311requests

June 22, 2023

[1]:
```
import pandas as pd
import numpy as np
import time
import matplotlib.pyplot as plt
import seaborn as sns
from scipy.stats import f_oneway
```

[2]:
```
df=pd.read_csv("311_Service_Requests_from_2010_to_Present.csv")
```

[3]:
```
df.head(5)
```

[3]:
```
   Unique Key            Created Date              Closed Date Agency  \
0    32310363  12/31/2015 11:59:45 PM  01/01/2016 12:55:15 AM   NYPD
1    32309934  12/31/2015 11:59:44 PM  01/01/2016 01:26:57 AM   NYPD
2    32309159  12/31/2015 11:59:29 PM  01/01/2016 04:51:03 AM   NYPD
3    32305098  12/31/2015 11:57:46 PM  01/01/2016 07:43:13 AM   NYPD
4    32306529  12/31/2015 11:56:58 PM  01/01/2016 03:24:42 AM   NYPD

                       Agency Name           Complaint Type  \
0  New York City Police Department  Noise - Street/Sidewalk
1  New York City Police Department         Blocked Driveway
2  New York City Police Department         Blocked Driveway
3  New York City Police Department          Illegal Parking
4  New York City Police Department          Illegal Parking

                    Descriptor    Location Type  Incident Zip  \
0              Loud Music/Party  Street/Sidewalk       10034.0
1                     No Access  Street/Sidewalk       11105.0
2                     No Access  Street/Sidewalk       10458.0
3  Commercial Overnight Parking  Street/Sidewalk       10461.0
4              Blocked Sidewalk  Street/Sidewalk       11373.0

         Incident Address  … Bridge Highway Name Bridge Highway Direction  \
0    71 VERMILYEA AVENUE  …                  NaN                       NaN
1        27-07 23 AVENUE  …                  NaN                       NaN
2  2897 VALENTINE AVENUE  …                  NaN                       NaN
3    2940 BAISLEY AVENUE  …                  NaN                       NaN
```

```
4          87-14 57 ROAD  …                  NaN                          NaN

  Road Ramp Bridge Highway Segment Garage Lot Name Ferry Direction  \
0       NaN                     NaN             NaN              NaN
1       NaN                     NaN             NaN              NaN
2       NaN                     NaN             NaN              NaN
3       NaN                     NaN             NaN              NaN
4       NaN                     NaN             NaN              NaN

  Ferry Terminal Name   Latitude  Longitude  \
0                 NaN  40.865682 -73.923501
1                 NaN  40.775945 -73.915094
2                 NaN  40.870325 -73.888525
3                 NaN  40.835994 -73.828379
4                 NaN  40.733060 -73.874170

                                  Location
0   (40.86568153633767, -73.92350095571744)
1  (40.775945312321085, -73.91509393898605)
2  (40.870324522111424, -73.88852464418646)
3   (40.83599404683083, -73.82837939584206)
4  (40.733059618956815, -73.87416975810375)

[5 rows x 53 columns]
```

[4]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 48673 entries, 0 to 48672
Data columns (total 53 columns):
 #   Column                          Non-Null Count  Dtype
---  ------                          --------------  -----
 0   Unique Key                      48673 non-null  int64
 1   Created Date                    48673 non-null  object
 2   Closed Date                     48409 non-null  object
 3   Agency                          48673 non-null  object
 4   Agency Name                     48673 non-null  object
 5   Complaint Type                  48673 non-null  object
 6   Descriptor                      47990 non-null  object
 7   Location Type                   48673 non-null  object
 8   Incident Zip                    48367 non-null  float64
 9   Incident Address                43011 non-null  object
 10  Street Name                     43011 non-null  object
 11  Cross Street 1                  42283 non-null  object
 12  Cross Street 2                  42235 non-null  object
 13  Intersection Street 1           5602 non-null   object
 14  Intersection Street 2           5548 non-null   object
```

```
 15  Address Type                    48324 non-null  object
 16  City                            48366 non-null  object
 17  Landmark                        29 non-null     object
 18  Facility Type                   48414 non-null  object
 19  Status                          48673 non-null  object
 20  Due Date                        48673 non-null  object
 21  Resolution Description          48672 non-null  object
 22  Resolution Action Updated Date  48413 non-null  object
 23  Community Board                 48672 non-null  object
 24  Borough                         48672 non-null  object
 25  X Coordinate (State Plane)      48264 non-null  float64
 26  Y Coordinate (State Plane)      48264 non-null  float64
 27  Park Facility Name              48672 non-null  object
 28  Park Borough                    48672 non-null  object
 29  School Name                     48672 non-null  object
 30  School Number                   48672 non-null  object
 31  School Region                   48672 non-null  object
 32  School Code                     48673 non-null  object
 33  School Phone Number             48673 non-null  object
 34  School Address                  48673 non-null  object
 35  School City                     48672 non-null  object
 36  School State                    48672 non-null  object
 37  School Zip                      48672 non-null  object
 38  School Not Found                48671 non-null  object
 39  School or Citywide Complaint    0 non-null      float64
 40  Vehicle Type                    0 non-null      float64
 41  Taxi Company Borough            0 non-null      float64
 42  Taxi Pick Up Location           0 non-null      float64
 43  Bridge Highway Name             44 non-null     object
 44  Bridge Highway Direction        44 non-null     object
 45  Road Ramp                       35 non-null     object
 46  Bridge Highway Segment          35 non-null     object
 47  Garage Lot Name                 0 non-null      float64
 48  Ferry Direction                 0 non-null      float64
 49  Ferry Terminal Name             0 non-null      float64
 50  Latitude                        48263 non-null  float64
 51  Longitude                       48263 non-null  float64
 52  Location                        48263 non-null  object
dtypes: float64(12), int64(1), object(40)
memory usage: 19.7+ MB
```

[5]:
```
df.shape  #shape of database
```

[5]:
```
(48673, 53)
```

[6]:
```
null_counts = df.isnull().sum()    # null values
```

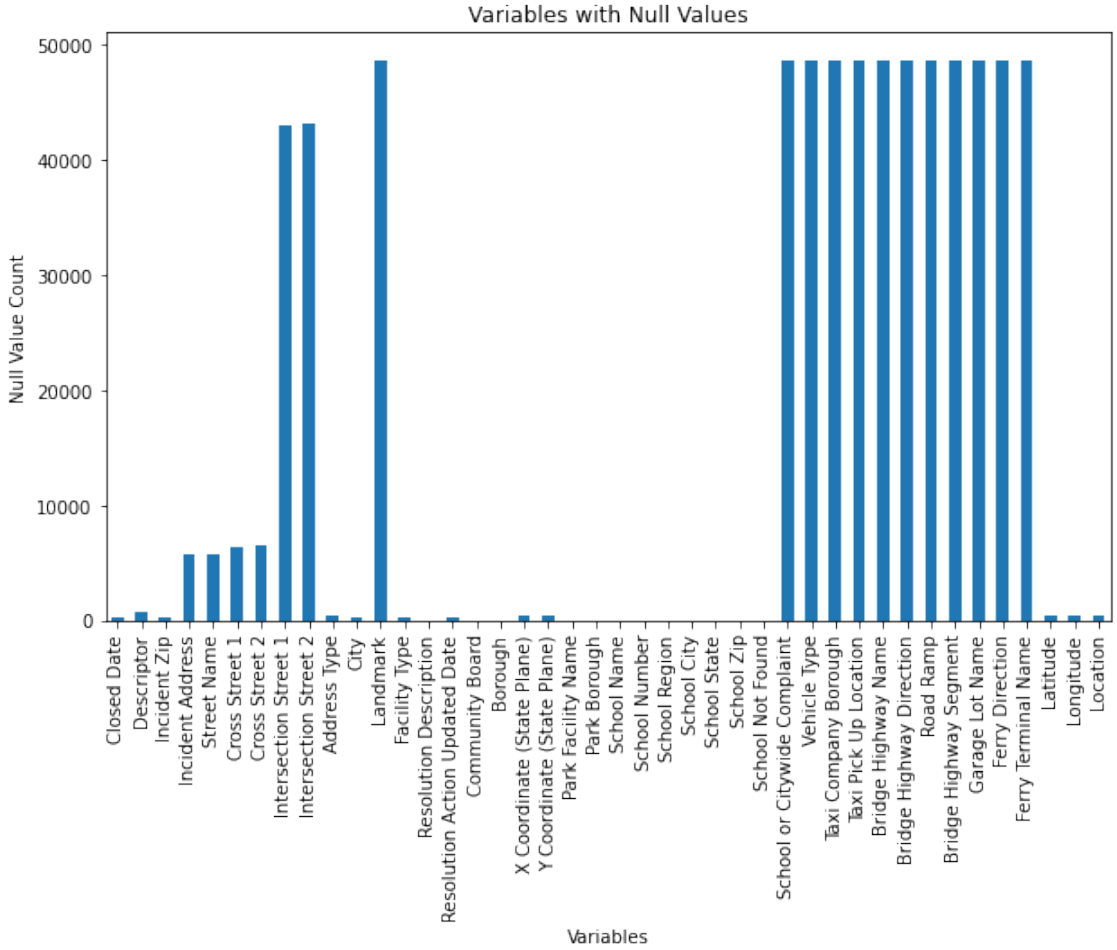
[7]:
```
null_counts
```

[7]:
```
Unique Key                          0
Created Date                        0
Closed Date                       264
Agency                              0
Agency Name                         0
Complaint Type                      0
Descriptor                        683
Location Type                       0
Incident Zip                      306
Incident Address                 5662
Street Name                      5662
Cross Street 1                   6390
Cross Street 2                   6438
Intersection Street 1           43071
Intersection Street 2           43125
Address Type                      349
City                              307
Landmark                        48644
Facility Type                     259
Status                              0
Due Date                            0
Resolution Description              1
Resolution Action Updated Date    260
Community Board                     1
Borough                             1
X Coordinate (State Plane)        409
Y Coordinate (State Plane)        409
Park Facility Name                  1
Park Borough                        1
School Name                         1
School Number                       1
School Region                       1
School Code                         0
School Phone Number                 0
School Address                      0
School City                         1
School State                        1
School Zip                          1
School Not Found                    2
School or Citywide Complaint    48673
Vehicle Type                    48673
Taxi Company Borough            48673
Taxi Pick Up Location           48673
Bridge Highway Name             48629
Bridge Highway Direction        48629
```

```
Road Ramp                       48638
Bridge Highway Segment          48638
Garage Lot Name                 48673
Ferry Direction                 48673
Ferry Terminal Name             48673
Latitude                          410
Longitude                         410
Location                          410
dtype: int64
```

[8]:
```
null_vars = null_counts[null_counts > 0]  # plot a graph of null values to␣
↪visualize
```

[9]:
```
plt.figure(figsize=(10, 6))
null_vars.plot(kind='bar')
plt.title('Variables with Null Values')
plt.xlabel('Variables')
plt.ylabel('Null Value Count')
plt.show()
```



[10]:
```
#dropping unneccessary columns
columns_to_drop = ["Intersection Street 1","Intersection Street␣
↪2","Landmark","School or Citywide Complaint","Vehicle Type","Taxi Company␣
↪Borough","Taxi Pick Up Location","Bridge Highway Name",
"Bridge Highway Direction","Road Ramp","Bridge Highway Segment","Garage Lot␣
↪Name","Ferry Direction","Ferry Terminal Name"]
df_dropped = df.drop(columns=columns_to_drop)
```

[11]:
```
df.shape
```

[11]: (48673, 53)

[12]:
```
df_dropped.shape
```

[12]: (48673, 39)

[13]:
```
df=df_dropped
```

[14]:
```
df.shape
```

[14]: (48673, 39)

[15]:
```
null_counts = df.isnull().sum()
```

[16]:
```
null_counts
```

[16]:
```
Unique Key                    0
Created Date                  0
Closed Date                 264
Agency                        0
Agency Name                   0
Complaint Type                0
Descriptor                  683
Location Type                 0
Incident Zip                306
Incident Address           5662
Street Name                5662
Cross Street 1             6390
Cross Street 2             6438
Address Type                349
City                        307
Facility Type               259
Status                        0
Due Date                      0
```

```
Resolution Description              1
Resolution Action Updated Date    260
Community Board                     1
Borough                             1
X Coordinate (State Plane)        409
Y Coordinate (State Plane)        409
Park Facility Name                  1
Park Borough                        1
School Name                         1
School Number                       1
School Region                       1
School Code                         0
School Phone Number                 0
School Address                      0
School City                         1
School State                        1
School Zip                          1
School Not Found                    2
Latitude                          410
Longitude                         410
Location                          410
dtype: int64
```

[17]:
```
unique_values = df['Created Date'].unique()
```

[18]:
```
unique_values
```

[18]:
```
array(['12/31/2015 11:59:45 PM', '12/31/2015 11:59:44 PM',
       '12/31/2015 11:59:29 PM', …, '11/14/2015 11:00:28 AM',
       '11/14/2015 10:59:17 AM', '11/14/2015 10:59:06 AM'], dtype=object)
```

[19]:
```
unique_values1 = df['Closed Date'].unique()
```

[20]:
```
unique_values1
```

[20]:
```
array(['01/01/2016 12:55:15 AM', '01/01/2016 01:26:57 AM',
       '01/01/2016 04:51:03 AM', …, '11/14/2015 11:42:22 AM',
       '11/14/2015 12:51:31 PM', '11/14/2015 12:14:52 PM'], dtype=object)
```

[21]:
```
# pd.date format
df_dropped['Created Date'] = pd.to_datetime(df_dropped['Created Date'])
```

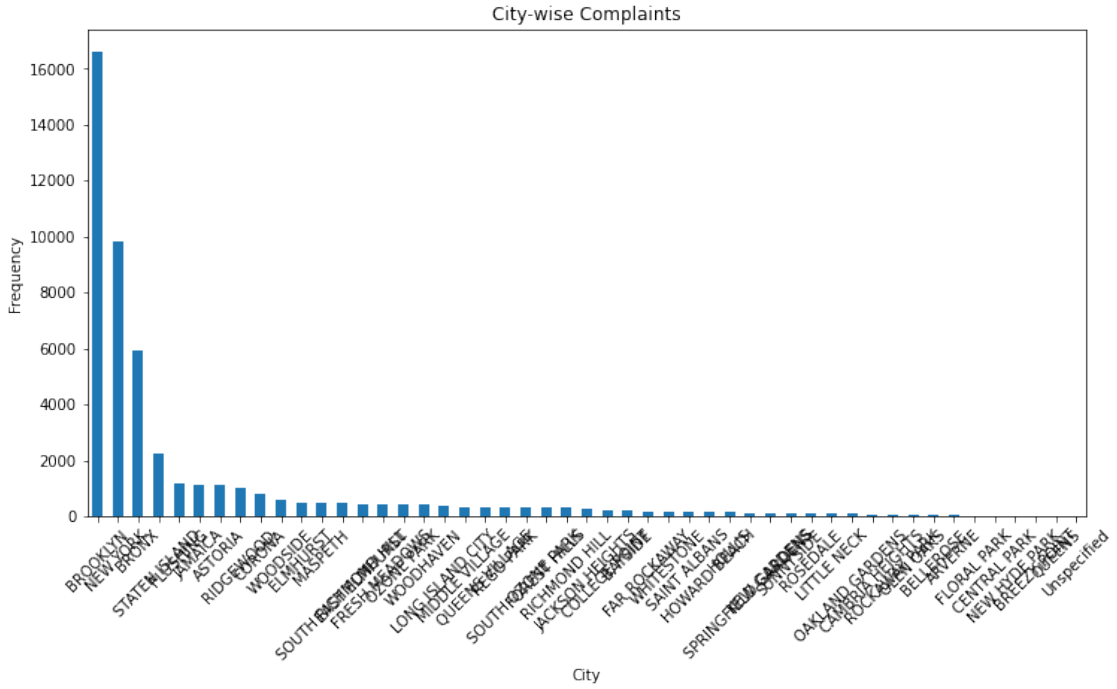
[22]:
```
start_date = pd.to_datetime('2010-01-01')  # Define your desired start date
df_dropped = df_dropped[df_dropped['Created Date'] >= start_date]
```

[23]:
```
df_dropped.head(5)
```

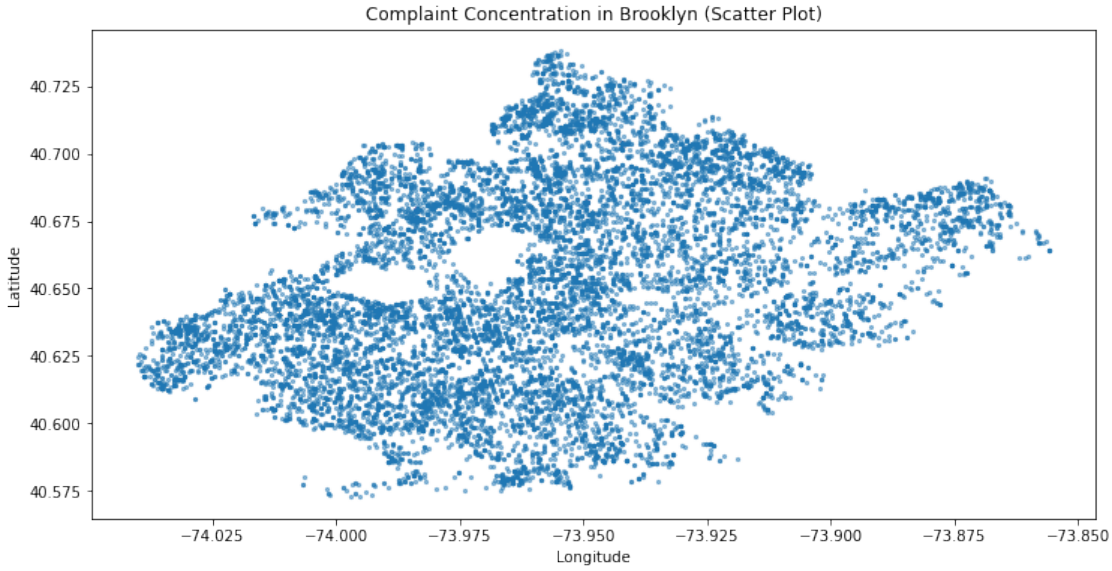
[23]:
```
   Unique Key        Created Date              Closed Date Agency  \
0    32310363 2015-12-31 23:59:45  01/01/2016 12:55:15 AM   NYPD
1    32309934 2015-12-31 23:59:44  01/01/2016 01:26:57 AM   NYPD
2    32309159 2015-12-31 23:59:29  01/01/2016 04:51:03 AM   NYPD
3    32305098 2015-12-31 23:57:46  01/01/2016 07:43:13 AM   NYPD
4    32306529 2015-12-31 23:56:58  01/01/2016 03:24:42 AM   NYPD

                       Agency Name           Complaint Type  \
0  New York City Police Department  Noise - Street/Sidewalk
1  New York City Police Department         Blocked Driveway
2  New York City Police Department         Blocked Driveway
3  New York City Police Department          Illegal Parking
4  New York City Police Department          Illegal Parking

                     Descriptor    Location Type  Incident Zip  \
0             Loud Music/Party  Street/Sidewalk       10034.0
1                    No Access  Street/Sidewalk       11105.0
2                    No Access  Street/Sidewalk       10458.0
3  Commercial Overnight Parking  Street/Sidewalk       10461.0
4             Blocked Sidewalk  Street/Sidewalk       11373.0

         Incident Address  …  School Code School Phone Number School Address  \
0    71 VERMILYEA AVENUE  …  Unspecified         Unspecified    Unspecified
1        27-07 23 AVENUE  …  Unspecified         Unspecified    Unspecified
2  2897 VALENTINE AVENUE  …  Unspecified         Unspecified    Unspecified
3    2940 BAISLEY AVENUE  …  Unspecified         Unspecified    Unspecified
4          87-14 57 ROAD  …  Unspecified         Unspecified    Unspecified

   School City School State   School Zip School Not Found   Latitude  \
0  Unspecified  Unspecified  Unspecified                N  40.865682
1  Unspecified  Unspecified  Unspecified                N  40.775945
2  Unspecified  Unspecified  Unspecified                N  40.870325
3  Unspecified  Unspecified  Unspecified                N  40.835994
4  Unspecified  Unspecified  Unspecified                N  40.733060

   Longitude                                    Location
0 -73.923501   (40.86568153633767, -73.92350095571744)
1 -73.915094  (40.775945312321085, -73.91509393898605)
2 -73.888525  (40.870324522111424, -73.88852464418646)
3 -73.828379   (40.83599404683083, -73.82837939584206)
4 -73.874170  (40.733059618956815, -73.87416975810375)

[5 rows x 39 columns]
```

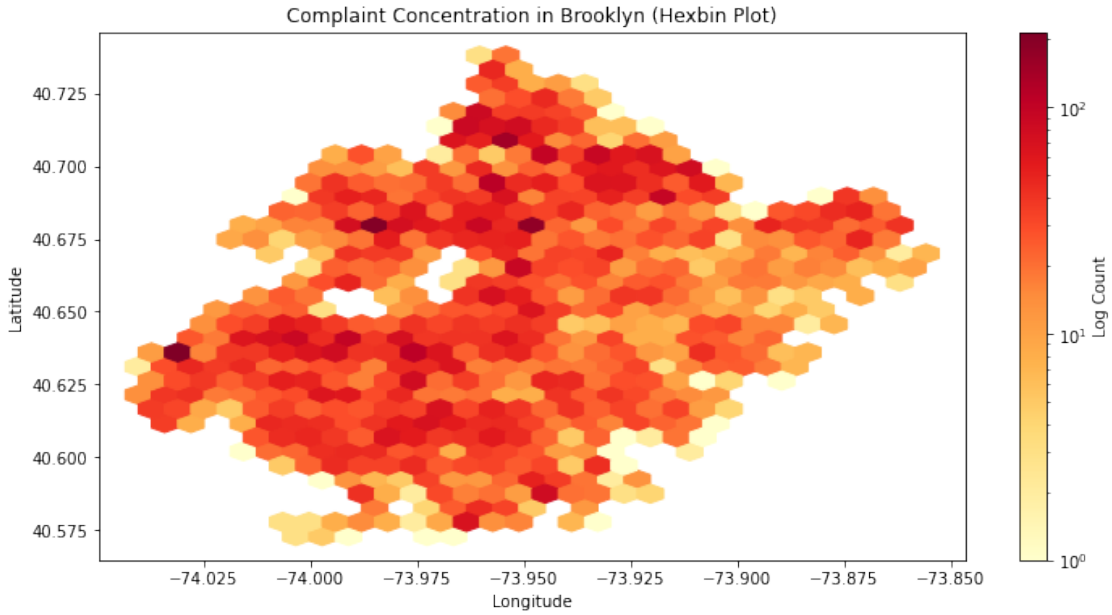
[24]:
```
#Frequency Plot for City-wise Complaints
plt.figure(figsize=(12, 6))
df['City'].value_counts().plot(kind='bar')
```

```
plt.title('City-wise Complaints')
plt.xlabel('City')
plt.ylabel('Frequency')
plt.xticks(rotation=45)
plt.show()
```



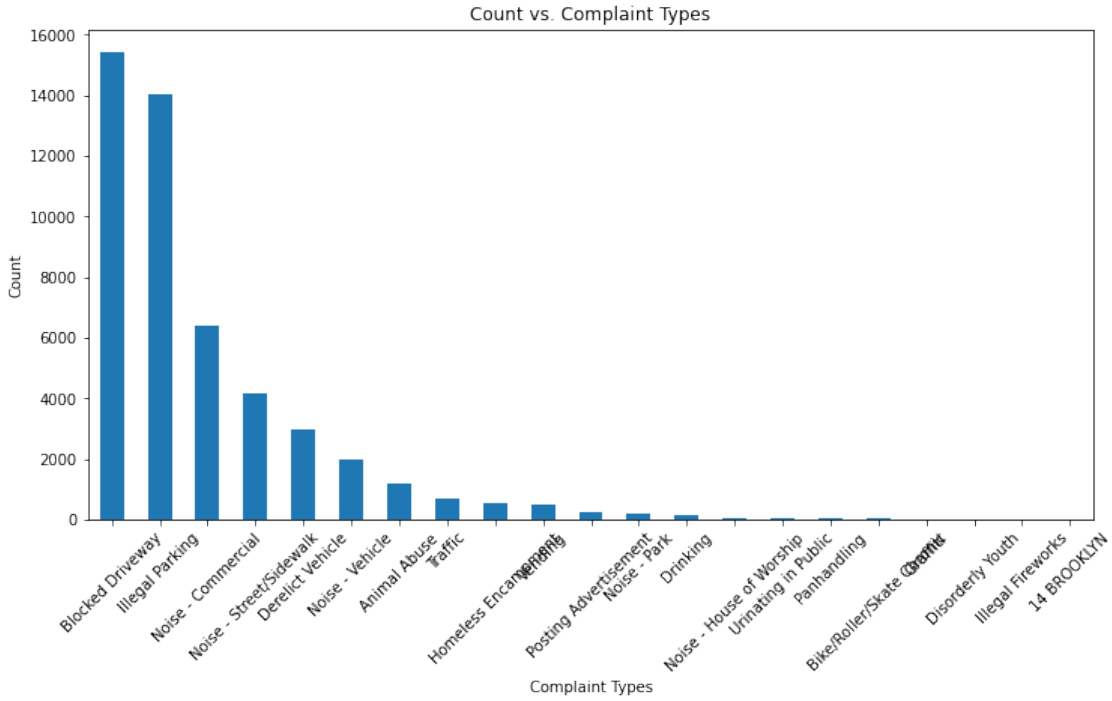
[25]:
```
#Draw scatter and hexbin plots for complaint concentration across Brooklyn
brooklyn_df = df_dropped[df_dropped['Borough'] == 'BROOKLYN']

plt.figure(figsize=(12, 6))
plt.scatter(brooklyn_df['Longitude'], brooklyn_df['Latitude'], s=5, alpha=0.5)
plt.title('Complaint Concentration in Brooklyn (Scatter Plot)')
plt.xlabel('Longitude')
plt.ylabel('Latitude')
plt.show()

plt.figure(figsize=(12, 6))
plt.hexbin(brooklyn_df['Longitude'], brooklyn_df['Latitude'], gridsize=30,␣
↪cmap='YlOrRd', bins='log')
plt.title('Complaint Concentration in Brooklyn (Hexbin Plot)')
plt.xlabel('Longitude')
plt.ylabel('Latitude')
plt.colorbar(label='Log Count')
plt.show()
```





[26]:
```
# bar graph of count vs. complaint types
complaint_counts = df_dropped['Complaint Type'].value_counts()

plt.figure(figsize=(12, 6))
complaint_counts.plot(kind='bar')
plt.title('Count vs. Complaint Types')
plt.xlabel('Complaint Types')
```

```
plt.ylabel('Count')
plt.xticks(rotation=45)
plt.show()
```



[27]:
```
# Top 10 complaints types
top_10_complaints = df_dropped['Complaint Type'].value_counts().head(10)
print(top_10_complaints)
```

```
Blocked Driveway           15396
Illegal Parking            14012
Noise - Commercial          6374
Noise - Street/Sidewalk     4172
Derelict Vehicle            2963
Noise - Vehicle             1984
Animal Abuse                1210
Traffic                      673
Homeless Encampment          545
Vending                      498
Name: Complaint Type, dtype: int64
```

[28]:
```
# Create a separate dataset with types of complaints in each city
complaints_by_city = df_dropped.groupby('City')['Complaint Type'].unique()
```

[29]:
```
complaints_by_city
```

[29]: City

ARVERNE	[Illegal Parking, Noise - Commercial, Animal A…
ASTORIA	[Blocked Driveway, Noise - Commercial, Noise -…
BAYSIDE	[Blocked Driveway, Derelict Vehicle, Illegal P…
BELLEROSE	[Derelict Vehicle, Blocked Driveway, Noise - S…
BREEZY POINT	[Noise - Street/Sidewalk, Blocked Driveway]
BRONX	[Blocked Driveway, Illegal Parking, Noise - St…
BROOKLYN	[Illegal Parking, Blocked Driveway, Noise - Co…
CAMBRIA HEIGHTS	[Derelict Vehicle, Blocked Driveway, Noise - C…
CENTRAL PARK	[Noise - Street/Sidewalk]
COLLEGE POINT	[Illegal Parking, Blocked Driveway, Derelict V…
CORONA	[Blocked Driveway, Illegal Parking, Urinating …
EAST ELMHURST	[Noise - House of Worship, Blocked Driveway, I…
ELMHURST	[Illegal Parking, Blocked Driveway, Noise - Ve…
FAR ROCKAWAY	[Blocked Driveway, Illegal Parking, Animal Abu…
FLORAL PARK	[Illegal Parking, Derelict Vehicle, Blocked Dr…
FLUSHING	[Blocked Driveway, Illegal Parking, Derelict V…
FOREST HILLS	[Illegal Parking, Noise - Commercial, Blocked …
FRESH MEADOWS	[Blocked Driveway, Illegal Parking, Noise - Ve…
GLEN OAKS	[Illegal Parking, Derelict Vehicle, Noise - Co…
HOLLIS	[Blocked Driveway, Illegal Parking, Derelict V…
HOWARD BEACH	[Illegal Parking, Blocked Driveway, Noise - Co…
JACKSON HEIGHTS	[Blocked Driveway, Noise - House of Worship, N…
JAMAICA	[Blocked Driveway, Illegal Parking, Animal Abu…
KEW GARDENS	[Illegal Parking, Animal Abuse, Blocked Drivew…
LITTLE NECK	[Blocked Driveway, Illegal Parking, Traffic, D…
LONG ISLAND CITY	[Illegal Parking, Blocked Driveway, Noise - Co…
MASPETH	[Illegal Parking, Blocked Driveway, Urinating …
MIDDLE VILLAGE	[Derelict Vehicle, Illegal Parking, Blocked Dr…
NEW HYDE PARK	[Derelict Vehicle, Blocked Driveway, Illegal P…
NEW YORK	[Noise - Street/Sidewalk, Illegal Parking, Noi…
OAKLAND GARDENS	[Blocked Driveway, Illegal Parking, Noise - Ve…
OZONE PARK	[Blocked Driveway, Illegal Parking, Animal Abu…
QUEENS	[Noise - Commercial, Illegal Parking]
QUEENS VILLAGE	[Animal Abuse, Blocked Driveway, Illegal Parki…
REGO PARK	[Blocked Driveway, Derelict Vehicle, Illegal P…
RICHMOND HILL	[Blocked Driveway, Illegal Parking, Drinking, …
RIDGEWOOD	[Blocked Driveway, Illegal Parking, Noise - Ve…
ROCKAWAY PARK	[Blocked Driveway, Animal Abuse, Illegal Parki…
ROSEDALE	[Animal Abuse, Illegal Parking, Blocked Drivew…
SAINT ALBANS	[Blocked Driveway, Illegal Parking, Derelict V…
SOUTH OZONE PARK	[Blocked Driveway, Illegal Parking, Derelict V…
SOUTH RICHMOND HILL	[Blocked Driveway, Illegal Parking, Noise - Co…
SPRINGFIELD GARDENS	[Illegal Parking, Blocked Driveway, Animal Abu…
STATEN ISLAND	[Posting Advertisement, Noise - Commercial, Il…
SUNNYSIDE	[Blocked Driveway, Noise - Commercial, Noise -…
Unspecified	[14 BROOKLYN]

```
WHITESTONE              [Illegal Parking, Blocked Driveway, Derelict V…
WOODHAVEN               [Illegal Parking, Blocked Driveway, Noise - Ve…
WOODSIDE                [Blocked Driveway, Illegal Parking, Derelict V…
Name: Complaint Type, dtype: object
```

[30]:
```
complaints_by_city_df_dropped = pd.DataFrame(complaints_by_city)
```

[31]:
```
complaints_by_city_df_dropped
```

[31]:

City	Complaint Type
ARVERNE	[Illegal Parking, Noise - Commercial, Animal A…
ASTORIA	[Blocked Driveway, Noise - Commercial, Noise -…
BAYSIDE	[Blocked Driveway, Derelict Vehicle, Illegal P…
BELLEROSE	[Derelict Vehicle, Blocked Driveway, Noise - S…
BREEZY POINT	[Noise - Street/Sidewalk, Blocked Driveway]
BRONX	[Blocked Driveway, Illegal Parking, Noise - St…
BROOKLYN	[Illegal Parking, Blocked Driveway, Noise - Co…
CAMBRIA HEIGHTS	[Derelict Vehicle, Blocked Driveway, Noise - C…
CENTRAL PARK	[Noise - Street/Sidewalk]
COLLEGE POINT	[Illegal Parking, Blocked Driveway, Derelict V…
CORONA	[Blocked Driveway, Illegal Parking, Urinating …
EAST ELMHURST	[Noise - House of Worship, Blocked Driveway, I…
ELMHURST	[Illegal Parking, Blocked Driveway, Noise - Ve…
FAR ROCKAWAY	[Blocked Driveway, Illegal Parking, Animal Abu…
FLORAL PARK	[Illegal Parking, Derelict Vehicle, Blocked Dr…
FLUSHING	[Blocked Driveway, Illegal Parking, Derelict V…
FOREST HILLS	[Illegal Parking, Noise - Commercial, Blocked …
FRESH MEADOWS	[Blocked Driveway, Illegal Parking, Noise - Ve…
GLEN OAKS	[Illegal Parking, Derelict Vehicle, Noise - Co…
HOLLIS	[Blocked Driveway, Illegal Parking, Derelict V…
HOWARD BEACH	[Illegal Parking, Blocked Driveway, Noise - Co…
JACKSON HEIGHTS	[Blocked Driveway, Noise - House of Worship, N…
JAMAICA	[Blocked Driveway, Illegal Parking, Animal Abu…
KEW GARDENS	[Illegal Parking, Animal Abuse, Blocked Drivew…
LITTLE NECK	[Blocked Driveway, Illegal Parking, Traffic, D…
LONG ISLAND CITY	[Illegal Parking, Blocked Driveway, Noise - Co…
MASPETH	[Illegal Parking, Blocked Driveway, Urinating …
MIDDLE VILLAGE	[Derelict Vehicle, Illegal Parking, Blocked Dr…
NEW HYDE PARK	[Derelict Vehicle, Blocked Driveway, Illegal P…
NEW YORK	[Noise - Street/Sidewalk, Illegal Parking, Noi…
OAKLAND GARDENS	[Blocked Driveway, Illegal Parking, Noise - Ve…
OZONE PARK	[Blocked Driveway, Illegal Parking, Animal Abu…
QUEENS	[Noise - Commercial, Illegal Parking]
QUEENS VILLAGE	[Animal Abuse, Blocked Driveway, Illegal Parki…
REGO PARK	[Blocked Driveway, Derelict Vehicle, Illegal P…
RICHMOND HILL	[Blocked Driveway, Illegal Parking, Drinking, …

```
RIDGEWOOD             [Blocked Driveway, Illegal Parking, Noise - Ve…
ROCKAWAY PARK         [Blocked Driveway, Animal Abuse, Illegal Parki…
ROSEDALE              [Animal Abuse, Illegal Parking, Blocked Drivew…
SAINT ALBANS          [Blocked Driveway, Illegal Parking, Derelict V…
SOUTH OZONE PARK      [Blocked Driveway, Illegal Parking, Derelict V…
SOUTH RICHMOND HILL   [Blocked Driveway, Illegal Parking, Noise - Co…
SPRINGFIELD GARDENS   [Illegal Parking, Blocked Driveway, Animal Abu…
STATEN ISLAND         [Posting Advertisement, Noise - Commercial, Il…
SUNNYSIDE             [Blocked Driveway, Noise - Commercial, Noise -…
Unspecified                                            [14 BROOKLYN]
WHITESTONE            [Illegal Parking, Blocked Driveway, Derelict V…
WOODHAVEN             [Illegal Parking, Blocked Driveway, Noise - Ve…
WOODSIDE              [Blocked Driveway, Illegal Parking, Derelict V…
```

[32]:
```
complaints_by_city_df_dropped = complaints_by_city_df_dropped.reset_index()
```

[33]:
```
complaints_by_city_df_dropped.columns = ['City', 'Complaint Types']
```

[34]:
```
complaints_by_city_df_dropped
```

[34]:

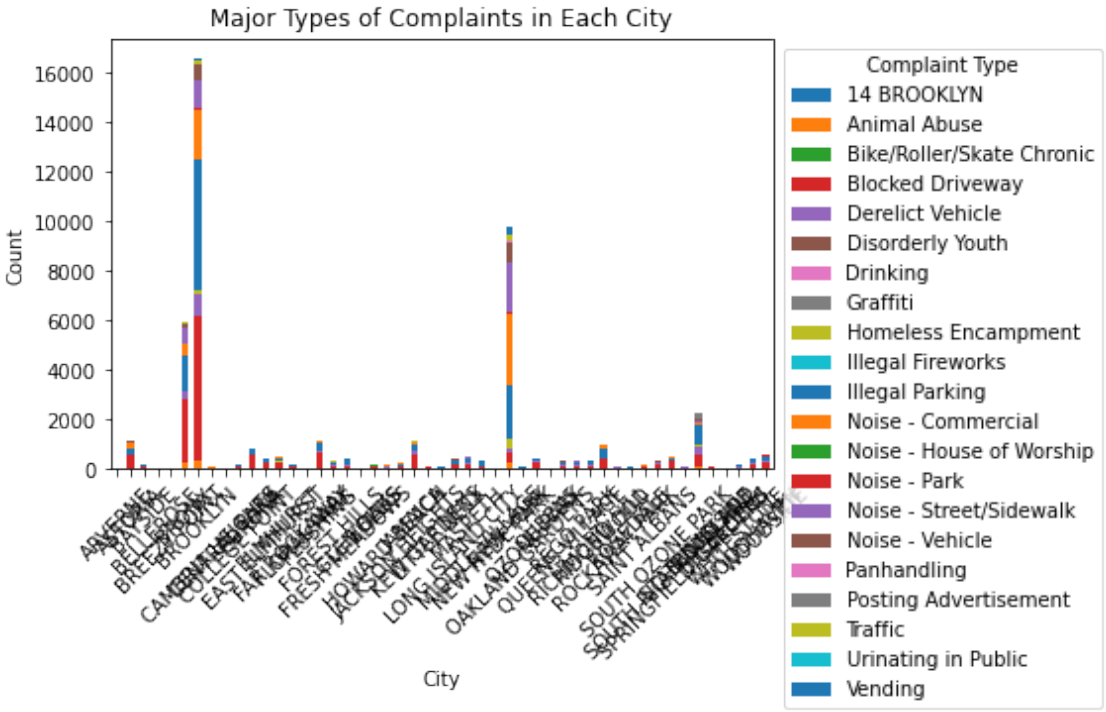
	City	Complaint Types
0	ARVERNE	[Illegal Parking, Noise - Commercial, Animal A…
1	ASTORIA	[Blocked Driveway, Noise - Commercial, Noise -…
2	BAYSIDE	[Blocked Driveway, Derelict Vehicle, Illegal P…
3	BELLEROSE	[Derelict Vehicle, Blocked Driveway, Noise - S…
4	BREEZY POINT	[Noise - Street/Sidewalk, Blocked Driveway]
5	BRONX	[Blocked Driveway, Illegal Parking, Noise - St…
6	BROOKLYN	[Illegal Parking, Blocked Driveway, Noise - Co…
7	CAMBRIA HEIGHTS	[Derelict Vehicle, Blocked Driveway, Noise - C…
8	CENTRAL PARK	[Noise - Street/Sidewalk]
9	COLLEGE POINT	[Illegal Parking, Blocked Driveway, Derelict V…
10	CORONA	[Blocked Driveway, Illegal Parking, Urinating …
11	EAST ELMHURST	[Noise - House of Worship, Blocked Driveway, I…
12	ELMHURST	[Illegal Parking, Blocked Driveway, Noise - Ve…
13	FAR ROCKAWAY	[Blocked Driveway, Illegal Parking, Animal Abu…
14	FLORAL PARK	[Illegal Parking, Derelict Vehicle, Blocked Dr…
15	FLUSHING	[Blocked Driveway, Illegal Parking, Derelict V…
16	FOREST HILLS	[Illegal Parking, Noise - Commercial, Blocked …
17	FRESH MEADOWS	[Blocked Driveway, Illegal Parking, Noise - Ve…
18	GLEN OAKS	[Illegal Parking, Derelict Vehicle, Noise - Co…
19	HOLLIS	[Blocked Driveway, Illegal Parking, Derelict V…
20	HOWARD BEACH	[Illegal Parking, Blocked Driveway, Noise - Co…
21	JACKSON HEIGHTS	[Blocked Driveway, Noise - House of Worship, N…
22	JAMAICA	[Blocked Driveway, Illegal Parking, Animal Abu…
23	KEW GARDENS	[Illegal Parking, Animal Abuse, Blocked Drivew…
24	LITTLE NECK	[Blocked Driveway, Illegal Parking, Traffic, D…
25	LONG ISLAND CITY	[Illegal Parking, Blocked Driveway, Noise - Co…

26	MASPETH	[Illegal Parking, Blocked Driveway, Urinating …
27	MIDDLE VILLAGE	[Derelict Vehicle, Illegal Parking, Blocked Dr…
28	NEW HYDE PARK	[Derelict Vehicle, Blocked Driveway, Illegal P…
29	NEW YORK	[Noise - Street/Sidewalk, Illegal Parking, Noi…
30	OAKLAND GARDENS	[Blocked Driveway, Illegal Parking, Noise - Ve…
31	OZONE PARK	[Blocked Driveway, Illegal Parking, Animal Abu…
32	QUEENS	[Noise - Commercial, Illegal Parking]
33	QUEENS VILLAGE	[Animal Abuse, Blocked Driveway, Illegal Parki…
34	REGO PARK	[Blocked Driveway, Derelict Vehicle, Illegal P…
35	RICHMOND HILL	[Blocked Driveway, Illegal Parking, Drinking, …
36	RIDGEWOOD	[Blocked Driveway, Illegal Parking, Noise - Ve…
37	ROCKAWAY PARK	[Blocked Driveway, Animal Abuse, Illegal Parki…
38	ROSEDALE	[Animal Abuse, Illegal Parking, Blocked Drivew…
39	SAINT ALBANS	[Blocked Driveway, Illegal Parking, Derelict V…
40	SOUTH OZONE PARK	[Blocked Driveway, Illegal Parking, Derelict V…
41	SOUTH RICHMOND HILL	[Blocked Driveway, Illegal Parking, Noise - Co…
42	SPRINGFIELD GARDENS	[Illegal Parking, Blocked Driveway, Animal Abu…
43	STATEN ISLAND	[Posting Advertisement, Noise - Commercial, Il…
44	SUNNYSIDE	[Blocked Driveway, Noise - Commercial, Noise -…
45	Unspecified	[14 BROOKLYN]
46	WHITESTONE	[Illegal Parking, Blocked Driveway, Derelict V…
47	WOODHAVEN	[Illegal Parking, Blocked Driveway, Noise - Ve…
48	WOODSIDE	[Blocked Driveway, Illegal Parking, Derelict V…

[35]:
```
#Visualize the major types of complaints in each city
complaints_by_city_type = df_dropped.groupby(['City', 'Complaint Type']).size().
↪unstack()
```

[36]:
```
# Plot stacked bar chart for each city
plt.figure(figsize=(22, 12))
complaints_by_city_type.plot(kind='bar', stacked=True)
plt.title('Major Types of Complaints in Each City')
plt.xlabel('City')
plt.ylabel('Count')
plt.xticks(rotation=45)
plt.legend(title='Complaint Type', bbox_to_anchor=(1, 1))
plt.show()
```

```
<Figure size 1584x864 with 0 Axes>
```



[37]:
```
#Check if the average response time across various types of complaints
# Convert the date columns to datetime format
df_dropped['Created Date'] = pd.to_datetime(df_dropped['Created Date'])
df_dropped['Closed Date'] = pd.to_datetime(df_dropped['Closed Date'])
```

[38]:
```
# Calculate the response time for each row
df_dropped['Response_Time'] = df_dropped['Closed Date'] - df_dropped['Created␣
↪Date']
```

[39]:
```
# Print the response time for each row
print(df_dropped['Response_Time'])
```

```
0        0 days 00:55:30
1        0 days 01:27:13
2        0 days 04:51:34
3        0 days 07:45:27
4        0 days 03:27:44
                ...
48668    0 days 03:06:02
48669    0 days 02:54:49
48670    0 days 00:41:54
48671    0 days 01:52:14
48672    0 days 01:15:46
Name: Response_Time, Length: 48673, dtype: timedelta64[ns]
```

[40]:
```
# Calculate average response time
average_response_time = df_dropped['Response_Time'].mean()
print("Average Response Time:", average_response_time)
```

```
Average Response Time: 0 days 04:43:41.167716746
```

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