

```
In [1]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings('ignore')
data=pd.read_csv("/home/placement/Downloads/Advertising.csv")
```

```
In [2]: data.describe()
```

Out[2]:

	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 [3]: data1=data.drop(['Unnamed: 0'],axis=1)
```

In [4]: data1

Out[4]:

	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 [5]: y=data1['sales']  
x=data1.drop(['sales'],axis=1)
```

In [6]:

y

Out[6]:

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 [7]:

```
from sklearn.model_selection import train_test_split
x_train, x_test, y_train, y_test=train_test_split(x,y,test_size=0.33,random_state=42)
```

## Lasso

In [8]:

```
from sklearn.model_selection import GridSearchCV
from sklearn.linear_model import Lasso
lasso=Lasso()
parameters={'alpha':[1e-15,1e-10,1e-8, 1e-4,1e-3,1e-2, 1, 5, 10, 20]}
lasso_regressor = GridSearchCV(lasso, parameters)
lasso_regressor.fit(x_train, y_train)
```

Out[8]:

```
GridSearchCV
  estimator: Lasso
    Lasso
```

In [9]:

```
lasso_regressor.best_params_
```

Out[9]:

```
{'alpha': 1}
```

```
In [10]: lasso=Lasso(alpha=1)
lasso.fit(x_train,y_train)
y_pred_lasso=lasso.predict(x_test)
```

```
In [12]: from sklearn.metrics import mean_squared_error
Lasso_Error=mean_squared_error(y_pred_lasso,y_test)
Lasso_Error
```

```
Out[12]: 3.641439660278575
```

```
In [13]: from sklearn.metrics import r2_score
r2_score(y_test,y_pred_lasso)
```

```
Out[13]: 0.8589079527148957
```

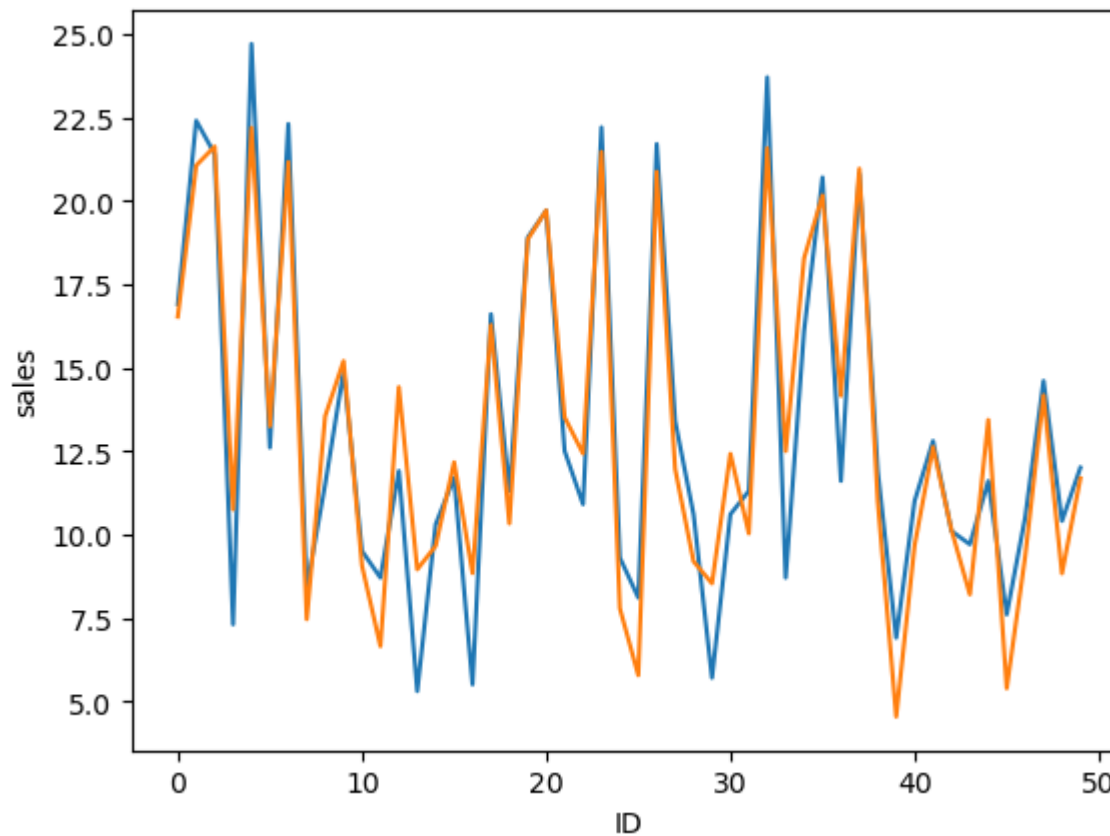
```
In [14]: Results=pd.DataFrame(columns=['sales','predicted'])
Results['sales']=y_test
Results['predicted']=y_pred_lasso
Results=Results.reset_index()
Results['ID']=Results.index
Results.head(15)
```

Out[14]:

	index	sales	predicted	ID
0	95	16.9	16.523920	0
1	15	22.4	21.058219	1
2	30	21.4	21.624966	2
3	158	7.3	10.745724	3
4	128	24.7	22.188269	4
5	115	12.6	13.243102	5
6	69	22.3	21.161155	6
7	170	8.4	7.454875	7
8	174	11.5	13.541765	8
9	45	14.9	15.197360	9
10	66	9.5	9.058959	10
11	182	8.7	6.647262	11
12	165	11.9	14.415342	12
13	78	5.3	8.949245	13
14	186	10.3	9.655571	14

```
In [15]: import seaborn as sns
import matplotlib.pyplot as plt
sns.lineplot(x='ID',y='sales',data=Results.head(50))
sns.lineplot(x='ID',y='predicted',data=Results.head(50))
plt.plot()
```

Out[15]: []



In [ ]:

