problem statement

a real esate agent want help to predict the house price for regions in USA. he gave us the daataset to work on to use liner regression model create a model that help him to estimate of what the house would sell sell for

DATA COLLECTIN

In [1]:

```
# IMPORT LIBRARIES
import numpy  as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [2]:

```
a=pd.read_csv(r"C:\Users\user\Downloads\10_USA_Housing.csv")
a
```

Out[2]:

	Avg. Area Income	Avg. Area House Age	Avg. Area Number of Rooms	Avg. Area Number of Bedrooms	Area Population	Price	
0	79545.458574	5.682861	7.009188	4.09	23086.800503	1.059034e+06	208 Michael 674\nLaur
1	79248.642455	6.002900	6.730821	3.09	40173.072174	1.505891e+06	188 Johns Suite 0 Kathl
2	61287.067179	5.865890	8.512727	5.13	36882.159400	1.058988e+06	9127 Stravenue\nDa W
3	63345.240046	7.188236	5.586729	3.26	34310.242831	1.260617e+06	USS Barnett\
4	59982.197226	5.040555	7.839388	4.23	26354.109472	6.309435e+05	USNS Raymo
...	...	...	...	...	...	...	
4995	60567.944140	7.830362	6.137356	3.46	22837.361035	1.060194e+06	USNS Willia AP 30
4996	78491.275435	6.999135	6.576763	4.02	25616.115489	1.482618e+06	PSC 9 8489\nAPO A
4997	63390.686886	7.250591	4.805081	2.13	33266.145490	1.030730e+06	4215 Trac Suite 076\nJo
4998	68001.331235	5.534388	7.130144	5.44	42625.620156	1.198657e+06	USS Wallace\
4999	65510.581804	5.992305	6.792336	4.07	46501.283803	1.298950e+06	37778 Georg Apt. 509\nE

5000 rows × 7 columns

DATA CLEANING AND PRE-

In [4]:

```
# to find
a.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 [7]:

```
# to display summary of statastic
a.describe()
```

Out[7]:

	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 [11]:

```
# to display colum heading
a.columns
```

Out[11]:

```
Index(['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of Roo
ms',
       'Avg. Area Number of Bedrooms', 'Area Population', 'Price', 'Addres
s'],
      dtype='object')
```

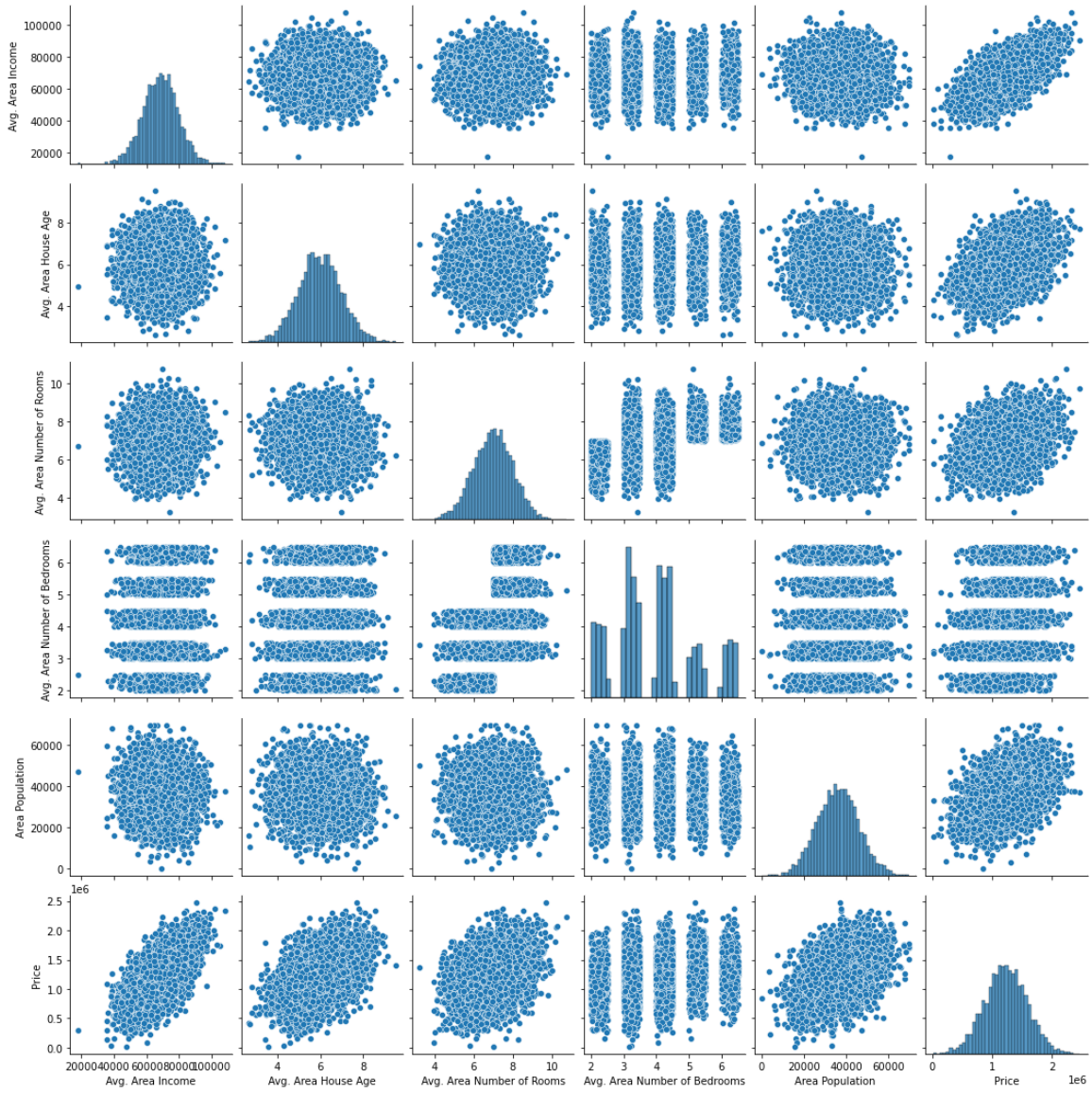
EDA and VISUALIZATION

In [12]:

```
sns.pairplot(a)
```

Out[12]:

```
<seaborn.axisgrid.PairGrid at 0x237911459d0>
```

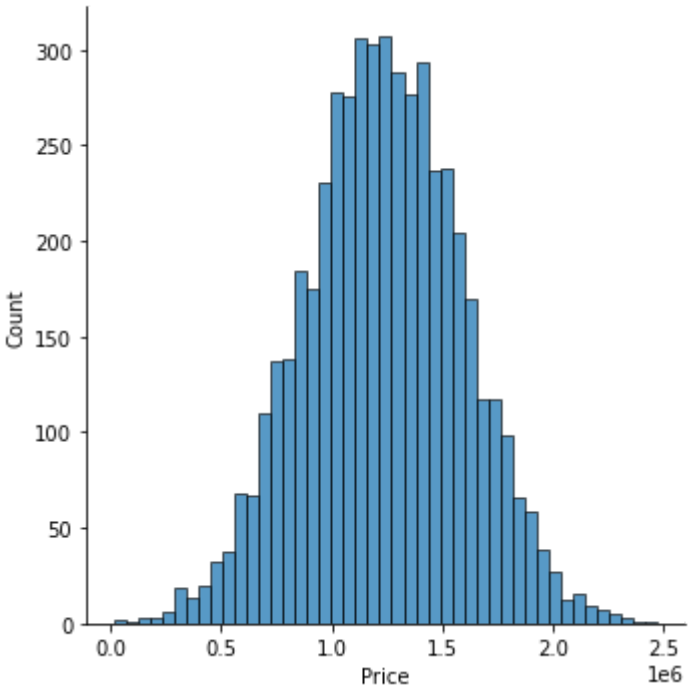


In [14]:

```
sns.displot(a["Price"])
```

Out[14]:

```
<seaborn.axisgrid.FacetGrid at 0x23793ed6b50>
```



In [15]:

```
b=a[['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of Rooms',
       'Avg. Area Number of Bedrooms', 'Area Population', 'Price']]
```

In [18]:

```
sns.heatmap(b.corr())
```

Out[18]:

<AxesSubplot:>

id train the model- model bulding

we are going to train liner hegression model ; we to split out data into two varialbe x and y where x is independent variable (input) and y is depending on x(output) we could ignore address column as it is not required for our model

In [21]:

```
x=a[['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of Rooms',
       'Avg. Area Number of Bedrooms', 'Area Population']]
y=a['Price']
```

In [23]:

```
from sklearn.model_selection import train_test_split

x_train,x_test,y_train,y_test = train_test_split(x,y,test_size=0.3)
```

In [26]:

```
from sklearn.linear_model import LinearRegression
lr=LinearRegression()
lr.fit(x_train,y_train)
```

Out[26]:

```
LinearRegression()
```

In [28]:

```
lr.intercept_
```

Out[28]:

```
-2628316.2526118616
```

In [31]:

```
coeff=pd.DataFrame(lr.coef_,x.columns,columns=['Co-efficient'])
coeff
```

Out[31]:

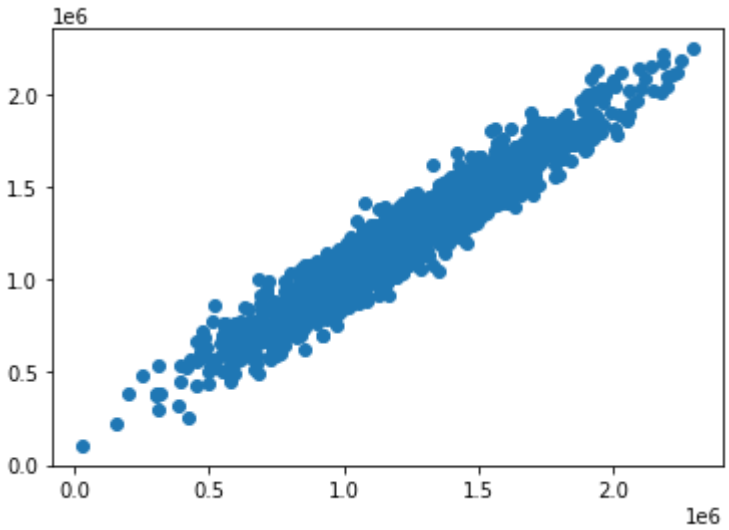
	Co-efficient
Avg. Area Income	21.590609
Avg. Area House Age	166192.278504
Avg. Area Number of Rooms	119202.096364
Avg. Area Number of Bedrooms	2972.498223
Area Population	14.975198

In [34]:

```
prediction = lr.predict(x_test)
plt.scatter(y_test,prediction)
```

Out[34]:

```
<matplotlib.collections.PathCollection at 0x23795c74910>
```



In [35]:

```
lr.score(x_test,y_test)
```

Out[35]:

```
0.9209554669633928
```

In [ ]:

```

```