In [1]:
```
import numpy as np
import pandas as pd
from sklearn.model_selection import train_test_split
from matplotlib import pyplot as plt
```

In [2]:
```
df=pd.read_csv(r"C:\Users\Sushma sree\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	Ad
0	79545.458574	5.682861	7.009188	4.09	23086.800503	1.059034e+06	208 Michael Fer 674\nLaurabu
1	79248.642455	6.002900	6.730821	3.09	40173.072174	1.505891e+06	188 Johnson Suite 079 Kathleer
2	61287.067179	5.865890	8.512727	5.13	36882.159400	1.058988e+06	9127 Eli Stravenue\nDanie 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 Raymond AE
...	...	...	...	...	...	...	
4995	60567.944140	7.830362	6.137356	3.46	22837.361035	1.060194e+06	USNS Williams AP 3015
4996	78491.275435	6.999135	6.576763	4.02	25616.115489	1.482618e+06	PSC 925 8489\nAPO AA
4997	63390.686886	7.250591	4.805081	2.13	33266.145490	1.030730e+06	4215 Tracy C Suite 076\nJoshu V
4998	68001.331235	5.534388	7.130144	5.44	42625.620156	1.198657e+06	USS Wallace\nF
4999	65510.581804	5.992305	6.792336	4.07	46501.283803	1.298950e+06	37778 George I Apt. 509\nEas

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	Addre
0	79545.458574	5.682861	7.009188	4.09	23086.800503	1.059034e+06	208 Michael Ferry A 674\nLaurabury, I 370
1	79248.642455	6.002900	6.730821	3.09	40173.072174	1.505891e+06	188 Johnson Vie Suite 079\nLa Kathleen, C/
2	61287.067179	5.865890	8.512727	5.13	36882.159400	1.058988e+06	9127 Elizab Stravenue\nDanieltov WI 0648
3	63345.240046	7.188236	5.586729	3.26	34310.242831	1.260617e+06	USS Barnett\nFPO 448
4	59982.197226	5.040555	7.839388	4.23	26354.109472	6.309435e+05	USNS Raymond\nFI AE 093

In [4]:
```
df.describe()
```

Out[4]:

	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

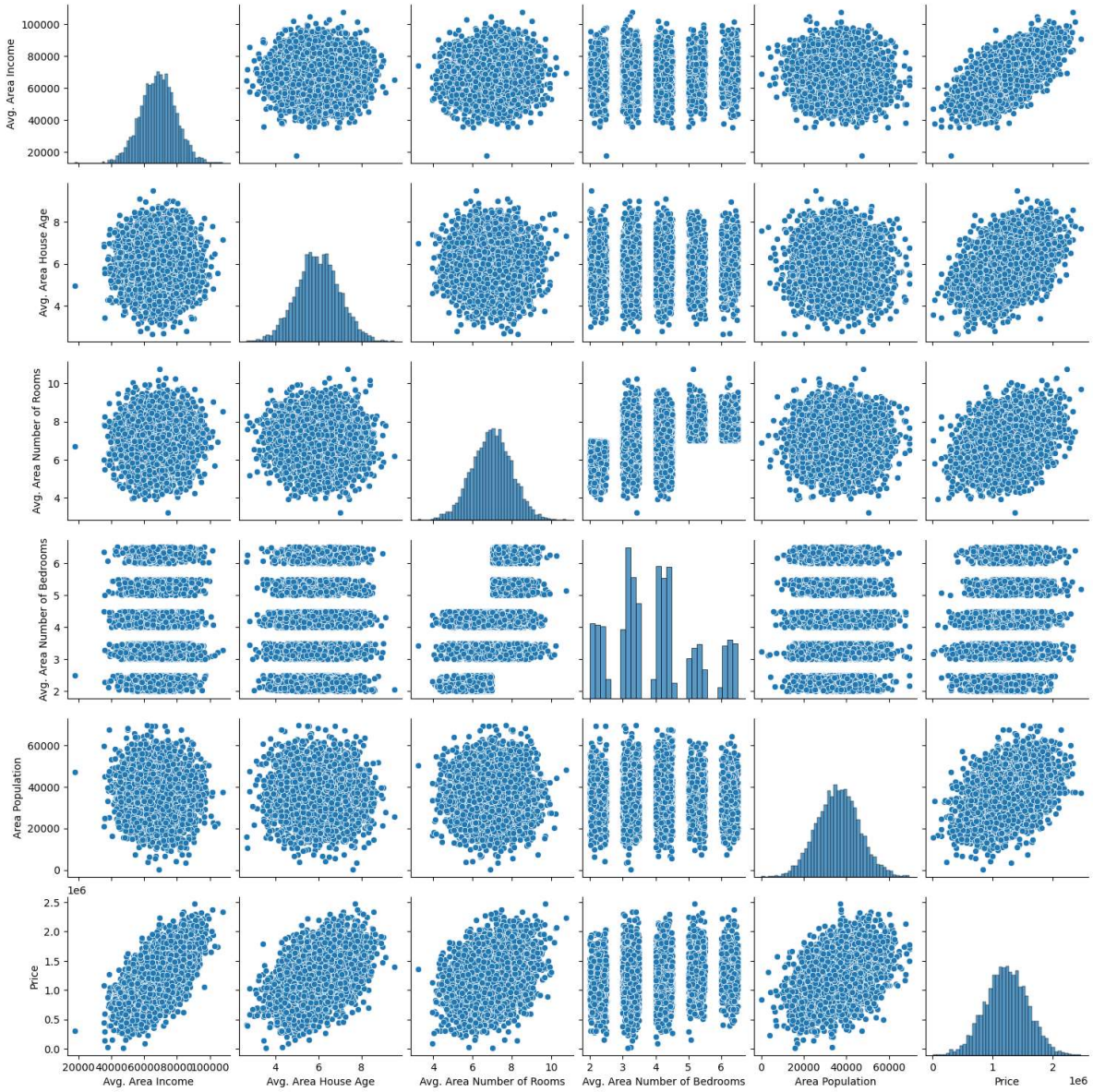
In [5]:
```
df.info()
```

```
<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 [6]:
```
import seaborn as sns
```

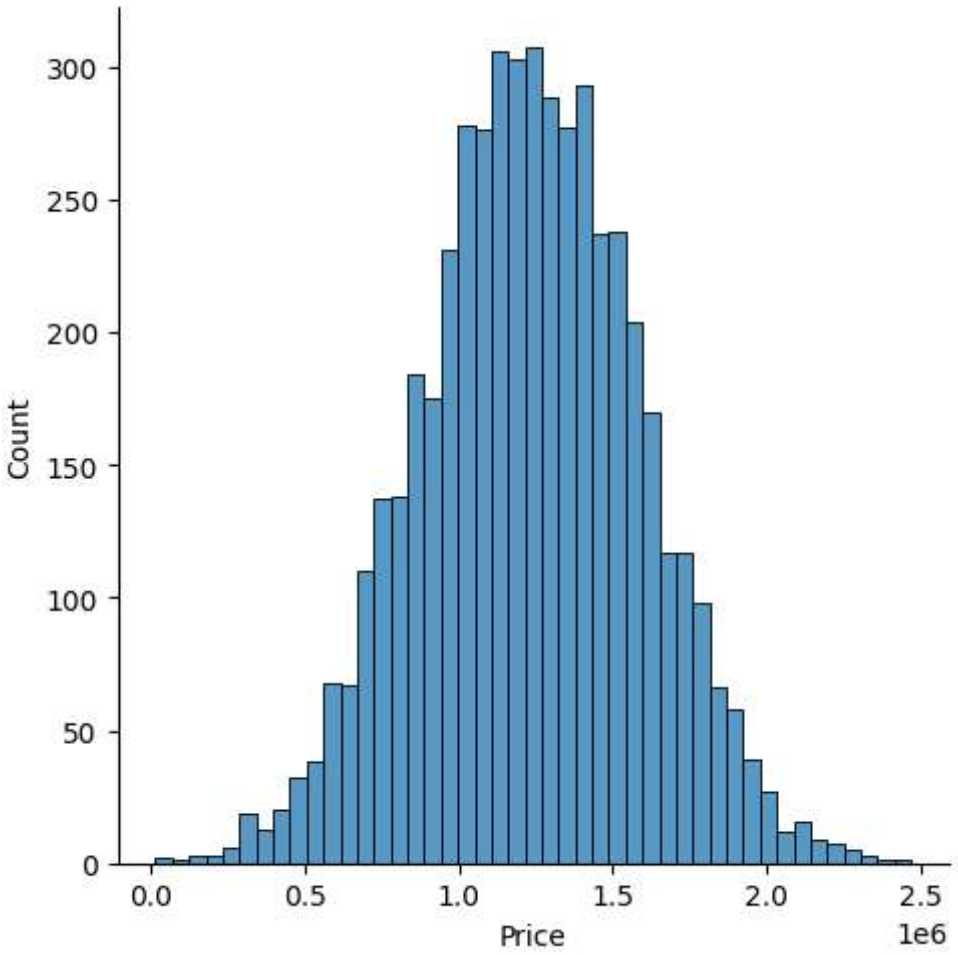
In [7]:
```
sns.pairplot(df)
```

Out[7]:
```
<seaborn.axisgrid.PairGrid at 0x1feb38d81c0>
```



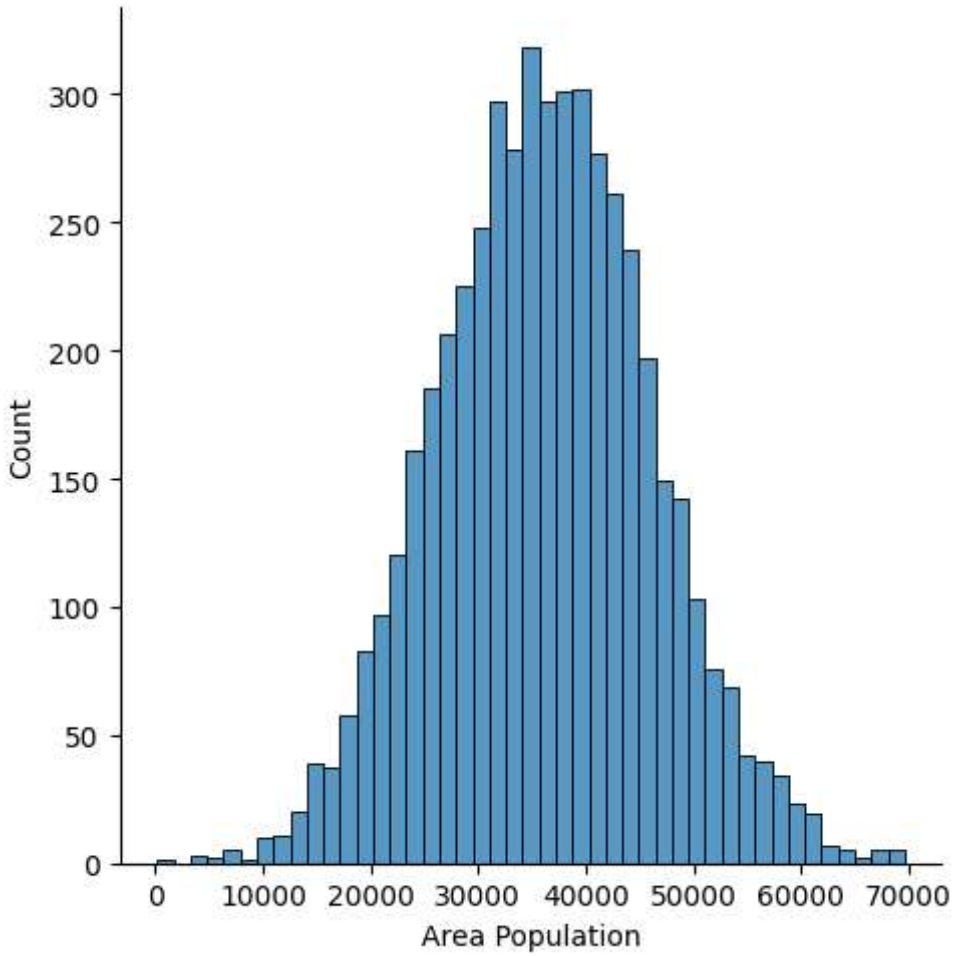
In [8]:
```
sns.displot(df['Price'])
```

Out[8]:
```
<seaborn.axisgrid.FacetGrid at 0x1feb8500130>
```



In [9]:
```
sns.displot(df['Area Population'])
```

Out[9]:
```
<seaborn.axisgrid.FacetGrid at 0x1fe821b2980>
```



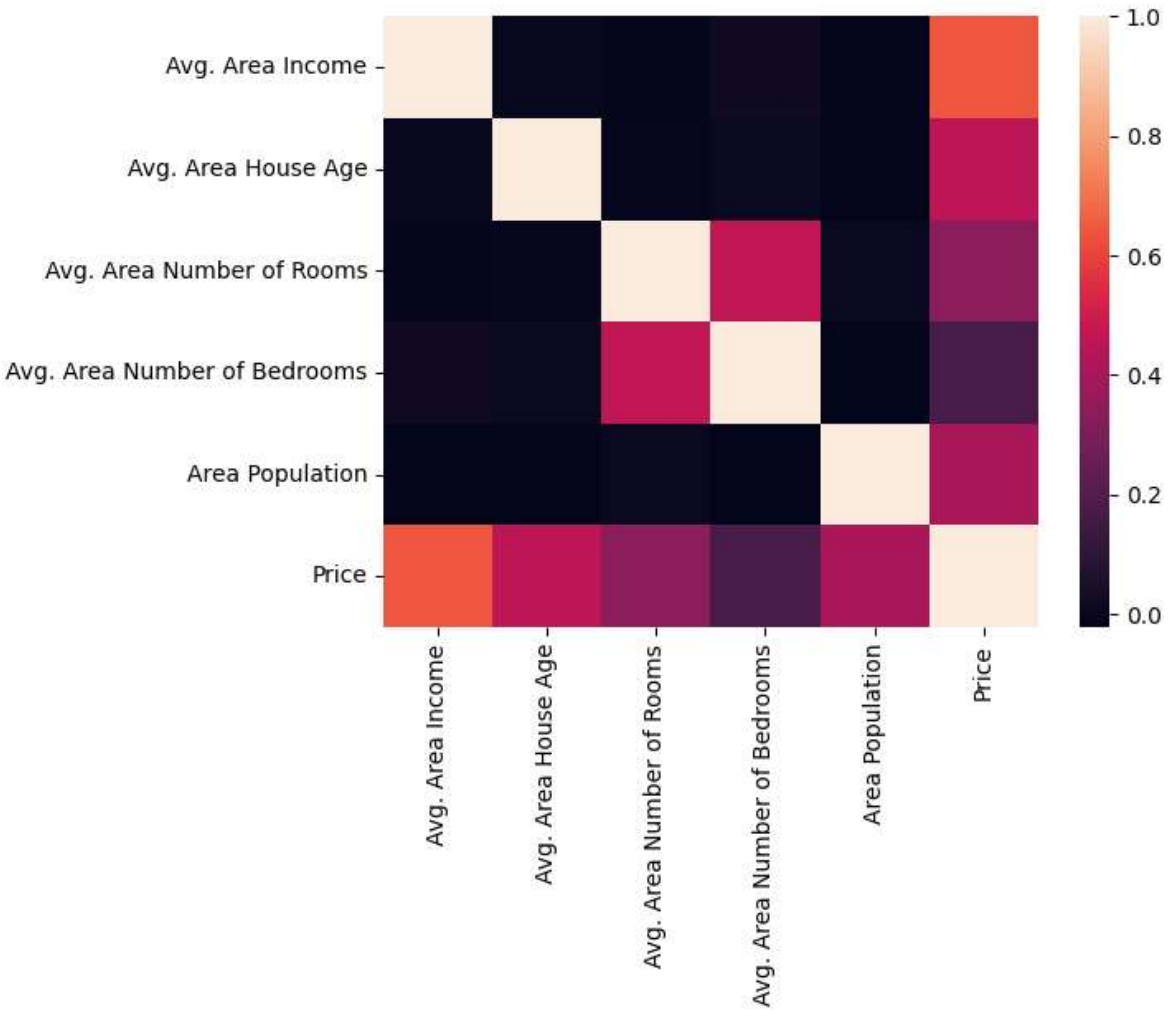
In [10]:
```
df.columns
```

Out[10]:
```
Index(['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of Room
s',
       'Avg. Area Number of Bedrooms', 'Area Population', 'Price', 'Addres
s'],
      dtype='object')
```

In [14]:
```
Housedf=df[['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of Ro
       'Avg. Area Number of Bedrooms', 'Area Population', 'Price']]
```

In [15]:
```
sns.heatmap(Housedf.corr())
```

Out[15]: <Axes: >



In [16]:
```
x=Housedf[['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of Roo
       'Avg. Area Number of Bedrooms', 'Area Population']]
y=df['Price']
```

In [18]:
```
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.2)
```

In [21]:
```
from sklearn.linear_model import LinearRegression
lr=LinearRegression()
```

In [22]:
```
lr.fit(x_train,y_train)
```

Out[22]: LinearRegression()

In a Jupyter environment, please rerun this cell to show the HTML representation or trust the notebook.
On GitHub, the HTML representation is unable to render, please try loading this page with nbviewer.org.

In [23]:
```
print(lr.score(x_test,y_test))
```

```
0.9198079156845083
```

In [25]:
```
print(lr.intercept_)
```

```
-2619463.218652005
```

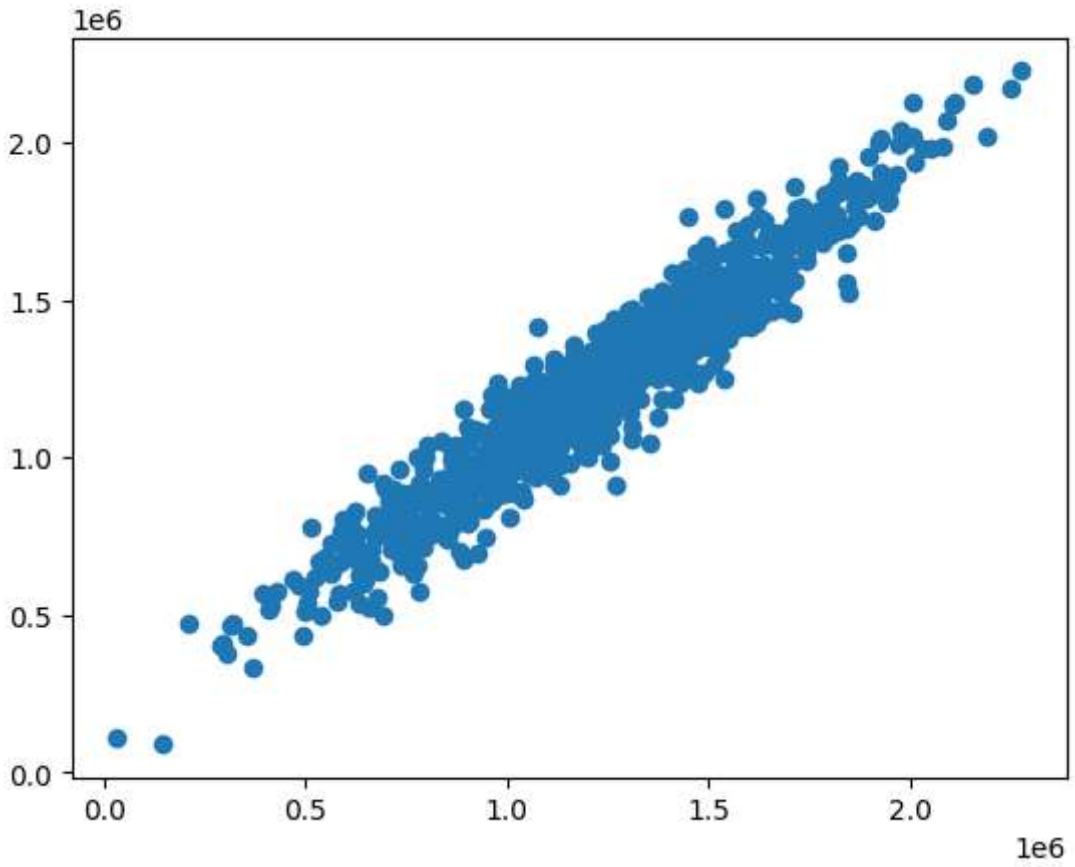
In [27]:
```
coeff_df=pd.DataFrame(lr.coef_,x.columns,columns=['Coefficient'])
coeff_df
```

Out[27]:

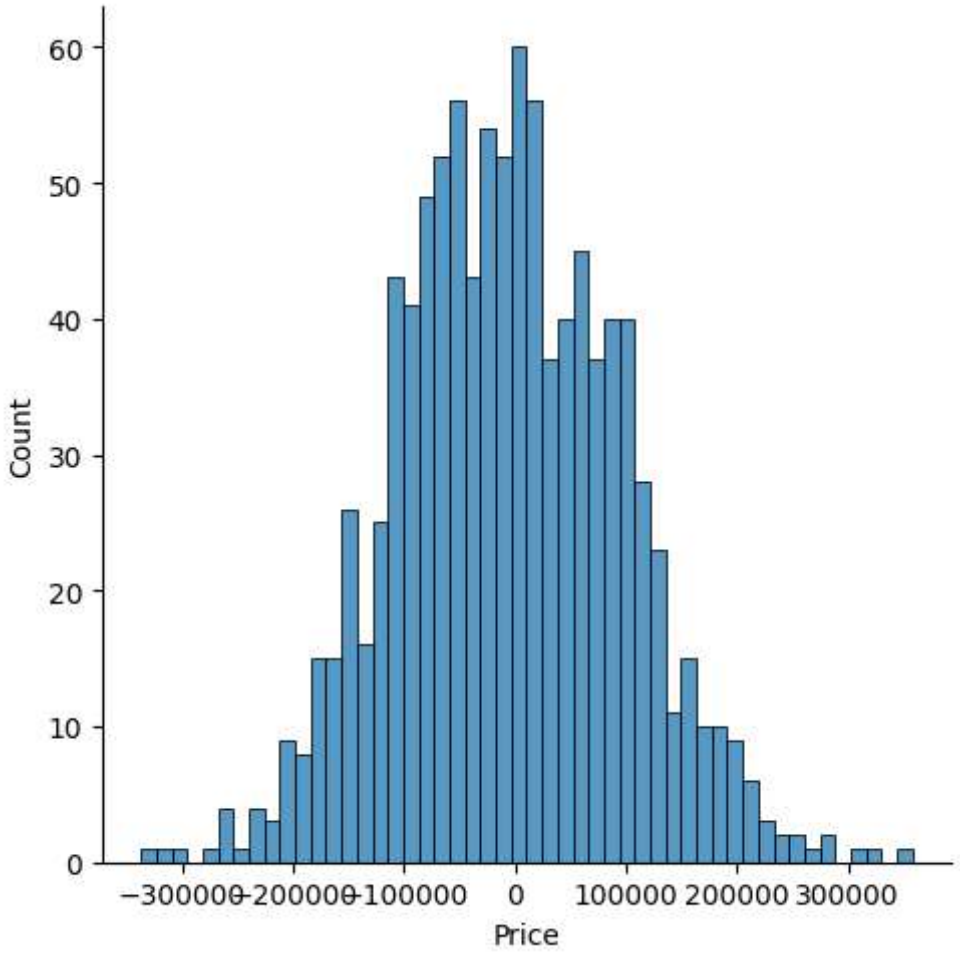
	Coefficient
Avg. Area Income	21.535275
Avg. Area House Age	164339.538813
Avg. Area Number of Rooms	120750.737272
Avg. Area Number of Bedrooms	190.849782
Area Population	15.184250

In [28]:
```
pred=lr.predict(x_test)
plt.scatter(y_test,pred)
```

Out[28]:
```
<matplotlib.collections.PathCollection at 0x1febf8b58a0>
```



In [29]:
```
sns.displot((y_test-pred),bins=50);
```



In [33]:
```
from sklearn import metrics
print('MAE:',metrics.mean_absolute_error(y_test,pred))
print('MSE:',metrics.mean_squared_error(y_test,pred))
print('RMSE:',np.sqrt(metrics.mean_squared_error(y_test,pred)))
```

```
MAE: 80948.97442328642
MSE: 10222307664.64593
RMSE: 101105.42846279783
```

In [ ]:
```

```