City-wise Apartment's Data Analysis

EDA

.EDA stands for Exploratory Data Analysis.

.EDA is an approach to analyze the data using visual techniques. It is used to discover trends, patterns, or to check assumptions with the help of statistical summary and graphical representations.

In [ ]:

Web-Scraping

Web scraping is an automatic method to obtain large amounts of data from websites. Most of this data is unstructured data in an HTML format which is then converted into structured data in a spreadsheet or a database so that it can be used in various applications.

In [ ]:

Problem Statements:

1. In which city we can buy an apartment in average price
2. Which owner have more apartments
3. Which Construction Status is More
4. Which type of Bhk is more
5. Which type of Bhk are more price

In [1]:

```python
import requests
from bs4 import BeautifulSoup
import re
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings("ignore")
```

Web-Scraping

In [2]:

```python
url="https://www.makaan.com/hyderabad-residential-property/buy-property-in-hyderabad-city"
response=requests.get(url)
response
```

```
Out[2]:

<Response [200]>

In [3]:

soup=BeautifulSoup(response.text,"html")
# print(soup.prettify())               # It Show the html code of the website.
```

Data Collection

```
In [4]:

city=["Bhubaneswar","Cuttack","Bangalore","Delhi","Mumbai","nagpur","bhopal","indore","pu
ne","visakhapatnam","chennai","coimbatore","chandigarh","noida","allahabad","surat","gur
gaon","varanasi","dehradun","faridabad","nashik","mysore","patna","lucknow","agra"]

In [5]:

city

Out[5]:

['Bhubaneswar',
 'Cuttack',
 'Bangalore',
 'Delhi',
 'Mumbai',
 'nagpur',
 'bhopal',
 'indore',
 'pune',
 'visakhapatnam',
 'chennai',
 'coimbatore',
 'chandigarh',
 'noida',
 'allahabad',
 'surat',
 'gurgaon',
 'varanasi',
 'dehradun',
 'faridabad',
 'nashik',
 'mysore',
 'patna',
 'lucknow',
 'agra']

In [ ]:



In [6]:

owner=[]
no_bhk=[]
citt=[]
loca=[]
pri=[]
psrf=[]
tsff=[]
cst=[]
# poss=[]
```

```python
for i in city:
    url="https://www.makaan.com/"+i+"-residential-property/buy-property-in-"+i+"-city"
    response=requests.get(url)
    soup=BeautifulSoup(response.text,"html")

    #Owner Info
    own=soup.find_all("span",attrs={"class":"seller-type"}) # Seller

    for o in own:
        owner.append(o.text)

    #No of BHK
    bhk=soup.find_all("a",attrs={"class":"typelink"}) #BHk

    for b in bhk:
        no_bhk.append(b.span.text)


    #Locality Info
    loc=soup.find_all("span",attrs={"itemprop":"addressLocality"}) #Locality

    for l in loc:
        loca.append(l.text)


    #City Info
    cit=soup.find_all("span",attrs={"class":"cityName"}) #Locality

    for l in cit:
        citt.append(l.text)




    #Price
    pr=soup.find_all("div",attrs={"data-type":"price-link"}) #price

    for p in pr:
        pri.append(p.text)


    #price/squarefeet Info
    ps=soup.find_all("td",attrs={"class":"lbl rate"}) # price/squarefeet
    psf=[]
    for pf in ps:
        psf.append(pf.text)

    for q in psf:
        q1=q.replace(" / sq ft","")
        psrf.append(q1)

    #Total Squarefeet Info
    ts=soup.find_all("td",attrs={"class":"size"}) # Total Squarefeet
    tsf=[]
    for t in ts:
        tsf.append(t.text)

    for t1 in tsf:
        f=float(t1)
        tsff.append(f)

    #Construction Status Info
    cs=soup.find_all("td",attrs={"class":"val"}) # Construction Status

    for c in cs:
        cst.append(c.text)
```

In [7]:

```python
df1=pd.DataFrame({"Owner":owner,
                "No_Bhk":no_bhk,
```

```
                "City":citt,
            "locality":loca,
            "Price(in Lakh)":pri,
            "price/squarefeet":psrf,
            "Total Squarefeet":tsff,
            "Construction Status":cst


        })
```

In [8]:

```
df1  # This the Raw Dataset
```

Out[8]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
0	VERIFIED OWNER	4	Bhubaneswar	Balianta	66 L	2,933	2250.0	Ready to move
1	VERIFIED OWNER	3	Bhubaneswar	Rasulgarh	93.96 L	5,400	1740.0	Under Construction
2	VERIFIED OWNER	2	Bhubaneswar	Bhagawanpur	47 L	4,700	1000.0	Under Construction
3	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	85 L	5,000	1700.0	Ready to move
4	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	80 L	4,369	1831.0	Ready to move
...	...	...	...	...	...	...	...	...
495	VERIFIED OWNER	3	Agra	Shastripuram	82 L	9,213	890.0	Ready to move
496	VERIFIED OWNER	Residential Plot	Agra	Shastripuram	4.41 L	1,037	425.0	Resale
497	BUILDER	Residential Plot	Agra	Rohta	6.5 L	722	900.0	New
498	BUILDER	Residential Plot	Agra	Agra Cantt	7.5 L	833	900.0	New
499	BUILDER	Residential Plot	Agra	Agra Cantonment Road	7.5 L	833	900.0	New

500 rows × 8 columns

In [9]:

```
print(len(owner))
```

500

In [10]:

```
print(len(no_bhk))
```

500

In [11]:

```
print(len(loca))
```

500

In [12]:

```
print(len(pri))
```

500

500

In [13]:

```
print(len(psrf))
```

500

In [14]:

```
print(len(tsff))
```

500

In [15]:

```
print(len(cst))
```

500

In [16]:

```
df1.dtypes
```

Out[16]:

```
Owner                 object
No_Bhk                object
City                  object
locality              object
Price(in Lakh)        object
price/squarefeet      object
Total Squarefeet      float64
Construction Status   object
dtype: object
```

In [17]:

```
df1["No_Bhk"].value_counts()
```

Out[17]:

```
3                 149
Residential Plot  131
2                 128
4                  47
1                  29
5                   8
6                   4
10                  2
7                   1
9                   1
Name: No_Bhk, dtype: int64
```

In [18]:

```
df1["No_Bhk"].replace("[a-z]",np.nan,regex=True,inplace=True)
```

In [19]:

```
df1
```

Out[19]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
0	VERIFIED OWNER	4	Bhubaneswar	Balianta	66 L	2,933	2250.0	Ready to move
1	VERIFIED OWNER	3	Bhubaneswar	Rasulgarh	93.96 L	5,400	1740.0	Under Construction
	VERIFIED							Under

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
2	VERIFIED OWNER	2	Bhubaneswar	Bhagawanpur	47 L	4,700	1000.0	Under Construction
3	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	85 L	5,000	1700.0	Ready to move
4	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	80 L	4,369	1831.0	Ready to move
...	...	...	...	...	...	...	...	...
495	VERIFIED OWNER	3	Agra	Shastripuram	82 L	9,213	890.0	Ready to move
496	VERIFIED OWNER	NaN	Agra	Shastripuram	4.41 L	1,037	425.0	Resale
497	BUILDER	NaN	Agra	Rohta	6.5 L	722	900.0	New
498	BUILDER	NaN	Agra	Agra Cantt	7.5 L	833	900.0	New
499	BUILDER	NaN	Agra	Agra Cantonment Road	7.5 L	833	900.0	New

500 rows × 8 columns

In [20]:

```
df1["No_Bhk"].isna().sum()
```

Out[20]:

```
131
```

In [21]:

```
df1["No_Bhk"].value_counts()
```

Out[21]:

```
3      149
2      128
4       47
1       29
5        8
6        4
10       2
7        1
9        1
Name: No_Bhk, dtype: int64
```

In [22]:

```
df1.columns
```

Out[22]:

```
Index(['Owner', 'No_Bhk', 'City', 'locality', 'Price(in Lakh)',
       'price/squarefeet', 'Total Squarefeet', 'Construction Status'],
      dtype='object')
```

In [23]:

```
df1["price/squarefeet"]
```

Out[23]:

```
0      2,933
1      5,400
2      4,700
3      5,000
4      4,369
       ...
495    9,213
496    1,037
497      722
498      833
```

```
499       833
Name: price/squarefeet, Length: 500, dtype: object
```

In [24]:

```python
df1["price/squarefeet"].replace("[,]","",regex=True).astype("int")
```

Out[24]:

```
0       2933
1       5400
2       4700
3       5000
4       4369
        ...
495     9213
496     1037
497      722
498      833
499      833
Name: price/squarefeet, Length: 500, dtype: int32
```

In [25]:

```python
df1["price/squarefeet"]=df1["price/squarefeet"].replace("[,]","",regex=True).astype("int"
)
```

In [26]:

```python
df1
```

Out[26]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
0	VERIFIED OWNER	4	Bhubaneswar	Balianta	66 L	2933	2250.0	Ready to move
1	VERIFIED OWNER	3	Bhubaneswar	Rasulgarh	93.96 L	5400	1740.0	Under Construction
2	VERIFIED OWNER	2	Bhubaneswar	Bhagawanpur	47 L	4700	1000.0	Under Construction
3	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	85 L	5000	1700.0	Ready to move
4	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	80 L	4369	1831.0	Ready to move
...	...	...	...	...	...	...	...	...
495	VERIFIED OWNER	3	Agra	Shastripuram	82 L	9213	890.0	Ready to move
496	VERIFIED OWNER	NaN	Agra	Shastripuram	4.41 L	1037	425.0	Resale
497	BUILDER	NaN	Agra	Rohta	6.5 L	722	900.0	New
498	BUILDER	NaN	Agra	Agra Cantt	7.5 L	833	900.0	New
499	BUILDER	NaN	Agra	Agra Cantonment Road	7.5 L	833	900.0	New

500 rows × 8 columns

In [27]:

```python
df1["No_Bhk"].fillna(method="ffill",inplace=True)
```

In [28]:

```python
df1["No_Bhk"].isna().sum()
```

0

In [29]:

```
df1["No_Bhk"].astype("int")
```

Out[29]:

```
0      4
1      3
2      2
3      3
4      3
      ..
495    3
496    3
497    3
498    3
499    3
Name: No_Bhk, Length: 500, dtype: int32
```

In [30]:

```
df1["No_Bhk"]=df1["No_Bhk"].astype("int")
```

In [31]:

```
df1
```

Out[31]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
0	VERIFIED OWNER	4	Bhubaneswar	Balianta	66 L	2933	2250.0	Ready to move
1	VERIFIED OWNER	3	Bhubaneswar	Rasulgarh	93.96 L	5400	1740.0	Under Construction
2	VERIFIED OWNER	2	Bhubaneswar	Bhagawanpur	47 L	4700	1000.0	Under Construction
3	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	85 L	5000	1700.0	Ready to move
4	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	80 L	4369	1831.0	Ready to move
...	...	...	...	...	...	...	...	...
495	VERIFIED OWNER	3	Agra	Shastripuram	82 L	9213	890.0	Ready to move
496	VERIFIED OWNER	3	Agra	Shastripuram	4.41 L	1037	425.0	Resale
497	BUILDER	3	Agra	Rohta	6.5 L	722	900.0	New
498	BUILDER	3	Agra	Agra Cantt	7.5 L	833	900.0	New
499	BUILDER	3	Agra	Agra Cantonment Road	7.5 L	833	900.0	New

500 rows × 8 columns

In [ ]:

In [32]:

```
df1["Price(in Lakh)"]
```

Out[32]:

```
0          66 L
1       93.96 L
2          47 L
3          85 L
4          80 L
          ...
495         82 L
496       4.41 L
497        6.5 L
498        7.5 L
499        7.5 L
Name: Price(in Lakh), Length: 500, dtype: object
```

In [33]:

```python
e=[]
for i in df1["Price(in Lakh)"]:
    if i.endswith("r"):
        x=i.replace("Cr"," ")
        b=float(x)*100
        e.append(b)
    else:
        c=i.replace("L","")
        e.append(float(c))
```

In [ ]:

In [34]:

```python
df1["Price(in Lakh)"]=pd.Series(e)
```

In [35]:

```python
df1
```

Out[35]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
0	VERIFIED OWNER	4	Bhubaneswar	Balianta	66.00	2933	2250.0	Ready to move
1	VERIFIED OWNER	3	Bhubaneswar	Rasulgarh	93.96	5400	1740.0	Under Construction
2	VERIFIED OWNER	2	Bhubaneswar	Bhagawanpur	47.00	4700	1000.0	Under Construction
3	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	85.00	5000	1700.0	Ready to move
4	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	80.00	4369	1831.0	Ready to move
...	...	...	...	...	...	...	...	...
495	VERIFIED OWNER	3	Agra	Shastripuram	82.00	9213	890.0	Ready to move
496	VERIFIED OWNER	3	Agra	Shastripuram	4.41	1037	425.0	Resale
497	BUILDER	3	Agra	Rohta	6.50	722	900.0	New
498	BUILDER	3	Agra	Agra Cantt	7.50	833	900.0	New
499	BUILDER	3	Agra	Agra Cantonment Road	7.50	833	900.0	New

500 rows × 8 columns

```
df1["Price(in Lakh)"]=np.round(df1["Price(in Lakh)"])
```

In [37]:

```
df1
```

Out[37]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
0	VERIFIED OWNER	4	Bhubaneswar	Balianta	66.0	2933	2250.0	Ready to move
1	VERIFIED OWNER	3	Bhubaneswar	Rasulgarh	94.0	5400	1740.0	Under Construction
2	VERIFIED OWNER	2	Bhubaneswar	Bhagawanpur	47.0	4700	1000.0	Under Construction
3	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	85.0	5000	1700.0	Ready to move
4	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	80.0	4369	1831.0	Ready to move
...	...	...	...	...	...	...	...	...
495	VERIFIED OWNER	3	Agra	Shastripuram	82.0	9213	890.0	Ready to move
496	VERIFIED OWNER	3	Agra	Shastripuram	4.0	1037	425.0	Resale
497	BUILDER	3	Agra	Rohta	6.0	722	900.0	New
498	BUILDER	3	Agra	Agra Cantt	8.0	833	900.0	New
499	BUILDER	3	Agra	Agra Cantonment Road	8.0	833	900.0	New

500 rows × 8 columns

In [38]:

```
df1.dtypes
```

Out[38]:

```
Owner                object
No_Bhk                int32
City                 object
locality             object
Price(in Lakh)      float64
price/squarefeet      int32
Total Squarefeet    float64
Construction Status  object
dtype: object
```

Data Cleaning

NaN Value

In [39]:

```
df1.isna().sum()
```

Out[39]:

```
Owner          0
No_Bhk         0
City           0
```

```
locality                0
Price(in Lakh)          0
price/squarefeet        0
Total Squarefeet        0
Construction Status     0
dtype: int64
```

Outlier Detection

In [ ]:

In [40]:

```python
sn=df1[["No_Bhk","Price(in Lakh)","price/squarefeet","Total Squarefeet"]] # Store all the
numerical columns in an another variables.
```
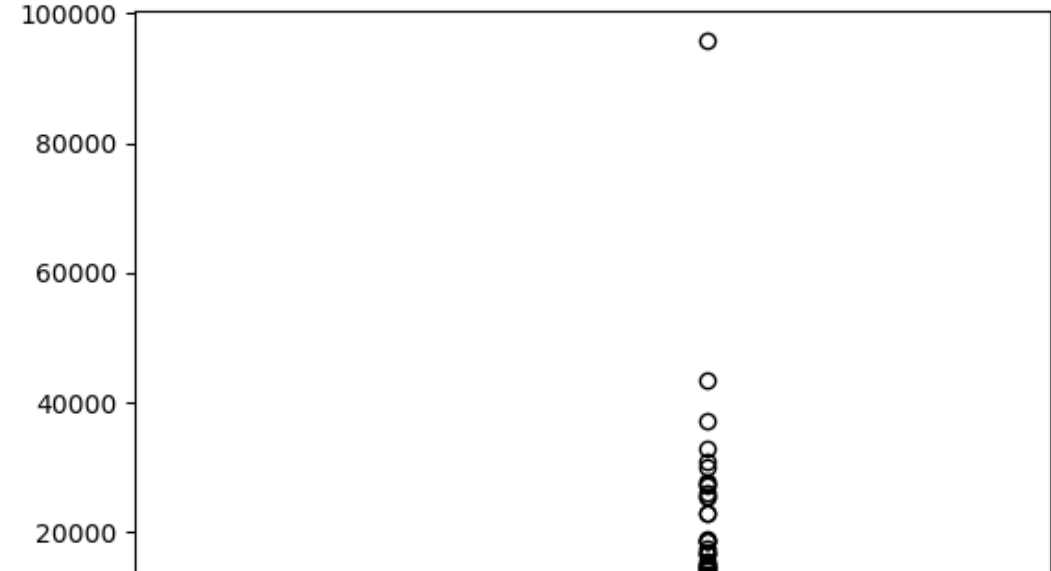
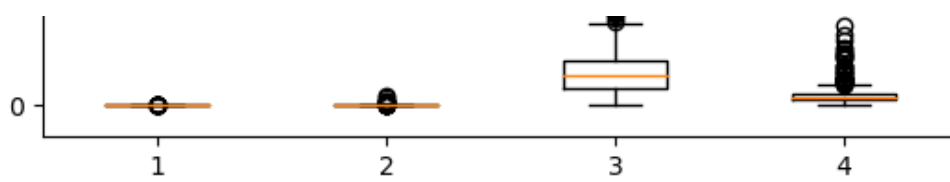In [41]:

```python
sn
```

Out[41]:

	No_Bhk	Price(in Lakh)	price/squarefeet	Total Squarefeet
0	4	66.0	2933	2250.0
1	3	94.0	5400	1740.0
2	2	47.0	4700	1000.0
3	3	85.0	5000	1700.0
4	3	80.0	4369	1831.0
...	...	...	...	...
495	3	82.0	9213	890.0
496	3	4.0	1037	425.0
497	3	6.0	722	900.0
498	3	8.0	833	900.0
499	3	8.0	833	900.0

500 rows × 4 columns

In [42]:

```python
plt.boxplot(sn)
plt.show()
```
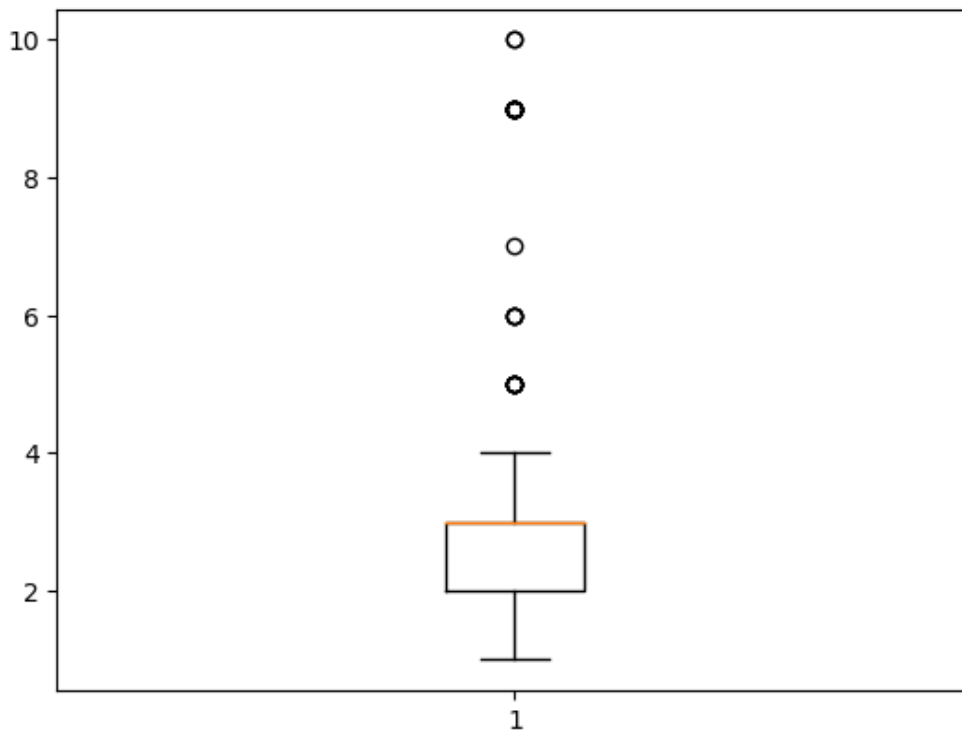
```
In [43]:
sn.columns
```

Out[43]:

```
Index(['No_Bhk', 'Price(in Lakh)', 'price/squarefeet', 'Total Squarefeet'], dtype='object
')
```

No_Bhk

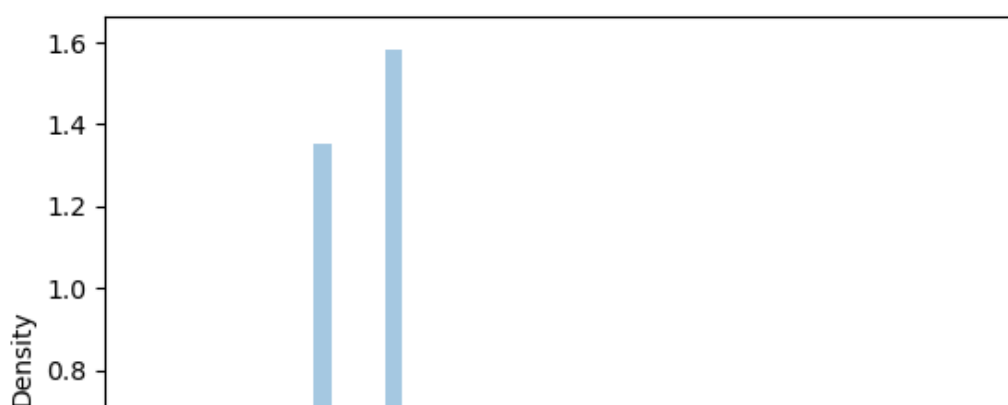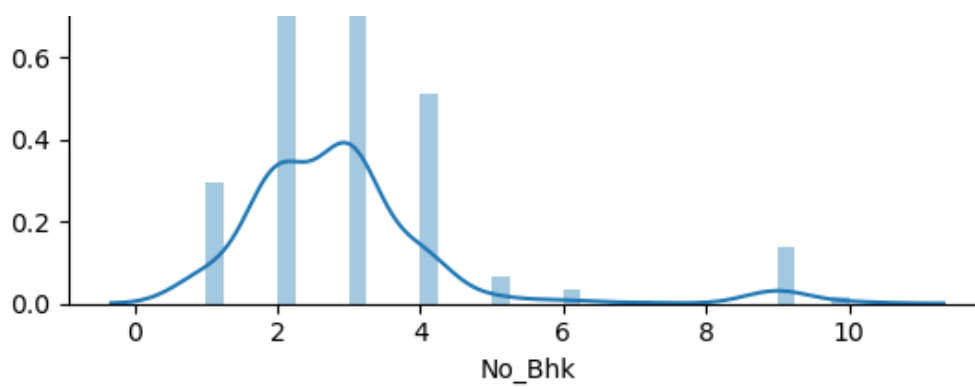In [44]:

```
plt.boxplot(df1["No_Bhk"])
plt.show()
```


In [45]:

```
sns.distplot(df1["No_Bhk"])
plt.show()
```

No_Bhk

```
df1["No_Bhk"].skew()
```

Out[46]:

2.462455224299497

```
np.round(df1["No_Bhk"].skew())
```

Out[47]:

2.0

Not Normally Distributed

IQR

```
Rule-->
    iqr = q3-q1
    Lower Limit = q1-(1.5*iqr)
    Upper Limit = q3+(1.5*iqr)
```

```
q1=df1["No_Bhk"].quantile(0.25)
```

```
q1
```

Out[49]:

2.0

```
q3=df1["No_Bhk"].quantile(0.75)
```

```
q3
```

Out[51]:

3.0

```
iqr=q3-q1
```

In [53]:

```
iqr
```

Out[53]:

```
1.0
```

In [54]:

```
Lower=q1-(1.5*iqr)
```

In [55]:

```
Lower
```

Out[55]:

```
0.5
```

In [56]:

```
Upper=q3+(1.5*iqr)
```

In [57]:

```
Upper
```

Out[57]:

```
4.5
```

In [58]:

```
df1["No_Bhk"]< Lower
```

Out[58]:

```
0      False
1      False
2      False
3      False
4      False
       ...
495    False
496    False
497    False
498    False
499    False
Name: No_Bhk, Length: 500, dtype: bool
```

In [59]:

```
df1[df1["No_Bhk"]< Lower]
```

Out[59]:

Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status

In [60]:

```
df1["No_Bhk"]>Upper
```

Out[60]:

```
0      False
1      False
2      False
3      False
4      False
       ...
495    False
496    False
```

```
497    False
498    False
499    False
Name: No_Bhk, Length: 500, dtype: bool
```

In [61]:

```
df1[df1["No_Bhk"]>Upper]
```

Out[61]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
21	AGENT	6	Cuttack	Professors Colony	250.0	6250	4000.0	Ready to move
83	BUILDER	5	Mumbai	Boisar	199.0	6813	2921.0	Under Construction
253	AGENT	5	Chandigarh	Mullanpur Garibdass	315.0	5893	5345.0	Ready to move
270	VERIFIED OWNER	5	Noida	Sector 93B	795.0	14454	5500.0	Ready to move
284	VERIFIED OWNER	6	Allahabad	Tagore town	320.0	7619	4200.0	Ready to move
308	VERIFIED OWNER	6	Surat	Nanpura	270.0	3698	7300.0	Ready to move
321	BUILDER	5	Gurgaon	Sector 22 Gurgaon	1515.0	15000	10105.0	Under Construction
339	VERIFIED OWNER	10	Gurgaon	Sector 11	280.0	3703	7560.0	Ready to move
367	VERIFIED OWNER	7	Dehradun	Dalanwala	314.0	7385	4265.0	Ready to move
368	VERIFIED OWNER	6	Dehradun	Ganesh Pur	300.0	9230	3250.0	Ready to move
370	VERIFIED OWNER	5	Dehradun	Dalanwala	199.0	6666	3000.0	Ready to move
380	BUILDER	5	Faridabad	Sector 88	198.0	9668	2048.0	Ready to move
381	BUILDER	5	Faridabad	Sector 88	198.0	9668	2048.0	Ready to move
382	BUILDER	5	Faridabad	Sector 88	195.0	9750	2000.0	Ready to move
425	VERIFIED OWNER	9	Mysore	Basavanahalli	325.0	5241	6200.0	Ready to move
426	VERIFIED OWNER	9	Mysore	Mahadeshwara Badavane Layout	70.0	5833	1200.0	Resale
427	VERIFIED OWNER	9	Mysore	Manuganahalli	13.0	1100	1200.0	Resale
428	VERIFIED OWNER	9	Mysore	Hebbal	44.0	2628	1693.0	Resale
429	VERIFIED OWNER	9	Mysore	Hootagalli	16.0	1344	1160.0	Resale
430	AGENT	9	Mysore	Bannimantap	36.0	4500	800.0	New
431	AGENT	9	Mysore	Dadadahalli	15.0	1282	1162.0	Resale
432	AGENT	9	Mysore	Ring Road	101.0	5099	2000.0	New
433	AGENT	9	Mysore	Bogadi Road	33.0	2750	1200.0	New
434	AGENT	9	Mysore	Vijayanagar	120.0	3000	4000.0	Resale
435	AGENT	9	Mysore	Karanji Layout	24.0	2000	1200.0	New

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
436	AGENT	9	Mysore	Bogadi Road	33.0	2750	1200.0	New
437	AGENT	9	Mysore	Nanjangud	82.0	4585	1799.0	Resale
438	AGENT	9	Mysore	Nanjangud	42.0	1870	2226.0	Resale
439	AGENT	9	Mysore	Bannimantap	54.0	4500	1200.0	New
440	VERIFIED OWNER	9	Patna	Chitragupta Nagar	400.0	9796	4083.0	Resale
441	VERIFIED OWNER	9	Patna	Bihta	12.0	1000	1200.0	Resale
452	VERIFIED OWNER	10	Patna	Sheikhpura	350.0	8750	4000.0	Ready to move

In [62]:

```python
df1[df1["No_Bhk"]>Upper].shape[0]
```

Out[62]:

32

In [63]:

```python
df1[(df1["No_Bhk"]< Lower) | (df1["No_Bhk"]>Upper)]
```

Out[63]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
21	AGENT	6	Cuttack	Professors Colony	250.0	6250	4000.0	Ready to move
83	BUILDER	5	Mumbai	Boisar	199.0	6813	2921.0	Under Construction
253	AGENT	5	Chandigarh	Mullanpur Garibdass	315.0	5893	5345.0	Ready to move
270	VERIFIED OWNER	5	Noida	Sector 93B	795.0	14454	5500.0	Ready to move
284	VERIFIED OWNER	6	Allahabad	Tagore town	320.0	7619	4200.0	Ready to move
308	VERIFIED OWNER	6	Surat	Nanpura	270.0	3698	7300.0	Ready to move
321	BUILDER	5	Gurgaon	Sector 22 Gurgaon	1515.0	15000	10105.0	Under Construction
339	VERIFIED OWNER	10	Gurgaon	Sector 11	280.0	3703	7560.0	Ready to move
367	VERIFIED OWNER	7	Dehradun	Dalanwala	314.0	7385	4265.0	Ready to move
368	VERIFIED OWNER	6	Dehradun	Ganesh Pur	300.0	9230	3250.0	Ready to move
370	VERIFIED OWNER	5	Dehradun	Dalanwala	199.0	6666	3000.0	Ready to move
380	BUILDER	5	Faridabad	Sector 88	198.0	9668	2048.0	Ready to move
381	BUILDER	5	Faridabad	Sector 88	198.0	9668	2048.0	Ready to move
382	BUILDER	5	Faridabad	Sector 88	195.0	9750	2000.0	Ready to move
425	VERIFIED OWNER	9	Mysore	Basavanahalli	325.0	5241	6200.0	Ready to move
426	VERIFIED OWNER	9	Mysore	Mahadeshwara Badavane Layout	70.0	5833	1200.0	Resale

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
427	VERIFIED OWNER	9	Mysore	Manuganahalli		1100	1200.0	
428	VERIFIED OWNER	9	Mysore	Hebbal	44.0	2628	1693.0	Resale
429	VERIFIED OWNER	9	Mysore	Hootagalli	16.0	1344	1160.0	Resale
430	AGENT	9	Mysore	Bannimantap	36.0	4500	800.0	New
431	AGENT	9	Mysore	Dadadahalli	15.0	1282	1162.0	Resale
432	AGENT	9	Mysore	Ring Road	101.0	5099	2000.0	New
433	AGENT	9	Mysore	Bogadi Road	33.0	2750	1200.0	New
434	AGENT	9	Mysore	Vijayanagar	120.0	3000	4000.0	Resale
435	AGENT	9	Mysore	Karanji Layout	24.0	2000	1200.0	New
436	AGENT	9	Mysore	Bogadi Road	33.0	2750	1200.0	New
437	AGENT	9	Mysore	Nanjangud	82.0	4585	1799.0	Resale
438	AGENT	9	Mysore	Nanjangud	42.0	1870	2226.0	Resale
439	AGENT	9	Mysore	Bannimantap	54.0	4500	1200.0	New
440	VERIFIED OWNER	9	Patna	Chitragupta Nagar	400.0	9796	4083.0	Resale
441	VERIFIED OWNER	9	Patna	Bihta	12.0	1000	1200.0	Resale
452	VERIFIED OWNER	10	Patna	Sheikhpura	350.0	8750	4000.0	Ready to move

Capping

In [64]:

```python
df1[(df1["No_Bhk"]< Lower) | (df1["No_Bhk"]>Upper)]
```

Out[64]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
21	AGENT	6	Cuttack	Professors Colony	250.0	6250	4000.0	Ready to move
83	BUILDER	5	Mumbai	Boisar	199.0	6813	2921.0	Under Construction
253	AGENT	5	Chandigarh	Mullanpur Garibdass	315.0	5893	5345.0	Ready to move
270	VERIFIED OWNER	5	Noida	Sector 93B	795.0	14454	5500.0	Ready to move
284	VERIFIED OWNER	6	Allahabad	Tagore town	320.0	7619	4200.0	Ready to move
308	VERIFIED OWNER	6	Surat	Nanpura	270.0	3698	7300.0	Ready to move
321	BUILDER	5	Gurgaon	Sector 22 Gurgaon	1515.0	15000	10105.0	Under Construction
339	VERIFIED OWNER	10	Gurgaon	Sector 11	280.0	3703	7560.0	Ready to move
367	VERIFIED OWNER	7	Dehradun	Dalanwala	314.0	7385	4265.0	Ready to move
368	VERIFIED OWNER	6	Dehradun	Ganesh Pur	300.0	9230	3250.0	Ready to move
370	VERIFIED OWNER	5	Dehradun	Dalanwala	199.0	6666	3000.0	Ready to move

	Owner	No_Bhk	City	Locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
380	BUILDER	5	Faridabad	Sector 88	198.0	9668	2048.0	Ready to move
381	BUILDER	5	Faridabad	Sector 88	198.0	9668	2048.0	Ready to move
382	BUILDER	5	Faridabad	Sector 88	195.0	9750	2000.0	Ready to move
425	VERIFIED OWNER	9	Mysore	Basavanahalli	325.0	5241	6200.0	Ready to move
426	VERIFIED OWNER	9	Mysore	Mahadeshwara Badavane Layout	70.0	5833	1200.0	Resale
427	VERIFIED OWNER	9	Mysore	Manuganahalli	13.0	1100	1200.0	Resale
428	VERIFIED OWNER	9	Mysore	Hebbal	44.0	2628	1693.0	Resale
429	VERIFIED OWNER	9	Mysore	Hootagalli	16.0	1344	1160.0	Resale
430	AGENT	9	Mysore	Bannimantap	36.0	4500	800.0	New
431	AGENT	9	Mysore	Dadadahalli	15.0	1282	1162.0	Resale
432	AGENT	9	Mysore	Ring Road	101.0	5099	2000.0	New
433	AGENT	9	Mysore	Bogadi Road	33.0	2750	1200.0	New
434	AGENT	9	Mysore	Vijayanagar	120.0	3000	4000.0	Resale
435	AGENT	9	Mysore	Karanji Layout	24.0	2000	1200.0	New
436	AGENT	9	Mysore	Bogadi Road	33.0	2750	1200.0	New
437	AGENT	9	Mysore	Nanjangud	82.0	4585	1799.0	Resale
438	AGENT	9	Mysore	Nanjangud	42.0	1870	2226.0	Resale
439	AGENT	9	Mysore	Bannimantap	54.0	4500	1200.0	New
440	VERIFIED OWNER	9	Patna	Chitragupta Nagar	400.0	9796	4083.0	Resale
441	VERIFIED OWNER	9	Patna	Bihta	12.0	1000	1200.0	Resale
452	VERIFIED OWNER	10	Patna	Sheikhpura	350.0	8750	4000.0	Ready to move

In [65]:

```
df1["No_Bhk"].map(lambda x: Lower if x<Lower else Upper if x>Upper else x)
```

Out[65]:

```
0      4.0
1      3.0
2      2.0
3      3.0
4      3.0
      ...
495    3.0
496    3.0
497    3.0
498    3.0
499    3.0
Name: No_Bhk, Length: 500, dtype: float64
```

In [66]:

```
df1["No_Bhk"]=df1["No_Bhk"].map(lambda x: Lower if x<Lower else Upper if x>Upper else x)
```

In [67]:

```
df1[(df1["No_Bhk"]< Lower) | (df1["No_Bhk"]>Upper)]
```

Out[67]:

Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status

In [68]:

```python
df1["No_Bhk"]=df1["No_Bhk"].astype("int")
```

In [69]:

```python
df1["No_Bhk"].unique()
```
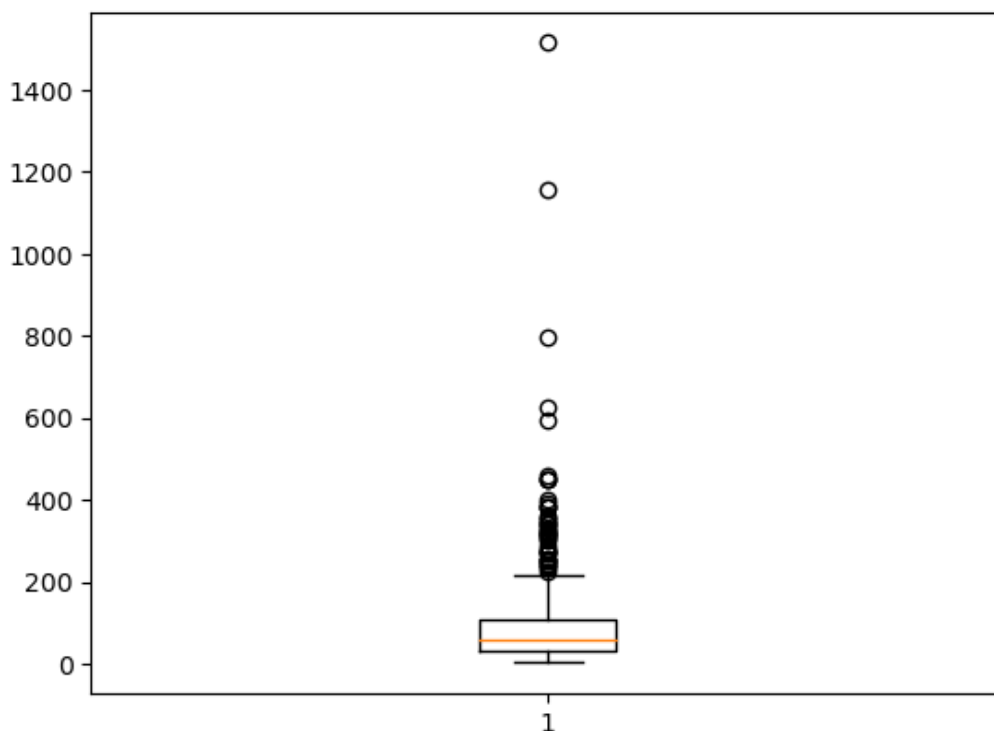
Out[69]:

```
array([4, 3, 2, 1])
```

In [ ]:

In [ ]:

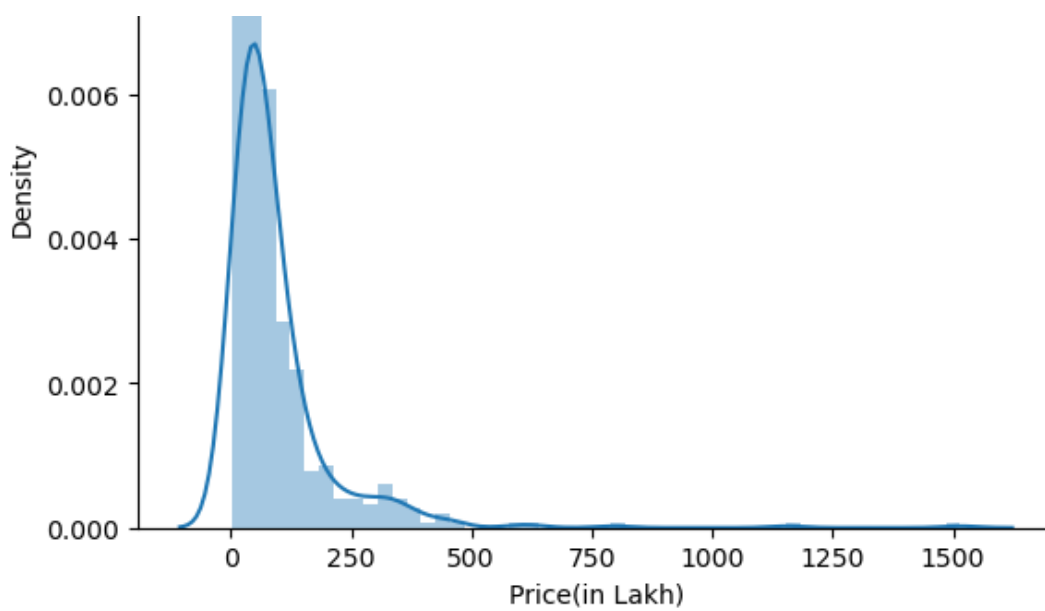## Price(in Lakh)

In [70]:

```python
plt.boxplot(df1["Price(in Lakh)"])
plt.show()
```


In [71]:

```python
sns.distplot(df1["Price(in Lakh)"])
```

Out[71]:

```
<AxesSubplot:xlabel='Price(in Lakh)', ylabel='Density'>
```

```
df1["Price(in Lakh)"].skew()
```

Out[72]:

5.418569908154095

In [73]:

```
np.round(df1["Price(in Lakh)"].skew())
```

Out[73]:

5.0

Not Normally Distributed

IQR

```
    Rule-->
        iqr = q3-q1
        Lower Limit = q1-(1.5*iqr)
        Upper Limit = q3+(1.5*iqr)
```

In [74]:

```
q1=df1["Price(in Lakh)"].quantile(0.25)
```

In [75]:

```
q1 # First Quartile
```

Out[75]:

32.75

In [76]:

```
q3=df1["Price(in Lakh)"].quantile(0.75)
```

In [77]:

```
q3 # Third Quartile
```

Out[77]:

107.0

```
iqr=q3-q1 # IQR
```

```
iqr
```

74.25

```
l=q1-(1.5*iqr) # Lower Limit
```

```
l
```

-78.625

```
u=q3+(1.5*iqr) # Upper Limit
```

```
u
```

218.375

```
df1["Price(in Lakh)"]<l
```

```
0      False
1      False
2      False
3      False
4      False
       ...
495    False
496    False
497    False
498    False
499    False
Name: Price(in Lakh), Length: 500, dtype: bool
```

```
df1[df1["Price(in Lakh)"]< l]
```

Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status

```
df1["Price(in Lakh)"]>u
```

```
0      False
```

```
1       False
2       False
3       False
4       False
        ...
495     False
496     False
497     False
498     False
499     False
Name: Price(in Lakh), Length: 500, dtype: bool
```

In [87]:

```
df1[df1["Price(in Lakh)"]>u]
```

Out[87]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
21	AGENT	4	Cuttack	Professors Colony	250.0	6250	4000.0	Ready to move
55	BUILDER	4	Bangalore	Marathahalli	460.0	11219	4100.0	Under Construction
56	BUILDER	4	Bangalore	Hebbal	341.0	11118	3067.0	Ready to move
64	VERIFIED OWNER	3	Delhi	Lajpat Nagar	305.0	16944	1800.0	Ready to move
69	VERIFIED OWNER	4	Delhi	Sector 14 Rohini	360.0	12000	3000.0	Ready to move
72	VERIFIED OWNER	4	Delhi	Vasant Kunj	330.0	27500	1200.0	Ready to move
79	VERIFIED OWNER	3	Delhi	Bali Nagar	275.0	12500	2200.0	Ready to move
81	BUILDER	3	Mumbai	Santacruz East	289.0	37146	778.0	Under Construction
87	BUILDER	3	Mumbai	Andheri West	344.0	30000	1147.0	Under Construction
89	BUILDER	2	Mumbai	Andheri West	226.0	32992	685.0	Under Construction
178	BUILDER	3	Pune	Baner	250.0	14551	1718.0	Under Construction
201	BUILDER	3	Chennai	Velachery	354.0	18930	1870.0	Under Construction
218	BUILDER	4	Chennai	Adyar	333.0	13990	2381.0	Ready to move
253	AGENT	4	Chandigarh	Mullanpur Garibdass	315.0	5893	5345.0	Ready to move
261	BUILDER	4	Noida	Sector 107	383.0	10300	3720.0	Under Construction
263	BUILDER	4	Noida	Sector 107	383.0	10300	3720.0	Under Construction
265	BUILDER	3	Noida	Sector 107	257.0	10300	2500.0	Under Construction
270	VERIFIED OWNER	4	Noida	Sector 93B	795.0	14454	5500.0	Ready to move
272	VERIFIED OWNER	4	Noida	Sector 92	340.0	8292	4100.0	Ready to move
284	VERIFIED OWNER	4	Allahabad	Tagore town	320.0	7619	4200.0	Ready to move
288	VERIFIED OWNER	3	Allahabad	Kareli	320.0	17582	1820.0	Ready to move

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
308	VERIFIED OWNER	4	Surat	Nanpura	270.0	3698	7300.0	Ready to move
317	VERIFIED OWNER	4	Surat	Athwa	625.0	13458	4644.0	Resale
318	AGENT	4	Surat	Nana Varachha	390.0	10263	3800.0	Ready to move
320	BUILDER	4	Gurgaon	DLF Phase 3	450.0	18579	2422.0	Under Construction
321	BUILDER	4	Gurgaon	Sector 22 Gurgaon	1515.0	15000	10105.0	Under Construction
324	BUILDER	4	Gurgaon	DLF Phase 3	450.0	18579	2422.0	Under Construction
325	BUILDER	4	Gurgaon	Sector 22 Gurgaon	1155.0	15000	7700.0	Under Construction
328	BUILDER	4	Gurgaon	DLF Phase 3	450.0	18579	2422.0	Under Construction
329	BUILDER	4	Gurgaon	Sector 22 Gurgaon	596.0	15000	3976.0	Under Construction
332	VERIFIED OWNER	4	Gurgaon	Sector 41	310.0	8695	3565.0	Under Construction
334	VERIFIED OWNER	4	Gurgaon	Sector 108	382.0	14444	2646.0	Resale
338	VERIFIED OWNER	4	Gurgaon	Sector 57	240.0	5860	4095.0	Ready to move
339	VERIFIED OWNER	4	Gurgaon	Sector 11	280.0	3703	7560.0	Ready to move
367	VERIFIED OWNER	4	Dehradun	Dalanwala	314.0	7385	4265.0	Ready to move
368	VERIFIED OWNER	4	Dehradun	Ganesh Pur	300.0	9230	3250.0	Ready to move
369	VERIFIED OWNER	3	Dehradun	Dhaulas	275.0	7236	3800.0	Ready to move
391	VERIFIED OWNER	4	Faridabad	Dlf Phase 1	270.0	10000	2700.0	Ready to move
394	VERIFIED OWNER	4	Faridabad	Sector 37	250.0	9920	2520.0	Ready to move
425	VERIFIED OWNER	4	Mysore	Basavanahalli	325.0	5241	6200.0	Ready to move
440	VERIFIED OWNER	4	Patna	Chitragupta Nagar	400.0	9796	4083.0	Resale
452	VERIFIED OWNER	4	Patna	Sheikhpura	350.0	8750	4000.0	Ready to move
460	BUILDER	4	Lucknow	Gomti Nagar	243.0	6891	3530.0	Under Construction
462	BUILDER	4	Lucknow	Gomti Nagar	243.0	6891	3530.0	Under Construction
464	BUILDER	4	Lucknow	Gomti Nagar	234.0	6897	3398.0	Under Construction

Capping

In [88]:

```
df1[(df1["Price(in Lakh)"]<l) | (df1["Price(in Lakh)"]>u)]
```

Out[88]:

| | Owner | No_Bhk | City | locality | Price(in Lakh) | price/squarefeet | Total | Construction |

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
21	AGENT	4	Cuttack	Professors Colony	250.0	6250	4000.0	Ready to move
55	BUILDER	4	Bangalore	Marathahalli	460.0	11219	4100.0	Under Construction
56	BUILDER	4	Bangalore	Hebbal	341.0	11118	3067.0	Ready to move
64	VERIFIED OWNER	3	Delhi	Lajpat Nagar	305.0	16944	1800.0	Ready to move
69	VERIFIED OWNER	4	Delhi	Sector 14 Rohini	360.0	12000	3000.0	Ready to move
72	VERIFIED OWNER	4	Delhi	Vasant Kunj	330.0	27500	1200.0	Ready to move
79	VERIFIED OWNER	3	Delhi	Bali Nagar	275.0	12500	2200.0	Ready to move
81	BUILDER	3	Mumbai	Santacruz East	289.0	37146	778.0	Under Construction
87	BUILDER	3	Mumbai	Andheri West	344.0	30000	1147.0	Under Construction
89	BUILDER	2	Mumbai	Andheri West	226.0	32992	685.0	Under Construction
178	BUILDER	3	Pune	Baner	250.0	14551	1718.0	Under Construction
201	BUILDER	3	Chennai	Velachery	354.0	18930	1870.0	Under Construction
218	BUILDER	4	Chennai	Adyar	333.0	13990	2381.0	Ready to move
253	AGENT	4	Chandigarh	Mullanpur Garibdass	315.0	5893	5345.0	Ready to move
261	BUILDER	4	Noida	Sector 107	383.0	10300	3720.0	Under Construction
263	BUILDER	4	Noida	Sector 107	383.0	10300	3720.0	Under Construction
265	BUILDER	3	Noida	Sector 107	257.0	10300	2500.0	Under Construction
270	VERIFIED OWNER	4	Noida	Sector 93B	795.0	14454	5500.0	Ready to move
272	VERIFIED OWNER	4	Noida	Sector 92	340.0	8292	4100.0	Ready to move
284	VERIFIED OWNER	4	Allahabad	Tagore town	320.0	7619	4200.0	Ready to move
288	VERIFIED OWNER	3	Allahabad	Kareli	320.0	17582	1820.0	Ready to move
308	VERIFIED OWNER	4	Surat	Nanpura	270.0	3698	7300.0	Ready to move
317	VERIFIED OWNER	4	Surat	Athwa	625.0	13458	4644.0	Resale
318	AGENT	4	Surat	Nana Varachha	390.0	10263	3800.0	Ready to move
320	BUILDER	4	Gurgaon	DLF Phase 3	450.0	18579	2422.0	Under Construction
321	BUILDER	4	Gurgaon	Sector 22 Gurgaon	1515.0	15000	10105.0	Under Construction
324	BUILDER	4	Gurgaon	DLF Phase 3	450.0	18579	2422.0	Under Construction
325	BUILDER	4	Gurgaon	Sector 22 Gurgaon	1155.0	15000	7700.0	Under Construction
328	BUILDER	4	Gurgaon	DLF Phase 3	450.0	18579	2422.0	Under Construction

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
329	BUILDER		Gurgaon	Sector 22 Gurgaon	598.0	15000	3976.0	Under Construction
332	VERIFIED OWNER	4	Gurgaon	Sector 41	310.0	8695	3565.0	Under Construction
334	VERIFIED OWNER	4	Gurgaon	Sector 108	382.0	14444	2646.0	Resale
338	VERIFIED OWNER	4	Gurgaon	Sector 57	240.0	5860	4095.0	Ready to move
339	VERIFIED OWNER	4	Gurgaon	Sector 11	280.0	3703	7560.0	Ready to move
367	VERIFIED OWNER	4	Dehradun	Dalanwala	314.0	7385	4265.0	Ready to move
368	VERIFIED OWNER	4	Dehradun	Ganesh Pur	300.0	9230	3250.0	Ready to move
369	VERIFIED OWNER	3	Dehradun	Dhaulas	275.0	7236	3800.0	Ready to move
391	VERIFIED OWNER	4	Faridabad	Dlf Phase 1	270.0	10000	2700.0	Ready to move
394	VERIFIED OWNER	4	Faridabad	Sector 37	250.0	9920	2520.0	Ready to move
425	VERIFIED OWNER	4	Mysore	Basavanahalli	325.0	5241	6200.0	Ready to move
440	VERIFIED OWNER	4	Patna	Chitragupta Nagar	400.0	9796	4083.0	Resale
452	VERIFIED OWNER	4	Patna	Sheikhpura	350.0	8750	4000.0	Ready to move
460	BUILDER	4	Lucknow	Gomti Nagar	243.0	6891	3530.0	Under Construction
462	BUILDER	4	Lucknow	Gomti Nagar	243.0	6891	3530.0	Under Construction
464	BUILDER	4	Lucknow	Gomti Nagar	234.0	6897	3398.0	Under Construction

In [89]:

```python
df1["Price(in Lakh)"].map(lambda x: l if x<l else u if x>u else x)
```

Out[89]:

```
0      66.0
1      94.0
2      47.0
3      85.0
4      80.0
       ...
495    82.0
496     4.0
497     6.0
498     8.0
499     8.0
Name: Price(in Lakh), Length: 500, dtype: float64
```

In [90]:

```python
df1["Price(in Lakh)"]=df1["Price(in Lakh)"].map(lambda x: l if x<l else u if x>u else x)
```

In [91]:

```python
df1[(df1["Price(in Lakh)"]<l) | (df1["Price(in Lakh)"]>u)]
```

Out[91]:

Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status

price/squarefeet

```python
df1["price/squarefeet"]
```
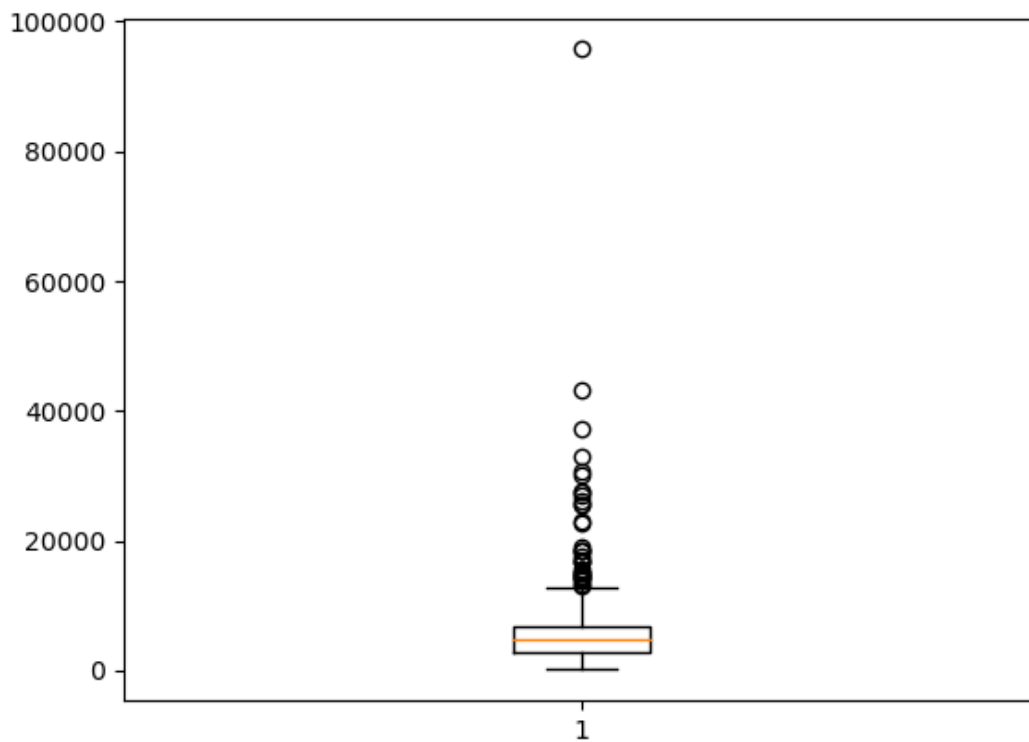
```
0        2933
1        5400
2        4700
3        5000
4        4369
         ...
495      9213
496      1037
497       722
498       833
499       833
Name: price/squarefeet, Length: 500, dtype: int32
```
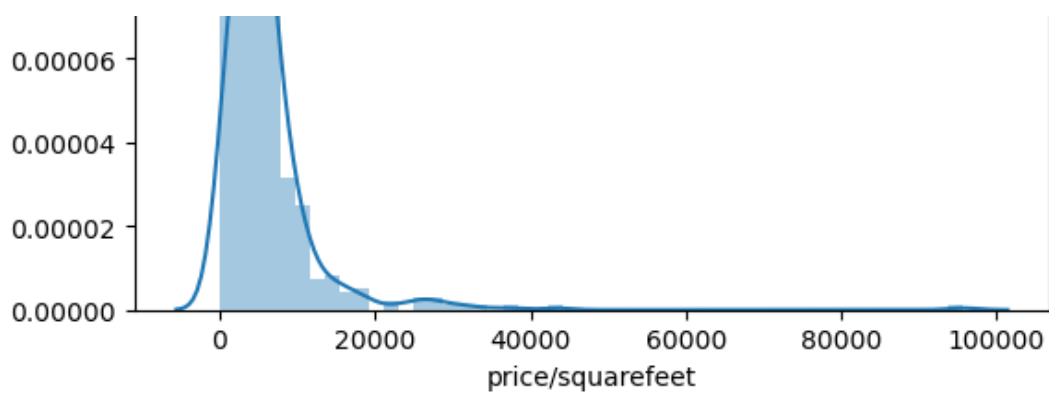
```python
plt.boxplot(df1["price/squarefeet"])
plt.show()
```

```python
sns.distplot(df1["price/squarefeet"])
plt.show()
```

In [95]:

```
df1["price/squarefeet"].skew()
```

Out[95]:

6.617060021897656

In [96]:

```
np.round(df1["price/squarefeet"].skew())
```

Out[96]:

7.0

Not Normally Distributed

IQR

```
    Rule-->
        IQR= q3-q1
        Lower Limit= q1-(1.5*iqr)
        Higher Limit= q3+(1.5*iqr)
```

In [97]:

```
q1= df1["price/squarefeet"].quantile(0.25)
```

In [98]:

```
q1
```

Out[98]:

2836.5

In [99]:

```
q3=df1["price/squarefeet"].quantile(0.75)
```

In [100]:

```
q3
```

Out[100]:

6841.25

In [101]:

```
iqr=q3-q1
```

In [102]:

```
iqr
```

Out[102]:

```
4004.75
```

In [103]:

```
l=q1-(1.5*iqr)
```

In [104]:

```
l
```

Out[104]:

```
-3170.625
```

In [105]:

```
u=q3+(1.5*iqr)
```

In [106]:

```
u
```

Out[106]:

```
12848.375
```

In [107]:

```
df1["price/squarefeet"]<l
```

Out[107]:

```
0      False
1      False
2      False
3      False
4      False
       ...
495    False
496    False
497    False
498    False
499    False
Name: price/squarefeet, Length: 500, dtype: bool
```

In [108]:

```
df1[df1["price/squarefeet"]<l]
```

Out[108]:

Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status

In [109]:

```
df1[df1["price/squarefeet"]<l].shape[0]
```

Out[109]:

```
0
```

In [110]:

```
df1["price/squarefeet"]>u
```

Out[110]:

```
0      False
1      False
```

```
2       False
3       False
4       False
         ...
495     False
496     False
497     False
498     False
499     False
Name: price/squarefeet, Length: 500, dtype: bool
```

In [111]:

```python
df1[df1["price/squarefeet"]>u]
```

Out[111]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
23	AGENT	2	Cuttack	Professors Colony	143.000	95726	150.0	Resale
27	AGENT	3	Cuttack	Nuapada	65.000	43333	150.0	Resale
64	VERIFIED OWNER	3	Delhi	Lajpat Nagar	218.375	16944	1800.0	Ready to move
72	VERIFIED OWNER	4	Delhi	Vasant Kunj	218.375	27500	1200.0	Ready to move
81	BUILDER	3	Mumbai	Santacruz East	218.375	37146	778.0	Under Construction
82	BUILDER	2	Mumbai	Mira Road East	94.000	14280	659.0	Under Construction
86	BUILDER	2	Mumbai	Malad East	161.000	26003	623.0	Ready to move
87	BUILDER	3	Mumbai	Andheri West	218.375	30000	1147.0	Under Construction
88	BUILDER	2	Mumbai	Thane West	142.000	25585	555.0	Under Construction
89	BUILDER	2	Mumbai	Andheri West	218.375	32992	685.0	Under Construction
93	BUILDER	1	Mumbai	Malad East	99.000	25581	387.0	Under Construction
95	BUILDER	2	Mumbai	Malad West	146.000	22848	639.0	Under Construction
96	BUILDER	2	Mumbai	Chembur	140.000	27668	506.0	Ready to move
97	BUILDER	1	Mumbai	Jogeshwari West	95.000	27066	351.0	Under Construction
98	BUILDER	1	Mumbai	Jogeshwari East	151.000	30800	492.0	Ready to move
99	BUILDER	1	Mumbai	Kurla	106.000	23000	461.0	Ready to move
171	BUILDER	2	Pune	Mahalunge	100.000	12920	774.0	Under Construction
175	BUILDER	2	Pune	Kothrud	190.000	15651	1214.0	Under Construction
178	BUILDER	3	Pune	Baner	218.375	14551	1718.0	Under Construction
201	BUILDER	3	Chennai	Velachery	218.375	18930	1870.0	Under Construction
218	BUILDER	4	Chennai	Adyar	218.375	13990	2381.0	Ready to move

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
240	AGENT Owner	3	Chandigarh City	Sector 71 locality	150.000	16666	900.0	Ready to move Status
270	VERIFIED OWNER	4	Noida	Sector 93B	218.375	14454	5500.0	Ready to move
279	VERIFIED OWNER	2	Noida	Sector 22D Yamuna Expressway	25.000	16666	150.0	Resale
288	VERIFIED OWNER	3	Allahabad	Kareli	218.375	17582	1820.0	Ready to move
317	VERIFIED OWNER	4	Surat	Athwa	218.375	13458	4644.0	Resale
320	BUILDER	4	Gurgaon	DLF Phase 3	218.375	18579	2422.0	Under Construction
321	BUILDER	4	Gurgaon	Sector 22 Gurgaon	218.375	15000	10105.0	Under Construction
324	BUILDER	4	Gurgaon	DLF Phase 3	218.375	18579	2422.0	Under Construction
325	BUILDER	4	Gurgaon	Sector 22 Gurgaon	218.375	15000	7700.0	Under Construction
328	BUILDER	4	Gurgaon	DLF Phase 3	218.375	18579	2422.0	Under Construction
329	BUILDER	4	Gurgaon	Sector 22 Gurgaon	218.375	15000	3976.0	Under Construction
334	VERIFIED OWNER	4	Gurgaon	Sector 108	218.375	14444	2646.0	Resale

In [112]:

```
df1[df1["price/squarefeet"]>u].shape[0]
```

Out[112]:

33

In [113]:

```
df1[(df1["price/squarefeet"]<l)   |   (df1["price/squarefeet"]>u)]
```

Out[113]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
23	AGENT	2	Cuttack	Professors Colony	143.000	95726	150.0	Resale
27	AGENT	3	Cuttack	Nuapada	65.000	43333	150.0	Resale
64	VERIFIED OWNER	3	Delhi	Lajpat Nagar	218.375	16944	1800.0	Ready to move
72	VERIFIED OWNER	4	Delhi	Vasant Kunj	218.375	27500	1200.0	Ready to move
81	BUILDER	3	Mumbai	Santacruz East	218.375	37146	778.0	Under Construction
82	BUILDER	2	Mumbai	Mira Road East	94.000	14280	659.0	Under Construction
86	BUILDER	2	Mumbai	Malad East	161.000	26003	623.0	Ready to move
87	BUILDER	3	Mumbai	Andheri West	218.375	30000	1147.0	Under Construction
88	BUILDER	2	Mumbai	Thane West	142.000	25585	555.0	Under Construction
89	BUILDER	2	Mumbai	Andheri West	218.375	32992	685.0	Under Construction
93	BUILDER	1	Mumbai	Malad East	99.000	25581	387.0	Under

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
95	BUILDER	2	Mumbai	Malad West	146.000	22848	639.0	Under Construction
96	BUILDER	2	Mumbai	Chembur	140.000	27668	506.0	Ready to move
97	BUILDER	1	Mumbai	Jogeshwari West	95.000	27066	351.0	Under Construction
98	BUILDER	1	Mumbai	Jogeshwari East	151.000	30800	492.0	Ready to move
99	BUILDER	1	Mumbai	Kurla	106.000	23000	461.0	Ready to move
171	BUILDER	2	Pune	Mahalunge	100.000	12920	774.0	Under Construction
175	BUILDER	2	Pune	Kothrud	190.000	15651	1214.0	Under Construction
178	BUILDER	3	Pune	Baner	218.375	14551	1718.0	Under Construction
201	BUILDER	3	Chennai	Velachery	218.375	18930	1870.0	Under Construction
218	BUILDER	4	Chennai	Adyar	218.375	13990	2381.0	Ready to move
240	AGENT	3	Chandigarh	Sector 71	150.000	16666	900.0	Ready to move
270	VERIFIED OWNER	4	Noida	Sector 93B	218.375	14454	5500.0	Ready to move
279	VERIFIED OWNER	2	Noida	Sector 22D Yamuna Expressway	25.000	16666	150.0	Resale
288	VERIFIED OWNER	3	Allahabad	Kareli	218.375	17582	1820.0	Ready to move
317	VERIFIED OWNER	4	Surat	Athwa	218.375	13458	4644.0	Resale
320	BUILDER	4	Gurgaon	DLF Phase 3	218.375	18579	2422.0	Under Construction
321	BUILDER	4	Gurgaon	Sector 22 Gurgaon	218.375	15000	10105.0	Under Construction
324	BUILDER	4	Gurgaon	DLF Phase 3	218.375	18579	2422.0	Under Construction
325	BUILDER	4	Gurgaon	Sector 22 Gurgaon	218.375	15000	7700.0	Under Construction
328	BUILDER	4	Gurgaon	DLF Phase 3	218.375	18579	2422.0	Under Construction
329	BUILDER	4	Gurgaon	Sector 22 Gurgaon	218.375	15000	3976.0	Under Construction
334	VERIFIED OWNER	4	Gurgaon	Sector 108	218.375	14444	2646.0	Resale

Capping

In [114]:

```python
df1["price/squarefeet"].map(lambda x: l if x<l else u if x>u  else x)
```

Out[114]:

```
0     2933.0
1     5400.0
2     4700.0
3     5000.0
4     4369.0
```

```
              ...
495      9213.0
496      1037.0
497       722.0
498       833.0
499       833.0
Name: price/squarefeet, Length: 500, dtype: float64
```

In [115]:

```python
df1["price/squarefeet"]=df1["price/squarefeet"].map(lambda x: l if x<l else u if x>u  el
se x)
```

In [116]:

```python
df1[(df1["price/squarefeet"]<l)    |    (df1["price/squarefeet"]>u)]
```

Out[116]:

Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status

Total Squarefeet

In [117]:

```python
df1["Total Squarefeet"]
```

Out[117]:

```
0        2250.0
1        1740.0
2        1000.0
3        1700.0
4        1831.0
          ...
495       890.0
496       425.0
497       900.0
498       900.0
499       900.0
Name: Total Squarefeet, Length: 500, dtype: float64
```

In [118]:

```python
plt.boxplot(df1["Total Squarefeet"])
plt.show()
```
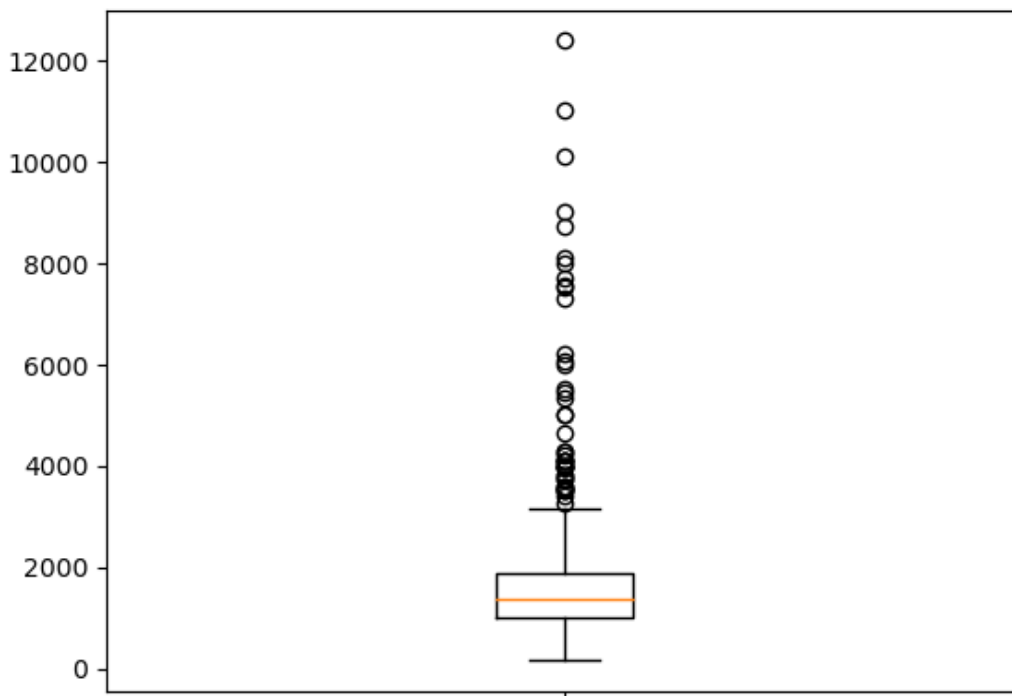
In [119]:

```python
sns.distplot(df1["Total Squarefeet"])
plt.show()
```
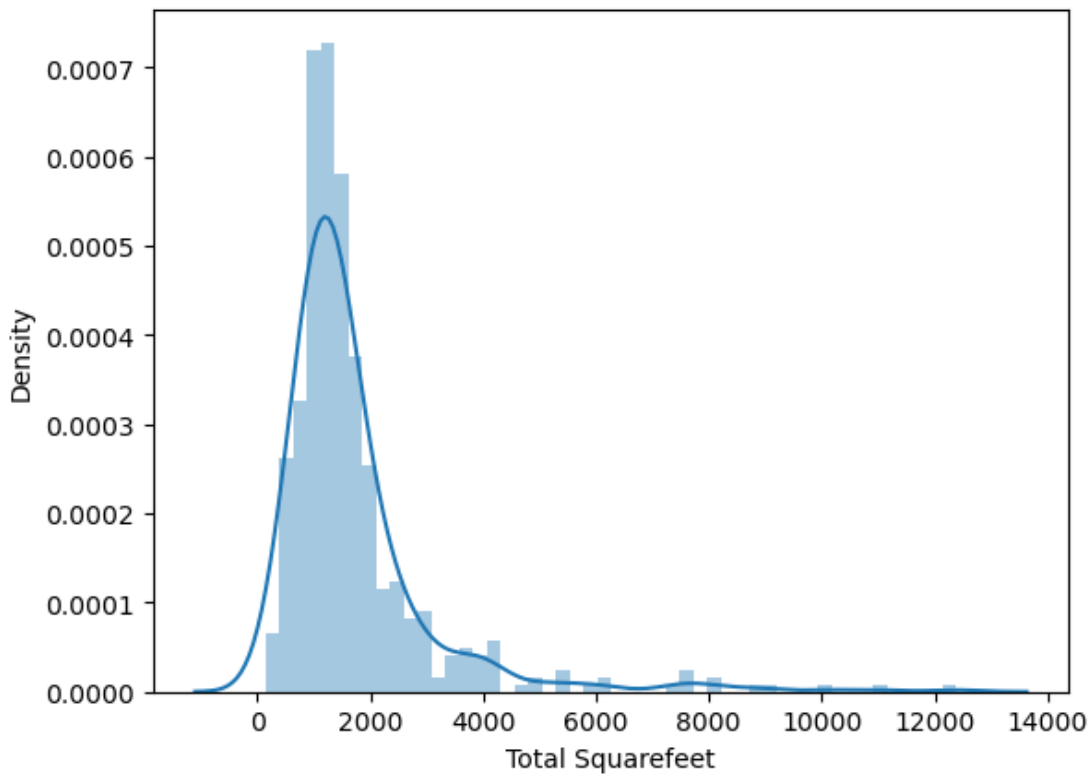

In [120]:

```python
df1["Total Squarefeet"].skew()
```

Out[120]:

3.483104904715013

In [121]:

```python
np.round(df1["Total Squarefeet"].skew())
```

Out[121]:

3.0

Not Normally Distributed

IQR

```
Rule-->
    IQR= q3-q1
    Lower Limit= q1-(1.5*iqr)
    Higher Limit= q3+(1.5*iqr)
```

In [122]:

```python
q1=df1["Total Squarefeet"].quantile(0.25)
```

In [123]:

```python
q1
```

Out[123]:

```
1000.0
```

In [124]:

```
q3=df1["Total Squarefeet"].quantile(0.75)
```

In [125]:

```
q3
```

Out[125]:

```
1876.75
```

In [126]:

```
iqr=q3-q1
```

In [127]:

```
iqr
```

Out[127]:

```
876.75
```

In [128]:

```
l=q1-(1.5*iqr)
```

In [129]:

```
l
```

Out[129]:

```
-315.125
```

In [130]:

```
u=q3+(1.5*iqr)
```

In [131]:

```
u
```

Out[131]:

```
3191.875
```

In [132]:

```
df1["Total Squarefeet"]<l
```

Out[132]:

```
0      False
1      False
2      False
3      False
4      False
       ...
495    False
496    False
497    False
498    False
499    False
Name: Total Squarefeet, Length: 500, dtype: bool
```

In [133]:

```
df1[df1["Total Squarefeet"]<l]
```

Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status

In [134]:

```
df1["Total Squarefeet"]>u
```

Out[134]:

```
0      False
1      False
2      False
3      False
4      False
       ...
495    False
496    False
497    False
498    False
499    False
Name: Total Squarefeet, Length: 500, dtype: bool
```

In [135]:

```
df1[df1["Total Squarefeet"]>u]
```

Out[135]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
19	AGENT	1	Bhubaneswar	Khordha	213.000	2450.000	8712.0	Resale
21	AGENT	4	Cuttack	Professors Colony	218.375	6250.000	4000.0	Ready to move
24	AGENT	2	Cuttack	CDA Area	105.000	2649.000	3963.0	Resale
26	AGENT	3	Cuttack	Trisulia	98.000	1618.000	6056.0	New
55	BUILDER	4	Bangalore	Marathahalli	218.375	11219.000	4100.0	Under Construction
135	VERIFIED OWNER	2	Bhopal	Barkheda	33.000	300.000	11000.0	Resale
136	VERIFIED OWNER	2	Bhopal	Phanda Kala	15.000	250.000	6000.0	Resale
138	VERIFIED OWNER	2	Bhopal	Phanda Kala	18.000	225.000	8000.0	Resale
139	VERIFIED OWNER	2	Bhopal	Phanda Kala	18.000	350.000	5000.0	Resale
142	BUILDER	2	Indore	Rau	139.000	3257.000	4268.0	New
245	VERIFIED OWNER	1	Chandigarh	Yadagirigutta	12.000	138.000	9000.0	Resale
248	VERIFIED OWNER	1	Chandigarh	Yadagirigutta	15.000	277.000	5445.0	Resale
253	AGENT	4	Chandigarh	Mullanpur Garibdass	218.375	5893.000	5345.0	Ready to move
261	BUILDER	4	Noida	Sector 107	218.375	10300.000	3720.0	Under Construction
263	BUILDER	4	Noida	Sector 107	218.375	10300.000	3720.0	Under Construction
270	VERIFIED OWNER	4	Noida	Sector 93B	218.375	12848.375	5500.0	Ready to move
272	VERIFIED OWNER	4	Noida	Sector 92	218.375	8292.000	4100.0	Ready to move

	VERIFIED OWNER	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Resale Status
278		2	Noida	Sector 105	21.000	289.000	8100.0	Resale
284	VERIFIED OWNER	4	Allahabad	Tagore town	218.375	7619.000	4200.0	Ready to move
308	VERIFIED OWNER	4	Surat	Nanpura	218.375	3698.000	7300.0	Ready to move
317	VERIFIED OWNER	4	Surat	Athwa	218.375	12848.375	4644.0	Resale
318	AGENT	4	Surat	Nana Varachha	218.375	10263.000	3800.0	Ready to move
319	AGENT	4	Surat	Dumas	157.000	4500.000	3500.0	Under Construction
321	BUILDER	4	Gurgaon	Sector 22 Gurgaon	218.375	12848.375	10105.0	Under Construction
325	BUILDER	4	Gurgaon	Sector 22 Gurgaon	218.375	12848.375	7700.0	Under Construction
329	BUILDER	4	Gurgaon	Sector 22 Gurgaon	218.375	12848.375	3976.0	Under Construction
332	VERIFIED OWNER	4	Gurgaon	Sector 41	218.375	8695.000	3565.0	Under Construction
338	VERIFIED OWNER	4	Gurgaon	Sector 57	218.375	5860.000	4095.0	Ready to move
339	VERIFIED OWNER	4	Gurgaon	Sector 11	218.375	3703.000	7560.0	Ready to move
367	VERIFIED OWNER	4	Dehradun	Dalanwala	218.375	7385.000	4265.0	Ready to move
368	VERIFIED OWNER	4	Dehradun	Ganesh Pur	218.375	9230.000	3250.0	Ready to move
369	VERIFIED OWNER	3	Dehradun	Dhaulas	218.375	7236.000	3800.0	Ready to move
372	VERIFIED OWNER	2	Dehradun	Balliwala	104.000	2888.000	3600.0	Resale
373	VERIFIED OWNER	2	Dehradun	Dhaulas	32.000	888.000	3600.0	Resale
397	VERIFIED OWNER	4	Faridabad	Sector 88	60.000	484.000	12375.0	Resale
425	VERIFIED OWNER	4	Mysore	Basavanahalli	218.375	5241.000	6200.0	Ready to move
434	AGENT	4	Mysore	Vijayanagar	120.000	3000.000	4000.0	Resale
440	VERIFIED OWNER	4	Patna	Chitragupta Nagar	218.375	9796.000	4083.0	Resale
452	VERIFIED OWNER	4	Patna	Sheikhpura	218.375	8750.000	4000.0	Ready to move
460	BUILDER	4	Lucknow	Gomti Nagar	218.375	6891.000	3530.0	Under Construction
462	BUILDER	4	Lucknow	Gomti Nagar	218.375	6891.000	3530.0	Under Construction
464	BUILDER	4	Lucknow	Gomti Nagar	218.375	6897.000	3398.0	Under Construction
465	BUILDER	4	Lucknow	Alambagh	42.000	850.000	5000.0	New
478	VERIFIED OWNER	3	Lucknow	Mohanlalganj	45.000	599.000	7500.0	Resale

In [136]:

```
df1[df1["Total Squarefeet"]>u].shape[0]
```

Out[136]:

In [137]:

```
df1[(df1["Total Squarefeet"]<l) | (df1["Total Squarefeet"]>u) ]
```

Out[137]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
19	AGENT	1	Bhubaneswar	Khordha	213.000	2450.000	8712.0	Resale
21	AGENT	4	Cuttack	Professors Colony	218.375	6250.000	4000.0	Ready to move
24	AGENT	2	Cuttack	CDA Area	105.000	2649.000	3963.0	Resale
26	AGENT	3	Cuttack	Trisulia	98.000	1618.000	6056.0	New
55	BUILDER	4	Bangalore	Marathahalli	218.375	11219.000	4100.0	Under Construction
135	VERIFIED OWNER	2	Bhopal	Barkheda	33.000	300.000	11000.0	Resale
136	VERIFIED OWNER	2	Bhopal	Phanda Kala	15.000	250.000	6000.0	Resale
138	VERIFIED OWNER	2	Bhopal	Phanda Kala	18.000	225.000	8000.0	Resale
139	VERIFIED OWNER	2	Bhopal	Phanda Kala	18.000	350.000	5000.0	Resale
142	BUILDER	2	Indore	Rau	139.000	3257.000	4268.0	New
245	VERIFIED OWNER	1	Chandigarh	Yadagirigutta	12.000	138.000	9000.0	Resale
248	VERIFIED OWNER	1	Chandigarh	Yadagirigutta	15.000	277.000	5445.0	Resale
253	AGENT	4	Chandigarh	Mullanpur Garibdass	218.375	5893.000	5345.0	Ready to move
261	BUILDER	4	Noida	Sector 107	218.375	10300.000	3720.0	Under Construction
263	BUILDER	4	Noida	Sector 107	218.375	10300.000	3720.0	Under Construction
270	VERIFIED OWNER	4	Noida	Sector 93B	218.375	12848.375	5500.0	Ready to move
272	VERIFIED OWNER	4	Noida	Sector 92	218.375	8292.000	4100.0	Ready to move
278	VERIFIED OWNER	2	Noida	Sector 165	21.000	259.000	8100.0	Resale
284	VERIFIED OWNER	4	Allahabad	Tagore town	218.375	7619.000	4200.0	Ready to move
308	VERIFIED OWNER	4	Surat	Nanpura	218.375	3698.000	7300.0	Ready to move
317	VERIFIED OWNER	4	Surat	Athwa	218.375	12848.375	4644.0	Resale
318	AGENT	4	Surat	Nana Varachha	218.375	10263.000	3800.0	Ready to move
319	AGENT	4	Surat	Dumas	157.000	4500.000	3500.0	Under Construction
321	BUILDER	4	Gurgaon	Sector 22 Gurgaon	218.375	12848.375	10105.0	Under Construction
325	BUILDER	4	Gurgaon	Sector 22 Gurgaon	218.375	12848.375	7700.0	Under Construction
329	BUILDER	4	Gurgaon	Sector 22 Gurgaon	218.375	12848.375	3976.0	Under Construction

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
332	VERIFIED OWNER	4	Gurgaon	Sector 41	218.375	6695.000	2565.0	Under Construction
338	VERIFIED OWNER	4	Gurgaon	Sector 57	218.375	5860.000	4095.0	Ready to move
339	VERIFIED OWNER	4	Gurgaon	Sector 11	218.375	3703.000	7560.0	Ready to move
367	VERIFIED OWNER	4	Dehradun	Dalanwala	218.375	7385.000	4265.0	Ready to move
368	VERIFIED OWNER	4	Dehradun	Ganesh Pur	218.375	9230.000	3250.0	Ready to move
369	VERIFIED OWNER	3	Dehradun	Dhaulas	218.375	7236.000	3800.0	Ready to move
372	VERIFIED OWNER	2	Dehradun	Balliwala	104.000	2888.000	3600.0	Resale
373	VERIFIED OWNER	2	Dehradun	Dhaulas	32.000	888.000	3600.0	Resale
397	VERIFIED OWNER	4	Faridabad	Sector 88	60.000	484.000	12375.0	Resale
425	VERIFIED OWNER	4	Mysore	Basavanahalli	218.375	5241.000	6200.0	Ready to move
434	AGENT	4	Mysore	Vijayanagar	120.000	3000.000	4000.0	Resale
440	VERIFIED OWNER	4	Patna	Chitragupta Nagar	218.375	9796.000	4083.0	Resale
452	VERIFIED OWNER	4	Patna	Sheikhpura	218.375	8750.000	4000.0	Ready to move
460	BUILDER	4	Lucknow	Gomti Nagar	218.375	6891.000	3530.0	Under Construction
462	BUILDER	4	Lucknow	Gomti Nagar	218.375	6891.000	3530.0	Under Construction
464	BUILDER	4	Lucknow	Gomti Nagar	218.375	6897.000	3398.0	Under Construction
465	BUILDER	4	Lucknow	Alambagh	42.000	850.000	5000.0	New
478	VERIFIED OWNER	3	Lucknow	Mohanlalganj	45.000	599.000	7500.0	Resale

Capping

In [138]:

```
df1["Total Squarefeet"].map(lambda x: l if x<l else u if x>u else x)
```

Out[138]:

```
0      2250.0
1      1740.0
2      1000.0
3      1700.0
4      1831.0
        ...
495     890.0
496     425.0
497     900.0
498     900.0
499     900.0
Name: Total Squarefeet, Length: 500, dtype: float64
```

In [139]:

```
df1["Total Squarefeet"]=df1["Total Squarefeet"].map(lambda x: l if x<l else u if x>u els
e x)
```

```
df1[(df1["Total Squarefeet"]<l) | (df1["Total Squarefeet"]>u) ]
```

Out[140]:

Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status

In [141]:

```
df1 # This the Fianl Dataset
```

Out[141]:

	Owner	No_Bhk	City	locality	Price(in Lakh)	price/squarefeet	Total Squarefeet	Construction Status
0	VERIFIED OWNER	4	Bhubaneswar	Balianta	66.0	2933.0	2250.0	Ready to move
1	VERIFIED OWNER	3	Bhubaneswar	Rasulgarh	94.0	5400.0	1740.0	Under Construction
2	VERIFIED OWNER	2	Bhubaneswar	Bhagawanpur	47.0	4700.0	1000.0	Under Construction
3	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	85.0	5000.0	1700.0	Ready to move
4	VERIFIED OWNER	3	Bhubaneswar	Sundarpada	80.0	4369.0	1831.0	Ready to move
...	...	...	...	...	...	...	...	...
495	VERIFIED OWNER	3	Agra	Shastripuram	82.0	9213.0	890.0	Ready to move
496	VERIFIED OWNER	3	Agra	Shastripuram	4.0	1037.0	425.0	Resale
497	BUILDER	3	Agra	Rohta	6.0	722.0	900.0	New
498	BUILDER	3	Agra	Agra Cantt	8.0	833.0	900.0	New
499	BUILDER	3	Agra	Agra Cantonment Road	8.0	833.0	900.0	New

500 rows × 8 columns

In [142]:

```
df1["Owner"].value_counts()
```

Out[142]:

```
VERIFIED OWNER    242
BUILDER           196
AGENT              61
OWNER               1
Name: Owner, dtype: int64
```

In [143]:

```
df1["No_Bhk"].value_counts()
```

Out[143]:

```
3    198
2    169
4     96
1     37
Name: No_Bhk, dtype: int64
```

In [144]:

```
df1["City"].value_counts()
```

```
df1["City"].value_counts()
```

Out[144]:

```
Bhubaneswar        20
Noida              20
Lucknow            20
Patna              20
Mysore             20
Nashik             20
Faridabad          20
Dehradun           20
Varanasi           20
Gurgaon            20
Surat              20
Allahabad          20
Chandigarh         20
Cuttack            20
Coimbatore         20
Chennai            20
Visakhapatnam      20
Pune               20
Indore             20
Bhopal             20
Nagpur             20
Mumbai             20
Delhi              20
Bangalore          20
Agra               20
Name: City, dtype: int64
```

In [145]:

```
df1["locality"].value_counts()
```

Out[145]:

```
Yadagirigutta          9
Bihta                  8
Jhalwa                 6
Rau                    6
Sundarpada             5
                      ..
Manapakkam             1
Kandigai               1
Panayur                1
Kattankulathur         1
Agra Cantonment Road   1
Name: locality, Length: 314, dtype: int64
```

In [146]:

```
df1["Construction Status"].value_counts()
```

Out[146]:

```
Ready to move        203
Under Construction   166
Resale                91
New                   40
Name: Construction Status, dtype: int64
```

In [147]:

```
df1.dtypes
```

Out[147]:

```
Owner              object
No_Bhk              int32
City               object
locality           object
Price(in Lakh)    float64
price/squarefeet  float64
```

```
Total Squarefeet          float64
Construction Status        object
dtype: object
```

Data Visualization

Uni-Variate Analysis

In Uni-Variate Analysis we can analysis the data by using one feature.

In [148]:

```python
plt.pie(df1["Owner"].value_counts(),labels=df1["Owner"].unique(),autopct="%0.2F%%")
plt.show()
```
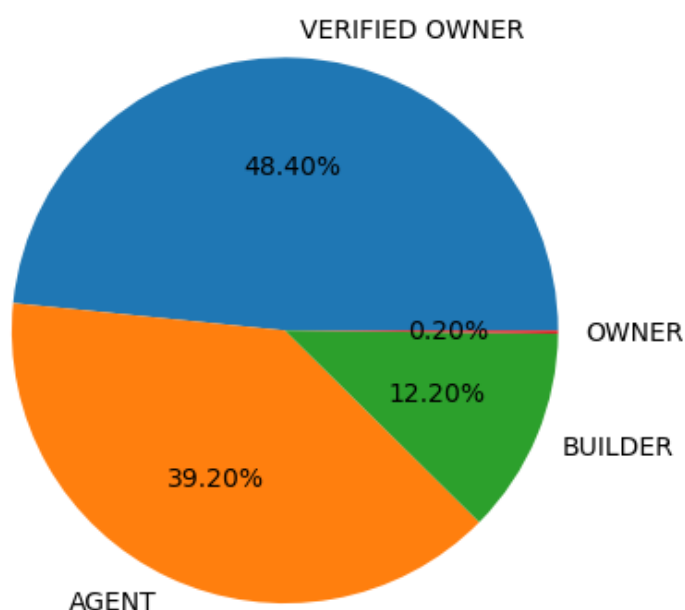

Here I have taken Owner feature and observed that Verified Owner have more numbers
of Apartment in every city.

In [149]:

```python
sns.countplot(x="Construction Status",data=df1)
plt.xticks(rotation=45)
plt.show()
```
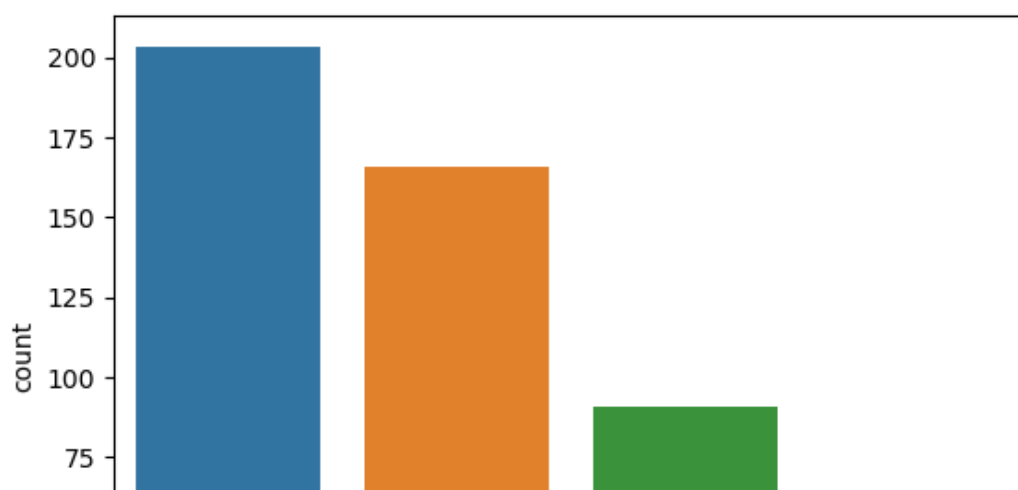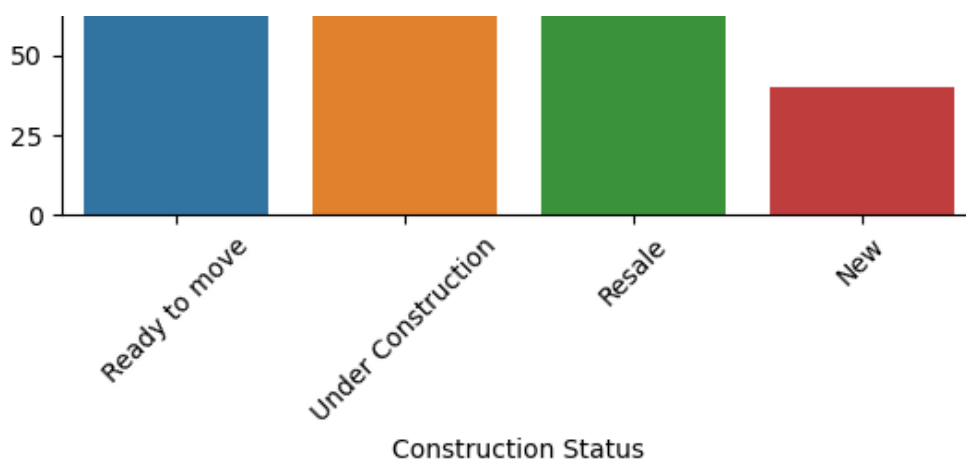
Here I have taken Construction Status Feature Ready to move(Those apartments are constructed and ready to sale) apartments are more in every city.

In [ ]:

In [150]:

```
sns.countplot(x="No_Bhk",data=df1)
plt.show()
```
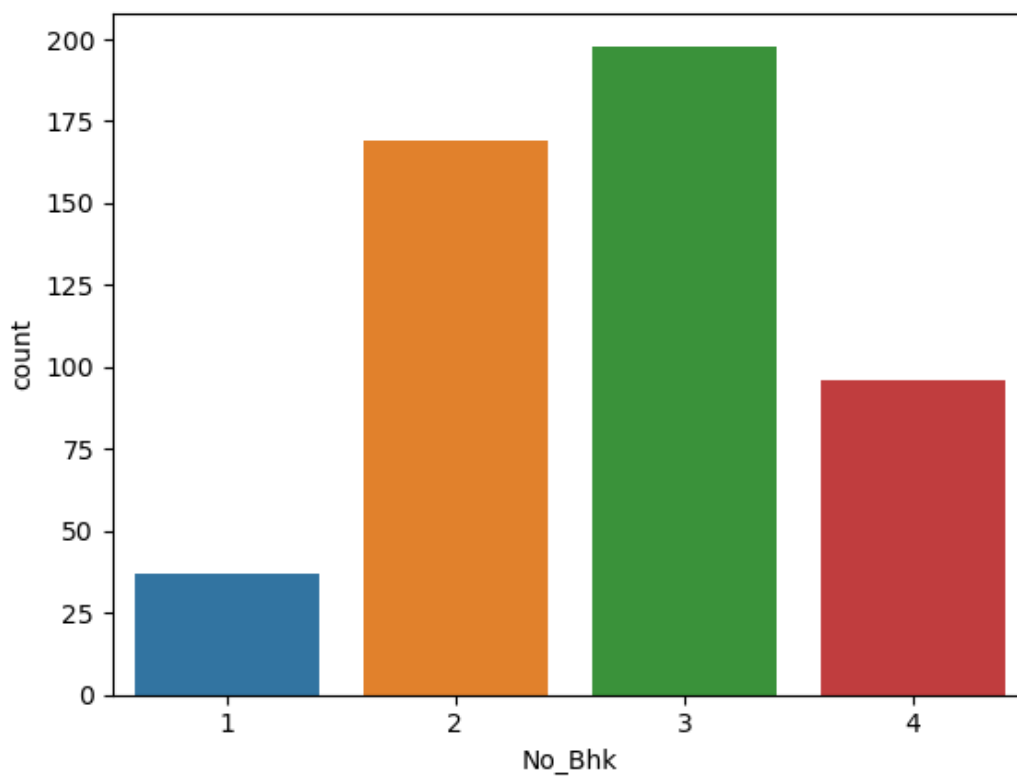

3-Bhk apartments are more in every city.

In [ ]:

Bi-Variate Analysis

In Bi-Variate Analysis we can analysis the data by using two features.

```
plt.bar(df1["City"],df1["No_Bhk"])
plt.xticks(rotation=90)
plt.show()
```
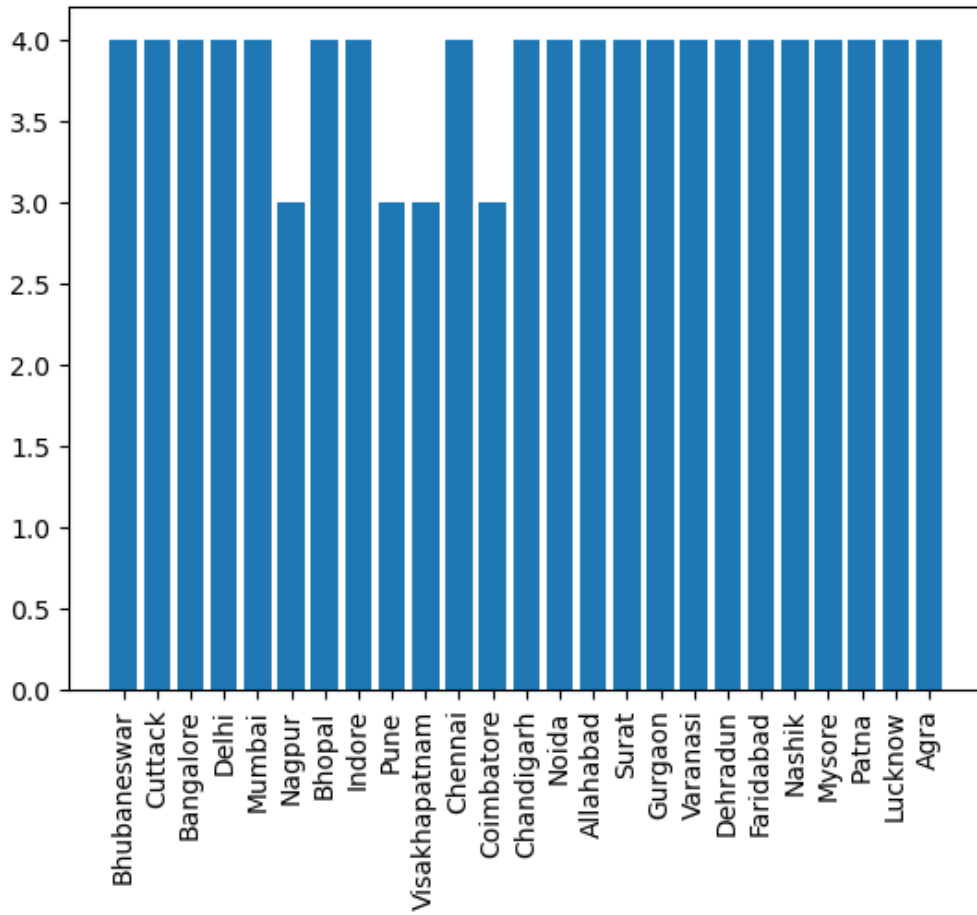
```
df1["Price(in Lakh)"].mean()
```

Out[152]:

78.77175

```
df1["Price(in Lakh)"].min()
```

Out[153]:

2.0

```
df1["Price(in Lakh)"].max()
```

Out[154]:

218.375

```
plt.bar(df1["City"],df1["Price(in Lakh)"])
plt.xticks(rotation=90)
plt.show()
```
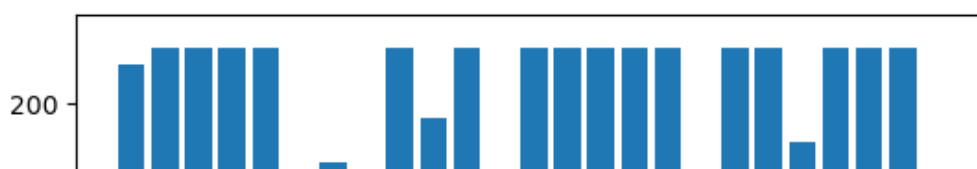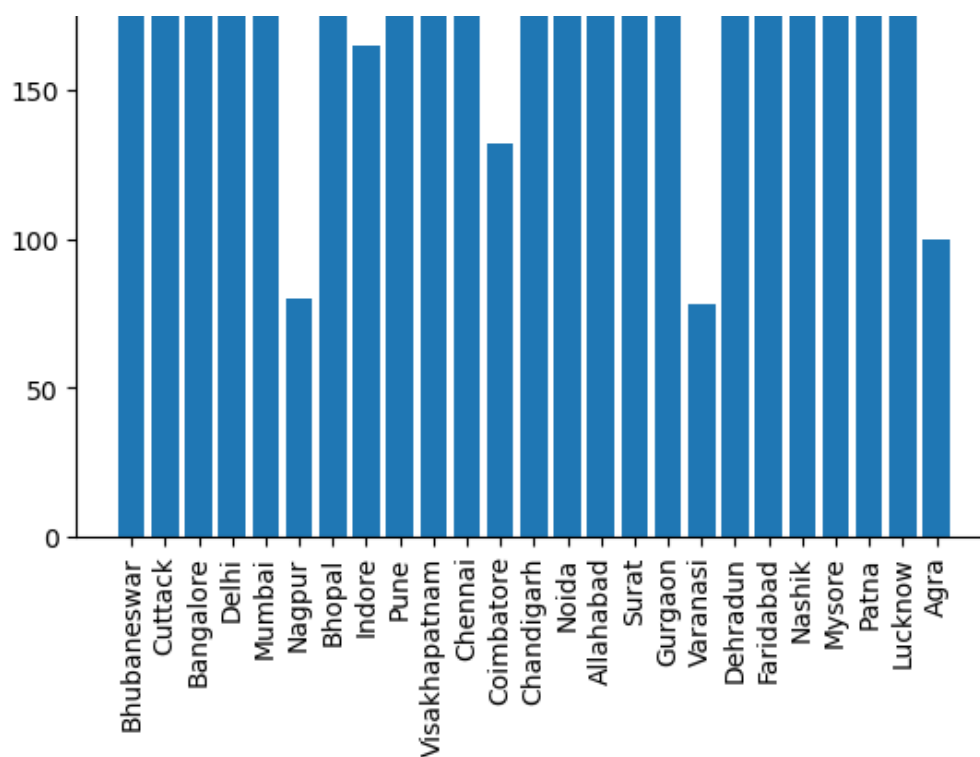
Here I have taken City and Price(in Lakh) Featues and observed that in Agra,Varanas
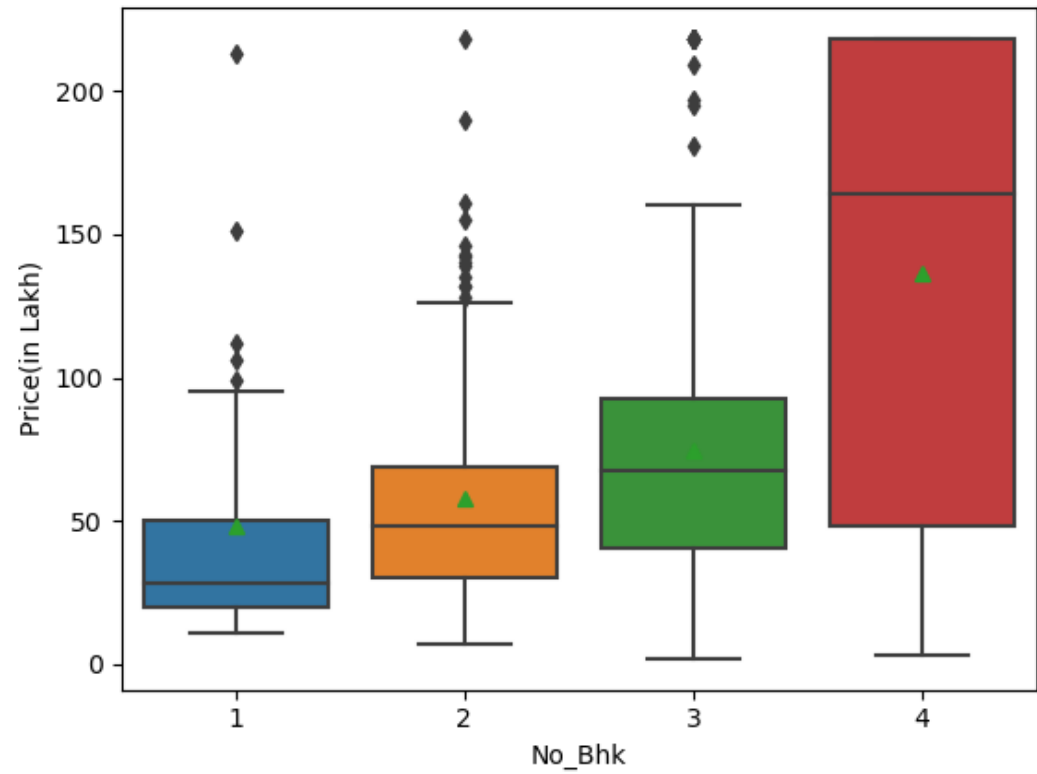i & Nagpur the apartment are in average price.

In [ ]:

In [156]:
```python
sns.barplot(x="No_Bhk",y="Price(in Lakh)",data=df1)
# plt.xticks(rotation=90)
plt.show()
```
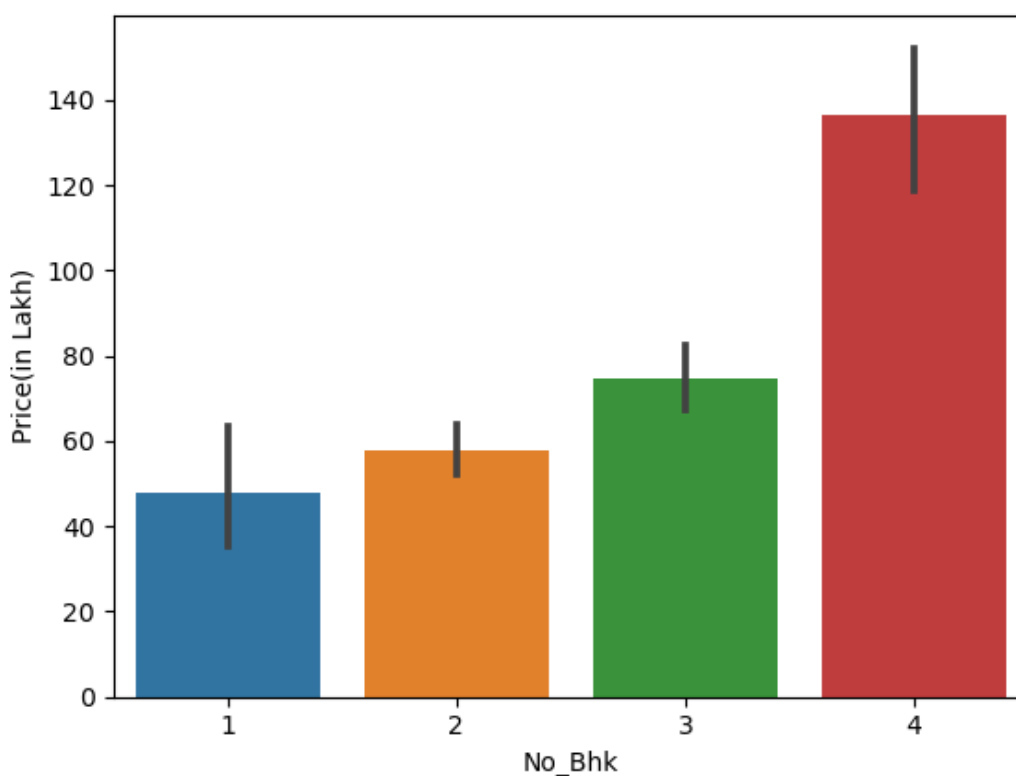

Here I have taken No_Bhk and Price(in Lakh) and observed that 3-Bhk Apartments will get in average price & 4-Bhk Apartments will get in more price.

```
sns.boxplot(x = "No_Bhk", y = "Price(in Lakh)", data = df1,showmeans=True)
plt.show()
```


Here I have taken No_Bhk and Price(in Lakh) features and observed that 1,2,3-Bhk have outliers but 4-Bhk donot have any ouliers

In [ ]:

Multi-Variate Analysis

In Multi-Variate Analysis we can analysis the data by using more than two features.

In [158]:

```
nop=df1.pivot_table(index="No_Bhk",columns="Construction Status",aggfunc="mean")
```

In [159]:

```
nop
```

Out[159]:

	Price(in Lakh)				Total Squarefeet				price/squ
Construction Status	New	Ready to move	Resale	Under Construction	New	Ready to move	Resale	Under Construction	New
No_Bhk									
1	32.000000	53.117647	45.428571	43.333333	2450.000000	723.470588	2271.803571	463.083333	1289.0000
2	61.857143	60.131148	37.703704	62.542910	1825.419643	1082.573770	1707.148148	1004.000000	3377.0714
3	35.142857	83.147059	26.371429	98.279297	1530.491071	1610.563235	1209.567857	1520.500000	1912.0000
4	38.000000	177.003125	56.005682	189.907609	1499.806818	2649.859375	1676.977273	2771.853261	2672.0909

In [160]:

```python
nop1=df1.pivot_table(index="No_Bhk",columns="Construction Status",values="Price(in Lakh)"
,aggfunc="mean")
```
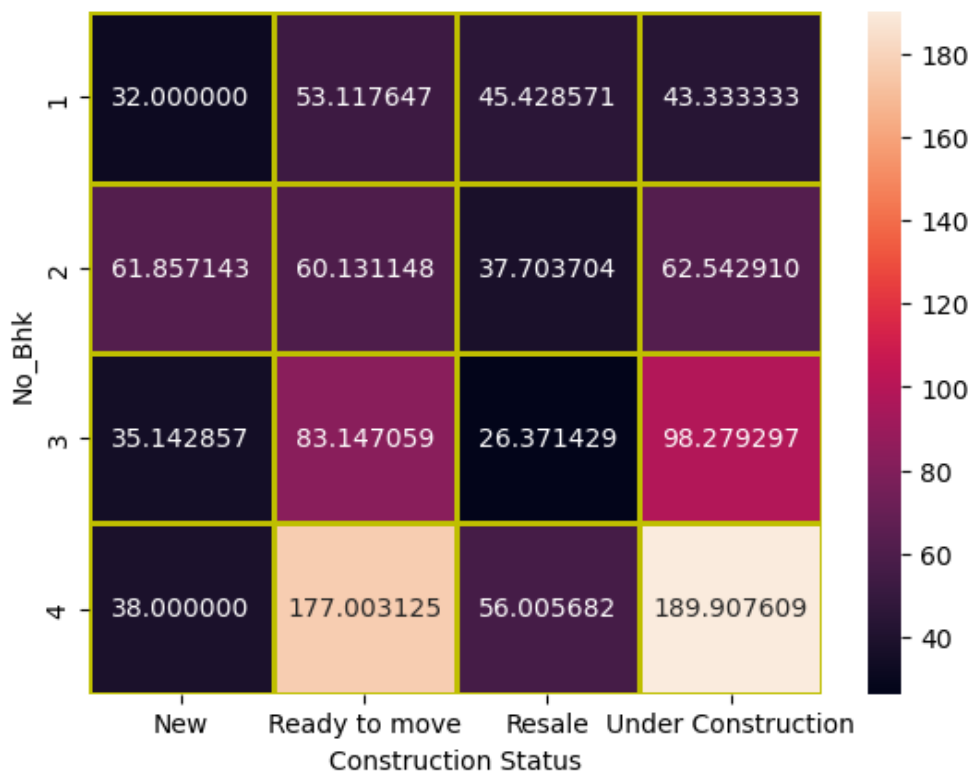
In [161]:

```python
nop1
```

Out[161]:

Construction Status	New	Ready to move	Resale	Under Construction
No_Bhk				
1	32.000000	53.117647	45.428571	43.333333
2	61.857143	60.131148	37.703704	62.542910
3	35.142857	83.147059	26.371429	98.279297
4	38.000000	177.003125	56.005682	189.907609

In [162]:

```python
sns.heatmap(nop1,linewidths=1, linecolor="y",annot=True,fmt="f")
plt.show()
```


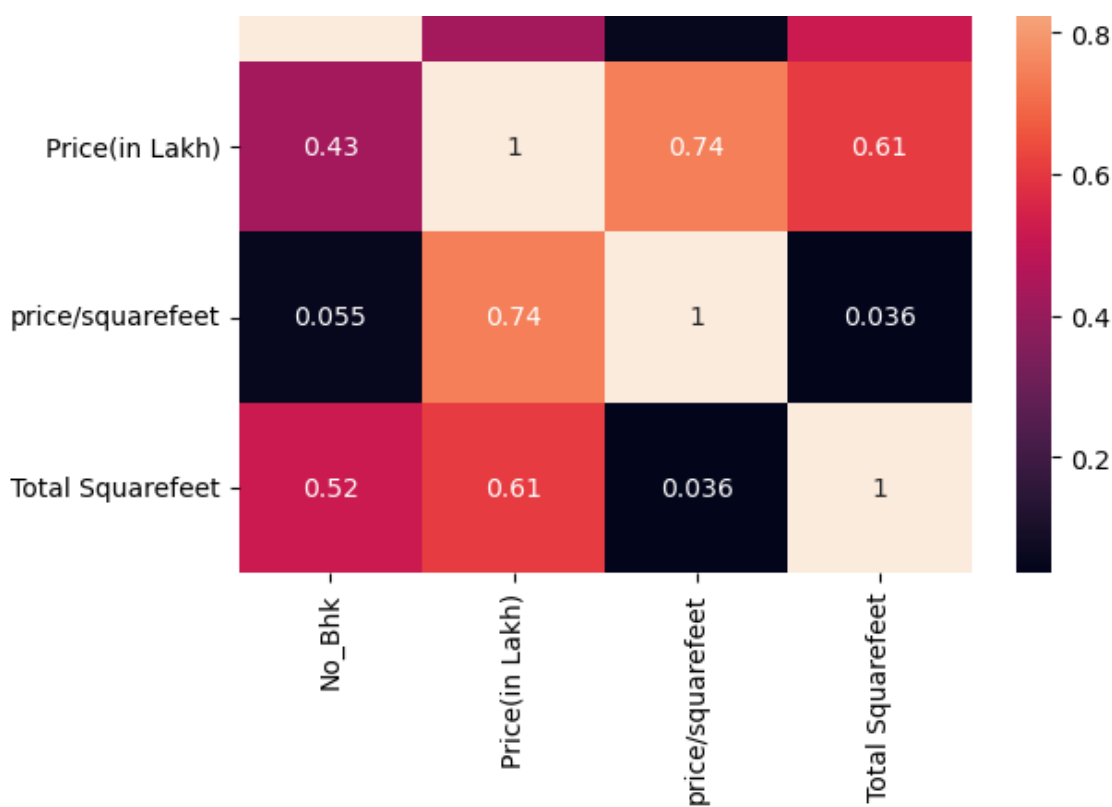Under Construction 4-Bhk is more in Price and New 1-Bhk is less in Price.

In [163]:

```python
sns.heatmap(df1.corr(),annot=True)
```

Out[163]:

```
<AxesSubplot:>
```

No_Bhk is corelated with Total Squarefeet that menas if No_Bhk is increases then Total Squarefeet also increases.
Total Sqaurefeet also corelated with Price(in Lakhe).
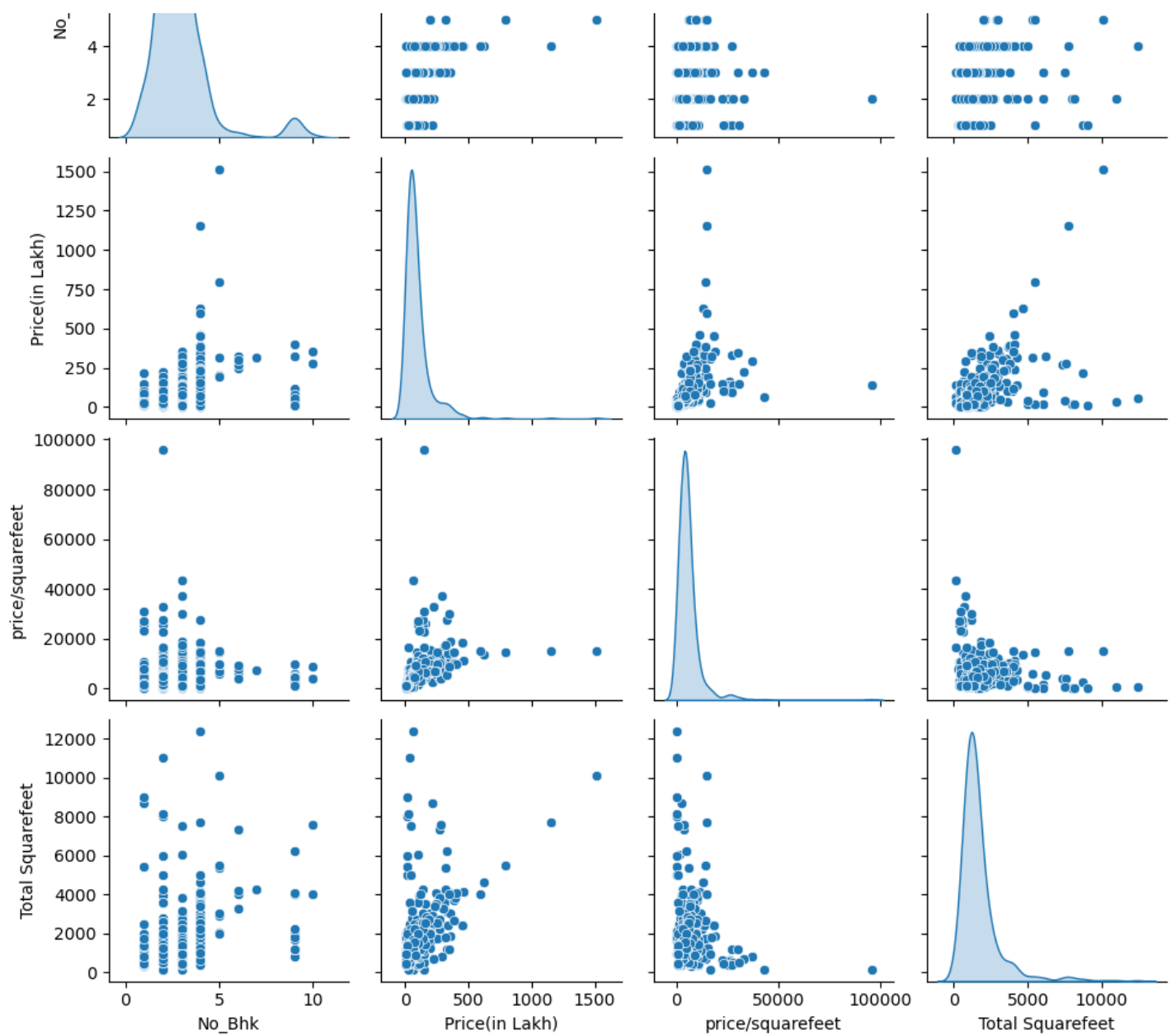
In [164]:

```
sn
```

Out[164]:

	No_Bhk	Price(in Lakh)	price/squarefeet	Total Squarefeet
0	4	66.0	2933	2250.0
1	3	94.0	5400	1740.0
2	2	47.0	4700	1000.0
3	3	85.0	5000	1700.0
4	3	80.0	4369	1831.0
...	...	...	...	...
495	3	82.0	9213	890.0
496	3	4.0	1037	425.0
497	3	6.0	722	900.0
498	3	8.0	833	900.0
499	3	8.0	833	900.0

500 rows × 4 columns

In [165]:

```
g=sns.pairplot(sn, diag_kind="kde")
```

Pair Plot use for Numerical Analysis.

In [ ]:

Insights

-WE CAN BUY AN APARTMENTS IN AGRA, VARANASI, & NAGPUR IN AVERAGE PRICE.
-VERIFIED OWNER HAVE MORE APARTMENTS IN EVERY CITIES.
-READY TO MOVE APARTMENTS ARE MORE IN EVERY CITIES.
-3-BHK APARTMENTS ARE MORE IN EVERY CITIES.
-4-BHK APARTMENTS ARE MORE IN PRICE IN EVERY CITIES.

In [ ]:

In [ ]: