

jupyter Used 7.3 of 50 hours in Aug. 2022 Start Lab End Lab

File Edit View Run Kernel Tabs Settings Help

project04_Comcast Telecom... Customer_service_analysis X 311_Service_Requests_from... X

OPEN TABS Close All

KERNELS Shut Down All

TERMINALS Shut Down All

```
364555 New York City Police Department Noise - Street/Sidewalk
364556 New York City Police Department Blocked Driveway
364557 New York City Police Department Blocked Driveway

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
...
364553 Blocked Hydrant Street/Sidewalk 11421.0
364554 Car/Truck Horn Street/Sidewalk 10468.0
364555 Loud Music/Party Street/Sidewalk 10031.0
364556 No Access Street/Sidewalk 10466.0
364557 No Access Street/Sidewalk 11420.0

Incident Address ... Bridge Highway Name \
0 71 VERMILYEA AVENUE ... NaN
1 27-07 23 AVENUE ... NaN
2 2897 VALENTINE AVENUE ... NaN
3 2940 BAILEY AVENUE ... NaN
4 87-14 57 ROAD ... NaN
...
364553 84-25 85 ROAD ... NaN
364554 2555 SEDGWICK AVENUE ... NaN
364555 508 WEST 139 STREET ... NaN
364556 931 EAST 226 STREET ... NaN
364557 123-19 135 STREET ... NaN

Bridge Highway Direction Road Ramp Bridge Highway Segment \
0 NaN NaN NaN NaN
1 NaN NaN NaN NaN
2 NaN NaN NaN NaN
```

Activate Windows
Go to Settings to activate Windows.

Simple 0 2 Python 3 | Idle Mode: Command Ln 4, Col 22 Customer_service_analysis.ipynb

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project04_Comcast Telecom... Customer_service_analysis X 311_Service_Requests_from... X

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```
[2]: import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
%matplotlib inline

[5]: Customer_service = pd.read_csv("project/311_Service_Requests_from_2010_to_Present.csv")

[4]: Customer_service.head

[4]: <bound method NDFrame.head of ... 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
...
364553 29600918 01/01/2015 12:04:44 AM 01/01/2015 10:22:31 AM NYPD
364554 29600392 01/01/2015 12:04:28 AM 01/01/2015 02:25:02 AM NYPD
364555 29607589 01/01/2015 12:01:30 AM 01/01/2015 12:20:33 AM NYPD
364556 29610809 01/01/2015 12:01:29 AM 01/01/2015 02:42:22 AM NYPD
364557 29611816 01/01/2015 12:00:50 AM 01/01/2015 02:47:50 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
```

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project04_Comcast Telecom... X Coustomer_service_analysis X 311_Service_Requests_from... X

OPEN TABS Close All

project04_Comcast Telecom...
Coustomer_service_analysis...
311_Service_Requests_from...

KERNELS Shut Down All

project04_Comcast Telecom...
Coustomer_service_analysis...

TERMINALS Shut Down All

```
364556      NaN      NaN      NaN
364557      NaN      NaN      NaN

Garage Lot Name Ferry Direction Ferry Terminal Name Latitude \
0      NaN      NaN      NaN      40.865682
1      NaN      NaN      NaN      40.775945
2      NaN      NaN      NaN      40.870325
3      NaN      NaN      NaN      40.835994
4      NaN      NaN      NaN      40.733060
...
364553      NaN      NaN      NaN      40.695145
364554      NaN      NaN      NaN      40.867830
364555      NaN      NaN      NaN      40.821647
364556      NaN      NaN      NaN      40.886361
364557      NaN      NaN      NaN      40.674212

...
Longitude      Location
0      -73.923501      (40.86568153633767, -73.92350099571744)
1      -73.915094      (40.775945312321085, -73.91509393896605)
2      -73.888525      (40.87032452211424, -73.88852464418646)
3      -73.828379      (40.83599404683083, -73.82837939584206)
4      -73.874170      (40.733059618956815, -73.87416975810375)
...
364553 -73.860949      (40.69514470265117, -73.86094888534394)
364554 -73.907178      (40.86782963689454, -73.90717786644662)
364555 -73.950873      (40.821646626438095, -73.95087342885292)
364556 -73.853290      (40.88636077906953, -73.85329048666742)
364557 -73.803585      (40.674211762243935, -73.80358548605278)

[364558 rows x 53 columns]
```

[7]: Coustomer_service[Coustomer_service.isnull().count()]

[7]: Unique Key 0

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OPEN TABS Close All

project04_Comcast Telecom...
Coustomer_service_analysis...
311_Service_Requests_from...

KERNELS Shut Down All

project04_Comcast Telecom...
Coustomer_service_analysis...

TERMINALS Shut Down All

```
[7]: Coustomer_service[Coustomer_service.isnull().count()]

[7]: Unique Key 0
Created Date 0
Closed Date 0
Agency 0
Agency Name 0
Complaint Type 0
Descriptor 0
Location Type 0
Incident Zip 0
Incident Address 0
Street Name 0
Cross Street 1 0
Cross Street 2 0
Intersection Street 1 0
Intersection Street 2 0
Address Type 0
City 0
Landmark 0
Facility Type 0
Status 0
Due Date 0
Resolution Description 0
Resolution Action Updated Date 0
Community Board 0
Borough 0
X Coordinate (State Plane) 0
Y Coordinate (State Plane) 0
Park Facility Name 0
Park Borough 0
School Name 0
School Number 0
School Radius 0
```

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OPEN TABS Close All

- project04_Comcast Telecom...
- Coustermer_service_analysis...
- 311_Service_Requests_from...

KERNELS Shut Down All

- project04_Comcast Telecom...
- Coustermer_service_analysis...

TERMINALS Shut Down All

```
School Number 0
School Region 0
School Code 0
School Phone Number 0
School Address 0
School City 0
School State 0
School Zip 0
School Not Found 0
School or Citywide Complaint 0
Vehicle Type 0
Taxi Company Borough 0
Taxi Pick Up Location 0
Bridge Highway Name 0
Bridge Highway Direction 0
Road Ramp 0
Bridge Highway Segment 0
Garage Lot Name 0
Ferry Direction 0
Ferry Terminal Name 0
Latitude 0
Longitude 0
Location 0
dtype: int64

[6]: Customer_service.shape

[6]: (364558, 53)

[7]: Customer_service.columns

[7]: 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')
```

Simple 0 2 Python 3 | Idle Mode: Command Ln 4, Col 22 Customer_service_analysis.ipynb

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File Edit View Run Kernel Tabs Settings Help

OPEN TABS Close All

- project04_Comcast Telecom...
- Coustermer_service_analysis...
- 311_Service_Requests_from...

KERNELS Shut Down All

- project04_Comcast Telecom...
- Coustermer_service_analysis...

TERMINALS Shut Down All

```
[7]: Customer_service.columns

[7]: 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')

[8]: Customer_service['Complaint Type'].unique()

[8]: 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', 'Bike/Roller/Skate Chronic', 'Panhandling',
'Noise - Park', 'Homeless Encampment', 'Urinating in Public',
'Graffiti', 'Disorderly Youth', 'Illegal Fireworks',
'Ferry Complaint', 'Agency Issues', 'Squeegee', 'Animal in a Park'],
dtype=object)

[9]: complaintTypecity = pd.DataFrame({'count':
Customer_service.groupby(['Complaint Type', 'City']).size()}).reset_index()

complaintTypecity
```

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OPEN TABS Close All

project04_Comcast Telecom...
Customer_service_analysis...
311_Service_Requests_from...

KERNELS Shut Down All

project04_Comcast Telecom...
Customer_service_analysis...

TERMINALS Shut Down All

```
[9]: complaintTypecity = pd.DataFrame({'count':
    Customer_service.groupby(['Complaint Type','City']).size()}).reset_index()
complaintTypecity
```

| | Complaint Type | City | count |
|-----|----------------|---------------|-------|
| 0 | Animal Abuse | ARVERNE | 46 |
| 1 | Animal Abuse | ASTORIA | 170 |
| 2 | Animal Abuse | BAYSIDE | 53 |
| 3 | Animal Abuse | BELLEROSE | 15 |
| 4 | Animal Abuse | BREEZY POINT | 2 |
| ... | ... | ... | ... |
| 772 | Vending | STATEN ISLAND | 25 |
| 773 | Vending | SUNNYSIDE | 15 |
| 774 | Vending | WHITESTONE | 1 |
| 775 | Vending | WOODHAVEN | 6 |
| 776 | Vending | WOODSIDE | 15 |

777 rows x 3 columns

```
[10]: Customer_service.groupby(['Borough','Complaint Type','Descriptor']).size()
```

| | Borough | Complaint Type | Descriptor | |
|---|---------|----------------|------------|-----|
| 0 | BRONX | Animal Abuse | Chained | 166 |
| 1 | | | In Car | 41 |
| 2 | | | Neglected | 951 |

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OPEN TABS Close All

project04_Comcast Telecom...
Customer_service_analysis...
311_Service_Requests_from...

KERNELS Shut Down All

project04_Comcast Telecom...
Customer_service_analysis...

TERMINALS Shut Down All

```
[10]: Customer_service.groupby(['Borough','Complaint Type','Descriptor']).size()
```

| | Borough | Complaint Type | Descriptor | |
|-----|-------------|-----------------------|---------------------------|-----|
| 0 | BRONX | Animal Abuse | Chained | 166 |
| 1 | | | In Car | 41 |
| 2 | | | Neglected | 951 |
| 3 | | | No Shelter | 165 |
| 4 | | | Other (complaint details) | 412 |
| ... | | | ... | ... |
| 5 | Unspecified | Noise - Vehicle | Engine Idling | 13 |
| 6 | | Posting Advertisement | Vehicle | 1 |
| 7 | | Traffic | Truck Route Violation | 1 |
| 8 | | Vending | In Prohibited Area | 2 |
| 9 | | | Unlicensed | 5 |

Length: 290, dtype: int64

```
[11]: import datetime
```

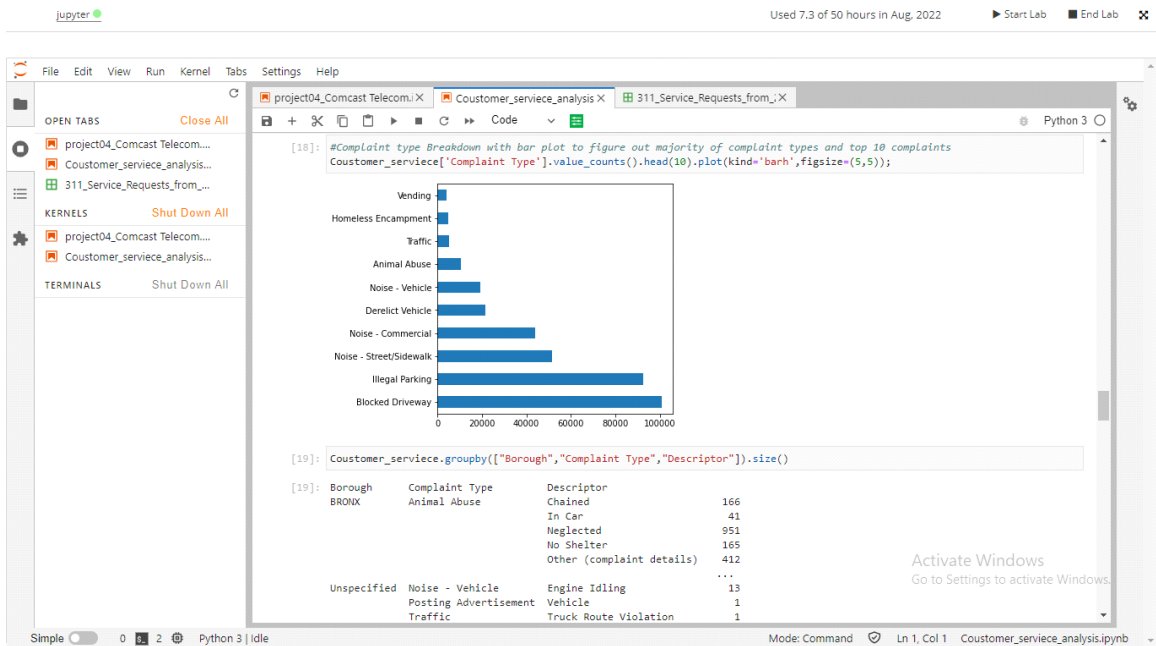
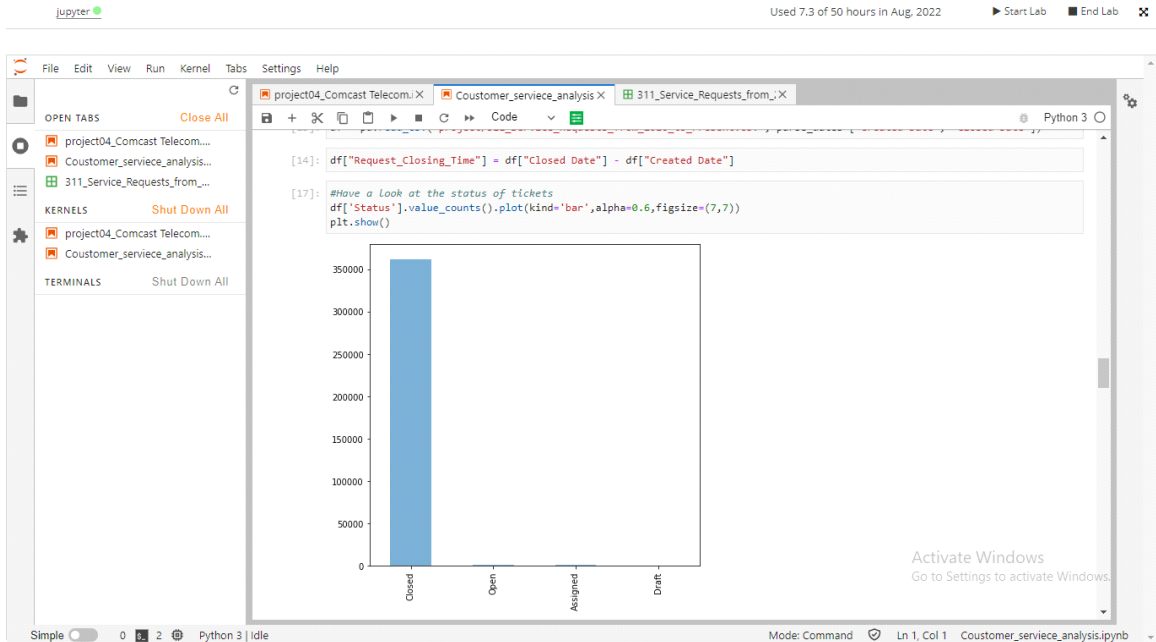
```
[13]: df = pd.read_csv("project/311_Service_Requests_from_2010_to_Present.csv", parse_dates=["Created Date", "Closed Date"])
```

```
[14]: df["Request_Closing_Time"] = df["Closed Date"] - df["Created Date"]
```

```
[17]: #Have a Look at the status of tickets
df['Status'].value_counts().plot(kind='bar',alpha=0.6,figsize=(7,7))
plt.show()
```

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project04_Comcast Telecom... Customer_service_analysis... 311_Service_Requests_from...

KERNELS Shut Down All

project04_Comcast Telecom... Customer_service_analysis...

TERMINALS Shut Down All

```
[19]: Customer_service.groupby(["Borough", "Complaint Type", "Descriptor"]).size()

[19]: Borough    Complaint Type    Descriptor    size
      BRONX      Animal Abuse    Chained          166
      BRONX      Animal Abuse    In Car           41
      BRONX      Animal Abuse    Neglected       951
      BRONX      Animal Abuse    No Shelter       165
      BRONX      Animal Abuse    Other (complaint details)  412
      ...
      Unspecified Noise - Vehicle    Engine Idling      13
      Unspecified Noise - Vehicle    Vehicle            1
      Unspecified Noise - Vehicle    Truck Route Violation  1
      Unspecified Noise - Vehicle    In Prohibited Area    2
      Unspecified Noise - Vehicle    Unlicensed            5

Length: 290, dtype: int64

[20]: majorcomplints=Customer_service.dropna(subset=["Complaint Type"])
      majorcomplints=Customer_service.groupby("Complaint Type")

      sortedComplaintType = majorcomplints.size().sort_values(ascending = False)
      sortedComplaintType = sortedComplaintType.to_frame('count').reset_index()

      sortedComplaintType
      sortedComplaintType.head(10)

[20]:
```

| | Complaint Type | count |
|---|-------------------------|--------|
| 0 | Blocked Driveway | 100881 |
| 1 | Illegal Parking | 92679 |
| 2 | Noise - Street/Sidewalk | 51692 |
| 3 | Noise - Commercial | 44109 |

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project04_Comcast Telecom... Customer_service_analysis... 311_Service_Requests_from...

KERNELS Shut Down All

project04_Comcast Telecom... Customer_service_analysis...

TERMINALS Shut Down All

```
[20]:
```

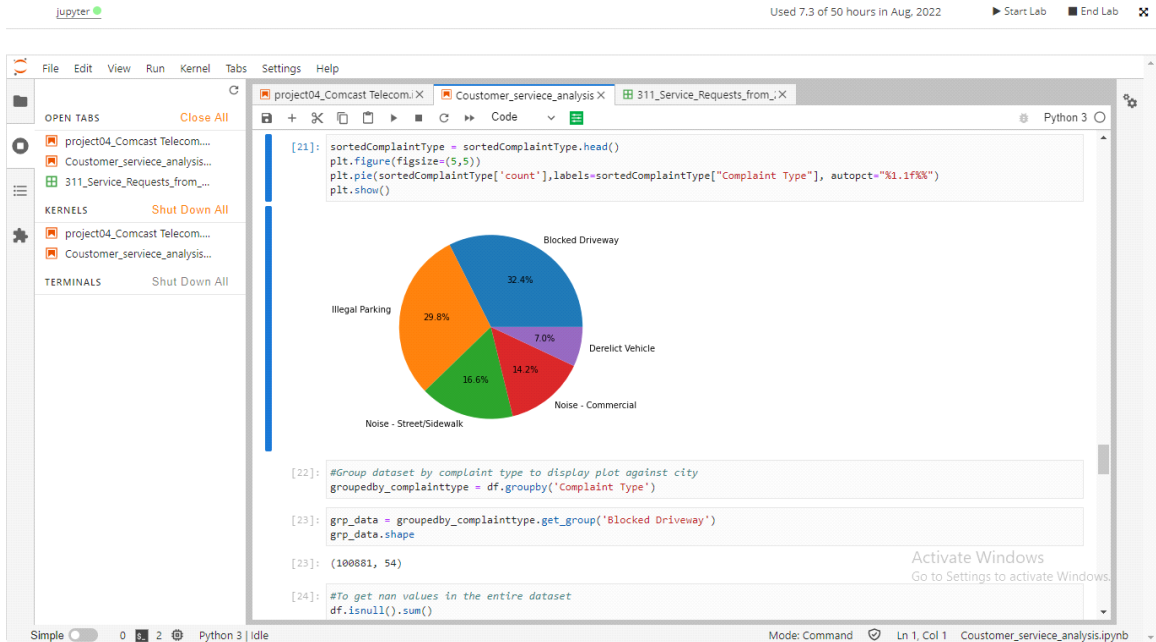
| | Complaint Type | count |
|---|-------------------------|--------|
| 0 | Blocked Driveway | 100881 |
| 1 | Illegal Parking | 92679 |
| 2 | Noise - Street/Sidewalk | 51692 |
| 3 | Noise - Commercial | 44109 |
| 4 | Derelict Vehicle | 21661 |
| 5 | Noise - Vehicle | 19352 |
| 6 | Animal Abuse | 10541 |
| 7 | Traffic | 5198 |
| 8 | Homeless Encampment | 4879 |
| 9 | Vending | 4192 |

```
[21]: sortedComplaintType = sortedComplaintType.head()
      plt.figure(figsize=(5,5))
      plt.pie(sortedComplaintType['count'], labels=sortedComplaintType["Complaint Type"], autopct="%1.1f%%")
      plt.show()

Blocked Driveway
Illegal Parking
Derelict Vehicle
```

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- 311_Service_Requests_from...

KERNELS Shut Down All

- project04_Comcast Telecom...
- Coustermer_service_analysis...

TERMINALS Shut Down All

```
[23]: grp_data = groupedby_complainttype.get_group("Blocked Driveway")
grp_data.shape

[23]: (100881, 54)

[24]: #To get nan values in the entire dataset
df.isnull().sum()
```

| | |
|--------------------------------|--------|
| 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 |

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KERNELS Shut Down All

- project04_Comcast Telecom...
- Coustomer_service_analysis...

TERMINALS Shut Down All

```
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
Request_Closing_Time 2381
dtype: int64
```

[25]: #fix blank values in City column
df['City'].dropna(inplace=True)

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- project04_Comcast Telecom...
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KERNELS Shut Down All

- project04_Comcast Telecom...
- Coustomer_service_analysis...

TERMINALS Shut Down All

```
df['City'].dropna(inplace=True)

[26]: #Shape after dropping nan values
df['City'].shape

[26]: (364558,)

[27]: #count of null values in grouped city column data
grp_data['City'].isnull().sum()

[27]: 333

[28]: #fix those NAN with "unknown city" value instead
grp_data['City'].fillna('Unknown City', inplace=True)

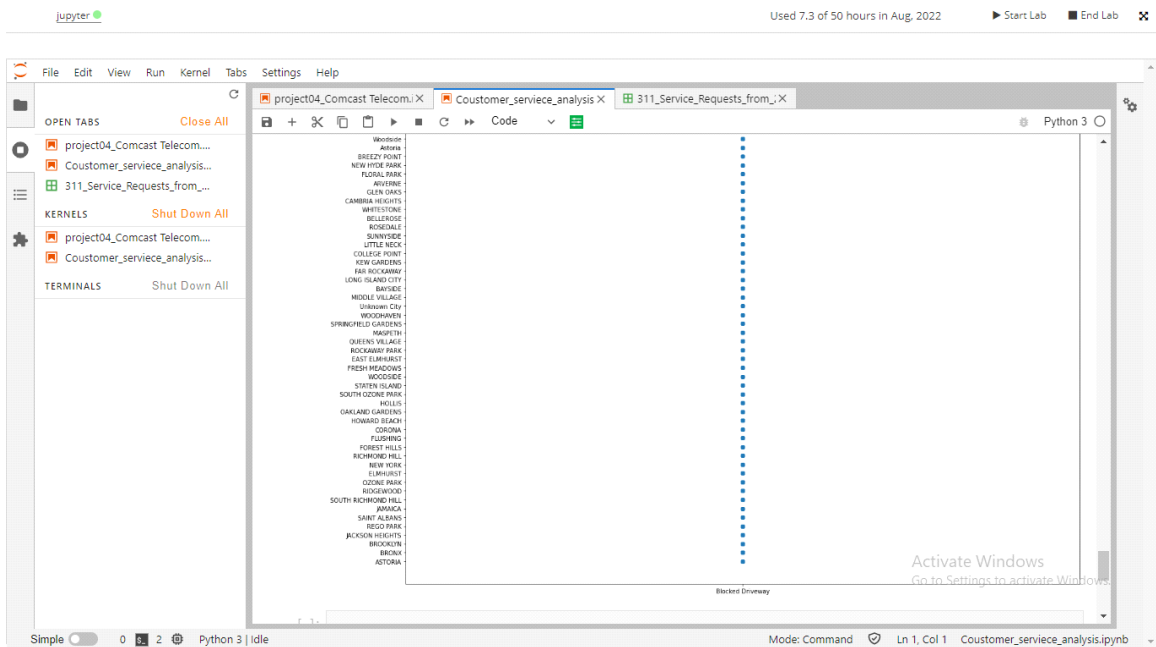
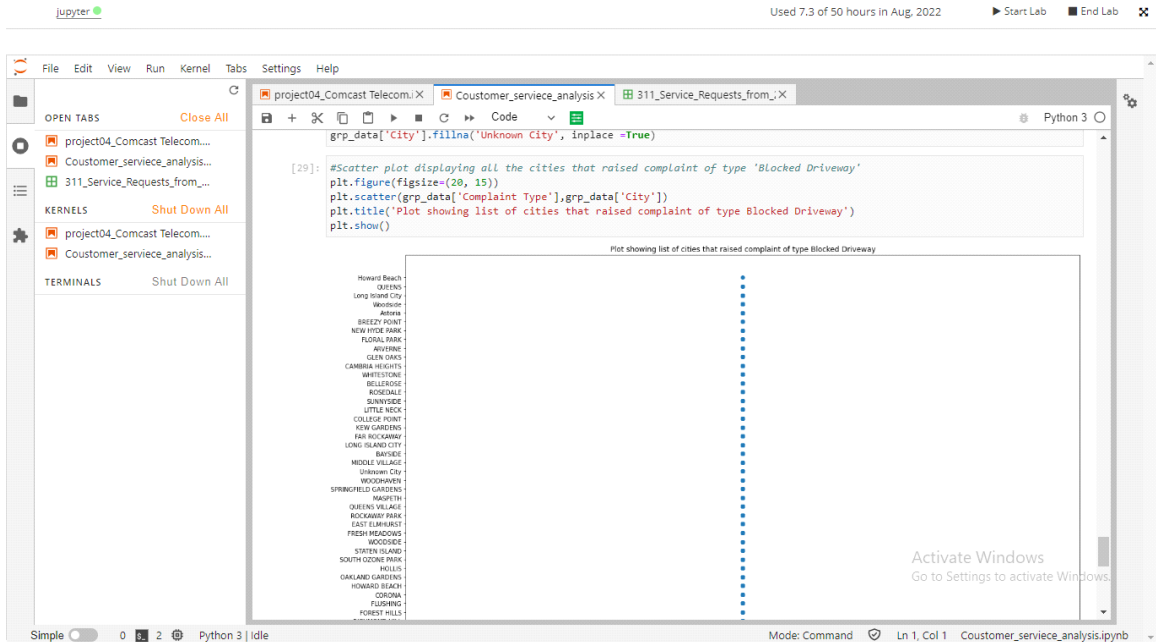
[29]: #Scatter plot displaying all the cities that raised complaint of type 'Blocked Driveway'
plt.figure(figsize=(20, 15))
plt.scatter(grp_data['Complaint Type'], grp_data['City'])
plt.title('Plot showing list of cities that raised complaint of type Blocked Driveway')
plt.show()
```

Plot showing list of cities that raised complaint of type Blocked Driveway

Howard Beach
QUEENS
Long Island City
Woodsburgh
Astoria
BREEZY POINT
NEW HYDE PARK
FLORAL PARK
MUYBOND
GLEN OAKS
CAMBRIDGE HEIGHTS
WHITESTONE
BELLEROSSE
ROSEDALE
SUNNYVALE
LITTLE NECK

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OPEN TABS Close All

project04_Comcast Telecom...
Customer_service_analysis...
311_Service_Requests_from...

KERNELS Shut Down All

project04_Comcast Telecom...
Customer_service_analysis...

TERMINALS Shut Down All

```
364556      NaN      NaN      NaN
364557      NaN      NaN      NaN

Garage Lot Name Ferry Direction Ferry Terminal Name Latitude \
0      NaN      NaN      NaN      NaN 40.865682
1      NaN      NaN      NaN      NaN 40.775945
2      NaN      NaN      NaN      NaN 40.870325
3      NaN      NaN      NaN      NaN 40.835994
4      NaN      NaN      NaN      NaN 40.733060
...
364553      NaN      NaN      NaN      NaN 40.695145
364554      NaN      NaN      NaN      NaN 40.867830
364555      NaN      NaN      NaN      NaN 40.821647
364556      NaN      NaN      NaN      NaN 40.886361
364557      NaN      NaN      NaN      NaN 40.674212

...
Longitude      Location
0 -73.923501 (40.86568153633767, -73.92350099571744)
1 -73.915094 (40.775945312321085, -73.9150993898605)
2 -73.888525 (40.870324522111424, -73.88852464418646)
3 -73.828379 (40.83599404683083, -73.82837939584206)
4 -73.874170 (40.733059618956815, -73.87416975810375)
...
364553 -73.860949 (40.69514470265117, -73.86094888534394)
364554 -73.907178 (40.86782963689454, -73.90717786644662)
364555 -73.950873 (40.821646626438095, -73.95087342885292)
364556 -73.853290 (40.88636077906953, -73.85329048666742)
364557 -73.803585 (40.674211762243935, -73.80358548685278)

[364558 rows x 53 columns]>

[7]: Customer_service[Customer_service.isnull().count()]

[7]: Unique Key      0
```

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Go to Settings to activate Windows.

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File Edit View Run Kernel Tabs Settings Help

project04_Comcast Telecom... X Customer_service_analysis X 311_Service_Requests_from... X

OPEN TABS Close All

project04_Comcast Telecom...
Customer_service_analysis...
311_Service_Requests_from...

KERNELS Shut Down All

project04_Comcast Telecom...
Customer_service_analysis...

TERMINALS Shut Down All

```
364556      NaN      NaN      NaN
364557      NaN      NaN      NaN

Garage Lot Name Ferry Direction Ferry Terminal Name Latitude \
0      NaN      NaN      NaN      NaN 40.865682
1      NaN      NaN      NaN      NaN 40.775945
2      NaN      NaN      NaN      NaN 40.870325
3      NaN      NaN      NaN      NaN 40.835994
4      NaN      NaN      NaN      NaN 40.733060
...
...
364553      NaN      NaN      NaN      NaN 40.695145
364554      NaN      NaN      NaN      NaN 40.867830
364555      NaN      NaN      NaN      NaN 40.821647
364556      NaN      NaN      NaN      NaN 40.886361
364557      NaN      NaN      NaN      NaN 40.674212

...
...
...
...
...
364553 -73.860949 (40.69514470265117, -73.86094888534394)
364554 -73.907178 (40.86782963689454, -73.90717786644662)
364555 -73.950873 (40.821646626438095, -73.95087342885292)
364556 -73.853290 (40.88636077906953, -73.85329048666742)
364557 -73.803585 (40.674211762243935, -73.80358548685278)

[364558 rows x 53 columns]>

[7]: Customer_service[Customer_service.isnull().count()]

[7]: Unique Key      0
```

Activate Windows
Go to Settings to activate Windows.

Simple 0 2 Python 3 | Idle Mode: Command Ln 4, Col 22 Customer_service_analysis.ipynb