

```
In [1]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import warnings
warnings.filterwarnings("ignore")
```

```
In [2]: data=pd.read_csv("/home/placement/Downloads/Advertising.csv")
```

```
In [3]: data.describe()
```

```
Out[3]:
```

	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 [4]: data.head()
```

```
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

In [5]: data.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 [6]: data1=data.drop(['Unnamed: 0'],axis=1)
data1

Out[6]:

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

```
In [8]: 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)
```

```
In [9]: from sklearn.linear_model import Lasso  
from sklearn.model_selection import GridSearchCV  
lasso=Lasso()  
parameters={'alpha':[1e-15,1e-10,1e-8,1e-4,1e-3,1e-2,1,5,10,20,30]}  
lasso_regressor=GridSearchCV(lasso,parameters)  
lasso_regressor.fit(x_train,y_train)
```

```
Out[9]: GridSearchCV(estimator=Lasso(),  
                    param_grid={'alpha': [1e-15, 1e-10, 1e-08, 0.0001, 0.001, 0.01, 1,  
                    5, 10, 20, 30]}))
```

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On GitHub, the HTML representation is unable to render, please try loading this page with nbviewer.org.**

```
In [10]: lasso_regressor.best_params_
```

```
Out[10]: {'alpha': 1}
```

```
In [12]: lasso=Lasso(alpha=30)  
lasso.fit(x_train,y_train)  
y_pred_lasso=lasso.predict(x_test)
```

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

```
Out[13]: 6.041034250446621
```

```
In [14]: from sklearn.metrics import r2_score  
r2_score(y_test,y_pred_lasso)
```

```
Out[14]: 0.7659327162791038
```

```
In [ ]:
```