In [34]:
```
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 [36]:
```
#Step-2: Reading the Dataset
df=pd.read_csv(r"C:\Users\sneha\Downloads\data.csv")
df
```

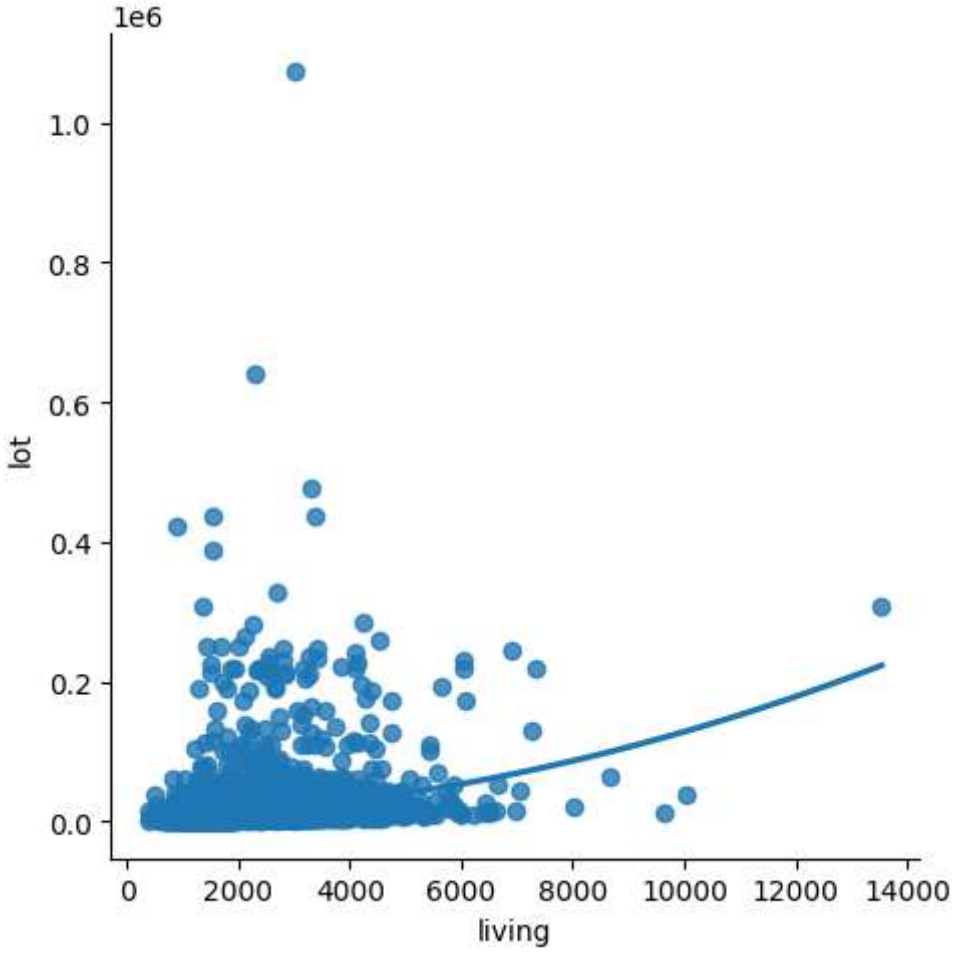
Out[36]:

edrooms	bathrooms	sqft_living	sqft_lot	floors	waterfront	view	condition	sqft_above	sqft_bas
3.0	1.50	1340	7912	1.5	0	0	3	1340	
5.0	2.50	3650	9050	2.0	0	4	5	3370	
3.0	2.00	1930	11947	1.0	0	0	4	1930	
3.0	2.25	2000	8030	1.0	0	0	4	1000	
4.0	2.50	1940	10500	1.0	0	0	4	1140	
...	...	...	...	...	...	...	...	...	
3.0	1.75	1510	6360	1.0	0	0	4	1510	
3.0	2.50	1460	7573	2.0	0	0	3	1460	
3.0	2.50	3010	7014	2.0	0	0	3	3010	
4.0	2.00	2090	6630	1.0	0	0	3	1070	
3.0	2.50	1490	8102	2.0	0	0	4	1490	

In [37]:
```
df=df[['sqft_living','sqft_lot']]
df.columns=['living','lot']
```

In [39]:
```
#Step-3: Exploring the Data Scatter - plotting the data scatter
sns.lmplot(x="living",y="lot", data = df, order = 2, ci = None)
df.describe()
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4600 entries, 0 to 4599
Data columns (total 2 columns):
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   living  4600 non-null   int64
 1   lot     4600 non-null   int64
dtypes: int64(2)
memory usage: 72.0 KB
```



In [40]:
```
#Step-4: Data cleaning - Eliminating NaN OR missing input numbers
df.fillna(method ='ffill', inplace = True)
```

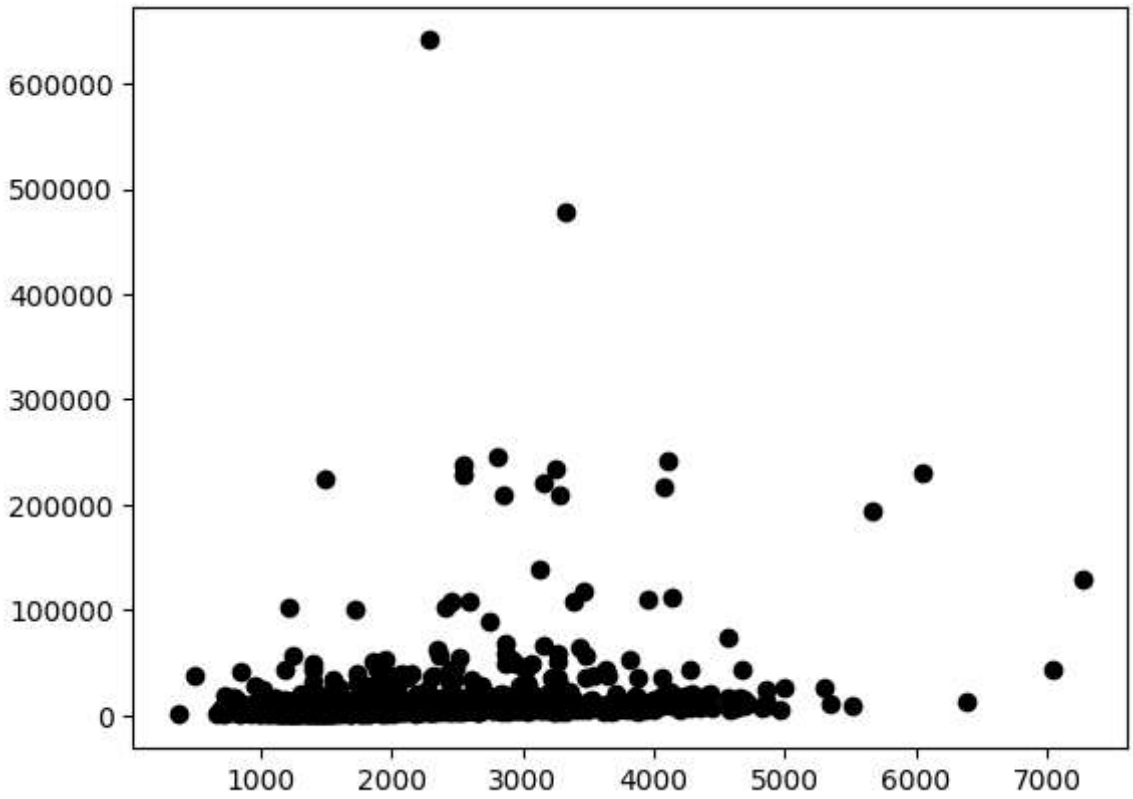
```
C:\Users\sneha\AppData\Local\Temp\ipykernel_24748\3221840372.py:2: SettingWit
hCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/s
table/user_guide/indexing.html#returning-a-view-versus-a-copy (https://panda
s.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-ver
sus-a-copy)
  df.fillna(method ='ffill', inplace = True)
```

In [41]:
```
# Step-5: Training Our Model
X = np.array(df['living']).reshape(-1, 1)
y = np.array(df['lot']).reshape(-1, 1)
#Seperating the data into independent and dependent variables and convert
#Now each dataset contains only one column
```

In [42]:
```
X_train,X_test,y_train,y_test = train_test_split(X, y, test_size = 0.25)
# Splitting the data into training data and test data
regr = LinearRegression()
regr.fit(X_train, y_train)
print(regr.score(X_test, y_test))
```

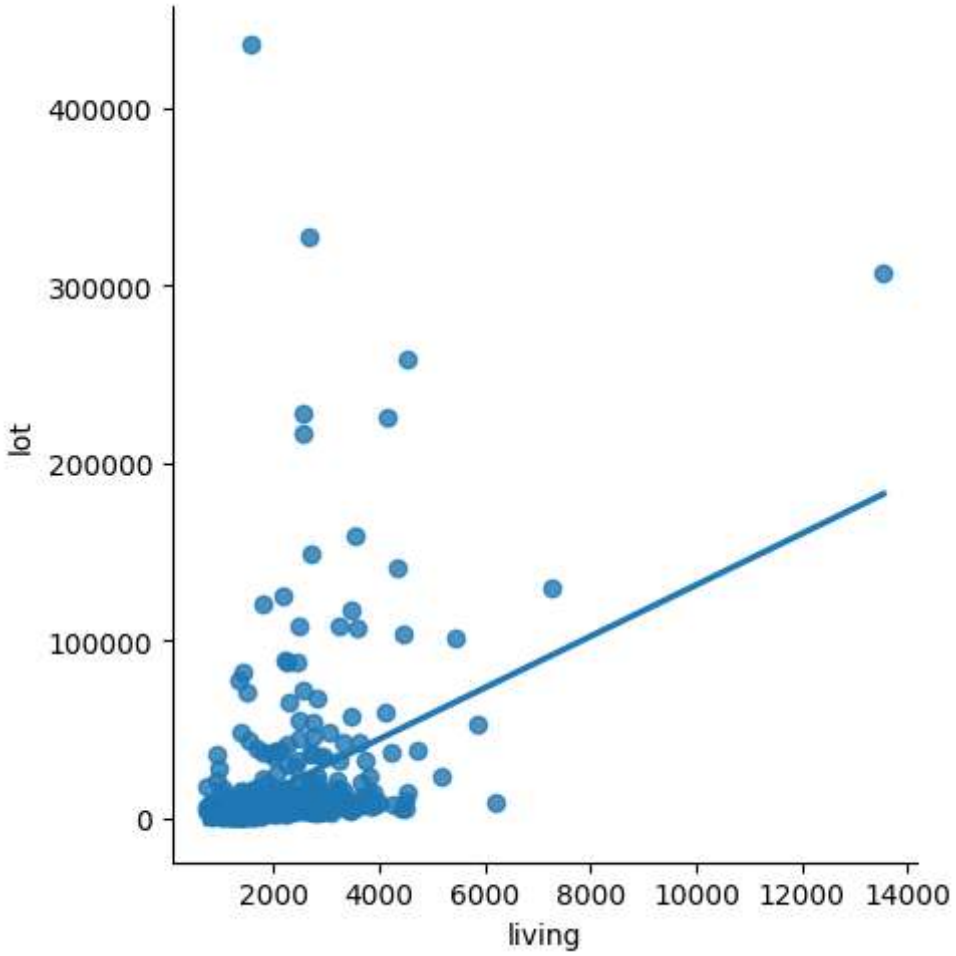
```
0.04871580357965233
```

In [43]:
```
#step-6: Exploring Our Results
y_pred = regr.predict(X_test)
plt.scatter(X_test, y_test, color = 'k')
plt.show()
# Data scatter of predicted values
```



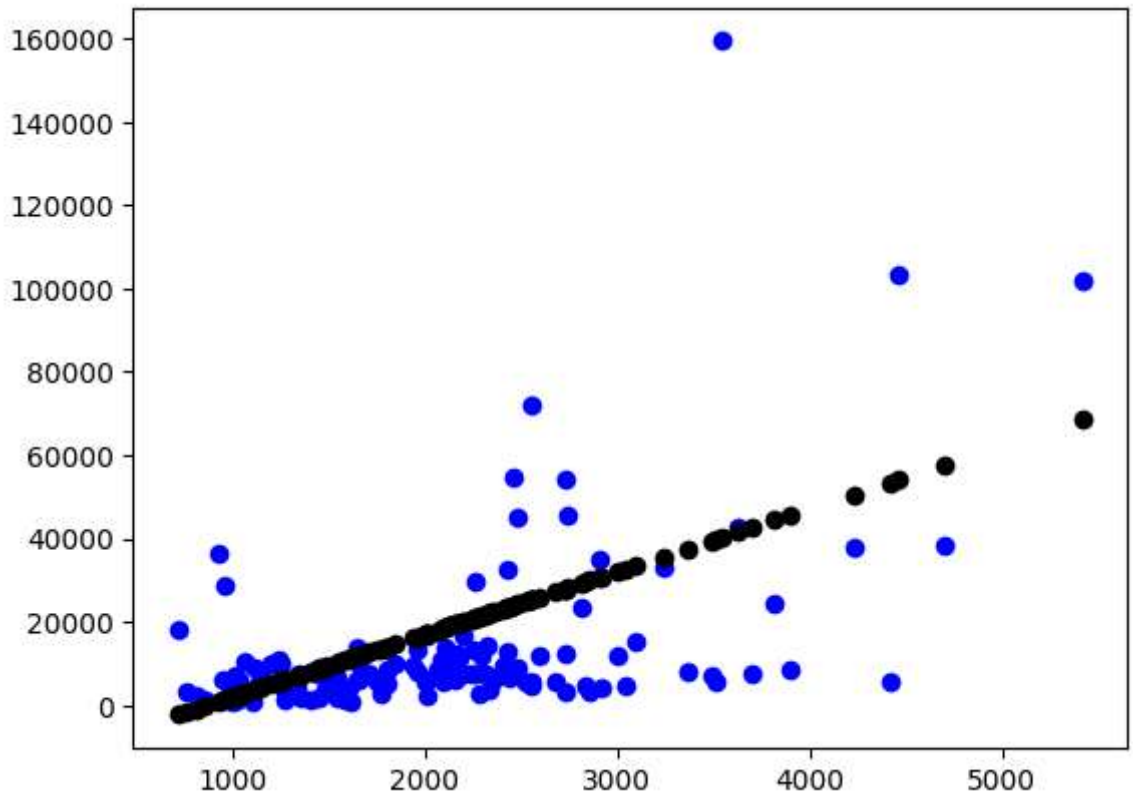
In [44]:
```
#Step7: Working with a Smaller dataset
df500 = df[:][:500]

#Selecting the 1st 500 rowss of the data
sns.lmplot(x= "living", y="lot", data= df500, order = 1, ci = None)
```

Out[44]: <seaborn.axisgrid.FacetGrid at 0x1a8b3513a90>



In [45]:
```
df500.fillna(method = 'ffill', inplace = True)
X = np.array(df500['living']).reshape(-1, 1)
y = np.array(df500['lot']).reshape(-1, 1)
df500.dropna(inplace = True)
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.25)
regr = LinearRegression()
regr.fit(X_train, y_train)
print("Regression:",regr.score(X_test, y_test))
y_pred = regr.predict(X_test)
plt.scatter(X_test, y_test, color = 'b')
plt.scatter(X_test, y_pred, color = 'k')
plt.show()
```

```
Regression: 0.1711533170209386
```



In [46]:
```
#Step-8: Evaluation of model

from sklearn.linear_model import LinearRegression

from sklearn.metrics import r2_score

#Train the model

model = LinearRegression()

model.fit(X_train, y_train)

#Evaluating the model on the test set

y_pred = model.predict(X_test)

r2 = r2_score(y_test, y_pred)

print("R2 score:",r2)
```

```
R2 score: 0.1711533170209386
```

#Step-9:Conclusion:

Dataset we have taken is poor for Linear Model,but with the smaller data works well with Linear Model.

In [ ]: