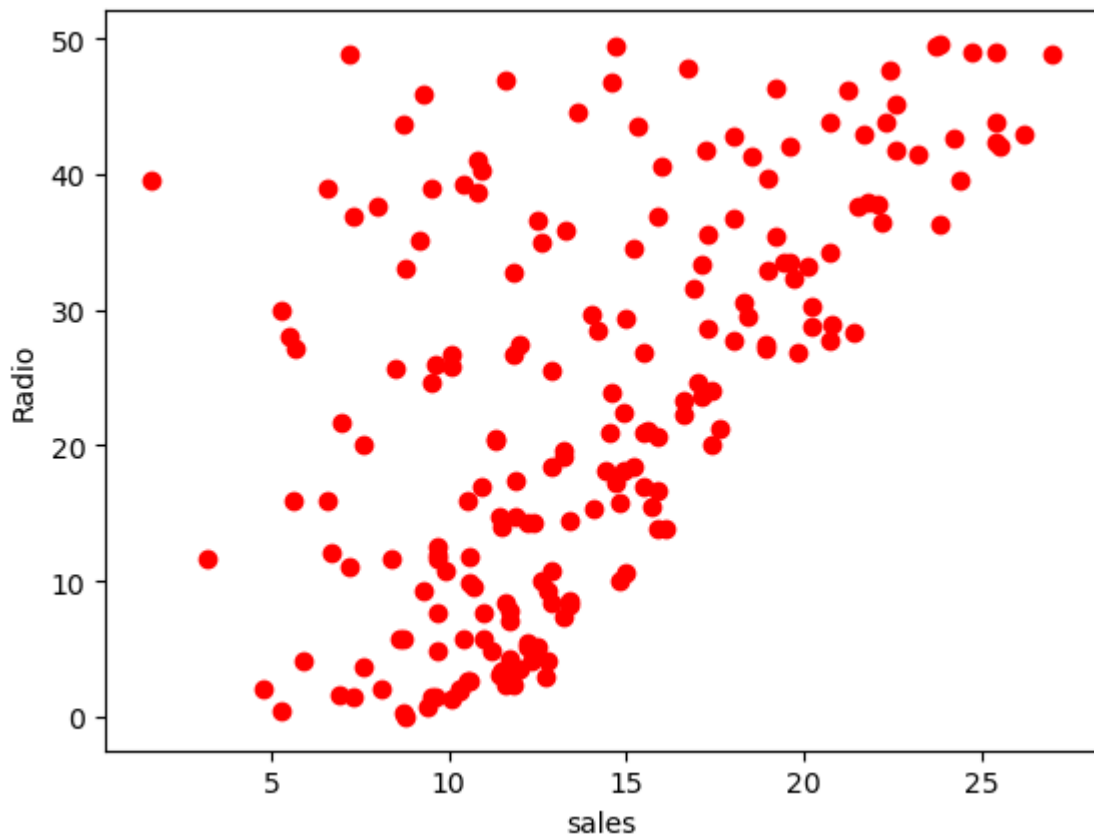
```
In [470]: 1 import matplotlib.pyplot as plt
          2 plt.xlabel('sales')
          3 plt.ylabel('TV')
          4 plt.scatter(Price["Sales"],Price["TV"],c='g')
```

Out[470]: <matplotlib.collections.PathCollection at 0x205c4593e20>



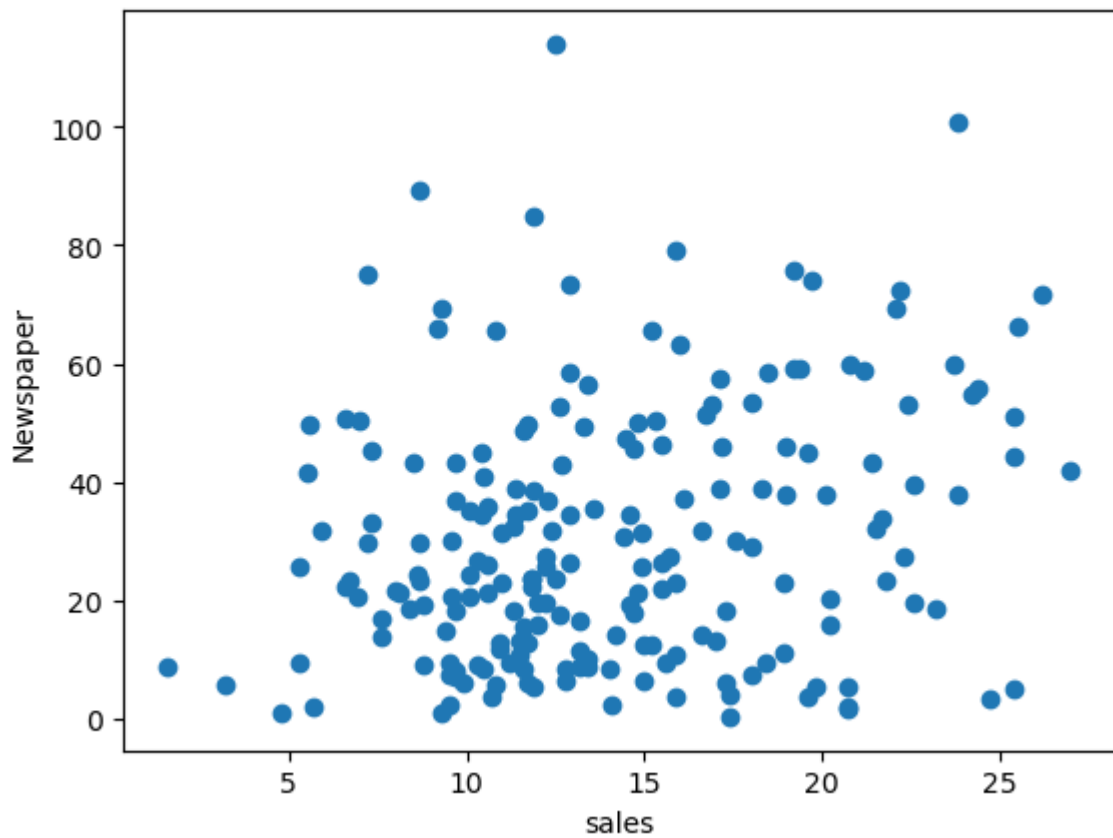
```
In [472]: 1 plt.xlabel('sales')
          2 plt.ylabel('Radio')
          3 plt.scatter(Price["Sales"],Price["Radio"],c='r')
```

Out[472]: <matplotlib.collections.PathCollection at 0x205c6f18af0>



```
In [473]: 1 plt.xlabel('sales')
          2 plt.ylabel('Newspaper')
          3 plt.scatter(Price["Sales"],Price["Newspaper"])
```

Out[473]: <matplotlib.collections.PathCollection at 0x205c70b1700>



```
In [417]: 1 Price=Price.drop(columns=['Unnamed: 0'])
```

In [418]:

```
1 Price
```

Out[418]:

	TV	Radio	Newspaper	Sales
0	230.1	37.8	69.2	22.1
1	44.5	39.3	45.1	10.4
2	17.2	45.9	69.3	9.3
3	151.5	41.3	58.5	18.5
4	180.8	10.8	58.4	12.9
...
195	38.2	3.7	13.8	7.6
196	94.2	4.9	8.1	9.7
197	177.0	9.3	6.4	12.8
198	283.6	42.0	66.2	25.5
199	232.1	8.6	8.7	13.4

200 rows × 4 columns

In [419]:

```
1 x=Price.iloc[:,0:-1]
2 x
```

Out[419]:

	TV	Radio	Newspaper
0	230.1	37.8	69.2
1	44.5	39.3	45.1
2	17.2	45.9	69.3
3	151.5	41.3	58.5
4	180.8	10.8	58.4
...
195	38.2	3.7	13.8
196	94.2	4.9	8.1
197	177.0	9.3	6.4
198	283.6	42.0	66.2
199	232.1	8.6	8.7

200 rows × 3 columns

```
In [420]: 1 y=Price.iloc[:,-1]
          2 y
```

```
Out[420]: 0      22.1
          1      10.4
          2       9.3
          3      18.5
          4      12.9
          ...
          195     7.6
          196     9.7
          197    12.8
          198    25.5
          199    13.4
          Name: Sales, Length: 200, dtype: float64
```

```
In [457]: 1 from sklearn.model_selection import train_test_split
          2 x_train,x_test,y_train,y_test=train_test_split(x,y,train_size=0.85)
```

```
In [458]: 1 x_train
```

```
Out[458]:
```

	TV	Radio	Newspaper
178	276.7	2.3	23.7
44	25.1	25.7	43.3
135	48.3	47.0	8.5
95	163.3	31.6	52.9
122	224.0	2.4	15.6
...
123	123.1	34.6	12.4
2	17.2	45.9	69.3
177	170.2	7.8	35.2
82	75.3	20.3	32.5
104	238.2	34.3	5.3

170 rows × 3 columns

In [459]:

1 x_test

Out[459]:

	TV	Radio	Newspaper
195	38.2	3.7	13.8
160	172.5	18.1	30.7
111	241.7	38.0	23.2
134	36.9	38.6	65.6
7	120.2	19.6	11.6
8	8.6	2.1	1.0
64	131.1	42.8	28.9
98	289.7	42.3	51.2
3	151.5	41.3	58.5
53	182.6	46.2	58.7
1	44.5	39.3	45.1
155	4.1	11.6	5.7
80	76.4	26.7	22.3
85	193.2	18.4	65.7
167	206.8	5.2	19.4
101	296.4	36.3	100.9
184	253.8	21.3	30.0
47	239.9	41.5	18.5
118	125.7	36.9	79.2
94	107.4	14.0	10.9
128	220.3	49.0	3.2
119	19.4	16.0	22.3
127	80.2	0.0	9.2
113	209.6	20.6	10.7
34	95.7	1.4	7.4
166	17.9	37.6	21.6
140	73.4	17.0	12.9
10	66.1	5.8	24.2
180	156.6	2.6	8.3
36	266.9	43.8	5.0

In [460]:

1	y_train
---	---------

Out[460]:

178	11.8
44	8.5
135	11.6
95	16.9
122	11.6
	...
123	15.2
2	9.3
177	11.7
82	11.3
104	20.7

Name: Sales, Length: 170, dtype: float64

In [461]:

1	y_test
---	--------

Out[461]:

195	7.6
160	14.4
111	21.8
134	10.8
7	13.2
8	4.8
64	18.0
98	25.4
3	18.5
53	21.2
1	10.4
155	3.2
80	11.8
85	15.2
167	12.2
101	23.8
184	17.6
47	23.2
118	15.9
94	11.5
128	24.7
119	6.6
127	8.8
113	15.9
34	9.5
166	8.0
140	10.9
10	8.6
180	10.5
36	25.4

Name: Sales, dtype: float64

```
In [462]: 1 x_train=x_train.astype(int)
          2 x_test=x_test.astype(int)
          3 y_train=y_train.astype(int)
          4 y_test=y_test.astype(int)
```

```
In [463]: 1 from sklearn.preprocessing import StandardScaler
          2 Sc=StandardScaler()
          3 x_train_scaled=Sc.fit_transform(x_train)
          4 x_test_scaled=Sc.fit_transform(x_test)
```

```
In [464]: 1 from sklearn.linear_model import LinearRegression
          2 lr=LinearRegression()
```

```
In [465]: 1 lr.fit(x_train_scaled,y_train)
```

Out[465]: LinearRegression()

```
In [466]: 1 y_prediction=lr.predict(x_test_scaled)
          2 y_prediction
```

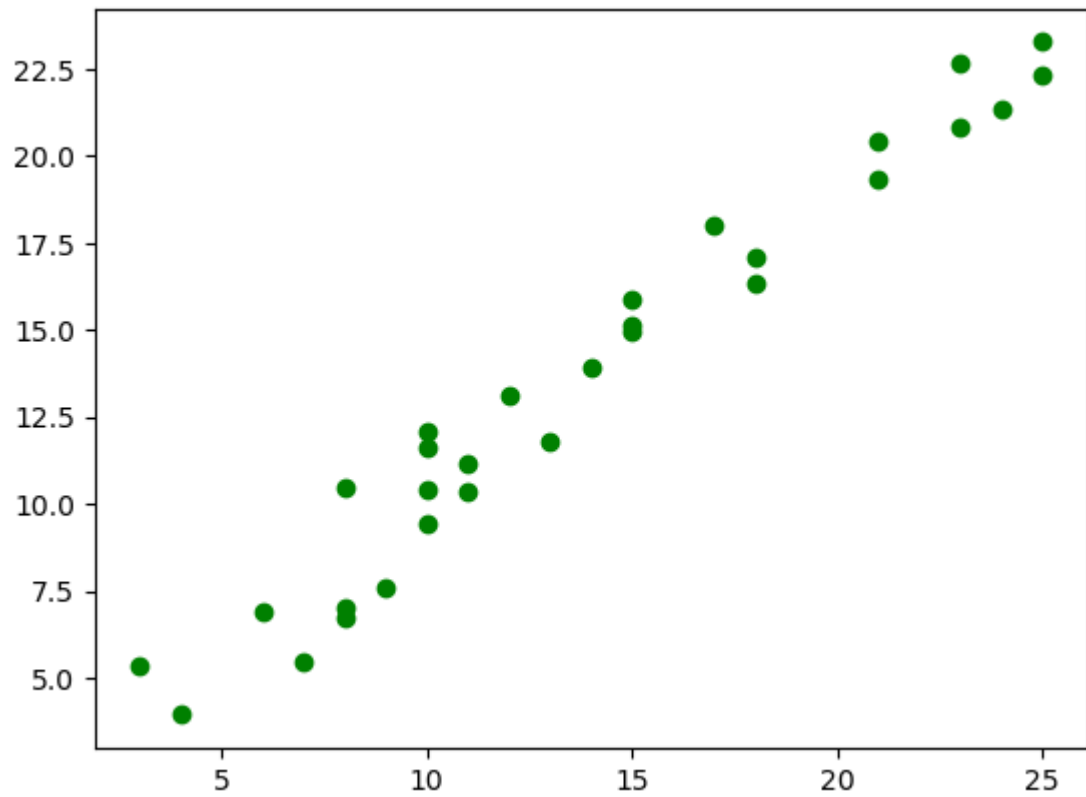
Out[466]: array([5.44544306, 13.93672514, 20.41190939, 11.59396167, 11.80091855,
 3.93553855, 16.33474038, 23.2683178 , 17.1051066 , 19.32667557,
12.06702085, 5.34164067, 11.13453238, 14.93748729, 13.12103851,
22.64763394, 17.98546586, 20.83589006, 15.15322449, 10.36027349,
21.36756581, 6.90900657, 6.74004165, 15.84640941, 7.56239329,
10.48345187, 9.4088948 , 7.04029772, 10.39421573, 22.32770832])

```
In [467]: 1 from sklearn.metrics import r2_score
          2 r2_score(y_test,y_prediction)
```

Out[467]: 0.9497589598382143

```
In [468]: 1 plt.scatter(y_test,y_prediction,c='g')
```

```
Out[468]: <matplotlib.collections.PathCollection at 0x205c4619a30>
```



```
In [ ]: 1
```

```
In [ ]: 1
```