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ASSIGNMENT – 2

Artificial Intelligence & Machine Learning in collaboration with Google (Applied Data Science)

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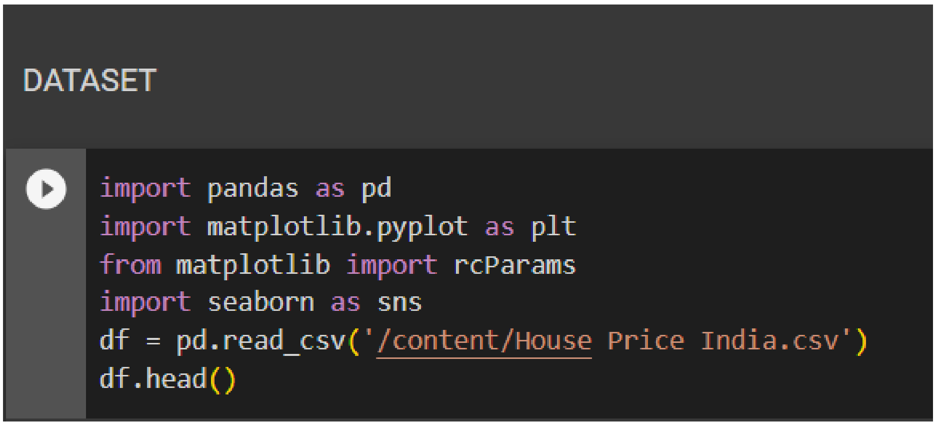
Tasks :

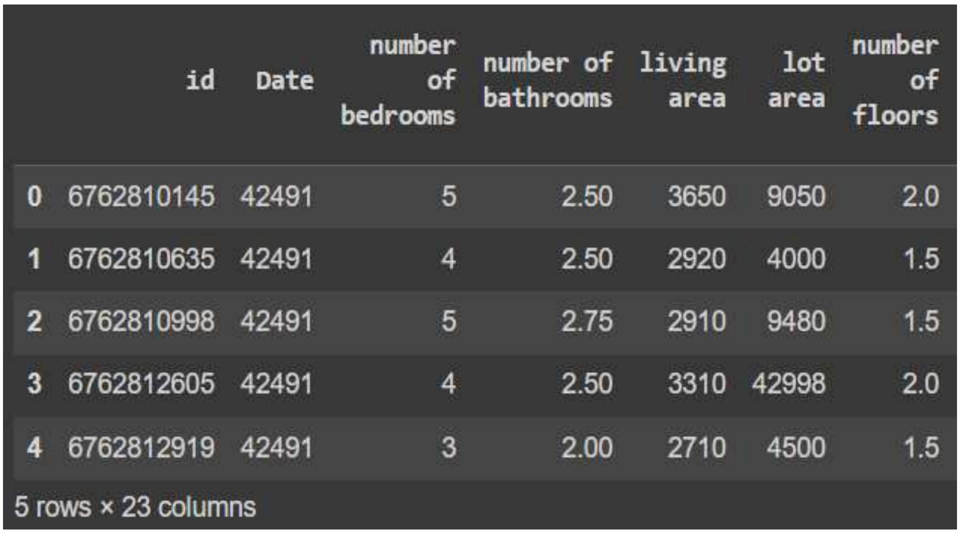
1. To download the dataset

   Dataset is downloaded – House Price India
2. Load the dataset



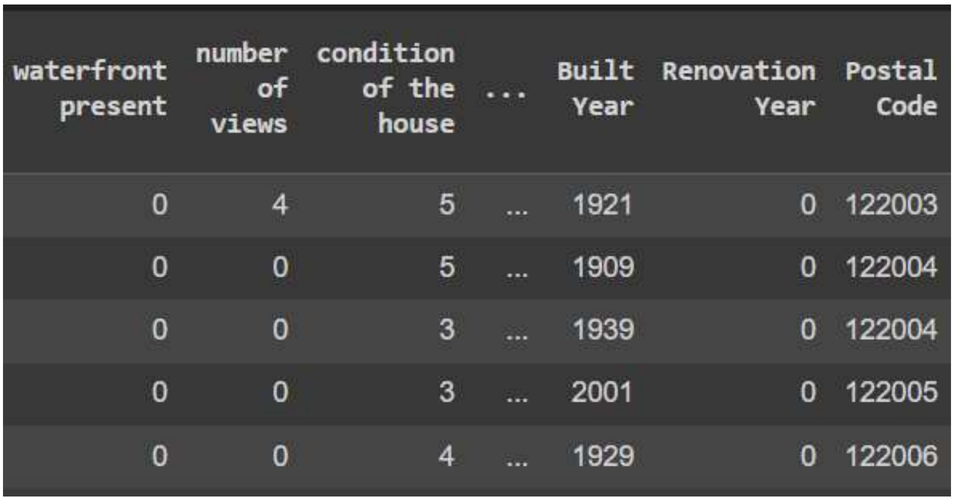
DATASET

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

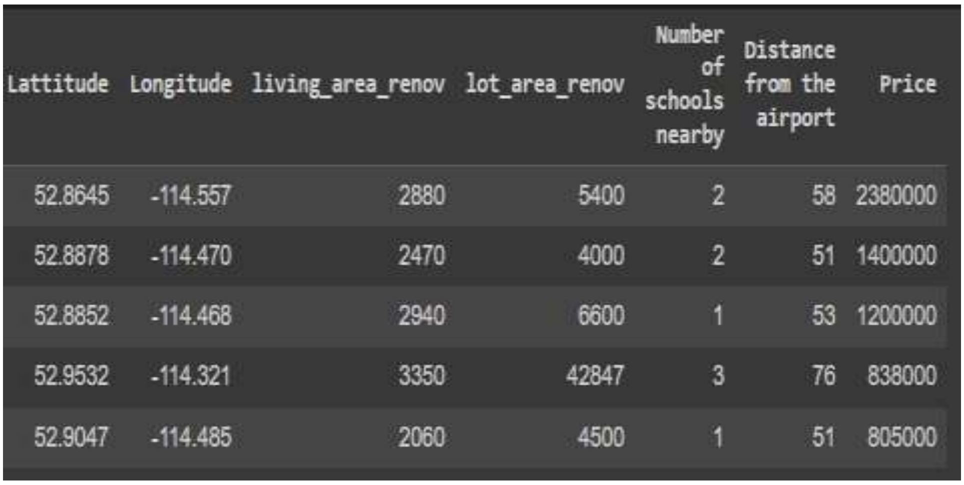


	id	Date	number of bedrooms	number of bathrooms	living area	lot area	number of floors
0	6762810145	42491	5	2.50	3650	9050	2.0
1	6762810635	42491	4	2.50	2920	4000	1.5
2	6762810998	42491	5	2.75	2910	9480	1.5
3	6762812605	42491	4	2.50	3310	42998	2.0
4	6762812919	42491	3	2.00	2710	4500	1.5

5 rows × 23 columns



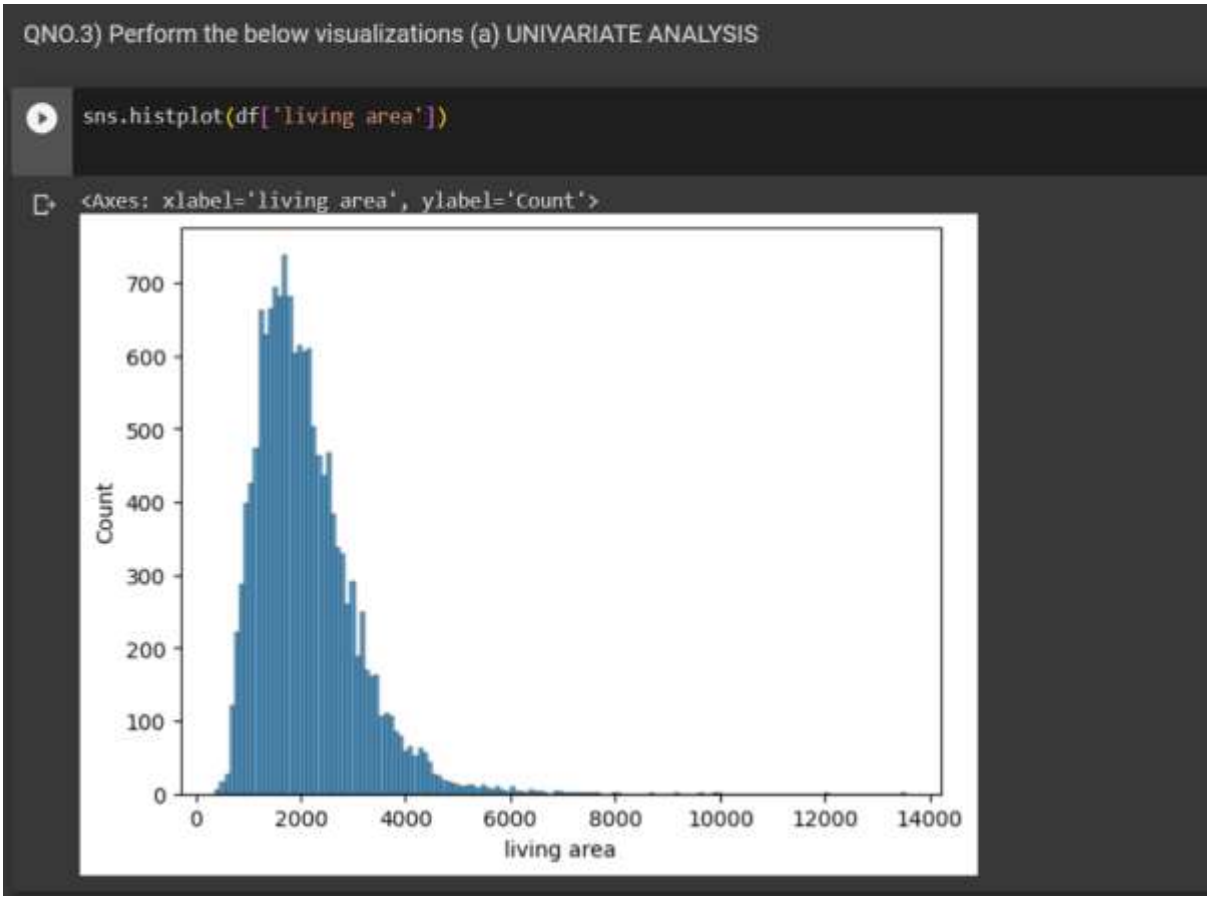
waterfront present	number of views	condition of the house	...	Built Year	Renovation Year	Postal Code
0	4	5	...	1921	0	122003
0	0	5	...	1909	0	122004
0	0	3	...	1939	0	122004
0	0	3	...	2001	0	122005
0	0	4	...	1929	0	122006



Lattitude	Longitude	living_area_renov	lot_area_renov	Number of schools nearby	Distance from the airport	Price
52.8645	-114.557	2880	5400	2	58	2380000
52.8878	-114.470	2470	4000	2	51	1400000
52.8852	-114.468	2940	6600	1	53	1200000
52.9532	-114.321	3350	42847	3	76	838000
52.9047	-114.485	2060	4500	1	51	805000

3. Perform the Below Visualizations.

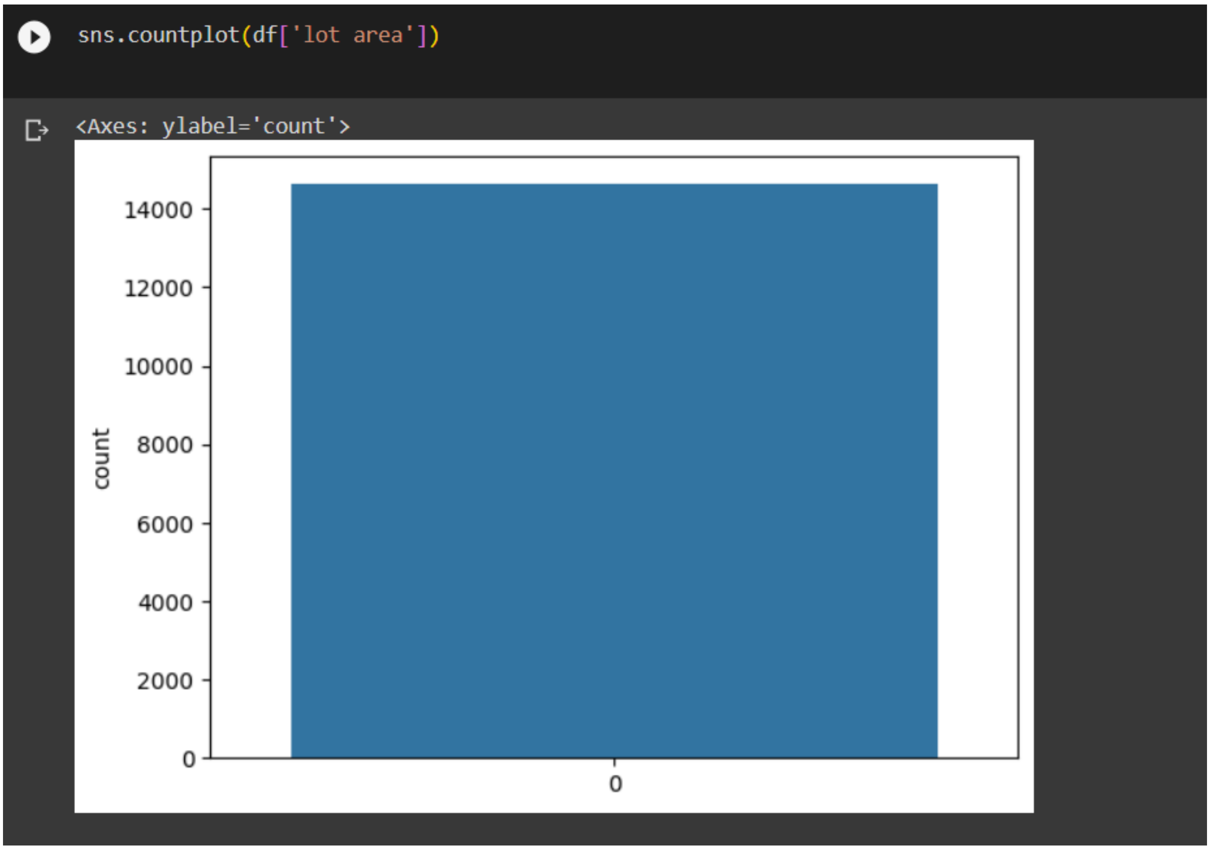
- Univariate Analysis
- Bi - Variate Analysis
- Multivariate Analysis



QNO.3) Perform the below visualizations (a) UNIVARIATE ANALYSIS

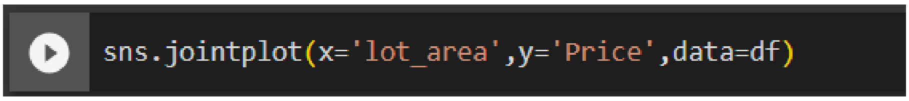
```
sns.histplot(df['living area'])
```

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

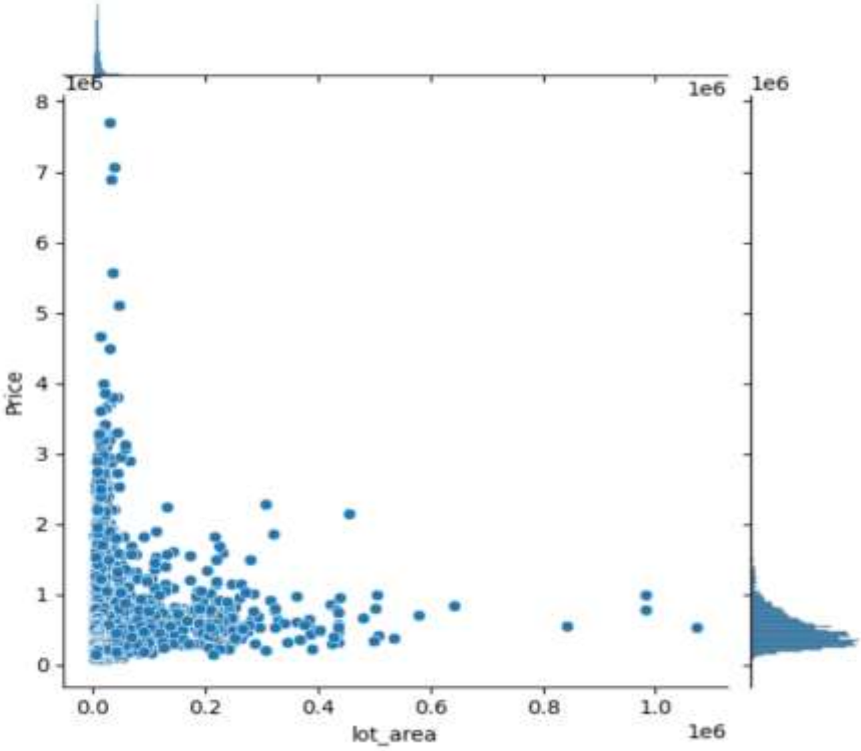


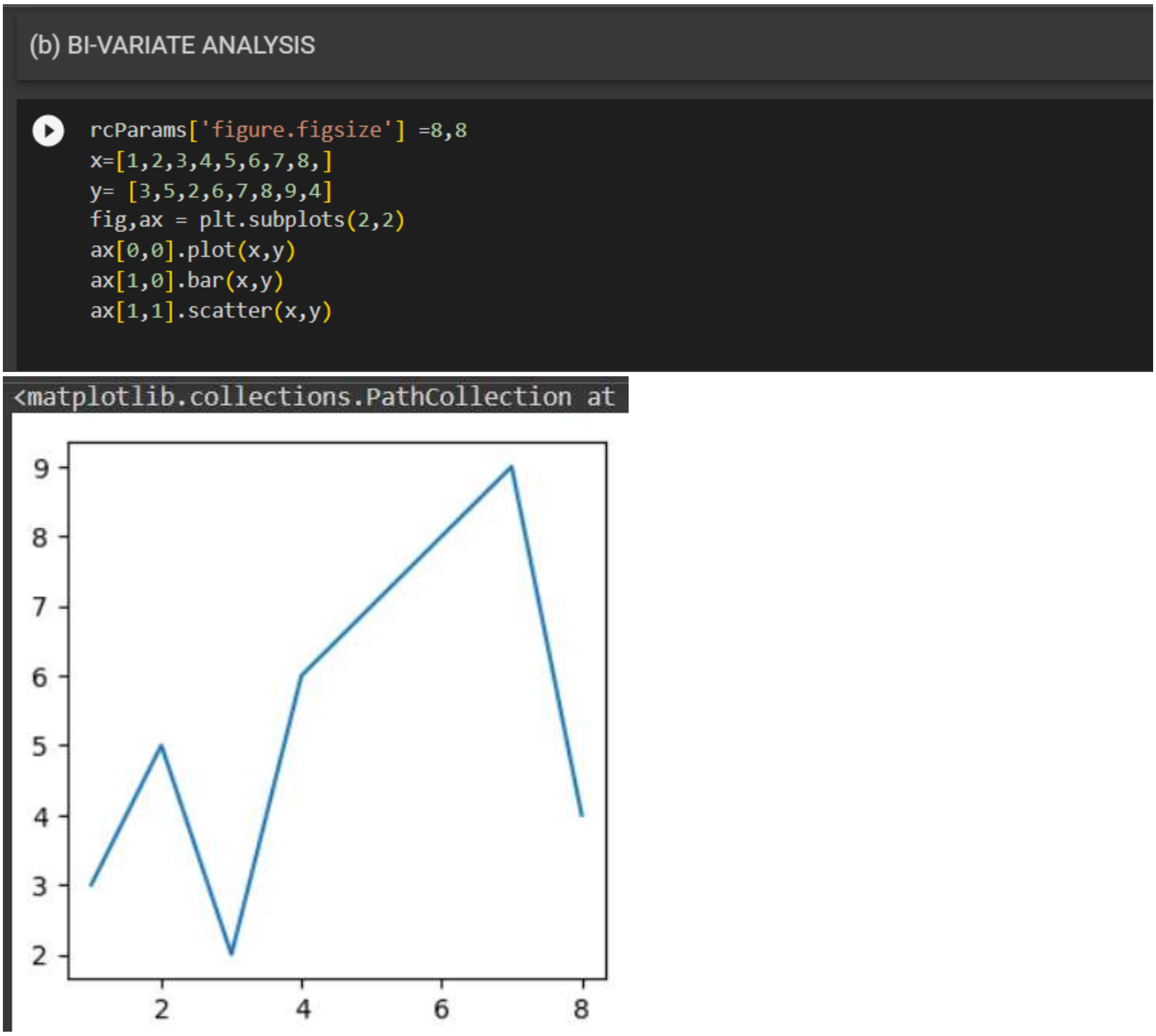
```
sns.countplot(df['lot area'])
```

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



```
sns.jointplot(x='lot_area',y='Price',data=df)
```

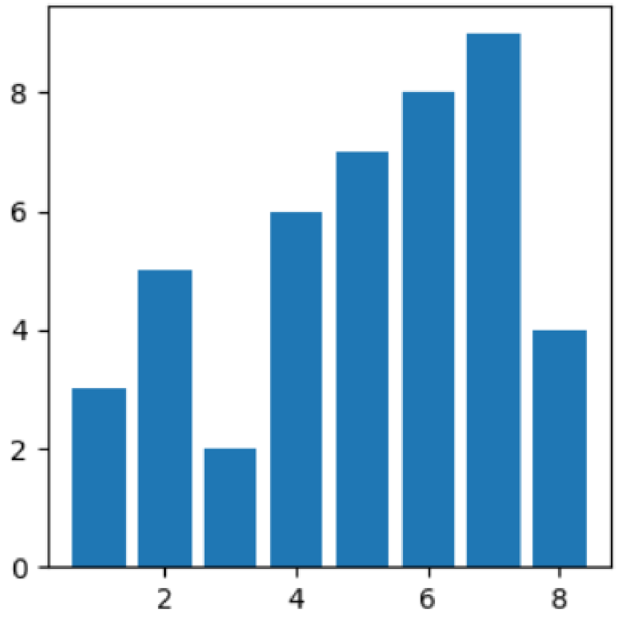


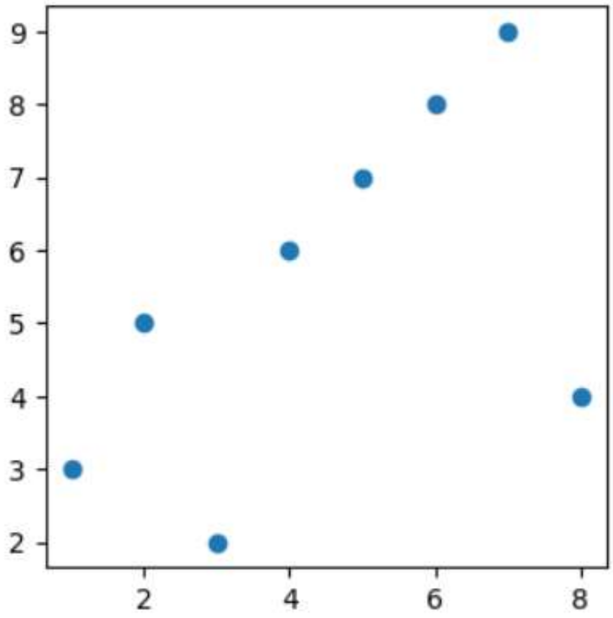


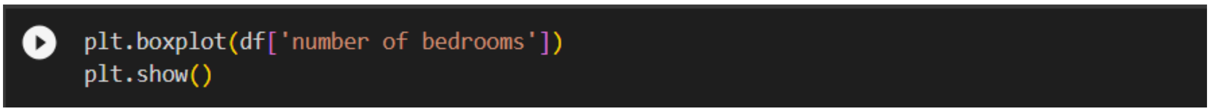
(b) BI-VARIATE ANALYSIS

```
rcParams['figure.figsize'] =8,8
x=[1,2,3,4,5,6,7,8,]
y= [3,5,2,6,7,8,9,4]
fig,ax = plt.subplots(2,2)
ax[0,0].plot(x,y)
ax[1,0].bar(x,y)
ax[1,1].scatter(x,y)
```

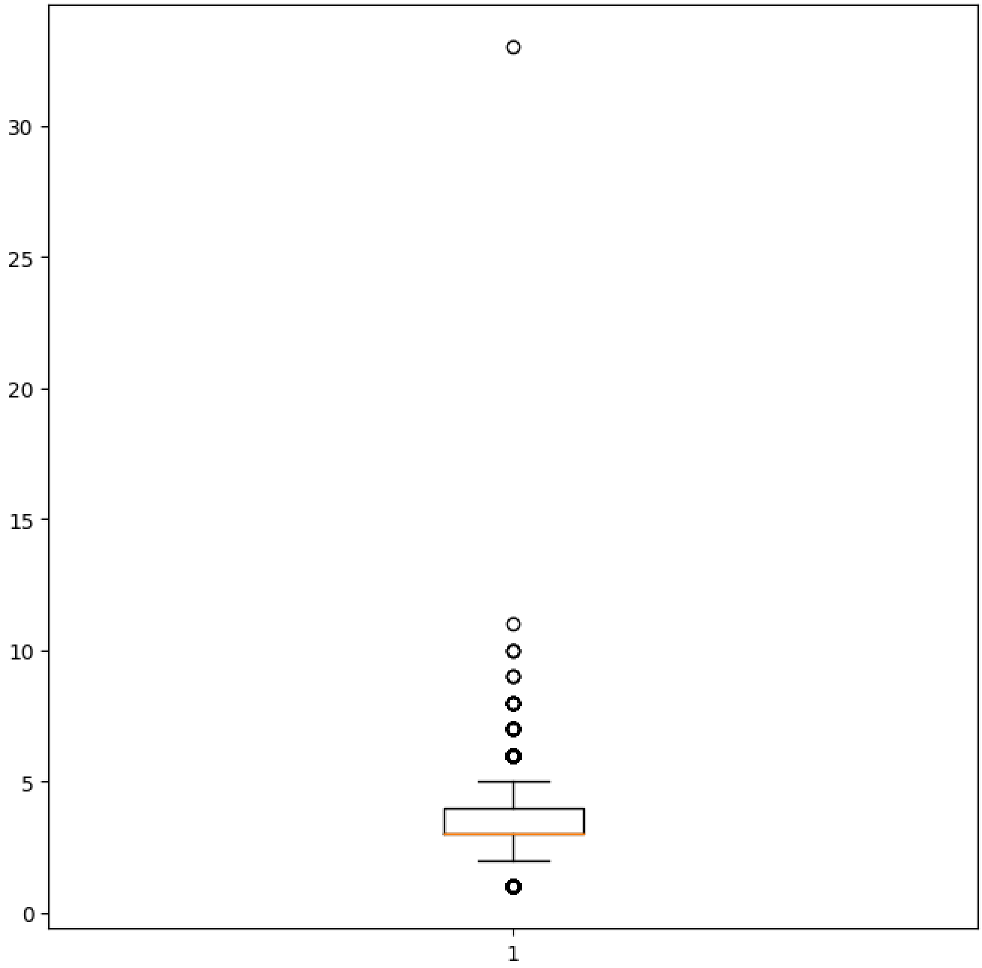
```
<matplotlib.collections.PathCollection at
```

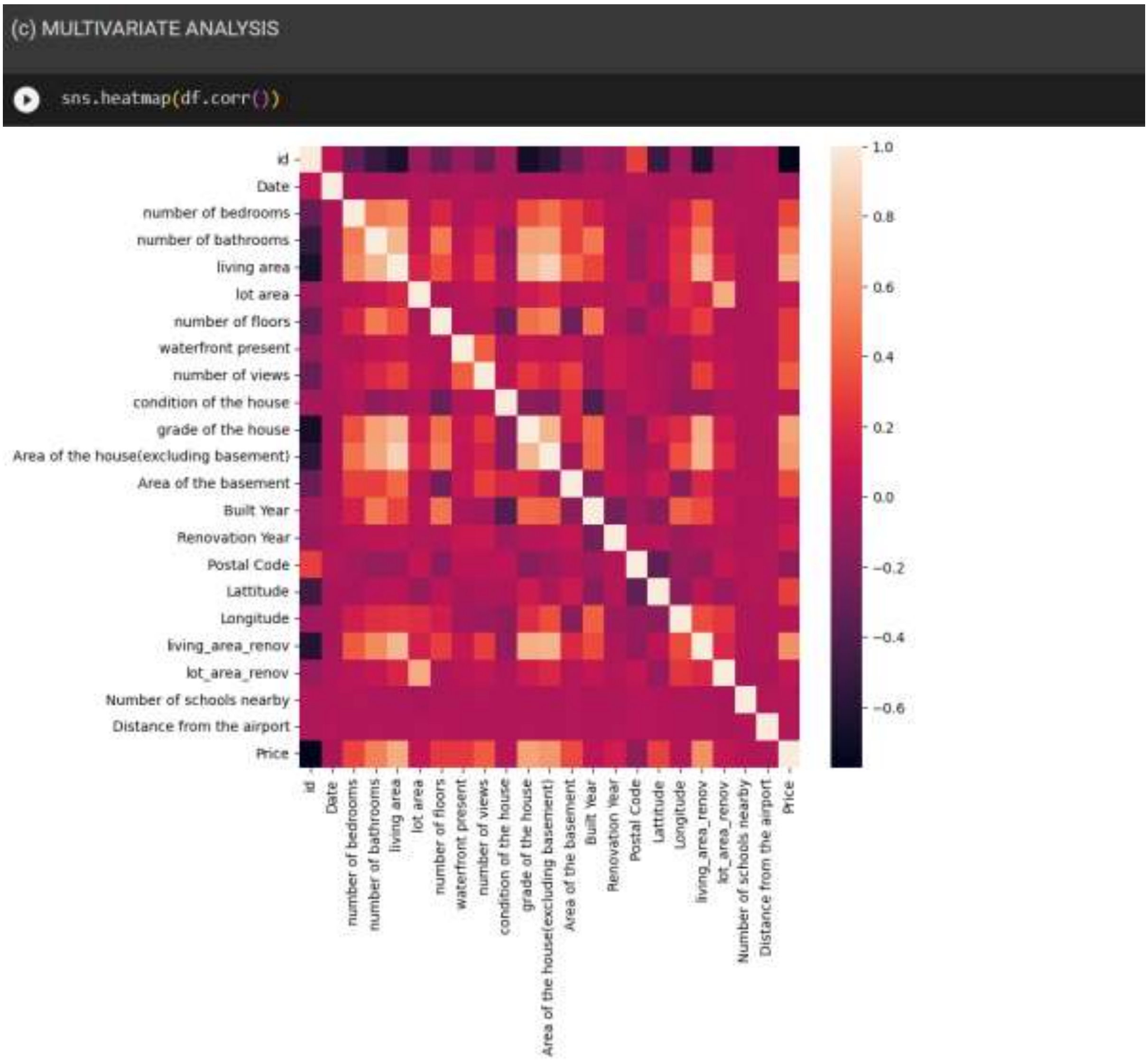

8
6
4
2
0
2
4
6
8


9
8
7
6
5
4
3
2
2
4
6
8



```
plt.boxplot(df['number of bedrooms'])
plt.show()
```

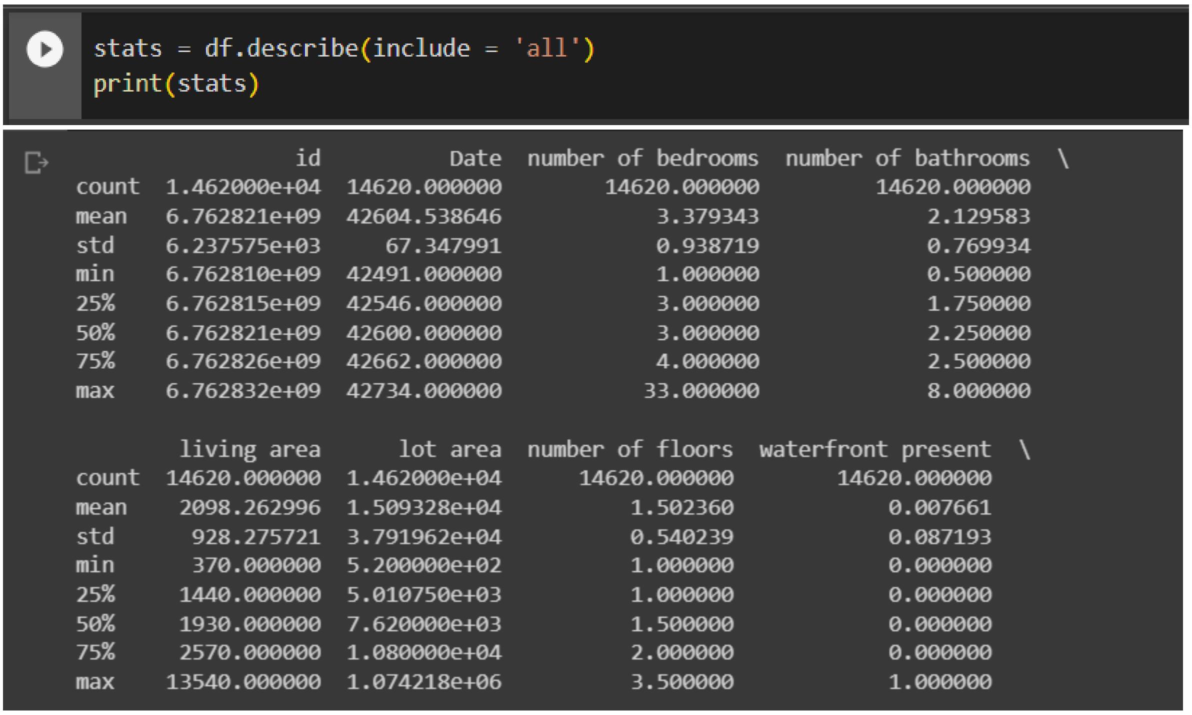




(c) MULTIVARIATE ANALYSIS

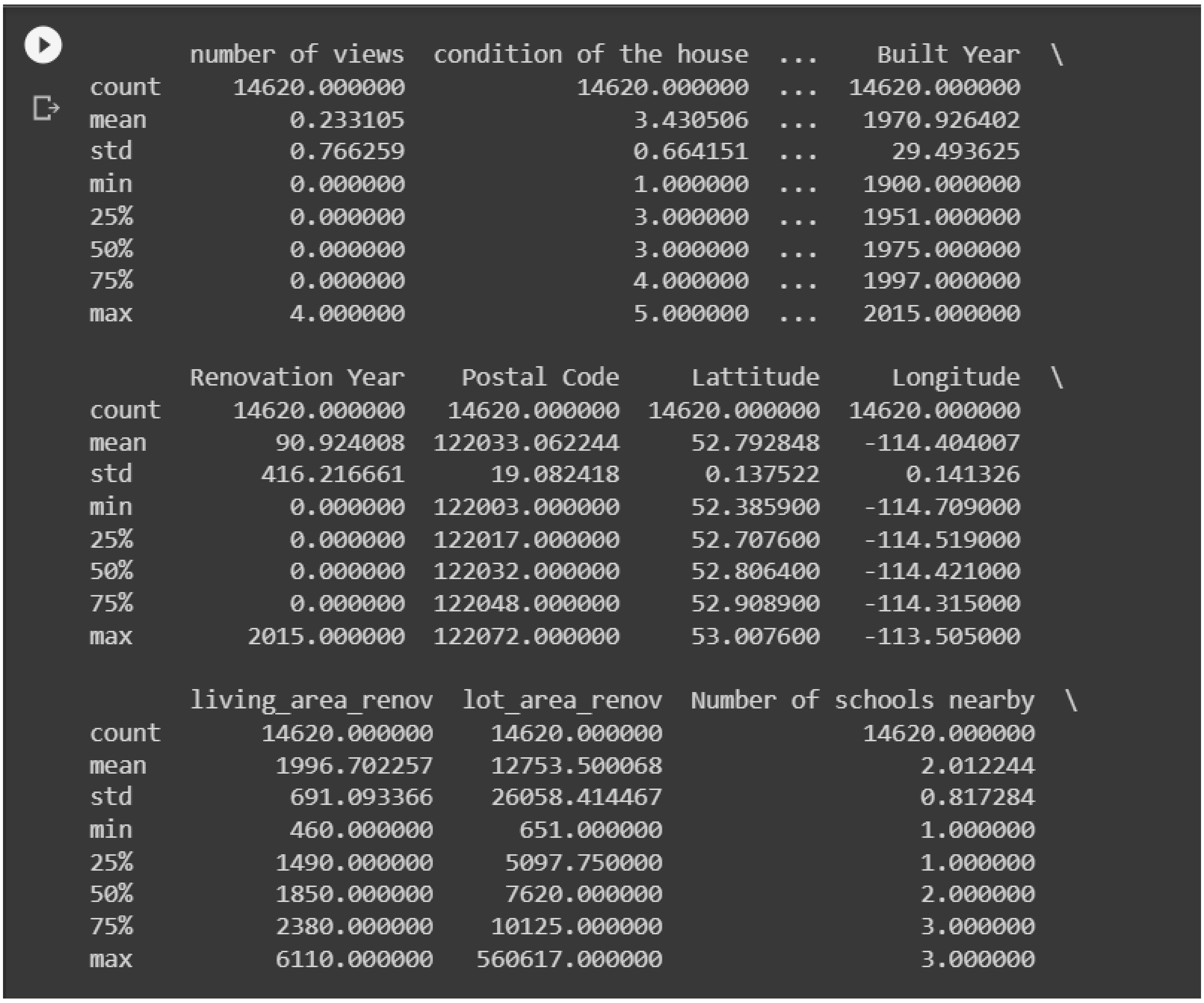
```
sns.heatmap(df.corr())
```

4. Perform descriptive statistics on the dataset.

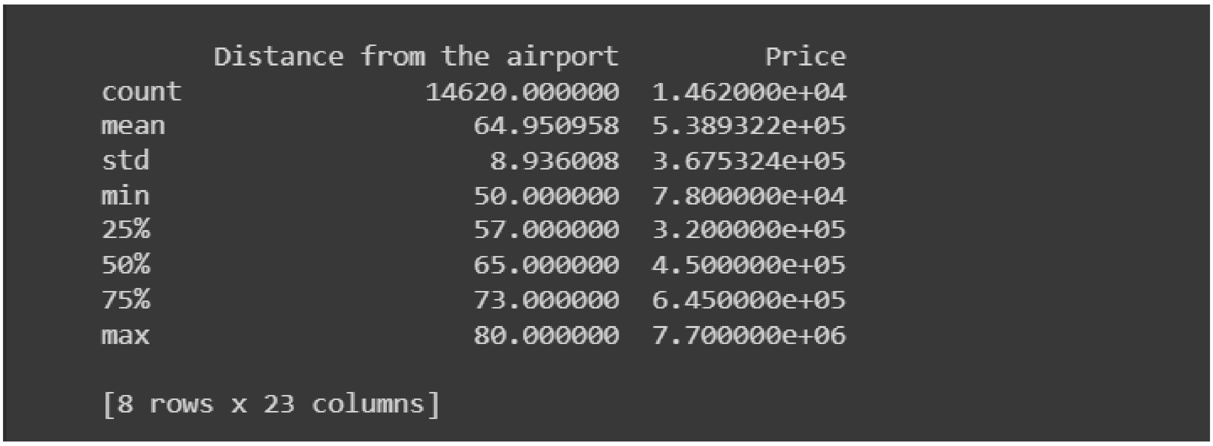


```
stats = df.describe(include = 'all')
print(stats)
```

```
                 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   
```

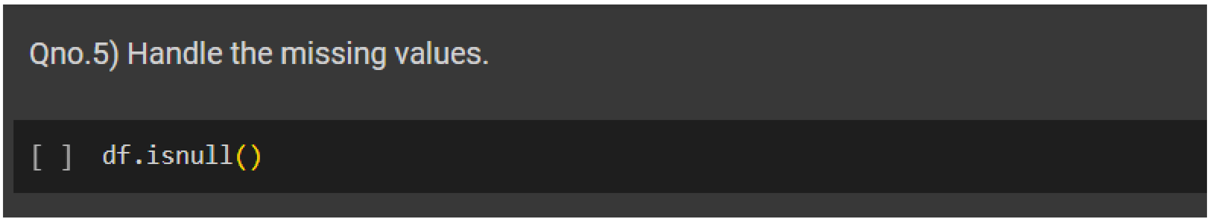


```
       number of views  condition of the house  ...    Built Year  \
count     14620.000000            14620.000000  ...  14620.000000
mean          0.233105                3.430506  ...   1970.926402
std           0.766259                0.664151  ...     29.493625
min           0.000000                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
```



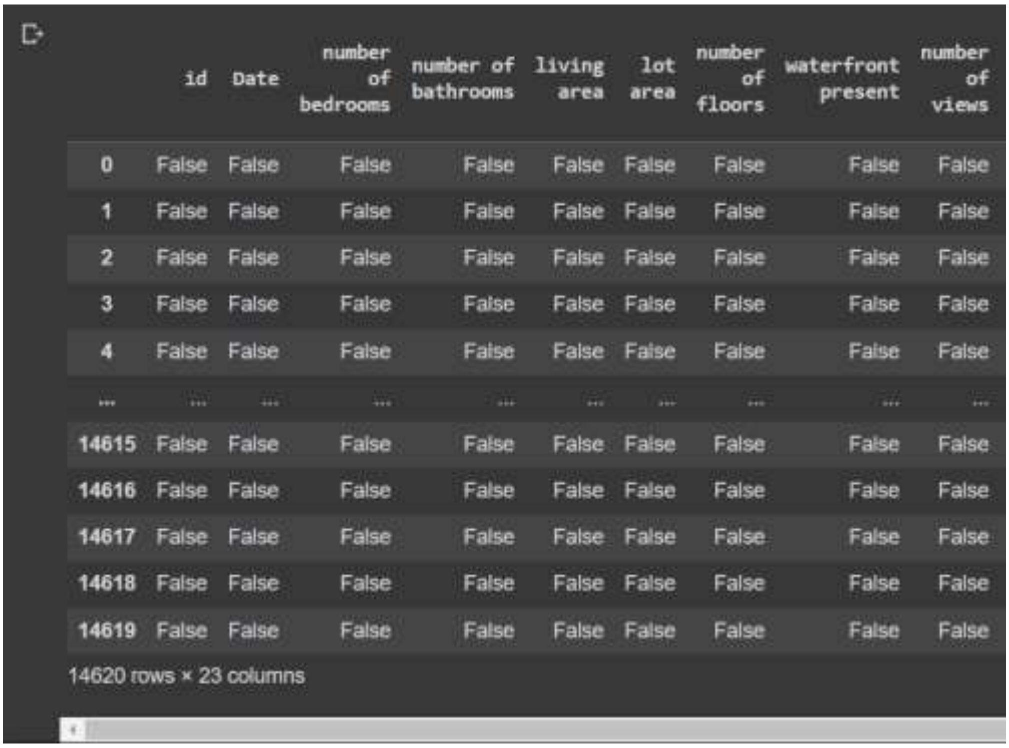
```
       Distance from the airport         Price
count               14620.000000  1.462000e+04
mean                   64.950958  5.389322e+05
std                     8.936008  3.675324e+05
min                    50.000000  7.800000e+04
25%                    57.000000  3.200000e+05
50%           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

[8 rows x 23 columns]
```

5. Handle the missing values



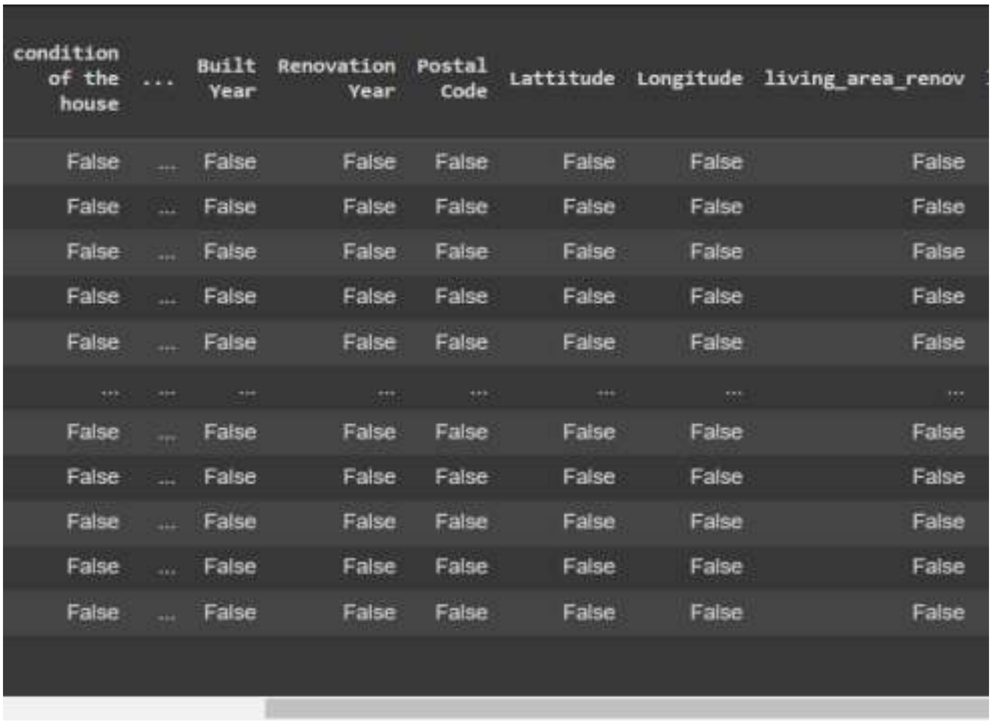
Qno.5) Handle the missing values.

```
[ ]  df.isnull()
```

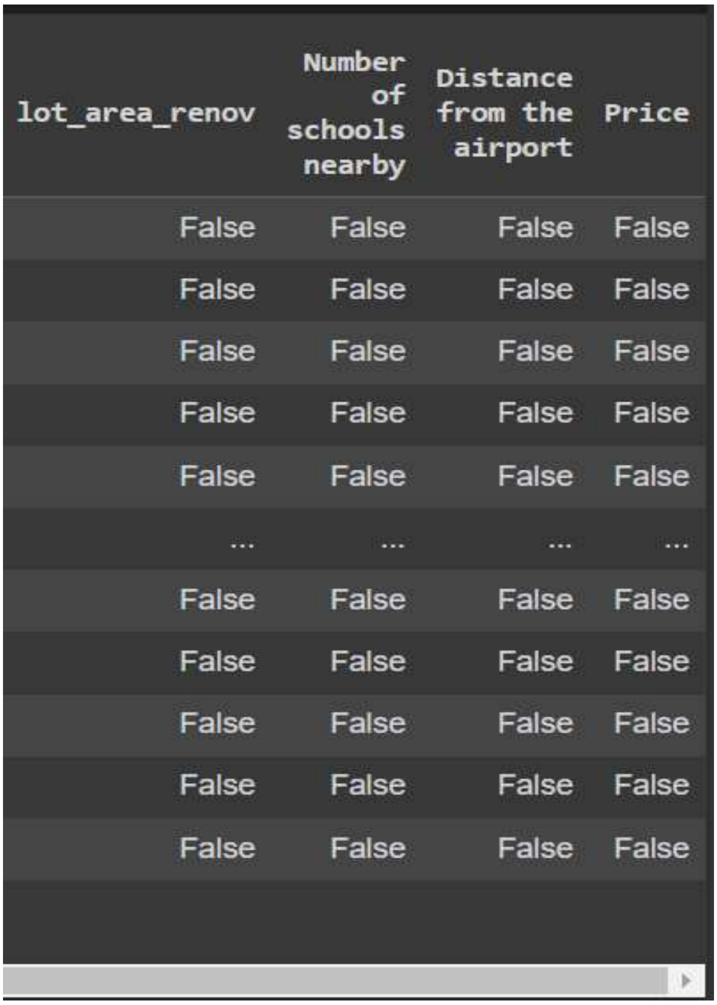


	id	Date	number of bedrooms	number of bathrooms	living area	lot area	number of floors	waterfront present	number of views
0	False	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...	...	...
14615	False	False	False	False	False	False	False	False	False
14616	False	False	False	False	False	False	False	False	False
14617	False	False	False	False	False	False	False	False	False
14618	False	False	False	False	False	False	False	False	False
14619	False	False	False	False	False	False	False	False	False

14620 rows × 23 columns



condition of the house	...	Built Year	Renovation Year	Postal Code	Lattitude	Longitude	living_area_renov
False	...	False	False	False	False	False	False
False	...	False	False	False	False	False	False
False	...	False	False	False	False	False	False
False	...	False	False	False	False	False	False
False	...	False	False	False	False	False	False
...	...	...	...	...	...	...	...
False	...	False	False	False	False	False	False
False	...	False	False	False	False	False	False
False	...	False	False	False	False	False	False
False	...	False	False	False	False	False	False
False	...	False	False	False	False	False	False



lot_area_renov	Number of schools nearby	Distance from the airport	Price
False	False	False	False
False	False	False	False
False	False	False	False
False	False	False	False
False	False	False	False
...	...	...	...
False	False	False	False
False	False	False	False
False	False	False	False
False	False	False	False
False	False	False	False