In [1]:

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

In [2]:

```
df=pd.read_csv(r"C:\Users\lenovo\Downloads\USA_Housing.csv")
df
```

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 Michae 674\nLau
1	79248.642455	6.002900	6.730821	3.09	40173.072174	1.505891e+06	188 Johr Suite Kath
2	61287.067179	5.865890	8.512727	5.13	36882.159400	1.058988e+06	912 Stravenue\nD \
3	63345.240046	7.188236	5.586729	3.26	34310.242831	1.260617e+06	USS Barnet
4	59982.197226	5.040555	7.839388	4.23	26354.109472	6.309435e+05	USNS Raym
...	...	...	...	...	...	...	
4995	60567.944140	7.830362	6.137356	3.46	22837.361035	1.060194e+06	USNS Willi AP 3
4996	78491.275435	6.999135	6.576763	4.02	25616.115489	1.482618e+06	PSC 8489\nAPO
4997	63390.686886	7.250591	4.805081	2.13	33266.145490	1.030730e+06	4215 Tra Suite 076\nJ
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 Geo Apt. 509\n

5000 rows × 7 columns

In [3]:

```
df.head()
```

Out[3]:

	Avg. Area Income	Avg. Area House Age	Avg. Area Number of Rooms	Avg. Area Number of Bedrooms	Area Population	Price	A
0	79545.458574	5.682861	7.009188	4.09	23086.800503	1.059034e+06	208 Michael Fe 674\nLaurabu
1	79248.642455	6.002900	6.730821	3.09	40173.072174	1.505891e+06	188 Johnsor Suite 079 Kathleer
2	61287.067179	5.865890	8.512727	5.13	36882.159400	1.058988e+06	9127 Eli Stravenue\nDani WI 0
3	63345.240046	7.188236	5.586729	3.26	34310.242831	1.260617e+06	USS Barnett\nF
4	59982.197226	5.040555	7.839388	4.23	26354.109472	6.309435e+05	USNS Raymonc AE

In [4]:

```
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 [5]:

```
df.describe()
```

Out[5]:

	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 [6]:

```
df.columns
```

Out[6]:

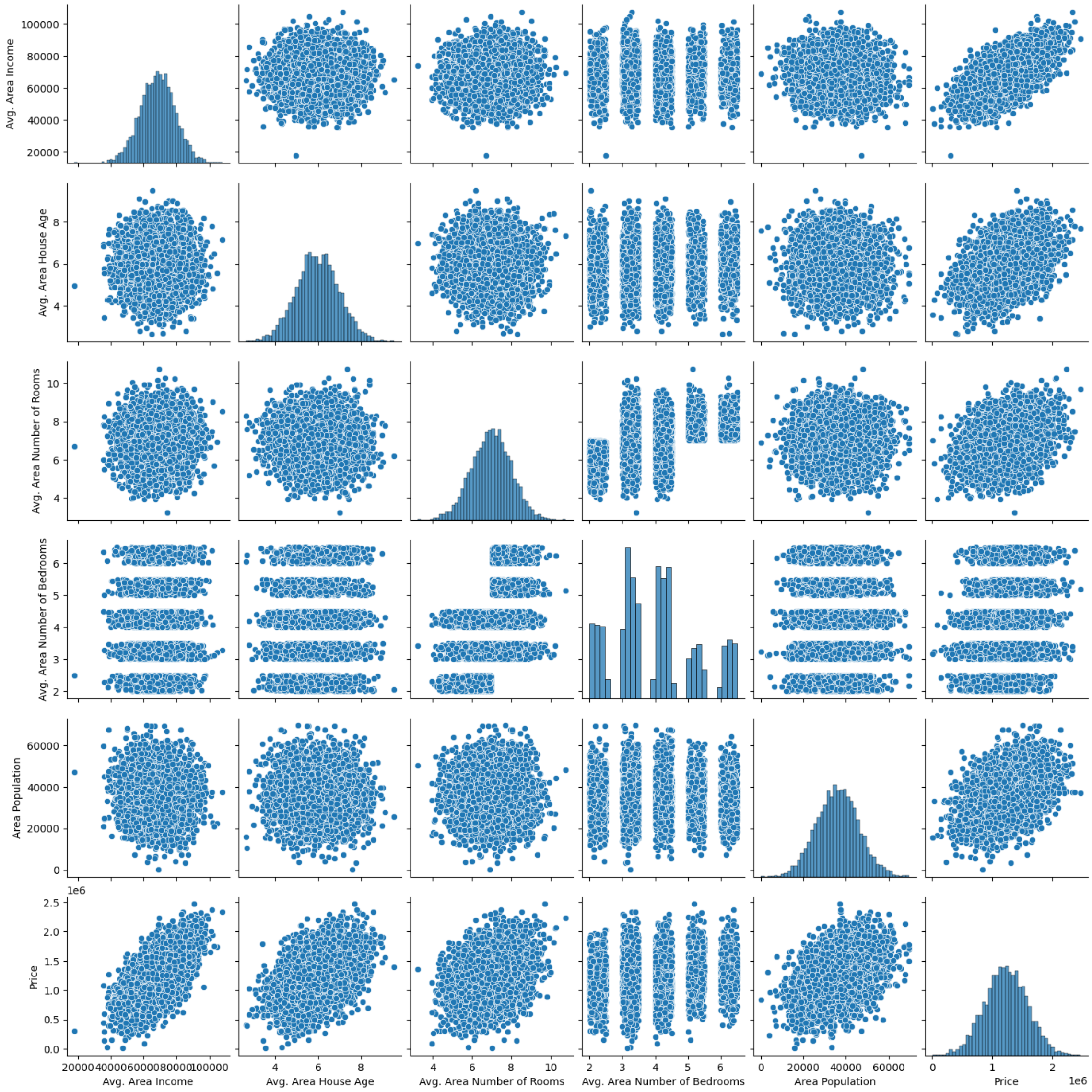
```
Index(['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of Roo
ms',
       'Avg. Area Number of Bedrooms', 'Area Population', 'Price', 'Addres
s'],
      dtype='object')
```

In [7]:

```
sns.pairplot(df)
```

Out[7]:

```
<seaborn.axisgrid.PairGrid at 0x239ab9ee890>
```

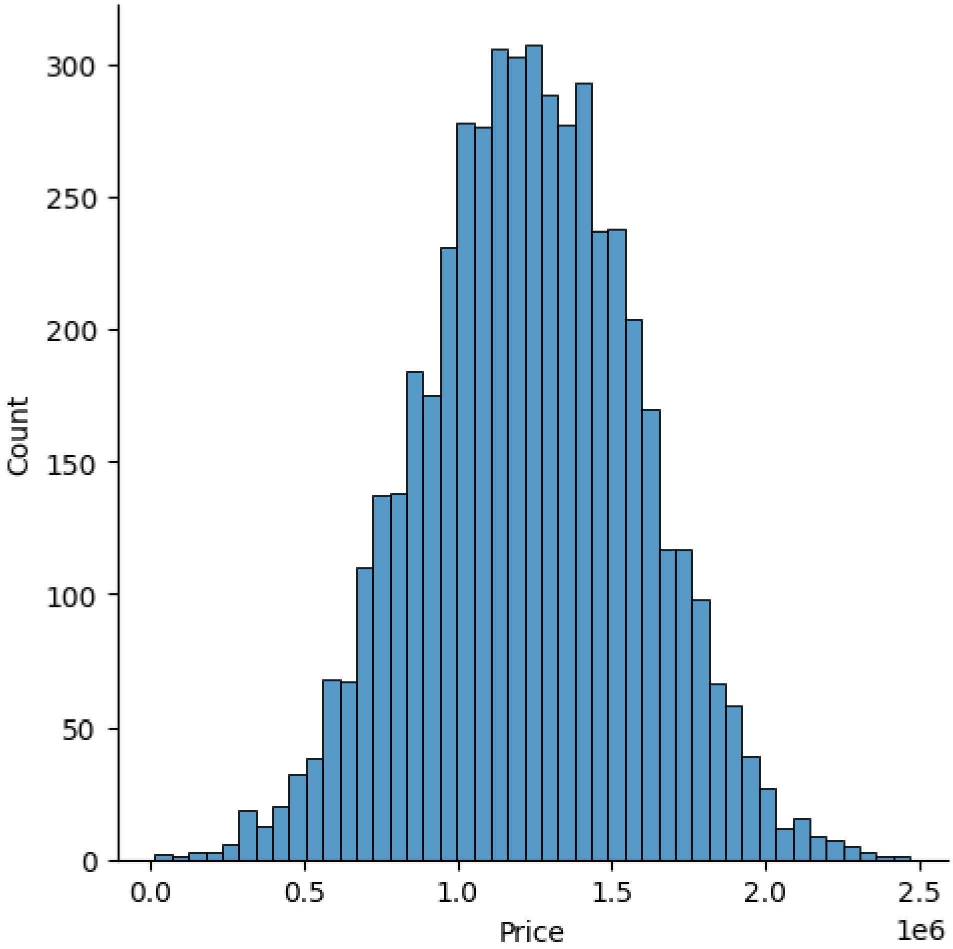


In [8]:

```
sns.displot(df['Price'])
```

Out[8]:

```
<seaborn.axisgrid.FacetGrid at 0x239aeff3e90>
```

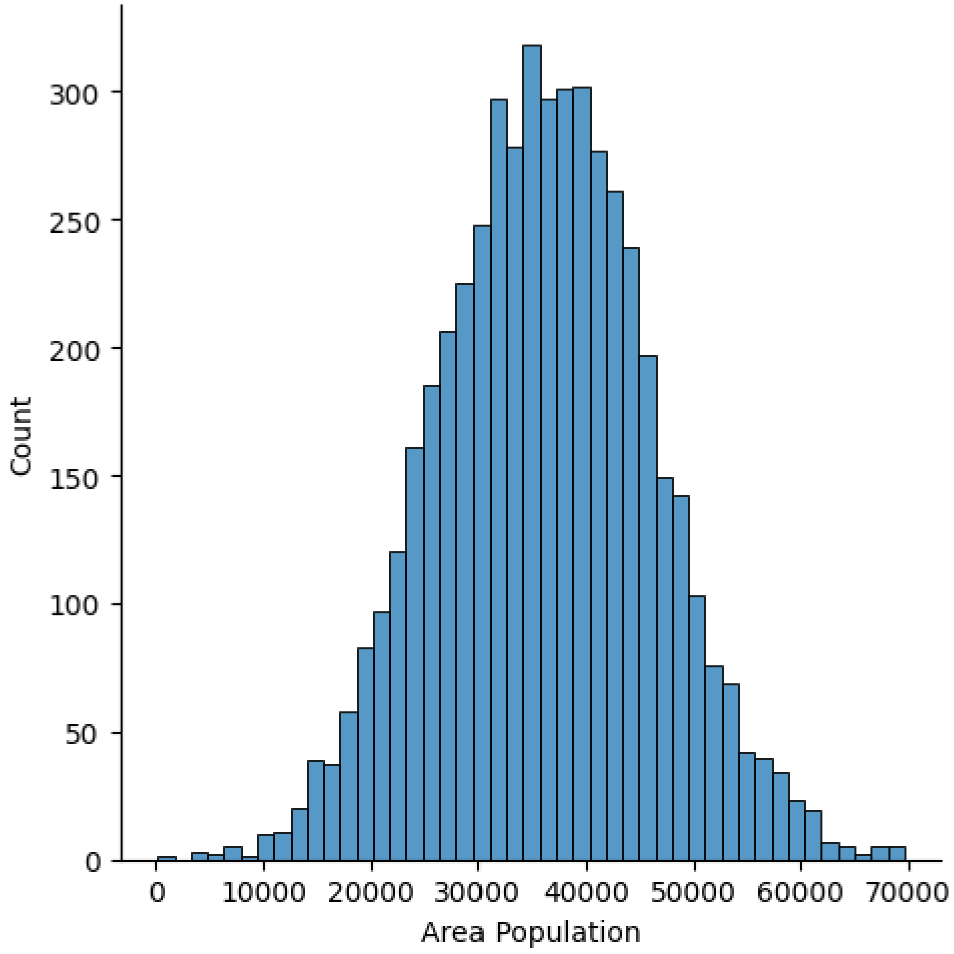


In [9]:

```
sns.displot(df['Area Population'])
```

Out[9]:

```
<seaborn.axisgrid.FacetGrid at 0x239af24e150>
```



In [10]:

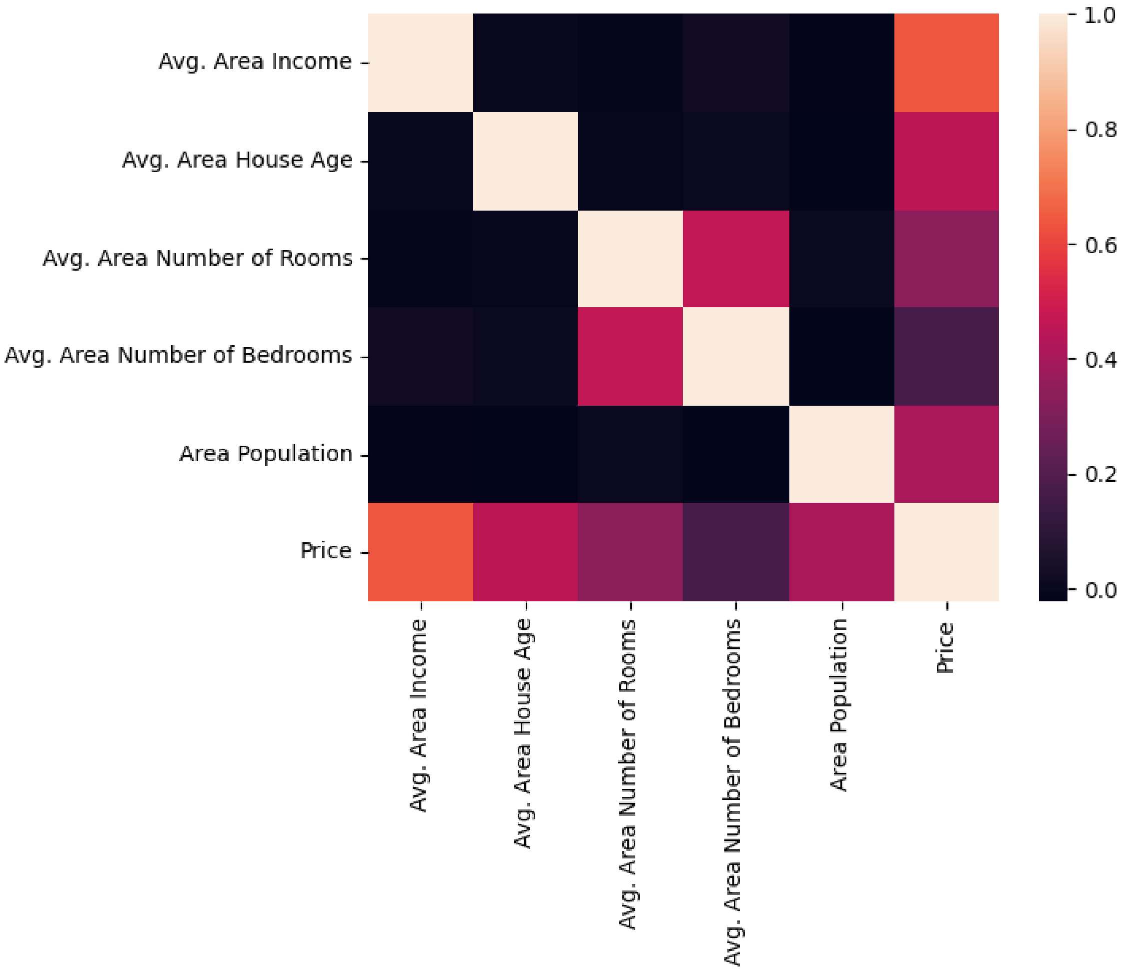
```
Housedf=df[['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of Rooms',
       'Avg. Area Number of Bedrooms', 'Area Population', 'Price']]
```

In [11]:

```
sns.heatmap(Housedf.corr())
```

Out[11]:

```
<Axes: >
```



In [12]:

```
X=Housedf[['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of Rooms',
       'Avg. Area Number of Bedrooms', 'Area Population']]
y=df['Price']
```

In [13]:

```
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,random_state=101)
```

In [14]:

```
from sklearn.linear_model import LinearRegression
regr=LinearRegression()
regr.fit(X_train,y_train)
print(regr.intercept_)
```

```
-2641372.6673006266
```

In [15]:

```
coeff_df=pd.DataFrame(regr.coef_,X.columns,columns=['coefficient'])
coeff_df
```

Out[15]:

	coefficient
Avg. Area Income	21.617635
Avg. Area House Age	165221.119872
Avg. Area Number of Rooms	121405.376596
Avg. Area Number of Bedrooms	1318.718783
Area Population	15.225196

In [16]:

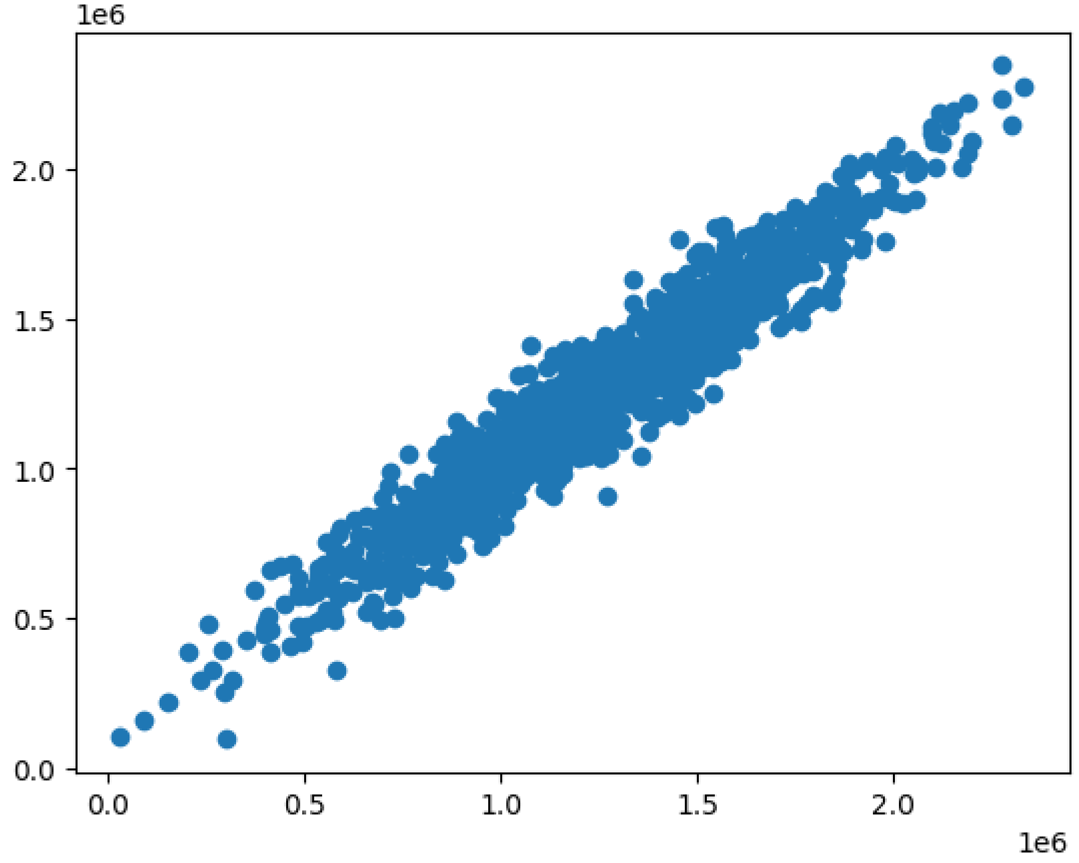
```
predictions=regr.predict(X_test)
```

In [17]:

```
plt.scatter(y_test,predictions)
```

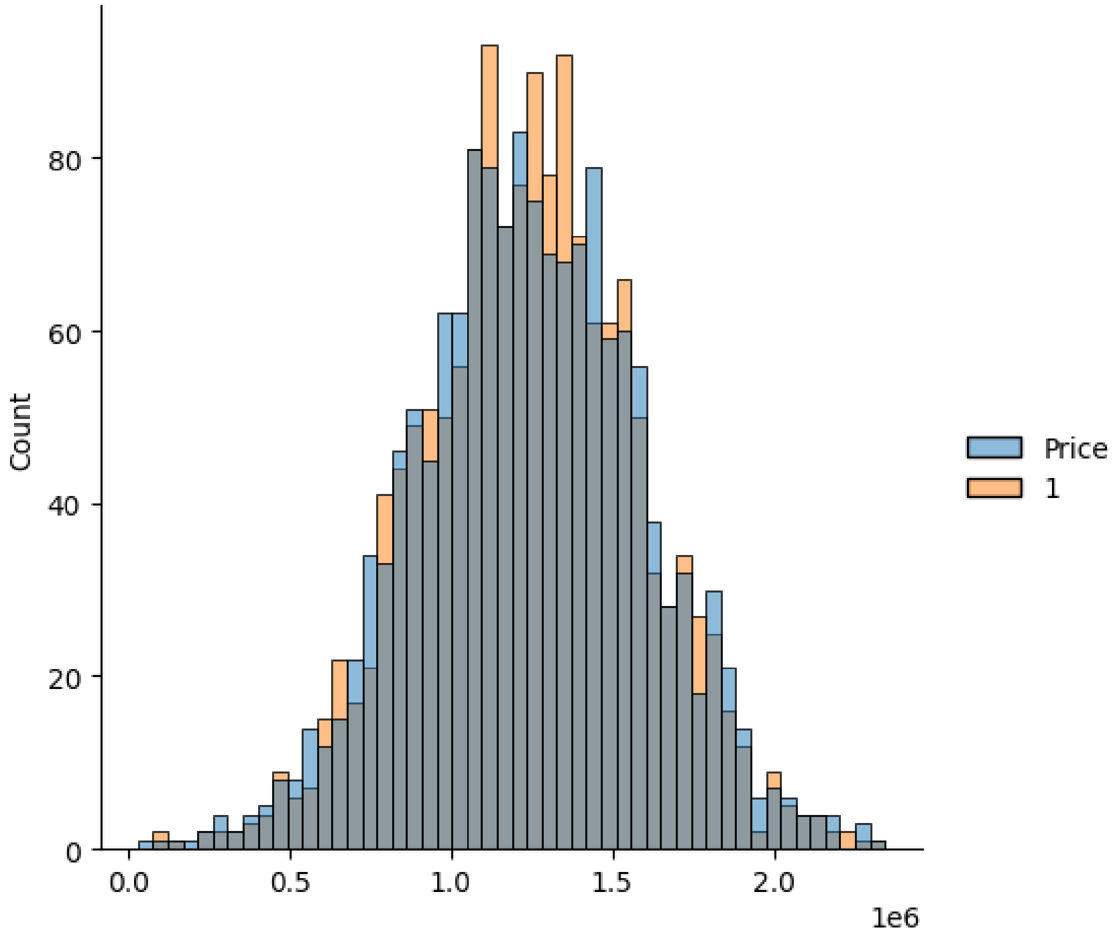
Out[17]:

```
<matplotlib.collections.PathCollection at 0x239b178b010>
```



In [18]:

```
sns.displot((y_test,predictions),bins=50);#with semicolon
```



In [19]:

```
from sklearn import metrics
print('MAE:',metrics.mean_absolute_error(y_test,predictions))
print('MSE:',metrics.mean_squared_error(y_test,predictions))
print('RMSE:',np.sqrt(metrics.mean_squared_error(y_test,predictions)))
```

```
MAE: 81257.5579585557
MSE: 10169125565.89724
RMSE: 100842.08231634866
```

In [20]:

```
#accuracy
regr=LinearRegression()
regr.fit(X_train,y_train)
regr.fit(X_train,y_train)
print(regr.score(X_test,y_test))
```

```
0.9185060945363651
```

In [21]:

```
df.fillna(method='ffill',inplace=True)
```

In [22]:

```
x=np.array(df['Avg. Area Income']).reshape(-1,1)
y=np.array(df['Price']).reshape(-1,1)
df.dropna(inplace=True)
```

In [23]:

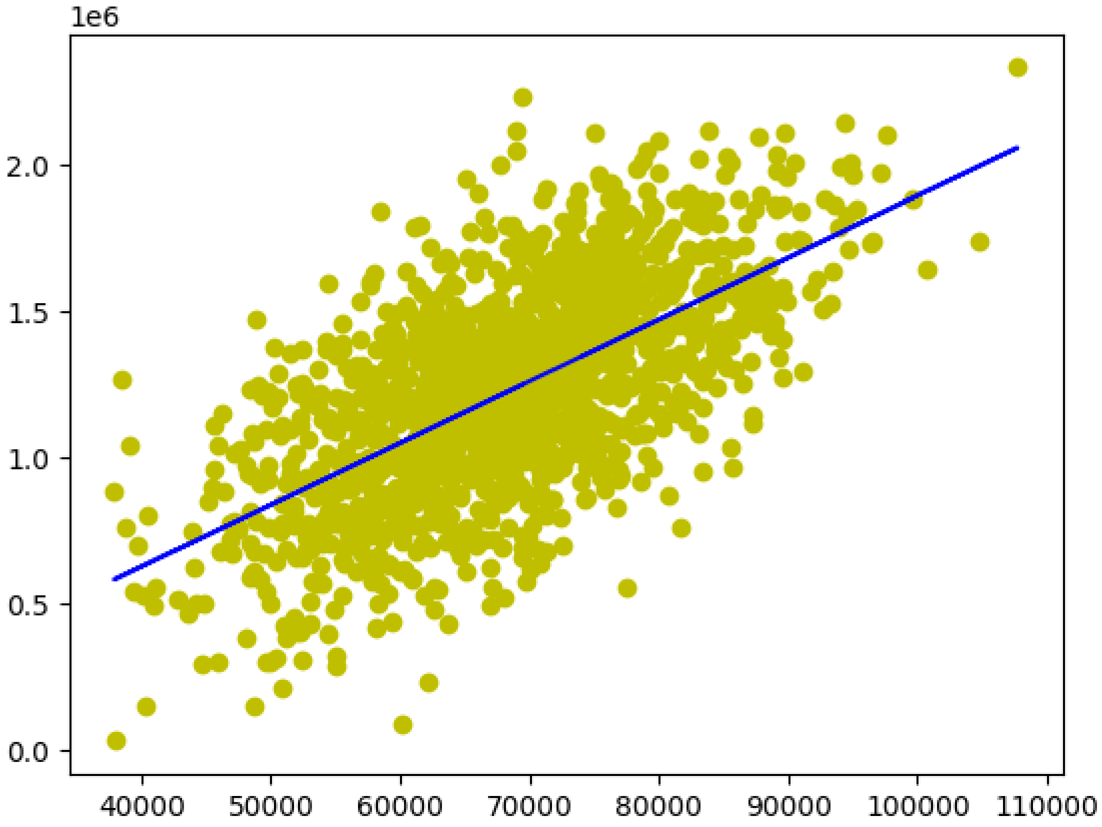
```
X_train,X_test,y_train,y_test=train_test_split(x,y,test_size=0.3)
regr.fit(X_train,y_train)
regr.fit(X_train,y_train)
```

Out[23]:

```
▾ LinearRegression
LinearRegression()
```

In [25]:

```
y_pred=regr.predict(X_test)
plt.scatter(X_test,y_test,color='y')
plt.plot(X_test,y_pred,color='b')
plt.show()
```



In [ ]:

```
```