In [2]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

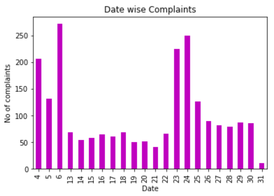
In [3]:
```
# Import data into Python environment.
telecom_train_df = pd.read_csv('Comcast_telecom_complaints_data.csv')
telecom_train_df.head()
```

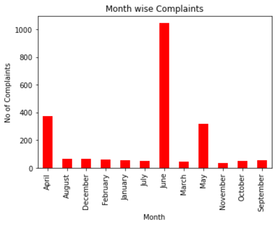
Out[3]:

	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

In [14]:
```
# Provide the trend chart for the number of complaints at monthly and daily granularity levels
telecom_train_df['Month'] = pd.to_datetime(telecom_train_df['Date_month_year']).dt.month_name()
telecom_train_df['Day'] = pd.to_datetime(telecom_train_df['Date_month_year']).dt.day
```

In [5]:
```
telecom_train_df.groupby('Day')['Customer Complaint'].count().plot(kind='bar', color='m')
plt.xlabel('Date')
plt.ylabel('No of complaints')
plt.title('Date wise Complaints')
plt.show()
telecom_train_df.groupby('Month')['Customer Complaint'].count().plot(kind='bar', color= 'r')
plt.xlabel('Month')
plt.ylabel('No of Complaints')
plt.title('Month wise Complaints')
plt.show()
```





In [6]:
```
# - Provide a table with the frequency of complaint types.
telecom_train_df['Customer Complaint'].str.lower().value_counts().to_frame().reset_index()
```

Out[6]:

	index	Customer Complaint
0	comcast	102
1	comcast data cap	30
2	comcast internet	29
3	comcast data caps	21
4	comcast billing	18
...	...	...
1735	consistent speed/connectivity with internet	1
1736	comcast fraud?	1
1737	questionable internet slowdown	1
1738	comcast (xfinity) internet service	1
1739	comcast bill and service disclosure	1

1740 rows × 2 columns

In [7]:
```
# Which complaint types are maximum i.e., around internet, network issues, or across any other domains.

telecom_train_df['Customer Complaint'].str.lower().value_counts().head(1).to_frame()
```

Out[7]:

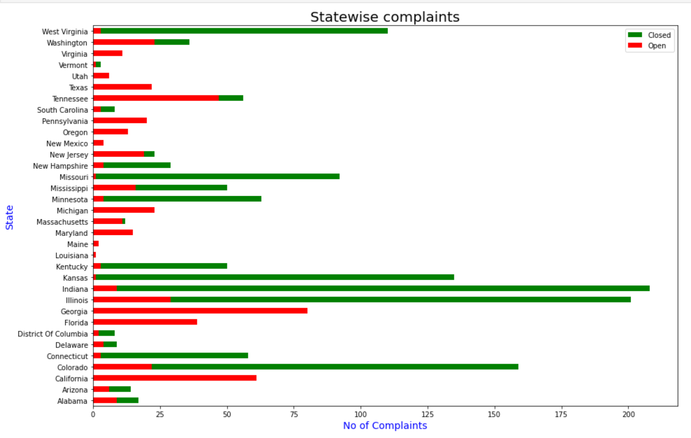
	Customer Complaint
comcast	102

In [8]:
```
# 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

telecom_train_df['New_status'] = telecom_train_df['Status'].apply(lambda x:
                                                                  'Open' if ((x=='Open')|(x=='Pending')) else 'Closed')
telecom_train_df.head()
```

Out[8]:

	Ticket #	Customer Complaint	Date	Date_month_year	Time	Received Via	City	State	Zip code	Status	Filing on Behalf of Someone	Month	Day	New_status
0	250635	Comcast Cable Internet Speeds	22-04-15	22-Apr-15	3:53:50 PM	Customer Care Call	Abingdon	Maryland	21009	Closed	No	April	22	Closed
1	223441	Payment disappear - service got disconnected	04-08-15	04-Aug-15	10:22:56 AM	Internet	Acworth	Georgia	30102	Closed	No	August	4	Closed
2	242732	Speed and Service	18-04-15	18-Apr-15	9:55:47 AM	Internet	Acworth	Georgia	30101	Closed	Yes	April	18	Closed
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	July	5	Open
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	May	26	Closed

In [10]:
```
# Provide state wise status of complaints in a stacked bar chart. Use the categorized variable from Q3. Provide insights on:
plt.figure(figsize=(15,10))
telecom_train_df[telecom_train_df['New_status']=='Closed'].groupby('State')['New_status'].count().plot(kind = 'barh', color='green')
telecom_train_df[telecom_train_df['New_status']=='Open'].groupby('State')['New_status'].count().plot(kind = 'barh', color='red')

plt.ylabel('State',size = 14,color='blue')
plt.xlabel('No of Complaints',size = 14,color='blue')
plt.title('Statewise complaints',size = 20)
plt.legend(['Closed','Open'])
plt.show()
```



In [15]:
```
# Which state has the maximum complaints
print("The Maximum no of complaints in the state: \n" , telecom_train_df['State'].str.title().value_counts().head(1))
```

```
The Maximum no of complaints in the state:
 Georgia    288
Name: State, dtype: int64
```

In [12]:
```
# Which state has the highest percentage of unresolved complaints

print("The highest percentage of unresolved complaints: \n" ,
      telecom_train_df[telecom_train_df['New_status']=='Open']['State'].str.title().value_counts(normalize=True).head(1))
```

```
The highest percentage of unresolved complaints:
 Georgia    0.154739
Name: State, dtype: float64
```

In [13]:
```
# Provide the percentage of complaints resolved till date, which were received through the Internet and customer care calls.

print('The percentage of complaints resolved till date:\n',
      telecom_train_df[telecom_train_df['New_status']=='Closed']['Received Via'].value_counts(normalize=True))
```

```
The percentage of complaints resolved till date:
 Customer Care Call    0.506151
Internet               0.493849
Name: Received Via, dtype: float64
```