assignment-2-Ayush
Reg No- 21BAI10215

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0.0.1 Task-1: Downloading the dataset

0.0.2 Task-2: Loading the dataset

[ ]:
```
import pandas as pd

dataset = pd.read_csv('/content/House Price India.csv')

print("House Price India Dataset is loaded successfully.")
```

```
House Price India Dataset is loaded successfully.
```

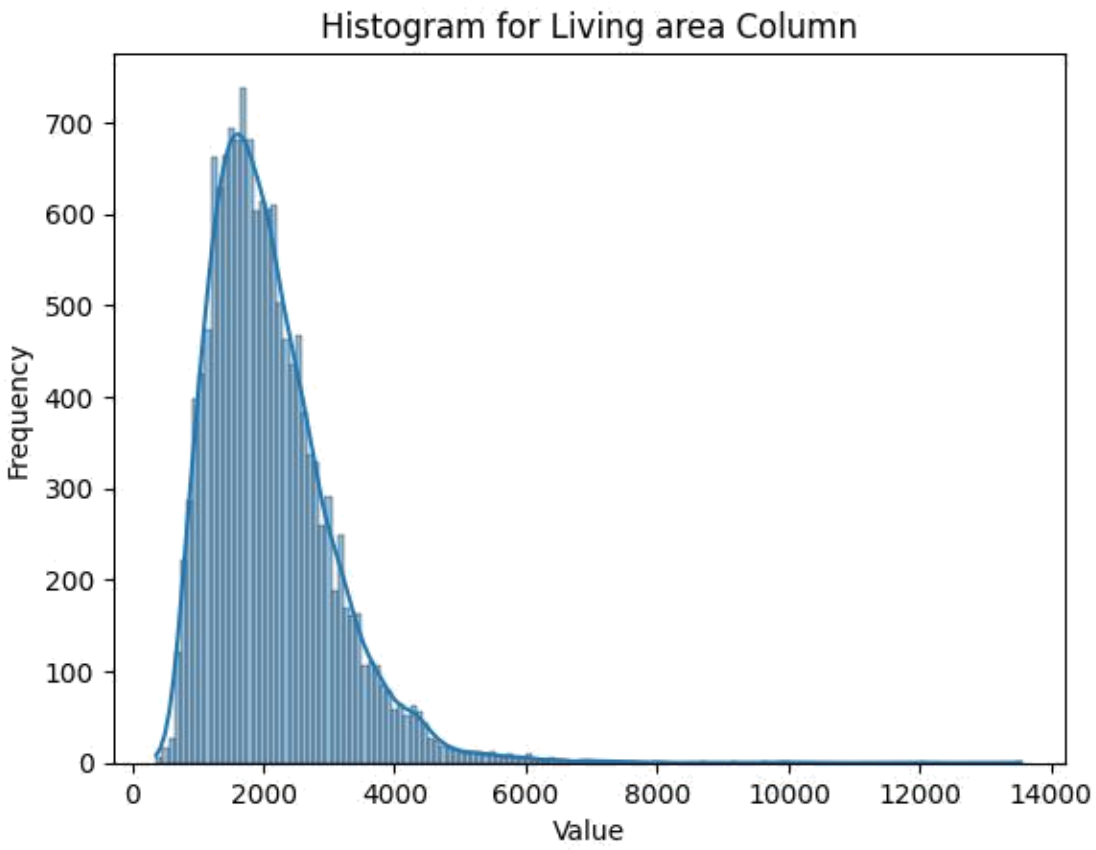
0.0.3 Task-3: Perform the Below Visualizations for that dataset

1. Univariate Analysis
2. Bi - Variate Analysis
3. Multivariate Analysis

1. **Univariate Analysis:**

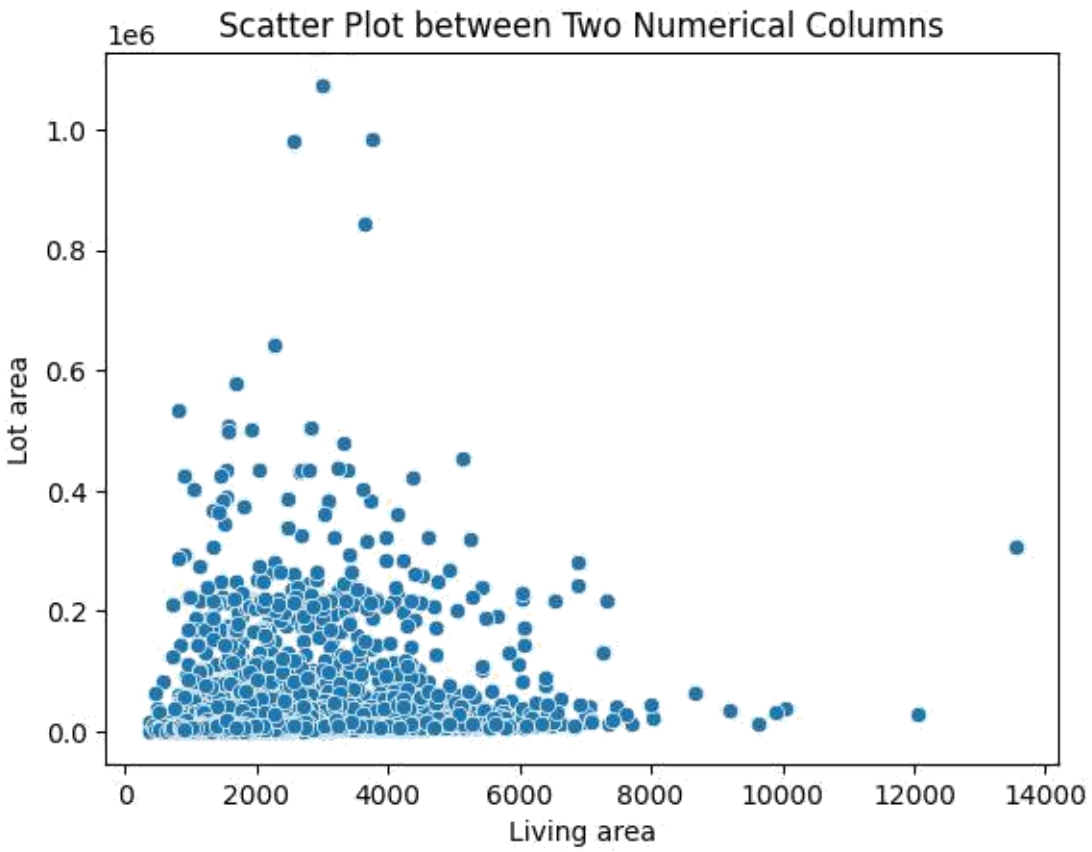
[ ]:
```
import seaborn as sns
import matplotlib.pyplot as plt

sns.histplot(dataset['living area'], kde=True)
plt.title('Histogram for Living area Column')
plt.xlabel('Value')
plt.ylabel('Frequency')
plt.show()
```



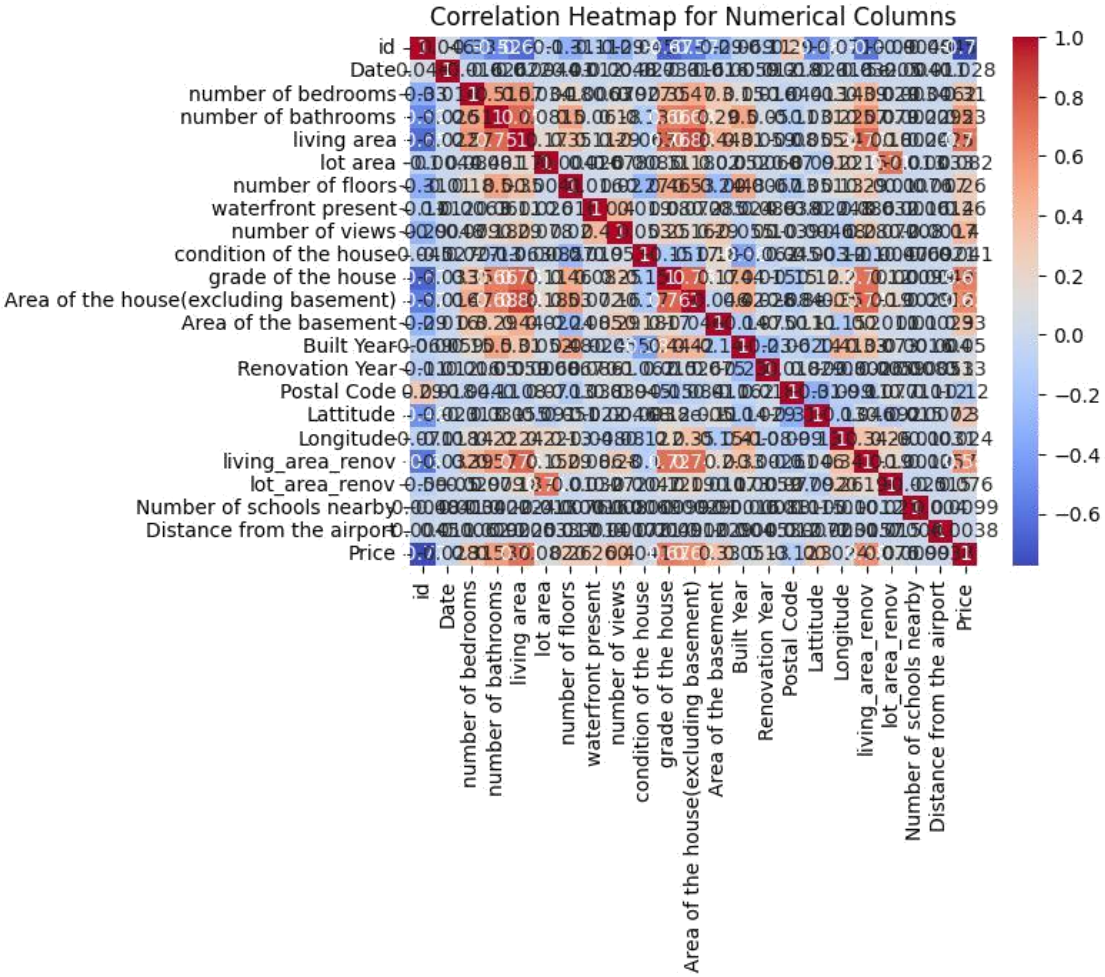
2. **Bi-Variate Analysis:**

```
[ ]: sns.scatterplot(data=dataset, x='living area',
y='lot area') plt.title('Scatter Plot between Two
Numerical Columns') plt.xlabel('Living area')
plt.ylabel('Lot
area') plt.show()
```



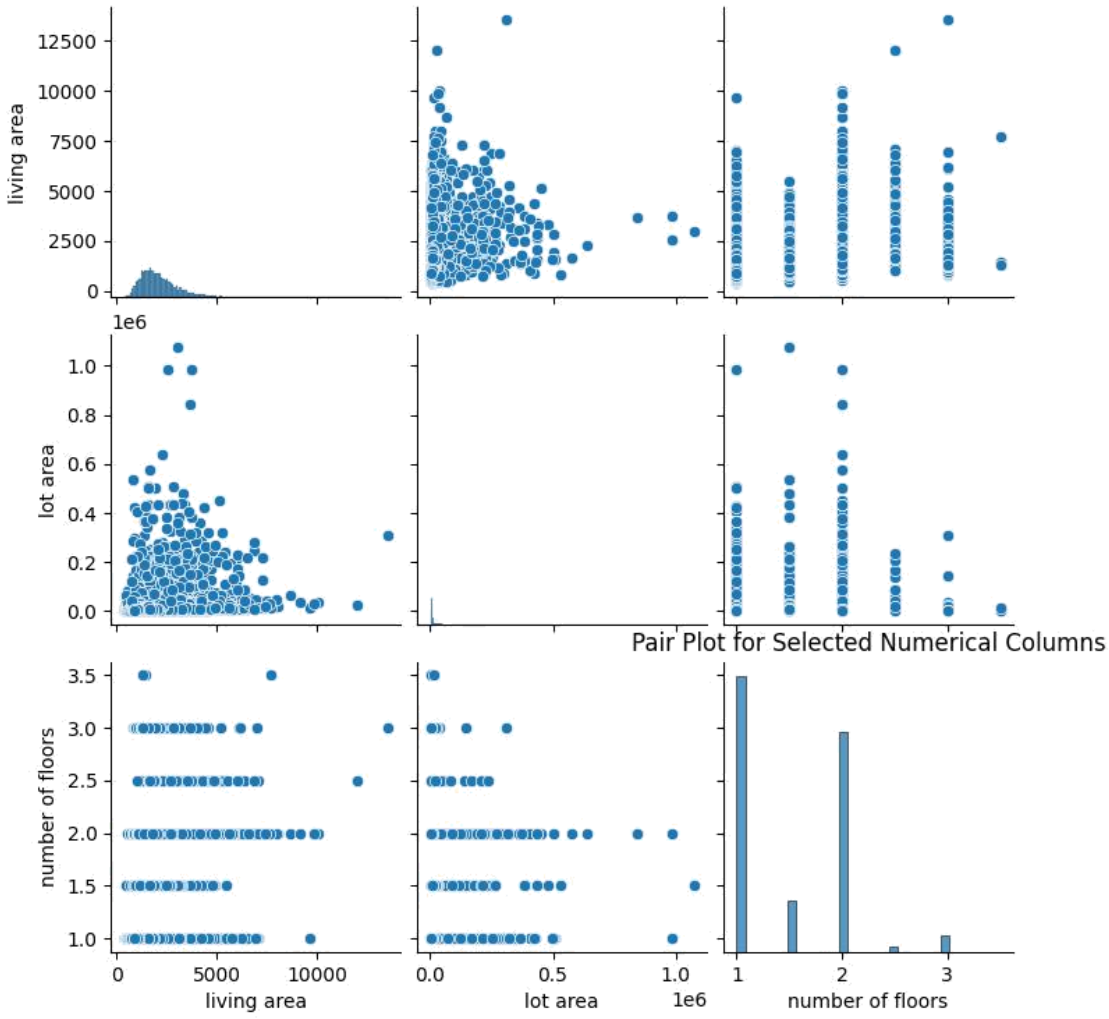
3. **Multi-Variate Analysis**

```
[ ]:  correlation_matrix = dataset.corr()
sns.heatmap(correlation_matrix, annot=True, cmap='coolwarm')
plt.title('Correlation Heatmap for Numerical Columns')
plt.show()
```



Multi-variate Analysis using Pairplot:

[ ]:
```
sns.pairplot(dataset[['living area', 'lot area', 'number of
floors']]) plt.title('Pair Plot for Selected Numerical Columns')
plt.show()
```



0.0.4 Task-4: Perform descriptive statistics on the dataset

[ ]:
```
numerical_stats = dataset.describe()

print("Descriptive Statistics for Numerical Columns:")
print(numerical_stats)
```

```
Descriptive Statistics for Numerical Columns:
                 id          Date  number of bedrooms  number of bathrooms  \
count  1.462000e+04  14620.000000        14620.000000         14620.000000
mean   6.762821e+09  42604.538646            3.379343             2.129583
std    6.237575e+03     67.347991            0.938719             0.769934
min    6.762810e+09  42491.000000            1.000000             0.500000
25%    6.762815e+09  42546.000000            3.000000             1.750000
50%    6.762821e+09  42600.000000            3.000000             2.250000
```

```
75%    6.762826e+09 42662.000000         4.000000           2.500000
max    6.762832e+09 42734.000000        33.000000           8.000000

       living area    lot area  number of floors  waterfront present  \
count  14620.000000 1.462000e+04    14620.000000      14620.000000
mean   2098.262996 1.509328e+04        1.502360          0.007661
std     928.275721 3.791962e+04        0.540239          0.087193
min     370.000000 5.200000e+02        1.000000          0.000000
25%    1440.000000 5.010750e+03        1.000000          0.000000
50%    1930.000000 7.620000e+03        1.500000          0.000000
75%    2570.000000 1.080000e+04        2.000000          0.000000
max   13540.000000 1.074218e+06        3.500000          1.000000

       number of views  condition of the house …  Built Year  \
count   14620.000000          14620.000000 …  14620.000000
mean        0.233105              3.430506 …  1970.926402
std         0.766259              0.664151 …    29.493625
min         0.000000              1.000000 …  1900.000000
25%         0.000000              3.000000 …  1951.000000
50%         0.000000              3.000000 …  1975.000000
75%         0.000000              4.000000 …  1997.000000
max         4.000000              5.000000 …  2015.000000

       Renovation Year  Postal Code    Lattitude    Longitude  \
count   14620.000000  14620.000000 14620.000000 14620.000000
mean       90.924008  122033.062244    52.792848 -114.404007
std       416.216661    19.082418     0.137522    0.141326
min         0.000000  122003.000000    52.385900 -114.709000
25%         0.000000  122017.000000    52.707600 -114.519000
50%         0.000000  122032.000000    52.806400 -114.421000
75%         0.000000  122048.000000    52.908900 -114.315000
max      2015.000000  122072.000000    53.007600 -113.505000

       living_area_renov  lot_area_renov Number of schools nearby  \
count    14620.000000   14620.000000           14620.000000
mean      1996.702257   12753.500068               2.012244
std        691.093366   26058.414467               0.817284
min        460.000000     651.000000               1.000000
25%       1490.000000    5097.750000               1.000000
50%       1850.000000    7620.000000               2.000000
75%       2380.000000   10125.000000               3.000000
max       6110.000000  560617.000000               3.000000

       Distance from the airport       Price
count            14620.000000 1.462000e+04
mean                64.950958 5.389322e+05
std                  8.936008 3.675324e+04
min                 50.000000 7.800000e+04
```

```
25%                   57.000000 3.200000e+05
50%                   65.000000 4.500000e+05
75%                   73.000000 6.450000e+05
max                   80.000000 7.700000e+06

[8 rows x 23 columns]
```

0.0.5 Task-5: Handling the missing values:

[ ]:
```python
missing_values = dataset.isna().sum()
print("Missing Values per Column:")
print(missing_values)

# Remove rows with missing values
dataset_cleaned = dataset.dropna()

# Impute missing values for numerical columns with mean
numerical_columns = dataset.select_dtypes(include='number')
for column in numerical_columns:
    dataset[column].fillna(dataset[column].mean(), inplace=True)

# Impute missing values for categorical columns with mode
categorical_columns = dataset.select_dtypes(include='object')
for column in categorical_columns:
    dataset[column].fillna(dataset[column].mode()[0], inplace=True)

# Mark missing values in a categorical column with 'Missing'
dataset['living area'].fillna('Missing', inplace=True)

# Drop columns with too many missing values
threshold = len(dataset) * 0.2
dataset.dropna(axis=1, thresh=threshold, inplace=True)

# Interpolate missing values for a numerical column
dataset['living area'].interpolate(method='linear', inplace=True)

# Display the cleaned dataset
print("Cleaned Dataset:")
print(dataset.head())
```

```
Missing Values per Column:
id                                0
Date                              0
number of bedrooms                0
number of bathrooms               0
living area                       0
lot area                          0
number of floors                  0
```

```
waterfront present                    0
number of views                       0
condition of the house                0
grade of the house                    0
Area of the house(excluding basement)  0
Area of the basement                  0
Built Year                            0
Renovation Year                       0
Postal Code                           0
Lattitude                             0
Longitude                             0
living_area_renov                     0
lot_area_renov                        0
Number of schools nearby              0
Distance from the airport             0
Price                                 0
dtype: int64
Cleaned Dataset:
           id   Date  number of bedrooms  number of bathrooms living area  \
0  6762810145  42491                   5                 2.50         3650
1  6762810635  42491                   4                 2.50         2920
2  6762810998  42491                   5                 2.75         2910
3  6762812605  42491                   4                 2.50         3310
4  6762812919  42491                   3                 2.00         2710

   lot area  number of floors  waterfront present  number of views  \
0      9050               2.0                   0                4
1      4000               1.5                   0                0
2      9480               1.5                   0                0
3     42998               2.0                   0                0
4      4500               1.5                   0                0

   condition of the house  …  Built Year  Renovation Year  Postal Code  \
0                       5  …        1921                0       122003
1                       5  …        1909                0       122004
2                       3  …        1939                0       122004
3                       3  …        2001                0       122005
4                       4  …        1929                0       122006

   Lattitude  Longitude  living_area_renov  lot_area_renov  \
0    52.8645   -114.557               2880            5400
1    52.8878   -114.470               2470            4000
2    52.8852   -114.468               2940            6600
3    52.9532   -114.321               3350           42847
4    52.9047   -114.485               2060            4500

   Number of schools nearby  Distance from the airport    Price
0                         2                         58  2380000
```

```
 1                       2                       51 1400000
 2                       1                       53 1200000
 3                       3                       76  838000
 4                       1                       51  805000

[5 rows x 23 columns]
```