In [1]:

```python
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn import preprocessing,svm
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
```

In [2]:

```python
df=pd.read_csv(r"C:\Users\teppa\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	Ac
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 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 Apt. 509\nEas

5000 rows × 7 columns

In [3]:

```
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 [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.columns
```

Out[5]:

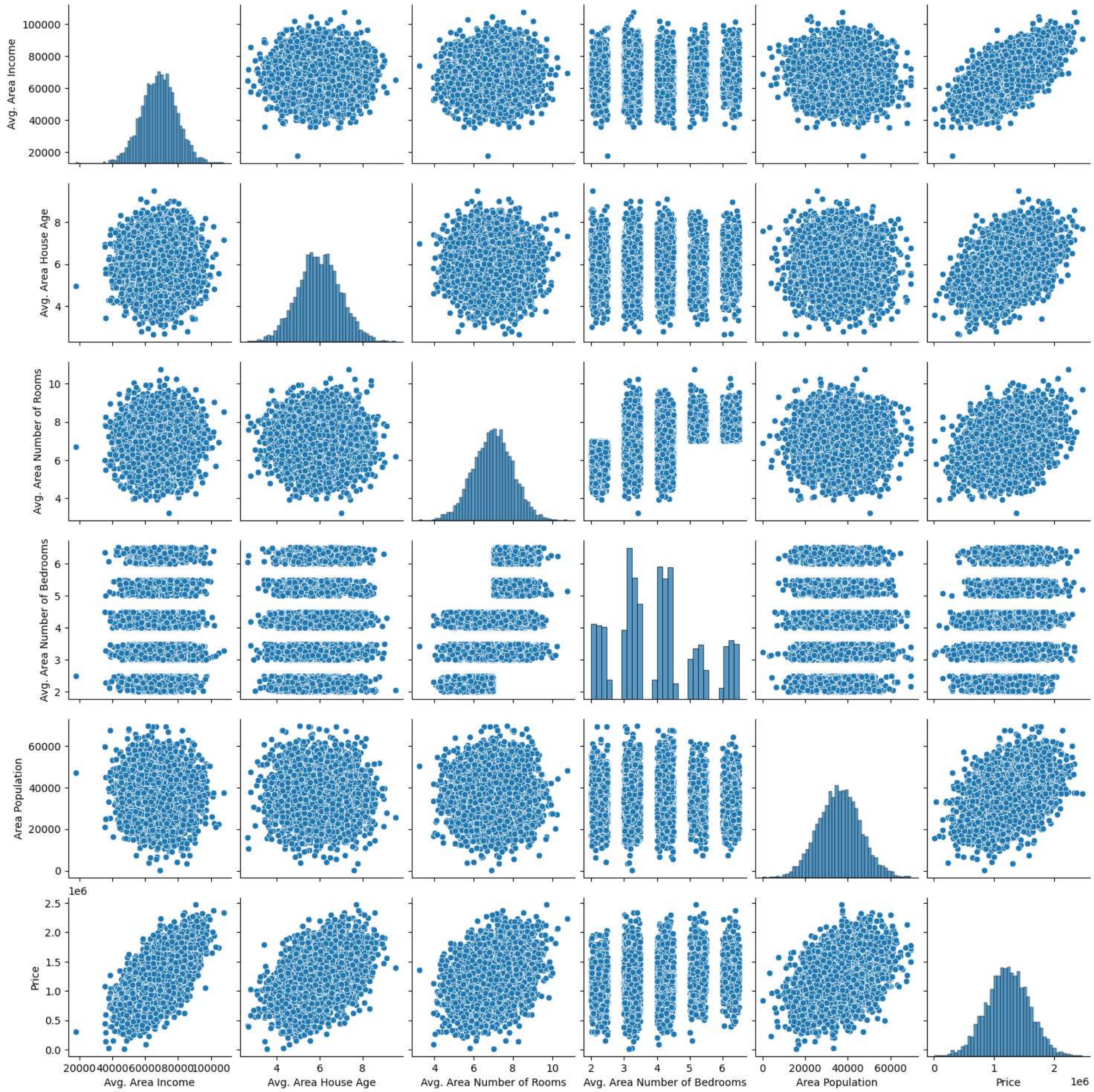
```
Index(['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number of Room
s',
       'Avg. Area Number of Bedrooms', 'Area Population', 'Price', 'Addres
s'],
      dtype='object')
```

In [6]:

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

Out[6]:

```
<seaborn.axisgrid.PairGrid at 0x14cc00eaa10>
```

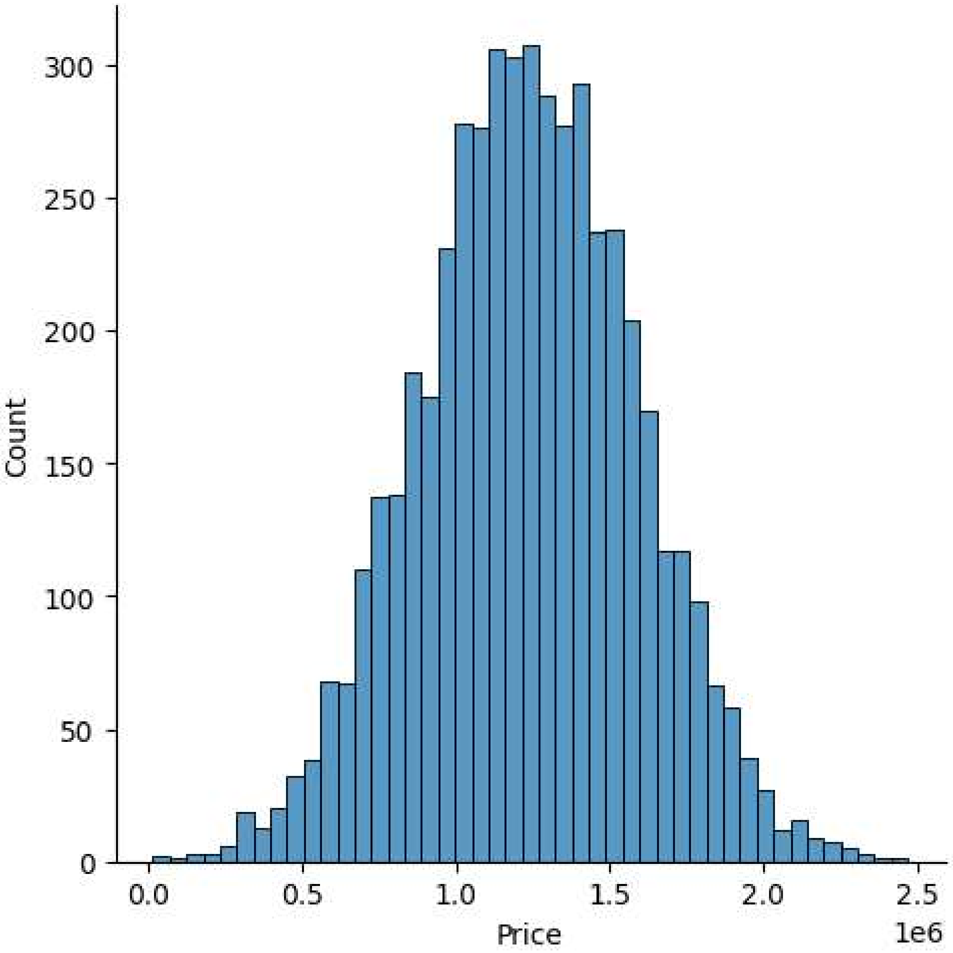


In [11]:

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

Out[11]:

```
<seaborn.axisgrid.FacetGrid at 0x14cd96e0d00>
```

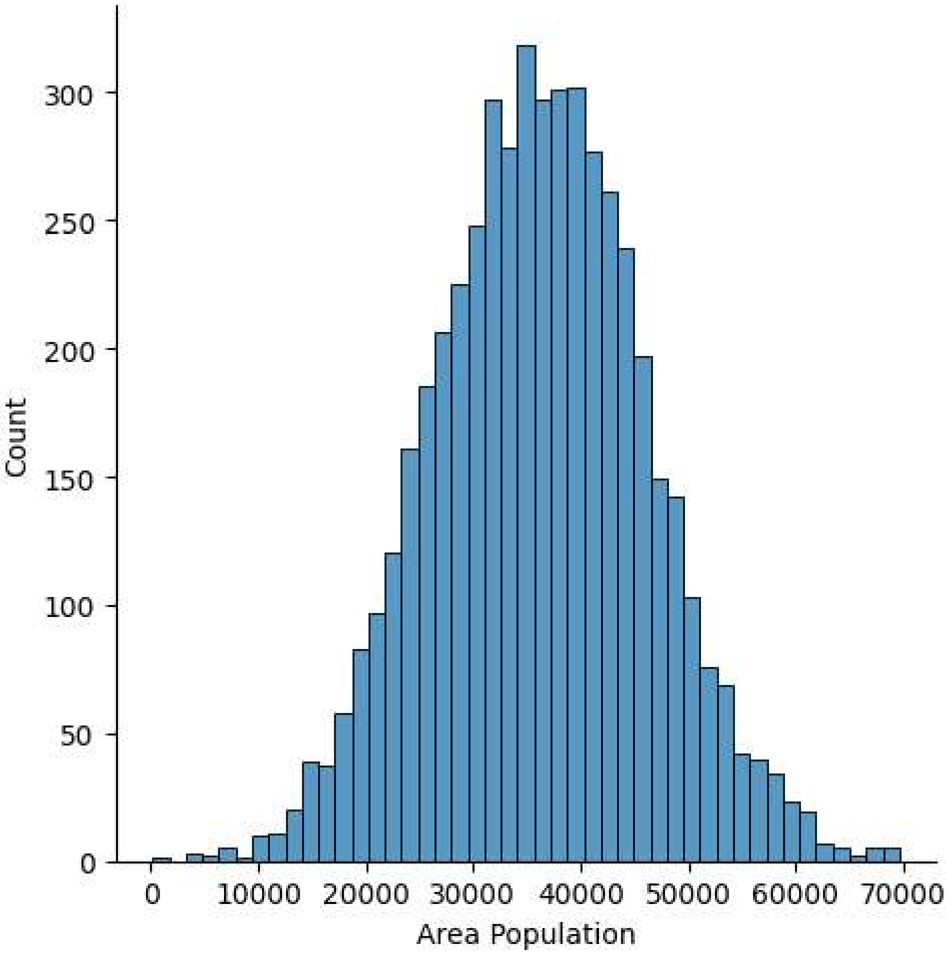


In [10]:

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

Out[10]:

```
<seaborn.axisgrid.FacetGrid at 0x14cd96c31c0>
```



In [29]:

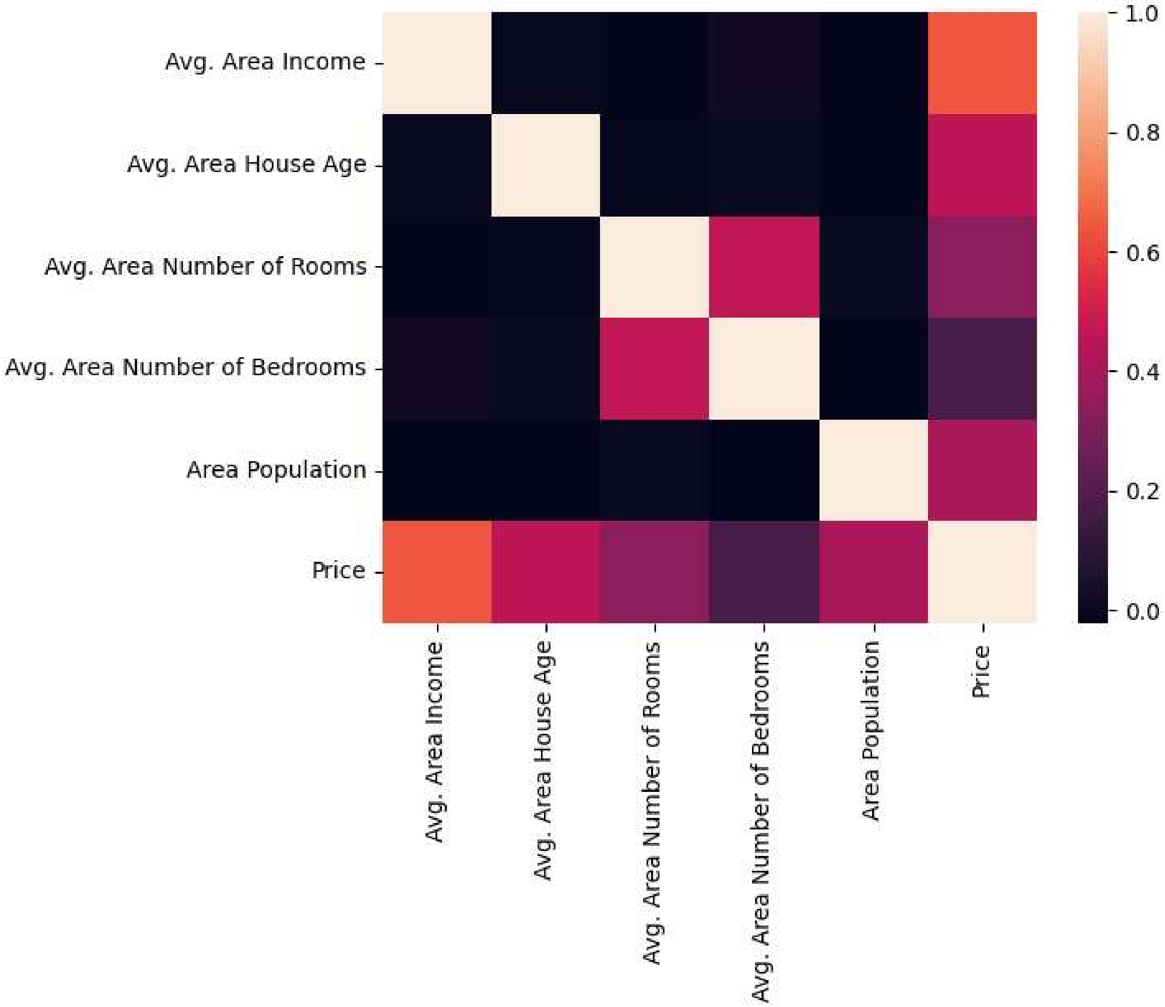
```
Housedf=df[['Avg. Area Income', 'Avg. Area House Age', 'Avg. Area Number 
       'Avg. Area Number of Bedrooms', 'Area Population', 'Price']]
```

In [30]:

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

Out[30]:

```
<Axes: >
```



In [32]:

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

In [35]:

```
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_s
```

In [36]:

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

```

Out[36]:

```
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 [37]:

```
print(lm.intercept_)
```

```
-2641372.6673014304
```

In [50]:

```
coeff_df=pd.DataFrame(lm.coef_,x.columns,columns=['coefficient'])
coeff_df
```

Out[50]:

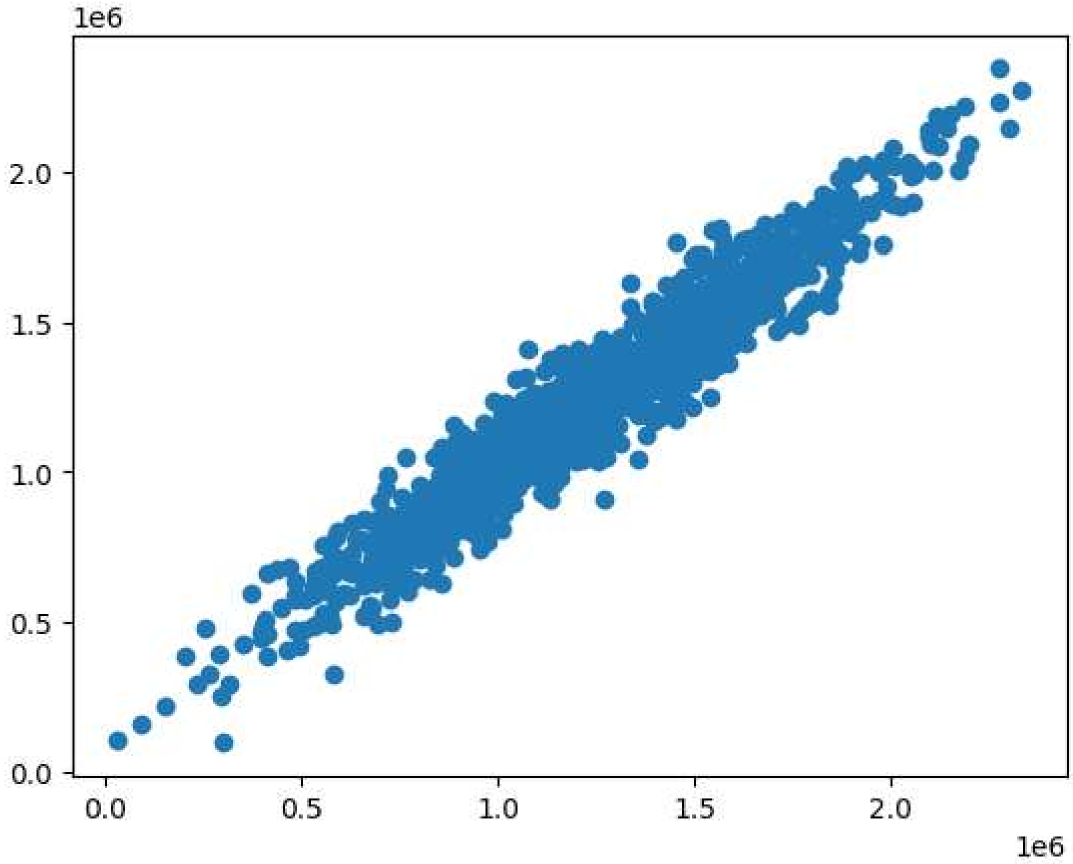
	coefficient
Avg. Area Income	21.617635
Avg. Area House Age	165221.119872
Avg. Area Number of Rooms	121405.376596
Avg. Area Number of Bedrooms	1318.718783
Area Population	15.225196

In [42]:

```
predictions=lm.predict(x_test)
plt.scatter(y_test,predictions)
```

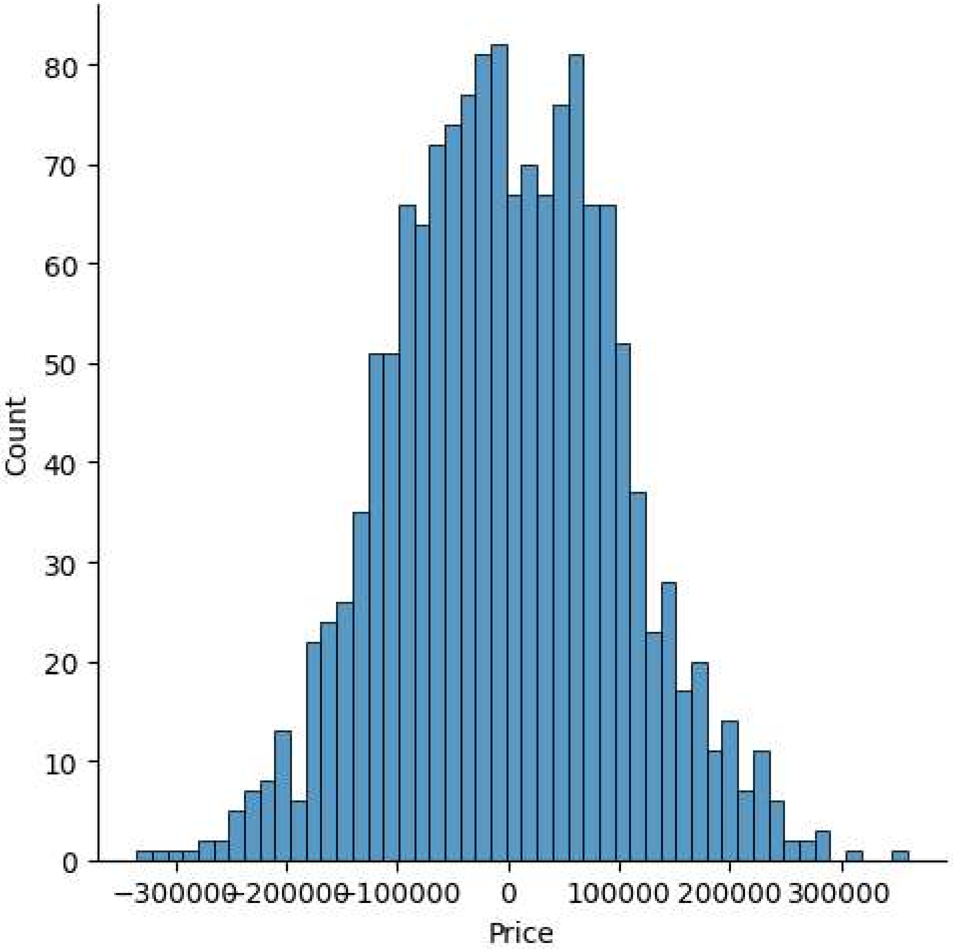
Out[42]:

```
<matplotlib.collections.PathCollection at 0x14cd9e13700>
```



In [44]:

```
sns.displot((y_test-predictions),bins=50);
```



In [46]:

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

```
MAE: 81257.55795855941
MSE: 10169125565.897606
MSE: 100842.08231635048
```

In [ ]:

```

```