IMPORTING LBRARIES

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

In [2]:
```
import numpy as np
```

IMPORTING DATASET

In [3]:
```
dataset = pd.read_csv("Advertising.csv")
```

In [4]:
```
dataset.head(15)
```

Out[4]:

	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
5	6	8.7	48.9	75.0	7.2
6	7	57.5	32.8	23.5	11.8
7	8	120.2	19.6	11.6	13.2
8	9	8.6	2.1	1.0	4.8
9	10	199.8	2.6	21.2	10.6
10	11	66.1	5.8	24.2	8.6
11	12	214.7	24.0	4.0	17.4
12	13	23.8	35.1	65.9	9.2
13	14	97.5	7.6	7.2	9.7
14	15	204.1	32.9	46.0	19.0

In [5]:
```
dataset.tail(15)
```

Out[5]:

	Unnamed: 0	TV	Radio	Newspaper	Sales
185	186	205.0	45.1	19.6	22.6
186	187	139.5	2.1	26.6	10.3
187	188	191.1	28.7	18.2	17.3
188	189	286.0	13.9	3.7	15.9
189	190	18.7	12.1	23.4	6.7
190	191	39.5	41.1	5.8	10.8
191	192	75.5	10.8	6.0	9.9
192	193	17.2	4.1	31.6	5.9
193	194	166.8	42.0	3.6	19.6
194	195	149.7	35.6	6.0	17.3
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 [6]:
```
dataset.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 [7]:
```
dataset
```

Out[7]:

	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 [8]:
```
dataset.shape
```

Out[8]:
```
(200, 5)
```

In [9]:
```
dataset = dataset.drop(columns = ["Unnamed: 0"])
```

In [10]:
```
dataset
```

Out[10]:

	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 [11]:
```
x = dataset.iloc[:, 0:-1]
```

In [12]:
```
x
```

Out[12]:

	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 [13]:
```
y = dataset.iloc[:, -1]
```

In [14]:
```
y
```

Out[14]:
```
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
```

TRAIN TEST SPLIT

In [15]:
```
from sklearn.model_selection import train_test_split
```

In [16]:
```
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.2,random_state=43)
```

In [17]:
```
x_train=x_train.astype(int)
y_train=y_train.astype(int)
x_test=x_test.astype(int)
y_test=y_test.astype(int)
```

In [18]:
```
from sklearn.preprocessing import StandardScaler
```

In [19]:
```
Sc=StandardScaler()
x_train_scaled=Sc.fit_transform(x_train)
x_test_scaled=Sc.fit_transform(x_test)
```

USING LINEAR REGRESSION

In [20]:
```
from sklearn.linear_model import LinearRegression
```

In [21]:
```
reg = LinearRegression()
```

In [22]:
```
reg.fit(x_train_scaled,y_train)
```

Out[22]:
```
LinearRegression()
```

In [23]:
```
y_pred=reg.predict(x_test_scaled)
```

EVALUATING R2 SCORE

In [24]:
```
from sklearn.metrics import r2_score
```

In [25]:
```
r2_score(y_test,y_pred)
```

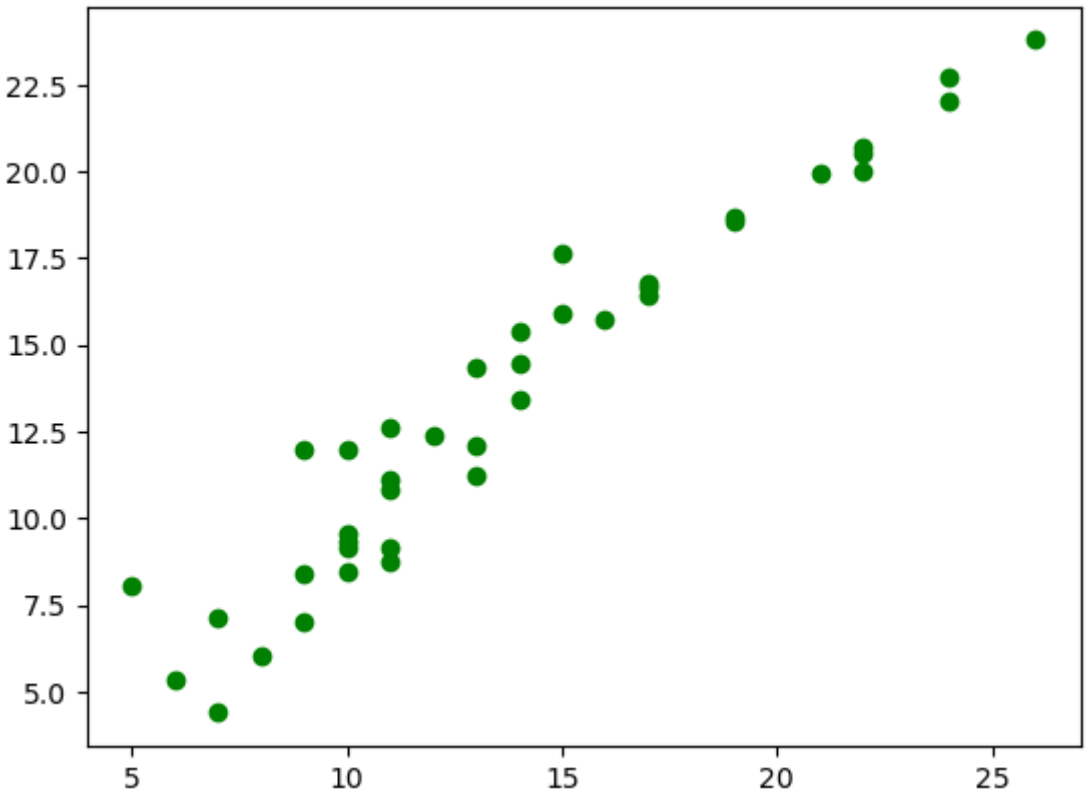
Out[25]:
```
0.9222988021105912
```

ANALYSIS OF DATA USING SCATTER PLOT

In [26]:
```
import matplotlib.pyplot as mlt
```

In [27]:
```
mlt.scatter(y_test,y_pred,c='g')
```

Out[27]:
```
<matplotlib.collections.PathCollection at 0x16c9311f040>
```



In [ ]:
```
```