```
import pandas as pd
import matplotlib.pyplot as plt


df = pd.read_csv('Advertising.csv')


df.head()
df.describe()
df.isnull().sum()
df.shape
```

```
(200, 5)
```

```
x=df[["TV","Radio","Newspaper"]]
x
y=df["Sales"]
y
```

```
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
```

```
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=101)


from sklearn.linear_model import LinearRegression
l = LinearRegression()
l.fit(x_train,y_train)
y_pred =l.predict(x_test)
x_test
```

	TV	Radio	Newspaper
37	74.7	49.4	45.7
109	255.4	26.9	5.5
31	112.9	17.4	38.6
89	109.8	47.8	51.4
66	31.5	24.6	2.2
119	19.4	16.0	22.3
54	262.7	28.8	15.9
74	213.4	24.6	13.1
145	140.3	1.9	9.0
142	220.5	33.2	37.9
148	38.0	40.3	11.9
112	175.7	15.4	2.4
174	222.4	3.4	13.1
55	198.9	49.4	60.0
141	193.7	35.4	75.6
149	44.7	25.8	20.6
25	262.9	3.5	19.5
34	95.7	1.4	7.4
170	50.0	11.6	18.4
39	228.0	37.7	32.0
172	19.6	20.1	17.0
153	171.3	39.7	37.7
175	276.9	48.9	41.8
61	261.3	42.7	54.7
65	69.0	9.3	0.9
50	199.8	3.1	34.6
42	293.6	27.7	1.8
129	59.6	12.0	43.1
179	165.6	10.0	17.6
2	17.2	45.9	69.3

12	23.8	35.1	65.9

```
print("Regressor Slope: ",l.coef_[0])
print("Regressor intercept:",l.intercept_)
y_pred
```

```
Regressor Slope:  0.04532831653793596
Regressor intercept: 2.9013136928731758
array([15.68292592, 19.58907536, 11.33442246, 16.97160642,  9.00229777,
        6.8258424 , 20.28370847, 17.25050474,  9.62422935, 19.21261943,
       12.28165709, 13.79124205, 13.63171832, 21.3166205 , 18.4260183 ,
        9.83360121, 15.48826256,  7.50717778,  7.37608168, 20.40569824,
        7.61221263, 18.21702553, 24.75227276, 22.87105326,  7.79566192,
       12.55620637, 21.47155589,  7.89397664, 12.3119109 , 12.41822104,
       10.6650977 , 19.23984433,  9.92216352,  6.53329195, 17.27904496,
        7.60035587,  9.1023379 ,  8.10416927, 10.45284718, 10.49584758])
```

```
from sklearn import metrics
MSE=metrics.mean_squared_error(y_test,y_pred)
```

```
print("MSE is {}".format(MSE))
r2=metrics.r2_score(y_test,y_pred)
print("R squared error is {}".format(r2))
l.predict([[150.3,240.5,234.5]])
```

```
MSE is 2.063418850121476
R squared error is 0.9303140201228004
/usr/local/lib/python3.7/dist-packages/sklearn/base.py:451: UserWarning: X does not hav
  "X does not have valid feature names, but"
array([55.4591243])
```