USA Housing

In [29]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

In [5]:
```
df=pd.read_csv(r"c:\Users\user\Downloads\10_USA_Housing.csv")
df
```

Out[5]:

	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

In [6]:
```
df.describe()
```

Out[6]:

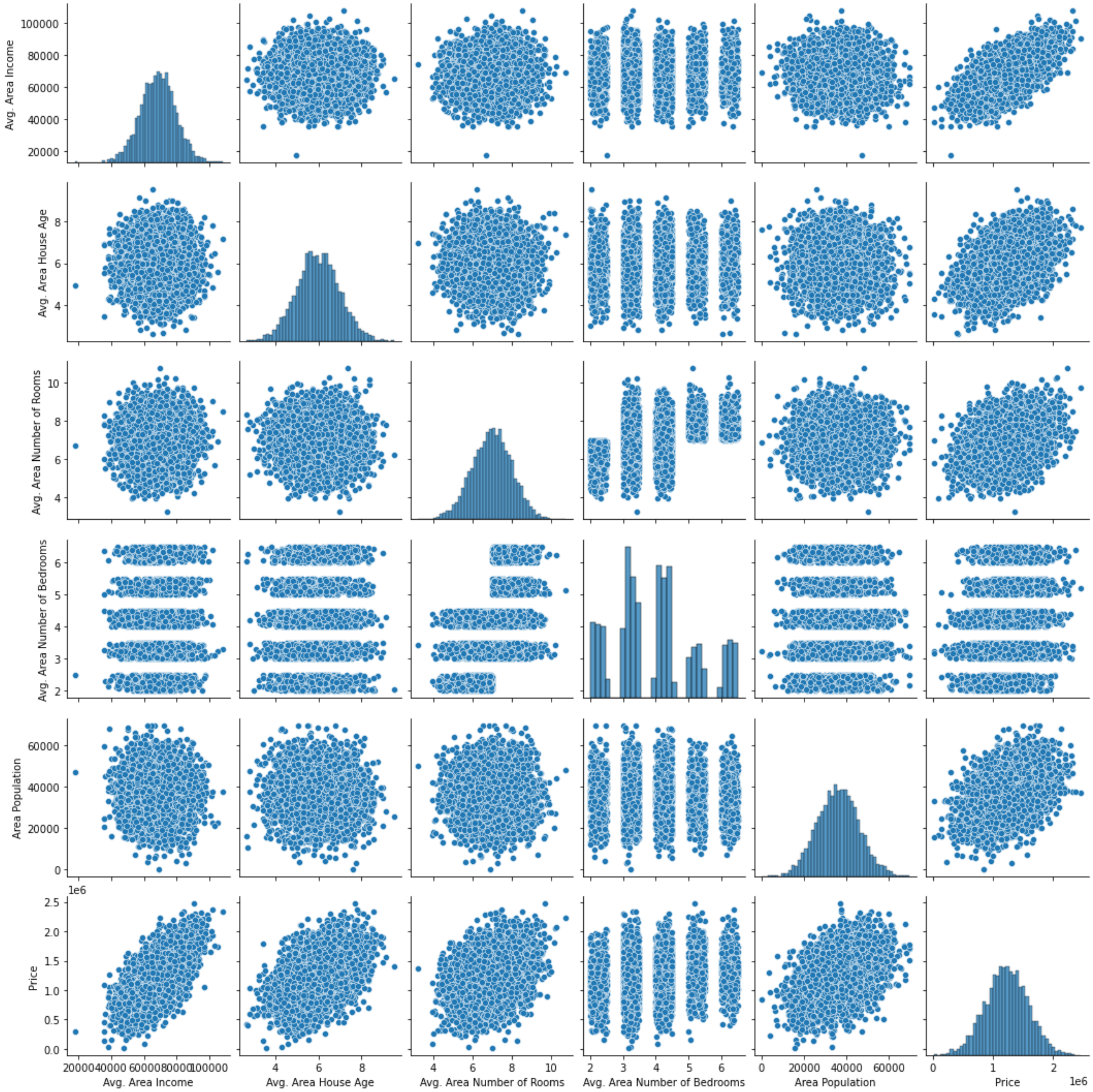
	Avg. Area Income	Avg. Area House Age	Avg. Area Number of Rooms	Avg. Area Number of Bedrooms	Area Population	Price
count	5000.000000	5000.000000	5000.000000	5000.000000	5000.000000	5.000000e+03
mean	68583.108984	5.977222	6.987792	3.981330	36163.516039	1.232073e+06
std	10657.991214	0.991456	1.005833	1.234137	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 [8]:
```
# To display column heading

df.columns
```

Out[8]:
```
Index(['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of Rooms',
       'Avg. Area Number of Bedrooms', 'Area Population', 'Price', 'Address'],
      dtype='object')
```

EDA and Visualization

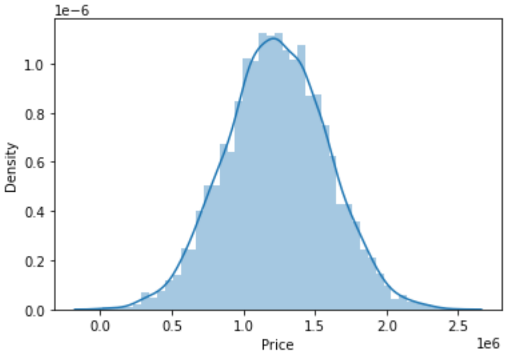
```
In [9]: sns.pairplot(df)

Out[9]: <seaborn.axisgrid.PairGrid at 0xe9b42d21c0>
```



In [14]:
```
sns.distplot(df['Price'])
```

```
C:\Users\user\anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarning: `distplot` is a deprecated function and
will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexi
bility) or `histplot` (an axes-level function for histograms).
  warnings.warn(msg, FutureWarning)
```

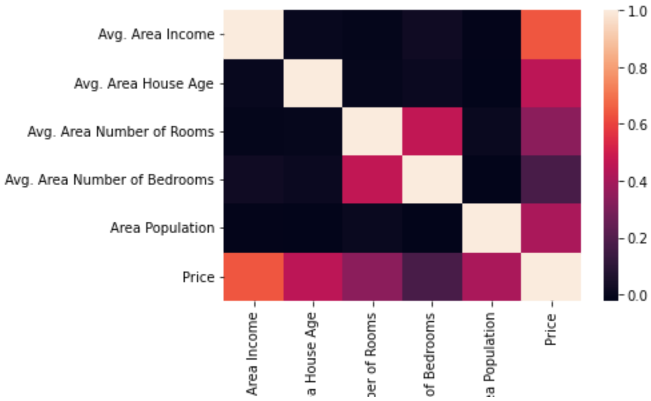
Out[14]:
```
<AxesSubplot:xlabel='Price', ylabel='Density'>
```



In [22]:
```
df1=df[['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of Rooms',
       'Avg. Area Number of Bedrooms', 'Area Population', 'Price']]
```

In [16]:
```
sns.heatmap(df1.corr())
```

Out[16]:
```
<AxesSubplot:>
```



To train the model - Model Building

we are going to train linear regression model. we need to split out data in to two variables x and y where x is independent variable(input) and y is dependent on x(output) we could ignore address column as it is not required for our model

In [23]:
```
x = df1[['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of Rooms',
       'Avg. Area Number of Bedrooms', 'Area Population']]
y = df1['Price']
```

In [25]:
```
# To split my dataset into training and test data

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 [27]:
```
print(lr.intercept_)
```

```
-2635404.7755354345
```

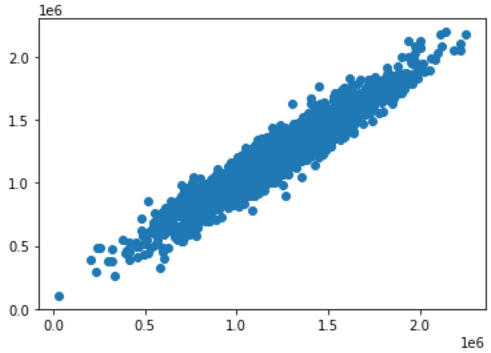
In [31]:
```
coeff = pd.DataFrame(lr.coef_,x.columns,columns=['co-efficient'])
coeff
```

Out[31]:

	co-efficient
Avg. Area Income	21.585078
Avg. Area House Age	166280.297338
Avg. Area Number of Rooms	120114.464131
Avg. Area Number of Bedrooms	1687.033393
Area Population	15.116412

In [37]:
```
prediction = lr.predict(x_test)
plt.scatter(y_test,prediction)
```

Out[37]:
```
<matplotlib.collections.PathCollection at 0xe9c07253d0>
```



In [38]:
```
print(lr.score(x_test,y_test))
```

```
0.9162852069198381
```

In [ ]: