Comcast Telecom Consumer Complaints .


```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

Task 1: Import data into Python environment

```
comcast_tele_consumer=pd.read_csv('/content/1568699544_comcast_telecom_complaints_data.zip
```

```
comcast_tele_consumer.head()
```

	Ticket #	Customer Complaint	Date	Date_month_year	Time	Received Via	City	State
0	250635	Comcast Cable Internet Speeds	22-04-15	22-Apr-15	3:53:50 PM	Customer Care Call	Abingdon	Maryland
1	223441	Payment disappear - service got disconnected	04-08-15	04-Aug-15	10:22:56 AM	Internet	Acworth	Georgia
2	242732	Speed and Service	18-04-15	18-Apr-15	9:55:47 AM	Internet	Acworth	Georgia
3	277946	Comcast Imposed a New Usage Cap of 300GB that	05-07-15	05-Jul-15	11:59:35 AM	Internet	Acworth	Georgia
4	307175	no service to	05-	26-May-15	PM	Internet	Acworth	Georgia

Step 1: Check the duplicate columns or Variables with duplicate names and delete such columns

```
comcast_tele_consumer.shape
```

```
(2224, 11)
```

```
comcast_tele_consumer.columns
```

```
Index(['Ticket #', 'Customer Complaint', 'Date', 'Date_month_year', 'Time',
       'Received Via', 'City', 'State', 'Zip code', 'Status',
       'Filing on Behalf of Someone', 'Date_Full', 'Day of Month',
       'New_Status'],
      dtype='object')
```

Hence no duplicate names found we will go to step 2

```
# Step 2: Check for 0 columns or single value
comcast_tele_consumer.describe()
```

	Zip code
count	2224.000000
mean	47994.393435
std	28885.279427
min	1075.000000
25%	30056.500000
75%	77058.750000

No Zero Columns or single Value Found, so we proceed to step 3

```
# Step 3: Missing value Treatment
comcast_tele_consumer.isnull().sum().sort_values(ascending=False)
```

```
Ticket #                      0
Customer Complaint            0
Date                          0
Date_month_year               0
Time                          0
Received Via                  0
City                          0
State                         0
Zip code                      0
Status                        0
Filing on Behalf of Someone   0
dtype: int64
```

No Missing value found so we proceed to step

Task 2: Provide the trend chart for the number of complaints at monthly and daily granularity levels.

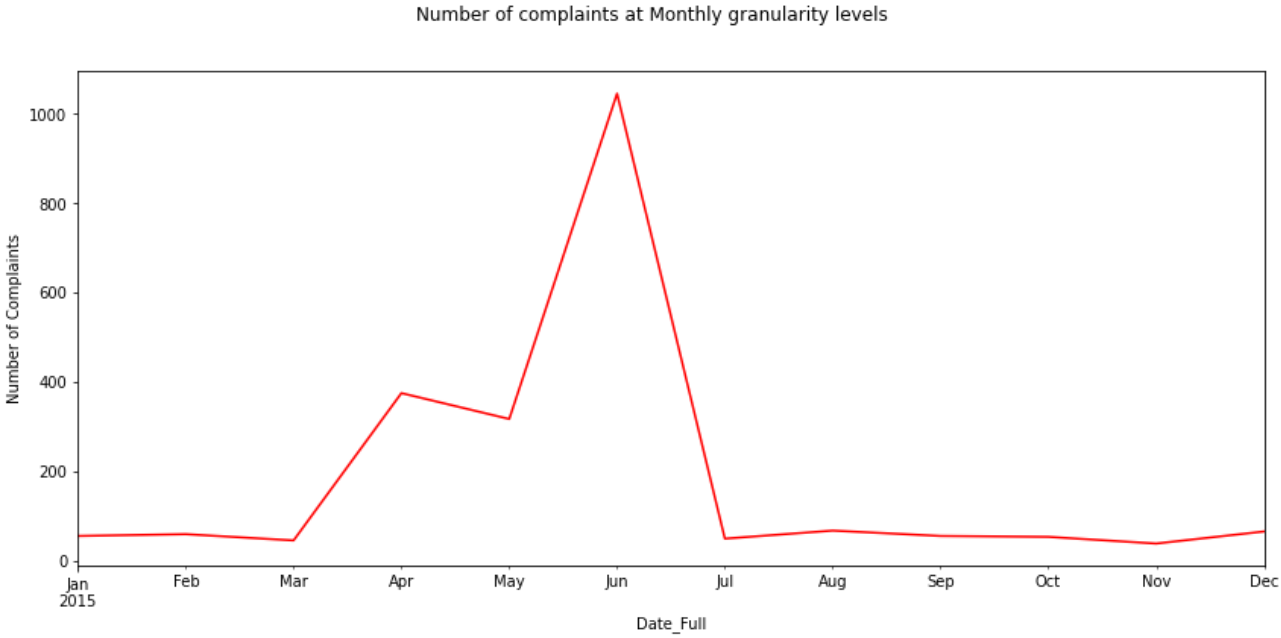
```
comcast_tele_consumer.dtypes
```

```
Ticket #                      object
Customer Complaint            object
Date                          object
Date_month_year               object
Time                          object
Received Via                  object
City                          object
State                         object
Zip code                       int64
Status                        object
Filing on Behalf of Someone   object
dtype: object
```

```
# Add Date Month year with Time and save it into Date_Full
```

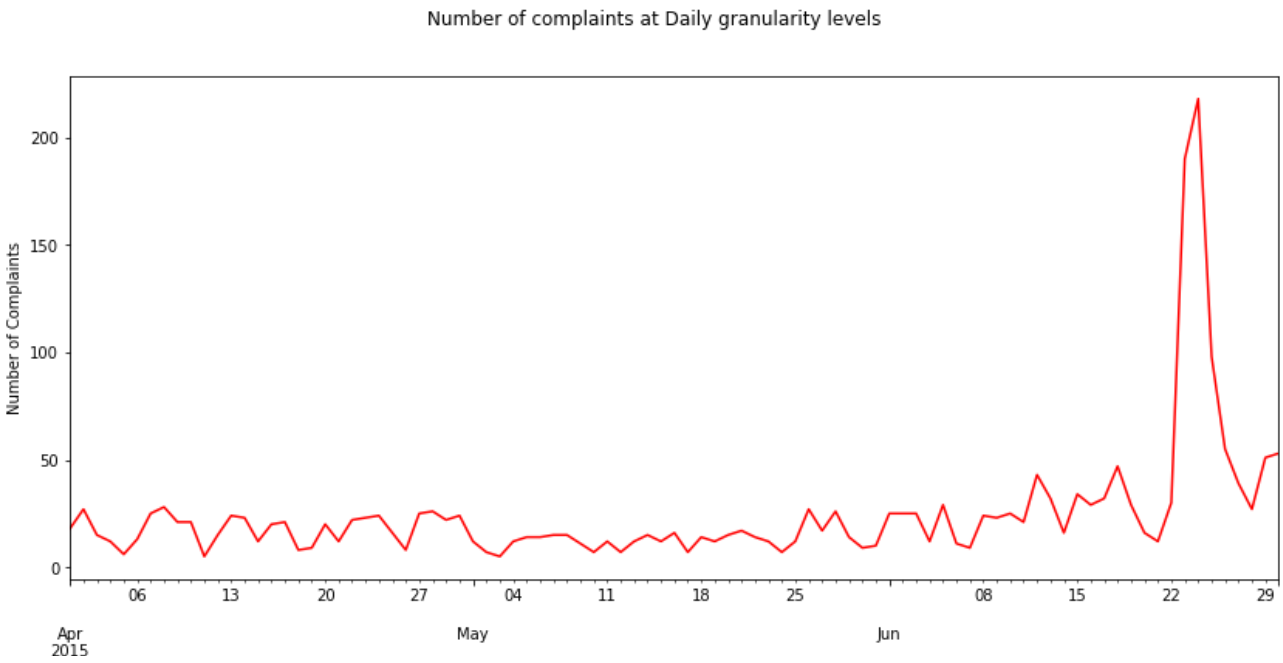
```
comcast_tele_consumer["Date_Full"] = comcast_tele_consumer["Date_month_year"] + ' ' +  com


#Convert Date_Full and Date_month_year to Datetime Format
comcast_tele_consumer["Date_Full"] = pd.to_datetime(comcast_tele_consumer["Date_Full"])
comcast_tele_consumer["Date_month_year"] = pd.to_datetime(comcast_tele_consumer["Date_mont
comcast_tele_consumer_monthly = comcast_tele_consumer.set_index(comcast_tele_consumer["Dat


# Provide the trend chart for the number of complaints at monthly granularity levels.
#Increase Graph Size
plt.figure(figsize=(14,6))
plt.suptitle('Number of complaints at Monthly granularity levels')
plt.ylabel('Number of Complaints')
comcast_tele_consumer_monthly.groupby(pd.Grouper(freq="M")).size().plot(color='red')
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f970e2d0850>
```




```
# Provide the trend chart for the number of complaints at daily granularity levels.
comcast_tele_consumer['Day of Month'] = pd.to_datetime(comcast_tele_consumer['Date'])
comcast_tele_consumer_daily = comcast_tele_consumer.set_index(comcast_tele_consumer["Day c
#Increase Graph Size
plt.figure(figsize=(14,6))
plt.suptitle('Number of complaints at Daily granularity levels')
plt.ylabel('Number of Complaints')
comcast_tele_consumer_daily.groupby(pd.Grouper(freq="D")).size().plot(color='red')
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f970e2d0a10>
```



Task 3: Provide a table with the frequency of complaint types.

```
# To get the frequency of complaint types first we have to see all complaint types and che
# Incomplete data so that we can make analytics better
comcast_tele_consumer_complaint_type = comcast_tele_consumer["Customer Complaint"].value_c
```

```
comcast_tele_consumer_complaint_type.head(10)
```

```
Comcast                    83
Comcast Internet           18
Comcast Data Cap           17
comcast                    13
Comcast Billing            11
Data Caps                  11
Comcast Data Caps          11
Unfair Billing Practices    9
Comcast data cap            8
Comcast internet            8
Name: Customer Complaint, dtype: int64
```

```
# Better to convert all data into uper case or sentence case so duplicate value will short
comcast_tele_consumer_complaint_type=comcast_tele_consumer["Customer Complaint"].str.upper
```

```
# Data is huge so we have showed only top 25 Complaint Types. We can show clearly in this
# COMCAST INTERNET are the Highest top 3 complaint types
comcast_tele_consumer_complaint_type.head(25)
```

```
COMCAST                          102
COMCAST DATA CAP                  30
COMCAST INTERNET                  29
COMCAST DATA CAPS                 21
COMCAST BILLING                   18
COMCAST SERVICE                   15
INTERNET SPEED                    15
```

```
UNFAIR BILLING PRACTICES             13
DATA CAPS                            13
DATA CAP                             12
COMCAST COMPLAINT                    11
COMCAST/XFINITY                      11
COMCAST INTERNET SERVICE             10
BILLING                               9
BILLING ISSUES                        8
COMCAST CABLE                         5
INTERNET                              5
COMCAST BILLING COMPLAINT             5
COMCAST ISSUES                        5
COMCAST BILLING PRACTICES             5
SERVICE ISSUES                        5
SLOW INTERNET                         5
INTERNET SERVICE                      5
COMPLAINT AGAINST COMCAST             5
COMCAST UNFAIR BILLING PRACTICES      4
Name: Customer Complaint, dtype: int64
```

Task 4: Create a new categorical variable with value as Open and Closed. Open & Pending is to be categorized as Open and Closed & Solved is to be categorized as Closed.

```
# Check how many unique values are under Status Column
comcast_tele_consumer['Status'].unique()
```

```
array(['Closed', 'Open', 'Solved', 'Pending'], dtype=object)
```

```
# Convert as per Instruction (Task 4) into New Column without changing the main data so th
# in Future
comcast_tele_consumer['New_Status']= ["Open" if Status=="Open" or Status=="Pending" else
                                      "Closed" for Status in comcast_tele_consumer["Status
```

```
# Check whether all status updated or not
comcast_tele_consumer['New_Status'].unique()
```

```
array(['Closed', 'Open'], dtype=object)
```

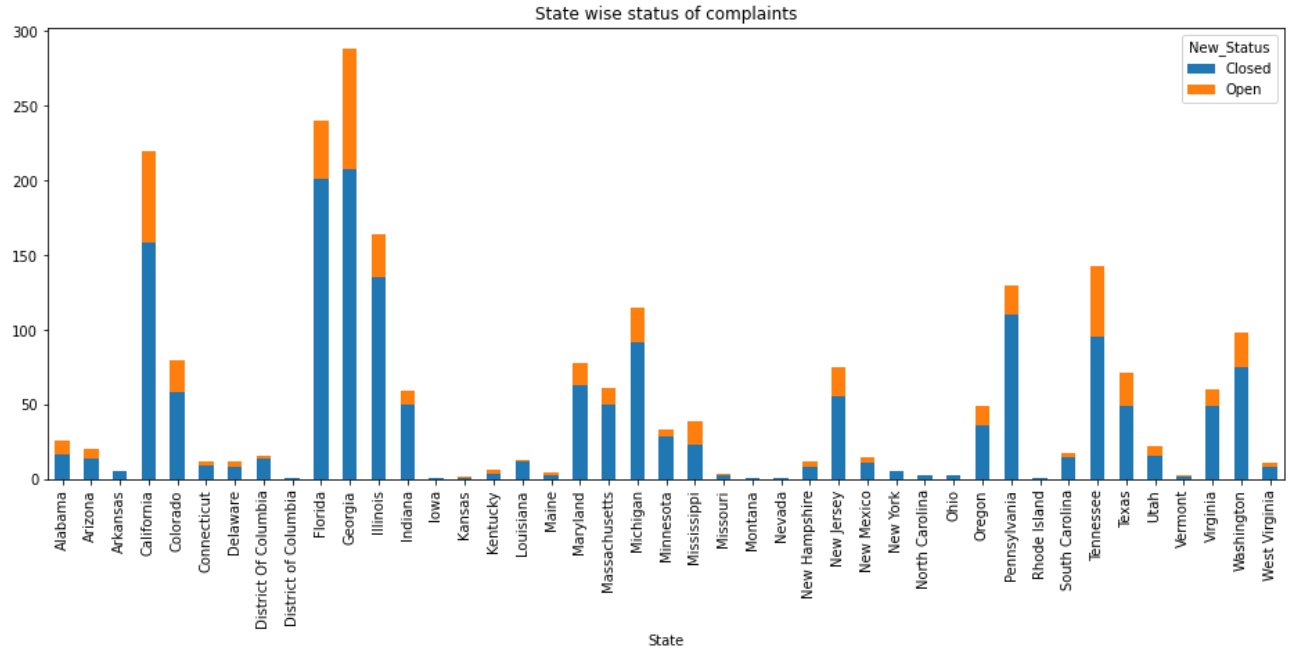
```
comcast_tele_consumer_status_by_state = pd.crosstab(comcast_tele_consumer.State,comcast_te
comcast_tele_consumer_status_by_state
```

New_Status	Closed	Open
State		
Alabama	17	9
Arizona	14	6
Arkansas	6	0
California	159	61
Colorado	58	22
Connecticut	9	3
Delaware	8	4
District Of Columbia	14	2
District of Columbia	1	0
Florida	201	39
Georgia	208	80
Illinois	135	29
Indiana	50	9
Iowa	1	0
Kansas	1	1
Kentucky	4	3
Louisiana	12	1
Maine	3	2
Maryland	63	15
Massachusetts	50	11
Michigan	92	23
Minnesota	29	4
Mississippi	23	16
Missouri	3	1
Montana	1	0
Nevada	1	0
New Hampshire	8	4
New Jersey	56	19
New Mexico	11	4
New York	6	0
North Carolina	3	0
Ohio	3	0

Ohio	3	0
Oregon	36	13
Pennsylvania	110	20
Rhode Island	1	0
South Carolina	15	3
Tennessee	96	47

```
pd.crosstab(comcast_tele_consumer.State,comcast_tele_consumer.New_Status).plot(kind='bar',
                                                                               stacked=True,
                                                                               title='State wise status of complair
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f970db49f90>
```



Which state has the maximum complaints?

- Georgia has maximum number of complaints

Task 5: Which state has the highest percentage of unresolved complaints

```
comcast_tele_consumer_unresolved_complaints = comcast_tele_consumer[comcast_tele_consumer[
```

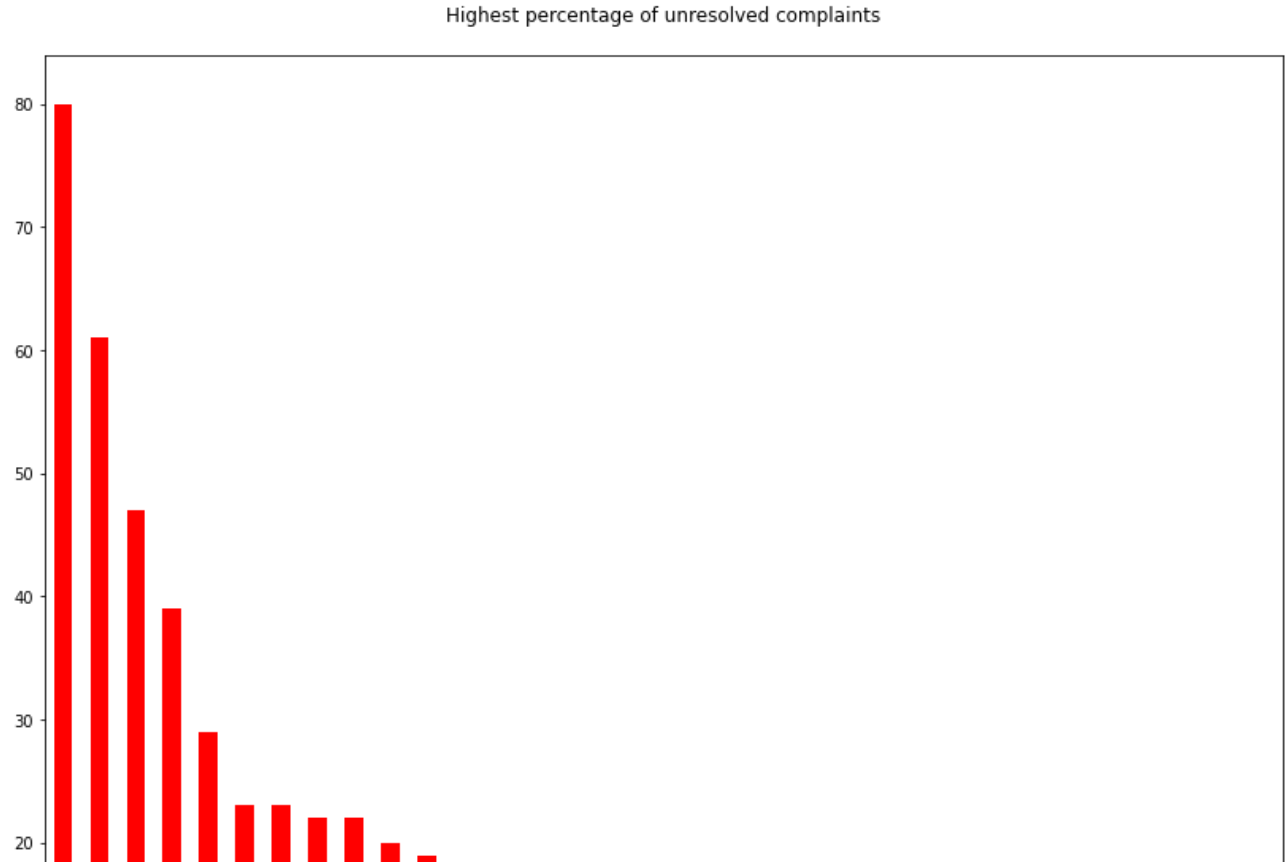
```
comcast_tele_consumer_unresolved_complaint_count = comcast_tele_consumer_unresolved_compla
comcast_tele_consumer_unresolved_complaint_count
```

```
Georgia                80
California             61
Tennessee              47
Florida                39
```

```
Illinois               29
Michigan               23
Washington             23
Texas                  22
Colorado               22
Pennsylvania           20
New Jersey             19
Mississippi            16
Maryland               15
Oregon                 13
Massachusetts          11
Virginia               11
Indiana                 9
Alabama                 9
Arizona                 6
Utah                    6
New Hampshire           4
Delaware                4
Minnesota               4
New Mexico              4
Connecticut             3
West Virginia           3
South Carolina          3
Kentucky                3
Maine                   2
District Of Columbia    2
Missouri                1
Vermont                 1
Kansas                  1
Louisiana               1
Name: State, dtype: int64
```

```
# Georgia has the Highest Number of unresolved complaints
# Show this by Bar Graph
comcast_tele_consumer_unresolved_complaint_count.plot(kind='bar',figsize=(14,12),color="re
plt.title('Highest percentage of unresolved complaints\n')
```

```
Text(0.5, 1.0, 'Highest percentage of unresolved complaints\n')
```



Task 6: Provide the percentage of complaints resolved till date, which were received through the Internet and customer care calls.

```
# Check unique values in Received Via Column
comcast_tele_consumer['Received Via'].unique()
```

```
array(['Customer Care Call', 'Internet'], dtype=object)
```

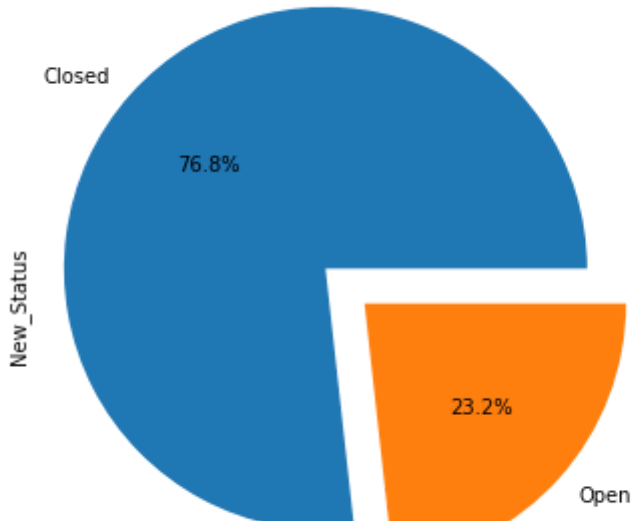
So there are only two values in that columns so no need to short we can directly proceed to task 6

```
comcast_tele_consumer.New_Status.value_counts()
```

```
Closed    1707
Open       517
Name: New_Status, dtype: int64
```

```
# Used autopct='%1.1f%%'  to show percentage under the pie chart
myexplode = [0.2, 0]
plt.title('Complaints Status through the Internet & Customer Care Calls\n')
comcast_tele_consumer.New_Status.value_counts().plot(kind='pie',explode = myexplode,autopc
                        figsize = (14,6))
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f970cc9ef10>
```



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