Comcast Telecom Consumer Complaints

Importing libraries

In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

In [2]:
```
df=pd.read_csv('C:\\Users\\lenovo\\Desktop\\Comcast_telecom_complaints_data.csv')
```

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

Out[3]:

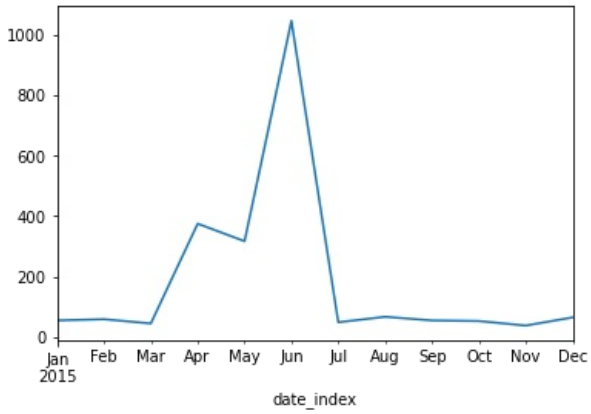
	Ticket #	Customer Complaint	Date	Date_month_year	Time	Received Via	City	State	Zip code	Status	Filing on Behalf of Someone
0	250635	Comcast Cable Internet Speeds	22-04-15	22-Apr-15	3:53:50 PM	Customer Care Call	Abingdon	Maryland	21009	Closed	No
1	223441	Payment disappear - service got disconnected	04-08-15	04-Aug-15	10:22:56 AM	Internet	Acworth	Georgia	30102	Closed	No
2	242732	Speed and Service	18-04-15	18-Apr-15	9:55:47 AM	Internet	Acworth	Georgia	30101	Closed	Yes
3	277946	Comcast Imposed a New Usage Cap of 300GB that ...	05-07-15	05-Jul-15	11:59:35 AM	Internet	Acworth	Georgia	30101	Open	Yes
4	307175	Comcast not working and no service to boot	26-05-15	26-May-15	1:25:26 PM	Internet	Acworth	Georgia	30101	Solved	No

Trend chart for the number of complaints at monthly granularity levels

In [4]:
```
df["date_index"] = df["Date_month_year"] + " " + df["Time"]
df["date_index"] = pd.to_datetime(df["date_index"])
df["Date_month_year"] = pd.to_datetime(df["Date_month_year"])
df = df.set_index(df["date_index"])
```

In [5]:
```
df.groupby(pd.Grouper(freq="M")).size().plot()
```

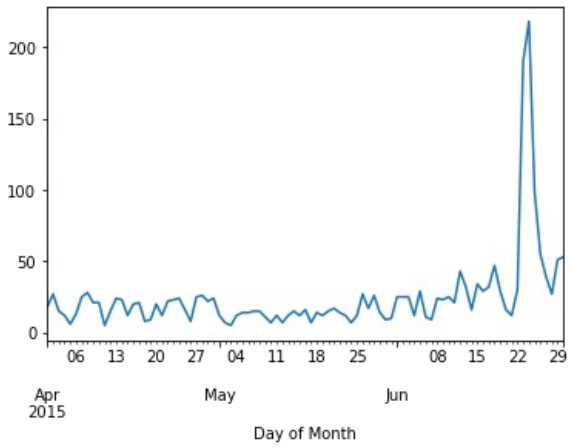
Out[5]:
```
<AxesSubplot:xlabel='date_index'>
```



Trend chart for the number of complaints at daily granularity levels

In [6]:
```
df['Day of Month'] = pd.to_datetime(df["Date"])
df = df.set_index(df["Day of Month"])
df.groupby(pd.Grouper(freq="D")).size().plot()
```

Out[6]: <AxesSubplot:xlabel='Day of Month'>



Provide a table with the frequency of complaint types

In [7]:
```
df_type = df["Customer Complaint"].value_counts()
```

In [8]:
```
df_type.head(25)
```

Out[8]:
```
Comcast                    83
Comcast Internet           18
Comcast Data Cap           17
comcast                    13
Comcast Data Caps          11
Data Caps                  11
Comcast Billing            11
Unfair Billing Practices    9
Internet speed              8
Data Cap                    8
Comcast/Xfinity             8
Comcast internet            8
Comcast data cap            8
Comcast data caps           8
Comcast service             6
Comcast billing             6
Comcast Service             6
COMCAST                     6
Billing                     6
Comcast Internet Service    5
Comcast Complaint           5
Comcast complaint           5
Internet Speed              5
availabilty                 4
Slow Internet               4
Name: Customer Complaint, dtype: int64
```

In [9]:
```
df_type = df['Customer Complaint'].str.upper().value_counts()
```

In [10]:
```
df_type.head(25)
```

Out[10]:
```
COMCAST                     102
COMCAST DATA CAP             30
COMCAST INTERNET             29
COMCAST DATA CAPS            21
COMCAST BILLING              18
INTERNET SPEED               15
COMCAST SERVICE              15
DATA CAPS                    13
UNFAIR BILLING PRACTICES     13
DATA CAP                     12
COMCAST/XFINITY              11
COMCAST COMPLAINT            11
COMCAST INTERNET SERVICE     10
BILLING                       9
BILLING ISSUES                8
```

```
COMCAST BILLING COMPLAINT      5
INTERNET SERVICE               5
COMCAST CABLE                  5
COMCAST BILLING PRACTICES      5
INTERNET                       5
SLOW INTERNET                  5
COMCAST ISSUES                 5
COMPLAINT AGAINST COMCAST      5
SERVICE ISSUES                 5
SLOW INTERNET SPEEDS           4
Name: Customer Complaint, dtype: int64
```

Create a new categorical variable with value as Open and Closed.

In [11]:
```
df["newStatus"] = ["Open" if Status=="Open" or Status=="Pending" else "Closed" for Status in df["Status"]]
```

In [12]:
```
df_status = df.groupby('State').newStatus.value_counts().unstack()
```

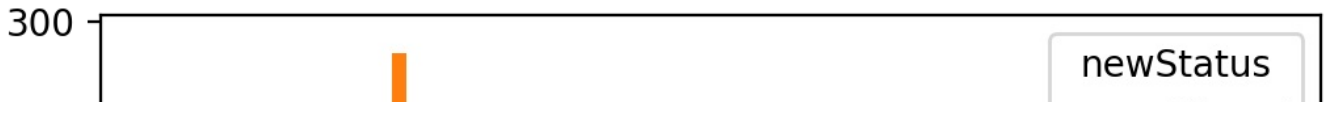
In [13]:
```
df_status.head(25)
```

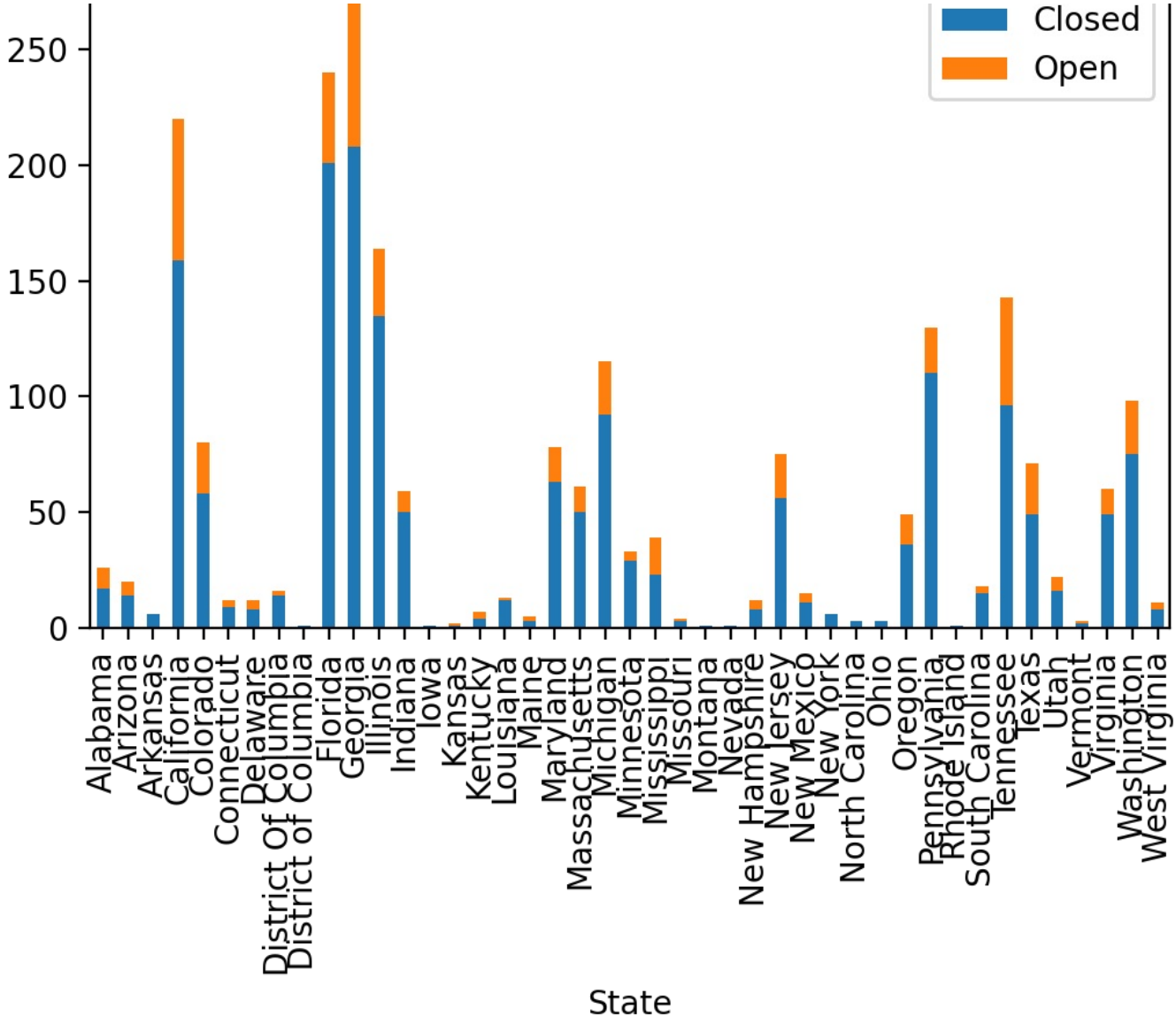
Out[13]:

newStatus	Closed	Open
State		
Alabama	17.0	9.0
Arizona	14.0	6.0
Arkansas	6.0	NaN
California	159.0	61.0
Colorado	58.0	22.0
Connecticut	9.0	3.0
Delaware	8.0	4.0
District Of Columbia	14.0	2.0
District of Columbia	1.0	NaN
Florida	201.0	39.0
Georgia	208.0	80.0
Illinois	135.0	29.0
Indiana	50.0	9.0
Iowa	1.0	NaN
Kansas	1.0	1.0
Kentucky	4.0	3.0
Louisiana	12.0	1.0
Maine	3.0	2.0
Maryland	63.0	15.0
Massachusetts	50.0	11.0
Michigan	92.0	23.0
Minnesota	29.0	4.0
Mississippi	23.0	16.0
Missouri	3.0	1.0
Montana	1.0	NaN

In [14]:
```
plt.figure(figsize=(200,100))
plt.rcParams['figure.dpi'] = 200
df_status.plot(kind='bar', stacked=True)
```

Out[14]:
```
<AxesSubplot:xlabel='State'>
<Figure size 14400x7200 with 0 Axes>
```





Georgia has maximum number of complaints

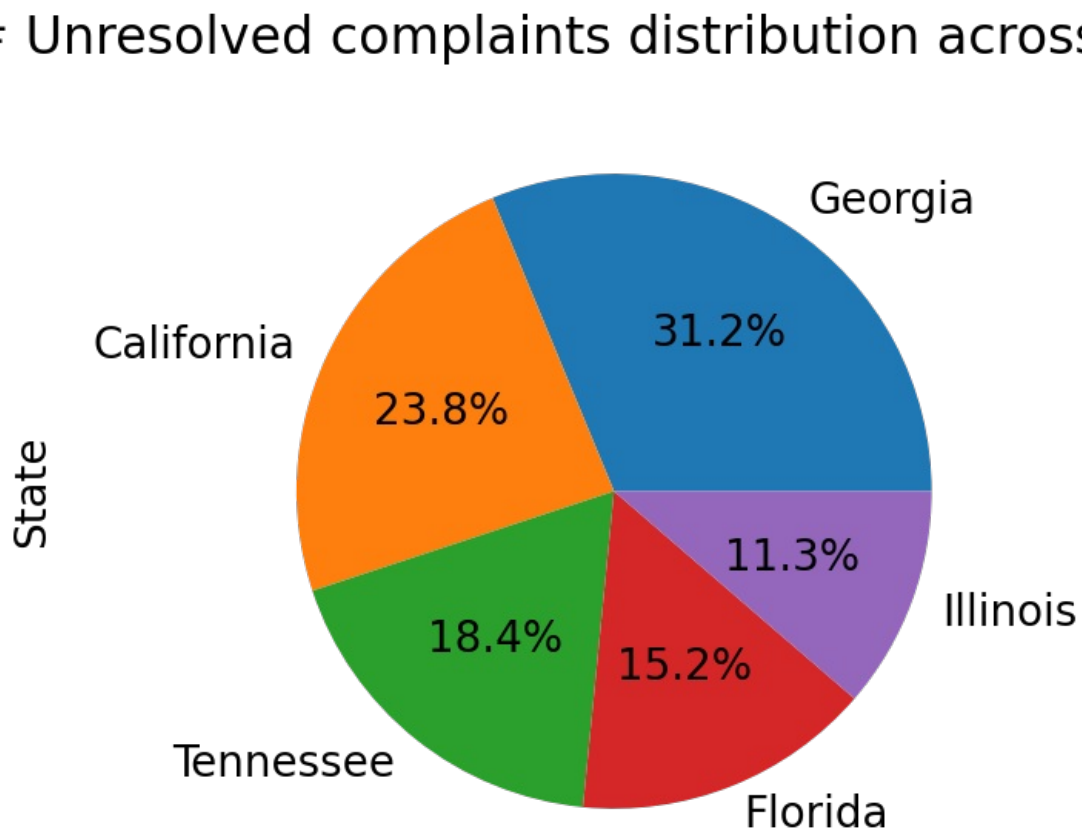
In [16]:
```
df_unresolved = df[df['newStatus']=='Open']
colors = ['#639ace','#ca6b39','#7f67ca','#5ba85f','#c360aa','#a7993f','#cc566a']
df_unresolved = df_unresolved['State'].value_counts()
df_unresolved.head(25)
```

Out[16]:
```
Georgia           80
California        61
Tennessee         47
Florida           39
Illinois          29
Washington        23
Michigan          23
Texas             22
Colorado          22
Pennsylvania      20
New Jersey        19
Mississippi       16
Maryland          15
Oregon            13
Virginia          11
Massachusetts     11
Alabama            9
Indiana            9
Arizona            6
Utah               6
Minnesota          4
New Hampshire      4
New Mexico         4
```

```
Delaware          4
West Virginia     3
Name: State, dtype: int64
```

In [17]:

```
df_unresolved.head().plot(kind='pie',autopct='%1.1f%%',
                          #explode = (0.15, 0, 0, 0, 0), startangle=45, shadow=False, colors = colors,
                          figsize = (4,3))
plt.axis('equal')
plt.title('# Unresolved complaints distribution across State\n')
plt.tight_layout()
plt.show()
```



Georgia has maximum percentage of unresolved complaints

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

In [18]:

```
df_received = df[df['Received Via'].isin(['Internet','Customer Care Call'])]
```

In [19]:

```
df_received.head()
```

Out[19]:

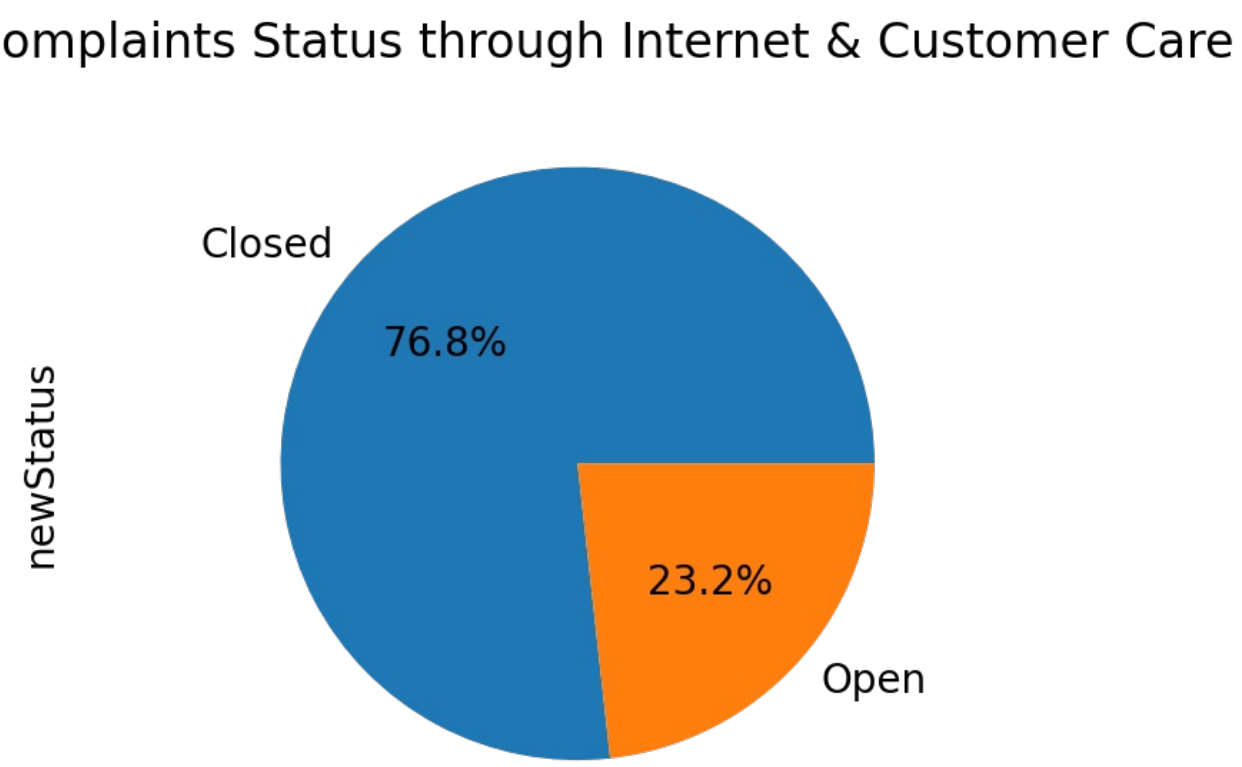
	Ticket #	Customer Complaint	Date	Date_month_year	Time	Received Via	City	State	Zip code	Status	Filing on Behalf of Someone	date_index	Day of Month	new	Day of Month
2015-04-22	250635	Comcast Cable Internet Speeds	22-04-15	2015-04-22	3:53:50 PM	Customer Care Call	Abingdon	Maryland	21009	Closed	No	2015-04-22 15:53:50	2015-04-22		
2015-04-08	223441	Payment disappear - service got disconnected	04-08-15	2015-08-04	10:22:56 AM	Internet	Acworth	Georgia	30102	Closed	No	2015-08-04 10:22:56	2015-04-08		
2015-	242732	Speed and	18-04-	2015-04-18	9:55:47	Internet	Acworth	Georgia	30101	Closed	Yes	2015-04-18	2015-		

04-18		Service	15		AM							09:55:47	04-18
2015-05-07	277946	Comcast Imposed a New Usage Cap of 300GB that ...	05-07-15	2015-07-05	11:59:35 AM	Internet	Acworth	Georgia	30101	Open	Yes	2015-07-05 11:59:35	2015-05-07
2015-05-26	307175	Comcast not working and no service to boot	26-05-15	2015-05-26	1:25:26 PM	Internet	Acworth	Georgia	30101	Solved	No	2015-05-26 13:25:26	2015-05-26

In [20]:
```
df_received.newStatus.value_counts()
```

Out[20]:
```
Closed    1707
Open       517
Name: newStatus, dtype: int64
```

In [21]:
```
df_received.newStatus.value_counts().plot(kind='pie',autopct='%1.1f%%',
                        #explode = (0.15, 0, 0, 0, 0), startangle=45, shadow=False, colors = colors,
                        figsize = (4,3))
plt.axis('equal')
plt.title('# complaints Status through Internet & Customer Care\n')
plt.tight_layout()
plt.show()
```



In [22]:
```
df_received_closed = df_received[df_received['newStatus']=='Closed']
```

In [23]:
```
df_received_closed.newStatus.value_counts()
```

Out[23]:
```
Closed    1707
Name: newStatus, dtype: int64
```

In [ ]:
```

```