



 master ▾



house-selling-and-price-prediction1 / Bangalore Housing Price Prediction.ipynb

 mohitdubey132 machine learning part added ✓

 History

 1 contributor

11851 lines (11851 sloc) | 587 KB



Bangalore Housing Price Prediction

```
In [1]: # Importing the necessary libraries

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

pd.options.display.max_columns = None
pd.set_option('display.max_rows', 500)
%matplotlib inline
matplotlib.rcParams["figure.figsize"] = (10,5)
```

```
In [2]: from sklearn.preprocessing import OneHotEncoder, LabelEncoder
from sklearn.pipeline import Pipeline
from sklearn.preprocessing import StandardScaler
from sklearn.base import BaseEstimator, TransformerMixin
from sklearn.pipeline import FeatureUnion
from sklearn.impute import SimpleImputer
from sklearn.compose import ColumnTransformer
from sklearn.model_selection import train_test_split
```

```
In [3]: #Reading the data

housing = pd.read_csv("Bengaluru_House_Data.csv")
housing.head()
```

```
Out[3]:
```

	area_type	availability	location	size	society	total_sqft	bath	balcony	pri
0	Super built-up Area	19-Dec	Electronic City Phase II	2 BHK	Coomee	1056	2.0	1.0	39.
1	Plot Area	Ready To Move	Chikka Tirupathi	4 Bedroom	Theanmp	2600	5.0	3.0	120.
2	Built-up Area	Ready To Move	Uttarahalli	3 BHK	NaN	1440	2.0	3.0	62.
3	Super built-up Area	Ready To Move	Lingadheeranahalli	3 BHK	Soiewre	1521	3.0	1.0	95.
4	Super built-up Area	Ready To Move	Kothanur	2 BHK	NaN	1200	2.0	1.0	51.

```
In [4]: #Checking the features in the dataset

housing.info()
```

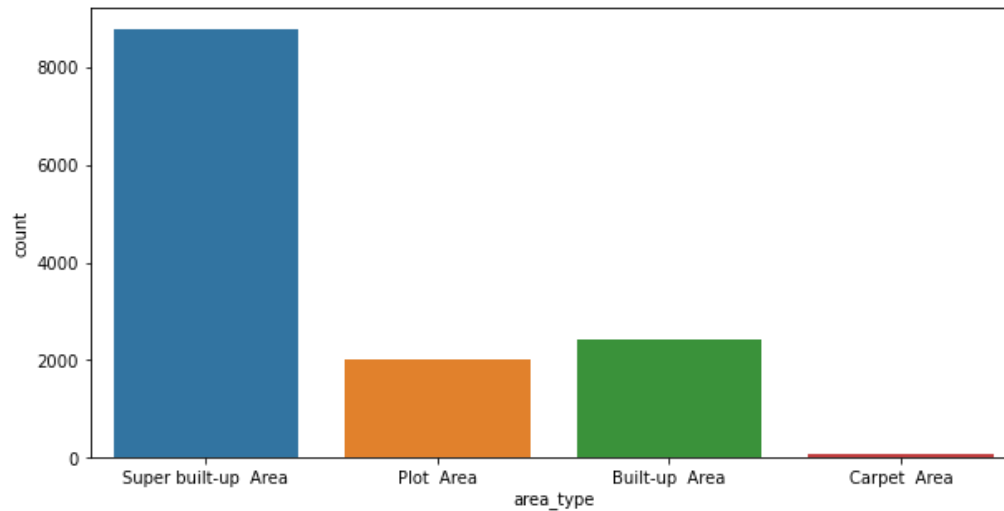
```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 13320 entries, 0 to 13319
Data columns (total 9 columns):
#   Column          Non-Null Count  Dtype  
---  -
0   area_type       13320 non-null  object  
1   availability     13320 non-null  object  
2   location        13319 non-null  object  
3   size            13304 non-null  object  
4   society         7818 non-null   object  
5   total_sqft      13320 non-null  object  
6   bath            13247 non-null  float64 
7   balcony         12711 non-null  float64 
8   price           13320 non-null  float64 
dtypes: float64(3), object(6)
memory usage: 936.7+ KB
```

There are 13320 samples and 9 features. There are few features with missing values.

Univariate Analysis

```
In [5]: sns.countplot(x="area_type", data = housing)
```

```
Out[5]: <AxesSubplot:xlabel='area_type', ylabel='count'>
```



```
In [6]: housing["availability"].value_counts()
```

```
Out[6]: Ready To Move          10581
18-Dec                307
18-May                295
18-Apr                271
18-Aug                200
19-Dec                185
18-Jul                143
18-Mar                131
18-Jun                 99
20-Dec                 98
21-Dec                 93
19-Mar                 88
18-Feb                 62
18-Nov                 47
18-Jan                 43
18-Sep                 41
19-Jun                 40
18-Oct                 39
19-Jan                 39
19-Jul                 36
17-Dec                 29
20-Jan                 24
17-Oct                 21
19-Sep                 21
22-Jun                 19
19-Aug                 18
21-Jun                 17
19-Apr                 16
Immediate Possession    16
20-Aug                 16
19-Oct                 15
21-Mar                 14
17-Jun                 13
21-May                 12
17-Jul                 12
17-Nov                 12
21-Jan                 12
22-Dec                 11
20-Jun                 11
17-Sep                 11
22-May                 10
19-May                  9
17-Aug                  9
21-Jul                  8
17-May                  8
```

```

20-Oct      7
19-Nov      7
17-Apr      7
21-Feb      6
20-Sep      6
21-Oct      6
22-Jan      6
21-Sep      6
21-Aug      5
20-Jul      5
17-Mar      5
20-Nov      4
16-Dec      4
20-Apr      4
20-May      4
21-Nov      3
16-Mar      3
22-Mar      3
19-Feb      3
20-Mar      2
22-Nov      2
16-Sep      2
15-Oct      2
17-Feb      2
15-Nov      2
20-Feb      2
15-Jun      1
16-Jul      1
14-Nov      1
15-Dec      1
16-Oct      1
15-Aug      1
17-Jan      1
16-Nov      1
16-Jan      1
14-Jul      1
Name: availability, dtype: int64

```

The feature can be labelled as "Ready to Move" or "To be Vacated"

```
In [7]: housing["location"].value_counts()
```

```

Out[7]: Whitefield      540
Sarjapur Road      399
Electronic City      302
Kanakpura Road      273
Thanisandra      234
...
Bapuji Layout      1
1st Stage Radha Krishna Layout      1
BEML Layout 5th stage      1
singapura paradise      1
Abshot Layout      1
Name: location, Length: 1305, dtype: int64

```

We can drop "location" feature

```
In [8]: housing["size"].value_counts()
```

```

Out[8]: 2 BHK      5199
3 BHK      4310
4 Bedroom      826
4 BHK      591
3 Bedroom      547
1 BHK      538
2 Bedroom      329
5 Bedroom      297
6 Bedroom      191
1 Bedroom      105
8 Bedroom      84
7 Bedroom      83
5 BHK      59
9 Bedroom      46
6 BHK      30
7 BHK      17
1 RK      13

```

```

10 Bedroom      12
9 BHK           8
8 BHK           5
11 BHK          2
11 Bedroom      2
10 BHK          2
14 BHK          1
13 BHK          1
12 Bedroom      1
27 BHK          1
43 Bedroom      1
16 BHK          1
19 BHK          1
18 Bedroom      1
Name: size, dtype: int64

```

We can relabel them to have only numerical data

```
In [9]: housing["society"].value_counts()
```

```

Out[9]: GrrvaGr      80
PrarePa      76
Sryalan      59
Prtates      59
GMown E      56
..
Amionce       1
JaghtDe       1
Jauraht       1
Brity U       1
RSntsAp       1
Name: society, Length: 2688, dtype: int64

```

We can drop "society" feature

```
In [10]: housing["total_sqft"].value_counts()
```

```

Out[10]: 1200      843
1100      221
1500      205
2400      196
600       180
...
3580       1
2461       1
1437       1
2155       1
4689       1
Name: total_sqft, Length: 2117, dtype: int64

```

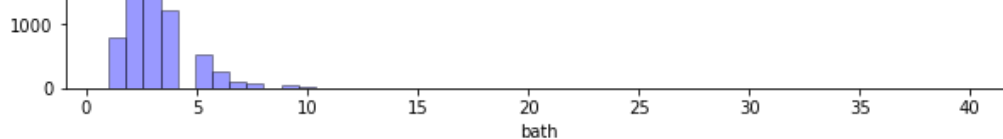
```
In [11]: sns.distplot(housing["bath"], hist=True, kde=False,
                      bins=50, color = 'blue',
                      hist_kws={'edgecolor':'black'})
```

C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2619: Future Warning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).

warnings.warn(msg, FutureWarning)

```
Out[11]: <AxesSubplot:xlabel='bath'>
```





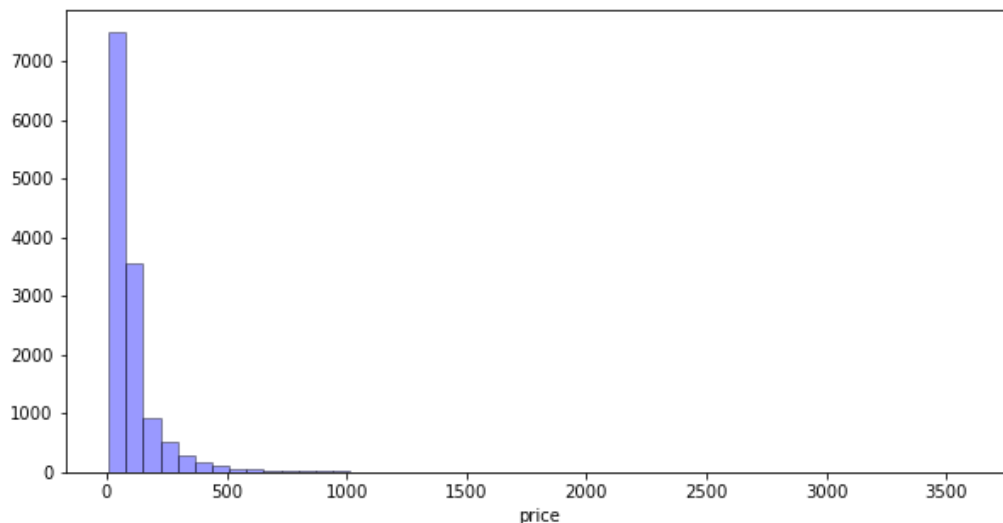
```
In [12]: housing["balcony"].value_counts()
```

```
Out[12]: 2.0    5113
         1.0    4897
         3.0    1672
         0.0    1029
         Name: balcony, dtype: int64
```

```
In [13]: sns.distplot(housing["price"], hist=True, kde=False,
                      bins=50, color = 'blue',
                      hist_kws={'edgecolor':'black'})
```

C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).
warnings.warn(msg, FutureWarning)

```
Out[13]: <AxesSubplot:xlabel='price'>
```



Handling Missing Values

```
In [14]: housing.isnull().sum()
```

```
Out[14]: area_type      0
         availability    0
         location       1
         size           16
         society       5502
         total_sqft     0
         bath           73
         balcony       609
         price          0
         dtype: int64
```

```
In [15]: housing_clean = housing.copy()
```

```
In [16]: housing_clean[pd.isnull(housing_clean["size"])]
```

```
Out[16]:
```

	area_type	availability	location	size	society	total_sqft	bath	balcony	price
--	-----------	--------------	----------	------	---------	------------	------	---------	-------

579	Plot Area	Immediate Possession	Sarjapur Road	NaN	Asiss B	1200 - 2400	NaN	NaN	34.185
-----	-----------	----------------------	---------------	-----	---------	-------------	-----	-----	--------

1775	Plot Area	Immediate Possession	IVC Road	NaN	Orana N	2000 - 5634	NaN	NaN	124.000
------	-----------	----------------------	----------	-----	---------	-------------	-----	-----	---------

Immediate

2264	Plot Area	Immediate Possession	Banashankari	NaN	NaN	2400	NaN	NaN	460.000
2809	Plot Area	Immediate Possession	Sarjapur Road	NaN	AsdiaAr	1200 - 2400	NaN	NaN	28.785
2862	Plot Area	Immediate Possession	Devanahalli	NaN	Ajleyor	1500 - 2400	NaN	NaN	46.800
5333	Plot Area	Immediate Possession	Devanahalli	NaN	Emngs S	2100 - 5405	NaN	NaN	177.115
6423	Plot Area	Immediate Possession	Whitefield	NaN	SRniaGa	2324	NaN	NaN	26.730
6636	Plot Area	Immediate Possession	Jigani	NaN	S2enste	1500	NaN	NaN	25.490
6719	Plot Area	Immediate Possession	Hoskote	NaN	SJowsn	800 - 2660	NaN	NaN	28.545
7680	Plot Area	Immediate Possession	Kasavanhalli	NaN	NaN	5000	NaN	NaN	400.000
8306	Plot Area	Immediate Possession	Anekal	NaN	Vaensnd	1453	NaN	NaN	16.500
8565	Plot Area	Immediate Possession	Carmelaram	NaN	Ocezes	2000	NaN	NaN	120.000
8703	Plot Area	Immediate Possession	Mysore Road	NaN	Naoden	1200 - 2400	NaN	NaN	42.300
10634	Plot Area	Immediate Possession	Rajankunte	NaN	NaN	1575	NaN	NaN	31.110
11019	Plot Area	Immediate Possession	Yelahanka	NaN	Saaveha	1200 - 1800	NaN	NaN	12.750
11569	Plot Area	Immediate Possession	Hosur Road	NaN	AVeldun	1350	NaN	NaN	8.440

```
In [17]: # Dropping samples with 3 or more missing records
housing_clean.dropna(axis=0, thresh = 7, inplace = True)
```

```
In [18]: housing_clean.isnull().sum()
```

```
Out[18]: area_type      0
availability    0
location        1
size            0
society        5499
total_sqft      0
bath            57
balcony         593
price           0
dtype: int64
```

```
In [19]: housing_clean[pd.isnull(housing_clean["location"])]
```

```
Out[19]:
```

	area_type	availability	location	size	society	total_sqft	bath	balcony	price
568	Super built-up Area	Ready To Move	NaN	3 BHK	Grare S	1600	3.0	2.0	86.0

```
In [20]: housing_clean[housing_clean["society"] == "Grare S"]
```

```
Out[20]:
```

	area_type	availability	location	size	society	total_sqft	bath	balcony	price
568	Super built-up Area	Ready To Move	NaN	3 BHK	Grare S	1600	3.0	2.0	86.0
12238	Carpet Area	Ready To Move	Anantapura	3 BHK	Grare S	1600	3.0	2.0	77.0

```
In [21]:
```

```
In [21]: housing_clean["location"] = housing_clean["location"].replace(to_replace = np.r
```

```
In [22]: housing_clean.isnull().sum()
```

```
Out[22]: area_type      0
availability  0
location      0
size          0
society      5499
total_sqft   0
bath         57
balcony      593
price        0
dtype: int64
```

```
In [23]: housing_clean["size"].unique()
```

```
Out[23]: array(['2 BHK', '4 Bedroom', '3 BHK', '4 BHK', '6 Bedroom', '3 Bedroom',
                '1 BHK', '1 RK', '1 Bedroom', '8 Bedroom', '2 Bedroom',
                '7 Bedroom', '5 BHK', '7 BHK', '6 BHK', '5 Bedroom', '11 BHK',
                '9 BHK', '9 Bedroom', '27 BHK', '10 Bedroom', '11 Bedroom',
                '10 BHK', '19 BHK', '16 BHK', '43 Bedroom', '14 BHK', '8 BHK',
                '12 Bedroom', '13 BHK', '18 Bedroom'], dtype=object)
```

```
In [24]: #Adding the "bhk" feature extracted from size

housing_clean["bhk"] = housing_clean["size"].apply(lambda x: int(x.split(" ")[0])
```

```
In [25]: housing_clean[pd.isnull(housing_clean["bath"])]
```

	area_type	availability	location	size	society	total_sqft	bath	balcony	price
56	Built-up Area	20-Feb	Devanahalli	4 Bedroom	BrereAt	3010 - 3410	NaN	NaN	192
81	Built-up Area	18-Oct	Hennur Road	4 Bedroom	Gollela	2957 - 3450	NaN	NaN	224
224	Super built-up Area	19-Dec	Devanahalli	3 BHK	Jurdsig	1520 - 1740	NaN	NaN	74
344	Super built-up Area	21-Dec	Kanakpura Road	1 BHK	PrarePa	525	NaN	NaN	21
669	Super built-up Area	18-Dec	JP Nagar	5 BHK	Pehtsa	4400 - 6640	NaN	NaN	375
702	Super built-up Area	18-Dec	JP Nagar	5 BHK	Pehtsa	4400 - 6800	NaN	NaN	548
801	Super built-up Area	18-Dec	JP Nagar	4 BHK	Pehtsa	4000 - 5249	NaN	NaN	453
941	Super built-up Area	Ready To Move	Whitefield	4 Bedroom	PrOakSi	3606 - 5091	NaN	NaN	304
1264	Built-up Area	18-May	Hennur	3 Bedroom	Asoilul	2264	NaN	NaN	155
1267	Super built-up Area	18-Jun	Yelahanka	3 BHK	Shalkri	1440 - 1884	NaN	NaN	67
1686	Super built-up Area	21-Dec	Whitefield	1 BHK	SudenEd	660 - 670	NaN	NaN	28
1724	Super built-up Area	Ready To Move	Thanisandra	1 BHK	Bhmesy	620 - 933	NaN	NaN	48

1765	Super built-up Area	19-Dec	Binny Pete	4 BHK	Shestlo	2695 - 2940	NaN	NaN	204
1852	Super built-up Area	19-Jun	Yelahanka	4 BHK	Vaaram	3450 - 3472	NaN	NaN	175
2500	Super built-up Area	22-May	Jakkur	4 BHK	SoineC	2249.81 - 4112.19	NaN	NaN	260
2563	Super built-up Area	Ready To Move	Rajaji Nagar	4 BHK	PhestOn	3436 - 3643	NaN	NaN	424
2944	Super built-up Area	18-Dec	Kudlu Gate	3 BHK	Sanzaat	1564 - 1850	NaN	NaN	95
2998	Super built-up Area	19-May	Sarjapur Road	3 BHK	Klark L	1446 - 1506	NaN	NaN	98
3370	Super built-up Area	Ready To Move	Kanakpura Road	3 BHK	Wiowsri	1430 - 1630	NaN	NaN	66
3544	Super built-up Area	19-Mar	Hennur Road	3 BHK	Puachal	1482 - 1846	NaN	NaN	95
3598	Super built-up Area	18-Jun	Haralur Road	4 BHK	SNnia E	2805 - 3565	NaN	NaN	175
3862	Super built-up Area	Ready To Move	Jigani	4 Bedroom	Prllasw	3293 - 5314	NaN	NaN	226
4210	Super built-up Area	Ready To Move	Malleshwaram	3 BHK	Sariaat	2215 - 2475	NaN	NaN	295
4346	Super built-up Area	18-Dec	Whitefield	3 BHK	Prtates	1650 - 2538	NaN	NaN	115
4843	Super built-up Area	18-Mar	Bhoganhalli	4 BHK	Rosha I	1974 - 2171	NaN	NaN	111
4894	Super built-up Area	Ready To Move	Bommanahalli	3 BHK	SNeur G	1360 - 1890	NaN	NaN	87
4995	Super built-up Area	18-Mar	Hebbal	3 BHK	SNontle	2466 - 2856	NaN	NaN	226
5464	Super built-up Area	18-Sep	KR Puram	3 BHK	MCnexva	1310 - 1615	NaN	NaN	62
5498	Built-up Area	Ready To Move	Chandapura	4 Bedroom	MRowsea	1782 - 2000	NaN	NaN	66
5747	Super built-up Area	18-Apr	Kanakpura Road	1 BHK	PrarePa	525	NaN	NaN	27
5918	Super built-up Area	Ready To Move	Sarjapur Road	4 BHK	Klark L	4260 - 4408	NaN	NaN	338
6256	Built-up Area	Ready To Move	Electronic City Phase II	4 Bedroom	Shrds O	3500 - 3600	NaN	NaN	167
6343	Super built-up Area	18-May	KR Puram	3 BHK	TGasyhu	1482 - 1684	NaN	NaN	70
6481	Super built-up Area	18-Jun	Chandapura	3 BHK	SuVue S	1100 - 1225	NaN	NaN	30

6778	Super built-up Area	Ready To Move	Old Madras Road	4 BHK	Saciatt	4050 - 4075	NaN	NaN	341
6873	Super built-up Area	18-Mar	JP Nagar	3 BHK	Shestut	1750 - 2640	NaN	NaN	152
6971	Super built-up Area	18-Dec	Whitefield	3 BHK	BSlasin	1390 - 1600	NaN	NaN	61
7398	Super built-up Area	18-Dec	JP Nagar	3 BHK	Pehtsa	3103 - 3890	NaN	NaN	237
7623	Super built-up Area	Ready To Move	Electronics City Phase 1	3 BHK	Shitt S	1450 - 1595	NaN	NaN	60
7921	Super built-up Area	18-Mar	Sarjapur Road	3 BHK	PualeSk	1618 - 1929	NaN	NaN	85
8020	Super built-up Area	22-May	Jakkur	4 BHK	SoineC	2249.81 - 4112.19	NaN	NaN	225
8056	Super built-up Area	Ready To Move	Jakkur	3 BHK	BrdgeNo	1610 - 1880	NaN	NaN	98
8275	Super built-up Area	21-Dec	Kanakpura Road	1 BHK	PrarePa	525	NaN	NaN	25
8289	Super built-up Area	18-Apr	Kanakpura Road	2 BHK	PrarePa	700 - 900	NaN	NaN	41
8472	Super built-up Area	18-Dec	Sarjapur	4 BHK	Kinuerg	1925 - 2680	NaN	NaN	80
8783	Super built-up Area	18-Dec	Whitefield	3 BHK	BSlasin	1390 - 1600	NaN	NaN	60
9129	Super built-up Area	18-May	Mysore Road	3 BHK	Brama P	1410 - 1710	NaN	NaN	85
9437	Built-up Area	18-May	Hennur	4 Bedroom	Asoilul	2557	NaN	NaN	170
9699	Super built-up Area	18-Jul	Bannerghatta	4 BHK	Mamespa	1791 - 4000	NaN	NaN	246
10330	Super built-up Area	Ready To Move	Kanakpura Road	3 BHK	Wiowsri	1430 - 1630	NaN	NaN	70
10553	Built-up Area	Ready To Move	Sarjapur Road	4 Bedroom	AztheBr	3418	NaN	NaN	222
10726	Super built-up Area	18-Mar	Sarjapur Road	3 BHK	PualeSk	1618 - 1929	NaN	NaN	102
11297	Super built-up Area	18-Dec	Hennur	4 BHK	Exitym	3484 - 3550	NaN	NaN	161
11496	Super built-up Area	21-Dec	Kanakpura Road	1 BHK	PrarePa	525	NaN	NaN	27
12768	Built-up Area	18-Mar	Bettahalsoor	5 Bedroom	Toainnt	3210	NaN	NaN	355
12861	Super built-up Area	21-Dec	KR Puram	4 BHK	Moquach	2204 - 2362	NaN	NaN	121

	Area								
13240	Super built-up Area	Ready To Move	Devanahalli	1 BHK	Pardsri	1020 - 1130	NaN	NaN	52



In [26]:

```
def fcnIsFloat(x):
    try:
        float(x)
    except:
        return False
    return True

housing_clean[~housing_clean["total_sqft"].apply(fcnIsFloat)]
```

Out[26]:

	area_type	availability	location	size	society	total_sqft	bath	balcony
30	Super built-up Area	19-Dec	Yelahanka	4 BHK	LedorSa	2100 - 2850	4.0	0.0
56	Built-up Area	20-Feb	Devanahalli	4 Bedroom	BrereAt	3010 - 3410	NaN	NaN
81	Built-up Area	18-Oct	Hennur Road	4 Bedroom	Gollela	2957 - 3450	NaN	NaN
122	Super built-up Area	18-Mar	Hebbal	4 BHK	SNontle	3067 - 8156	4.0	0.0
137	Super built-up Area	19-Mar	8th Phase JP Nagar	2 BHK	Vaarech	1042 - 1105	2.0	0.0
165	Super built-up Area	18-Dec	Sarjapur	2 BHK	Kinurg	1145 - 1340	2.0	0.0
188	Super built-up Area	Ready To Move	KR Puram	2 BHK	MCvarar	1015 - 1540	2.0	0.0
224	Super built-up Area	19-Dec	Devanahalli	3 BHK	Jurdsig	1520 - 1740	NaN	NaN
410	Super built-up Area	Ready To Move	Kengeri	1 BHK	NaN	34.46Sq. Meter	1.0	0.0
549	Super built-up Area	18-Sep	Hennur Road	2 BHK	Shxorm	1195 - 1440	2.0	0.0
648	Built-up Area	Ready To Move	Arekere	9 Bedroom	NaN	4125Perch	9.0	NaN
661	Super built-up Area	Ready To Move	Yelahanka	2 BHK	Rarthne	1120 - 1145	2.0	0.0
669	Super built-up Area	18-Dec	JP Nagar	5 BHK	Pehtsa	4400 - 6640	NaN	NaN
672	Built-up Area	18-Mar	Bettahalsoor	4 Bedroom	Toainnt	3090 - 5002	4.0	0.0
702	Super built-up Area	18-Dec	JP Nagar	5 BHK	Pehtsa	4400 - 6800	NaN	NaN
772	Super built-up Area	20-Dec	Banashankari Stage VI	2 BHK	Brens7	1160 - 1195	2.0	0.0
775	Built-up Area	Ready To Move	Basavanagara	1 BHK	NaN	1000Sq. Meter	2.0	1.0
	Super					4000 -		

801	built-up Area	18-Dec	JP Nagar	4 BHK	Pehtsa	4000 - 5249	NaN	NaN
850	Super built-up Area	22-Dec	Bannerghatta Road	2 BHK	PrarePa	1115 - 1130	2.0	0.0
872	Super built-up Area	Ready To Move	Singapura Village	2 BHK	NaN	1100Sq. Yards	2.0	NaN
886	Super built-up Area	18-Jun	Chandapura	1 BHK	SuVue S	520 - 645	1.0	0.0
927	Super built-up Area	18-Dec	Thanisandra	2 BHK	Omter A	1000 - 1285	2.0	0.0
941	Super built-up Area	Ready To Move	Whitefield	4 Bedroom	PrOakSi	3606 - 5091	NaN	NaN
959	Super built-up Area	Ready To Move	Kammasandra	1 BHK	Puitea	650 - 665	1.0	0.0
990	Super built-up Area	Ready To Move	Sarjapur	1 BHK	DSousyl	633 - 666	1.0	0.0
1019	Plot Area	18-Mar	Marathi Layout	1 Bedroom	NaN	5.31Acres	1.0	0.0
1086	Plot Area	19-Mar	Narasapura	2 Bedroom	NaN	30Acres	2.0	2.0
1178	Super built-up Area	20-Dec	Yelahanka	3 BHK	Un 46th	1445 - 1455	3.0	0.0
1183	Super built-up Area	18-Aug	Magadi Road	2 BHK	Vrenty	884 - 1116	2.0	0.0
1187	Super built-up Area	18-Mar	Thanisandra	2 BHK	SLityee	850 - 1093	2.0	0.0
1267	Super built-up Area	18-Jun	Yelahanka	3 BHK	Shalkri	1440 - 1884	NaN	NaN
1400	Super built-up Area	Ready To Move	Chamrajpet	9 BHK	NaN	716Sq. Meter	9.0	1.0
1484	Carpet Area	18-Mar	Hebbal	2 BHK	Arcia S	547.34 - 827.31	2.0	0.0
1542	Super built-up Area	19-Jul	Sarjapur Road	1 BHK	Sasta S	580 - 650	1.0	0.0
1614	Super built-up Area	Ready To Move	Sarjapur Road	4 BHK	DSndsod	3425 - 3435	6.0	0.0
1643	Super built-up Area	18-May	Talaghattapura	3 BHK	Sodgere	1804 - 2273	3.0	0.0
1683	Super built-up Area	Ready To Move	Old Madras Road	4 BHK	Brica E	3630 - 3800	6.0	0.0
1686	Super built-up Area	21-Dec	Whitefield	1 BHK	SudenEd	660 - 670	NaN	NaN
1694	Super built-up Area	18-Dec	JP Nagar	4 BHK	Pehtsa	4000 - 5249	4.0	0.0
1712	Plot Area	Ready To	Singena	3	CoimSu	1500Sq.	3.0	1.0

1712	Plot Area	Move	Agrahara	Bedroom	Colewysy	Meter	3.0	1.0
1724	Super built-up Area	Ready To Move	Thanisandra	1 BHK	Bhmesy	620 - 933	NaN	NaN
1743	Super built-up Area	19-Mar	Hosa Road	3 BHK	Sosisic	142.61Sq. Meter	3.0	1.0
1765	Super built-up Area	19-Dec	Binny Pete	4 BHK	Shestlo	2695 - 2940	NaN	NaN
1821	Plot Area	Ready To Move	Sarjapur	3 Bedroom	Inensba	1574Sq. Yards	3.0	1.0
1852	Super built-up Area	19-Jun	Yelahanka	4 BHK	Vaaram	3450 - 3472	NaN	NaN
2088	Super built-up Area	Ready To Move	Yeshwanthpur	2 BHK	Prthand	1250 - 1305	2.0	0.0
2128	Super built-up Area	20-Dec	Kanakpura Road	1 BHK	GolusLi	670 - 980	1.0	0.0
2228	Carpet Area	Ready To Move	KR Puram	3 BHK	Jahidva	1005.03 - 1252.49	3.0	0.0
2265	Super built-up Area	Ready To Move	Old Madras Road	4 BHK	Brica E	3630 - 3800	6.0	0.0
2301	Super built-up Area	18-Mar	Hosa Road	2 BHK	Akvam P	1004 - 1204	2.0	0.0
2310	Super built-up Area	Ready To Move	Whitefield	4 BHK	Haestt	361.33Sq. Yards	4.0	NaN
2396	Super built-up Area	20-Jan	Balagere	1 BHK	Soresea	645 - 936	1.0	0.0
2431	Super built-up Area	Ready To Move	EPIP Zone	4 BHK	BrontLa	2710 - 3360	5.0	0.0
2500	Super built-up Area	22-May	Jakkur	4 BHK	SoineC	2249.81 - 4112.19	NaN	NaN
2563	Super built-up Area	Ready To Move	Rajaji Nagar	4 BHK	PhestOn	3436 - 3643	NaN	NaN
2575	Super built-up Area	18-Dec	Whitefield	4 BHK	Prtates	2830 - 2882	5.0	0.0
2587	Super built-up Area	21-Jun	Tumkur Road	1 BHK	Coowsri	596 - 804	1.0	0.0
2713	Super built-up Area	Ready To Move	KR Puram	3 BHK	MCvarar	1255 - 1863	3.0	0.0
2716	Super built-up Area	18-Mar	JP Nagar	2 BHK	Shestut	1300 - 1405	2.0	0.0
2881	Built-up Area	Ready To Move	Volagerekallahalli	2 BHK	PSterAs	117Sq. Yards	2.0	2.0
2916	Super built-up Area	18-Nov	Thanisandra	2 BHK	Bhe 2ko	934 - 1437	2.0	0.0
2920	Super built-up	18-Jun	Mysore Road	2 BHK	Gopia O	980 - 1020	2.0	0.0

	Area					1030		
2944	Super built-up Area	18-Dec	Kudlu Gate	3 BHK	Sanzaat	1564 - 1850	NaN	NaN
2998	Super built-up Area	19-May	Sarjapur Road	3 BHK	Klark L	1446 - 1506	NaN	NaN
3174	Super built-up Area	22-May	Jakkur	4 BHK	SoineC	2249.81 - 4112.19	4.0	0.0
3215	Super built-up Area	18-Sep	KR Puram	2 BHK	MCnexva	1070 - 1315	2.0	0.0
3228	Built-up Area	Ready To Move	Dodda Banaswadi	5 Bedroom	NaN	3040Sq. Meter	5.0	1.0
3285	Plot Area	18-May	Whitefield	4 Bedroom	Prtates	500Sq. Yards	4.0	2.0
3356	Super built-up Area	Ready To Move	Yelahanka	4 BHK	Niareum	2806 - 3019	6.0	0.0
3364	Super built-up Area	19-Dec	Whitefield	1 BHK	Goted U	613 - 648	1.0	0.0
3370	Super built-up Area	Ready To Move	Kanakpura Road	3 BHK	Wiowsri	1430 - 1630	NaN	NaN
3468	Super built-up Area	Ready To Move	Yeshwanthpur	2 BHK	VSlistr	704 - 730	2.0	0.0
3544	Super built-up Area	19-Mar	Hennur Road	3 BHK	Puachal	1482 - 1846	NaN	NaN
3598	Super built-up Area	18-Jun	Haralur Road	4 BHK	SNnia E	2805 - 3565	NaN	NaN
3862	Super built-up Area	Ready To Move	Jigani	4 Bedroom	Prllasw	3293 - 5314	NaN	NaN
3890	Super built-up Area	21-Jun	Tumkur Road	3 BHK	Coowsri	1210 - 1477	3.0	0.0
3947	Built-up Area	18-May	Sarjapur Road	4 Bedroom	Cetattu	3369 - 3464	6.0	0.0
3984	Super built-up Area	Ready To Move	Uttarahalli	3 BHK	Niiewem	1125 - 1500	3.0	0.0
4113	Super built-up Area	18-Jan	BTM Layout	3 BHK	NaN	167Sq. Meter	3.0	2.0
4122	Super built-up Area	21-Jun	Tumkur Road	2 BHK	Coowsri	1076 - 1199	2.0	0.0
4190	Carpet Area	20-Dec	Kanakpura Road	1 BHK	Roiti A	381 - 535	1.0	0.0
4210	Super built-up Area	Ready To Move	Malleshwaram	3 BHK	Sariaat	2215 - 2475	NaN	NaN
4226	Super built-up Area	19-Dec	Whitefield	1 BHK	Oreldhi	524 - 894	1.0	0.0
4289	Super built-up Area	Ready To Move	Yeshwanthpur	1 BHK	VSlistr	540 - 670	1.0	0.0

4293	Built-up Area	Ready To Move	Bannerghatta Road	4 BHK	NaN	315Sq. Yards	5.0	NaN
4346	Super built-up Area	18-Dec	Whitefield	3 BHK	Prtates	1650 - 2538	NaN	NaN
4497	Super built-up Area	Ready To Move	Iblur Village	4 BHK	DNionfl	2725 - 3250	5.0	0.0
4843	Super built-up Area	18-Mar	Bhoganhalli	4 BHK	Rosha I	1974 - 2171	NaN	NaN
4884	Super built-up Area	18-Oct	Electronic City Phase II	2 BHK	SRhtsa	888 - 1290	2.0	0.0
4894	Super built-up Area	Ready To Move	Bommanahalli	3 BHK	SNeur G	1360 - 1890	NaN	NaN
4995	Super built-up Area	18-Mar	Hebbal	3 BHK	SNontle	2466 - 2856	NaN	NaN
5179	Super built-up Area	18-May	Rachenahalli	1 BHK	AsNowre	660 - 700	1.0	0.0
5285	Super built-up Area	18-May	Rachenahalli	1 RK	AsNowre	385 - 440	1.0	0.0
5374	Super built-up Area	19-Dec	Varthur Road	2 BHK	Aseenh	770 - 841	2.0	0.0
5382	Super built-up Area	19-Dec	Whitefield	1 BHK	Oreldhi	524 - 894	1.0	0.0
5453	Plot Area	Ready To Move	Kannur	6 Bedroom	NaN	3Cents	6.0	3.0
5464	Super built-up Area	18-Sep	KR Puram	3 BHK	MCnexva	1310 - 1615	NaN	NaN
5498	Built-up Area	Ready To Move	Chandapura	4 Bedroom	MRowsea	1782 - 2000	NaN	NaN
5537	Built-up Area	Ready To Move	Frazer Town	3 BHK	CaaveEn	188.89Sq. Yards	3.0	1.0
5599	Super built-up Area	19-Aug	Hormavu	3 BHK	DSapete	1469 - 1766	3.0	0.0
5631	Super built-up Area	Ready To Move	Thanisandra	3 BHK	Soitya	204Sq. Meter	4.0	2.0
5643	Super built-up Area	18-Jan	Kengeri Satellite Town	2 BHK	V6estde	1255 - 1350	2.0	0.0
5658	Super built-up Area	19-Jul	Sarjapur Road	2 BHK	Sasta S	870 - 1080	2.0	0.0
5668	Built-up Area	Ready To Move	Judicial Layout	5 Bedroom	NaN	45Sq. Yards	6.0	3.0
5708	Plot Area	Ready To Move	Jigani	4 Bedroom	Ceeury	133.3Sq. Yards	3.0	2.0
5783	Built-up Area	19-Jun	Sarjapur	4 Bedroom	Caonand	2580 - 2591	4.0	0.0
5848	Super built-up Area	19-Dec	Whitefield	1 BHK	Goted U	613 - 648	1.0	0.0

5887	Super built-up Area	17-Dec	Rajaji Nagar	4 BHK	ProdsWe	2563 - 2733	5.0	0.0
5908	Super built-up Area	Ready To Move	Sonnenahalli	1 BHK	Skacak	605 - 624	1.0	0.0
5918	Super built-up Area	Ready To Move	Sarjapur Road	4 BHK	Klark L	4260 - 4408	NaN	NaN
5940	Super built-up Area	18-Nov	Thanisandra	3 BHK	Bhe 2ko	1349 - 3324	3.0	0.0
5976	Built-up Area	Ready To Move	1st Phase JP Nagar	1 BHK	Opamaan	78.03Sq. Meter	1.0	1.0
5983	Super built-up Area	Ready To Move	Bannerghatta Road	2 BHK	SNity S	1255 - 1350	2.0	0.0
5985	Super built-up Area	Ready To Move	Omarbagh Layout	4 BHK	SNtua S	3300 - 3335	5.0	0.0
6056	Super built-up Area	19-Aug	Yelahanka	2 BHK	SMllay	1180 - 1630	2.0	0.0
6229	Super built-up Area	22-Dec	Bannerghatta Road	3 BHK	PrarePa	1365 - 1700	3.0	0.0
6256	Built-up Area	Ready To Move	Electronic City Phase II	4 Bedroom	Shrds O	3500 - 3600	NaN	NaN
6268	Built-up Area	Ready To Move	Chickpet	2 BHK	NaN	122Sq. Yards	2.0	0.0
6275	Super built-up Area	18-Dec	Whitefield	4 BHK	Prtates	2830 - 2882	5.0	0.0
6303	Built-up Area	Ready To Move	JP Nagar	3 BHK	NaN	84.53Sq. Meter	3.0	1.0
6333	Plot Area	Ready To Move	Harohalli	2 Bedroom	NaN	2.09Acres	2.0	0.0
6334	Super built-up Area	18-Dec	Whitefield	4 BHK	Prtates	2830 - 2882	5.0	0.0
6343	Super built-up Area	18-May	KR Puram	3 BHK	TGasyhu	1482 - 1684	NaN	NaN
6386	Super built-up Area	20-Dec	Whitefield	2 BHK	Somns T	981 - 1249	2.0	0.0
6481	Super built-up Area	18-Jun	Chandapura	3 BHK	SuVue S	1100 - 1225	NaN	NaN
6522	Super built-up Area	18-Mar	Panathur	3 BHK	EcEONfe	1565 - 1595	3.0	0.0
6552	Plot Area	Ready To Move	5 Bedroom Farm House in Lakshmipura	5 Bedroom	NaN	24Guntha	6.0	2.0
6581	Super built-up Area	Ready To Move	Sarjapur Road	3 BHK	Shthi S	1270 - 1275	2.0	0.0
6587	Super built-up Area	Ready To Move	Kadugodi	1 BHK	RatatHa	840 - 1010	1.0	0.0
6592	Built-up Area	Ready To Move	Langford Town	4 BHK	NaN	697Sq. Yards	4.0	2.0

6592	Area	Move	Langford town	4 BHK	NaN	Meter	4.0	2.0
6643	Super built-up Area	18-Dec	Whitefield	4 BHK	Prtates	2830 - 2882	5.0	0.0
6682	Super built-up Area	18-May	Devanahalli	1 BHK	Sabixtt	655 - 742	1.0	0.0
6769	Super built-up Area	19-Mar	8th Phase JP Nagar	3 BHK	Vaarech	1408 - 1455	3.0	0.0
6778	Super built-up Area	Ready To Move	Old Madras Road	4 BHK	Saciatt	4050 - 4075	NaN	NaN
6832	Super built-up Area	18-May	Mysore Road	2 BHK	Brama P	942 - 1117	2.0	0.0
6873	Super built-up Area	18-Mar	JP Nagar	3 BHK	Shestut	1750 - 2640	NaN	NaN
6953	Super built-up Area	18-Aug	Hosa Road	3 BHK	Sosisic	142.61Sq. Meter	3.0	1.0
6971	Super built-up Area	18-Dec	Whitefield	3 BHK	BSlasin	1390 - 1600	NaN	NaN
6987	Super built-up Area	19-Feb	Chandapura	2 BHK	PavesGr	598 - 958	2.0	0.0
7001	Plot Area	Ready To Move	Thyagaraja Nagar	8 Bedroom	NaN	1500Cents	6.0	2.0
7248	Built-up Area	Ready To Move	Hulimavu	2 BHK	NaN	132Sq. Yards	2.0	3.0
7286	Super built-up Area	Ready To Move	Kanakpura Road	2 BHK	Wiowsri	1010 - 1300	2.0	0.0
7334	Plot Area	Ready To Move	Kanakpura Road	1 Bedroom	NaN	2Acres	1.0	0.0
7398	Super built-up Area	18-Dec	JP Nagar	3 BHK	Pehtsa	3103 - 3890	NaN	NaN
7412	Super built-up Area	21-Jul	Devanahalli	3 BHK	Oznuean	1450 - 1950	3.0	0.0
7520	Super built-up Area	Ready To Move	Doddaballapur	3 BHK	NaN	1100Sq. Meter	2.0	1.0
7607	Plot Area	Ready To Move	Bommenahalli	3 Bedroom	Prood G	15Acres	3.0	1.0
7623	Super built-up Area	Ready To Move	Electronics City Phase 1	3 BHK	Shitt S	1450 - 1595	NaN	NaN
7679	Super built-up Area	Ready To Move	Thanisandra	1 BHK	Gontsoo	763 - 805	1.0	0.0
7718	Built-up Area	Ready To Move	Sarjapur Road	4 Bedroom	Cetattu	3307 - 3464	6.0	0.0
7726	Plot Area	Ready To Move	Kanakpura Road	1 Bedroom	NaN	1.26Acres	1.0	0.0
7747	Super built-up Area	18-Nov	Thanisandra	1 BHK	Bhe 2ko	620 - 934	1.0	0.0
	Super					2462 -		

7797	built-up Area	19-Aug	Begur Road	4 BHK	Pruthg	2467	6.0	0.0
7843	Super built-up Area	20-Dec	Whitefield	1 BHK	Somns T	540 - 740	1.0	0.0
7921	Super built-up Area	18-Mar	Sarjapur Road	3 BHK	PualeSk	1618 - 1929	NaN	NaN
7962	Built-up Area	Ready To Move	Sarjapur	4 Bedroom	Prldsum	3508 - 4201	6.0	0.0
8020	Super built-up Area	22-May	Jakkur	4 BHK	SoineC	2249.81 - 4112.19	NaN	NaN
8023	Built-up Area	Ready To Move	Devanahalli	4 Bedroom	Pardst	4900 - 4940	4.0	0.0
8056	Super built-up Area	Ready To Move	Jakkur	3 BHK	BrdgeNo	1610 - 1880	NaN	NaN
8087	Super built-up Area	Ready To Move	Electronics City Phase 1	1 BHK	Shitt S	755 - 770	1.0	0.0
8236	Super built-up Area	Ready To Move	Budigere	1 BHK	PrityTr	664 - 722	1.0	0.0
8273	Built-up Area	Ready To Move	V.V Puram	3 BHK	NaN	151.11Sq. Yards	2.0	0.0
8289	Super built-up Area	18-Apr	Kanakpura Road	2 BHK	PrarePa	700 - 900	NaN	NaN
8312	Super built-up Area	21-Jun	Tumkur Road	1 BHK	Coowsri	596 - 861	1.0	0.0
8472	Super built-up Area	18-Dec	Sarjapur	4 BHK	Kinuerg	1925 - 2680	NaN	NaN
8477	Super built-up Area	19-Mar	Hosa Road	1 BHK	Skume R	615 - 985	1.0	0.0
8724	Super built-up Area	19-Dec	Varthur Road	1 BHK	Aseenh	540 - 565	1.0	0.0
8783	Super built-up Area	18-Dec	Whitefield	3 BHK	BSlasin	1390 - 1600	NaN	NaN
8871	Super built-up Area	Ready To Move	Jalahalli East	1 BHK	ShshaSa	750 - 800	1.0	0.0
8873	Super built-up Area	Ready To Move	Carmelaram	3 BHK	DSensn	1660 - 1805	3.0	0.0
9050	Super built-up Area	22-Dec	Bannerghatta Road	3 BHK	PrarePa	1365 - 1700	3.0	0.0
9129	Super built-up Area	18-May	Mysore Road	3 BHK	Brama P	1410 - 1710	NaN	NaN
9147	Super built-up Area	18-Nov	Thanisandra	2 BHK	Bhe 2ko	1079 - 1183	2.0	0.0
9149	Super built-up Area	Ready To Move	Hosur Road	4 BHK	Saageat	2800 - 2870	4.0	0.0
	Super	Ready To				1220		

9164	built-up Area	Ready To Move	Jakkur	2 BHK	BrdgeNo	1230 - 1290	2.0	0.0
9183	Super built-up Area	Ready To Move	Hormavu	2 BHK	SKvanin	943 - 1220	2.0	0.0
9200	Super built-up Area	19-Dec	Hoodi	4 BHK	Caycend	2041 - 2090	4.0	0.0
9285	Carpet Area	19-Jun	Hormavu	1 BHK	Kolisl	527 - 639	1.0	0.0
9299	Super built-up Area	20-Jan	Balagere	1 BHK	Soresea	645 - 936	1.0	0.0
9423	Plot Area	Ready To Move	Ramamurthy Nagar	1 Bedroom	NaN	1Grounds	1.0	1.0
9434	Super built-up Area	Ready To Move	Bannerghatta Road	2 BHK	Loals P	1160 - 1315	2.0	0.0
9476	Super built-up Area	21-Dec	Hoodi	1 BHK	GoAirej	706 - 716	1.0	0.0
9519	Built-up Area	Ready To Move	Bommenahalli	3 Bedroom	Prood G	2940Sq. Yards	3.0	1.0
9699	Super built-up Area	18-Jul	Bannerghatta	4 BHK	Mamespa	1791 - 4000	NaN	NaN
9734	Carpet Area	Ready To Move	Yelahanka New Town	1 BHK	KHatsFl	45.06Sq. Meter	2.0	1.0
9736	Super built-up Area	18-Apr	Pragathi Nagar	1 BHK	Asarkia	799 - 803	1.0	0.0
9814	Super built-up Area	19-Jun	Hebbal	4 BHK	Raard B	2470 - 2790	5.0	0.0
9853	Super built-up Area	20-Sep	Hoodi	1 BHK	Ranuetz	783 - 943	1.0	0.0
10050	Super built-up Area	18-Jun	Old Madras Road	5 BHK	Brica E	4500 - 5540	7.0	0.0
10257	Super built-up Area	Ready To Move	Hulimavu	2 BHK	RatosAr	1255 - 1375	2.0	0.0
10330	Super built-up Area	Ready To Move	Kanakpura Road	3 BHK	Wiowsri	1430 - 1630	NaN	NaN
10351	Super built-up Area	19-Dec	Jalahalli	1 BHK	Vaniai	610 - 615	1.0	0.0
10439	Super built-up Area	Ready To Move	ITPL	2 BHK	Samukja	854 - 960	2.0	0.0
10467	Super built-up Area	Ready To Move	Harlur	4 BHK	Shodsir	2650 - 2990	4.0	0.0
10488	Plot Area	Ready To Move	2 Bedroom Furnished Farm House in Kolar Road	2 Bedroom	NaN	1.25Acres	2.0	2.0
10491	Super built-up Area	Ready To Move	Rajapura	2 BHK	NaN	86.72Sq. Meter	2.0	2.0
10544	Carpet	20-Dec	Kanakpura Road	1 BHK	Deiti A	201 - 525	1.0	0.0

10541	Area	20-Dec	Kanakapura Road	1 BHK	Koltri A	381 - 535	1.0	0.0
10569	Super built-up Area	19-Dec	Devanahalli	2 BHK	Jurdsig	1230 - 1490	2.0	0.0
10620	Super built-up Area	18-Jun	Old Madras Road	4 BHK	Brica E	3630 - 3800	6.0	0.0
10706	Super built-up Area	18-Apr	Anwar Layout	1 BHK	UKicte	660 - 780	1.0	0.0
10726	Super built-up Area	18-Mar	Sarjapur Road	3 BHK	PualeSk	1618 - 1929	NaN	NaN
10870	Super built-up Area	20-Jun	Budigere	2 BHK	Brstaue	1150 - 1194	2.0	0.0
10895	Super built-up Area	19-Dec	Thanisandra	1 BHK	Cotaror	684 - 810	1.0	0.0
11042	Super built-up Area	20-Jun	Budigere	3 BHK	Brstaue	1510 - 1670	3.0	0.0
11178	Super built-up Area	18-Sep	Hennur Road	3 BHK	Shxorm	1550 - 1590	3.0	0.0
11285	Super built-up Area	20-Dec	Whitefield	3 BHK	Somns T	1235 - 1410	3.0	0.0
11297	Super built-up Area	18-Dec	Hennur	4 BHK	Exitym	3484 - 3550	NaN	NaN
11320	Plot Area	Ready To Move	Arishinakunte	1 Bedroom	NaN	38Guntha	1.0	0.0
11373	Super built-up Area	Ready To Move	Hoskote	2 BHK	Soose P	929 - 1078	2.0	0.0
11389	Super built-up Area	18-May	Electronic City Phase II	4 BHK	SNbay G	2150 - 2225	4.0	0.0
11407	Super built-up Area	19-Sep	Whitefield	3 BHK	DSersus	1520 - 1759	3.0	0.0
11490	Built-up Area	19-Jun	Sarjapur	4 Bedroom	Caonand	2580 - 2591	4.0	0.0
11498	Super built-up Area	19-Dec	Yelahanka	1 BHK	Goues A	629 - 1026	1.0	0.0
11583	Super built-up Area	Ready To Move	Bommanahalli	2 BHK	SNeur G	1215 - 1495	2.0	0.0
11615	Plot Area	Ready To Move	arudi	3 Bedroom	NaN	6Acres	2.0	0.0
11650	Super built-up Area	Ready To Move	Yelahanka	2 BHK	Neite T	1140 - 1250	2.0	0.0
11764	Super built-up Area	19-Aug	Begur Road	4 BHK	Pruthg	2400 - 2600	6.0	0.0
11827	Super built-up Area	18-Aug	Magadi Road	3 BHK	Vrenty	1052 - 1322	2.0	0.0
11921	Super built-up Area	Ready To Move	ITPL	4 BHK	Toodvit	5666 - 5666	5.0	0.0

	Area	Move				5669		
11969	Super built-up Area	18-Nov	Thanisandra	1 BHK	Bhe 2ko	620 - 934	1.0	0.0
12161	Super built-up Area	19-Dec	Kanakapura	1 BHK	GoityEt	712 - 938	1.0	0.0
12184	Super built-up Area	18-Dec	Hennur	3 BHK	Exitym	1783 - 1878	3.0	0.0
12186	Built-up Area	Ready To Move	7th Phase JP Nagar	2 BHK	NaN	120Sq. Yards	2.0	1.0
12252	Built-up Area	Ready To Move	Gowdanapalya	5 BHK	NaN	24Sq. Meter	5.0	0.0
12280	Super built-up Area	18-Nov	Whitefield	4 BHK	Asarqz	2528 - 3188	4.0	0.0
12334	Super built-up Area	20-Jun	Budigere	1 BHK	Brstaue	650 - 760	1.0	0.0
12435	Super built-up Area	20-Dec	Banashankari Stage VI	3 BHK	Brens7	1400 - 1421	2.0	0.0
12544	Super built-up Area	Ready To Move	Hebbal	4 BHK	Brium C	4000 - 4450	6.0	0.0
12560	Super built-up Area	18-Dec	Hosa Road	3 BHK	Sosisic	142.84Sq. Meter	3.0	1.0
12652	Plot Area	Ready To Move	Billamaranahalli	2 Bedroom	AWharan	300Sq. Yards	2.0	2.0
12791	Super built-up Area	22-Dec	Bannerghatta Road	2 BHK	PrarePa	1115 - 1130	2.0	0.0
12861	Super built-up Area	21-Dec	KR Puram	4 BHK	Moquach	2204 - 2362	NaN	NaN
12955	Super built-up Area	18-Nov	Thanisandra	3 BHK	Bhe 2ko	1437 - 1629	3.0	0.0
12975	Super built-up Area	20-Aug	Whitefield	2 BHK	Bhath N	850 - 1060	2.0	0.0
12990	Super built-up Area	18-May	Talaghattapura	3 BHK	Sodgere	1804 - 2273	3.0	0.0
13059	Super built-up Area	Ready To Move	Harlur	2 BHK	Shodsir	1200 - 1470	2.0	0.0
13240	Super built-up Area	Ready To Move	Devanahalli	1 BHK	Pardsri	1020 - 1130	NaN	NaN
13265	Super built-up Area	20-Sep	Hoodi	2 BHK	Ranuetz	1133 - 1384	2.0	0.0
13299	Super built-up Area	18-Dec	Whitefield	4 BHK	Prtates	2830 - 2882	5.0	0.0

In [27]:

```
metrics = []
def forConvertToSqFt(x, metric):
```

```

def fcnConvertToSqFt(x, metric):
    if metric == "Acres":
        return x * 43560
    elif metric == "Cents":
        return x * 435.6
    elif metric == "Grounds":
        return x * 2400
    elif metric == "Guntha":
        return x * 1088.98
    elif metric == "Perch":
        return x * 272.25
    elif metric == "Sq. Meter":
        return x * 10.7639
    elif metric == "Sq. Yards":
        return x * 9
    else:
        return np.nan

def fcnExtractTotalSqft(x):
    try:
        values = x.split("-")
        return np.mean(list(map(float, values)))
    except:
        if x == np.nan:
            return np.nan
        else:
            for intIndex in range(len(x)-1, -1, -1):
                if fcnIsFloat(x[0:intIndex]):
                    return fcnConvertToSqFt(float(x[0:intIndex]), x[intIndex:])

```

```
In [28]: housing_clean["sqft"] = housing_clean["total_sqft"].apply(fcnExtractTotalSqft)
```

```
In [29]: housing_clean["sqft"].describe()
```

```

Out[29]: count    1.330400e+04
mean      1.911209e+03
std       1.728725e+04
min       1.000000e+00
25%      1.100000e+03
50%      1.276000e+03
75%      1.680000e+03
max       1.306800e+06
Name: sqft, dtype: float64

```

There are some outliers in this feature

```
In [30]: housing_clean.head()
```

	area_type	availability	location	size	society	total_sqft	bath	balcony	pri
0	Super built-up Area	19-Dec	Electronic City Phase II	2 BHK	Coomee	1056	2.0	1.0	39.
1	Plot Area	Ready To Move	Chikka Tirupathi	4 Bedroom	Theanmp	2600	5.0	3.0	120.
2	Built-up Area	Ready To Move	Uttarahalli	3 BHK	NaN	1440	2.0	3.0	62.
3	Super built-up Area	Ready To Move	Lingadheeranahalli	3 BHK	Soiewre	1521	3.0	1.0	95.
4	Super built-up Area	Ready To Move	Kothanur	2 BHK	NaN	1200	2.0	1.0	51.

```
In [31]: housing_clean.isnull().sum()
```

```

Out[31]: area_type      0
availability    0

```

```
location      0
size          0
society       5499
total_sqft    0
bath          57
balcony       593
price         0
bhk           0
sqft          0
dtype: int64
```

```
In [32]: bhk_groupby_bathroom = housing_clean.groupby("bhk")["bath"].value_counts()
```

```
In [33]: def fcnFillBathrooms(bhk_groupby_bathroom, row):
         if pd.isnull(row["bath"]):
             return int(bhk_groupby_bathroom[row["bhk"]].index[0])
         else:
             return int(row["bath"])
```

```
In [34]: bhk_groupby_bathroom = housing_clean.groupby("bhk")["bath"].value_counts()
         housing_clean["bath"] = housing_clean.apply(lambda row: fcnFillBathrooms(bhk_groupby_bathroom, row))
```

```
In [35]: def fcnFillBalcony(bhk_groupby_balcony, row):
         if pd.isnull(row["balcony"]):
             return int(bhk_groupby_balcony[row["bhk"]].index[0])
         else:
             return int(row["balcony"])
```

```
In [36]: bhk_groupby_balcony = housing_clean.groupby("bhk")["balcony"].value_counts()
         housing_clean["balcony"] = housing_clean.apply(lambda row: fcnFillBalcony(bhk_groupby_balcony, row))
```

Handled all the missing values based on highest frequency

```
In [37]: housing_clean.drop(["society", "size", "total_sqft"], inplace = True, axis=1)
```

Dropping the redundant features

```
In [38]: housing_clean.isnull().sum()
```

```
Out[38]: area_type      0
         availability    0
         location       0
         bath           0
         balcony        0
         price          0
         bhk            0
         sqft           0
         dtype: int64
```

```
In [39]: housing_clean.head()
```

```
Out[39]:
```

	area_type	availability	location	bath	balcony	price	bhk	sqft
0	Super built-up Area	19-Dec	Electronic City Phase II	2	1	39.07	2	1056.0
1	Plot Area	Ready To Move	Chikka Tirupathi	5	3	120.00	4	2600.0
2	Built-up Area	Ready To Move	Uttarahalli	2	3	62.00	3	1440.0
3	Super built-up Area	Ready To Move	Lingadheeranahalli	3	1	95.00	3	1521.0
4	Super built-up Area	Ready To Move	Kothanur	2	1	51.00	2	1200.0

```
In [40]: def fcnRelabelAvailability(x):
        values = x.split("-")
        try:
            if len(values) > 1:
                return "Soon to be Vacated"
            else:
                return x
        except:
            return ""
```

```
In [41]: housing_clean["availability"] = housing_clean["availability"].apply(fcnRelabelAv
```

Categorized the feature into 2 buckets

```
In [42]: housing_clean["location"] = housing_clean["location"].apply(lambda x: x.strip())
```

```
In [43]: unique_location_count = housing_clean.groupby("location")["location"].agg("count")
        unique_location_count
```

```
Out[43]: location
Whitefield          540
Sarjapur Road       397
Electronic City     304
Kanakpura Road      273
Thanisandra         237
...
1 Giri Nagar        1
Kanakapura Road,    1
Kanakapura main Road 1
Karnataka Shabarimala 1
whitefiled         1
Name: location, Length: 1293, dtype: int64
```

```
In [44]: unique_location_count_10 = unique_location_count[unique_location_count <= 10]
```

```
In [45]: housing_clean["location"] = housing_clean["location"].apply(lambda x : "Other" if
```

```
In [46]: housing_clean["location"].nunique()
```

```
Out[46]: 242
```

Relabelled few locations as Others whose count was less than 10

```
In [47]: housing_clean["price_per_sqft"] = housing_clean["price"] * 100000 / housing_clean["sqft"]
```

```
In [48]: housing_clean["sqft_per_bhk"] = housing_clean["sqft"] / housing_clean["bhk"]
```

```
In [49]: housing_clean.head()
```

	area_type	availability	location	bath	balcony	price	bhk	sqft	price_per_sqft
0	Super built-up Area	Soon to be Vacated	Electronic City Phase II	2	1	39.07	2	1056.0	3699.810606
1	Plot Area	Ready To Move	Chikka Tirupathi	5	3	120.00	4	2600.0	4615.384615
2	Built-up Area	Ready To Move	Uttarahalli	2	3	62.00	3	1440.0	4305.555556
3	Super built-up Area	Ready To Move	Lingadheeranahalli	3	1	95.00	3	1521.0	6245.890861
4	Super built-up Area	Ready To Move	Uttarahalli	2	3	62.00	3	1440.0	4305.555556

Added a feature "price_per_sqft" and "sqft_per_bhk" that can help detect outliers

Outlier Analysis

```
In [50]: # Removing samples that show sqft_per_room to be less than 300 and more than 1500

housing_clean[housing_clean["sqft_per_bhk"] < 300].count()
```

```
Out[50]: area_type      748
availability  748
location     748
bath         748
balcony      748
price        748
bhk          748
sqft         748
price_per_sqft 748
sqft_per_bhk  748
dtype: int64
```

```
In [51]: housing_clean[housing_clean["sqft_per_bhk"] > 1500].count()
```

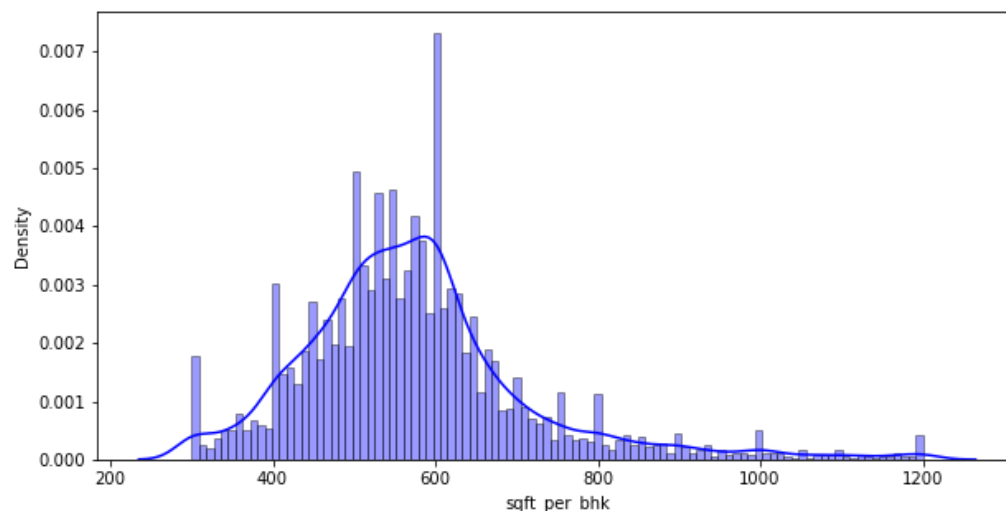
```
Out[51]: area_type      104
availability  104
location     104
bath         104
balcony      104
price        104
bhk          104
sqft         104
price_per_sqft 104
sqft_per_bhk  104
dtype: int64
```

```
In [52]: housing_clean = housing_clean[~(housing_clean["sqft_per_bhk"] < 300)]
housing_clean = housing_clean[~(housing_clean["sqft_per_bhk"] > 1200)]
```

```
In [53]: sns.distplot(housing_clean["sqft_per_bhk"], hist=True, kde=True,
                      bins=100, color = 'blue',
                      hist_kws={'edgecolor':'black'})
```

C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).
warnings.warn(msg, FutureWarning)

```
Out[53]: <AxesSubplot:xlabel='sqft_per_bhk', ylabel='Density'>
```



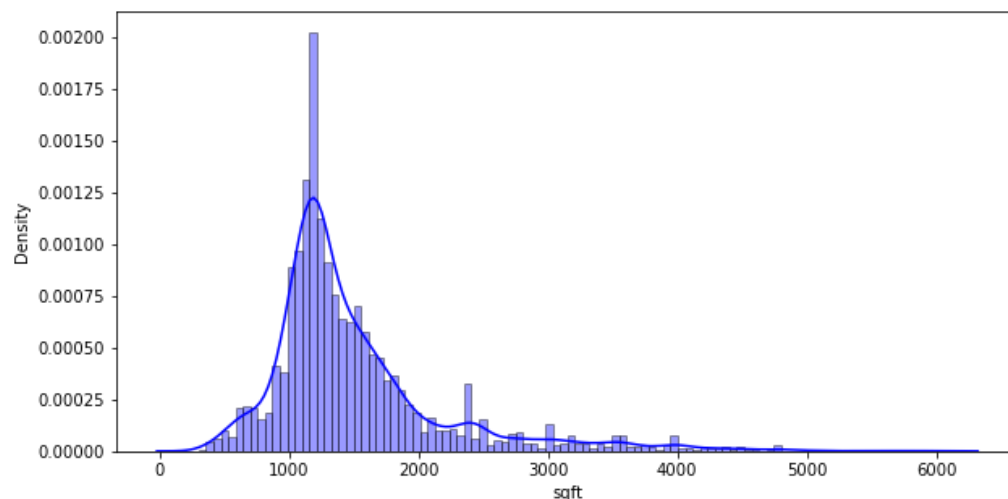
```
In [54]:
```

```
In [54]: housing_clean = housing_clean[~(housing_clean["sqft"] > 6000)]
```

```
In [55]: sns.distplot(housing_clean["sqft"], hist=True, kde=True,
                    bins=100, color = 'blue',
                    hist_kws={'edgecolor':'black'})
```

C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).
warnings.warn(msg, FutureWarning)

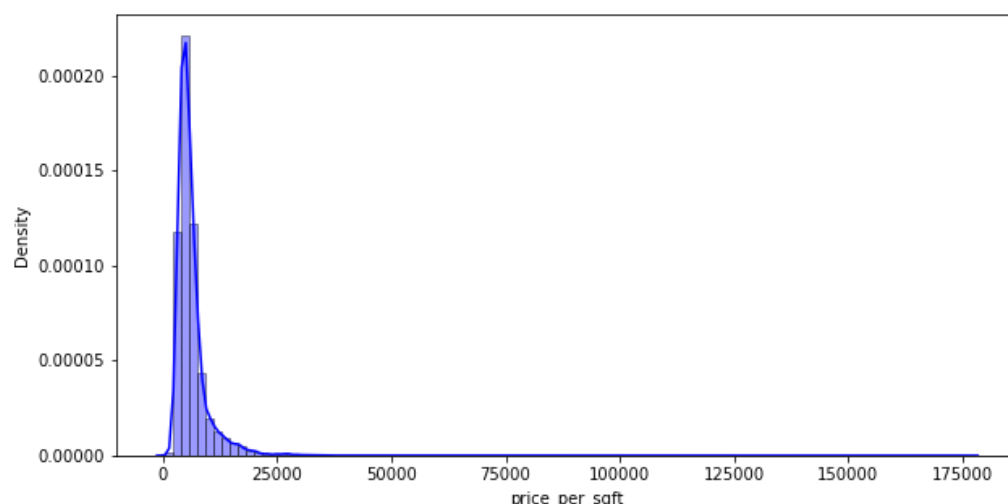
```
Out[55]: <AxesSubplot:xlabel='sqft', ylabel='Density'>
```



```
In [56]: sns.distplot(housing_clean["price_per_sqft"], hist=True, kde=True,
                    bins=100, color = 'blue',
                    hist_kws={'edgecolor':'black'})
```

C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).
warnings.warn(msg, FutureWarning)

```
Out[56]: <AxesSubplot:xlabel='price_per_sqft', ylabel='Density'>
```



```
In [57]: housing_clean.sort_values(["price"], ascending=False)
```

```
Out[57]:
```

	area_type	availability	location	bath	balcony	price	bhk	sqft	price_per_sqft
12443	Plot Area	Ready To Move	Other	8	4	2600.0	4	4350.0	59770.114943
6421	Plot Area	Soon to be Vacated	Bommenahalli	3	2	2250.0	4	2940.0	76530.612245
8398	Super built-up Area	Ready To Move	Bannerghatta Road	4	5	1400.0	5	2500.0	56000.000000

9535	Plot Area	Ready To Move	Indira Nagar	5	4	1250.0	4	2400.0	52083.333333
1299	Plot Area	Ready To Move	Chamrajpet	7	1	1200.0	9	4050.0	29629.629630
...
5410	Super built-up Area	Ready To Move	Attibele	1	1	10.0	1	400.0	2500.000000
11091	Built-up Area	Ready To Move	Attibele	1	1	10.0	1	410.0	2439.024390
7482	Super built-up Area	Ready To Move	Other	2	1	10.0	1	470.0	2127.659574
12579	Super built-up Area	Ready To Move	Chandapura	1	1	10.0	1	410.0	2439.024390
8594	Built-up Area	Ready To Move	Chandapura	1	1	9.0	1	450.0	2000.000000

12339 rows × 10 columns

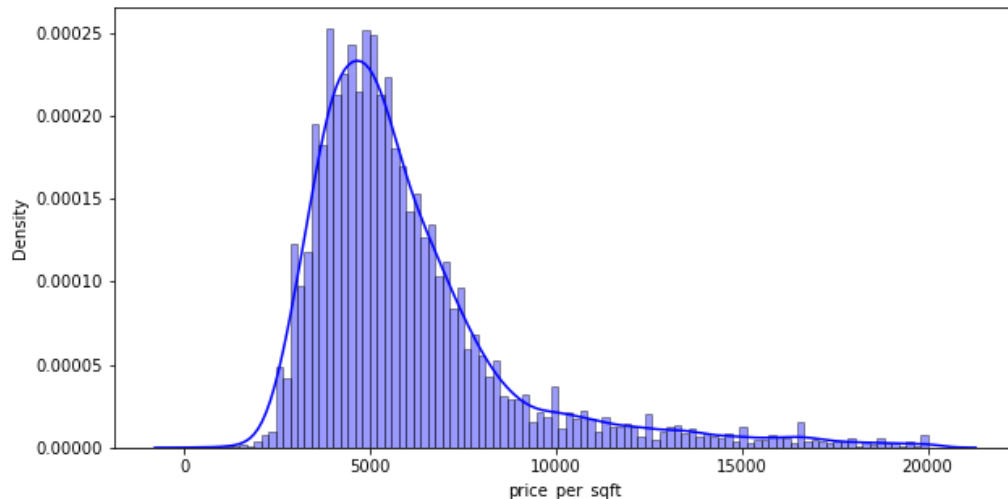


```
In [58]: housing_clean = housing_clean[~(housing_clean["price_per_sqft"] > 20000)]
```

```
In [59]: sns.distplot(housing_clean["price_per_sqft"], hist=True, kde=True,
                    bins=100, color = 'blue',
                    hist_kws={'edgecolor':'black'})
```

C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).
warnings.warn(msg, FutureWarning)

Out[59]: <AxesSubplot:xlabel='price_per_sqft', ylabel='Density'>

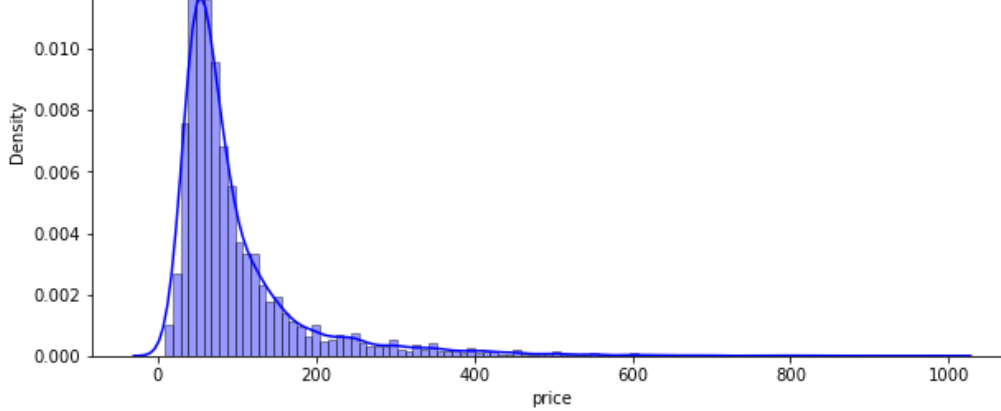


```
In [60]: sns.distplot(housing_clean["price"], hist=True, kde=True,
                    bins=100, color = 'blue',
                    hist_kws={'edgecolor':'black'})
```

C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).
warnings.warn(msg, FutureWarning)

Out[60]: <AxesSubplot:xlabel='price', ylabel='Density'>





```
In [61]: housing_clean.shape
```

```
Out[61]: (12210, 10)
```

```
In [62]: def remove_bhk_outliers(df):
    exclude_indices = np.array([])
    for location, location_df in df.groupby('location'):
        bhk_stats = {}
        for bhk, bhk_df in location_df.groupby('bhk'):
            bhk_stats[bhk] = {
                'mean': np.mean(bhk_df.price_per_sqft),
                'std': np.std(bhk_df.price_per_sqft),
                'count': bhk_df.shape[0]
            }
        for bhk, bhk_df in location_df.groupby('bhk'):
            stats = bhk_stats.get(bhk-1)
            if stats and stats['count'] > 5:
                exclude_indices = np.append(exclude_indices, bhk_df[bhk_df.price
            return df.drop(exclude_indices, axis='index')
```

```
In [63]: housing_clean = remove_bhk_outliers(housing_clean)
```

```
In [64]: housing_clean = housing_clean[housing_clean.bath < housing_clean.bhk+2]
housing_clean.shape
```

```
Out[64]: (8498, 10)
```

Dropping feature based on correlation

```
In [65]: housing_clean.corr()["price"].sort_values(ascending=False)
```

```
Out[65]: price          1.000000
sqft          0.820807
price_per_sqft 0.782903
bath          0.650978
bhk           0.634278
sqft_per_bhk   0.470972
balcony        0.295589
Name: price, dtype: float64
```

```
In [66]: housing_clean.drop(["price_per_sqft", "sqft_per_bhk", "balcony"], axis = 1, inplace = True)
```

```
In [67]: price = housing_clean["price"]
housing_clean.drop(["price"], axis = 1, inplace = True)
```

```
In [68]: housing_clean = housing_clean[["sqft", "bhk", "bath", "availability", "area_type"]]
```

Handling Categorical Features

```
In [69]: le1 = LabelEncoder()
housing_availability = le1.fit_transform(housing_clean.availability)
```

```
housing_availability = le1.fit_transform(housing_clean.iloc[:,5])
```

```
In [70]: le2 = LabelEncoder()  
housing_area_type = le2.fit_transform(housing_clean.iloc[:,4])
```

```
In [71]: le3 = LabelEncoder()  
housing_location = le3.fit_transform(housing_clean.iloc[:,5])
```

```
In [72]: ohe1 = OneHotEncoder()  
housing_availability = ohe1.fit_transform(housing_availability.reshape(-1,1))  
housing_availability = pd.DataFrame(housing_availability.toarray(), columns=le1.classes_)
```

```
In [73]: ohe2 = OneHotEncoder()  
housing_area_type = ohe2.fit_transform(housing_area_type.reshape(-1,1))  
housing_area_type = pd.DataFrame(housing_area_type.toarray(), columns=le2.classes_)
```

```
In [74]: ohe3 = OneHotEncoder()  
housing_location = ohe3.fit_transform(housing_location.reshape(-1,1))  
housing_location = pd.DataFrame(housing_location.toarray(), columns=le3.classes_)
```

Preparing data for Model

```
In [75]: housing_availability.drop([housing_availability.columns[len(housing_availability.columns)-1],  
housing_area_type.drop([housing_area_type.columns[len(housing_area_type.columns)-1],  
housing_location.drop([housing_location.columns[len(housing_location.columns)-1],
```

```
In [76]: housing_num_features = housing_clean.iloc[:, 0:3].reset_index()  
housing_num_features.drop(["index"], axis = 1, inplace = True)
```

```
In [77]: std_scaler = StandardScaler()  
housing_num_scaled_features = pd.DataFrame(std_scaler.fit_transform(housing_num_features.toarray()), columns=housing_num_features.columns)
```

```
In [78]: housing_for_model = pd.concat([housing_num_scaled_features, housing_availability, housing_location, housing_area_type])
```

```
In [79]: housing_for_model
```

```
Out[79]:
```

sqft	bhk	bath	Ready To Move	Built-up Area	Carpet Area	Plot Area	1st Block Jayanagar	1st Phase JP Nagar	2nd Phase Judicial Layout
------	-----	------	---------------	---------------	-------------	-----------	---------------------	--------------------	---------------------------