In [36]:

```
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 [37]:

```
dt=pd.read_csv(r"C:\Users\91903\Downloads\data.csv")
dt
```

Out[37]:

	date	price	bedrooms	bathrooms	sqft_living	sqft_lot	floors	waterfront	vie
0	2014-05-02 00:00:00	3.130000e+05	3.0	1.50	1340	7912	1.5	0	
1	2014-05-02 00:00:00	2.384000e+06	5.0	2.50	3650	9050	2.0	0	
2	2014-05-02 00:00:00	3.420000e+05	3.0	2.00	1930	11947	1.0	0	
3	2014-05-02 00:00:00	4.200000e+05	3.0	2.25	2000	8030	1.0	0	
4	2014-05-02 00:00:00	5.500000e+05	4.0	2.50	1940	10500	1.0	0	
...	...	...	...	...	...	...	...	...	.
4595	2014-07-09 00:00:00	3.081667e+05	3.0	1.75	1510	6360	1.0	0	
4596	2014-07-09 00:00:00	5.343333e+05	3.0	2.50	1460	7573	2.0	0	
4597	2014-07-09 00:00:00	4.169042e+05	3.0	2.50	3010	7014	2.0	0	
4598	2014-07-10 00:00:00	2.034000e+05	4.0	2.00	2090	6630	1.0	0	
4599	2014-07-10 00:00:00	2.206000e+05	3.0	2.50	1490	8102	2.0	0	

4600 rows × 18 columns

In [38]:

```
dt=dt[['sqft_living','sqft_lot']]
dt.columns=['Liv','Lot']
```

In [39]:

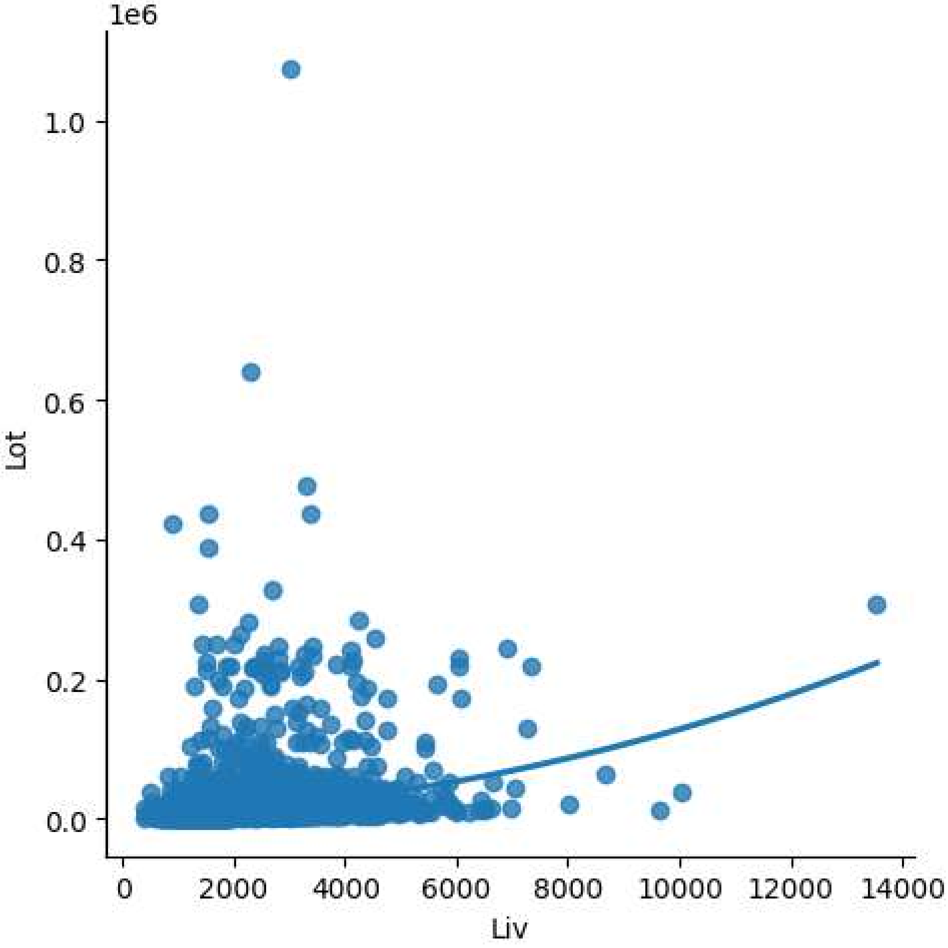
```
dt.head(10)
```

Out[39]:

	Liv	Lot
0	1340	7912
1	3650	9050
2	1930	11947
3	2000	8030
4	1940	10500
5	880	6380
6	1350	2560
7	2710	35868
8	2430	88426
9	1520	6200

```
In [40]: sns.lmplot(x='Liv',y='Lot',data=dt,order=2,ci=None)
```

```
Out[40]: <seaborn.axisgrid.FacetGrid at 0x28e4e82b5b0>
```



```
In [41]: dt.info()
```

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

In [42]:
```
dt.describe()
```

Out[42]:

	Liv	Lot
count	4600.000000	4.600000e+03
mean	2139.346957	1.485252e+04
std	963.206916	3.588444e+04
min	370.000000	6.380000e+02
25%	1460.000000	5.000750e+03
50%	1980.000000	7.683000e+03
75%	2620.000000	1.100125e+04
max	13540.000000	1.074218e+06

In [43]:
```
dt.fillna(method='ffill')
```

Out[43]:

	Liv	Lot
0	1340	7912
1	3650	9050
2	1930	11947
3	2000	8030
4	1940	10500
...	...	...
4595	1510	6360
4596	1460	7573
4597	3010	7014
4598	2090	6630
4599	1490	8102

4600 rows × 2 columns

In [44]:
```
x=np.array(dt['Liv']).reshape(-1,1)
y=np.array(dt['Lot']).reshape(-1,1)
```

In [45]:
```
dt.dropna(inplace=True)
```

```
C:\Users\91903\AppData\Local\Temp\ipykernel_13088\735218168.py:1: SettingWith
CopyWarning:
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)
  dt.dropna(inplace=True)
```

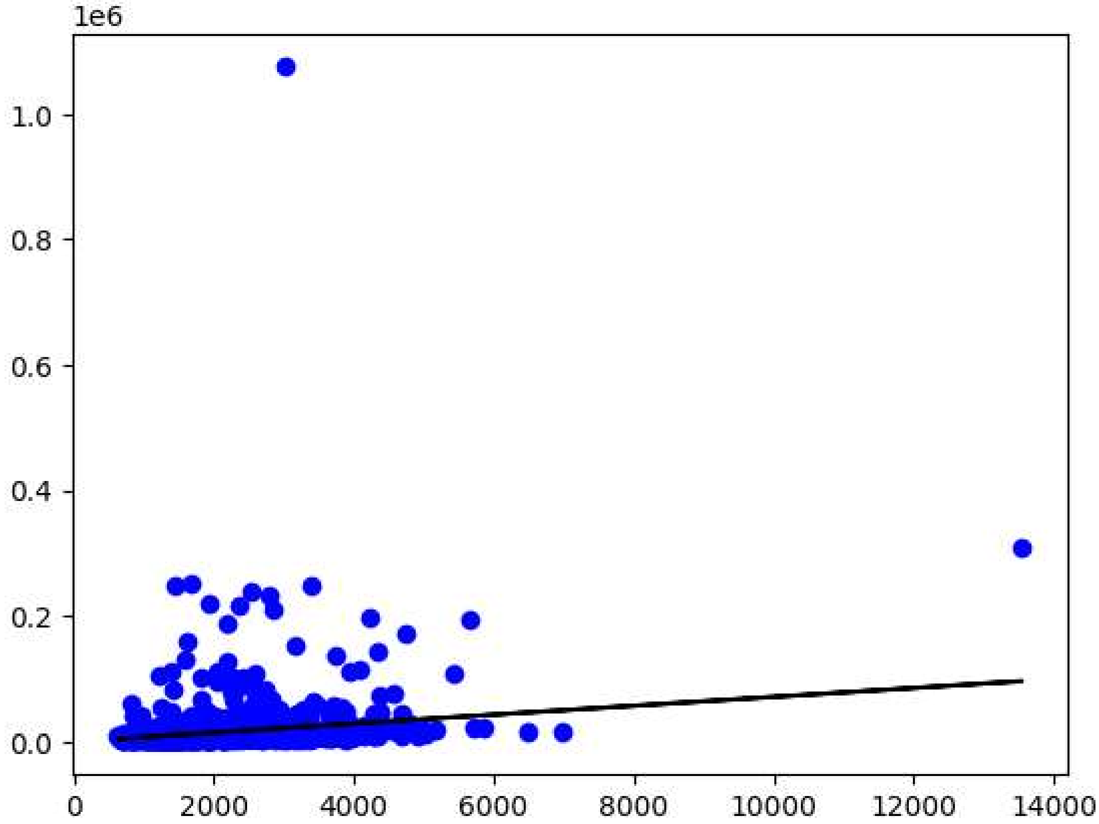
In [46]:

```
X_train,X_test,y_train,y_test=train_test_split(x,y,test_size=0.25)
reg=LinearRegression()
reg.fit(X_train,y_train)
print(reg.score(X_test,y_test))
```

```
0.0470503657560466
```

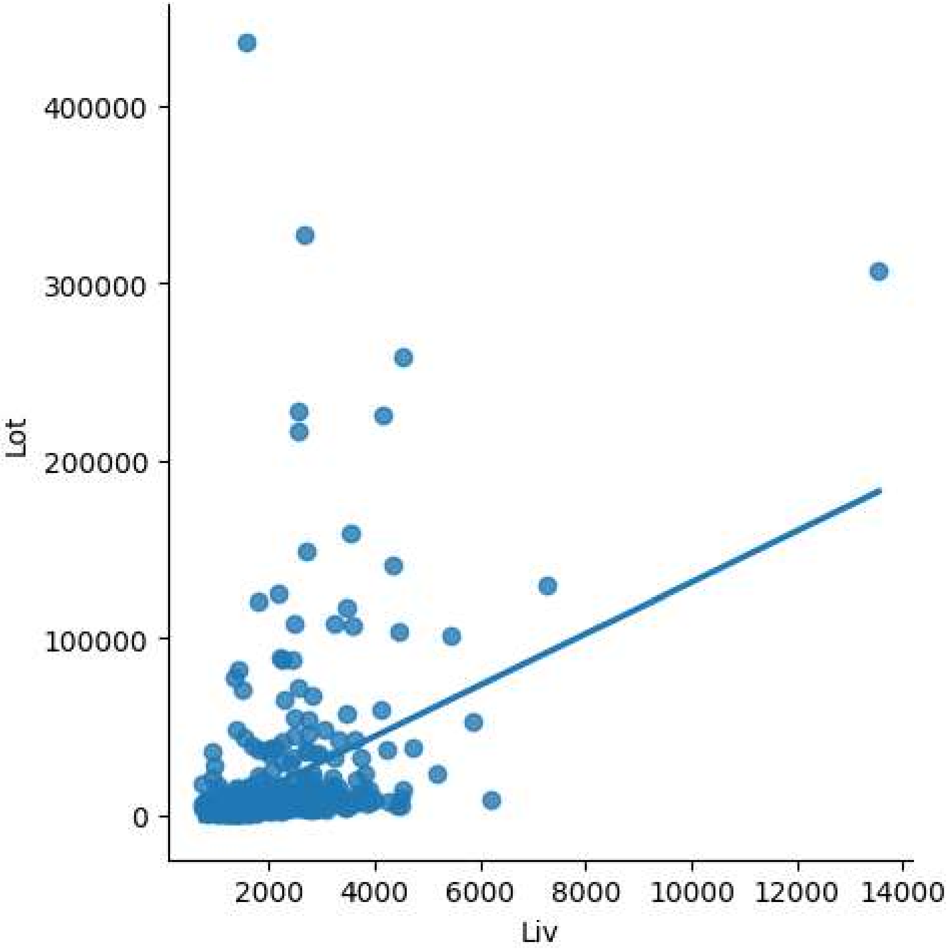
In [47]:

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



In [48]:
```
dt500=dt[:][:500]
sns.lmplot(x="Liv",y="Lot",data=dt500,order=1,ci=None)
```

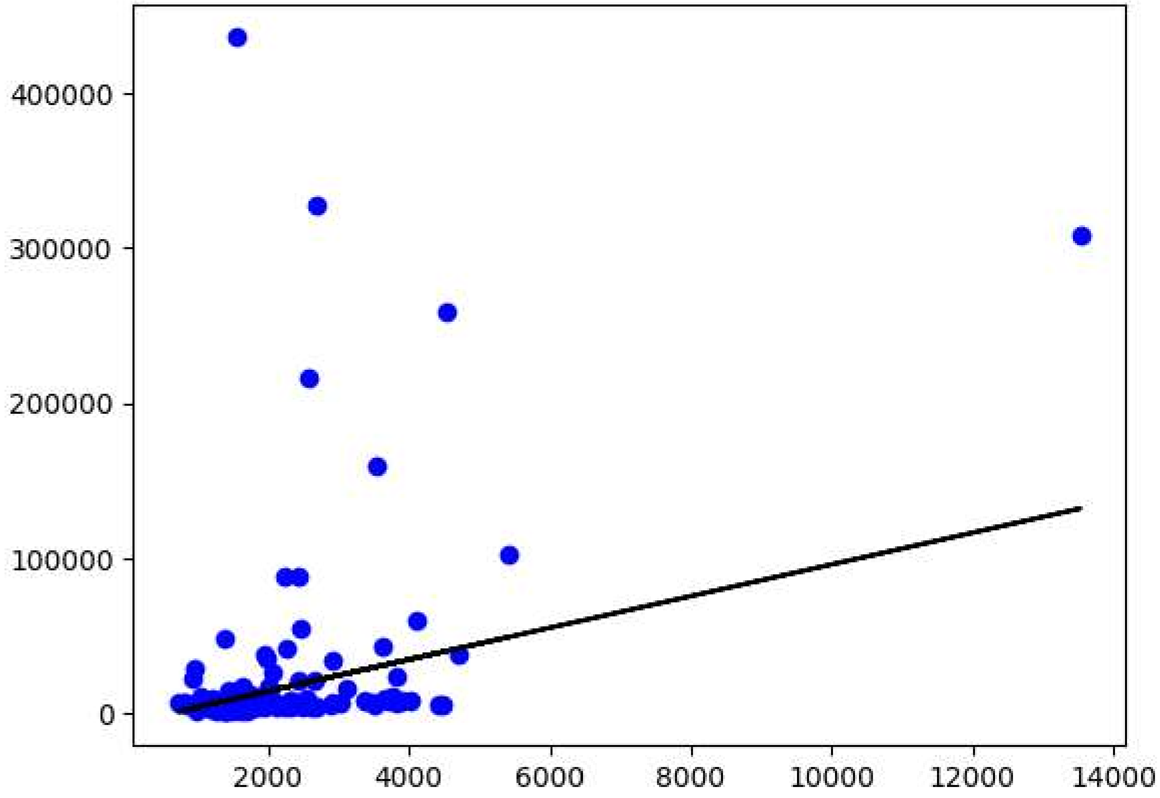
Out[48]:
```
<seaborn.axisgrid.FacetGrid at 0x28e4ead0eb0>
```



In [49]:

```
dt500.fillna(method='ffill',inplace=True)
X=np.array(dt500['Liv']).reshape(-1,1)
y=np.array(dt500['Lot']).reshape(-1,1)
dt500.dropna(inplace=True)
X_train,X_test,y_train,y_test=train_test_split(X,y,test_size=0.25)
reg=LinearRegression()
reg.fit(X_train,y_train)
print("Regression:",reg.score(X_test,y_test))
y_pred=reg.predict(X_test)
plt.scatter(X_test,y_test,color="b")
plt.plot(X_test,y_pred,color='k')
plt.show()
```

```
Regression: 0.1176114702593889
```



In [50]:

```
from sklearn.linear_model import LinearRegression
from sklearn.metrics import r2_score
mode1=LinearRegression()
mode1.fit(X_train,y_train)
y_pred=mode1.predict(X_test)
r2=r2_score(y_test,y_pred)
print("R2 score:",r2)
```

```
R2 score: 0.1176114702593889
```

#conclusion : Linear regression is best fit for the model

```
In [ ]:
```