[1]:
```
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
```

[3]:
```
dataset=pd.read_csv("USA_Housing.csv")
print(dataset)
```

```
      Avg. Area Income  Avg. Area House Age  Avg. Area Number of Rooms  \
0         79545.458574             5.682861                   7.009188
1         79248.642455             6.002900                   6.730821
2         61287.067179             5.865890                   8.512727
3         63345.240046             7.188236                   5.586729
4         59982.197226             5.040555                   7.839388
…                  …                    …                          …
4995      60567.944140             7.830362                   6.137356
4996      78491.275435             6.999135                   6.576763
4997      63390.686886             7.250591                   4.805081
4998      68001.331235             5.534388                   7.130144
4999      65510.581804             5.992305                   6.792336

      Avg. Area Number of Bedrooms  Area Population         Price  \
0                             4.09     23086.800503  1.059034e+06
1                             3.09     40173.072174  1.505891e+06
2                             5.13     36882.159400  1.058988e+06
3                             3.26     34310.242831  1.260617e+06
4                             4.23     26354.109472  6.309435e+05
…                             …              …             …
4995                          3.46     22837.361035  1.060194e+06
4996                          4.02     25616.115489  1.482618e+06
4997                          2.13     33266.145490  1.030730e+06
4998                          5.44     42625.620156  1.198657e+06
4999                          4.07     46501.283803  1.298950e+06

                                          Address
0     208 Michael Ferry Apt. 674\nLaurabury, NE 3701…
```

```
1     188 Johnson Views Suite 079\nLake Kathleen, CA…
2     9127 Elizabeth Stravenue\nDanieltown, WI 06482…
3                            USS Barnett\nFPO AP 44820
4                           USNS Raymond\nFPO AE 09386
…                                                   …
4995                   USNS Williams\nFPO AP 30153-7653
4996              PSC 9258, Box 8489\nAPO AA 42991-3352
4997  4215 Tracy Garden Suite 076\nJoshualand, VA 01…
4998                           USS Wallace\nFPO AE 73316
4999  37778 George Ridges Apt. 509\nEast Holly, NV 2…

[5000 rows x 7 columns]
```

[4]:
```
dataset.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
```

[5]:
```
dataset.describe()
```

[5]:

	Avg. Area Income	Avg. Area House Age	Avg. Area Number of Rooms	\
count	5000.000000	5000.000000	5000.000000	
mean	68583.108984	5.977222	6.987792	
std	10657.991214	0.991456	1.005833	
min	17796.631190	2.644304	3.236194	
25%	61480.562388	5.322283	6.299250	
50%	68804.286404	5.970429	7.002902	
75%	75783.338666	6.650808	7.665871	
max	107701.748378	9.519088	10.759588	

	Avg. Area Number of Bedrooms	Area Population	Price
count	5000.000000	5000.000000	5.000000e+03
mean	3.981330	36163.516039	1.232073e+06
std	1.234137	9925.650114	3.531176e+05
min	2.000000	172.610686	1.593866e+04

```
25%                      3.140000     29403.928702  9.975771e+05
50%                      4.050000     36199.406689  1.232669e+06
75%                      4.490000     42861.290769  1.471210e+06
max                      6.500000     69621.713378  2.469066e+06
```

[6]:
```
dataset.head()
```

[6]:
```
   Avg. Area Income  Avg. Area House Age  Avg. Area Number of Rooms  \
0      79545.458574             5.682861                   7.009188
1      79248.642455             6.002900                   6.730821
2      61287.067179             5.865890                   8.512727
3      63345.240046             7.188236                   5.586729
4      59982.197226             5.040555                   7.839388

   Avg. Area Number of Bedrooms  Area Population         Price  \
0                          4.09     23086.800503  1.059034e+06
1                          3.09     40173.072174  1.505891e+06
2                          5.13     36882.159400  1.058988e+06
3                          3.26     34310.242831  1.260617e+06
4                          4.23     26354.109472  6.309435e+05

                                             Address
0  208 Michael Ferry Apt. 674\nLaurabury, NE 3701…
1  188 Johnson Views Suite 079\nLake Kathleen, CA…
2  9127 Elizabeth Stravenue\nDanieltown, WI 06482…
3                         USS Barnett\nFPO AP 44820
4                        USNS Raymond\nFPO AE 09386
```

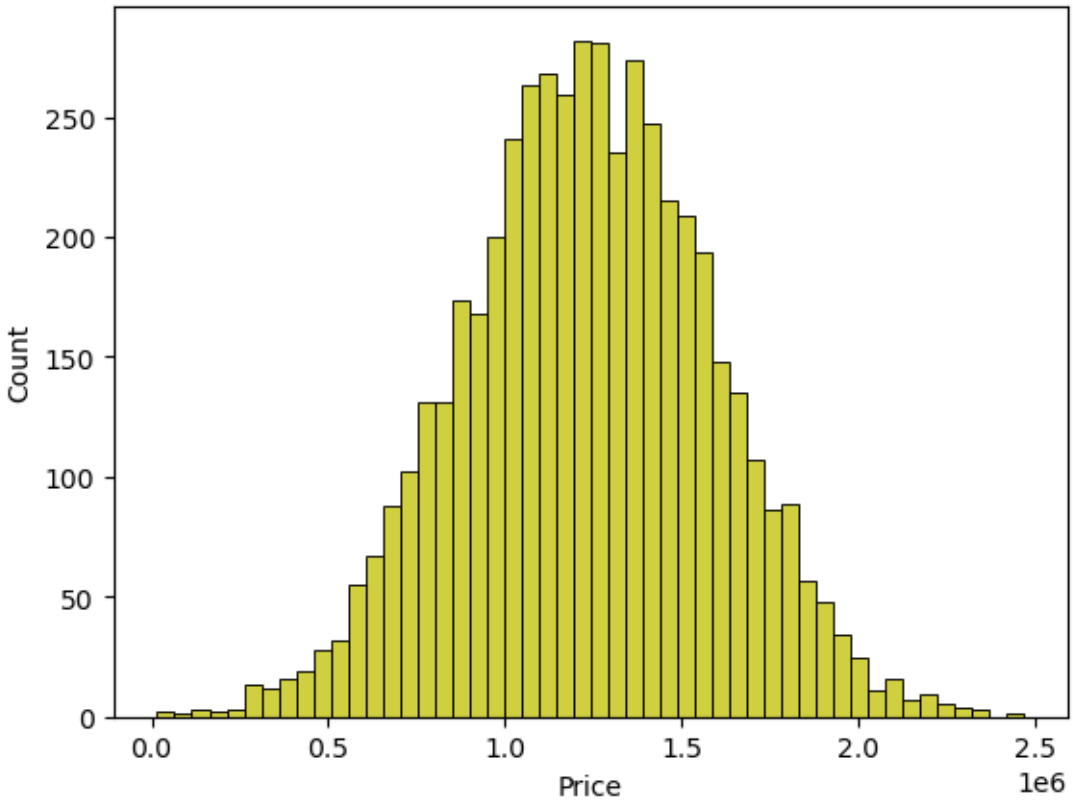
[7]:
```
dataset.tail()
```

[7]:
```
      Avg. Area Income  Avg. Area House Age  Avg. Area Number of Rooms  \
4995      60567.944140             7.830362                   6.137356
4996      78491.275435             6.999135                   6.576763
4997      63390.686886             7.250591                   4.805081
4998      68001.331235             5.534388                   7.130144
4999      65510.581804             5.992305                   6.792336

      Avg. Area Number of Bedrooms  Area Population         Price  \
4995                          3.46     22837.361035  1.060194e+06
4996                          4.02     25616.115489  1.482618e+06
4997                          2.13     33266.145490  1.030730e+06
4998                          5.44     42625.620156  1.198657e+06
4999                          4.07     46501.283803  1.298950e+06

                                          Address
4995                  USNS Williams\nFPO AP 30153-7653
4996             PSC 9258, Box 8489\nAPO AA 42991-3352
```

```
4997  4215 Tracy Garden Suite 076\nJoshualand, VA 01…
4998                          USS Wallace\nFPO AE 73316
4999  37778 George Ridges Apt. 509\nEast Holly, NV 2…
```

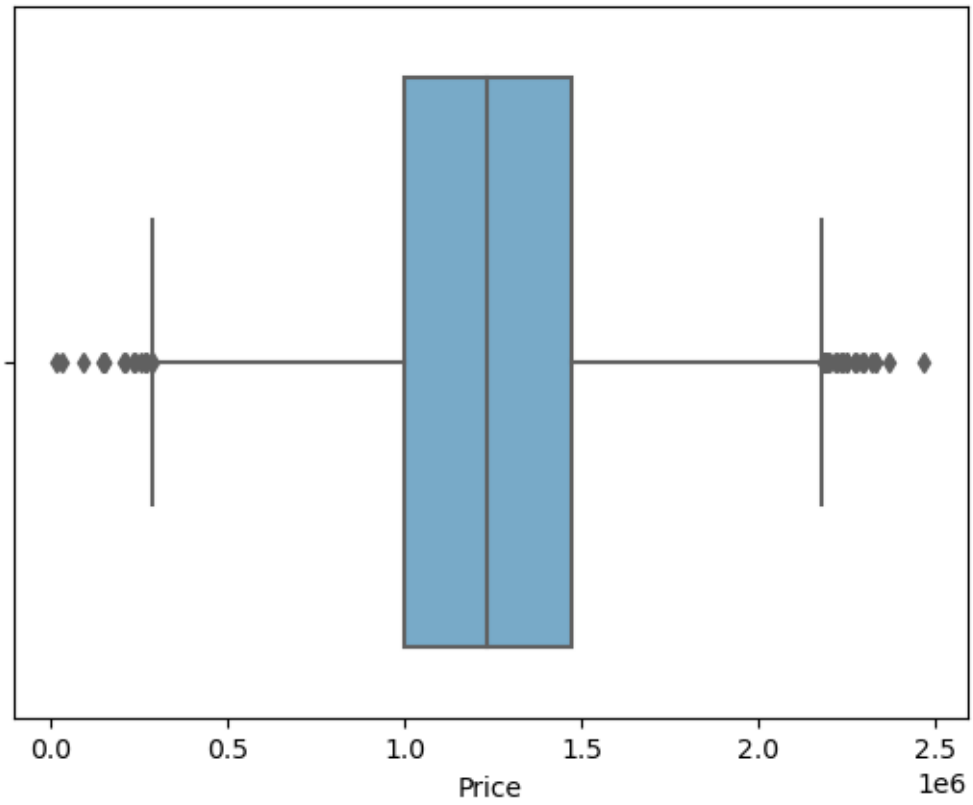
[8]:
```
sns.histplot(dataset,x='Price',bins=50,color='y')
```

[8]:
```
<Axes: xlabel='Price', ylabel='Count'>
```



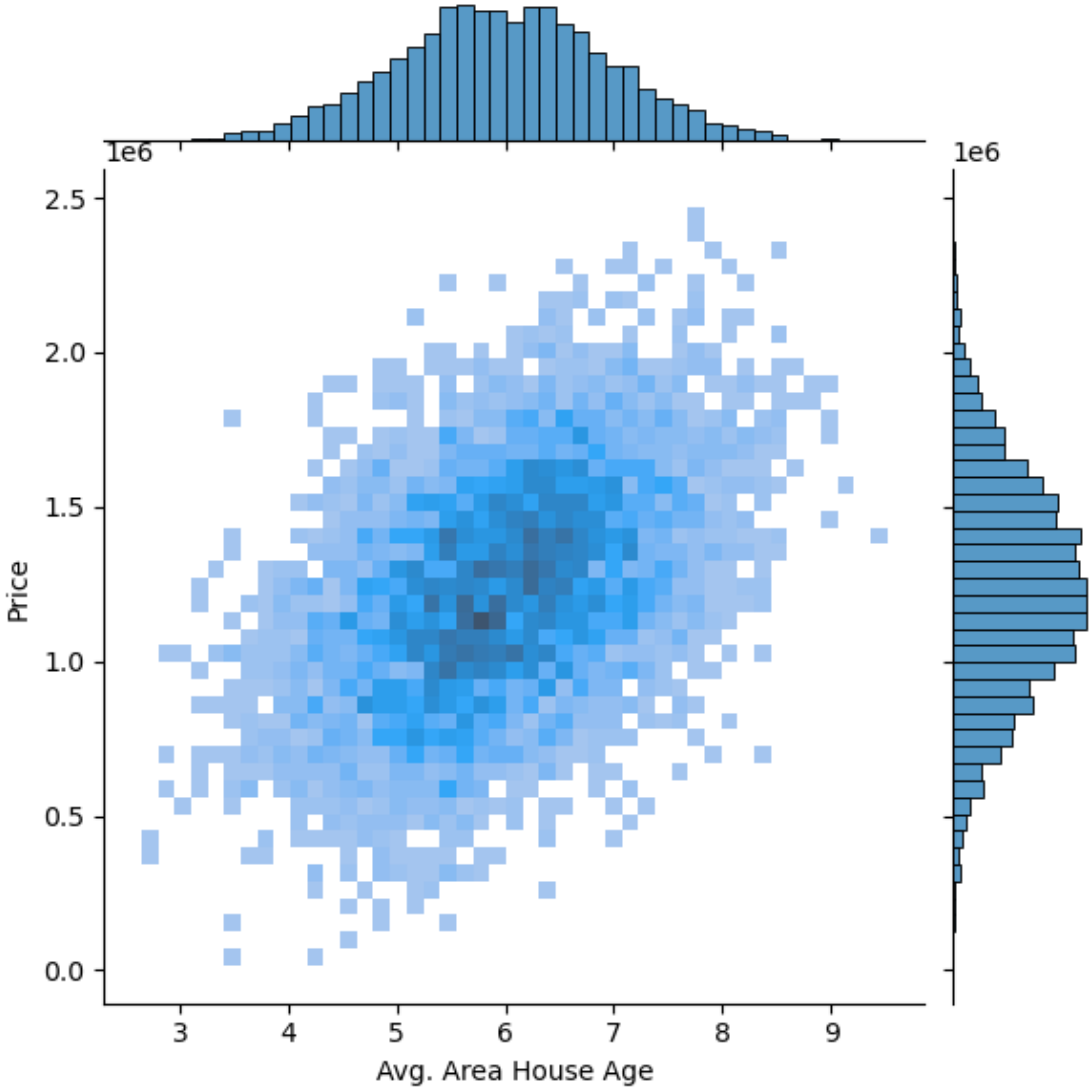
[9]:
```
sns.boxplot(dataset, x='Price', palette='Blues')
```

[9]:
```
<Axes: xlabel='Price'>
```



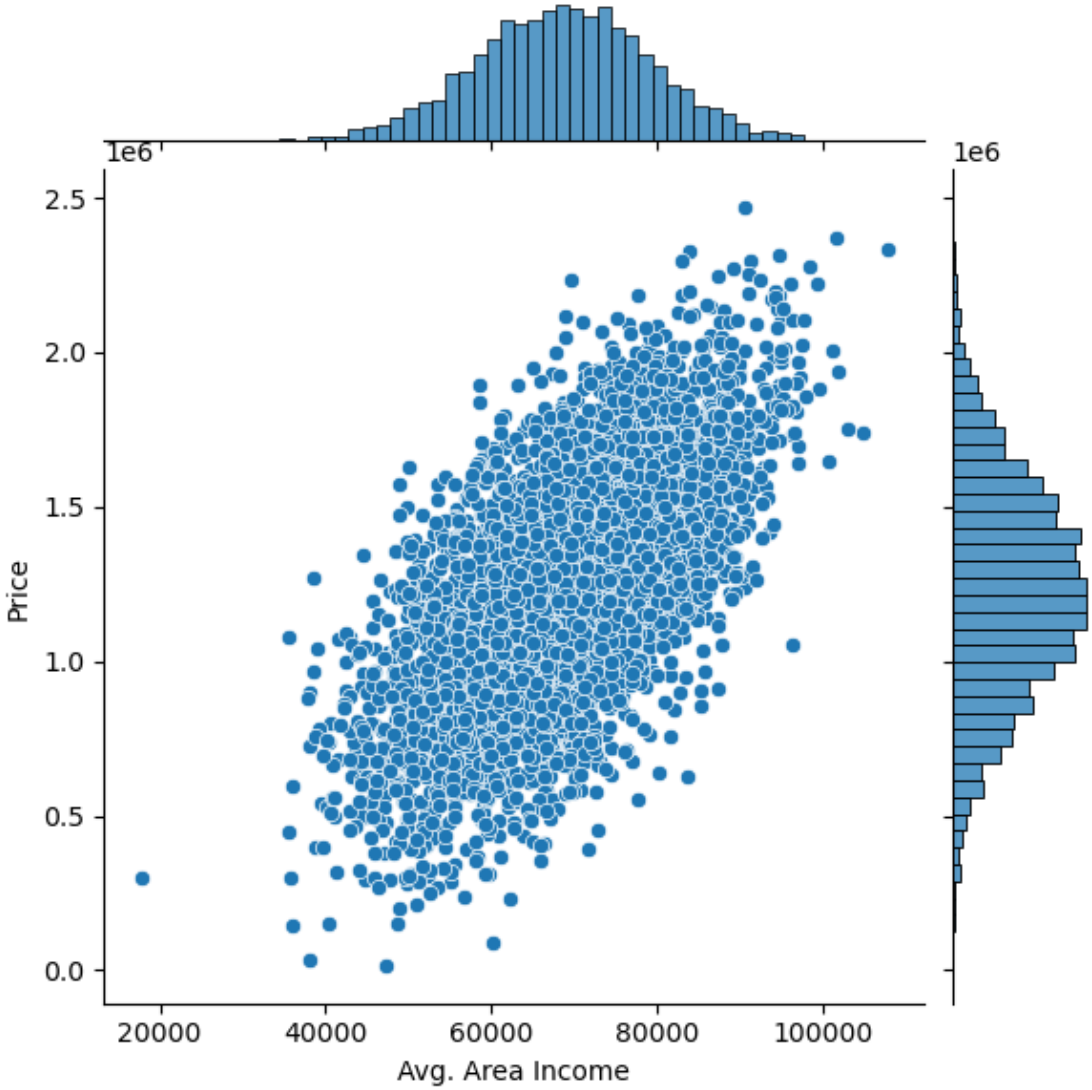
[10]:
```
sns.jointplot(dataset, x='Avg. Area House Age', y='Price', kind='hist')
```

[10]: <seaborn.axisgrid.JointGrid at 0x1f982011ea0>



[11]:
```
sns.jointplot(dataset, x='Avg. Area Income', y='Price')
```

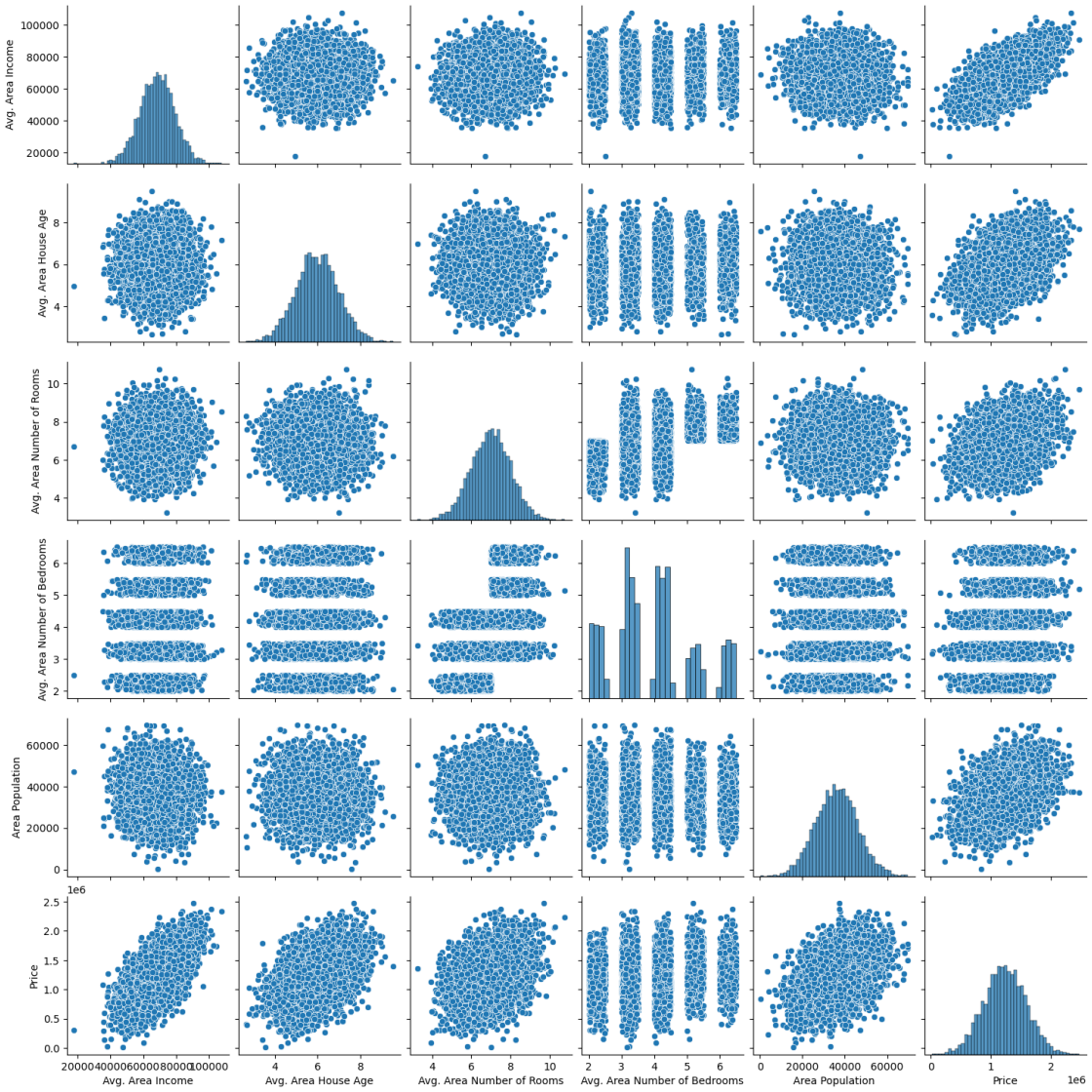
[11]:
```
<seaborn.axisgrid.JointGrid at 0x1f98234f0d0>
```



[12]:
```
plt.figure(figsize=(12,8))
sns.pairplot(dataset)
```

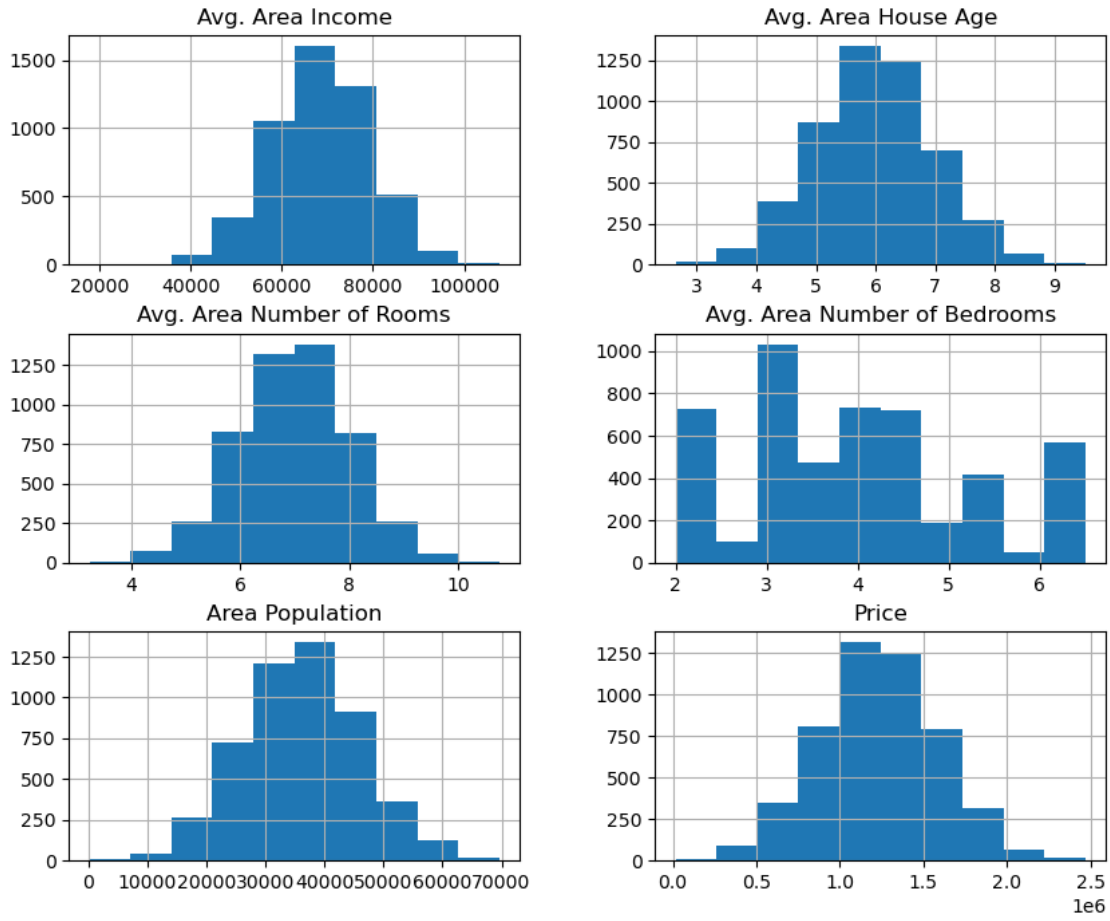
[12]: <seaborn.axisgrid.PairGrid at 0x1f9ff020a30>

<Figure size 1200x800 with 0 Axes>



[13]:
```
dataset.hist(figsize=(10,8))
```

[13]:
```
array([[<Axes: title={'center': 'Avg. Area Income'}>,
        <Axes: title={'center': 'Avg. Area House Age'}>],
       [<Axes: title={'center': 'Avg. Area Number of Rooms'}>,
        <Axes: title={'center': 'Avg. Area Number of Bedrooms'}>],
       [<Axes: title={'center': 'Area Population'}>,
        <Axes: title={'center': 'Price'}>]], dtype=object)
```



[14]:
```
dataset.corr(numeric_only='True')
```

[14]:

	Avg. Area Income	Avg. Area House Age	Avg. Area Number of Rooms	Avg. Area Number of Bedrooms	Area Population	Price
Avg. Area Income	1.000000	-0.002007	-0.011032	0.019788	-0.016234	0.639734
Avg. Area House Age	-0.002007	1.000000	-0.009428	0.006149	-0.018743	0.452543
Avg. Area Number of Rooms	-0.011032	-0.009428	1.000000	0.462695	0.002040	0.335664
Avg. Area Number of Bedrooms	0.019788	0.006149	0.462695	1.000000	-0.022168	0.171071
Area Population	-0.016234	-0.018743	0.002040	-0.022168	1.000000	0.408556
Price	0.639734	0.452543	0.335664	0.171071	0.408556	1.000000

```
                             Avg. Area Number of Bedrooms  Area Population  \
Avg. Area Income                                 0.019788        -0.016234
Avg. Area House Age                              0.006149        -0.018743
Avg. Area Number of Rooms                        0.462695         0.002040
Avg. Area Number of Bedrooms                     1.000000        -0.022168
Area Population                                 -0.022168         1.000000
Price                                            0.171071         0.408556

                                Price
Avg. Area Income             0.639734
Avg. Area House Age          0.452543
Avg. Area Number of Rooms    0.335664
Avg. Area Number of Bedrooms 0.171071
Area Population              0.408556
Price                        1.000000
```

[15]:
```
plt.figure(figsize=(10,5))
sns.heatmap(dataset.corr(numeric_only=True), annot=True)
```

[15]: <Axes: >

[16]:
```
X = dataset[['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of␣
↪Rooms',
```

```
       'Avg. Area Number of Bedrooms', 'Area Population']]
Y = dataset['Price']
```

[17]:
```
X_train, X_test, Y_train, Y_test = train_test_split(X, Y, test_size=0.2,␣
↪random_state=101)
```

[18]:
```
Y_train.head()
```

[18]:
```
3413    1.305210e+06
1610    1.400961e+06
3459    1.048640e+06
4293    1.231157e+06
1039    1.391233e+06
Name: Price, dtype: float64
```

[19]:
```
Y_train.shape
```

[19]:
```
(4000,)
```

[20]:
```
Y_test.head()
```

[20]:
```
1718    1.251689e+06
2511    8.730483e+05
345     1.696978e+06
2521    1.063964e+06
54      9.487883e+05
Name: Price, dtype: float64
```

[21]:
```
Y_test.shape
```

[21]:
```
(1000,)
```

[22]:
```
sc = StandardScaler()
X_train_scal = sc.fit_transform(X_train)
X_test_scal = sc.fit_transform(X_test)
```

[ ]:
```

```