NAAN MUDHALVAN
DATA ANALYTICS
ASSIGNMENT-3

KNOWLEDGE INSTITUTE OF TECHNOLOGY

REG NO: 611220104115
NAME: REVATHI A
BRANCH/YEAR: B.E-CSE & IV

Perform the Below Tasks to complete the assignment:-
Tasks:-
1. Download the dataset: Dataset
2. Load the dataset.
3. Perform the Below Visualizations.
● Univariate Analysis

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2. Load the dataset.
3. Perform the Below Visualizations.
● Univariate Analysis
● Bi - Variate Analysis
● Multi-Variate Analysis
4. Perform descriptive statistics on the dataset.
5. Handle the Missing values.

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
```

```
import io
```

```
hr = pd.read_csv("/content/House Price India.csv")
```

```
hr.head()
```

	id	Date	number of bedrooms	number of bathrooms	living area	lot area	number of floors	waterfront present	number of views

```
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```

	id	Date	number of bedrooms	number of bathrooms	living area	lot area	number of floors	waterfront present	number of views
0	6762810145	42491	5	2.50	3650	9050	2.0	0	4
1	6762810635	42491	4	2.50	2920	4000	1.5	0	0
2	6762810998	42491	5	2.75	2910	9480	1.5	0	0
3	6762812605	42491	4	2.50	3310	42998	2.0	0	0
4	6762812919	42491	3	2.00	2710	4500	1.5	0	0

5 rows × 23 columns

```
hr.tail(10)
```

	id	Date	number of bedrooms	number of bathrooms	living area	lot area	number of floors	waterfront present	nu v
14610	6762828349	42734	4	2.75	1810	7350	1.0	0	
14611	6762828783	42734	3	1.75	1350	7686	1.0	0	
14612	6762828856	42734	3	1.00	1180	5350	1.5	0	
14613	6762829600	42734	3	1.00	1400	10425	1.0	0	
14614	6762829669	42734	3	1.75	1590	7931	1.0	0	
14615	6762830250	42734	2	1.50	1556	20000	1.0	0	
14616	6762830339	42734	3	2.00	1680	7000	1.5	0	
14617	6762830618	42734	2	1.00	1070	6120	1.0	0	
14618	6762830709	42734	4	1.00	1030	6621	1.0	0	
14619	6762831463	42734	3	1.00	900	4770	1.0	0	

10 rows × 23 columns

```
hr.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 14620 entries, 0 to 14619
Data columns (total 23 columns):
```

```
 16  Lattitude                              14620 non-null  float64
 17  Longitude                              14620 non-null  float64
 18  living_area_renov                      14620 non-null  int64
 19  lot_area_renov                         14620 non-null  int64
 20  Number of schools nearby               14620 non-null  int64
 21  Distance from the airport              14620 non-null  int64
 22  Price                                  14620 non-null  int64
dtypes: float64(4), int64(19)
memory usage: 2.6 MB
```

```
hr.isnull()
```

	id	Date	number of bedrooms	number of bathrooms	living area	lot area	number of floors	wat
0	False	False	False	False	False	False	False	
1	False	False	False	False	False	False	False	

```
 16  Lattitude                               14620 non-null  float64
 17  Longitude                               14620 non-null  float64
 18  living_area_renov                       14620 non-null  int64
 19  lot_area_renov                          14620 non-null  int64
 20  Number of schools nearby                14620 non-null  int64
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 22  Price                                   14620 non-null  int64
dtypes: float64(4), int64(19)
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```

```
hr.isnull()
```

	id	Date	number of bedrooms	number of bathrooms	living area	lot area	number of floors	wat
0	False	False	False	False	False	False	False	
1	False	False	False	False	False	False	False	
2	False	False	False	False	False	False	False	
3	False	False	False	False	False	False	False	
4	False	False	False	False	False	False	False	
...	...	...	...	...	...	...	...	
14615	False	False	False	False	False	False	False	
14616	False	False	False	False	False	False	False	
14617	False	False	False	False	False	False	False	

```
hr.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
```

	id	Date	number of bedrooms	number of bathrooms	liv
mean	6.762821e+09	42604.538646	3.379343	2.129583	209
min	6.762810e+09	42491.000000	1.000000	0.500000	37
25%	6.762815e+09	42546.000000	3.000000	1.750000	144

```
from sklearn.preprocessing import LabelEncoder

gk=LabelEncoder()

hr["waterfront present"] = gk.fit_transform(hr["waterfront present"])
```

```
hr.head()
```

	id	Date	number of bedrooms	number of bathrooms	living area	lot area	number of floors

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2	6762810998	42491	5	2.75	2910	9480	1.5
3	6762812605	42491	4	2.50	3310	42998	2.0

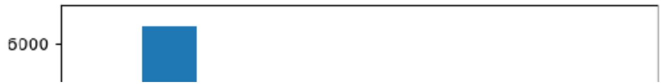
```
print(hr.describe())
```

```
                 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                                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
```

```
plt.hist(hr['Area of the house(excluding basement)'])
```

```
(array([4.479e+03, 6.255e+03, 2.653e+03, 9.190e+02, 2.440e+02,
4.600e+01,
        1.800e+01, 1.000e+00, 2.000e+00, 3.000e+00]),
 array([ 370., 1274., 2178., 3082., 3986., 4890., 5794., 6698.,
7602.,
        8506., 9410.]),
 <BarContainer object of 10 artists>)
```



```
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
```

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4.600e+01,
        1.800e+01, 1.000e+00, 2.000e+00, 3.000e+00]),
 array([ 370., 1274., 2178., 3082., 3986., 4890., 5794., 6698.,
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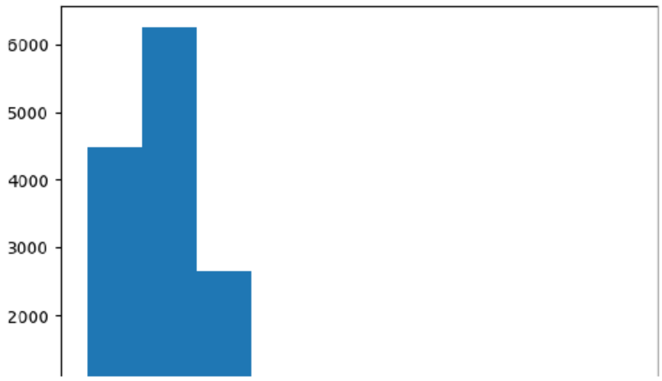
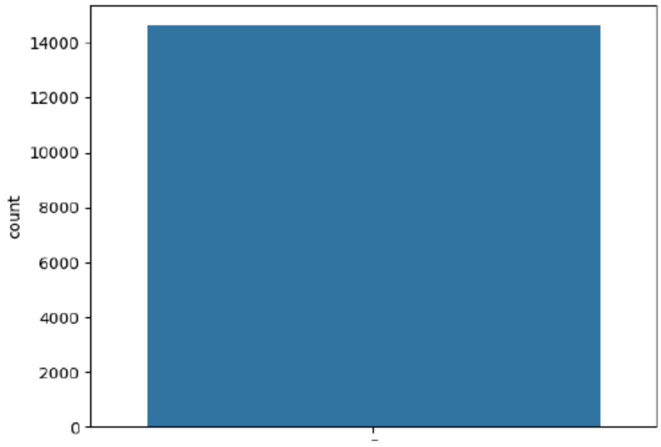


```
sns.countplot(hr['lot area'])
```

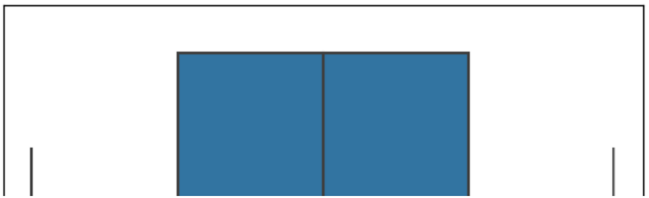
```
<Axes: ylabel='count'>
```



```
<Axes: ylabel='count'>
```

```
sns.boxplot(x=df['id'])
```

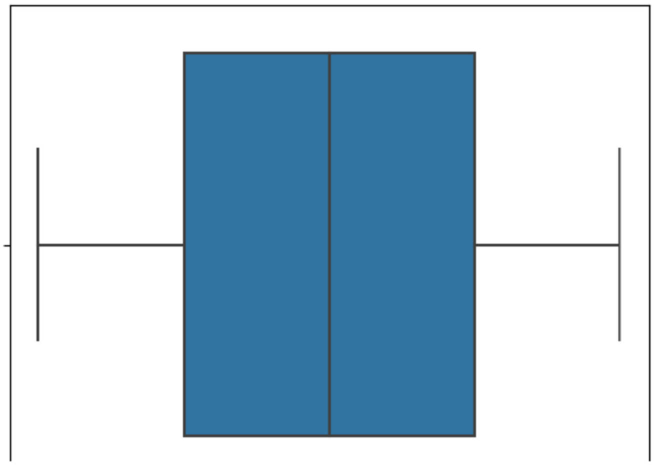
```
<Axes: xlabel='id'>
```



```
<Axes: ylabel='count'>
```

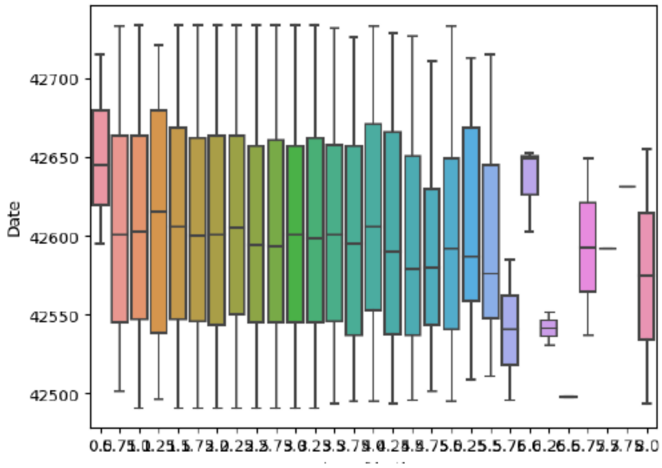
```
sns.boxplot(x=df['id'])
```

```
<Axes: xlabel='id'>
```



```
sns.boxplot(x=hr['number of bathrooms'],y=hr['Date'])
```

```
<Axes: xlabel='number of bathrooms', ylabel='Date'>
```



```
<Axes: xlabel='living area', ylabel='lot area'>
```

```
sns.lineplot(x=hr['Built Year'],y=hr['Date'])
```

```
<Axes: xlabel='Built Year', ylabel='Date'>
```

```
<Axes: xlabel='living area', ylabel='lot area'>
```

```
sns.lineplot(x=hr['Built Year'],y=hr['Date'])
```

```
<Axes: xlabel='Built Year', ylabel='Date'>
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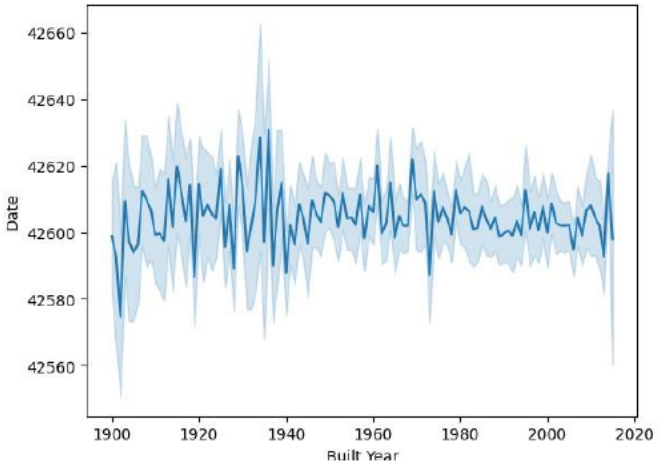
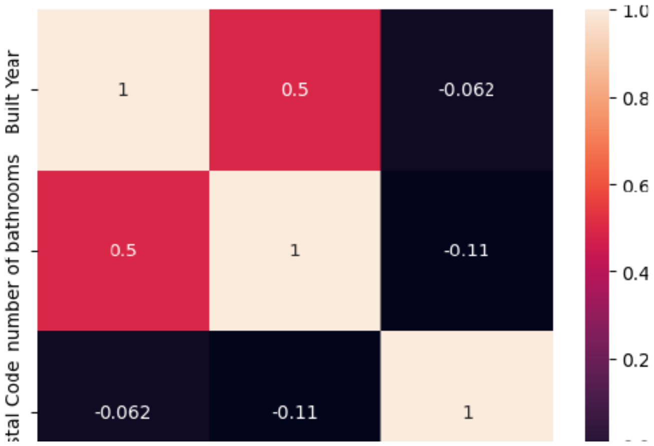


```
sns.heatmap(hr[['Built Year','number of bathrooms','Postal Code']].corr(),annot=True)
```

```
<Axes: >
```



	Price	number of views	grade of the house	condition of the house
0	2380000	4	10	5
1	1400000	0	8	5
2	1200000	0	8	3
3	838000	0	9	3

```
plt.hist(hr['number of bedrooms'],bins=50)
```

```
(array([1.360e+02, 1.844e+03, 0.000e+00, 6.612e+03, 4.724e+03,
0.000e+00,
        1.079e+03, 1.760e+02, 0.000e+00, 3.000e+01, 1.100e+01,
0.000e+00,
        3.000e+00, 0.000e+00, 3.000e+00, 1.000e+00, 0.000e+00,
0.000e+00,
        0.000e+00, 0.000e+00, 0.000e+00, 0.000e+00, 0.000e+00,
0.000e+00,
```

	Price	number of views	grade of the house	condition of the house
0	2380000	4	10	5
1	1400000	0	8	5
2	1200000	0	8	3
3	838000	0	9	3

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(array([1.360e+02, 1.844e+03, 0.000e+00, 6.612e+03, 4.724e+03,
0.000e+00,
        1.079e+03, 1.760e+02, 0.000e+00, 3.000e+01, 1.100e+01,
0.000e+00,
        3.000e+00, 0.000e+00, 3.000e+00, 1.000e+00, 0.000e+00,
0.000e+00,
        0.000e+00, 0.000e+00, 0.000e+00, 0.000e+00, 0.000e+00,
0.000e+00,
        0.000e+00, 0.000e+00, 0.000e+00, 0.000e+00, 0.000e+00,
0.000e+00,
        0.000e+00, 0.000e+00, 0.000e+00, 0.000e+00, 0.000e+00,
0.000e+00,
        0.000e+00, 0.000e+00, 0.000e+00, 0.000e+00, 0.000e+00,
0.000e+00,
        0.000e+00, 0.000e+00, 0.000e+00, 0.000e+00, 0.000e+00,
0.000e+00,
        0.000e+00, 1.000e+00]),
 array([ 1.  ,  1.64,  2.28,  2.92,  3.56,  4.2 ,  4.84,  5.48,
6.12,
         6.76,  7.4 ,  8.04,  8.68,  9.32,  9.96, 10.6 , 11.24,
11.88,
        12.52, 13.16, 13.8 , 14.44, 15.08, 15.72, 16.36, 17.  ,
17.64,
        18.28, 18.92, 19.56, 20.2 , 20.84, 21.48, 22.12, 22.76,
23.4 ,
        24.04, 24.68, 25.32, 25.96, 26.6 , 27.24, 27.88, 28.52,
29.16,
        29.8 , 30.44, 31.08, 31.72, 32.36, 33.  ]),
 <BarContainer object of 50 artists>)
```
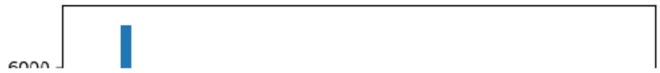
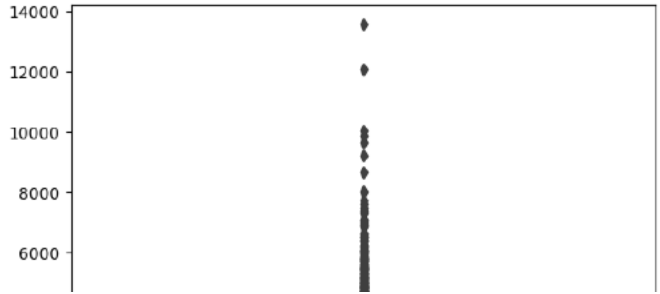



```
sns.distplot(hr['Distance from the airport'],bins=30)
```

```
<ipython-input-52-9951cfa0f999>:1: UserWarning:

`distplot` is a deprecated function and will be removed in seabor
```

```
sns.boxplot(hr['living area'])
```

```
<Axes: >
```



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<ipython-input-52-9951cfa0f999>:1: UserWarning:

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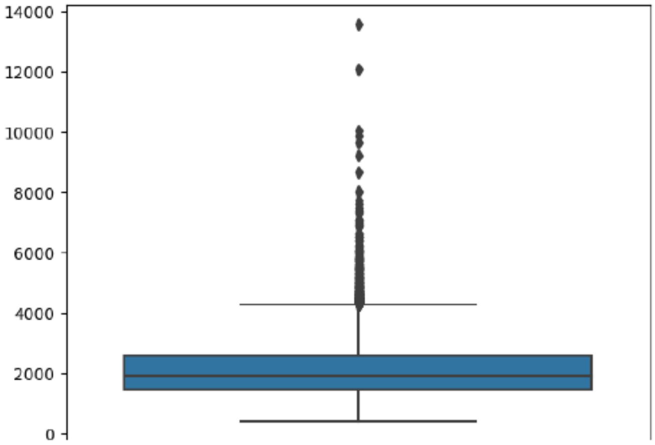
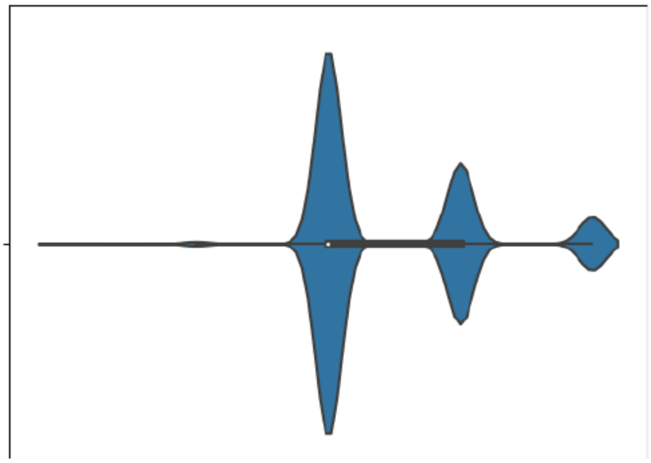


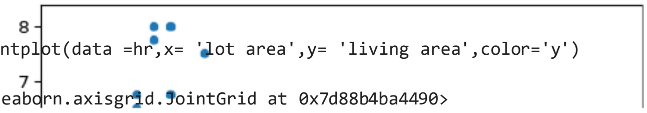
```
sns.violinplot(x=hr['condition of the house'])
```

```
<Axes: xlabel='condition of the house'>
```



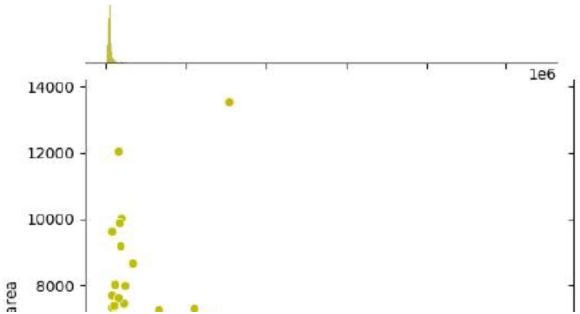
```
sns.scatterplot(x=hr['number of bedrooms'],y=hr['number of bathrooms'])
```

```
<Axes: xlabel='number of bedrooms', ylabel='number of bathrooms'>
```

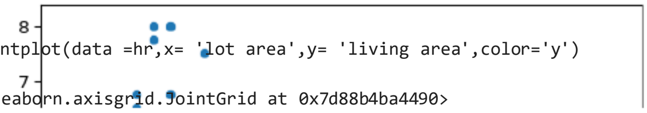


```
sns.jointplot(data =hr,x= 'lot area',y= 'living area',color='y')
```

```
<seaborn.axisgrid.JointGrid at 0x7d88b4ba4490>
```

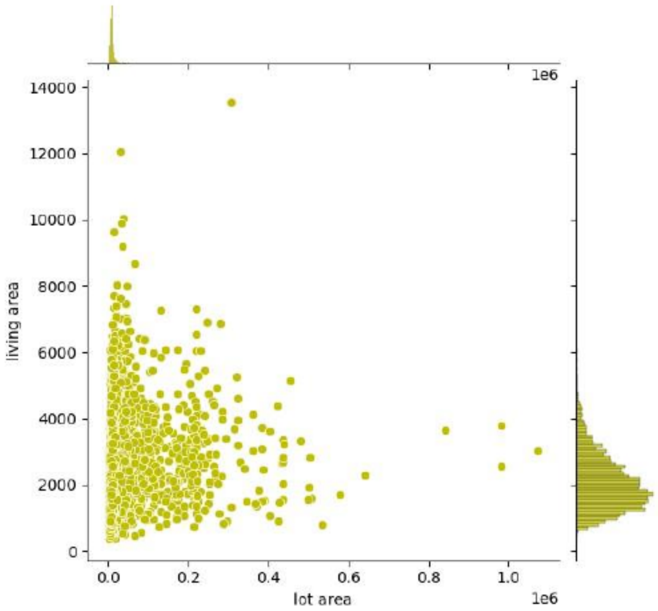


```
<Axes: xlabel='number of bedrooms', ylabel='number of bathrooms'>
```



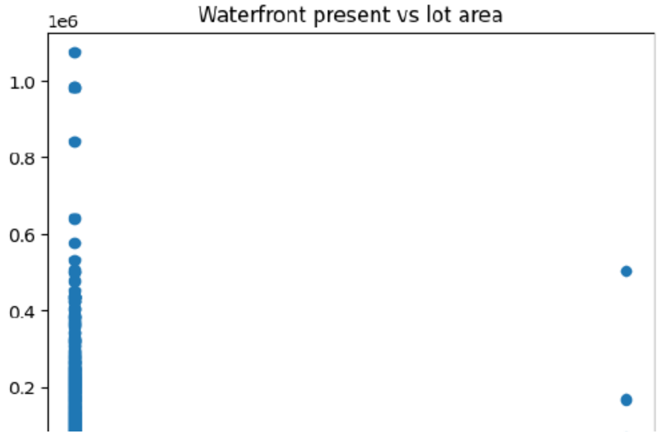
```
sns.jointplot(data =hr,x= 'lot area',y= 'living area',color='y')
```

```
<seaborn.axisgrid.JointGrid at 0x7d88b4ba4490>
```

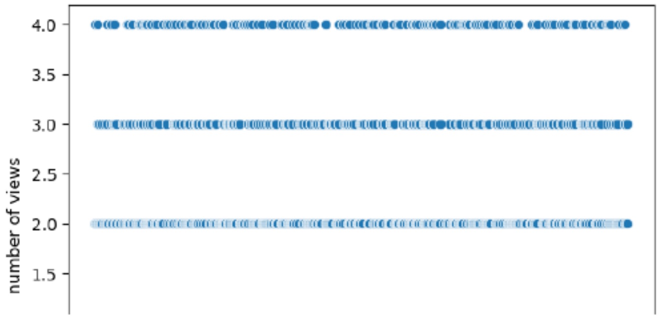


```
a=hr.groupby("number of bedrooms")['Price'].median()
```

```
plt.scatter(hr['waterfront present'],hr['lot area'])
plt.title("Waterfront present vs lot area")
plt.grid(linestyle='-', linewidth=0.)
```

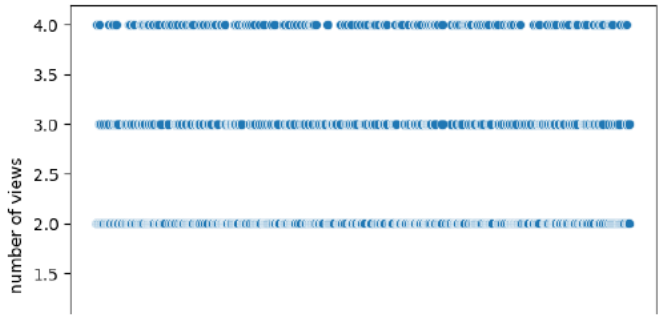


```
<Axes: ylabel='number of views'>
```



```
plt.subplots(figsize=(15,15))
sns.heatmap(hr.drop(['living area'],axis=1).corr(),linewidth=0.3,annot=True)
plt.show()
```

```
<Axes: ylabel='number of views'>
```



```
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sns.heatmap(hr.drop(['living area'],axis=1).corr(),linewidth=0.3,annot=True)
plt.show()
```

```
number of views                          14620
condition of the house                   14620
grade of the house                       14620
Area of the house(excluding basement)    14620
Area of the basement                     14620
Built Year                               14620
Renovation Year                          14620
Postal Code                              14620
Lattitude                                14620
Longitude                                14620
living_area_renov                        14620
lot_area_renov                           14620
Number of schools nearby                 14620
Distance from the airport                14620
Price                                    14620
dtype: int64
```

```
print(hr['number of bedrooms'].value_counts())
```

```
number of views                            14620
condition of the house                     14620
grade of the house                         14620
Area of the house(excluding basement)      14620
Area of the basement                       14620
Built Year                                 14620
Renovation Year                            14620
Postal Code                                14620
Lattitude                                  14620
Longitude                                  14620
living_area_renov                          14620
lot_area_renov                             14620
Number of schools nearby                   14620
Distance from the airport                  14620
Price                                      14620
dtype: int64
```

Lattitude
-0.013
0.031
-0.091
0.051
-0.023
0.0046
-0.003
0.12
8.8e-05
0.11
-0.14
0.029
-0.31
1
-0.13
0.048
-0.092
0.015
0.0072
0.3

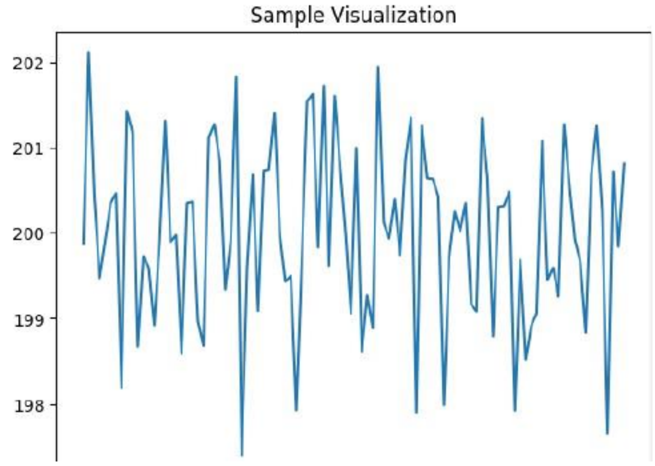
```
print(hr['number of bedrooms'].value_counts())
```

```
3     6612
4     4724
2     1844
5     1079
6      176
1      136
7       30
8       11
9        3
10       3
33       1
11       1
Name: number of bedrooms, dtype: int64
```

```
ys = 200 + np.random.randn(100)
x = [x for x in range(len(ys))]

plt.plot(x, ys, '-')
plt.fill_between(x, ys, 195, where=(ys < 195), facecolor='b', alpha=0.6)

plt.title("Sample Visualization")
plt.show()
```


Sample Visualization