```python
import pandas as pd
```

```python
df = pd.read_csv('dataset/final_data.csv')
```

```python
df.head(5)
```

```
   symboling  normalized-losses         make aspiration num-of-doors  \
0          3                122  alfa-romero        std          two   
1          3                122  alfa-romero        std          two   
2          1                122  alfa-romero        std          two   
3          2                164         audi        std         four   
4          2                164         audi        std         four   

    body-style drive-wheels engine-location  wheel-base    length  ...  \
0  convertible          rwd           front        88.6  0.811148  ...   
1  convertible          rwd           front        88.6  0.811148  ...   
2    hatchback          rwd           front        94.5  0.822681  ...   
3        sedan          fwd           front        99.8  0.848630  ...   
4        sedan          4wd           front        99.4  0.848630  ...   

   compression-ratio  horsepower  peak-rpm city-mpg highway-mpg    price  \
0                9.0       111.0    5000.0       21          27  13495.0   
1                9.0       111.0    5000.0       21          27  16500.0   
2                9.0       154.0    5000.0       19          26  16500.0   
3               10.0       102.0    5500.0       24          30  13950.0   
4                8.0       115.0    5500.0       18          22  17450.0   
```

	symboling	normalized-losses	make	aspiration	num-of-doors	body-style	drive-wheels	engine-location	wheel-base	length	...	compression-ratio	hor
0	3	122	alfa-romero	std	two	convertible	rwd	front	88.6	0.811148	...	9.0	111
1	3	122	alfa-romero	std	two	convertible	rwd	front	88.6	0.811148	...	9.0	111
2	1	122	alfa-romero	std	two	hatchback	rwd	front	94.5	0.822681	...	9.0	154
3	2	164	audi	std	four	sedan	fwd	front	99.8	0.848630	...	10.0	102
4	2	164	audi	std	four	sedan	4wd	front	99.4	0.848630	...	8.0	115

5 rows × 29 columns

```
df.columns
```

```
Index(['symboling', 'normalized-losses', 'make', 'aspiration', 'num-of-doors',
       'body-style', 'drive-wheels', 'engine-location', 'wheel-base', 'length',
       'width', 'height', 'curb-weight', 'engine-type', 'num-of-cylinders',
       'engine-size', 'fuel-system', 'bore', 'stroke', 'compression-ratio',
       'horsepower', 'peak-rpm', 'city-mpg', 'highway-mpg', 'price',
       'city-L/100km', 'horsepower-binned', 'diesel', 'gas'],
      dtype='object')
```

```
X = df[['length','width','curb-weight','engine-size','horsepower','city-mpg','highway-mpg'
Y = df[['price']].copy()
```

```
X
```

```
       length     width  curb-weight  engine-size  horsepower  city-mpg  \
0    0.811148  0.890278         2548          130       111.0        21
1    0.811148  0.890278         2548          130       111.0        21
2    0.822681  0.909722         2823          152       154.0        19
3    0.848630  0.919444         2337          109       102.0        24
4    0.848630  0.922222         2824          136       115.0        18
..        ...       ...          ...          ...         ...       ...
196  0.907256  0.956944         2952          141       114.0        23
197  0.907256  0.955556         3049          141       160.0        19
198  0.907256  0.956944         3012          173       134.0        18
199  0.907256  0.956944         3217          145       106.0        26
200  0.907256  0.956944         3062          141       114.0        19

     highway-mpg  wheel-base  bore
0             27        88.6  3.47
1             27        88.6  3.47
2             26        94.5  2.68
3             30        99.8  3.19
4             22        99.4  3.19
..           ...         ...   ...
```

	length	width	curb-weight	engine-size	horsepower	city-mpg	highway-mpg	wheel-base	bore
0	0.811148	0.890278	2548	130	111.0	21	27	88.6	3.47
1	0.811148	0.890278	2548	130	111.0	21	27	88.6	3.47
2	0.822681	0.909722	2823	152	154.0	19	26	94.5	2.68
3	0.848630	0.919444	2337	109	102.0	24	30	99.8	3.19
4	0.848630	0.922222	2824	136	115.0	18	22	99.4	3.19
...	...	...	...	...	...	...	...	...	...
196	0.907256	0.956944	2952	141	114.0	23	28	109.1	3.78
197	0.907256	0.955556	3049	141	160.0	19	25	109.1	3.78
198	0.907256	0.956944	3012	173	134.0	18	23	109.1	3.58
199	0.907256	0.956944	3217	145	106.0	26	27	109.1	3.01
200	0.907256	0.956944	3062	141	114.0	19	25	109.1	3.78

201 rows × 9 columns

```
Y
```

```
       price
0    13495.0
1    16500.0
2    16500.0
3    13950.0
4    17450.0
..       ...
196  16845.0
197  19045.0
198  21485.0
199  22470.0
200  22625.0

[201 rows x 1 columns]
```

	price
0	13495.0
1	16500.0
2	16500.0
3	13950.0
4	17450.0
...	...
196	16845.0
197	19045.0
198	21485.0
199	22470.0
200	22625.0

201 rows × 1 columns

```
feature = X.values
```

```
value = Y.values
```

```
from sklearn.model_selection import  train_test_split
feature_train,feature_test,value_train,value_test=train_test_split(feature,value,test_size
```

Feature Scaling

from sklearn.preprocessing import StandardScaler sc = StandardScaler feature_train=sc.fit_transform(feature_train) feature_test=sc.fit_transform(feature_test)

```python
from sklearn.linear_model import LinearRegression
# create an object
ml=LinearRegression()
ml.fit(feature_train,value_train)
```

```
LinearRegression()
```

```
▾ LinearRegression
LinearRegression()
```

```python
value_pred = ml.predict(feature_test)
print(value_pred)
```

```
[[ 5844.78826709]
 [11348.76667238]
 [20251.35191747]
 [21406.74779824]
 [20982.97703476]
 [ 9879.57644106]
 [14505.61640274]
 [ 6268.36622588]
 [17371.50852175]
 [ 7133.70247958]
 [11507.71500216]
 [20541.38134988]
 [ 7886.8953474 ]
 [ 8265.97639025]
 [17609.8386963 ]
 [18850.71526732]
 [ 7187.296721  ]
 [15162.619681  ]
 [10059.0243429 ]
 [ 6519.28263493]
```

```python
value=[[0.811148,0.890278,2548,130,111.0,21,27,88.6,3.47]]

ml.predict(value)
```

```
array([[11136.98548867]])
```

```python
from sklearn.metrics import r2_score
r2_score(value_test,value_pred)
```

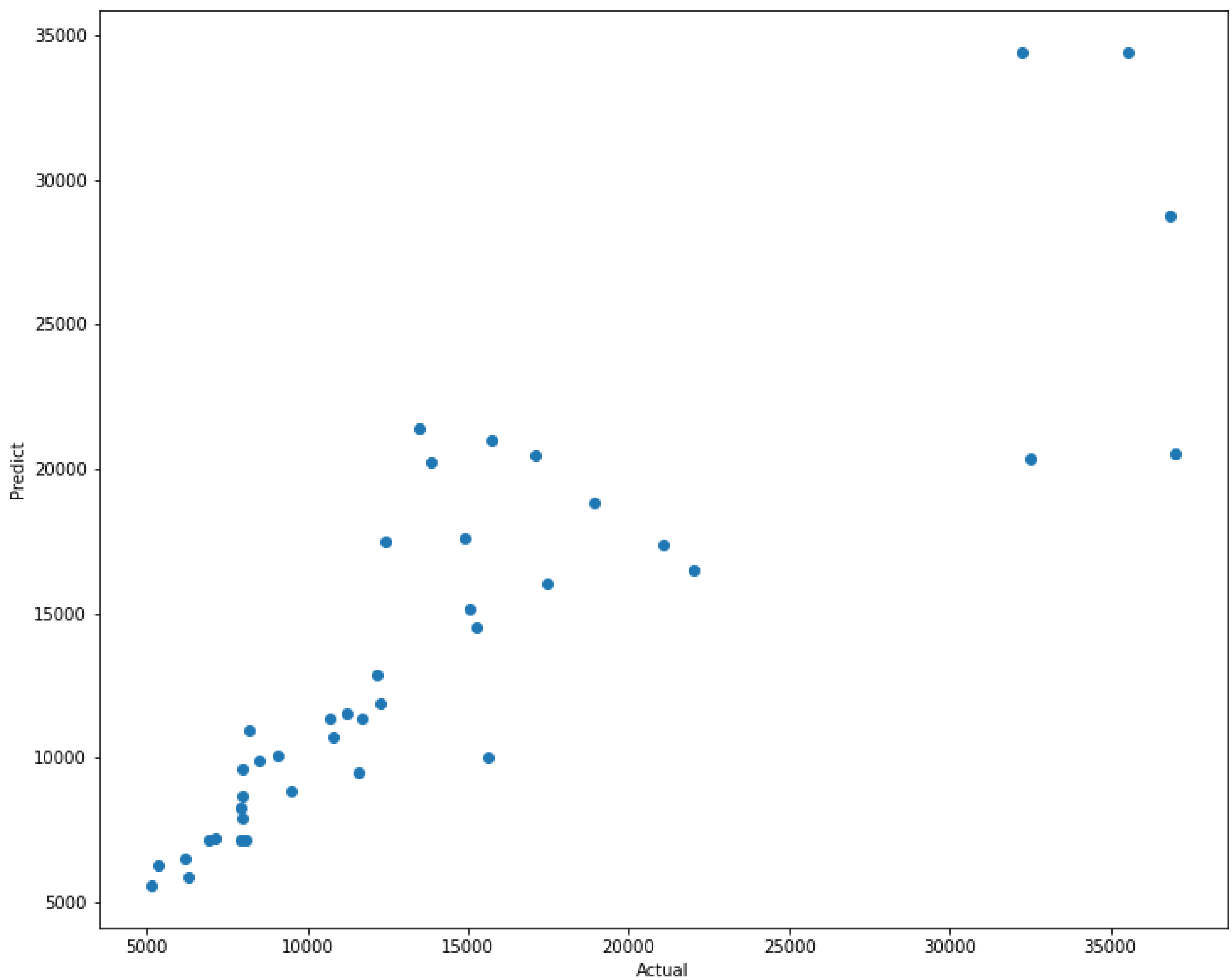
```
0.7526252480045523
```

```python
import matplotlib.pyplot as plt
plt.figure(figsize=(12,10))
plt.scatter(value_test,value_pred)
plt.xlabel('Actual')
plt.ylabel('Predict')
```

```
Text(0, 0.5, 'Predict')
```

```
<Figure size 864x720 with 1 Axes>
```

Download



future_value = pd.DataFrame({'Actual value':value_test, 'Predicted value':value_pred, 'Difference': value_test-value_pred}) future_value[0:20]

```
import pickle
pickle.dump(LinearRegression,open("model.pkl", "wb"))
```