Import Dependcies

```
import numpy as np
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn import metrics
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.ensemble import RandomForestRegressor
from sklearn.linear_model import LinearRegression
from sklearn.linear_model import Lasso
```

Data Collection and Preprocessing

```
data =pd.read_csv('car data.csv')
```

```
data.head()
```

	Car_Name	Year	Selling_Price	Present_Price	Kms_Driven	Fuel_Type	Seller_Type	Tra
0	ritz	2014	3.35	5.59	27000	Petrol	Dealer	
1	sx4	2013	4.75	9.54	43000	Diesel	Dealer	
2	ciaz	2017	7.25	9.85	6900	Petrol	Dealer	
3	wagon r	2011	2.85	4.15	5200	Petrol	Dealer	
4	swift	2014	4.60	6.87	42450	Diesel	Dealer	

Data Summary

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 301 entries, 0 to 300
Data columns (total 9 columns):
 #   Column         Non-Null Count  Dtype
---  ------         --------------  -----
 0   Car_Name       301 non-null    object
 1   Year           301 non-null    int64
 2   Selling_Price  301 non-null    float64
 3   Present_Price  301 non-null    float64
 4   Kms_Driven     301 non-null    int64
 5   Fuel_Type      301 non-null    object
 6   Seller_Type    301 non-null    object
 7   Transmission   301 non-null    object
 8   Owner          301 non-null    int64
dtypes: float64(2), int64(3), object(4)
memory usage: 21.3+ KB
```

```
data.shape
```

```
(301, 9)
```

```
data.isnull().sum()
```

```
Car_Name         0
Year             0
Selling_Price    0
Present_Price    0
Kms_Driven       0
Fuel_Type        0
Seller_Type      0
Transmission     0
Owner            0
dtype: int64
```

Data Analysis

```
data.describe()
```

	Year	Selling_Price	Present_Price	Kms_Driven	Owner
count	301.000000	301.000000	301.000000	301.000000	301.000000
mean	2013.627907	4.661296	7.628472	36947.205980	0.043189
std	2.891554	5.082812	8.644115	38886.883882	0.247915
min	2003.000000	0.100000	0.320000	500.000000	0.000000
25%	2012.000000	0.900000	1.200000	15000.000000	0.000000
50%	2014.000000	3.600000	6.400000	32000.000000	0.000000
75%	2016.000000	6.000000	9.900000	48767.000000	0.000000
max	2018.000000	35.000000	92.600000	500000.000000	3.000000

See Catogorical Values

```
print(data.Fuel_Type.value_counts())
print(data.Seller_Type.value_counts())
print(data['Transmission'].value_counts())
```

```
Petrol    239
Diesel     60
CNG         2
Name: Fuel_Type, dtype: int64
Dealer        195
Individual    106
Name: Seller_Type, dtype: int64
Manual       261
Automatic     40
Name: Transmission, dtype: int64
```

Label Encoding

```
from sklearn.preprocessing  import LabelEncoder
encoder=LabelEncoder()
data['Fuel_Type']=encoder.fit_transform(data['Fuel_Type'])
data['Seller_Type']=encoder.fit_transform(data['Seller_Type'])
data['Transmission']=encoder.fit_transform(data['Transmission'])
```

```
data.head()
```

	Car_Name	Year	Selling_Price	Present_Price	Kms_Driven	Fuel_Type	Seller_Type	Tra
0	ritz	2014	3.35	5.59	27000	2	0	
1	sx4	2013	4.75	9.54	43000	1	0	
2	ciaz	2017	7.25	9.85	6900	2	0	
3	wagon r	2011	2.85	4.15	5200	2	0	
4	swift	2014	4.60	6.87	42450	1	0	

Train Test Split

```
X=data.drop(['Car_Name','Selling_Price'],axis=1)
Y=data['Selling_Price']
```

```
X_train,X_test,Y_train,Y_test=train_test_split(X,Y,test_size=0.2,random_state=2)
```

Model Training

```
lin_reg=LinearRegression()
lin_reg.fit(X_train,Y_train)
```

```
▾ LinearRegression
LinearRegression()
```

Testing

```
pred=lin_reg.predict(X_test)
print(pred)
print(Y_test)
```

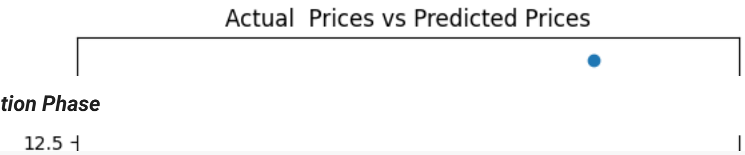
```
[10.39222503  0.71269634  4.26367425  4.89542882  9.84484784  4.22631808
  7.1173891   7.37327394  0.1592961   5.16712598  6.20624893  6.17414198
  2.11880837  7.74045843  1.92235986  1.71406658  2.02899942  1.8536463
  9.35171759  4.2546458   1.48996098  9.14496453  1.45846216  9.63402658
  0.82165042  8.07898502  1.53763892 -3.19873666  4.22373915  2.09526116
  3.42865389  3.72427545  5.58001877  7.75879392 -1.91563192  6.80980082
  8.20694812  5.81047156  6.15629896  6.27493028 16.02197751  2.07455343
  1.04886513 -0.45830577  6.82090538  6.78567581  0.98725428  6.83257783
 14.31925066  3.01359825  8.04481951 -0.89441322  8.99139759  1.14814903
  2.1191082  -0.82919712  0.68456956 10.02743111 -0.46773344 -2.43254957
 10.0831552 ]
99      9.65
161     0.45
89      4.75
30      3.10
232    11.45
       ...
172     0.40
94      4.00
160     0.45
199     0.12
91     11.25
Name: Selling_Price, Length: 61, dtype: float64
```

```
score=metrics.r2_score(Y_test,pred)
print(score)
```

```
0.8401532365377663
```

Visualization

```
plt.scatter(Y_test,pred)
plt.xlabel("Actual Price")
plt.ylabel("Predicted Price")
plt.title("Actual  Prices vs Predicted Prices")
plt.show()
```



Application Phase

```
Year=input("Enter Year").strip()
Present_Price=input("Enter Present-Price: ").strip()
Kms_Driven=input(" Enter Kms_Driven: ").strip()
Fuel_Type=input("Enter Fuel_Type: ").strip()
Seller_Type=input("Enter Seller Type: ").strip()
Transmission=input("Enter Transmission: ").strip()
Owner=input("Enter Owner: ").strip()
```

```
Enter Year2014
Enter Present-Price: 6.87
 Enter Kms_Driven: 42450
Enter Fuel_Type: Diesel
Enter Seller Type: Dealer
Enter Transmission: Manual
Enter Owner: 0
```

```
data = {
    'Year': [Year],
    'Present_Price': [Present_Price],
    'Kms_Driven': [Kms_Driven],
    'Fuel_Type': [Fuel_Type],
    'Seller_Type': [Seller_Type],
    'Transmission': [Transmission],
    'Owner': [Owner]
}
df=pd.DataFrame(data)
df.head()
```

	Year	Present_Price	Kms_Driven	Fuel_Type	Seller_Type	Transmission	Owner
0	2014	6.87	42450	Diesel	Dealer	Manual	0

```
df['Fuel_Type']=encoder.fit_transform(df['Fuel_Type'])
df['Seller_Type']=encoder.fit_transform(df['Seller_Type'])
df['Transmission']=encoder.fit_transform(df['Transmission'])
```

```
predict_car_price=lin_reg.predict(df)
print(predict_car_price)
```

```
[9.52662988]
```

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