```
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   Branch:CSE with specialization in AI and ML'''
```

```
{"type":"string"}
```

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
df=pd.read_csv('/content/House Price India.csv')
df
```

```
                id   Date  number of bedrooms  number of bathrooms  \
0      6762810145  42491                   5                 2.50
1      6762810635  42491                   4                 2.50
2      6762810998  42491                   5                 2.75
3      6762812605  42491                   4                 2.50
4      6762812919  42491                   3                 2.00
...           ...    ...                 ...                  ...
14615  6762830250  42734                   2                 1.50
14616  6762830339  42734                   3                 2.00
14617  6762830618  42734                   2                 1.00
14618  6762830709  42734                   4                 1.00
14619  6762831463  42734                   3                 1.00

       living area  lot area  number of floors  waterfront present  \
0             3650      9050               2.0                   0
1             2920      4000               1.5                   0
2             2910      9480               1.5                   0
3             3310     42998               2.0                   0
4             2710      4500               1.5                   0
...            ...       ...               ...                 ...
14615         1556     20000               1.0                   0
14616         1680      7000               1.5                   0
14617         1070      6120               1.0                   0
14618         1030      6621               1.0                   0
14619          900      4770               1.0                   0

       number of views  condition of the house  ...  Built Year  \
0                    4                       5  ...        1921
1                    0                       5  ...        1909
2                    0                       3  ...        1939
3                    0                       3  ...        2001
4                    0                       4  ...        1929
...                ...                     ...  ...         ...
14615                0                       4  ...        1957
14616                0                       4  ...        1968
14617                0                       3  ...        1962
14618                0                       4  ...        1955
```

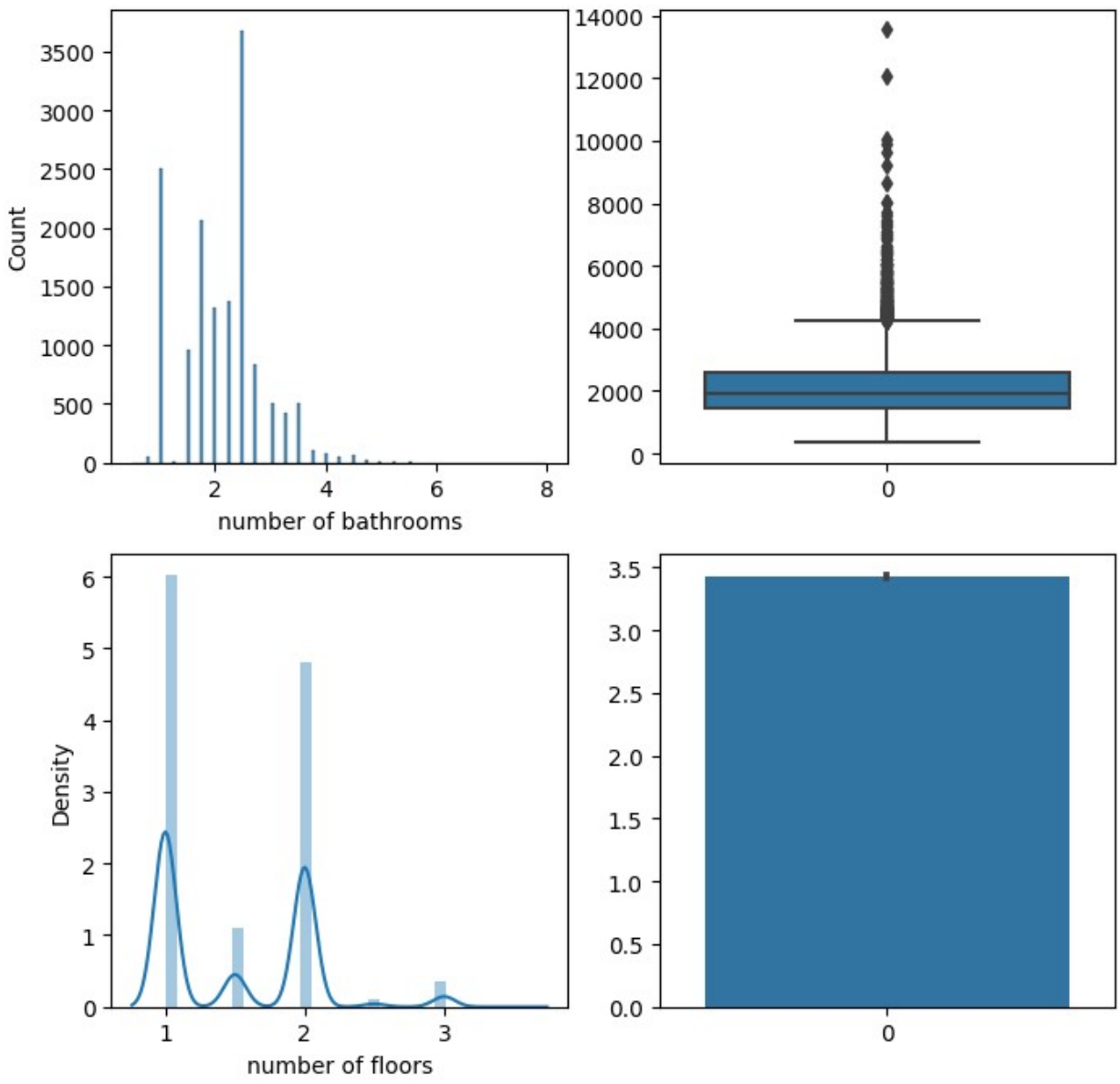
```
14619                0                         3  ...        1969

       Renovation Year  Postal Code  Lattitude  Longitude
living_area_renov  \
0                    0       122003    52.8645   -114.557
2880
1                    0       122004    52.8878   -114.470
2470
2                    0       122004    52.8852   -114.468
2940
3                    0       122005    52.9532   -114.321
3350
4                    0       122006    52.9047   -114.485
2060
...                ...          ...        ...        ...
...
14615                0       122066    52.6191   -114.472
2250
14616                0       122072    52.5075   -114.393
1540
14617                0       122056    52.7289   -114.507
1130
14618                0       122042    52.7157   -114.411
1420
14619             2009       122018    52.5338   -114.552
900

       lot_area_renov  Number of schools nearby  Distance from the
airport  \
0                5400                         2
58
1                4000                         2
51
2                6600                         1
53
3               42847                         3
76
4                4500                         1
51
...               ...                       ...
...
14615           17286                         3
76
14616            7480                         3
59
14617            6120                         2
64
14618            6631                         3
54
```

```
14619            3480                          2
55
```

```
         Price
0      2380000
1      1400000
2      1200000
3       838000
4       805000
...        ...
14615   221700
14616   219200
14617   209000
14618   205000
14619   146000

[14620 rows x 23 columns]
```

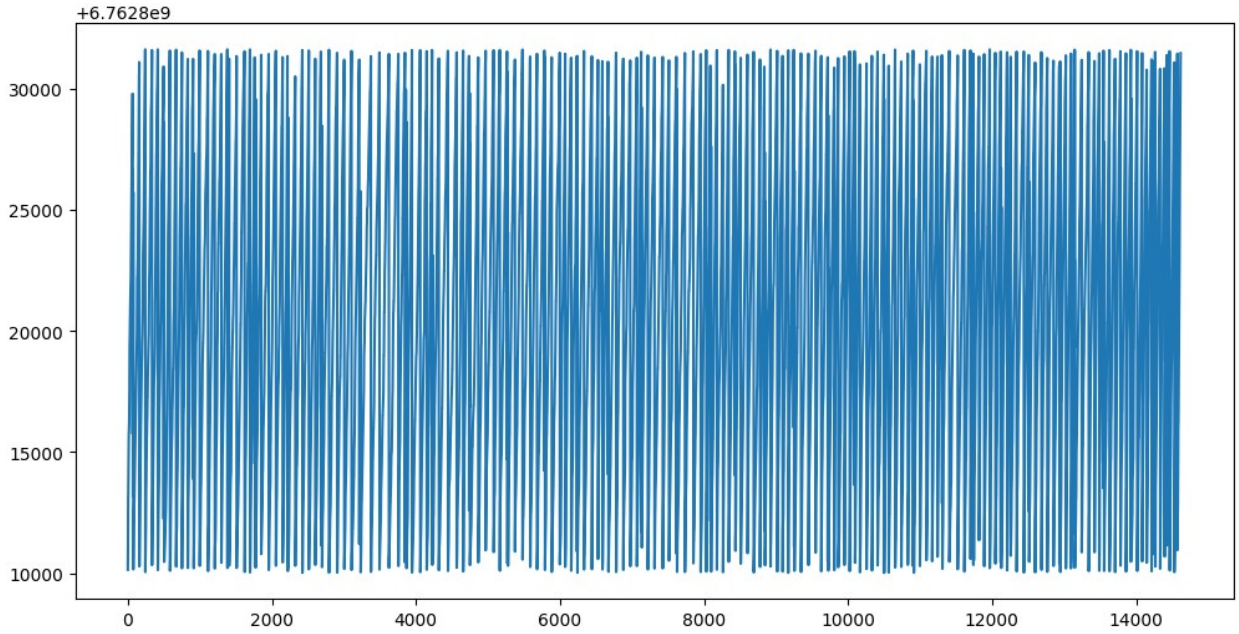
```
from matplotlib import rcParams
rcParams['figure.figsize']=8,8
fig,axes=plt.subplots(2,2)
sns.histplot(data=df['number of bathrooms'],ax=axes[0,0])
sns.boxplot(data=df['living area'],ax=axes[0,1])
sns.distplot(df['number of floors'],ax=axes[1,0])
sns.barplot(df['condition of the house'],ax=axes[1,1])
```

```
<ipython-input-65-175fa27109b6>:6: UserWarning:

`distplot` is a deprecated function and will be removed in seaborn
v0.14.0.

Please adapt your code to use either `displot` (a figure-level
function with
similar flexibility) or `histplot` (an axes-level function for
histograms).

For a guide to updating your code to use the new functions, please see
https://gist.github.com/mwaskom/de44147ed2974457ad6372750bbe5751

  sns.distplot(df['number of floors'],ax=axes[1,0])

<Axes: >
```




```
plt.figure(figsize=(12,6))
plt.plot(df['id'])
```

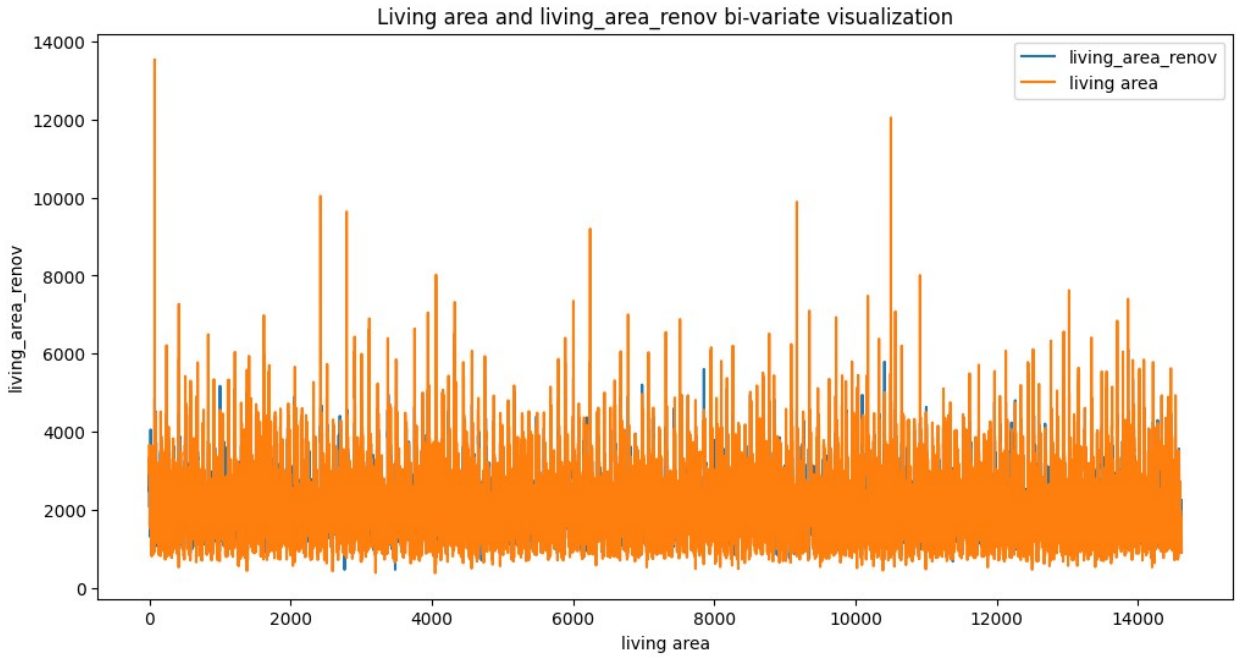
```
[<matplotlib.lines.Line2D at 0x7ef431291f30>]
```



#Bi-Variate Analysis

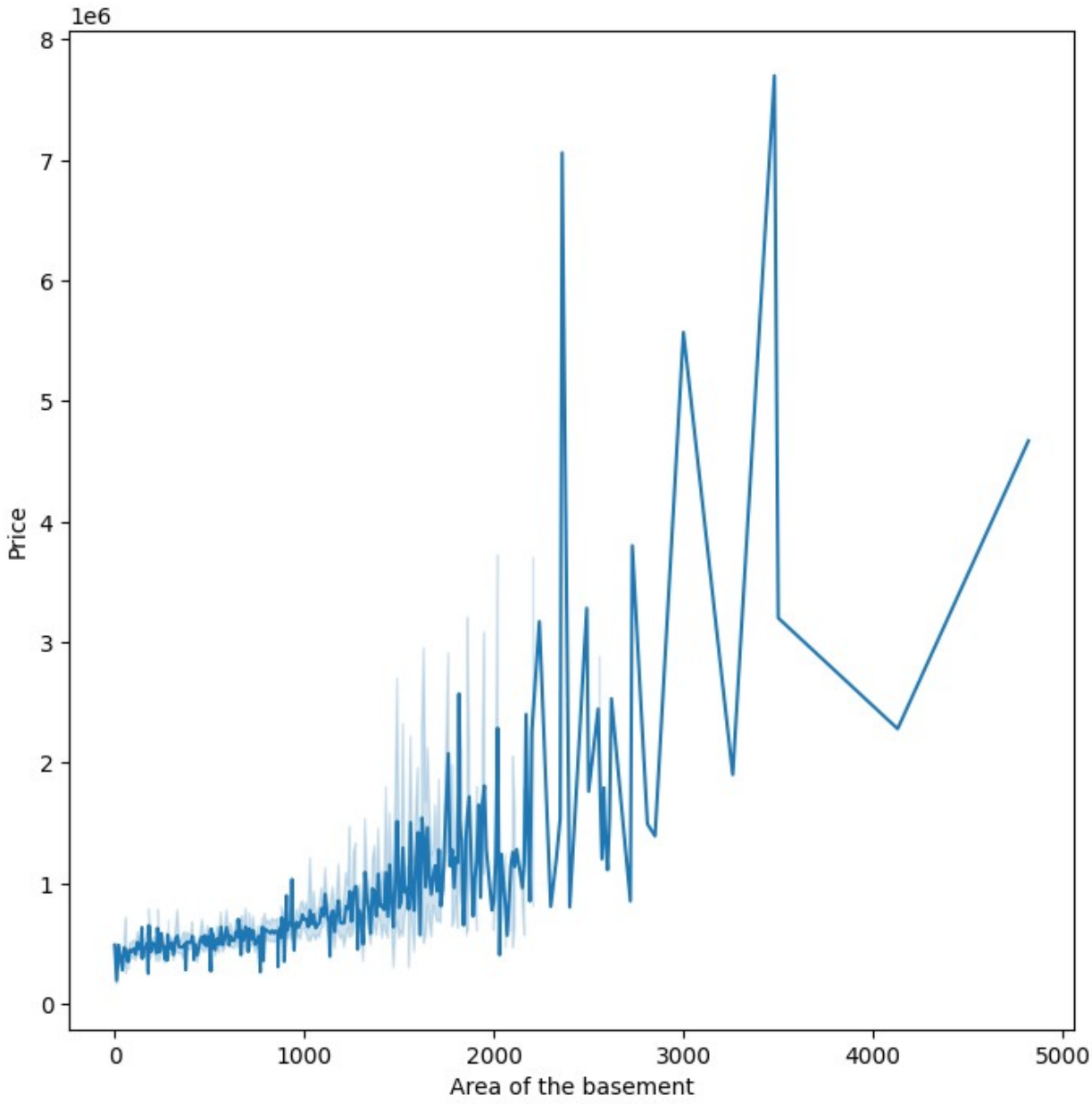
```
plt.figure(figsize=(12,6))
plt.title("Living area and living_area_renov bi-variate
visualization")
plt.xlabel("living area")
plt.ylabel("living_area_renov")
plt.plot(df['living_area_renov'])
plt.plot(df['living area'])
plt.legend(['living_area_renov','living area'])
```

```
<matplotlib.legend.Legend at 0x7ef431244e80>
```



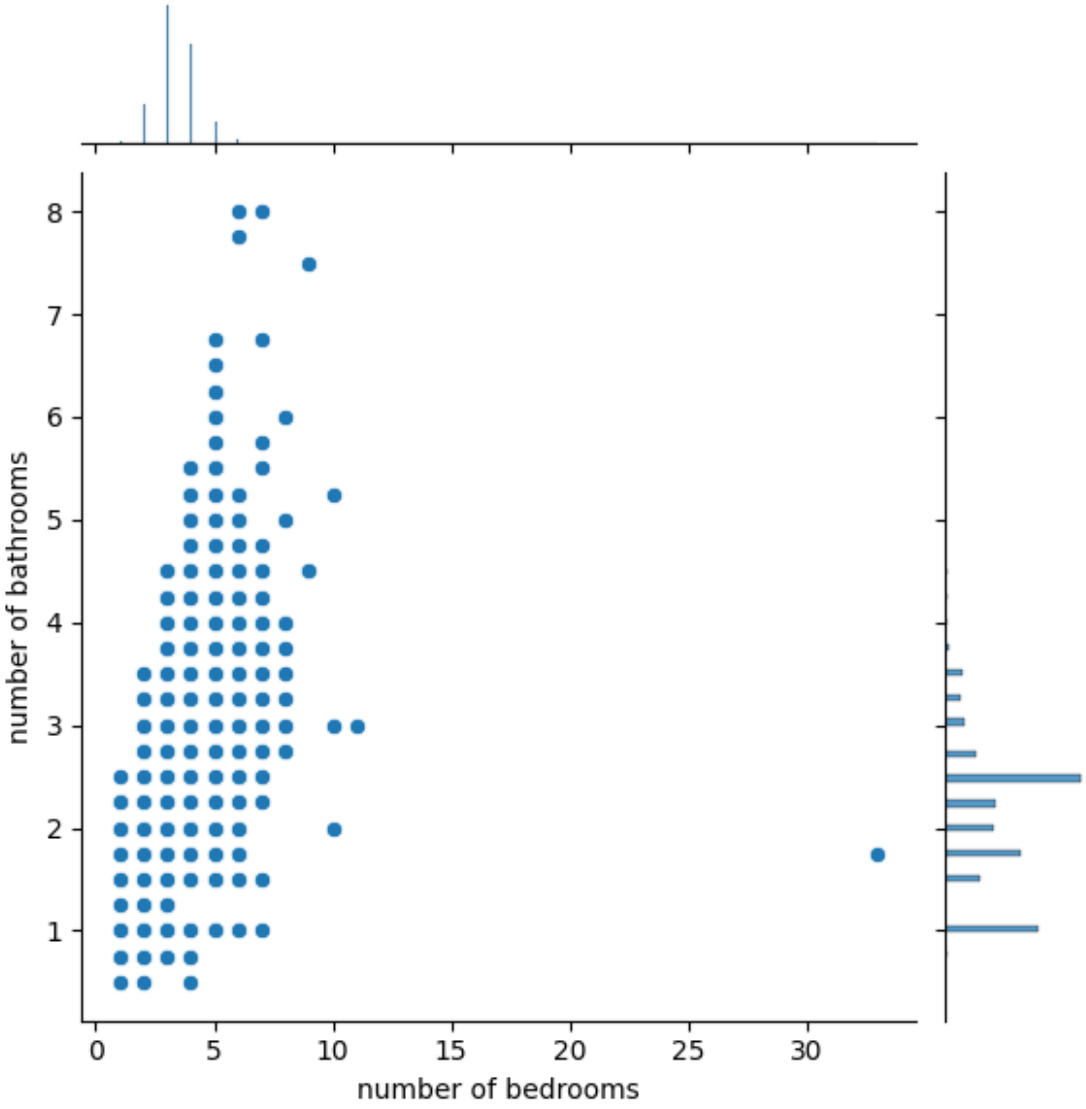

```
sns.lineplot(x='Area of the basement',y='Price',data=df)
```

```
<Axes: xlabel='Area of the basement', ylabel='Price'>
```




```
sns.jointplot(x= 'number of bedrooms',y ='number of
bathrooms',data=df)
```

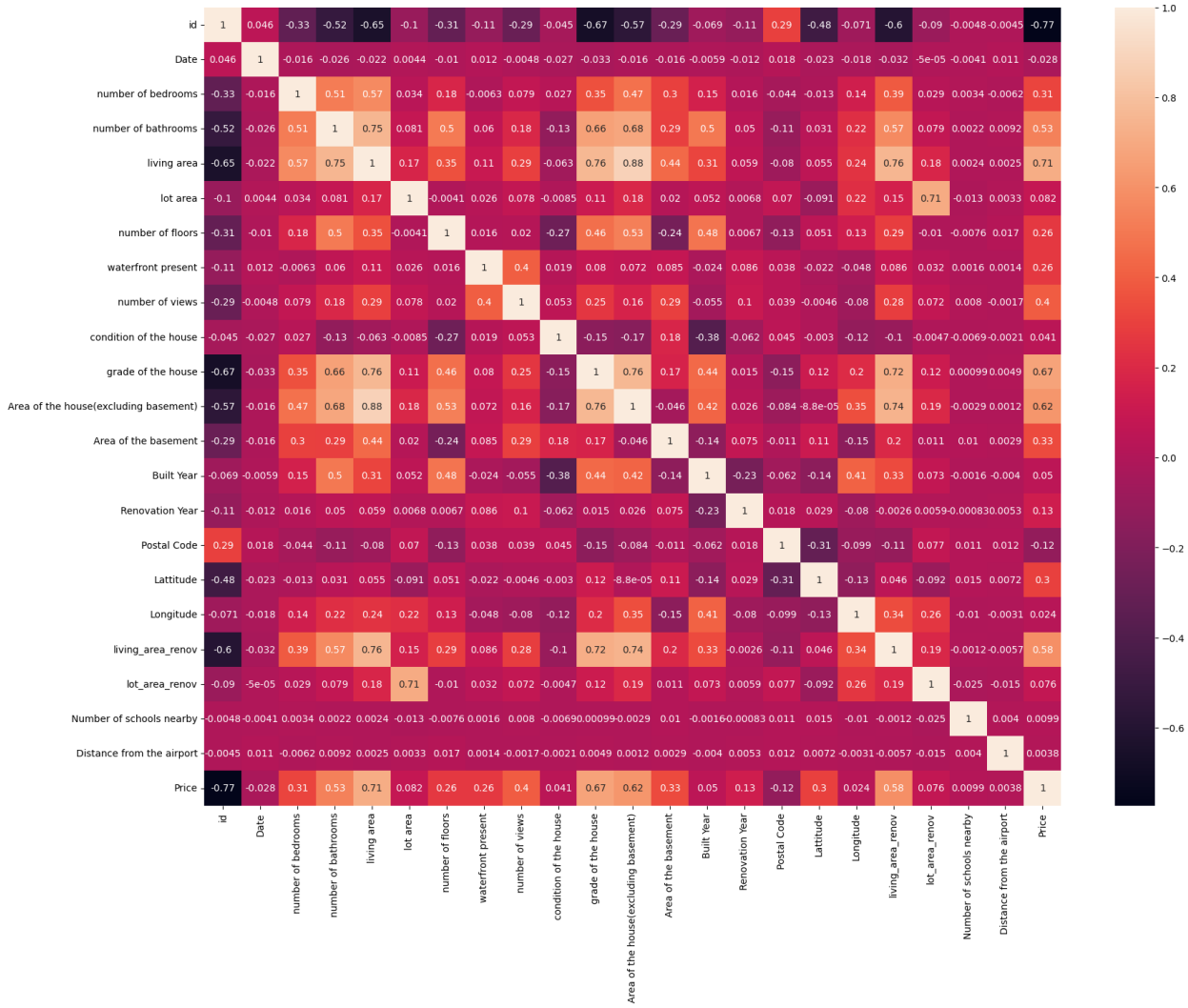
```
<seaborn.axisgrid.JointGrid at 0x7ef4307ffb50>
```



#Multivariate analysis

```
plt.figure(figsize=(20,15))
sns.heatmap(df.corr(),annot=True)
```

```
<Axes: >
```



#4.Performing descriptive statistics on the dataset

```
df.describe()
```

```
                  id          Date  number of bedrooms  number of
bathrooms  \
count  1.462000e+04  14620.000000        14620.000000
14620.000000
mean   6.762821e+09  42604.538646            3.379343
2.129583
std    6.237575e+03     67.347991            0.938719
0.769934
min    6.762810e+09  42491.000000            1.000000
0.500000
25%    6.762815e+09  42546.000000            3.000000
1.750000
50%    6.762821e+09  42600.000000            3.000000
2.250000
```

```
75%    6.762826e+09  42662.000000            4.000000
2.500000
max    6.762832e+09  42734.000000           33.000000
8.000000

        living area      lot area  number of floors  waterfront
present  \
count  14620.000000  1.462000e+04      14620.000000
14620.000000
mean    2098.262996  1.509328e+04          1.502360
0.007661
std      928.275721  3.791962e+04          0.540239
0.087193
min      370.000000  5.200000e+02          1.000000
0.000000
25%     1440.000000  5.010750e+03          1.000000
0.000000
50%     1930.000000  7.620000e+03          1.500000
0.000000
75%     2570.000000  1.080000e+04          2.000000
0.000000
max    13540.000000  1.074218e+06          3.500000
1.000000

       number of views  condition of the house  ...    Built Year  \
count     14620.000000            14620.000000  ...  14620.000000
mean          0.233105                3.430506  ...   1970.926402
std           0.766259                0.664151  ...     29.493625
min           0.000000                1.000000  ...   1900.000000
25%           0.000000                3.000000  ...   1951.000000
50%           0.000000                3.000000  ...   1975.000000
75%           0.000000                4.000000  ...   1997.000000
max           4.000000                5.000000  ...   2015.000000

       Renovation Year    Postal Code     Lattitude     Longitude  \
count     14620.000000   14620.000000  14620.000000  14620.000000
mean         90.924008  122033.062244     52.792848   -114.404007
std         416.216661      19.082418      0.137522      0.141326
min           0.000000  122003.000000     52.385900   -114.709000
25%           0.000000  122017.000000     52.707600   -114.519000
50%           0.000000  122032.000000     52.806400   -114.421000
75%           0.000000  122048.000000     52.908900   -114.315000
max        2015.000000  122072.000000     53.007600   -113.505000

       living_area_renov  lot_area_renov  Number of schools nearby  \
count       14620.000000    14620.000000              14620.000000
mean         1996.702257    12753.500068                  2.012244
std           691.093366    26058.414467                  0.817284
min           460.000000      651.000000                  1.000000
25%          1490.000000     5097.750000                  1.000000
```

```
50%          1850.000000     7620.000000                    2.000000
75%          2380.000000    10125.000000                    3.000000
max          6110.000000   560617.000000                    3.000000

       Distance from the airport         Price
count               14620.000000  1.462000e+04
mean                   64.950958  5.389322e+05
std                     8.936008  3.675324e+05
min                    50.000000  7.800000e+04
25%                    57.000000  3.200000e+05
50%                    65.000000  4.500000e+05
75%                    73.000000  6.450000e+05
max                    80.000000  7.700000e+06

[8 rows x 23 columns]
```

#Handling the missing values

```
df.isnull().any()
df.isnull().sum()
```

```
id                                        0
Date                                      0
number of bedrooms                        0
number of bathrooms                       0
living area                               0
lot area                                  0
number of floors                          0
waterfront present                        0
number of views                           0
condition of the house                    0
grade of the house                        0
Area of the house(excluding basement)     0
Area of the basement                      0
Built Year                                0
Renovation Year                           0
Postal Code                               0
Lattitude                                 0
Longitude                                 0
living_area_renov                         0
lot_area_renov                            0
Number of schools nearby                  0
Distance from the airport                 0
Price                                     0
dtype: int64
```