RIDGE REGRESSION MODEL

12_ redge_ regression_fiat500_data_20june23

In [24]:
```
import pandas as pd
import warnings
warnings.filterwarnings("ignore")
```

In [25]:
```
data=pd.read_csv("/home/placement/Desktop/saimohan data/csv files/fiat500.csv")
```

In [26]:
```
data.describe()
```

Out[26]:

	ID	engine_power	age_in_days	km	previous_owners	lat	lon	price
count	1538.000000	1538.000000	1538.000000	1538.000000	1538.000000	1538.000000	1538.000000	1538.000000
mean	769.500000	51.904421	1650.980494	53396.011704	1.123537	43.541361	11.563428	8576.003901
std	444.126671	3.988023	1289.522278	40046.830723	0.416423	2.133518	2.328190	1939.958641
min	1.000000	51.000000	366.000000	1232.000000	1.000000	36.855839	7.245400	2500.000000
25%	385.250000	51.000000	670.000000	20006.250000	1.000000	41.802990	9.505090	7122.500000
50%	769.500000	51.000000	1035.000000	39031.000000	1.000000	44.394096	11.869260	9000.000000
75%	1153.750000	51.000000	2616.000000	79667.750000	1.000000	45.467960	12.769040	10000.000000
max	1538.000000	77.000000	4658.000000	235000.000000	4.000000	46.795612	18.365520	11100.000000

In [27]:
```
data.head(2)
```

Out[27]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
0	1	lounge	51	882	25000	1	44.907242	8.61156	8900
1	2	pop	51	1186	32500	1	45.666359	12.24189	8800

In [28]:
```
data.tail(2)
```

Out[28]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
1536	1537	lounge	51	2557	80750	1	45.000702	7.68227	5990
1537	1538	pop	51	1766	54276	1	40.323410	17.56827	7900

In [ ]:
```

```

In [29]:
```
data1=data.drop(["lat","lon","ID"],axis=1)
```

In [30]:
```
data1=pd.get_dummies(data1)
```

In [31]:
```
data1
```

Out[31]:

	engine_power	age_in_days	km	previous_owners	price	model_lounge	model_pop	model_sport
0	51	882	25000	1	8900	1	0	0
1	51	1186	32500	1	8800	0	1	0
2	74	4658	142228	1	4200	0	0	1
3	51	2739	160000	1	6000	1	0	0
4	73	3074	106880	1	5700	0	1	0
...	...	...	...	...	...	...	...	...
1533	51	3712	115280	1	5200	0	0	1
1534	74	3835	112000	1	4600	1	0	0
1535	51	2223	60457	1	7500	0	1	0
1536	51	2557	80750	1	5990	1	0	0
1537	51	1766	54276	1	7900	0	1	0

1538 rows × 8 columns

In [32]:
```
z=data1.loc[(data.model=="lounge")]
```

In [33]:
```
z
```

Out[33]:

	engine_power	age_in_days	km	previous_owners	price	model_lounge	model_pop	model_sport
0	51	882	25000	1	8900	1	0	0
3	51	2739	160000	1	6000	1	0	0
6	51	731	11600	1	10750	1	0	0
7	51	1521	49076	1	9190	1	0	0
11	51	366	17500	1	10990	1	0	0
...	...	...	...	...	...	...	...	...
1528	51	2861	126000	1	5500	1	0	0
1529	51	731	22551	1	9900	1	0	0
1530	51	670	29000	1	10800	1	0	0
1534	74	3835	112000	1	4600	1	0	0
1536	51	2557	80750	1	5990	1	0	0

1094 rows × 8 columns

In [34]:
```
#which  the parameter is predected values can be removed from the data file
#1) we copied the data into another data("y")
#2) later we can removed those file from main data set
y=z['price']
x=z.drop(['price'],axis=1)
```

In [35]:
```
#i am calling function to split
#split enter data into ->67% traning  ,  ->33% testing

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 [36]:
```
x_train.head(5)
#testing and training
```

Out[36]:

	engine_power	age_in_days	km	previous_owners	model_lounge	model_pop	model_sport
441	51	762	36448	1	1	0	0
701	51	701	27100	1	1	0	0
695	51	3197	51083	1	1	0	0
1415	51	670	33000	1	1	0	0
404	51	456	14000	1	1	0	0

In [37]:
```
y_train.head(5)
```

Out[37]:
```
441      8980
701     10300
695      5880
1415    10490
404      9499
Name: price, dtype: int64
```

In [38]:
```
from sklearn.model_selection import GridSearchCV
from sklearn.linear_model import Ridge

alpha = [1e-15, 1e-10, 1e-8, 1e-4, 1e-3,1e-2, 1, 5, 10, 20,30]

ridge = Ridge()

parameters = {'alpha': alpha}

ridge_regressor = GridSearchCV(ridge, parameters)

ridge_regressor.fit(x_train, y_train)
```

Out[38]:

▸ **GridSearchCV**

▸ **estimator: Ridge**

▸ Ridge

In [39]:
```
ridge_regressor.best_params_
```

Out[39]:
```
{'alpha': 30}
```

In [40]:
```
ridge=Ridge(alpha=30)
ridge.fit(x_train,y_train)
y_pred_ridge=ridge.predict(x_test)
```

In [41]:
```
from sklearn.metrics import mean_squared_error
Ridge_Error=mean_squared_error(y_pred_ridge,y_test)
Ridge_Error
```

Out[41]:
```
519771.8129989745
```

In [42]:
```
from sklearn.metrics import r2_score
r2_score(y_test,y_pred_ridge)
```

Out[42]: 0.8373030813683994

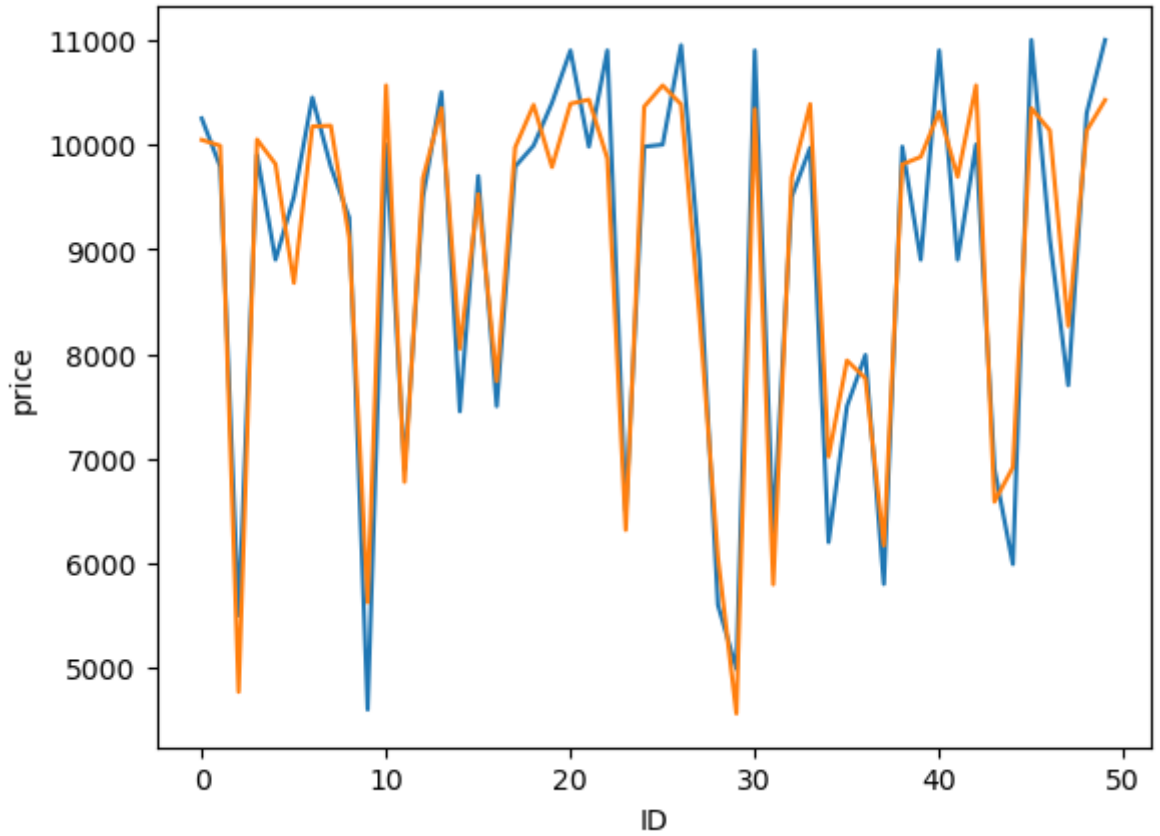
In [43]:
```
Results=pd.DataFrame(columns=['price','predicted'])
Results['price']=y_test
Results['predicted']=y_pred_ridge
Results=Results.reset_index()
Results['ID']=Results.index
Results.head(15)
```

Out[43]:

	index	price	predicted	ID
0	676	10250	10045.347779	0
1	215	9790	9989.171535	1
2	146	5500	4769.099603	2
3	1319	9900	10048.683238	3
4	1041	8900	9813.944798	4
5	1425	9500	8678.143561	5
6	409	10450	10173.797921	6
7	617	9790	10180.627008	7
8	1526	9300	9107.315259	8
9	1010	4600	5625.007407	9
10	1301	10000	10565.711088	10
11	923	6900	6776.128155	11
12	1200	9500	9677.360191	12
13	845	10500	10348.971360	13
14	799	7450	8049.201047	14

In [44]:
```
########################################
import seaborn as sns
import matplotlib.pyplot as plt
sns.lineplot(x='ID',y='price',data=Results.head(50))
sns.lineplot(x='ID',y='predicted',data=Results.head(50))
plt.plot()
```

Out[44]: []



In [ ]: