In [96]:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings("ignore")
```

In [97]:

```
df=pd.read_csv("Real_estates.csv")
```

In [98]:

```
df
```

Out[98]:

	Avg. Area Income	Avg. Area House Age	Avg. Area Number of Rooms	Avg. Area Number of Bedrooms	Area Population	Price	Address
0	79545.458574	5.682861	7.009188	4.09	23086.800503	1.059034e+06	208 Michael Ferry Apt. 674\nLaurabury, NE 3701...
1	79248.642455	6.002900	6.730821	3.09	40173.072174	1.505891e+06	188 Johnson Views Suite 079\nLake Kathleen, CA...
2	61287.067179	5.865890	8.512727	5.13	36882.159400	1.058988e+06	9127 Elizabeth Stravenue\nDanieltown, WI 06482...
3	63345.240046	7.188236	5.586729	3.26	34310.242831	1.260617e+06	USS Barnett\nFPO AP 44820
4	59982.197226	5.040555	7.839388	4.23	26354.109472	6.309435e+05	USNS Raymond\nFPO AE 09386
...	...	...	...	...	...	...	...
4995	60567.944140	7.830362	6.137356	3.46	22837.361035	1.060194e+06	USNS Williams\nFPO AP 30153-7653
4996	78491.275435	6.999135	6.576763	4.02	25616.115489	1.482618e+06	PSC 9258, Box 8489\nAPO AA 42991-3352
4997	63390.686886	7.250591	4.805081	2.13	33266.145490	1.030730e+06	4215 Tracy Garden Suite 076\nJoshualand, VA 01...
4998	68001.331235	5.534388	7.130144	5.44	42625.620156	1.198657e+06	USS Wallace\nFPO AE 73316
4999	65510.581804	5.992305	6.792336	4.07	46501.283803	1.298950e+06	37778 George Ridges Apt. 509\nEast Holly, NV 2...

5000 rows × 7 columns

check the null value

In [99]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 5000 entries, 0 to 4999
Data columns (total 7 columns):
 #   Column                        Non-Null Count  Dtype  
---  ------                        --------------  -----  
 0   Avg. Area Income              5000 non-null   float64
 1   Avg. Area House Age           5000 non-null   float64
 2   Avg. Area Number of Rooms     5000 non-null   float64
 3   Avg. Area Number of Bedrooms  5000 non-null   float64
 4   Area Population               5000 non-null   float64
 5   Price                         5000 non-null   float64
 6   Address                       5000 non-null   object 
dtypes: float64(6), object(1)
memory usage: 273.6+ KB
```

In [100…

```
df.isna().sum()
```

Out[100]:

```
Avg. Area Income                0
Avg. Area House Age             0
Avg. Area Number of Rooms       0
Avg. Area Number of Bedrooms    0
Area Population                 0
Price                           0
Address                         0
dtype: int64
```

In [130…

```
df.describe()
```

Out[130]:

	Avg. Area Income	Avg. Area House Age	Avg. Area Number of Rooms	Avg. Area Number of Bedrooms	Area Population	Price
count	5000.000000	5000.000000	5000.000000	5000.000000	5000.000000	5.000000e+03
mean	68583.108984	5.977222	6.987792	3.981330	36163.516039	1.232073e+06
std	10657.991214	0.991456	1.005833	1.234137	9925.650114	3.531176e+05
min	17796.631190	2.644304	3.236194	2.000000	172.610686	1.593866e+04
25%	61480.562388	5.322283	6.299250	3.140000	29403.928702	9.975771e+05
50%	68804.286404	5.970429	7.002902	4.050000	36199.406689	1.232669e+06
75%	75783.338666	6.650808	7.665871	4.490000	42861.290769	1.471210e+06
max	107701.748378	9.519088	10.759588	6.500000	69621.713378	2.469066e+06

In [131…

```
df.duplicated().any()
```

Out[131]:

```
False
```

split input and output

In [132…

```
feature=df.iloc[:,:-2]
target=df.iloc[:,-2]
```

In [133…

```
feature
```

Out[133]:

	Avg. Area Income	Avg. Area House Age	Avg. Area Number of Rooms	Avg. Area Number of Bedrooms	Area Population
0	79545.458574	5.682861	7.009188	4.09	23086.800503
1	79248.642455	6.002900	6.730821	3.09	40173.072174
2	61287.067179	5.865890	8.512727	5.13	36882.159400
3	63345.240046	7.188236	5.586729	3.26	34310.242831
4	59982.197226	5.040555	7.839388	4.23	26354.109472
...	...	...	...	...	...
4995	60567.944140	7.830362	6.137356	3.46	22837.361035
4996	78491.275435	6.999135	6.576763	4.02	25616.115489
4997	63390.686886	7.250591	4.805081	2.13	33266.145490
4998	68001.331235	5.534388	7.130144	5.44	42625.620156
4999	65510.581804	5.992305	6.792336	4.07	46501.283803

5000 rows × 5 columns

In [134…

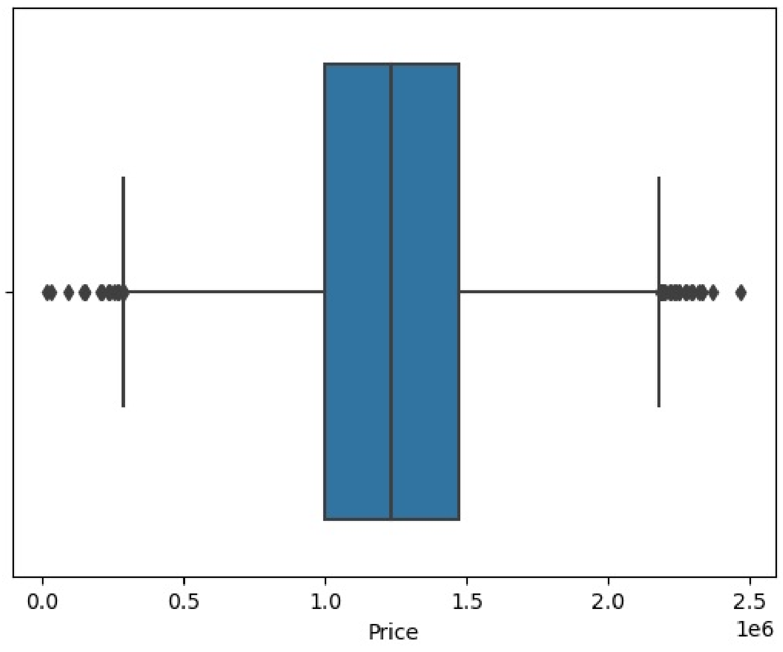
```
target
```

Out[134]:

```
0       1.059034e+06
1       1.505891e+06
2       1.058988e+06
3       1.260617e+06
4       6.309435e+05
            ...
4995    1.060194e+06
4996    1.482618e+06
4997    1.030730e+06
4998    1.198657e+06
4999    1.298950e+06
Name: Price, Length: 5000, dtype: float64
```

In [135…

```
sns.boxplot(data=feature,x=target)
plt.show()
```



split train and test

```
In [136… from sklearn.model_selection import train_test_split
         xtrain,xtest,ytrain,ytest=train_test_split(feature,target,test_size=0.3,random_state=1)
```

```
In [137… from sklearn.linear_model import LinearRegression
         lr=LinearRegression()
         lr.fit(xtrain,ytrain)
         ypred=lr.predict(xtest)
```

```
In [138… ypred
```

```
Out[138]: array([1555151.93144969, 1583399.08583431,  941481.35482434, ...,
                 1099846.27252109,  974837.76044627, 1731306.80613941])
```

Evaluation metrics

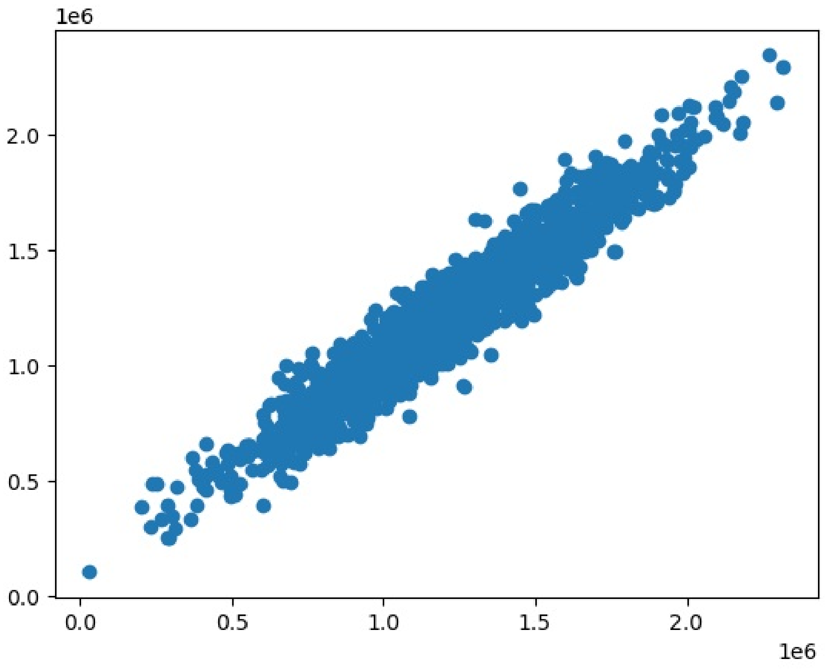
```
In [139… lr.coef_
```

```
Out[139]: array([2.16398550e+01, 1.65729214e+05, 1.20958349e+05, 1.94909254e+03,
                 1.52262240e+01])
```

```
In [140… lr.intercept_
```

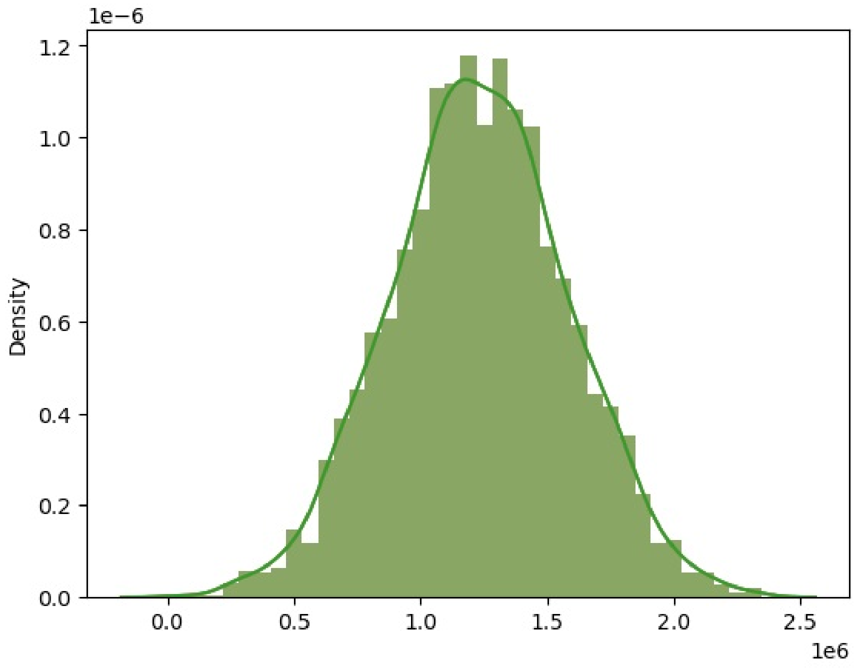
```
Out[140]: -2645289.8643436683
```

```
In [141… plt.scatter(ytest,ypred)
         plt.show()
```



In [127…

```
sns.distplot((ytest,ypred))
plt.show()
```



model

In [142…

```
from sklearn.metrics import mean_absolute_error,mean_squared_error,r2_score
mae=mean_absolute_error(ytest,ypred)
mse=mean_squared_error(ytest,ypred)
rmse=np.sqrt(mse)
r2=r2_score(ytest,ypred)

print(f"MAE  :{mae}\nMSE  :{mse}\nRMSE  :{rmse}\nACCURACY  :{r2}")
```

```
MAE  :82745.90894156008
MSE  :10567448570.930983
RMSE  :102798.09614448597
ACCURACY  :0.9166912271539742
```

In [ ]:

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