In [4]:
```
# importing libraries
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt
```

In [5]:
```
df=pd.read_csv(r"C:\Users\venka\Downloads\archive (1)\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	A
0	79545.458574	5.682861	7.009188	4.09	23086.800503	1.059034e+06	208 Michael Fe 674\nLaurab
1	79248.642455	6.002900	6.730821	3.09	40173.072174	1.505891e+06	188 Johnso Suite 07 Kathlee
2	61287.067179	5.865890	8.512727	5.13	36882.159400	1.058988e+06	9127 E Stravenue\nDani WI
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 Raymon AE
...	...	...	...	...	...	...	
4995	60567.944140	7.830362	6.137356	3.46	22837.361035	1.060194e+06	USNS William AP 301
4996	78491.275435	6.999135	6.576763	4.02	25616.115489	1.482618e+06	PSC 92 8489\nAPO AA
4997	63390.686886	7.250591	4.805081	2.13	33266.145490	1.030730e+06	4215 Tracy Suite 076\nJosh
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\nEa

5000 rows × 7 columns

In [6]:

```
df.head()
```

Out[6]:

	Avg. Area Income	Avg. Area House Age	Avg. Area Number of Rooms	Avg. Area Number of Bedrooms	Area Population	Price	Addr
0	79545.458574	5.682861	7.009188	4.09	23086.800503	1.059034e+06	208 Michael Ferry A 674\nLaurabury, 370
1	79248.642455	6.002900	6.730821	3.09	40173.072174	1.505891e+06	188 Johnson Vi Suite 079\nL Kathleen, C
2	61287.067179	5.865890	8.512727	5.13	36882.159400	1.058988e+06	9127 Elizab Stravenue\nDanielto WI 0648
3	63345.240046	7.188236	5.586729	3.26	34310.242831	1.260617e+06	USS Barnett\nFPO 44
4	59982.197226	5.040555	7.839388	4.23	26354.109472	6.309435e+05	USNS Raymond\nF AE 09

In [7]:

```
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 [8]:
```
df.describe()
```

Out[8]:

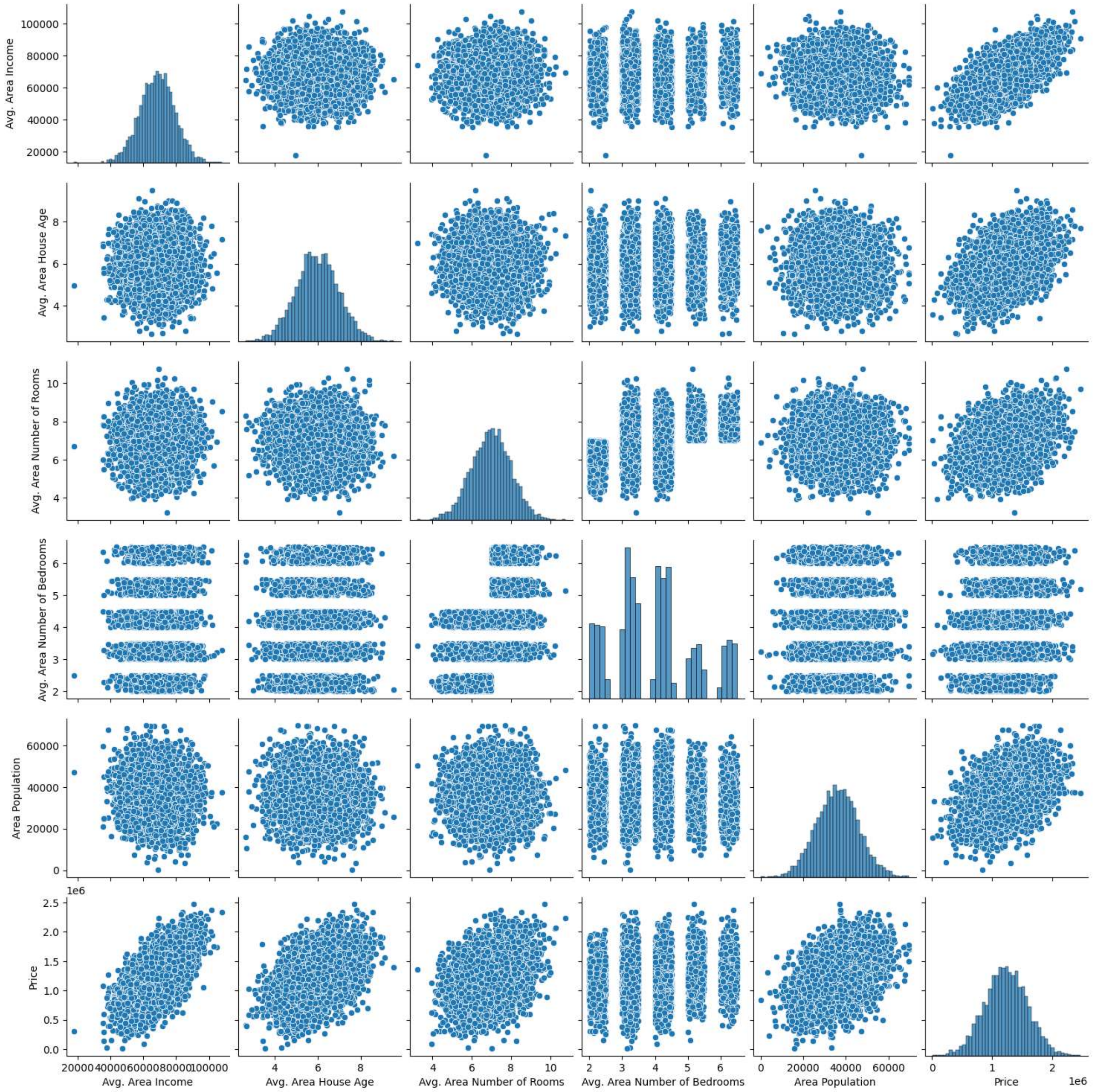
	Avg. Area Income	Avg. Area House Age	Avg. Area Number of Rooms	Avg. Area Number of Bedrooms	Area Population	Price
count	5000.000000	5000.000000	5000.000000	5000.000000	5000.000000	5.000000e+03
mean	68583.108984	5.977222	6.987792	3.981330	36163.516039	1.232073e+06
std	10657.991214	0.991456	1.005833	1.234137	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 [9]:
```
df.columns
```

Out[9]:
```
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')
```

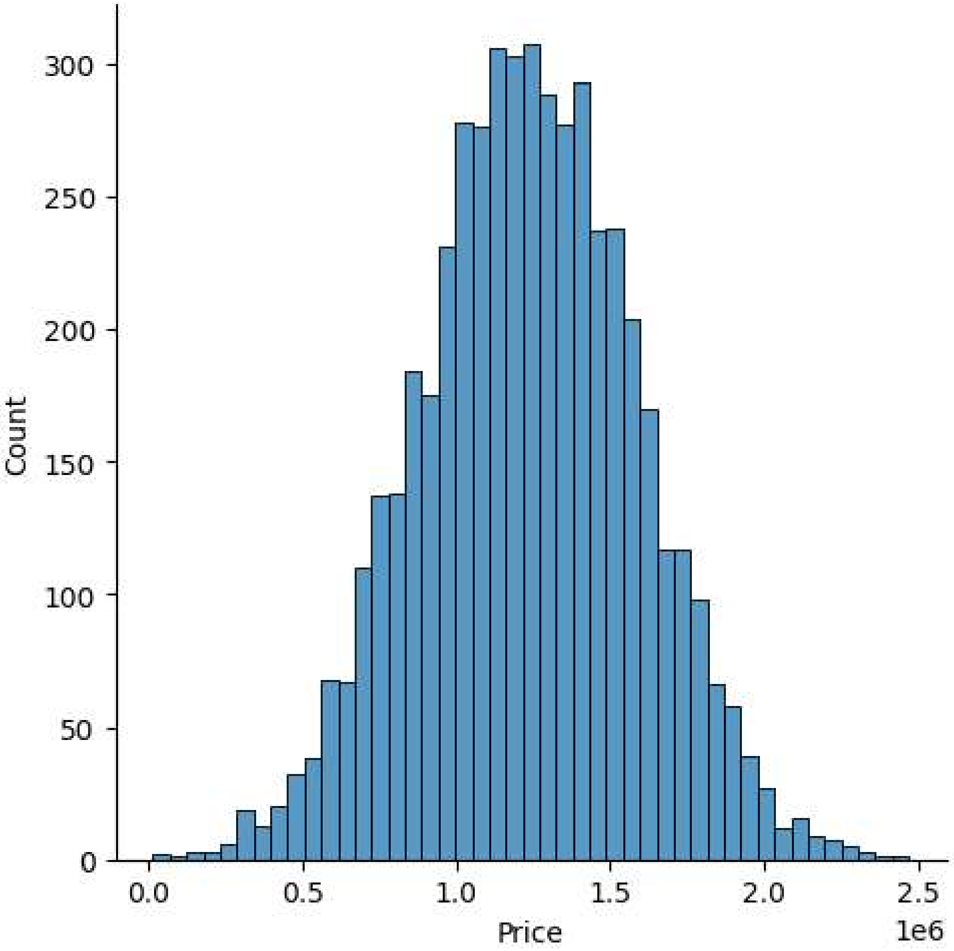
In [11]:
```
# exploration dataanalysis
sns.pairplot(df)
```

Out[11]:
```
<seaborn.axisgrid.PairGrid at 0x21ae87c3b90>
```



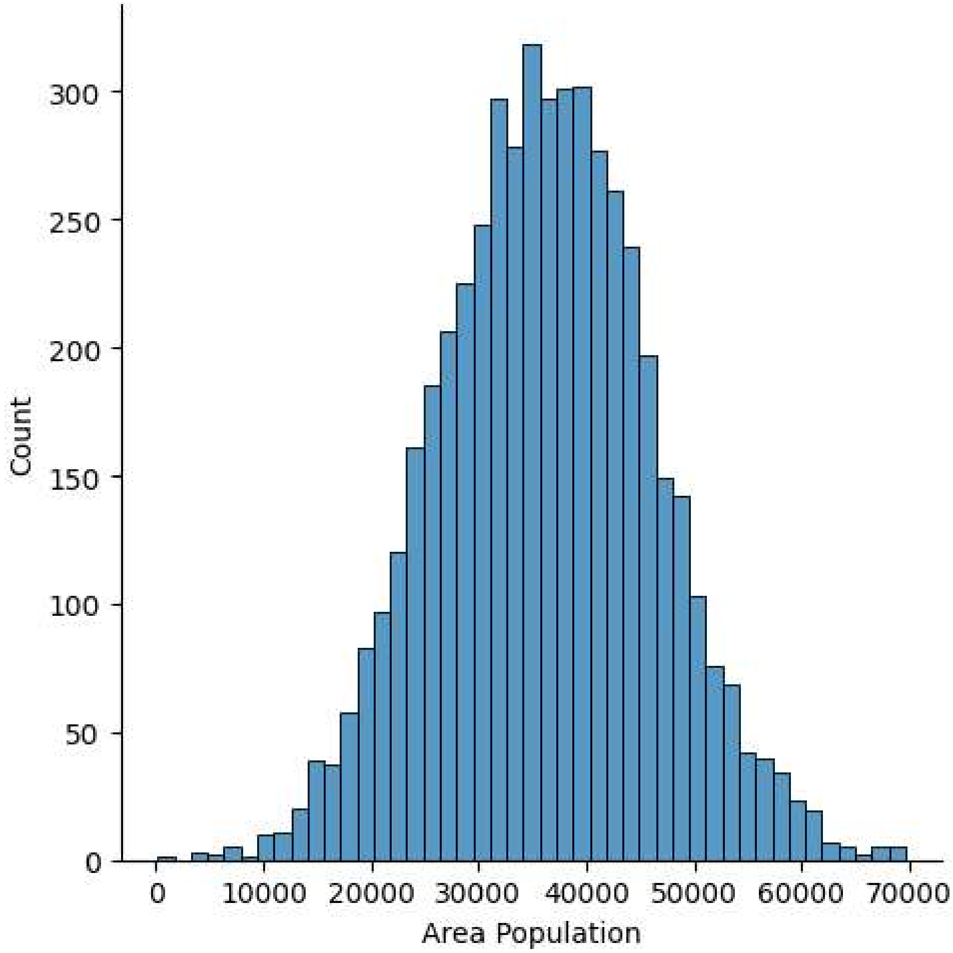
```
In [13]: sns.displot(df['Price'])

Out[13]: <seaborn.axisgrid.FacetGrid at 0x21ae89af790>
```



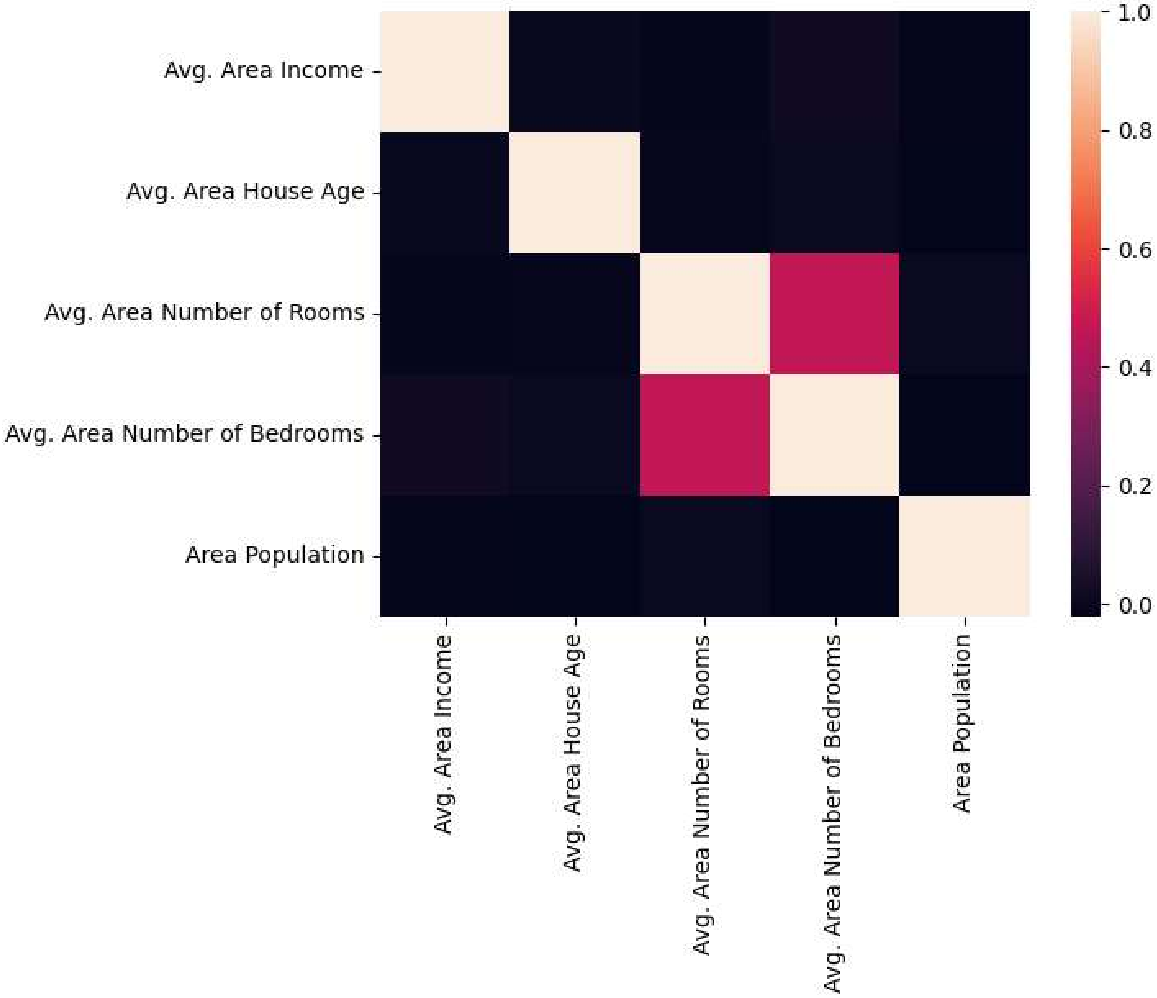
In [14]:
```
sns.displot(df['Area Population'])
```

Out[14]:
```
<seaborn.axisgrid.FacetGrid at 0x21ae2780fd0>
```



In [26]:
```
Housedf= df[['Avg. Area Income','Avg. Area House Age','Avg. Area Number of Ro
sns. heatmap(Housedf.corr())
```

Out[26]:
```
<Axes: >
```



In [31]:
```
# to train model
X=Housedf[['Avg. Area Income','Avg. Area House Age','Avg. Area Number of Room
y=df['Price']
```

In [38]:
```
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
```

In [40]:

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

Out[40]:

```
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 [41]:

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

```
-2641372.6673013885
```

In [47]:

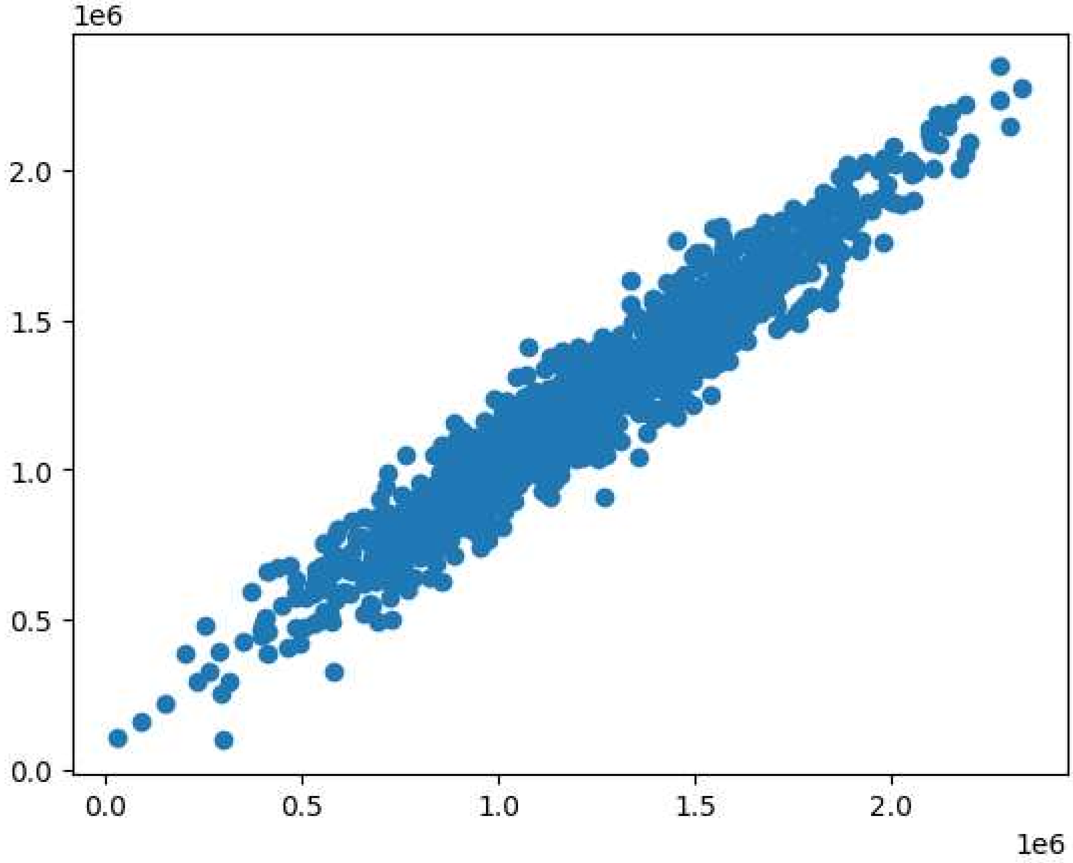
```
coeff_df=pd.DataFrame(lm.coef_,X.columns,columns=['coeffecient'])
coeff_df
```

Out[47]:

	coeffecient
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

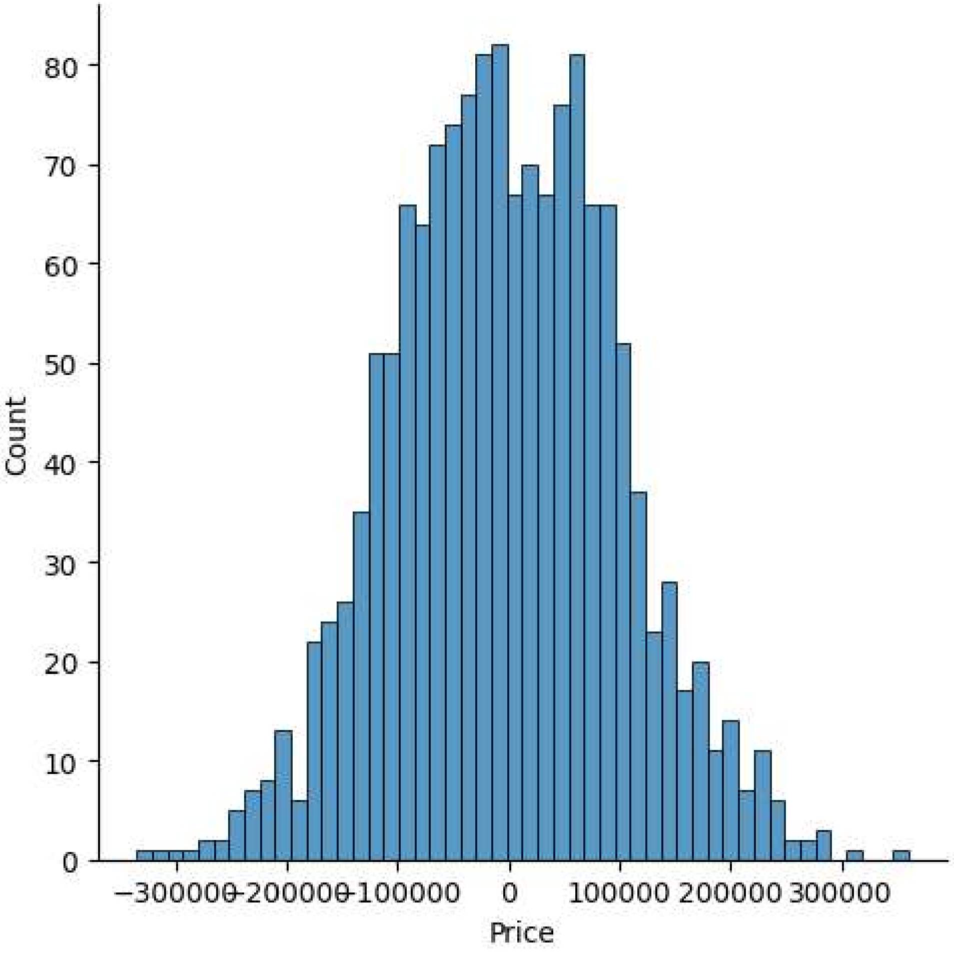
In [46]:
```
predictions=lm.predict(x_test)
plt.scatter(y_test,predictions)
```

Out[46]:
```
<matplotlib.collections.PathCollection at 0x21ae9b233d0>
```



In [48]:

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



In [49]:

```
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: 81257.55795855928
MSE: 10169125565.897568
RMSE: 100842.0823163503
```

In [ ]: