real-state-insights

October 17, 2024

```python
[72]: import pandas as pd
      import matplotlib.pyplot as plt
      import seaborn as sns
```

```python
[30]: data = pd.read_csv("Downloads/flats.csv")
```

```python
[45]: flats_df = data
```

```python
[47]: flats_df.head()
```

```
[47]:                     property_name  \
      0      2 BHK Flat in Krishna Colony
      1          2 BHK Flat in Ashok Vihar
      2                  2 BHK Flat in Sohna
      3  2 BHK Flat in Sector 61 Gurgaon
      4  2 BHK Flat in Sector 92 Gurgaon


                                          link                 society  \
      0  https://www.99acres.com/2-bhk-bedroom-apartmen…  maa bhagwati residency
      1  https://www.99acres.com/2-bhk-bedroom-apartmen…            Apna Enclave
      2  https://www.99acres.com/2-bhk-bedroom-apartmen…  Tulsiani Easy in Homes
      3  https://www.99acres.com/2-bhk-bedroom-apartmen…     Smart World Orchard
      4  https://www.99acres.com/2-bhk-bedroom-apartmen…        Parkwood Westend

            price          rate                          areaWithType  \
      0     45 Lac    5,000/sq.ft.        Carpet area: 900 (83.61 sq.m.)
      1     50 Lac    7,692/sq.ft.        Carpet area: 650 (60.39 sq.m.)
      2     40 Lac    6,722/sq.ft.        Carpet area: 595 (55.28 sq.m.)
      3  1.47 Crore  12,250/sq.ft.      Carpet area: 1200 (111.48 sq.m.)
      4     70 Lac    5,204/sq.ft.  Super Built up area 1345(124.95 sq.m.)

           bedRoom      bathroom       balcony additionalRoom  \
      0  2 Bedrooms  2 Bathrooms    1 Balcony             NaN
      1  2 Bedrooms  2 Bathrooms    1 Balcony             NaN
      2  2 Bedrooms  2 Bathrooms  3 Balconies             NaN
      3  2 Bedrooms  2 Bathrooms  2 Balconies     Study Room
      4  2 Bedrooms  2 Bathrooms  3 Balconies     Study Room
```

```
                           address          floorNum facing  \
0      Krishna Colony, Gurgaon, Haryana     4th   of 4 Floors   West
1    46b, Ashok Vihar, Gurgaon, Haryana     1st   of 3 Floors   West
2                Sohna, Gurgaon, Haryana  12th   of 14 Floors    NaN
3  Sector 61 Gurgaon, Gurgaon, Haryana     2nd   of 4 Floors    NaN
4  Sector 92 Gurgaon, Gurgaon, Haryana     5th   of 8 Floors    NaN

         agePossession                               nearbyLocations  \
0    1 to 5 Year Old   ['Chintapurni Mandir', 'State bank ATM', 'Pear…
1       10+ Year Old   ['Chintapurni Mandir', 'Sheetla Mata Mandir', …
2    0 to 1 Year Old   ['Huda City Metro', 'Golf Course extn road', '…
3             Dec-23   ['Sector 55-56 Metro station', 'Bestech Centra…
4  Under Construction  ['Yadav Clinic', 'Bangali Clinic', 'Dr. J. S. …

                                       description  \
0  So with lift.Maa bhagwati residency is one of …
1  Property situated on main road, railway statio…
2  This property is 15 km away from badshapur, gu…
3  Near to metro station of sector 56 and opposit…
4  We are the proud owners of this 2 bhk alongwit…

                                    furnishDetails  \
0  ['3 Fan', '4 Light', '1 Wardrobe', 'No AC', 'N…
1  ['3 Wardrobe', '4 Fan', '1 Exhaust Fan', '1 Ge…
2                                              NaN
3                                              NaN
4                                               []

                                         features  \
0  ['Feng Shui / Vaastu Compliant', 'Security / F…
1  ['Security / Fire Alarm', 'Maintenance Staff',…
2  ['Power Back-up', 'Feng Shui / Vaastu Complian…
3  ['Security / Fire Alarm', 'Private Garden / Te…
4                                              NaN

                                   rating property_id
0  ['Environment4 out of 5', 'Safety4 out of 5', …   C68850746
1  ['Environment4 out of 5', 'Safety4 out of 5', …   H68850564
2  ['Environment4 out of 5', 'Safety4 out of 5', …   J68850120
3                                              NaN   S68849476
4  ['Environment5 out of 5', 'Safety3 out of 5', …   L47956793
```

```
[49]: flats_df.tail()
```

```
[49]:                      property_name  \
      3012    3 BHK Flat in Sector 86 Gurgaon
```

```
3013     5 BHK Flat in Sector 48 Gurgaon
3014   3 BHK Flat in Sector 108 Gurgaon
3015           3 BHK Flat in DLF Phase 3
3016     4 BHK Flat in Sector 54 Gurgaon

                                                    link  \
3012  https://www.99acres.com/3-bhk-bedroom-apartmen…
3013  https://www.99acres.com/5-bhk-bedroom-apartmen…
3014  https://www.99acres.com/3-bhk-bedroom-apartmen…
3015  https://www.99acres.com/3-bhk-bedroom-apartmen…
3016  https://www.99acres.com/4-bhk-bedroom-apartmen…

                        society       price            rate  \
3012           Ansal Heights 86  1.05 Crore     5,541/sq.ft.
3013  Parsvnath Green Ville3.9     3.3 Crore     9,984/sq.ft.
3014       Raheja Vedaanta3.6        95 Lac     5,214/sq.ft.
3015       Ambience Lagoon3.9     5.8 Crore    12,500/sq.ft.
3016         DLF The Crest3.6       11 Crore    35,222/sq.ft.

                                    areaWithType      bedRoom  \
3012          Super Built up area 1895(176.05 sq.m.)  3 Bedrooms
3013  Super Built up area 3905(362.79 sq.m.)Built Up…  5 Bedrooms
3014          Super Built up area 1822(169.27 sq.m.)  3 Bedrooms
3015            Built Up area: 3700 (343.74 sq.m.)  3 Bedrooms
3016          Super Built up area 3123(290.14 sq.m.)  4 Bedrooms

         bathroom        balcony                            additionalRoom  \
3012  3 Bathrooms    3 Balconies                              Servant Room
3013  5 Bathrooms   3+ Balconies                              Servant Room
3014  3 Bathrooms    3 Balconies                                    Others
3015  4 Bathrooms   3+ Balconies  Pooja Room,Study Room,Servant Room,Others
3016  6 Bathrooms    3 Balconies                              Servant Room

                                         address       floorNum  \
3012  Tower C, Sector 86 Gurgaon, Gurgaon, Haryana   9th   of 13 Floors
3013          Sector 48 Gurgaon, Gurgaon, Haryana   4th    of 5 Floors
3014         Sector 108 Gurgaon, Gurgaon, Haryana   3rd   of 22 Floors
3015       Gurgaon, DLF Phase 3, Gurgaon, Haryana   9th    of 9 Floors
3016          Sector 54 Gurgaon, Gurgaon, Haryana   7th   of 36 Floors

         facing        agePossession  \
3012  North-East   Under Construction
3013         NaN          10+ Year Old
3014         NaN      1 to 5 Year Old
3015  North-East          10+ Year Old
3016         NaN      1 to 5 Year Old
```

```
                                   nearbyLocations  \
3012  ['IRIS Broadway Mall', 'Delhi Jaipur Expresswa…
3013  ['Sri Radhe Krishna Temple', 'Icici bank ATM',…
3014                                            NaN
3015  ['Micromax moulsari avenue metro station', 'In…
3016  ['Sector 53-54 Metro Station', 'Ardee Mall', '…


                                      description  \
3012  Residential apartment for sell.Located in sect…
3013  5 bhk duplex penthouse in low rise building.Av…
3014  3 bedroom flat with full woodwork. Ready to mo…
3015  Luxury condominium complex located on delhi gu…
3016          Club & pool facing\nVrv air conditioning


                                     furnishDetails  \
3012                                             []
3013                                            NaN
3014                                             []
3015  ['1 Water Purifier', '10 Fan', '1 Fridge', '1 …
3016  ['6 Fan', '1 Fridge', '1 Exhaust Fan', '5 Geys…


                                        features  \
3012                                          NaN
3013  ['Security / Fire Alarm', 'Private Garden / Te…
3014  ['Security / Fire Alarm', 'Feng Shui / Vaastu …
3015  ['Security / Fire Alarm', 'Private Garden / Te…
3016  ['Security / Fire Alarm', 'Power Back-up', 'In…


                                          rating property_id
3012  ['Safety4.5 out of 5', 'Lifestyle5 out of 5', …   D26586124
3013  ['Management4 out of 5', 'Green Area4 out of 5…   J17123294
3014  ['Management3 out of 5', 'Green Area4 out of 5…   A41215323
3015  ['Management5 out of 5', 'Green Area5 out of 5…   J18888617
3016  ['Management4 out of 5', 'Green Area4 out of 5…   V70296402
```

[51]: `flats_df.columns`

[51]:
```
Index(['property_name', 'link', 'society', 'price', 'rate', 'areaWithType',
       'bedRoom', 'bathroom', 'balcony', 'additionalRoom', 'address',
       'floorNum', 'facing', 'agePossession', 'nearbyLocations', 'description',
       'furnishDetails', 'features', 'rating', 'property_id'],
      dtype='object')
```

[53]: `flats_df.info()`

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 3017 entries, 0 to 3016
```

```
Data columns (total 20 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   property_name   3017 non-null   object
 1   link            3017 non-null   object
 2   society         3016 non-null   object
 3   price           3007 non-null   object
 4   rate            3004 non-null   object
 5   areaWithType    3008 non-null   object
 6   bedRoom         3008 non-null   object
 7   bathroom        3008 non-null   object
 8   balcony         3008 non-null   object
 9   additionalRoom  1694 non-null   object
 10  address         3002 non-null   object
 11  floorNum        3006 non-null   object
 12  facing          2127 non-null   object
 13  agePossession   3007 non-null   object
 14  nearbyLocations 2913 non-null   object
 15  description     3008 non-null   object
 16  furnishDetails  2203 non-null   object
 17  features        2594 non-null   object
 18  rating          2676 non-null   object
 19  property_id     3008 non-null   object
dtypes: object(20)
memory usage: 471.5+ KB
```

[55]: `flats_df.describe()`

[55]:
```
                property_name  \
count                    3017
unique                    404
top      2 BHK Flat in Sohna
freq                      126


                                               link        society  \
count                                          3017           3016
unique                                         2880            638
top      https://www.99acres.com/2-bhk-bedroom-apartmen…  SS The Leaf3.8
freq                                              2             73


              price          rate                          areaWithType  \
count          3007          3004                                  3008
unique          439          2130                                  1932
top      1.25 Crore  10,000/sq.ft.  Super Built up area 1578(146.6 sq.m.)
freq             79            19                                    17


           bedRoom      bathroom      balcony additionalRoom  \
```

```
count            3008           3008           3008           1694
unique              6              7              5             49
top      3 Bedrooms    2 Bathrooms    3 Balconies   Servant Room
freq             1439           1047            977            630


                    address        floorNum      facing  \
count                  3002            3006        2127
unique                 1287             550           8
top      Sohna, Gurgaon, Haryana  2nd   of 4 Floors  North-East
freq                     77              74         506


        agePossession                              nearbyLocations  \
count            3007                                         2913
unique             48                                          599
top      1 to 5 Year Old  ['Airia Mall Sector 68', 'Southern Peripheral …
freq             1479                                           73


                                      description furnishDetails  \
count                                        3008           2203
unique                                       2787           1367
top      Best in class property available at sohna loca…           []
freq                                            7            367


                                      features  \
count                                     2594
unique                                    1438
top      ['Feng Shui / Vaastu Compliant', 'Security / F…
freq                                       290


                                    rating property_id
count                                 2676        3008
unique                                 341        2874
top      ['Green Area5 out of 5', 'Construction4 out of…   I69037888
freq                                   128           2
```

[58]: ```python
flats_df.drop(columns=['link'], inplace=True)
```

[62]: ```python
flats_df.head()
```

[62]:
```
                   property_name                society         price  \
0     2 BHK Flat in Krishna Colony  maa bhagwati residency       45 Lac
1          2 BHK Flat in Ashok Vihar           Apna Enclave       50 Lac
2                2 BHK Flat in Sohna  Tulsiani Easy in Homes       40 Lac
3   2 BHK Flat in Sector 61 Gurgaon    Smart World Orchard  1.47 Crore
4   2 BHK Flat in Sector 92 Gurgaon        Parkwood Westend       70 Lac


             rate                         areaWithType     bedRoom  \
```

```
0     5,000/sq.ft.          Carpet area: 900 (83.61 sq.m.)   2 Bedrooms
1     7,692/sq.ft.          Carpet area: 650 (60.39 sq.m.)   2 Bedrooms
2     6,722/sq.ft.          Carpet area: 595 (55.28 sq.m.)   2 Bedrooms
3    12,250/sq.ft.         Carpet area: 1200 (111.48 sq.m.)  2 Bedrooms
4     5,204/sq.ft.  Super Built up area 1345(124.95 sq.m.)   2 Bedrooms


       bathroom       balcony additionalRoom  \
0  2 Bathrooms   1 Balcony              NaN
1  2 Bathrooms   1 Balcony              NaN
2  2 Bathrooms   3 Balconies            NaN
3  2 Bathrooms   2 Balconies     Study Room
4  2 Bathrooms   3 Balconies     Study Room


                              address         floorNum facing  \
0     Krishna Colony, Gurgaon, Haryana    4th    of 4 Floors   West
1   46b, Ashok Vihar, Gurgaon, Haryana    1st    of 3 Floors   West
2            Sohna, Gurgaon, Haryana    12nd   of 14 Floors    NaN
3  Sector 61 Gurgaon, Gurgaon, Haryana    2nd    of 4 Floors    NaN
4  Sector 92 Gurgaon, Gurgaon, Haryana    5th    of 8 Floors    NaN


      agePossession                                nearbyLocations  \
0    1 to 5 Year Old  ['Chintapurni Mandir', 'State bank ATM', 'Pear…
1       10+ Year Old  ['Chintapurni Mandir', 'Sheetla Mata Mandir', …
2    0 to 1 Year Old  ['Huda City Metro', 'Golf Course extn road', '…
3            Dec-23  ['Sector 55-56 Metro station', 'Bestech Centra…
4  Under Construction  ['Yadav Clinic', 'Bangali Clinic', 'Dr. J. S. …


                                   description  \
0  So with lift.Maa bhagwati residency is one of …
1  Property situated on main road, railway statio…
2  This property is 15 km away from badshapur, gu…
3  Near to metro station of sector 56 and opposit…
4  We are the proud owners of this 2 bhk alongwit…


                                 furnishDetails  \
0  ['3 Fan', '4 Light', '1 Wardrobe', 'No AC', 'N…
1  ['3 Wardrobe', '4 Fan', '1 Exhaust Fan', '1 Ge…
2                                            NaN
3                                            NaN
4                                             []


                                       features  \
0  ['Feng Shui / Vaastu Compliant', 'Security / F…
1  ['Security / Fire Alarm', 'Maintenance Staff',…
2  ['Power Back-up', 'Feng Shui / Vaastu Amplian…
3  ['Security / Fire Alarm', 'Private Garden / Te…
4                                            NaN
```

```
                                              rating property_id
0  ['Environment4 out of 5', 'Safety4 out of 5', …   C68850746
1  ['Environment4 out of 5', 'Safety4 out of 5', …   H68850564
2  ['Environment4 out of 5', 'Safety4 out of 5', …   J68850120
3                                            NaN   S68849476
4  ['Environment5 out of 5', 'Safety3 out of 5', …   L47956793
```

[64]:
```python
# Clean price Column

def clean_price(price):
    if isinstance(price, str):
        price = price.strip()
        if 'Lac' in price:
            return float(price.replace(' Lac', '').replace(',', '')) * 100000
        elif 'Crore' in price:
            return float(price.replace(' Crore', '').replace(',', '')) *
  ↪10000000
    return 0


flats_df['price'] = flats_df['price'].apply(clean_price)
print(flats_df[['price']].head())
print(flats_df.info())
```

```
        price
0   4500000.0
1   5000000.0
2   4000000.0
3  14700000.0
4   7000000.0
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 3017 entries, 0 to 3016
Data columns (total 19 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   property_name   3017 non-null   object
 1   society         3016 non-null   object
 2   price           3017 non-null   float64
 3   rate            3004 non-null   object
 4   areaWithType    3008 non-null   object
 5   bedRoom         3008 non-null   object
 6   bathroom        3008 non-null   object
 7   balcony         3008 non-null   object
 8   additionalRoom  1694 non-null   object
 9   address         3002 non-null   object
 10  floorNum        3006 non-null   object
 11  facing          2127 non-null   object
```

```
12   agePossession      3007 non-null    object
13   nearbyLocations    2913 non-null    object
14   description        3008 non-null    object
15   furnishDetails     2203 non-null    object
16   features           2594 non-null    object
17   rating             2676 non-null    object
18   property_id        3008 non-null    object
dtypes: float64(1), object(18)
memory usage: 448.0+ KB
None
```

[78]:
```python
# Q1 How many flats are listed in each society?

society_counts = flats_df['society'].value_counts().head(10)
print(society_counts)
```

```
society
SS The Leaf3.8                         73
Tulip Violet4.3                        40
Shapoorji Pallonji Joyville Gurugram4.0    39
Signature Global Park4.0               36
Shree Vardhman Victoria3.8             35
Tulip Violet4.2                        33
Emaar MGF Emerald Floors Premier3.8    32
Smart World Orchard                    32
Smart World Gems                       32
Paras Dews                             31
Name: count, dtype: int64
```

[146]:
```python
# Visualization

plt.figure(figsize=(14, 8))
sns.barplot(x=society_counts.values, y=society_counts.index, palette='coolwarm')

plt.title('Top 10 Societies with Most Flats Listed', fontsize=20, weight='bold')
plt.xlabel('')
plt.ylabel('')

for index, value in enumerate(society_counts):
    plt.text(value, index, str(value), fontsize=12, color='black', va='center')

plt.xticks(fontsize=12)
plt.yticks(fontsize=12)
plt.grid(axis='x', linestyle='--', alpha=0.7)
plt.show()
```
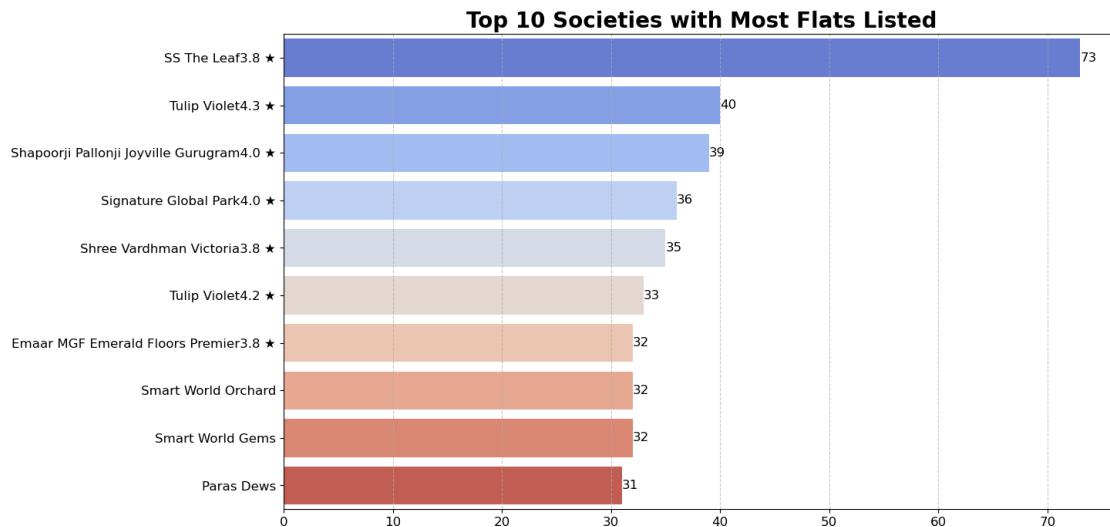
```
C:\Users\Abc\AppData\Local\Temp\ipykernel_1100\1544059436.py:4: FutureWarning:
```

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `legend=False` for the same effect.

```
sns.barplot(x=society_counts.values, y=society_counts.index,
palette='coolwarm')
```

Top 10 Societies with Most Flats Listed

Society	Count
SS The Leaf3.8 ★	73
Tulip Violet4.3 ★	40
Shapoorji Pallonji Joyville Gurugram4.0 ★	39
Signature Global Park4.0 ★	36
Shree Vardhman Victoria3.8 ★	35
Tulip Violet4.2 ★	33
Emaar MGF Emerald Floors Premier3.8 ★	32
Smart World Orchard	32
Smart World Gems	32
Paras Dews	31

[97]:
```python
# Q2 What is the average price of 2 BHK flats?

average_price_2_bhk = flats_df[flats_df['bedRoom'] == '2 Bedrooms']['price'].
 ↪mean()
print("The average price of 2 BHK flats is: {:.2f}".
 ↪format(average_price_2_bhk))
```

The average price of 2 BHK flats is: 8848447.26

[ ]:

[128]:
```python
# Visualization

average_price_by_bedroom = flats_df.groupby('bedRoom')['price'].mean()
plt.figure(figsize=(10, 6))
bars = flats_df.groupby('bedRoom')['price'].mean().plot(kind='bar',␣
 ↪color='steelblue')

plt.title('Average Price of Flats by Number of Bedrooms', fontsize=16)
plt.xlabel('')
plt.ylabel('')
plt.xticks(rotation=0)
```

```
plt.grid(axis='y')

for bar in bars.patches:
    plt.text(bar.get_x() + bar.get_width() / 2, bar.get_height(), f'{bar.
 ↪get_height():,.0f}',
             ha='center', va='bottom')

plt.show()
```


Average Price of Flats by Number of Bedrooms
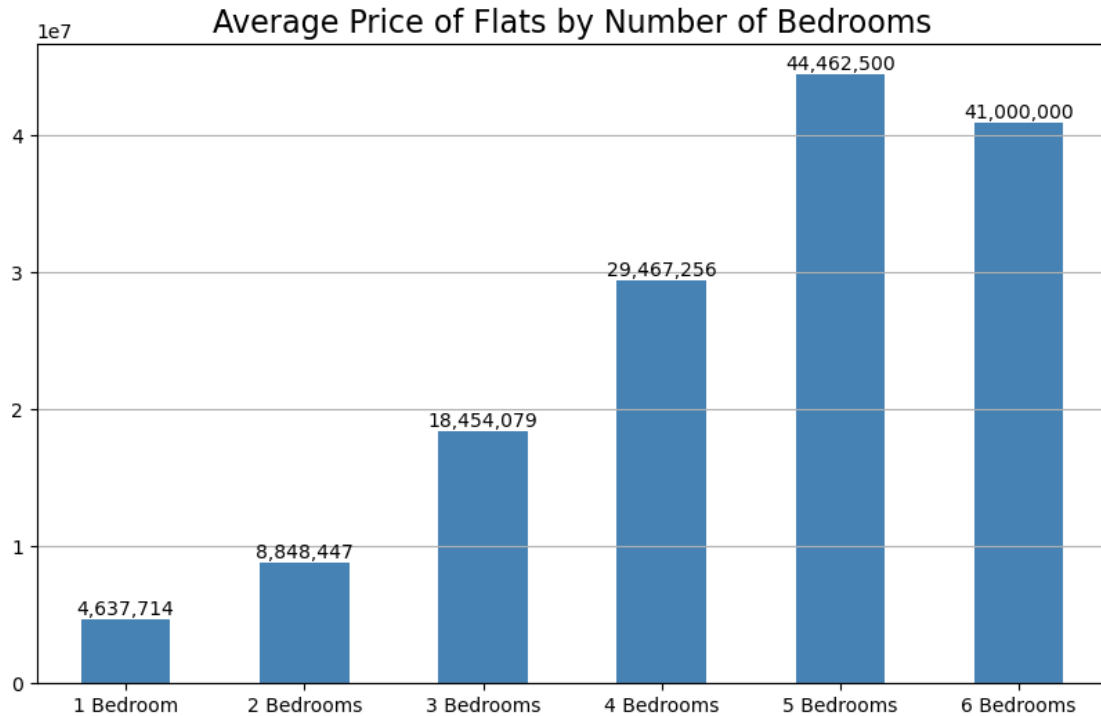
[110]:
```
# Q3 Count the number of flats available in each bedroom category.

bedroom_counts = flats_df['bedRoom'].value_counts()
print(bedroom_counts)
```

```
bedRoom
3 Bedrooms    1439
2 Bedrooms     948
4 Bedrooms     481
1 Bedroom      105
5 Bedrooms      32
6 Bedrooms       3
Name: count, dtype: int64
```

```
[144]:  # Visualization

        plt.figure(figsize=(10, 6))
        bedroom_counts.plot(kind='bar', color='skyblue')

        plt.title('Number of Flats Available by Bedroom Category', fontsize=16)
        plt.xlabel('')
        plt.ylabel('')
        plt.xticks(rotation=0)
        plt.grid(axis='y')

        for index, value in enumerate(bedroom_counts):
            plt.text(index, value, str(value), ha='center', va='bottom')

        plt.show()
```
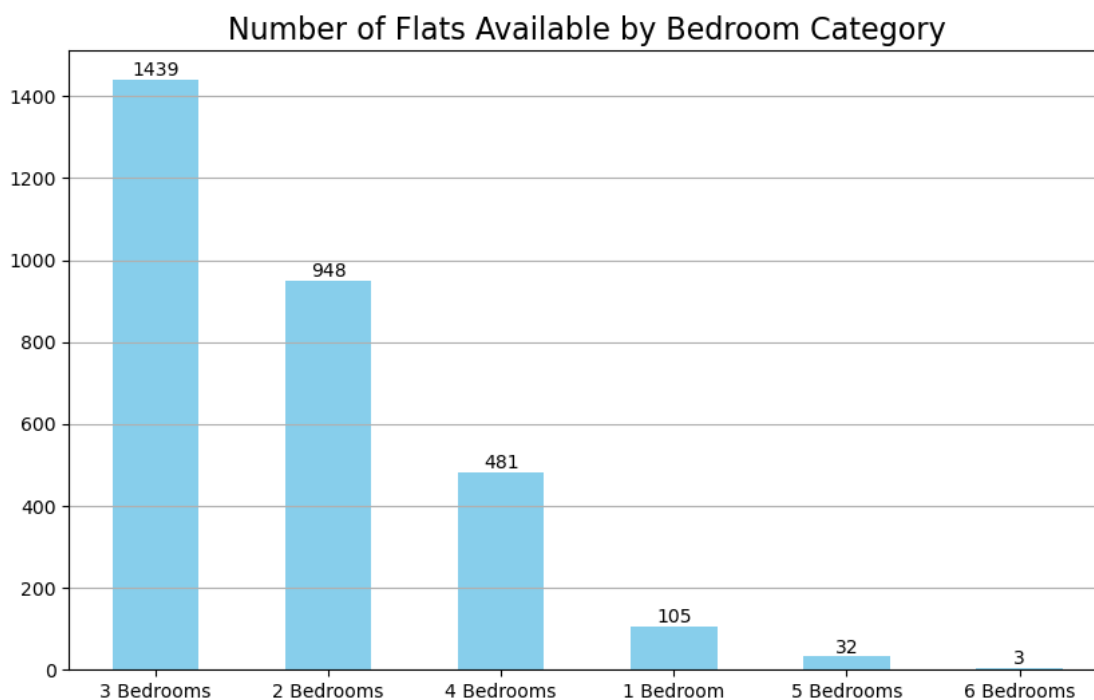


```
[120]:  # Q4 What is the distribution of flats based on the number of bathrooms?

        bathroom_counts = flats_df['bathroom'].value_counts()
        print(bathroom_counts)
```

```
bathroom
2 Bathrooms    1047
3 Bathrooms     991
4 Bathrooms     638
```

```
5 Bathrooms      170
1 Bathroom       115
6 Bathrooms       42
7 Bathrooms        5
Name: count, dtype: int64
```

[142]:
```python
# Visualization

plt.figure(figsize=(10, 6))
bathroom_counts.plot(kind='bar', color='steelblue')

plt.title('Distribution of Flats Based on Number of Bathrooms', fontsize=16)
plt.xlabel('')
plt.ylabel('')
plt.xticks(rotation=0)
plt.grid(axis='y')

for index, value in enumerate(bathroom_counts):
    plt.text(index, value, str(value), ha='center', va='bottom')

plt.show()
```

Distribution of Flats Based on Number of Bathrooms
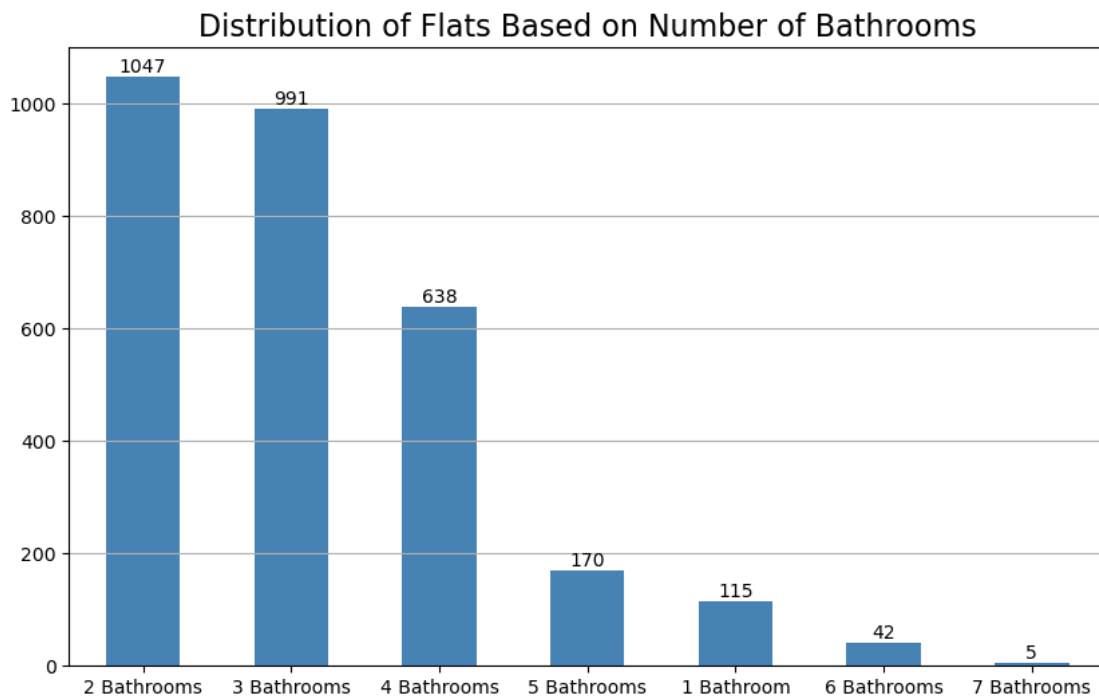
[130]:
```python
flats_df.head()
```

```
[130]:                     property_name                   society         price  \
       0    2 BHK Flat in Krishna Colony  maa bhagwati residency     4500000.0
       1          2 BHK Flat in Ashok Vihar           Apna Enclave    5000000.0
       2                 2 BHK Flat in Sohna  Tulsiani Easy in Homes   4000000.0
       3  2 BHK Flat in Sector 61 Gurgaon      Smart World Orchard  14700000.0
       4  2 BHK Flat in Sector 92 Gurgaon          Parkwood Westend   7000000.0

                   rate                             areaWithType      bedRoom  \
       0     5,000/sq.ft.          Carpet area: 900 (83.61 sq.m.)  2 Bedrooms
       1     7,692/sq.ft.          Carpet area: 650 (60.39 sq.m.)  2 Bedrooms
       2     6,722/sq.ft.          Carpet area: 595 (55.28 sq.m.)  2 Bedrooms
       3    12,250/sq.ft.         Carpet area: 1200 (111.48 sq.m.)  2 Bedrooms
       4     5,204/sq.ft.  Super Built up area 1345(124.95 sq.m.)  2 Bedrooms

            bathroom       balcony additionalRoom  \
       0  2 Bathrooms    1 Balcony            NaN
       1  2 Bathrooms    1 Balcony            NaN
       2  2 Bathrooms  3 Balconies            NaN
       3  2 Bathrooms  2 Balconies     Study Room
       4  2 Bathrooms  3 Balconies     Study Room

                                  address          floorNum facing  \
       0    Krishna Colony, Gurgaon, Haryana    4th   of 4 Floors   West
       1  46b, Ashok Vihar, Gurgaon, Haryana    1st   of 3 Floors   West
       2             Sohna, Gurgaon, Haryana   12nd  of 14 Floors    NaN
       3  Sector 61 Gurgaon, Gurgaon, Haryana    2nd   of 4 Floors    NaN
       4  Sector 92 Gurgaon, Gurgaon, Haryana    5th   of 8 Floors    NaN

            agePossession                                 nearbyLocations  \
       0   1 to 5 Year Old  ['Chintapurni Mandir', 'State bank ATM', 'Pear…
       1      10+ Year Old  ['Chintapurni Mandir', 'Sheetla Mata Mandir', …
       2   0 to 1 Year Old  ['Huda City Metro', 'Golf Course extn road', '…
       3            Dec-23  ['Sector 55-56 Metro station', 'Bestech Centra…
       4  Under Construction  ['Yadav Clinic', 'Bangali Clinic', 'Dr. J. S. …

                                       description  \
       0  So with lift.Maa bhagwati residency is one of …
       1  Property situated on main road, railway statio…
       2  This property is 15 km away from badshapur, gu…
       3  Near to metro station of sector 56 and opposit…
       4  We are the proud owners of this 2 bhk alongwit…

                                     furnishDetails  \
       0  ['3 Fan', '4 Light', '1 Wardrobe', 'No AC', 'N…
       1  ['3 Wardrobe', '4 Fan', '1 Exhaust Fan', '1 Ge…
       2                                          NaN
       3                                          NaN
```

```
4                                                                  []

                                                            features  \
0  ['Feng Shui / Vaastu Compliant', 'Security / F…
1  ['Security / Fire Alarm', 'Maintenance Staff',…
2  ['Power Back-up', 'Feng Shui / Vaastu Complian…
3  ['Security / Fire Alarm', 'Private Garden / Te…
4                                                  NaN


                                          rating property_id
0  ['Environment4 out of 5', 'Safety4 out of 5', …   C68850746
1  ['Environment4 out of 5', 'Safety4 out of 5', …   H68850564
2  ['Environment4 out of 5', 'Safety4 out of 5', …   J68850120
3                                             NaN   S68849476
4  ['Environment5 out of 5', 'Safety3 out of 5', …   L47956793
```

```python
# Clean Area Column
flats_df['area'] = flats_df['areaWithType'].str.extract('(\d+\.?\d*)')
flats_df['area_type'] = flats_df['areaWithType'].str.extract('([A-Za-z ]+)')

flats_df['area'] = flats_df['area'].astype(float)
flats_df.head()
```

```
<>:2: SyntaxWarning: invalid escape sequence '\d'
<>:2: SyntaxWarning: invalid escape sequence '\d'
C:\Users\Abc\AppData\Local\Temp\ipykernel_1100\2579475786.py:2: SyntaxWarning:
invalid escape sequence '\d'
  flats_df['area'] = flats_df['areaWithType'].str.extract('(\d+\.?\d*)')
```

[136]:

[136]:
```
                property_name                 society        price  \
0    2 BHK Flat in Krishna Colony  maa bhagwati residency   4500000.0
1         2 BHK Flat in Ashok Vihar            Apna Enclave   5000000.0
2                2 BHK Flat in Sohna  Tulsiani Easy in Homes   4000000.0
3  2 BHK Flat in Sector 61 Gurgaon     Smart World Orchard  14700000.0
4  2 BHK Flat in Sector 92 Gurgaon        Parkwood Westend   7000000.0


              rate                              areaWithType     bedRoom  \
0    5,000/sq.ft.          Carpet area: 900 (83.61 sq.m.)  2 Bedrooms
1    7,692/sq.ft.          Carpet area: 650 (60.39 sq.m.)  2 Bedrooms
2    6,722/sq.ft.          Carpet area: 595 (55.28 sq.m.)  2 Bedrooms
3   12,250/sq.ft.        Carpet area: 1200 (111.48 sq.m.)  2 Bedrooms
4    5,204/sq.ft.  Super Built up area 1345(124.95 sq.m.)  2 Bedrooms


        bathroom        balcony additionalRoom  \
0  2 Bathrooms    1 Balcony                NaN
```

```
1  2 Bathrooms    1 Balcony             NaN
2  2 Bathrooms  3 Balconies             NaN
3  2 Bathrooms  2 Balconies      Study Room
4  2 Bathrooms  3 Balconies      Study Room


                                address  … facing      agePossession  \
0     Krishna Colony, Gurgaon, Haryana  …   West    1 to 5 Year Old
1   46b, Ashok Vihar, Gurgaon, Haryana  …   West       10+ Year Old
2            Sohna, Gurgaon, Haryana    …    NaN    0 to 1 Year Old
3  Sector 61 Gurgaon, Gurgaon, Haryana  …    NaN             Dec-23
4  Sector 92 Gurgaon, Gurgaon, Haryana  …    NaN  Under Construction


                             nearbyLocations  \
0  ['Chintapurni Mandir', 'State bank ATM', 'Pear…
1  ['Chintapurni Mandir', 'Sheetla Mata Mandir', …
2  ['Huda City Metro', 'Golf Course extn road', '…
3  ['Sector 55-56 Metro station', 'Bestech Centra…
4  ['Yadav Clinic', 'Bangali Clinic', 'Dr. J. S. …


                                 description  \
0  So with lift.Maa bhagwati residency is one of …
1  Property situated on main road, railway statio…
2  This property is 15 km away from badshapur, gu…
3  Near to metro station of sector 56 and opposit…
4  We are the proud owners of this 2 bhk alongwit…


                              furnishDetails  \
0  ['3 Fan', '4 Light', '1 Wardrobe', 'No AC', 'N…
1  ['3 Wardrobe', '4 Fan', '1 Exhaust Fan', '1 Ge…
2                                         NaN
3                                         NaN
4                                          []


                                    features  \
0  ['Feng Shui / Vaastu Compliant', 'Security / F…
1  ['Security / Fire Alarm', 'Maintenance Staff',…
2  ['Power Back-up', 'Feng Shui / Vaastu Complian…
3  ['Security / Fire Alarm', 'Private Garden / Te…
4                                         NaN


                                   rating property_id    area  \
0  ['Environment4 out of 5', 'Safety4 out of 5', …   C68850746    900.0
1  ['Environment4 out of 5', 'Safety4 out of 5', …   H68850564    650.0
2  ['Environment4 out of 5', 'Safety4 out of 5', …   J68850120    595.0
3                                          NaN   S68849476   1200.0
4  ['Environment5 out of 5', 'Safety3 out of 5', …   L47956793   1345.0
```

```
            area_type
0          Carpet area
1          Carpet area
2          Carpet area
3          Carpet area
4  Super Built up area

[5 rows x 21 columns]
```

[138]:
```python
# Q5 Determine the average area of flats for each type of facing (e.g., North,␣
 ↪South).

average_area_by_facing = flats_df.groupby('facing')['area'].mean()
print(average_area_by_facing)
```

```
facing
East          1930.989858
North         3931.697781
North-East    3162.792510
North-West    2413.443025
South         1921.257291
South-East    2025.120000
South-West    6500.352074
West          1870.265464
Name: area, dtype: float64
```

[160]:
```python
# Visualization

plt.figure(figsize=(10, 6))
average_area_by_facing.plot(kind='bar', color='skyblue')

plt.title('Average Area of Flats by Facing', fontsize=16)
plt.xlabel('')
plt.ylabel('')
plt.xticks(rotation=0)
plt.grid(axis='y')

for index, value in enumerate(average_area_by_facing):
    plt.text(index, value, round(value, 2), ha='center', va='bottom')

plt.show()
```

Average Area of Flats by Facing

	East	North	North-East	North-West	South	South-East	South-West	West
Value	1930.99	3931.7	3162.79	2413.44	1921.26	2025.12	6500.35	1870.27
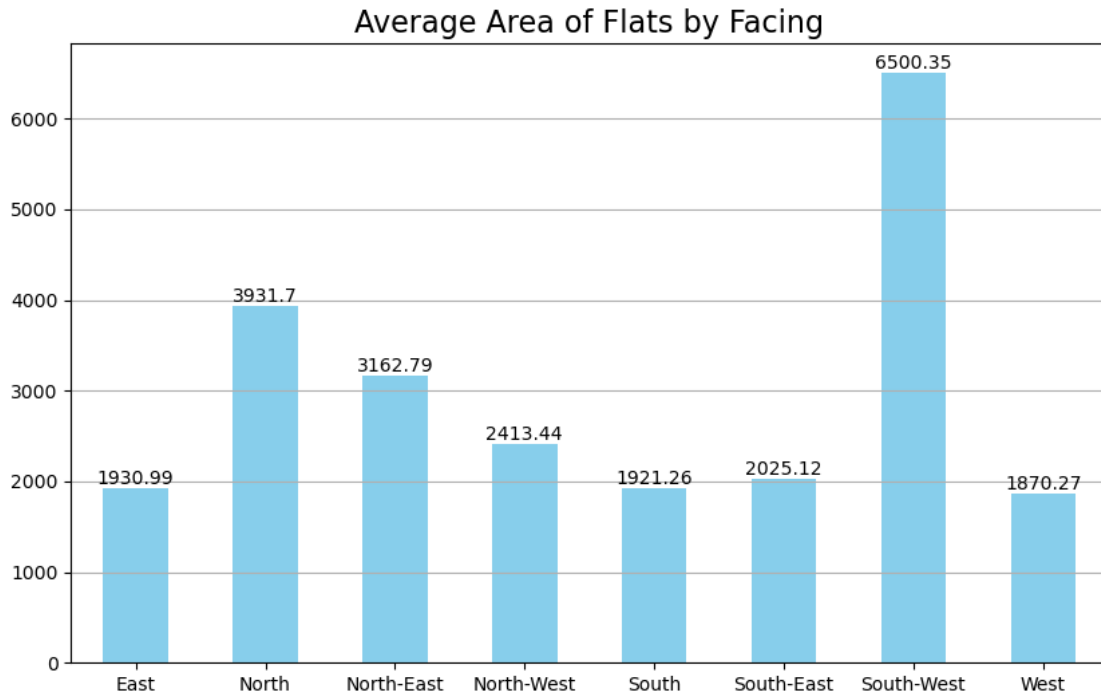
[162]:
```python
# Q6 Analyze the correlation between the area of flats and their prices.

correlation = flats_df['area'].corr(flats_df['price'])
print("Correlation between area and price:", correlation)
```

Correlation between area and price: -0.00929493102328238

[168]:
```python
# Q7 Create a histogram to visualize the distribution of flat prices.

plt.figure(figsize=(10, 6))
plt.hist(flats_df['price'], bins=30, color='steelblue', edgecolor='white',
 ↪alpha=0.7)
plt.title('Distribution of Flat Prices', fontsize=16)
plt.xlabel('Price (in currency)')
plt.ylabel('Number of Flats')
plt.grid(axis='y')

plt.show()
```

Distribution of Flat Prices
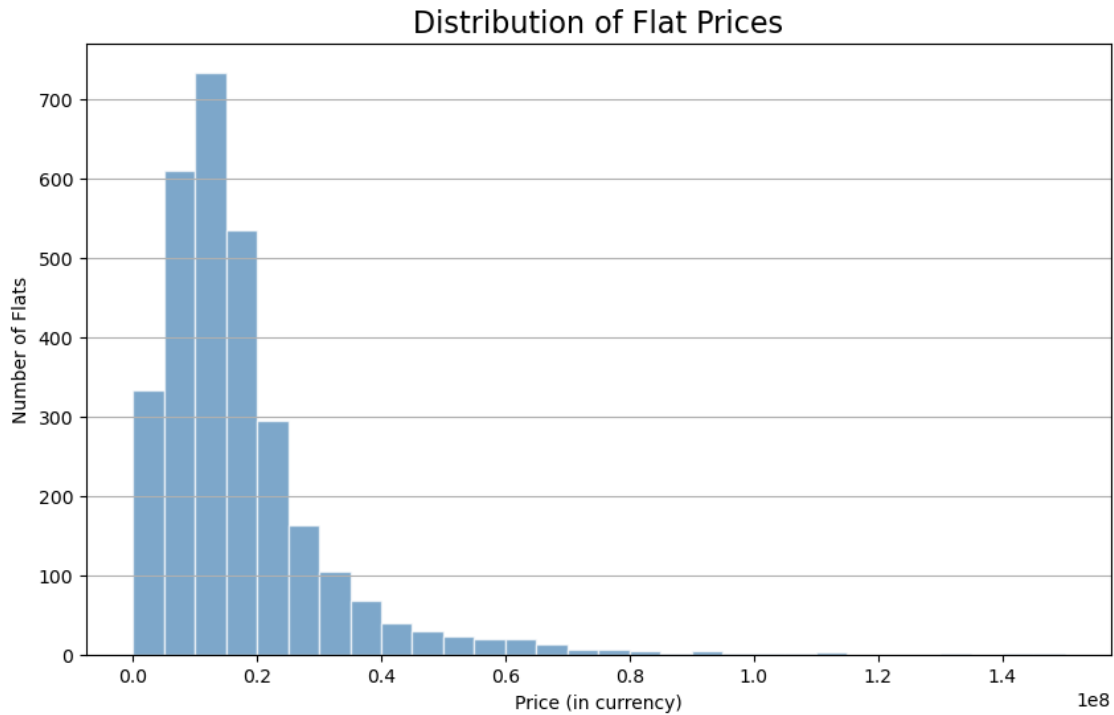

```
[212]: new = pd.read_csv("Downloads/houses.csv")
```

```
[217]: houses_df = new
```

```
[219]: houses_df.head()
```

```
[219]:                                      property_name  \
       0     5 Bedroom House for sale in Sector 70A Gurgaon
       1    5 Bedroom House for sale in Sector 21A Faridabad
       2   10 Bedroom House for sale in Sushant Lok Phase 1
       3      21 Bedroom House for sale in Sector 54 Gurgaon
       4   12 Bedroom House for sale in Sushant Lok Phase 1


                                                    link          society  \
       0  https://www.99acres.com/5-bhk-bedroom-independ…  Bptp Visionnaire
       1  https://www.99acres.com/5-bhk-bedroom-independ…               NaN
       2  https://www.99acres.com/10-bhk-bedroom-indepen…               NaN
       3  https://www.99acres.com/21-bhk-bedroom-indepen…               NaN
       4  https://www.99acres.com/12-bhk-bedroom-indepen…               NaN


              price              rate                       area  \
       0  5.25 Crore     20,115/sq.ft.   (242 sq.m.) Plot Area
       1   5.7 Crore    105,751/sq.ft.    (50 sq.m.) Plot Area
       2   2.1 Crore     38,251/sq.ft.    (51 sq.m.) Plot Area
```

```
3     5 Crore     43,066/sq.ft.   (108 sq.m.) Plot Area
4     3 Crore     53,763/sq.ft.    (52 sq.m.) Plot Area


                     areaWithType      bedRoom       bathroom       balcony  … \
0  Plot area 290(242.48 sq.m.)    5 Bedrooms    4 Bathrooms   3+ Balconies  …
1   Plot area 539(50.07 sq.m.)    5 Bedrooms    4 Bathrooms    2 Balconies  …
2       Plot area 61(51 sq.m.)   10 Bedrooms   10 Bathrooms   3+ Balconies  …
3  Plot area 129(107.86 sq.m.)   21 Bedrooms   21 Bathrooms   3+ Balconies  …
4    Plot area 62(51.84 sq.m.)   12 Bedrooms   12 Bathrooms   3+ Balconies  …


                                       address noOfFloor      facing  \
0    29b, Sector 70A Gurgaon, Gurgaon, Haryana  3 Floors  North-East
1        Sector 21A Faridabad, Gurgaon, Haryana  2 Floors        NaN
2         Sushant Lok Phase 1, Gurgaon, Haryana  5 Floors       West
3           Sector 54 Gurgaon, Gurgaon, Haryana  5 Floors      North
4  1228, Sushant Lok Phase 1, Gurgaon, Haryana  5 Floors       West


    agePossession                             nearbyLocations  \
0   0 to 1 Year Old   ['Good Earth City Center 2', 'Kunskapsskolan I…
1  5 to 10 Year Old                                         NaN
2   0 to 1 Year Old   ['Sector 42-43 metro station', 'Huda city cent…
3   1 to 5 Year Old   ['Sector 53-54 metro station', 'Sector 54 chow…
4   Within 6 months   ['Sector 42-43 metro station', 'Huda city cent…


                                     description  \
0  Do you wish to buy an independent house in sec…
1  Hi, we have an independent house/villa availab…
2  Monthly rental income is rs1,40,000/- Best opt…
3  129 sq yd plot size. 5 floors built up , fully…
4  Best for investment purpose. Fully furnished b…


                                   furnishDetails  \
0  ['1 Wardrobe', '1 Fan', '1 Exhaust Fan', '1 Ge…
1  ['1 Water Purifier', '5 Fan', '1 Exhaust Fan',…
2  ['10 Bed', '3 Fan', '10 Geyser', '2 Light', 'N…
3  ['1 Water Purifier', '21 Fan', '1 Fridge', '1 …
4  ['1 Water Purifier', '1 Fridge', '12 Fan', '1 …


                                        features  \
0  ['Feng Shui / Vaastu Compliant', 'Private Gard…
1  ['Private Garden / Terrace', 'Park', 'Visitor …
2  ['Maintenance Staff', 'Water Storage', 'Visito…
3  ['Feng Shui / Vaastu Compliant', 'Private Gard…
4  ['Maintenance Staff', 'Water Storage', 'Visito…


                                 rating property_id
0  ['Environment5 out of 5', 'Lifestyle4 out of 5…   K70037724
```

```
1                                                      NaN    E69288322
2    ['Environment5 out of 5', 'Lifestyle5 out of 5…  F69536898
3    ['Environment4 out of 5', 'Lifestyle5 out of 5…  R69483164
4    ['Environment5 out of 5', 'Lifestyle5 out of 5…  M69381272

[5 rows x 21 columns]
```

[221]: `houses_df.tail()`

[221]:
```
                                          property_name  \
1039     4 Bedroom House for sale in Sector 26 Gurgaon
1040               3 Bedroom House for sale in DLF Phase 2
1041     3 Bedroom House for sale in Sector 26 Gurgaon
1042     3 Bedroom House for sale in Sector 26 Gurgaon
1043                    3 Bedroom House for sale in Bissar

                                                   link  \
1039  https://www.99acres.com/4-bhk-bedroom-independ…
1040  https://www.99acres.com/3-bhk-bedroom-independ…
1041  https://www.99acres.com/3-bhk-bedroom-independ…
1042  https://www.99acres.com/3-bhk-bedroom-independ…
1043  https://www.99acres.com/3-bhk-bedroom-independ…

                                     society       price            rate  \
1039                       DLF City Phase 1   5.5 Crore     30,556/sq.ft.
1040                  DLF City Plots Phase 2  4.25 Crore     31,481/sq.ft.
1041                       DLF City Phase 1    4.5 Crore     33,333/sq.ft.
1042                       DLF City Phase 1   3.25 Crore     33,129/sq.ft.
1043  Silverglades Tarudhan Valley Golf Resort   3.6 Crore     14,815/sq.ft.

                       area                areaWithType      bedRoom  \
1039  (167 sq.m.) Plot Area   Plot area 200(167.23 sq.m.)  4 Bedrooms
1040  (125 sq.m.) Plot Area   Plot area 150(125.42 sq.m.)  3 Bedrooms
1041  (125 sq.m.) Plot Area   Plot area 150(125.42 sq.m.)  3 Bedrooms
1042   (91 sq.m.) Plot Area    Plot area 109(91.14 sq.m.)  3 Bedrooms
1043  (226 sq.m.) Plot Area   Plot area 270(225.75 sq.m.)  3 Bedrooms

          bathroom       balcony  …                                address  \
1039   4 Bathrooms   3 Balconies  …   Sector 26 Gurgaon, Gurgaon, Haryana
1040   2 Bathrooms   3 Balconies  …        DLF Phase 2, Gurgaon, Haryana
1041   3 Bathrooms   2 Balconies  …   Sector 26 Gurgaon, Gurgaon, Haryana
1042   3 Bathrooms   3 Balconies  …   Sector 26 Gurgaon, Gurgaon, Haryana
1043   3 Bathrooms   2 Balconies  …            Bissar, Gurgaon, Haryana

      noOfFloor       facing     agePossession  \
1039   2 Floors   North-East   5 to 10 Year Old
1040   2 Floors        North      10+ Year Old
```

```
1041  2 Floors        East  5 to 10 Year Old
1042  2 Floors        West     10+ Year Old
1043  2 Floors         NaN  5 to 10 Year Old


                                        nearbyLocations  \
1039  ['Dlf phase 1 metro station', 'Sikandarpur met…
1040  ['Sahara Mall', 'Delhi Public School', 'Privat…
1041  ['Dlf phase 1 metro station', 'Sikandarpur met…
1042  ['Dlf phase 1 metro station', 'Sikandarpur met…
1043                                              NaN


                                          description  \
1039  Residential house, g block, dlf phase-1, gurga…
1040  Residential house, k block, dlf phase-2, gurga…
1041  Residential house, e block 150 sq.Yds , dlf ph…
1042  Residential house, e block, dlf phase-1, gurga…
1043  This 3 bhk house for sale in bissar is an idea…


                                        furnishDetails  \
1039  ['10 Light', 'No AC', 'No Bed', 'No Chimney', …
1040                                              NaN
1041  ['6 Fan', '20 Light', 'No AC', 'No Bed', 'No C…
1042  ['5 Fan', '16 Light', 'No AC', 'No Bed', 'No C…
1043  ['1 Water Purifier', '10 Fan', '1 Fridge', '1 …


                                             features  \
1039  ['Feng Shui / Vaastu Compliant', 'High Ceiling…
1040  ['High Ceiling Height', 'Maintenance Staff', '…
1041  ['Feng Shui / Vaastu Compliant', 'Private Gard…
1042  ['Feng Shui / Vaastu Compliant', 'Private Gard…
1043  ['Centrally Air Conditioned', 'Water purifier'…


                                       rating property_id
1039                                      NaN   Q70281606
1040  ['Environment5 out of 5', 'Safety5 out of 5', …   B70281212
1041                                      NaN   L70280308
1042                                      NaN   J70280212
1043                                      NaN   W70221444

[5 rows x 21 columns]
```

[223]: `houses_df.columns`

[223]: Index(['property_name', 'link', 'society', 'price', 'rate', 'area',
        'areaWithType', 'bedRoom', 'bathroom', 'balcony', 'additionalRoom',
        'address', 'noOfFloor', 'facing', 'agePossession', 'nearbyLocations',
        'description', 'furnishDetails', 'features', 'rating', 'property_id'],

```
                dtype='object')
```

[225]: `houses_df.info()`

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1044 entries, 0 to 1043
Data columns (total 21 columns):
 #   Column            Non-Null Count  Dtype
---  ------            --------------  -----
 0   property_name     1044 non-null   object
 1   link              1044 non-null   object
 2   society           453 non-null    object
 3   price             968 non-null    object
 4   rate              1005 non-null   object
 5   area              1044 non-null   object
 6   areaWithType      987 non-null    object
 7   bedRoom           987 non-null    object
 8   bathroom          987 non-null    object
 9   balcony           987 non-null    object
 10  additionalRoom    589 non-null    object
 11  address           1031 non-null   object
 12  noOfFloor         967 non-null    object
 13  facing            674 non-null    object
 14  agePossession     987 non-null    object
 15  nearbyLocations   913 non-null    object
 16  description       1036 non-null   object
 17  furnishDetails    743 non-null    object
 18  features          674 non-null    object
 19  rating            907 non-null    object
 20  property_id       1036 non-null   object
dtypes: object(21)
memory usage: 171.4+ KB
```

[227]:
```python
# Clean Price Column

def cleaned_price(price):
    if isinstance(price, str):
        price = price.strip()
        if 'Lac' in price:
            return float(price.replace(' Lac', '').replace(',', '')) * 100000
        elif 'Crore' in price:
            return float(price.replace(' Crore', '').replace(',', '')) *␣
  ↪10000000
    return 0

houses_df['price'] = houses_df['price'].apply(cleaned_price)
houses_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1044 entries, 0 to 1043
Data columns (total 21 columns):
 #   Column           Non-Null Count  Dtype
---  ------           --------------  -----
 0   property_name    1044 non-null   object
 1   link             1044 non-null   object
 2   society          453 non-null    object
 3   price            1044 non-null   float64
 4   rate             1005 non-null   object
 5   area             1044 non-null   object
 6   areaWithType     987 non-null    object
 7   bedRoom          987 non-null    object
 8   bathroom         987 non-null    object
 9   balcony          987 non-null    object
 10  additionalRoom   589 non-null    object
 11  address          1031 non-null   object
 12  noOfFloor        967 non-null    object
 13  facing           674 non-null    object
 14  agePossession    987 non-null    object
 15  nearbyLocations  913 non-null    object
 16  description      1036 non-null   object
 17  furnishDetails   743 non-null    object
 18  features         674 non-null    object
 19  rating           907 non-null    object
 20  property_id      1036 non-null   object
dtypes: float64(1), object(20)
memory usage: 171.4+ KB
```

[231]:
```python
# Q1 What is the most common number of floors in the listed houses?

most_common_floors = houses_df['noOfFloor'].mode()[0]
print(most_common_floors)
```

3 Floors

[245]:
```python
# Q2 Calculate the average price of houses with more than 3 bedrooms.

average_price = houses_df[houses_df['bedRoom'] > 3]['price'].mean()
print(average_price)

average_price_by_bedroom = houses_df[houses_df['bedRoom'] > 3].
 ↪groupby('bedRoom')['price'].mean().head()
print(average_price_by_bedroom)
```

58821562.94200849
bedRoom
4.0   5.118146e+07

```
5.0    6.424264e+07
6.0    6.485366e+07
7.0    5.111250e+07
8.0    5.207632e+07
Name: price, dtype: float64
```
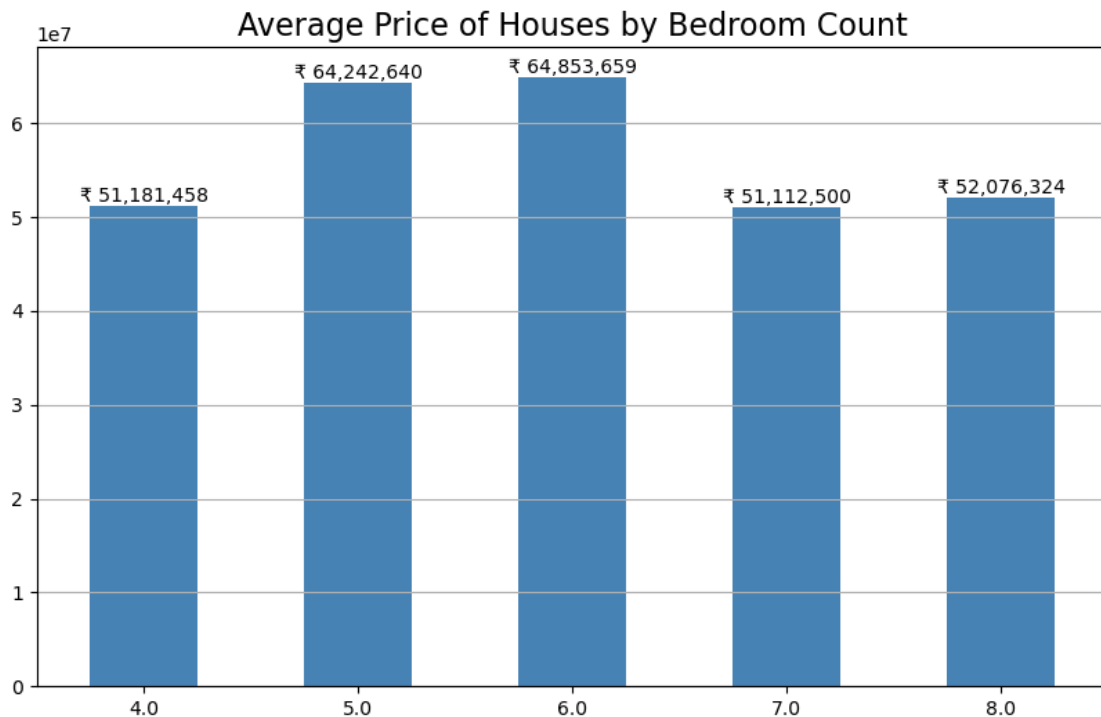
[255]:
```python
# Vuisualization

plt.figure(figsize=(10, 6))
average_price_by_bedroom.plot(kind='bar', color='steelblue')

plt.title('Average Price of Houses by Bedroom Count', fontsize=16)
plt.xlabel('')
plt.ylabel('')
plt.xticks(rotation=0)
plt.grid(axis='y')

for index, value in enumerate(average_price_by_bedroom):
    plt.text(index, value, f' {value:,.0f}', ha='center', va='bottom')

plt.show()
```

Average Price of Houses by Bedroom Count

₹ 64,242,640   ₹ 64,853,659

₹ 51,181,458   ₹ 51,112,500   ₹ 52,076,324

| 4.0 | 5.0 | 6.0 | 7.0 | 8.0 |

[259]:
```python
# Q3 Compare the average areas of furnished vs. unfurnished houses.
```

```
houses_df[['furnishDetails']]
```

[259]:
```
                                    furnishDetails
0      ['1 Wardrobe', '1 Fan', '1 Exhaust Fan', '1 Ge…
1      ['1 Water Purifier', '5 Fan', '1 Exhaust Fan',…
2      ['10 Bed', '3 Fan', '10 Geyser', '2 Light', 'N…
3      ['1 Water Purifier', '21 Fan', '1 Fridge', '1 …
4      ['1 Water Purifier', '1 Fridge', '12 Fan', '1 …
…                                                  …
1039   ['10 Light', 'No AC', 'No Bed', 'No Chimney', …
1040                                               NaN
1041   ['6 Fan', '20 Light', 'No AC', 'No Bed', 'No C…
1042   ['5 Fan', '16 Light', 'No AC', 'No Bed', 'No C…
1043   ['1 Water Purifier', '10 Fan', '1 Fridge', '1 …

[1044 rows x 1 columns]
```

[265]:
```python
# Q3 Compare the average areas of furnished vs. unfurnished houses.


def determine_furnishing(furnish_details):
    if pd.isna(furnish_details):
        return 'Unfurnished'

    items = eval(furnish_details)  # Convert string representation to list
    furnished_items = ['Wardrobe', 'Fan', 'Fridge', 'Bed', 'Geyser', 'Light',
 'AC']

    # Check if any furnished item is present in the furnishDetails
    for item in items:
        if any(furnished_item in item for furnished_item in furnished_items):
            return 'Furnished'

    return 'Unfurnished'

houses_df['status'] = houses_df['furnishDetails'].apply(determine_furnishing)
print(houses_df[['furnishDetails', 'status']].head())
```

```
                             furnishDetails     status
0  ['1 Wardrobe', '1 Fan', '1 Exhaust Fan', '1 Ge…  Furnished
1  ['1 Water Purifier', '5 Fan', '1 Exhaust Fan',…  Furnished
2  ['10 Bed', '3 Fan', '10 Geyser', '2 Light', 'N…  Furnished
3  ['1 Water Purifier', '21 Fan', '1 Fridge', '1 …  Furnished
4  ['1 Water Purifier', '1 Fridge', '12 Fan', '1 …  Furnished
```

[271]:
```python
# Q3 Compare the average areas of furnished vs. unfurnished houses.
```

```python
# Clean Area Column
houses_df['area_value'] = houses_df['areaWithType'].str.extract('(\d+\.?\d*)')
houses_df['area_type'] = houses_df['areaWithType'].str.extract('([A-Za-z ]+)')
houses_df['area_value'] = houses_df['area_value'].astype(float)
print(houses_df[['areaWithType', 'area_type', 'area_value']].head())
```

[279]:
```python
# Q3 Compare the average areas of furnished vs. unfurnished houses.

average_area_comparison = houses_df.groupby('status')['area_value'].mean()
print(average_area_comparison)
```

```
status
Furnished      959.917946
Unfurnished    918.916781
Name: area_value, dtype: float64
```

[285]:
```python
# Visualization

plt.figure(figsize=(8, 6))
plt.pie(average_area_comparison, labels=average_area_comparison.index,
  ↪autopct='%1.1f%%', startangle=90, colors=sns.color_palette("Blues",
  ↪len(average_area_comparison)))

centre_circle = plt.Circle((0, 0), 0.70, fc='white')
fig = plt.gcf()
fig.gca().add_artist(centre_circle)

plt.title('Average Area Comparison: Furnished vs Unfurnished Houses',
  ↪fontsize=16)
plt.axis('equal')
plt.show()
```

Average Area Comparison: Furnished vs Unfurnished Houses

Furnished 51.1%   48.9% Unfurnished
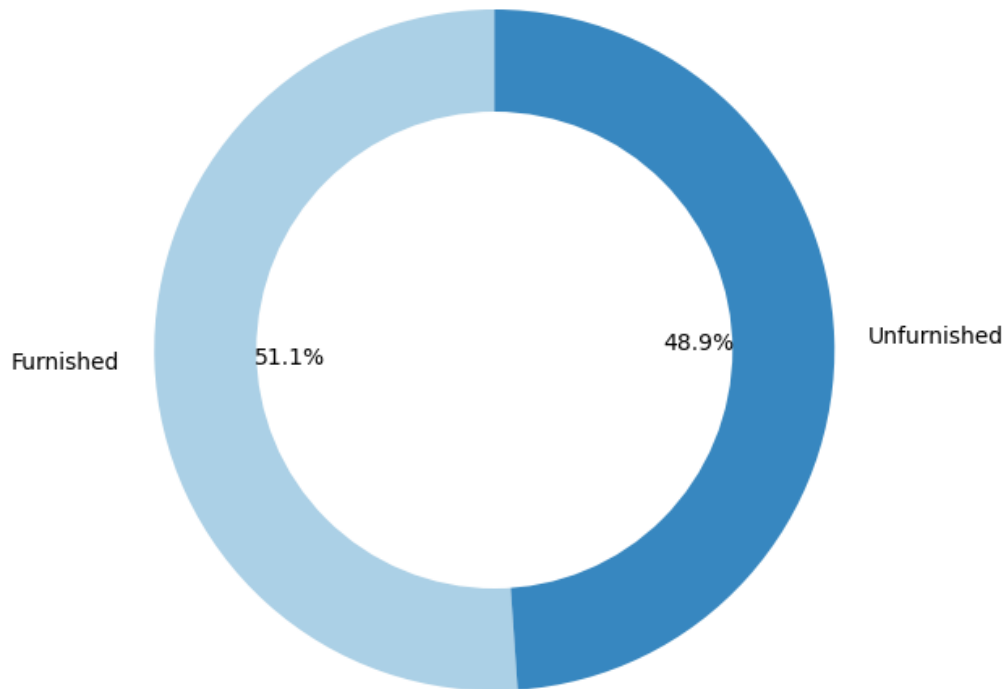
[293]:
```python
# Key Performance Indicator (KPI)

average_price_flats = flats_df['price'].mean()
average_price_houses = houses_df['price'].mean()
average_area_flats = flats_df['area'].mean()
average_area_houses = houses_df['area_value'].mean()

print("Flats Data KPIs:")
print(f"Average Price per Flat: {average_price_flats:,.2f}")
print(f"Average Area per Flat: {average_area_flats:.2f} sq.ft")
```

```
Flats Data KPIs:
Average Price per Flat:  0.00
Average Area per Flat: 2696.63 sq.ft
```

[295]:
```python
print("\nHouses Data KPIs:")
print(f"Average Price per House: {average_price_houses:,.2f}")
print(f"Average Area per House: {average_area_houses:.2f} sq.ft")
```

```
Houses Data KPIs:
Average Price per House:  45,224,675.29
```

```
Average Area per House: 946.62 sq.ft
```

[ ]: