Car data = https://www.kaggle.com/CooperUnion/cardataset

CODE

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
from sklearn.metrics import r2_score,mean_squared_error
%matplotlib inline
```

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

```
df.sample(7)
```

	Make	Model	Year	Engine Fuel Type	Engine HP	Engine Cylinders	Transmission Type	Driven_Wheels	Number of Doors	Market Category	Vehicle Size	Vehicle Style	highway MPG	city mpg	Popularity	MSRP
2466	Dodge	Challenger	2017	regular unleaded	375.0	8.0	MANUAL	rear wheel drive	2.0	High-Performance	Large	Coupe	23	15	1851	35890
4150	Cadillac	Escalade	2015	flex-fuel (unleaded/E85)	420.0	8.0	AUTOMATIC	rear wheel drive	4.0	Flex Fuel,Luxury,Performance	Large	4dr SUV	21	15	1624	80195
10164	Toyota	T100	1998	regular unleaded	190.0	6.0	MANUAL	four wheel drive	2.0	NaN	Large	Extended Cab Pickup	18	15	2031	3480
7305	Honda	Odyssey	2016	regular unleaded	248.0	6.0	AUTOMATIC	front wheel drive	4.0	NaN	Large	Passenger Minivan	28	19	2202	29400
8365	Ford	Ranger	2011	regular unleaded	143.0	4.0	MANUAL	rear wheel drive	2.0	NaN	Compact	Regular Cab Pickup	27	22	5657	19120
1055	Audi	A3	2017	premium unleaded (recommended)	220.0	4.0	AUTOMATED_MANUAL	all wheel drive	2.0	Luxury	Compact	Convertible	34	25	3105	49250
7751	Audi	Q3	2015	premium unleaded (recommended)	200.0	4.0	AUTOMATIC	front wheel drive	4.0	Crossover,Luxury	Compact	4dr SUV	29	20	3105	36400

```
print(df.shape)
```

```
(11914, 16)
```

```
print(df['Make'].value_counts())
```

```
Chevrolet        1123
Ford              881
Volkswagen        809
Toyota            746
Dodge             626
Nissan            558
GMC               515
Honda             449
Mazda             423
Cadillac          397
Mercedes-Benz     353
Suzuki            351
BMW               334
Infiniti          330
Audi              328
Hyundai           303
Volvo             281
Subaru            256
Acura             252
Kia               231
Mitsubishi        213
Lexus             202
Buick             196
Chrysler          187
Pontiac           186
Lincoln           164
Oldsmobile        150
Land Rover        143
Porsche           136
Saab              111
Aston Martin       93
Plymouth           82
Bentley            74
Ferrari            69
FIAT               62
Scion              60
Maserati           58
Lamborghini        52
Rolls-Royce        31
Lotus              29
Tesla              18
HUMMER             17
Maybach            16
Alfa Romeo          5
```

```
McLaren            5
Bugatti            3
Spyker             3
Genesis            3
Name: Make, dtype: int64
```

```
new_df = df[df['Make']=='Mercedes-Benz']
```

```
print(new_df.shape)
```

```
(353, 16)
```

```
print(new_df.isnull().sum())
```

```
Make                0
Model               0
Year                0
Engine Fuel Type    0
Engine HP           1
Engine Cylinders    0
Transmission Type   0
Driven_Wheels       0
Number of Doors     0
Market Category     0
Vehicle Size        0
Vehicle Style       0
highway MPG         0
city mpg            0
Popularity          0
MSRP                0
dtype: int64
```

```
new_df = new_df.dropna()
```

```
new_df.shape
```

```
(352, 16)
```

```
new_df.isnull().sum()
```

```
Make                0
Model               0
Year                0
Engine Fuel Type    0
Engine HP           0
Engine Cylinders    0
Transmission Type   0
Driven_Wheels       0
Number of Doors     0
Market Category     0
Vehicle Size        0
Vehicle Style       0
highway MPG         0
city mpg            0
Popularity          0
MSRP                0
dtype: int64
```

```
new_df.sample(7)
```

	Make	Model	Year	Engine Fuel Type	Engine HP	Engine Cylinders	Transmission Type	Driven_Wheels	Number of Doors	Market Category	Vehicle Size	Vehicle Style	highway MPG	city mpg	Popularity	MSRP
602	Mercedes-Benz	560-Class	1991	regular unleaded	238.0	8.0	AUTOMATIC	rear wheel drive	2.0	Luxury	Large	Coupe	16	12	617	2443
3704	Mercedes-Benz	E-Class	2016	diesel	195.0	4.0	AUTOMATIC	rear wheel drive	4.0	Diesel,Luxury	Midsize	Sedan	42	28	617	52650
5291	Mercedes-Benz	GL-Class	2015	premium unleaded (required)	362.0	6.0	AUTOMATIC	all wheel drive	4.0	Crossover,Luxury	Large	4dr SUV	21	17	617	65200
3674	Mercedes-Benz	E-Class	2015	premium unleaded (required)	402.0	8.0	AUTOMATIC	rear wheel drive	2.0	Luxury,High-Performance	Midsize	Convertible	26	17	617	67750
9684	Mercedes-Benz	SLR McLaren	2009	premium unleaded (required)	617.0	8.0	AUTOMATIC	rear wheel drive	2.0	Exotic,Factory Tuner,Luxury,High-Performance	Compact	Convertible	16	12	617	495000
3700	Mercedes-Benz	E-Class	2016	diesel	195.0	4.0	AUTOMATIC	all wheel drive	4.0	Diesel,Luxury	Midsize	Sedan	38	27	617	55150
9668	Mercedes-Benz	SL-Class	2017	premium unleaded (required)	577.0	8.0	AUTOMATIC	rear wheel drive	2.0	Factory Tuner,Luxury,High-Performance	Compact	Convertible	25	16	617	151350

```
new_df = new_df[['Engine HP','MSRP']]
```

```
new_df.sample(7)
```

	Engine HP	MSRP
2718	268.0	56100.0
2064	241.0	41050.0
8829	449.0	95650.0
673	389.0	3211.0
3687	329.0	62350.0
3671	302.0	54800.0

```
print(new_df['Engine HP'].dtypes)
print(new_df['MSRP'].dtypes)
```

```
float64
int64
```

```
new_df['MSRP'] = new_df['MSRP'].astype(dtype='float64')
```

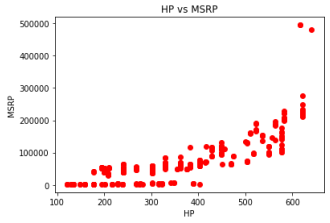
```
new_df.sample(7)
```

	Engine HP	MSRP
2686	536.0	154600.0
5290	429.0	89950.0
9674	415.0	68925.0
5297	208.0	31300.0
6576	329.0	62900.0
2677	429.0	114100.0
3711	241.0	52150.0

```
X = np.array(new_df[['Engine HP']])
y = np.array(new_df[['MSRP']])
print(X.shape)
print(y.shape)
```

```
(352, 1)
(352, 1)
```

```
plt.scatter(X,y,color="red")
plt.title('HP vs MSRP')
plt.xlabel('HP')
plt.ylabel('MSRP')
plt.show()
```

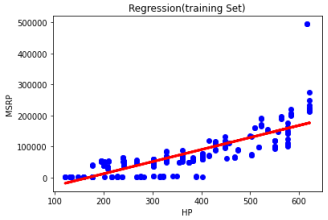



```
X_train,X_test,y_train,y_test = train_test_split(X,y,test_size = 0.25,random_state=15)
regressor = LinearRegression()
regressor.fit(X_train,y_train)
```

```
LinearRegression(copy_X=True, fit_intercept=True, n_jobs=None, normalize=False)
```

```
plt.scatter(X_test,y_test,color="green")
plt.plot(X_train,regressor.predict(X_train),color="red",linewidth=3)
plt.title('Regression(Test Set)')
plt.xlabel('HP')
plt.ylabel('MSRP')
plt.show()
```


```
plt.scatter(X_train,y_train,color="blue")
plt.plot(X_train,regressor.predict(X_train),color="red",linewidth=3)
plt.title('Regression(training Set)')
plt.xlabel('HP')
plt.ylabel('MSRP')
plt.show()
```




```
y_pred = regressor.predict(X_test)
print('R2 score: %.2f' % r2_score(y_test,y_pred))
```

```
R2 score: 0.65
```

```
print('Mean Error :',mean_squared_error(y_test,y_pred))
```

```
Mean Error : 1833108741.6904762
```

```
def car_price(hp):
    result = regressor.predict(np.array(hp).reshape(1, -1))
    return(result[0,0])
```

```
car_hp = int(input('Enter Mercedes cars Horse Power : '))
print('This Mercedes-Benz Price will be : ',int(car_price(car_hp)),'$')
```

```
Enter Mercedes cars Horse Power : 400
This Mercedes-Benz Price will be :  90383 $
```

✓ 4s completed at 21:04