In [1]:

```
import os
os.getcwd()
```

Out[1]:

```
'C:\\Users\\Preksha\\Simplilearn\\Project'
```

In [2]:

```
import numpy as np
import matplotlib.pyplot as plt
from matplotlib import style
import seaborn as sns
import pandas as pd
%matplotlib inline
```

1 Import a 311 NYC service request

In [3]:

```
dataset = pd.read_csv('311_Service_Requests_from_2010_to_Present.csv', parse_dates=["Crea
ted Date", "Closed Date"])
```

```
C:\anaconda\lib\site-packages\IPython\core\interactiveshell.py:3146: DtypeWarning: Column
s (48,49) have mixed types.Specify dtype option on import or set low_memory=False.
  has_raised = await self.run_ast_nodes(code_ast.body, cell_name,
```

In [4]:

```
dataset
```

Out[4]:

	Unique Key	Created Date	Closed Date	Agency	Agency Name	Complaint Type	Descriptor	Location Type	Incident Zip	In A
0	32310363	2015-12-31 23:59:00	2016-01-01 00:55:00	NYPD	New York City Police Department	Noise - Street/Sidewalk	Loud Music/Party	Street/Sidewalk	10034.0	VERM AV
1	32309934	2015-12-31 23:59:00	2016-01-01 01:26:00	NYPD	New York City Police Department	Blocked Driveway	No Access	Street/Sidewalk	11105.0	27 AV
2	32309159	2015-12-31 23:59:00	2016-01-01 04:51:00	NYPD	New York City Police Department	Blocked Driveway	No Access	Street/Sidewalk	10458.0	VALE AV
3	32305098	2015-12-31 23:57:00	2016-01-01 07:43:00	NYPD	New York City Police Department	Illegal Parking	Commercial Overnight Parking	Street/Sidewalk	10461.0	BA AV
4	32306529	2015-12-31 23:56:00	2016-01-01 03:24:00	NYPD	New York City Police Department	Illegal Parking	Blocked Sidewalk	Street/Sidewalk	11373.0	87
...	...	...	...	...	...	...	...	...	...	
300693	30281872	2015-03-29 00:33:00	NaT	NYPD	New York City Police Department	Noise - Commercial	Loud Music/Party	Club/Bar/Restaurant	NaN	CRES AV
300694	30281230	2015-03-29 00:33:00	2015-03-29 02:33:00	NYPD	New York City Police Department	Blocked Driveway	Partial Access	Street/Sidewalk	11418.0	100 AV
300695	30283424	2015-03-29 00:33:00	2015-03-29 03:40:00	NYPD	New York City Police Department	Noise - Commercial	Loud Music/Party	Club/Bar/Restaurant	11206.0	TH AV

	Unique Key	Created Date	Closed Date	Agency	Agency Name	Complaint Type	Descriptor	Location Type	Incident Zip	I A
300696	30280[illegible]	2015-03-29 00:33:00	2015-03-29 04:38:00	NYPD	New York City Police Department	Noise - Commercial	Loud Music/Party	Club/Bar/Restaurant	10464.0	315 TR A
300697	30281825	2015-03-29 00:33:00	2015-03-29 04:41:00	NYPD	New York City Police Department	Noise - Commercial	Loud Music/Party	Store/Commercial	10036.0	251 48 S

300698 rows × 53 columns

In [5]:

```
dataset.columns
```

Out[5]:

```
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')
```

In [6]:

```
dataset.replace('Unspecified',np.NaN,inplace=True)
```

In [7]:

```
# Check for duplicates and NA values and resolving them

remove_columns= ['Agency Name','Incident Address','Street Name','Cross Street 1','Cross Street 2','Intersection Street 1',
'Intersection 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','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','Landmark',
'X Coordinate (State Plane)','Y Coordinate (State Plane)','Due Date','Resolution Action Updated Date','Community Board','Facility Type',
'Location']

dataset.drop(remove_columns, inplace=True, axis=1)
dataset = dataset[dataset['Status']=='Closed']
dataset.drop(['Status'],inplace=True, axis=1)
dataset = dataset[(dataset['Latitude'].notnull())& (dataset['Longitude'].notnull()) & (dataset['Descriptor'].notnull())]
dataset.info()
```

```
C:\anaconda\lib\site-packages\pandas\core\frame.py:4163: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versus-a-copy
  return super().drop(
```

```
<class 'pandas.core.frame.DataFrame'>
```

```
Int64Index: 291204 entries, 0 to 300697
Data columns (total 13 columns):
 #   Column                  Non-Null Count   Dtype
---  ------                  --------------   -----
 0   Unique Key              291204 non-null  int64
 1   Created Date            291204 non-null  datetime64[ns]
 2   Closed Date             291204 non-null  datetime64[ns]
 3   Agency                  291204 non-null  object
 4   Complaint Type          291204 non-null  object
 5   Descriptor              291204 non-null  object
 6   Location Type           291149 non-null  object
 7   Incident Zip            291164 non-null  float64
 8   City                    291164 non-null  object
 9   Resolution Description  291204 non-null  object
 10  Borough                 291204 non-null  object
 11  Latitude                291204 non-null  float64
 12  Longitude               291204 non-null  float64
dtypes: datetime64[ns](2), float64(3), int64(1), object(7)
memory usage: 31.1+ MB
```

In [8]:

```
# Making a uniform format for city names
def camel_case(city):
    try:
        city = city.split(' ')
        city = ' '.join([x.lower().capitalize() for x in city])
        if city == 'Unknown':
            return np.nan
        else:
            return city
    except:
        return np.nan

# Apply camel_case function to City column
dataset['City'] = dataset['City'].apply(camel_case)
dataset['City'].value_counts()
```

Out[8]:

```
Brooklyn               96881
New York               61940
Bronx                  40223
Staten Island          12214
Jamaica                 7155
Astoria                 6970
Flushing                5919
Ridgewood               5124
Corona                  4266
Woodside                3614
South Richmond Hill     2759
East Elmhurst           2739
Ozone Park              2735
Elmhurst                2624
Long Island City        2543
Woodhaven               2449
Maspeth                 2445
South Ozone Park        2165
Fresh Meadows           1886
Richmond Hill           1865
Queens Village          1788
Middle Village          1759
Jackson Heights         1671
Forest Hills            1655
Rego Park               1477
College Point           1217
Bayside                 1215
Far Rockaway            1163
Whitestone              1093
Hollis                  1001
Howard Beach             923
Rosedale                 913
```

```
Springfield Gardens      871
Saint Albans             825
Kew Gardens              763
Rockaway Park            738
Sunnyside                708
Little Neck              558
Oakland Gardens          546
Cambria Heights          471
Bellerose                370
Glen Oaks                304
Arverne                  214
Floral Park              152
New Hyde Park             98
Central Park              97
Breezy Point              30
Queens                    28
Name: City, dtype: int64
```

In [9]:

```
dataset.count()
```

Out[9]:

```
Unique Key                 291204
Created Date               291204
Closed Date                291204
Agency                     291204
Complaint Type             291204
Descriptor                 291204
Location Type              291149
Incident Zip               291164
City                       291164
Resolution Description     291204
Borough                    291204
Latitude                   291204
Longitude                  291204
dtype: int64
```

In [10]:

```
dataset.nunique()
```

Out[10]:

```
Unique Key                 291204
Created Date               194128
Closed Date                166384
Agency                          1
Complaint Type                 15
Descriptor                     41
Location Type                  14
Incident Zip                  200
City                           48
Resolution Description         12
Borough                         5
Latitude                   123042
Longitude                  123141
dtype: int64
```

2 Read or convert the columns ‘Created Date’ and Closed Date’ to datetime datatype and create a new column ‘Request_Closing_Time’ as the time elapsed between request creation and request closing.

In [11]:

```
import datetime
```

```
exclude_columns = ['Created Date','Closed Date']

for col in exclude_columns:
    dataset[col] = pd.to_datetime(dataset[col],format='%m/%d/%Y %I:%M:%S %p')

for col in dataset.columns:
    if dataset[col].nunique() < 300 and col not in exclude_columns:
        dataset[col] = dataset[col].astype('category')


dataset.dropna(subset=['Created Date','Closed Date','City'], inplace=True)
dataset['Request_Closing_Time'] = dataset['Closed Date'] - dataset['Created Date']
```

In [12]:

```
dataset
```

Out[12]:

	Unique Key	Created Date	Closed Date	Agency	Complaint Type	Descriptor	Location Type	Incident Zip	City	Resol Descri
0	32310363	2015-12-31 23:59:00	2016-01-01 00:55:00	NYPD	Noise - Street/Sidewalk	Loud Music/Party	Street/Sidewalk	10034.0	New York	The P Depart respo and a
1	32309934	2015-12-31 23:59:00	2016-01-01 01:26:00	NYPD	Blocked Driveway	No Access	Street/Sidewalk	11105.0	Astoria	The P Depart respo t comp
2	32309159	2015-12-31 23:59:00	2016-01-01 04:51:00	NYPD	Blocked Driveway	No Access	Street/Sidewalk	10458.0	Bronx	The P Depart respo and a
3	32305098	2015-12-31 23:57:00	2016-01-01 07:43:00	NYPD	Illegal Parking	Commercial Overnight Parking	Street/Sidewalk	10461.0	Bronx	The P Depart respo t comp
4	32306529	2015-12-31 23:56:00	2016-01-01 03:24:00	NYPD	Illegal Parking	Blocked Sidewalk	Street/Sidewalk	11373.0	Elmhurst	The P Depart respo and a
...	...	...	...	...	...	...	...	...	...	
300692	30281370	2015-03-29 00:34:00	2015-03-29 01:13:00	NYPD	Noise - Commercial	Loud Music/Party	Store/Commercial	10002.0	New York	The P Depart respo t comp
300694	30281230	2015-03-29 00:33:00	2015-03-29 02:33:00	NYPD	Blocked Driveway	Partial Access	Street/Sidewalk	11418.0	Richmond Hill	The P Depart respo and a
300695	30283424	2015-03-29 00:33:00	2015-03-29 03:40:00	NYPD	Noise - Commercial	Loud Music/Party	Club/Bar/Restaurant	11206.0	Brooklyn	The P Depart respo t comp
300696	30280004	2015-03-29 00:33:00	2015-03-29 04:38:00	NYPD	Noise - Commercial	Loud Music/Party	Club/Bar/Restaurant	10461.0	Bronx	The P Depart respo t comp

	Unique Key	Created Date	Closed Date	Agency	Complaint Type	Descriptor	Location Type	Incident Zip	City	Resol Descri
300697	30281825	2015-03-29 00:33:00	2015-03-29 04:41:00	NYPD	Noise - Commercial	Loud Music/Party	Store/Commercial	10036.0	New York	The P Depart respo t comp

291164 rows × 14 columns

In [13]:

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

Out[13]:

```
['Noise - Street/Sidewalk', 'Blocked Driveway', 'Illegal Parking', 'Derelict Vehicle', 'N
oise - Commercial', ..., 'Traffic', 'Drinking', 'Noise - Park', 'Graffiti', 'Disorderly Y
outh']
Length: 15
Categories (15, object): ['Noise - Street/Sidewalk', 'Blocked Driveway', 'Illegal Parking
', 'Derelict Vehicle', ..., 'Drinking', 'Noise - Park', 'Graffiti', 'Disorderly Youth']
```

In [14]:

```
dataset['Descriptor'].unique()
```

Out[14]:

```
['Loud Music/Party', 'No Access', 'Commercial Overnight Parking', 'Blocked Sidewalk', 'Po
sted Parking Sign Violation', ..., 'Chronic Speeding', 'Playing in Unsuitable Place', 'Dr
ag Racing', 'Police Report Not Requested', 'Nuisance/Truant']
Length: 41
Categories (41, object): ['Loud Music/Party', 'No Access', 'Commercial Overnight Parking'
, 'Blocked Sidewalk', ..., 'Playing in Unsuitable Place', 'Drag Racing', 'Police Report N
ot Requested', 'Nuisance/Truant']
```

In [15]:

```
complaintTypecity = pd.DataFrame({'count':dataset.groupby(['Complaint Type','City']).siz
e()}).reset_index()
complaintTypecity
```

Out[15]:

	Complaint Type	City	count
0	Animal Abuse	Arverne	38
1	Animal Abuse	Astoria	125
2	Animal Abuse	Bayside	37
3	Animal Abuse	Bellerose	7
4	Animal Abuse	Breezy Point	2
...	...	...	...
715	Vending	Staten Island	25
716	Vending	Sunnyside	15
717	Vending	Whitestone	1
718	Vending	Woodhaven	6
719	Vending	Woodside	15

720 rows × 3 columns

In [16]:

```
dataset.groupby(['Borough','Complaint Type','Descriptor']).size()
```

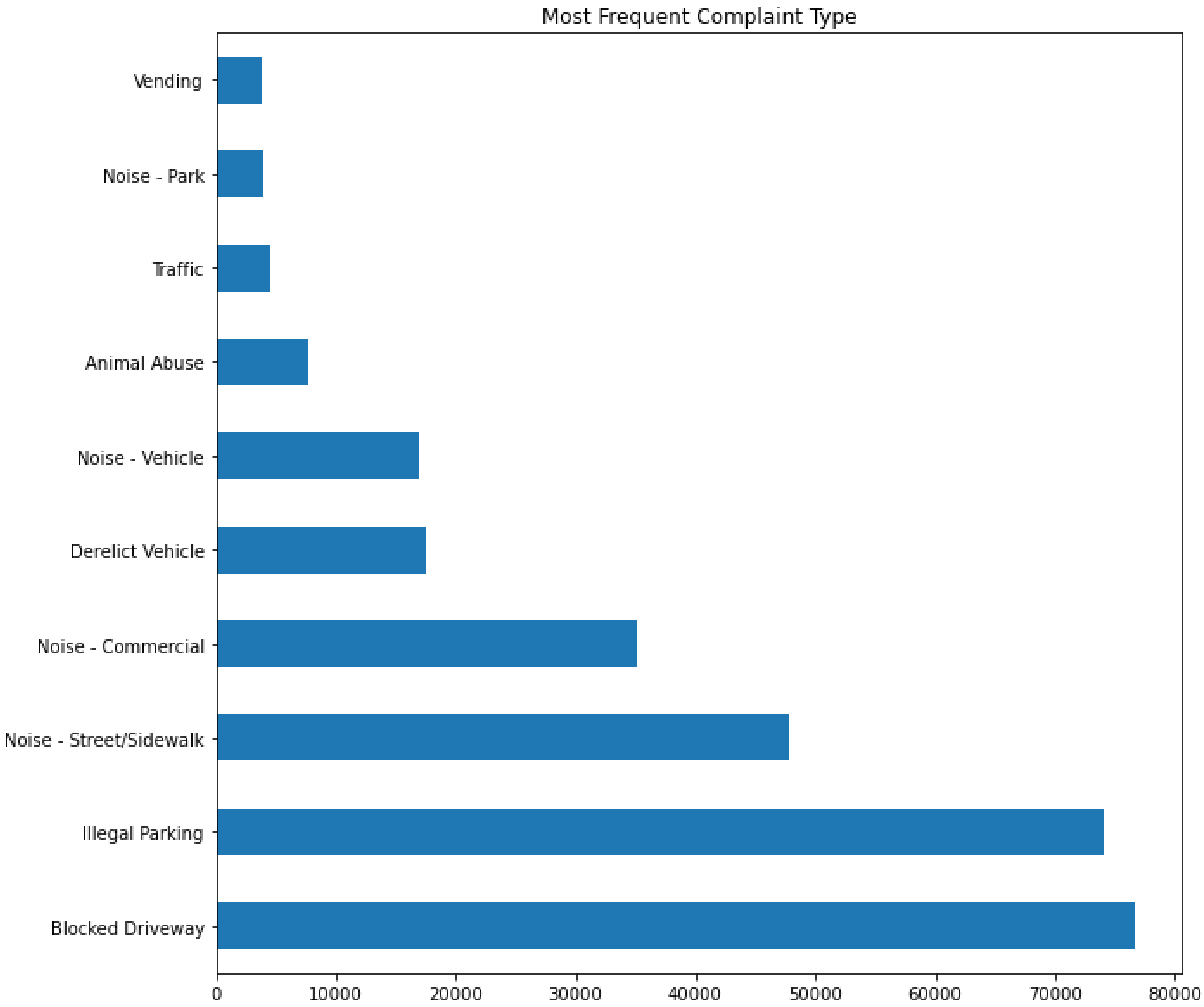
Out[16]:

```
Borough        Complaint Type  Descriptor
BRONX          Animal Abuse    After Hours - Licensed Est     0
                               Banging/Pounding               0
                               Blocked Hydrant                0
                               Blocked Sidewalk               0
                               Building                       0
                                                             ..
STATEN ISLAND  Vending         Unauthorized Bus Layover       0
                               Underage - Licensed Est        0
                               Unlicensed                    20
                               Vehicle                        0
                               With License Plate             0
Length: 3075, dtype: int64
```

3 Provide major insights/patterns that you can offer in a visual format (graphs or tables); at least 4 major conclusions that you can come up with after generic data mining.

In [17]:

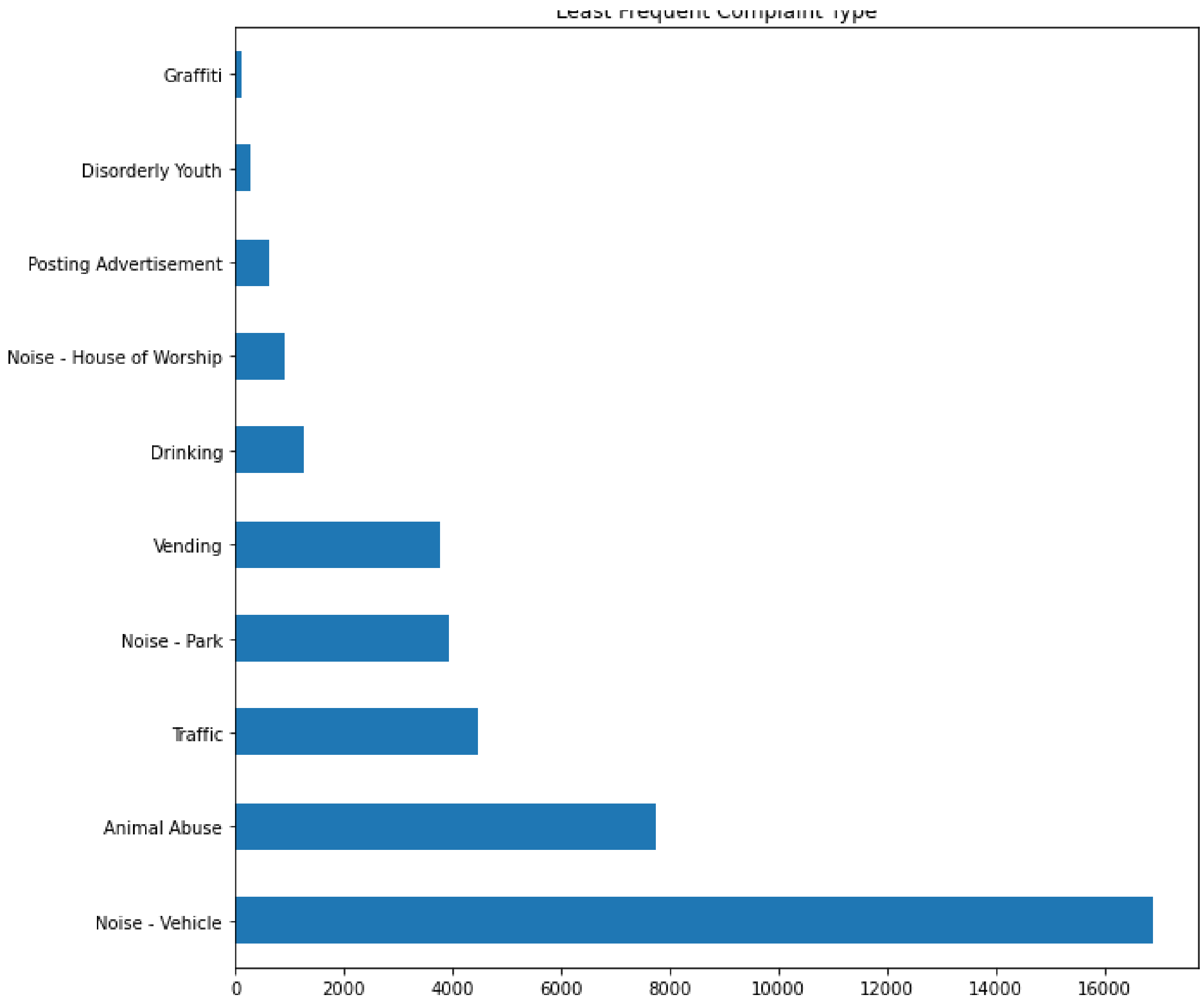
```
# MAJOR INSIGHTS - 1
# Most frequent type of complain
dataset['Complaint Type'].value_counts().head(10).plot(kind='barh',figsize=(10,10), titl
e = ('Most Frequent Complaint Type'));
```



In [18]:

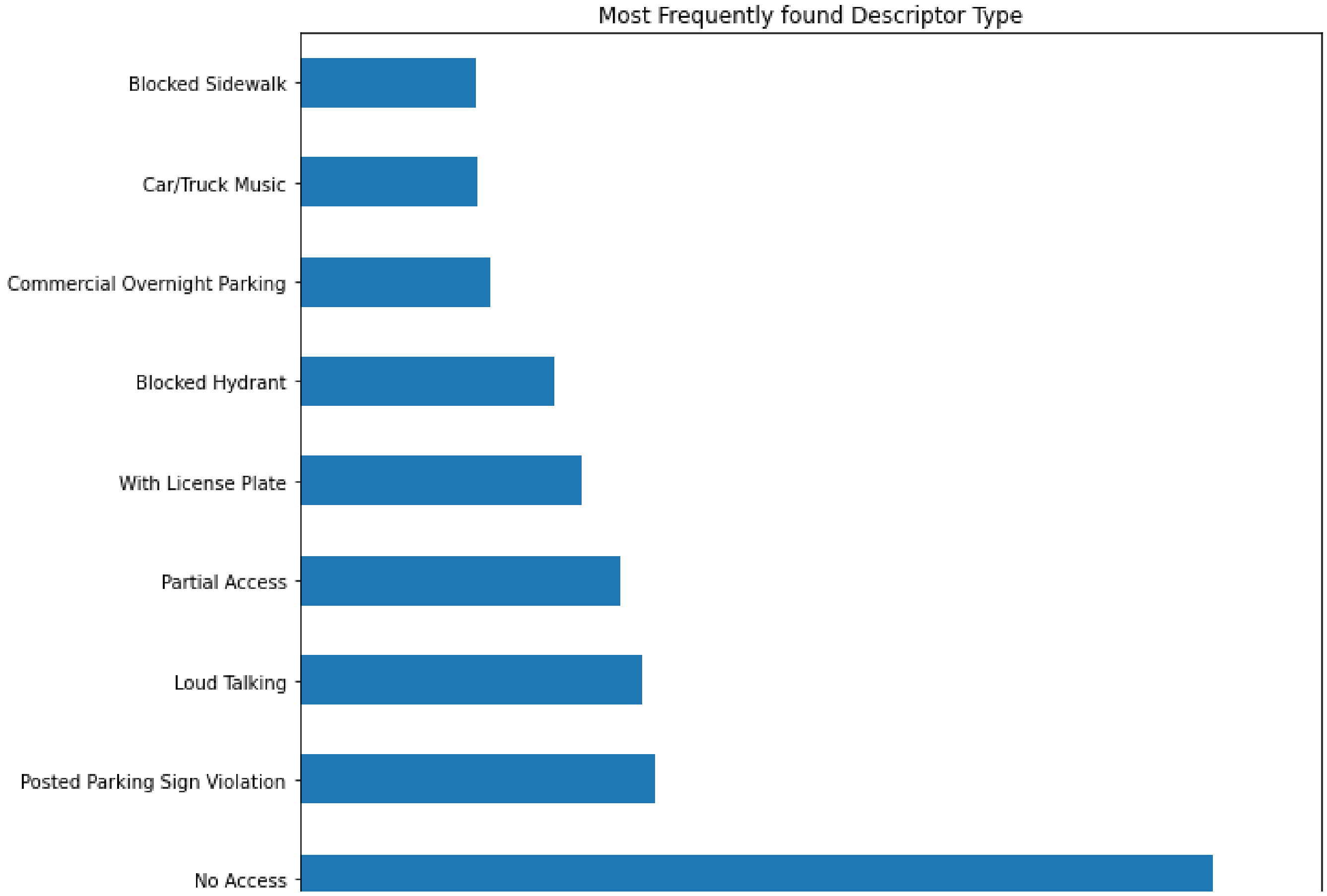
```
# MAJOR INSIGHTS - 2
# Least frequent type of complain
dataset['Complaint Type'].value_counts().tail(10).plot(kind='barh',figsize=(10,10), titl
e = ('Least Frequent Complaint Type'));
```

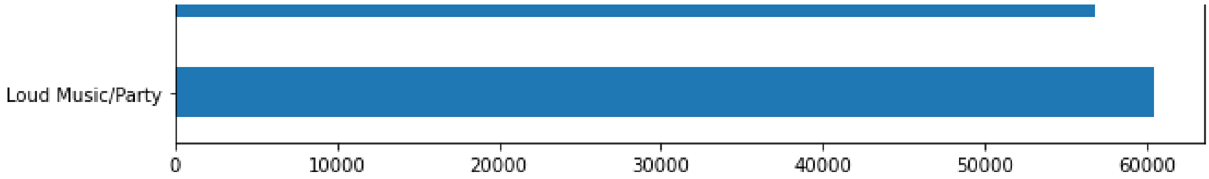
Least Frequent Complaint Type



In [19]:

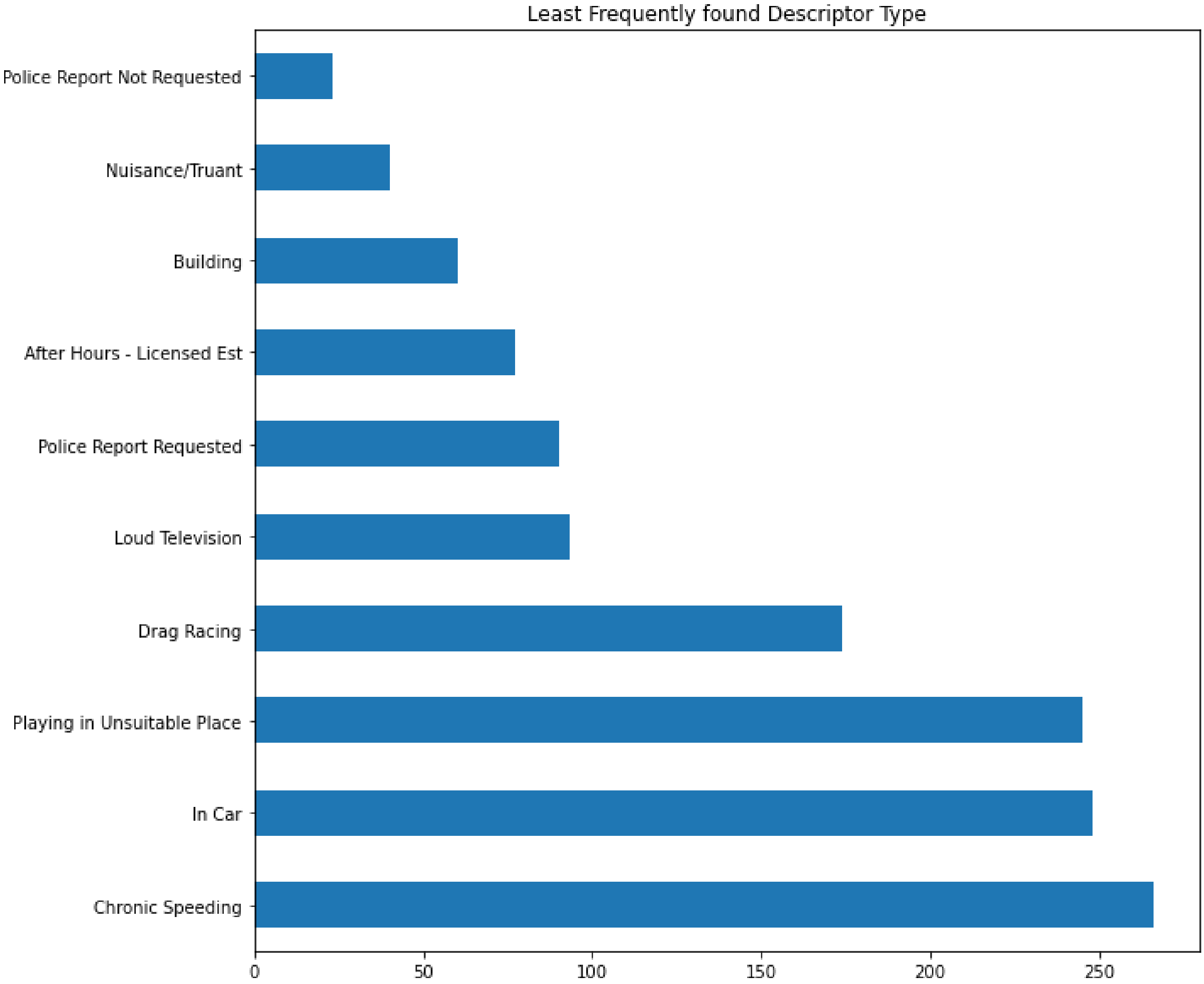
```
# MAJOR INSIGHTS - 3
# Most frequently fount descriptor
dataset['Descriptor'].value_counts().head(10).plot(kind='barh',figsize=(10,10), title =
('Most Frequently found Descriptor Type'));
```





In [20]:

```
# MAJOR INSIGHTS - 4
# Least frequent type of complain
dataset['Descriptor'].value_counts().tail(10).plot(kind='barh',figsize=(10,10), title =
('Least Frequently found Descriptor Type'));
```



In [21]:

```
# MAJOR INSIGHTS - 5
# A Pie Chart representing maximum number of complaints filed for cities
majorComplintsCity = dataset.dropna(subset=["City"])
majorComplintsCity = dataset.groupby("City")

sortedCityType = majorComplintsCity.size().sort_values(ascending = False)
sortedCityType = sortedCityType.to_frame('count').reset_index()

sortedCityType
sortedCityType.head()
```

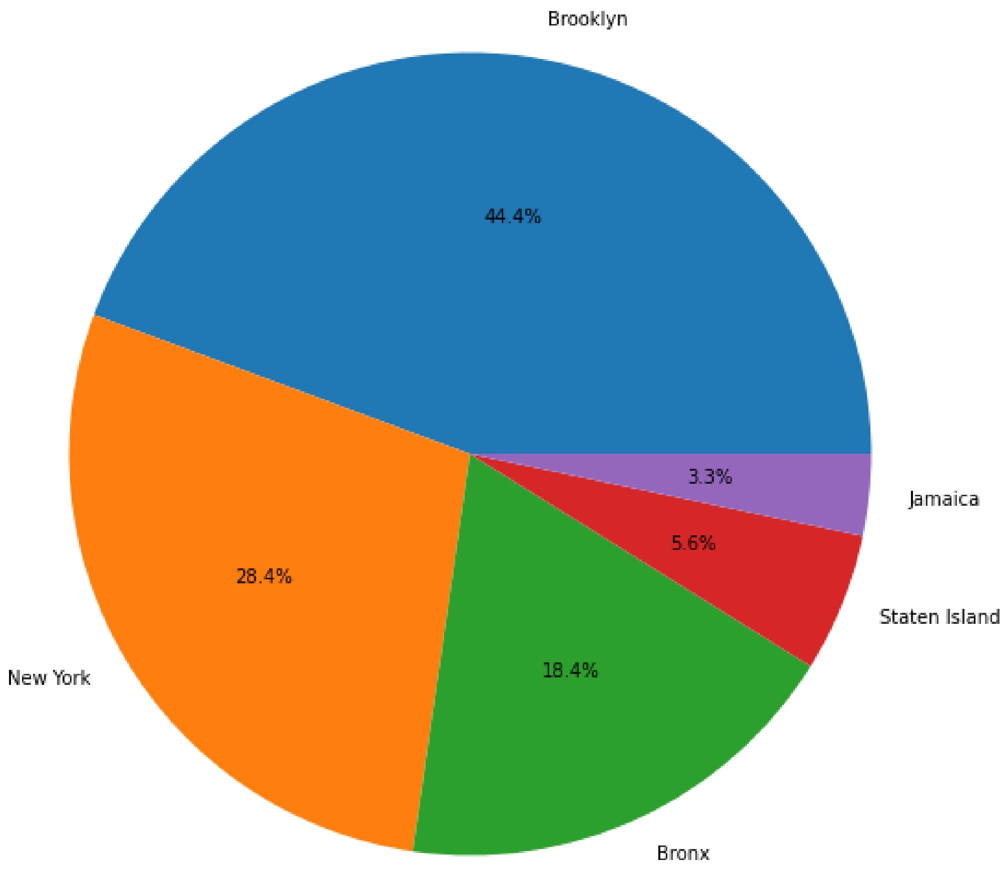
Out[21]:

	City	count
0	Brooklyn	96881
1	New York	61940
2	Bronx	40223

	City	count
3	Staten Island	13214
4	Jamaica	7155

In [22]:

```
#MAJOR INSIGHT - 6
# Pie Chart Representation for 5 most frequently complaint registering cities
sortedCityType = sortedCityType.head()
plt.figure(figsize=(10,10))
plt.pie(sortedCityType['count'],labels=sortedCityType["City"], autopct="%1.1f%%")
plt.show()
```



4 Order the complaint types based on the average ‘Request_Closing_Time’, grouping them for different locations.

In [23]:

```
dataset['Request_Closing_Hours'] = dataset['Request_Closing_Time'].astype('timedelta64[h
]')+1
dataset[['Request_Closing_Time','Request_Closing_Hours']].head()
mean = dataset['Request_Closing_Hours'].mean()
std = dataset['Request_Closing_Hours'].std()

print('Mean: ',mean)
print('Std: ',std)
```

```
Mean:  4.823075654957344
Std:  6.064308137841479
```

In [24]:

```
sort = dataset['Request_Closing_Hours'].sort_values(ascending=True)
```

In [25]:

```
req_time_grouping = dataset.groupby(['Complaint Type','Borough'])[['Request_Closing_Hour
s']].mean().unstack()
```

In [26]:

```
req_time_grouping
```

Out[26]:

	Request_Closing_Hours				
Borough	**BRONX**	**BROOKLYN**	**MANHATTAN**	**QUEENS**	**STATEN ISLAND**
Complaint Type					
Animal Abuse	7.840057	5.343096	4.200529	5.925827	5.466786
Blocked Driveway	6.766266	4.919404	4.062257	5.043218	4.585708
Derelict Vehicle	9.711134	6.472421	4.784906	9.011849	5.546795
Disorderly Youth	4.746032	4.652778	2.926471	3.796610	4.434783
Drinking	6.329787	4.038911	3.588435	4.397759	3.977143
Graffiti	9.333333	8.767442	5.545455	7.054054	10.500000
Illegal Parking	7.074320	4.781229	3.896002	5.267016	4.362277
Noise - Commercial	5.220485	3.501484	3.259326	4.289369	3.516987
Noise - House of Worship	5.037975	3.600592	2.851852	4.120401	3.058824
Noise - Park	5.254789	3.662980	3.472151	4.365931	3.462687
Noise - Street/Sidewalk	5.745262	3.817888	3.258668	4.147802	3.498160
Noise - Vehicle	6.081241	3.799650	3.155721	4.225844	3.724719
Posting Advertisement	4.062500	3.911111	3.463415	5.700000	2.071845
Traffic	5.429775	3.628466	3.181462	4.778972	4.025510
Vending	7.339523	5.035019	3.815546	5.291405	4.720000

5 (a) Whether the average response time across complaint types is similar or not (overall)

In [27]:

```
dataset['Request_Closing_Minutes'] = dataset['Request_Closing_Time'].astype('timedelta64
[m]')+1
```

In [28]:

```
data = {}
for complaint in dataset['Complaint Type'].unique():
    data[complaint] = np.log(dataset[dataset['Complaint Type']==complaint]['Request_Clos
ing_Minutes'])
```

In [29]:

```
data.keys()
```

Out[29]:

```
dict_keys(['Noise - Street/Sidewalk', 'Blocked Driveway', 'Illegal Parking', 'Derelict Ve
hicle', 'Noise - Commercial', 'Noise - House of Worship', 'Posting Advertisement', 'Noise
- Vehicle', 'Animal Abuse', 'Vending', 'Traffic', 'Drinking', 'Noise - Park', 'Graffiti',
'Disorderly Youth'])
```

In [30]:

In [30]:

```
[ complaint for complaint in data.keys() ]
```

Out[30]:

```
['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']
```

Null Hypothesis: Average response time for all the complaints type is same.

Alternate Hypothesis: Average response time for all the complaints type is not same and theres is some difference among the groups.

Below We conduct ANOVA test for top 5 type of complaints

if p < alpha(0.05) : Reject Null Hypothesis, Average response time for all the complaints type is not same.

if p > alpha(0.05) : Fail to reject Null Hypothesis, Average response time for all the complaints type is same.

In [31]:

```
from scipy.stats import f_oneway

stat, p = f_oneway(data['Noise - Street/Sidewalk'],data['Blocked Driveway'],data['Illegal Parking'],data['Derelict Vehicle'],
                   data['Noise - Commercial'])
print('Statistics=%.3f, p=%.3f' % (stat, p))
# interpret
alpha = 0.05
if p > alpha:
    print('Same distributions (fail to reject H0)')
else:
    print('Different distributions (reject H0)')
```

```
Statistics=2457.700, p=0.000
Different distributions (reject H0)
```

As our p-value is quite low , hence it is being converted to 0.0 Since our p-value is lowere that our critical p-value, we will conclude that we have enogh evidence to reject pur Null Hypothesis and that

Average response time for all the complaints type is not same.

5(b) Are the type of complaint or service requested and location related?

In [32]:

```
dataset1 = dataset[['Complaint Type', 'City']]
dataset1 = dataset1.dropna()
dataset1.shape
```

Out[32]:

```
(291164, 2)
```

In [33]:

```
C_C = pd.crosstab(dataset1['Complaint Type'], dataset1['City'], margins=True, margins_na
me = 'Total')
C_C
```

Out[33]:

City	Arverne	Astoria	Bayside	Bellerose	Breezy Point	Bronx	Brooklyn	Cambria Heights	Central Park	College Point	...	Saint Albans	South Ozone Park
Complaint Type													
Animal Abuse	38	125	37	7	2	1413	2390	11	0	28	...	30	55
Blocked Driveway	35	2734	376	95	3	12741	28128	147	0	435	...	244	942
Derelict Vehicle	27	363	198	89	3	1949	5167	115	0	184	...	202	358
Disorderly Youth	2	3	1	2	0	63	72	0	0	1	...	1	2
Drinking	1	35	1	1	1	188	257	0	0	0	...	3	13
Graffiti	1	4	3	0	0	9	43	0	0	1	...	0	0
Illegal Parking	58	1278	512	106	15	7831	27394	76	2	352	...	181	494
Noise - Commercial	2	1543	40	37	4	2431	11452	12	0	35	...	29	70
Noise - House of Worship	11	19	2	1	0	79	338	2	0	0	...	1	3
Noise - Park	2	61	3	1	0	522	1537	0	0	2	...	1	4
Noise - Street/Sidewalk	29	499	15	13	1	8865	13317	25	95	33	...	79	105
Noise - Vehicle	7	204	16	10	1	3385	5146	77	0	131	...	41	85
Posting Advertisement	0	1	0	1	0	16	45	0	0	0	...	0	1
Traffic	0	47	9	7	0	354	1081	6	0	14	...	11	28
Vending	1	54	2	0	0	377	514	0	0	1	...	2	5
Total	214	6970	1215	370	30	40223	96881	471	97	1217	...	825	2165

16 rows × 49 columns

In [34]:

```
#Chi Square test
```

Null Hypothesis: Complaint type is not related to Cities. Alternate Hypothesis: Complaint type is related to Cities.

Below We conduct CHI SQUARE test for complaints

if p < alpha(0.05) : Reject Null Hypothesis, Complaint type is not related to Cities.

if p > alpha(0.05) : Fail to reject Null Hypothesis, Complaint type is related to Cities.

In [35]:

```
from scipy.stats import chi2_contingency

#Defining the data

stat,p,dof,expected = chi2_contingency(C_C)
print('Chi Square value : ', stat)

alpha = 0.05
```

```
print('p value is ' +str(p))

if p > alpha:
    print('Same distributions (fail to reject H0)')
else:
    print('Different distributions (reject H0)')
```

```
Chi Square value :  104694.51946928105
p value is 0.0
Different distributions (reject H0)
```

As our p-value is quite low , hence it is being converted to 0.0 Since our p-value is lowere that our critical p-value, we will conclude that we have enogh evidence to reject pur Null Hypothesis and that

Complaint type is related to Cities.