project 1 nyc

October 4, 2022

[117]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
```

[2]:
```
df=pd.read_csv("311_Service_Requests_from_2010_to_Present.csv",low_memory =␣
↪False)
```

[84]:
```
df.head()
```

[84]:

	Unique Key	Created Date	Closed Date	Agency	Agency Name	Complaint Type	Descriptor	Location Type	Incident Zip	Incident Address	…	Bridge Highway Name	Bridge Highway Direction
0	32310363	12/31/2015 11:59:45 PM	01/01/2016 12:55:15 AM	NYPD	New York City Police Department	Noise - Street/Sidewalk	Loud Music/Party	Street/Sidewalk	10034.0	71 VERMILYEA AVENUE	…	NaN	NaN
1	32309934	12/31/2015 11:59:44 PM	01/01/2016 01:26:57 AM	NYPD	New York City Police Department	Blocked Driveway	No Access	Street/Sidewalk	11105.0	27-07 23 AVENUE	…	NaN	NaN
2	32309159	12/31/2015 11:59:29 PM	01/01/2016 04:51:03 AM	NYPD	New York City Police Department	Blocked Driveway	No Access	Street/Sidewalk	10458.0	2897 VALENTINE AVENUE	…	NaN	NaN
3	32305098	12/31/2015 11:57:46 PM	01/01/2016 07:43:13 AM	NYPD	New York City Police Department	Illegal Parking	Commercial Overnight Parking	Street/Sidewalk	10461.0	2940 BAISLEY AVENUE	…	NaN	NaN
4	32306529	12/31/2015 11:56:58 PM	01/01/2016 03:24:42 AM	NYPD	New York City Police Department	Illegal Parking	Blocked Sidewalk	Street/Sidewalk	11373.0				

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

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

[20]:
```
#shape of the dataframe
df.shape
```

[20]:
```
(364558, 53)
```

[85]:
```
df.columns
```

[85]:
```
Index(['Unique Key', 'Created Date', 'Closed Date', 'Agency', 'Agency Name',
       'Complaint Type', 'Descriptor', 'Location Type', 'Incident Zip',
       'Incident Address', 'Street Name', 'Cross Street 1', 'Cross Street 2',
       'Intersection Street 1', 'Intersection Street 2', 'Address Type',
       'City', 'Landmark', 'Facility Type', 'Status', 'Due Date',
       'Resolution Description', 'Resolution Action Updated Date',
       'Community Board', 'Borough', 'X Coordinate (State Plane)',
       'Y Coordinate (State Plane)', 'Park Facility Name', 'Park Borough',
       'School Name', 'School Number', 'School Region', 'School Code',
       'School Phone Number', 'School Address', 'School City', 'School State',
       'School Zip', 'School Not Found', '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', 'Latitude', 'Longitude', 'Location'],
```

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

[25]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 364558 entries, 0 to 364557
Data columns (total 53 columns):
 #   Column                          Non-Null Count   Dtype
---  ------                          --------------   -----
 0   Unique Key                      364558 non-null  int64
 1   Created Date                    364558 non-null  object
 2   Closed Date                     362177 non-null  object
 3   Agency                          364558 non-null  object
 4   Agency Name                     364558 non-null  object
 5   Complaint Type                  364558 non-null  object
 6   Descriptor                      358057 non-null  object
 7   Location Type                   364425 non-null  object
 8   Incident Zip                    361560 non-null  float64
 9   Incident Address                312859 non-null  object
 10  Street Name                     312859 non-null  object
 11  Cross Street 1                  307370 non-null  object
 12  Cross Street 2                  306753 non-null  object
 13  Intersection Street 1           51120 non-null   object
 14  Intersection Street 2           50512 non-null   object
 15  Address Type                    361306 non-null  object
 16  City                            361561 non-null  object
 17  Landmark                        375 non-null     object
 18  Facility Type                   362169 non-null  object
 19  Status                          364558 non-null  object
 20  Due Date                        364555 non-null  object
 21  Resolution Description          364558 non-null  object
 22  Resolution Action Updated Date  362156 non-null  object
 23  Community Board                 364558 non-null  object
 24  Borough                         364558 non-null  object
 25  X Coordinate (State Plane)      360528 non-null  float64
 26  Y Coordinate (State Plane)      360528 non-null  float64
 27  Park Facility Name              364558 non-null  object
 28  Park Borough                    364558 non-null  object
 29  School Name                     364558 non-null  object
 30  School Number                   364558 non-null  object
 31  School Region                   364557 non-null  object
 32  School Code                     364557 non-null  object
 33  School Phone Number             364558 non-null  object
 34  School Address                  364558 non-null  object
 35  School City                     364558 non-null  object
 36  School State                    364558 non-null  object
 37  School Zip                      364557 non-null  object
```

```
 38  School Not Found                364558 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             297 non-null     object
 44  Bridge Highway Direction        297 non-null     object
 45  Road Ramp                       262 non-null     object
 46  Bridge Highway Segment          262 non-null     object
 47  Garage Lot Name                 0 non-null       float64
 48  Ferry Direction                 1 non-null       object
 49  Ferry Terminal Name             2 non-null       object
 50  Latitude                        360528 non-null  float64
 51  Longitude                       360528 non-null  float64
 52  Location                        360528 non-null  object
dtypes: float64(10), int64(1), object(42)
memory usage: 147.4+ MB
```

[86]:
```
#variables with null values
df.isnull().sum()
```

[86]:
```
Unique Key                          0
Created Date                        0
Closed Date                      2381
Agency                              0
Agency Name                         0
Complaint Type                      0
Descriptor                       6501
Location Type                     133
Incident Zip                     2998
Incident Address                51699
Street Name                     51699
Cross Street 1                  57188
Cross Street 2                  57805
Intersection Street 1          313438
Intersection Street 2          314046
Address Type                     3252
City                             2997
Landmark                       364183
Facility Type                    2389
Status                              0
Due Date                            3
Resolution Description              0
Resolution Action Updated Date   2402
Community Board                     0
Borough                             0
X Coordinate (State Plane)       4030
```

```
Y Coordinate (State Plane)          4030
Park Facility Name                     0
Park Borough                           0
School Name                            0
School Number                          0
School Region                          1
School Code                            1
School Phone Number                    0
School Address                         0
School City                            0
School State                           0
School Zip                             1
School Not Found                       0
School or Citywide Complaint      364558
Vehicle Type                      364558
Taxi Company Borough              364558
Taxi Pick Up Location             364558
Bridge Highway Name               364261
Bridge Highway Direction          364261
Road Ramp                         364296
Bridge Highway Segment            364296
Garage Lot Name                   364558
Ferry Direction                   364557
Ferry Terminal Name               364556
Latitude                            4030
Longitude                           4030
Location                            4030
dtype: int64
```

[ ]:
```
#to check the percentage of the missing values
```

[87]:
```
pd.DataFrame(df.isnull().sum()/df.shape[0]*100).sort_values(0,ascending=False)[:
↪15]
```

[87]:
```
                                    0
School or Citywide Complaint  100.000000
Vehicle Type                  100.000000
Taxi Company Borough          100.000000
Taxi Pick Up Location         100.000000
Garage Lot Name               100.000000
Ferry Direction                99.999726
Ferry Terminal Name            99.999451
Road Ramp                      99.928132
Bridge Highway Segment         99.928132
Bridge Highway Name            99.918531
Bridge Highway Direction       99.918531
Landmark                       99.897136
```

```
Intersection Street 2          86.144317
Intersection Street 1          85.977540
Cross Street 2                 15.856187
```

[ ]:
```
#to remove the column with very high percentage
```

[88]:
```
missing_data = df.loc[:,(df.isnull().sum()/df.shape[0]*100)>=50]
```

[5]:
```
missing_data
```

[5]:
```
        Intersection Street 1 Intersection Street 2 Landmark  \
0                         NaN                   NaN      NaN
1                         NaN                   NaN      NaN
2                         NaN                   NaN      NaN
3                         NaN                   NaN      NaN
4                         NaN                   NaN      NaN
…                           …                     …        …
364553                    NaN                   NaN      NaN
364554                    NaN                   NaN      NaN
364555                    NaN                   NaN      NaN
364556                    NaN                   NaN      NaN
364557                    NaN                   NaN      NaN

        School or Citywide Complaint  Vehicle Type  Taxi Company Borough  \
0                                NaN           NaN                   NaN
1                                NaN           NaN                   NaN
2                                NaN           NaN                   NaN
3                                NaN           NaN                   NaN
4                                NaN           NaN                   NaN
…                                  …             …                     …
364553                           NaN           NaN                   NaN
364554                           NaN           NaN                   NaN
364555                           NaN           NaN                   NaN
364556                           NaN           NaN                   NaN
364557                           NaN           NaN                   NaN

        Taxi Pick Up Location Bridge Highway Name Bridge Highway Direction  \
0                         NaN                 NaN                      NaN
1                         NaN                 NaN                      NaN
2                         NaN                 NaN                      NaN
3                         NaN                 NaN                      NaN
4                         NaN                 NaN                      NaN
…                           …                   …                        …
364553                    NaN                 NaN                      NaN
364554                    NaN                 NaN                      NaN
364555                    NaN                 NaN                      NaN
364556                    NaN                 NaN                      NaN
```

```
364557                    NaN                 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
…             …                       …                …                …
364553        NaN                     NaN              NaN              NaN
364554        NaN                     NaN              NaN              NaN
364555        NaN                     NaN              NaN              NaN
364556        NaN                     NaN              NaN              NaN
364557        NaN                     NaN              NaN              NaN

       Ferry Terminal Name
0                      NaN
1                      NaN
2                      NaN
3                      NaN
4                      NaN
…                      …
364553                 NaN
364554                 NaN
364555                 NaN
364556                 NaN
364557                 NaN

[364558 rows x 14 columns]
```

[89]:
```
missing_col=missing_data.columns
```

[7]:
```
missing_col
```

[7]:
```
Index(['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'],
      dtype='object')
```

[90]:
```
df.drop(columns=missing_col,inplace=True)
```

[13]:
```
df.shape
```

[13]:
```
(364558, 39)
```

[91]:
```
df.head()
```

[91]:
```
   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  …  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]
```

[ ]:
```
#droping irrelevant columns
```

[92]:
```
drop_columns = ['Agency Name','Incident Address','Street Name','Cross Street␣
↪1','Cross Street 2','Address Type','Park Facility Name','Park␣
↪Borough','School Name',
'School Number','School Region','School Code','School Phone Number','School␣
↪Address','School City','School State','School Zip','School Not Found',
'X Coordinate (State Plane)','Y Coordinate (State Plane)','Due␣
↪Date','Resolution Action Updated Date',
'Community Board','Facility Type','Location']
```

[12]:
```
dataset = df.drop(drop_columns,axis=1)
```

[93]:
```
dataset.head()
```

[93]:

```
   Unique Key        Created Date         Closed Date Agency  \
0    32310363 2015-12-31 23:59:45 2016-01-01 00:55:15   NYPD
1    32309934 2015-12-31 23:59:44 2016-01-01 01:26:57   NYPD
2    32309159 2015-12-31 23:59:29 2016-01-01 04:51:03   NYPD
3    32305098 2015-12-31 23:57:46 2016-01-01 07:43:13   NYPD
4    32306529 2015-12-31 23:56:58 2016-01-01 03:24:42   NYPD

             Complaint Type                    Descriptor    Location Type  \
0  Noise - Street/Sidewalk               Loud Music/Party  Street/Sidewalk
1         Blocked Driveway                      No Access  Street/Sidewalk
2         Blocked Driveway                      No Access  Street/Sidewalk
3          Illegal Parking  Commercial Overnight Parking  Street/Sidewalk
4          Illegal Parking               Blocked Sidewalk  Street/Sidewalk

   Incident Zip Intersection Street 1 Intersection Street 2  …  \
0       10034.0                   NaN                   NaN  …
1       11105.0                   NaN                   NaN  …
2       10458.0                   NaN                   NaN  …
3       10461.0                   NaN                   NaN  …
4       11373.0                   NaN                   NaN  …

  Bridge Highway Name Bridge Highway Direction Road Ramp  \
0                 NaN                       NaN       NaN
1                 NaN                       NaN       NaN
2                 NaN                       NaN       NaN
3                 NaN                       NaN       NaN
4                 NaN                       NaN       NaN

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

```
   Ferry Terminal Name   Latitude  Longitude Request_Closing_Time
0                  NaN  40.865682 -73.923501      0 days 00:55:30
1                  NaN  40.775945 -73.915094      0 days 01:27:13
2                  NaN  40.870325 -73.888525      0 days 04:51:34
3                  NaN  40.835994 -73.828379      0 days 07:45:27
4                  NaN  40.733060 -73.874170      0 days 03:27:44

[5 rows x 29 columns]
```

[42]:
```
dataset.shape
```

[42]:
```
(364558, 14)
```

[94]:
```
dataset['Status'].unique()
```

[94]:
```
array(['Closed', 'Open', 'Assigned', 'Draft'], dtype=object)
```

[48]:
```
dataset['Status'].value_counts()
```

[48]:
```
Closed      362114
Open          1640
Assigned       802
Draft            2
Name: Status, dtype: int64
```

[95]:
```
dataset.isnull().sum()
```

[95]:
```
Unique Key                          0
Created Date                        0
Closed Date                      2381
Agency                              0
Complaint Type                      0
Descriptor                       6501
Location Type                     133
Incident Zip                     2998
Intersection Street 1          313438
Intersection Street 2          314046
City                             2997
Landmark                       364183
Status                              0
Resolution Description              0
Borough                             0
School or Citywide Complaint    364558
Vehicle Type                    364558
Taxi Company Borough            364558
Taxi Pick Up Location           364558
```

```
Bridge Highway Name             364261
Bridge Highway Direction        364261
Road Ramp                       364296
Bridge Highway Segment          364296
Garage Lot Name                 364558
Ferry Direction                 364557
Ferry Terminal Name             364556
Latitude                          4030
Longitude                         4030
Request_Closing_Time              2381
dtype: int64
```

[53]:
```
dataset= dataset.dropna(subset=['Descriptor','Longitude','Latitude','Incident␣
↪Zip','City','Closed Date','Location Type'])
```

[96]:
```
dataset.isnull().sum()
```

[96]:
```
Unique Key                          0
Created Date                        0
Closed Date                      2381
Agency                              0
Complaint Type                      0
Descriptor                       6501
Location Type                     133
Incident Zip                     2998
Intersection Street 1          313438
Intersection Street 2          314046
City                             2997
Landmark                       364183
Status                              0
Resolution Description              0
Borough                             0
School or Citywide Complaint   364558
Vehicle Type                   364558
Taxi Company Borough           364558
Taxi Pick Up Location          364558
Bridge Highway Name            364261
Bridge Highway Direction       364261
Road Ramp                      364296
Bridge Highway Segment         364296
Garage Lot Name                364558
Ferry Direction                364557
Ferry Terminal Name            364556
Latitude                         4030
Longitude                        4030
Request_Closing_Time             2381
dtype: int64
```

[55]:
```
dataset.shape
```

[55]:
```
(353891, 14)
```

[97]:
```
#check diff types of complaints
```

[57]:
```
dataset['Complaint Type'].unique()
```

[57]:
```
array(['Noise - Street/Sidewalk', 'Blocked Driveway', 'Illegal Parking',
       'Derelict Vehicle', 'Noise - Commercial',
       'Noise - House of Worship', 'Posting Advertisement',
       'Noise - Vehicle', 'Animal Abuse', 'Vending', 'Traffic',
       'Drinking', 'Noise - Park', 'Graffiti', 'Disorderly Youth'],
      dtype=object)
```

[98]:
```
dataset['Complaint Type'].value_counts()
```

[98]:
```
Blocked Driveway             100881
Illegal Parking               92679
Noise - Street/Sidewalk       51692
Noise - Commercial            44109
Derelict Vehicle              21661
Noise - Vehicle               19352
Animal Abuse                  10541
Traffic                        5198
Homeless Encampment            4879
Vending                        4192
Noise - Park                   4109
Drinking                       1409
Noise - House of Worship       1070
Posting Advertisement           681
Urinating in Public             641
Bike/Roller/Skate Chronic       478
Panhandling                     327
Disorderly Youth                315
Illegal Fireworks               172
Graffiti                        157
Agency Issues                     8
Squeegee                          4
Ferry Complaint                   2
Animal in a Park                  1
Name: Complaint Type, dtype: int64
```

[63]:
```
dataset.groupby(['City','Complaint Type']).size()
```

[63]:
```
City      Complaint Type
ARVERNE   Animal Abuse               46
```

```
            Blocked Driveway            50
            Derelict Vehicle            32
            Disorderly Youth             2
            Drinking                     1
                                       ...
Woodside    Blocked Driveway            27
            Derelict Vehicle             8
            Illegal Parking            124
            Noise - Commercial           2
            Noise - Street/Sidewalk      5
Length: 629, dtype: int64
```

[99]:
```
pd.DataFrame({'count':dataset.groupby(['City','Complaint Type']).size()}).
↪reset_index
```

[99]:
```
<bound method DataFrame.reset_index of                                  count
City     Complaint Type
ARVERNE  Animal Abuse                 46
         Blocked Driveway             50
         Derelict Vehicle             32
         Disorderly Youth              2
         Drinking                      1
...                                  ...
Woodside Blocked Driveway             27
         Derelict Vehicle              8
         Illegal Parking             124
         Noise - Commercial            2
         Noise - Street/Sidewalk       5

[777 rows x 1 columns]>
```

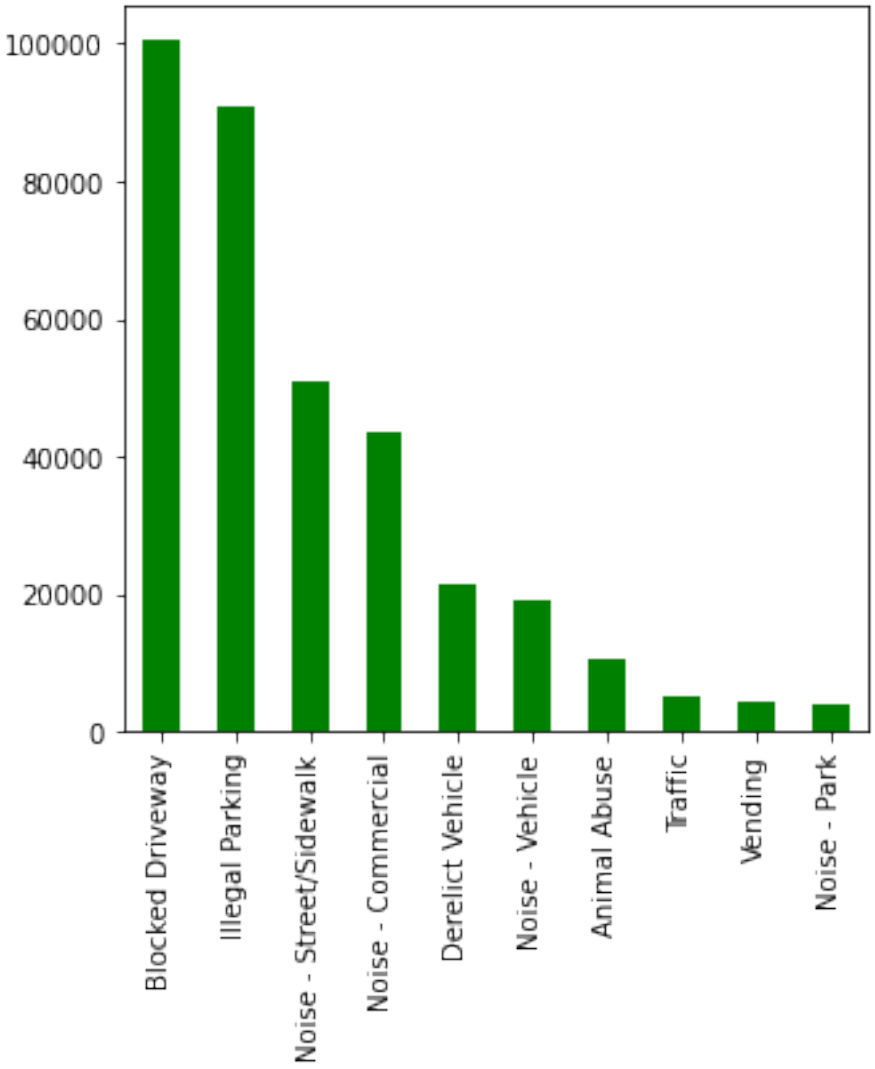
[ ]:
```
#top 10 complaints
```

[100]:
```
dataset['Complaint Type'].value_counts().head(10)
```

[100]:
```
Blocked Driveway           100881
Illegal Parking             92679
Noise - Street/Sidewalk     51692
Noise - Commercial          44109
Derelict Vehicle            21661
Noise - Vehicle             19352
Animal Abuse                10541
Traffic                      5198
Homeless Encampment          4879
Vending                      4192
Name: Complaint Type, dtype: int64
```

[75]:
```
dataset['Complaint Type'].value_counts().head(10).
↪plot(kind='bar',figsize=(5,5),color='g')
```

[75]: <AxesSubplot:>



[101]:
```
#To find major complaints
majorcomplaints = dataset.groupby('Complaint Type')
sorted_complaints = majorcomplaints.size().sort_values(ascending=False)
```

[81]:
```
sorted_complaints
```

[81]:
```
Complaint Type
Blocked Driveway            100455
Illegal Parking              91057
```

```
Noise - Street/Sidewalk      50791
Noise - Commercial           43623
Derelict Vehicle             21419
Noise - Vehicle              19122
Animal Abuse                 10500
Traffic                       5161
Vending                       4162
Noise - Park                  3994
Drinking                      1399
Noise - House of Worship      1059
Posting Advertisement          678
Disorderly Youth               314
Graffiti                       157
dtype: int64
```

[102]:
```
#top 10 complaints
sorted_complaints.head(10)
```

[102]:
```
Complaint Type
Blocked Driveway           100881
Illegal Parking             92679
Noise - Street/Sidewalk     51692
Noise - Commercial          44109
Derelict Vehicle            21661
Noise - Vehicle             19352
Animal Abuse                10541
Traffic                      5198
Homeless Encampment          4879
Vending                      4192
dtype: int64
```

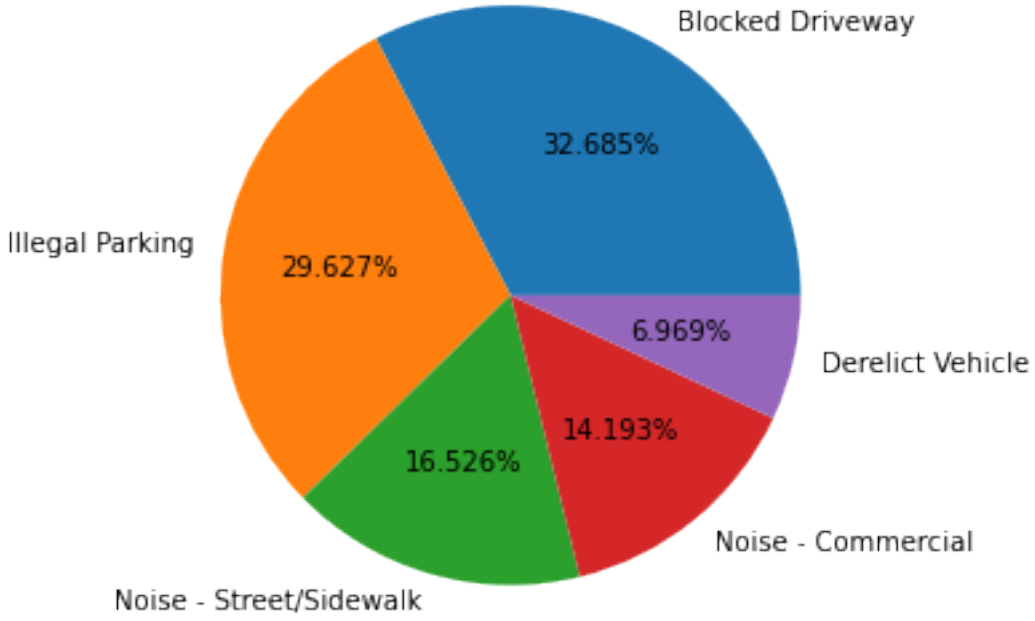
[83]:
```
sorted_complaints = sorted_complaints.to_frame('count').reset_index()
```

[103]:
```
sorted_complaints
```

[103]:
```
Complaint Type
Blocked Driveway             100881
Illegal Parking               92679
Noise - Street/Sidewalk       51692
Noise - Commercial            44109
Derelict Vehicle              21661
Noise - Vehicle               19352
Animal Abuse                  10541
Traffic                        5198
Homeless Encampment            4879
Vending                        4192
Noise - Park                   4109
```

```
Drinking                          1409
Noise - House of Worship          1070
Posting Advertisement              681
Urinating in Public                641
Bike/Roller/Skate Chronic          478
Panhandling                        327
Disorderly Youth                   315
Illegal Fireworks                  172
Graffiti                           157
Agency Issues                        8
Squeegee                             4
Ferry Complaint                      2
Animal in a Park                     1
dtype: int64
```

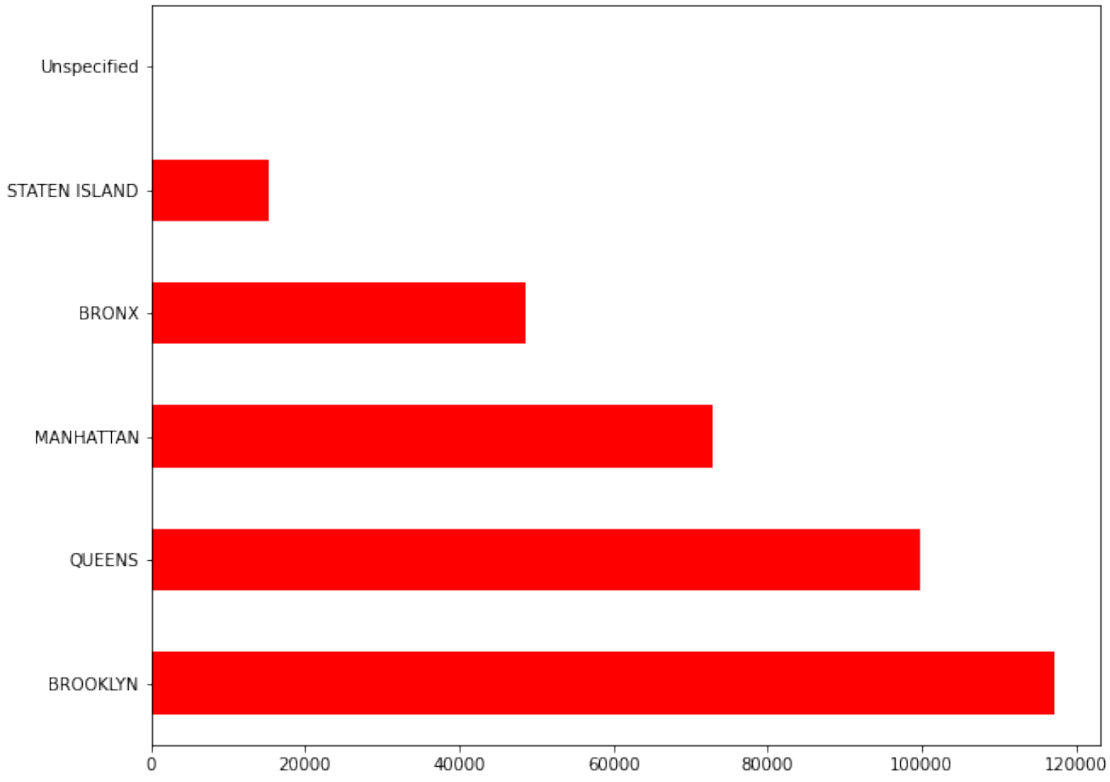
[90]:
```
 sorted_complaint_type = sorted_complaints.head(5)
plt.figure(figsize=(7,5))
plt.pie(sorted_complaint_type['count'],
labels=sorted_complaint_type['Complaint Type'],
autopct="%2.3f%%")
plt.show()
```



[104]:
```
dataset['Borough'].value_counts().head()
```

[104]:
```
BROOKLYN         118864
QUEENS           100766
MANHATTAN         77462
BRONX             49169
STATEN ISLAND     15339
Name: Borough, dtype: int64
```

[111]:
```
 plt.figure(figsize=(10,8))
dataset['Borough'].value_counts().plot(kind='barh',color='r')
plt.show()
```



[105]:
```
#calculating percentage of each borough
```

[99]:
```
for x in dataset['Borough'].unique():print("Percentage of ",x,"Division is :␣
↪",round((dataset['Borough']==x).sum()/len(dataset)*100,3))
```

```
Percentage of  MANHATTAN Division is :  20.616
Percentage of  QUEENS Division is :  28.211
Percentage of  BRONX Division is :  13.744
Percentage of  BROOKLYN Division is :  33.137
Percentage of  STATEN ISLAND Division is :  4.292
Percentage of  Unspecified Division is :  0.0
```

[106]:
```
for x in dataset['Borough'].unique():print(x)
```

```
MANHATTAN
QUEENS
BRONX
BROOKLYN
Unspecified
STATEN ISLAND
```

[115]:
```
dataset.head()
```

[115]:

	Unique Key	Created Date	Closed Date	Agency	Complaint Type	Descriptor	Location Type	Incident Zip	City	Status	Resolution Description	Borough	Latitude	Longitude
0	32310363	12/31/2015 11:59:45 PM	01/01/2016 12:55:15 AM	NYPD	Noise - Street/Sidewalk	Loud Music/Party	Street/Sidewalk	10034.0	NEW YORK	Closed	The Police Department responded and upon arriv…	MANHATTAN	40.865682	-73.923501
1	32309934	12/31/2015 11:59:44 PM	01/01/2016 01:26:57 AM	NYPD	Blocked Driveway	No Access	Street/Sidewalk	11105.0	ASTORIA	Closed	The Police Department responded to the complai…	QUEENS	40.775945	-73.915094
2	32309159	12/31/2015 11:59:29 PM	01/01/2016 04:51:03 AM	NYPD	Blocked Driveway	No Access	Street/Sidewalk	10458.0	BRONX	Closed	The Police Department responded and upon arriv…	BRONX	40.870325	-73.888525
3	32305098	12/31/2015 11:57:46 PM	01/01/2016 07:43:13 AM	NYPD	Illegal Parking	Commercial Overnight Parking	Street/Sidewalk	10461.0	BRONX	Closed	The Police Department responded to the complai…	BRONX	40.835994	-73.828379
4	32306529	12/31/2015 11:56:58 PM	01/01/2016 03:24:42 AM	NYPD	Illegal Parking	Blocked Sidewalk	Street/Sidewalk	11373.0	ELMHURST	Closed	The Police Department responded and upon arriv…	QUEENS	40.733060	-73.874170

[107]:
```
dataset.dtypes
```

[107]:
```
Unique Key                              int64
Created Date                    datetime64[ns]
Closed Date                     datetime64[ns]
Agency                                  object
Complaint Type                          object
Descriptor                              object
Location Type                           object
Incident Zip                           float64
Intersection Street 1                   object
Intersection Street 2                   object
City                                    object
Landmark                                object
Status                                  object
Resolution Description                  object
Borough                                 object
School or Citywide Complaint           float64
Vehicle Type                           float64
Taxi Company Borough                   float64
Taxi Pick Up Location                  float64
Bridge Highway Name                     object
Bridge Highway Direction                object
Road Ramp                               object
Bridge Highway Segment                  object
Garage Lot Name                        float64
Ferry Direction                         object
Ferry Terminal Name                     object
Latitude                               float64
Longitude                              float64
Request_Closing_Time           timedelta64[ns]
dtype: object
```

[ ]:
```
#converting date time column as date time datatype
```

[120]:
```
dataset['Created Date'] = pd.to_datetime(dataset['Created Date'])
dataset['Closed Date'] = pd.to_datetime(dataset['Closed Date'])
```

[121]:
```
dataset.dtypes
```

[121]:
```
Unique Key                              int64
Created Date                    datetime64[ns]
Closed Date                     datetime64[ns]
Agency                                  object
Complaint Type                          object
Descriptor                              object
Location Type                           object
Incident Zip                           float64
Intersection Street 1                   object
```

```
Intersection Street 2                    object
City                                     object
Landmark                                 object
Status                                   object
Resolution Description                   object
Borough                                  object
School or Citywide Complaint            float64
Vehicle Type                            float64
Taxi Company Borough                    float64
Taxi Pick Up Location                   float64
Bridge Highway Name                      object
Bridge Highway Direction                 object
Road Ramp                                object
Bridge Highway Segment                   object
Garage Lot Name                         float64
Ferry Direction                          object
Ferry Terminal Name                      object
Latitude                                float64
Longitude                               float64
Request_Closing_Time           timedelta64[ns]
dtype: object
```

[122]:
```
dataset['Request_Closing_Time'] = dataset['Closed Date'] - dataset['Created␣
↪Date']
```

[123]:
```
dataset.head(2)
```

[123]:
```
   Unique Key        Created Date         Closed Date Agency  \
0    32310363 2015-12-31 23:59:45 2016-01-01 00:55:15   NYPD
1    32309934 2015-12-31 23:59:44 2016-01-01 01:26:57   NYPD

            Complaint Type        Descriptor    Location Type  Incident Zip  \
0  Noise - Street/Sidewalk  Loud Music/Party  Street/Sidewalk       10034.0
1         Blocked Driveway         No Access  Street/Sidewalk       11105.0

  Intersection Street 1 Intersection Street 2  … Bridge Highway Name  \
0                   NaN                   NaN  …                 NaN
1                   NaN                   NaN  …                 NaN

  Bridge Highway Direction Road Ramp Bridge Highway Segment Garage Lot Name  \
0                      NaN       NaN                   NaN             NaN
1                      NaN       NaN                   NaN             NaN

   Ferry Direction  Ferry Terminal Name   Latitude  Longitude  \
0              NaN                  NaN  40.865682 -73.923501
1              NaN                  NaN  40.775945 -73.915094
```

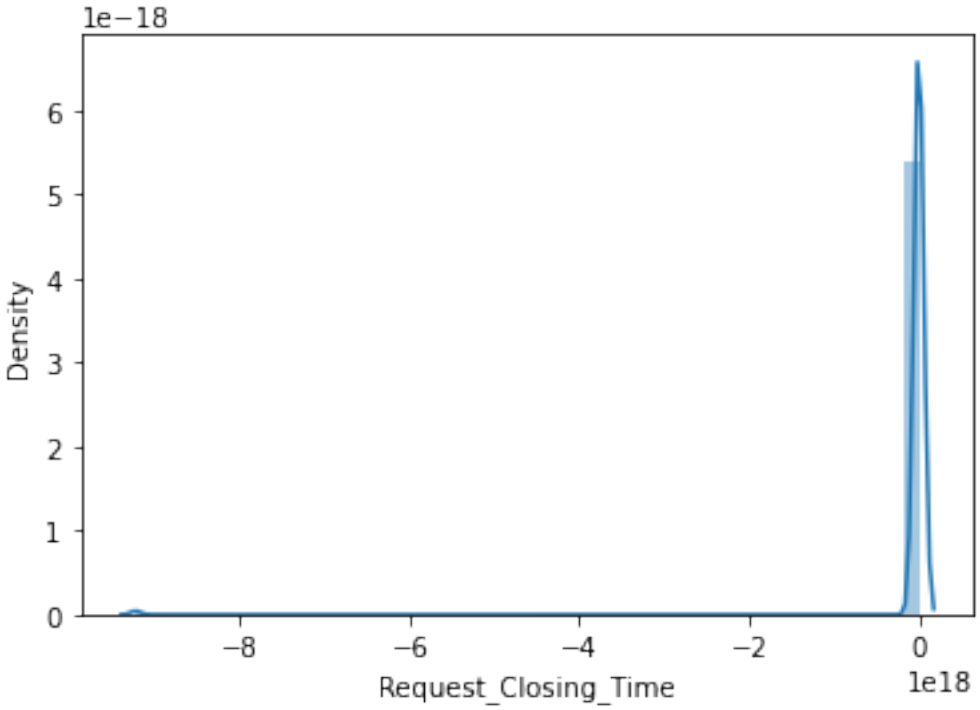
```
  Request_Closing_Time
0      0 days 00:55:30
1      0 days 01:27:13

[2 rows x 29 columns]
```

[110]:
```
sns.distplot(dataset['Request_Closing_Time'])
```

```
/usr/local/lib/python3.7/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)
```

[110]:
```
<AxesSubplot:xlabel='Request_Closing_Time', ylabel='Density'>
```



[47]:
```
dataset['Location Type'].unique()
```

[47]:
```
array(['Street/Sidewalk', 'Club/Bar/Restaurant', 'Store/Commercial',
       'House of Worship', 'Residential Building/House',
       'Residential Building', 'Park/Playground', 'Vacant Lot',
       'House and Store', 'Highway', 'Commercial', 'Roadway Tunnel',
       'Subway Station', 'Parking Lot', 'Bridge', 'Terminal', nan,
```

```
       'Ferry', 'Park'], dtype=object)
```

[111]:
```
dataset['Location Type'].value_counts()
```

[111]:
```
Street/Sidewalk                301372
Store/Commercial                25217
Club/Bar/Restaurant             21527
Residential Building/House       8869
Park/Playground                  4871
House of Worship                 1068
Residential Building              533
Highway                           265
House and Store                   245
Parking Lot                       167
Commercial                        108
Vacant Lot                         95
Roadway Tunnel                     43
Subway Station                     40
Bridge                              2
Park                                1
Terminal                            1
Ferry                               1
Name: Location Type, dtype: int64
```

[80]:
```
dataset.head(1)
```

[80]:
```
   Unique Key        Created Date         Closed Date Agency  \
0    32310363 2015-12-31 23:59:45 2016-01-01 00:55:15   NYPD

            Complaint Type        Descriptor    Location Type  Incident Zip  \
0  Noise - Street/Sidewalk  Loud Music/Party  Street/Sidewalk       10034.0

  Intersection Street 1 Intersection Street 2  … Bridge Highway Name  \
0                   NaN                   NaN  …                 NaN

  Bridge Highway Direction Road Ramp Bridge Highway Segment Garage Lot Name  \
0                      NaN       NaN                    NaN             NaN

   Ferry Direction  Ferry Terminal Name   Latitude  Longitude  \
0             NaN                  NaN  40.865682 -73.923501

  Request_Closing_Time
0      0 days 00:55:30

[1 rows x 29 columns]
```

[ ]:

[ ]: