import libraries

In [10]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import plotly.offline as py
from plotly import tools
py.init_notebook_mode(connected=True)
import plotly.graph_objs as go
import seaborn as sns
%matplotlib inline
```

import datasets

In [11]:

```
comp = pd.read_csv('H:\\Level 4 Information Systems\\Plastikat\\Plastikat Data\\new data CSV\\companies-data.csv')
dele = pd.read_csv('H:\\Level 4 Information Systems\\Plastikat\\Plastikat Data\\new data CSV\\delegates-data.csv')
items = pd.read_csv("H:\\Level 4 Information Systems\\Plastikat\\Plastikat Data\\new data CSV\\items.csv")
off = pd.read_csv("H:\\Level 4 Information Systems\\Plastikat\\Plastikat Data\\new data CSV\\offers-data.csv")

comp.head()
```

Out[11]:

	_id	district	governorate	name	number_of_delegates	number_of_offers	plastic_quantity	status
0	658831322585495430201	Hasna	North Sinai	Walker Inc	18	0	0	IN_APPROVAL
1	787724556714630537834	Maadi	Cairo	Schmitt - Jacobi	11	17	113	SUSPENDED
2	230941608708513477807	Daraw	Aswan	Klocko, Heaney and Swift	1	25	86	APPROVED
3	942049446566310900173	El Zohour	Port Said	Lehner, Lehner and Walsh	7	43	275	SUSPENDED
4	115739777917852395553	Tanta	Gharbia	Bailey - McLaughlin	9	17	99	APPROVED

Data Preprocessing

In [12]:

```
#dimensions of the data
comp.shape
#Taking an overview of data
comp.sample(10)
#Let's check if there are any missing values in our dataset
comp.isnull().sum()
#check if their is duplication in the data
print(comp.duplicated().sum())
#Let's take a more analytical look at our dataset
comp.describe()
```

0

Out[12]:

	number_of_delegates	number_of_offers	plastic_quantity
count	400.000000	400.000000	400.000000
mean	10.460000	14.995000	83.772500
std	5.870653	14.012525	80.128942
min	1.000000	0.000000	0.000000
25%	5.000000	0.000000	0.000000
50%	11.000000	14.000000	81.500000
75%	15.250000	23.000000	127.000000
max	20.000000	61.000000	360.000000

insights from company table

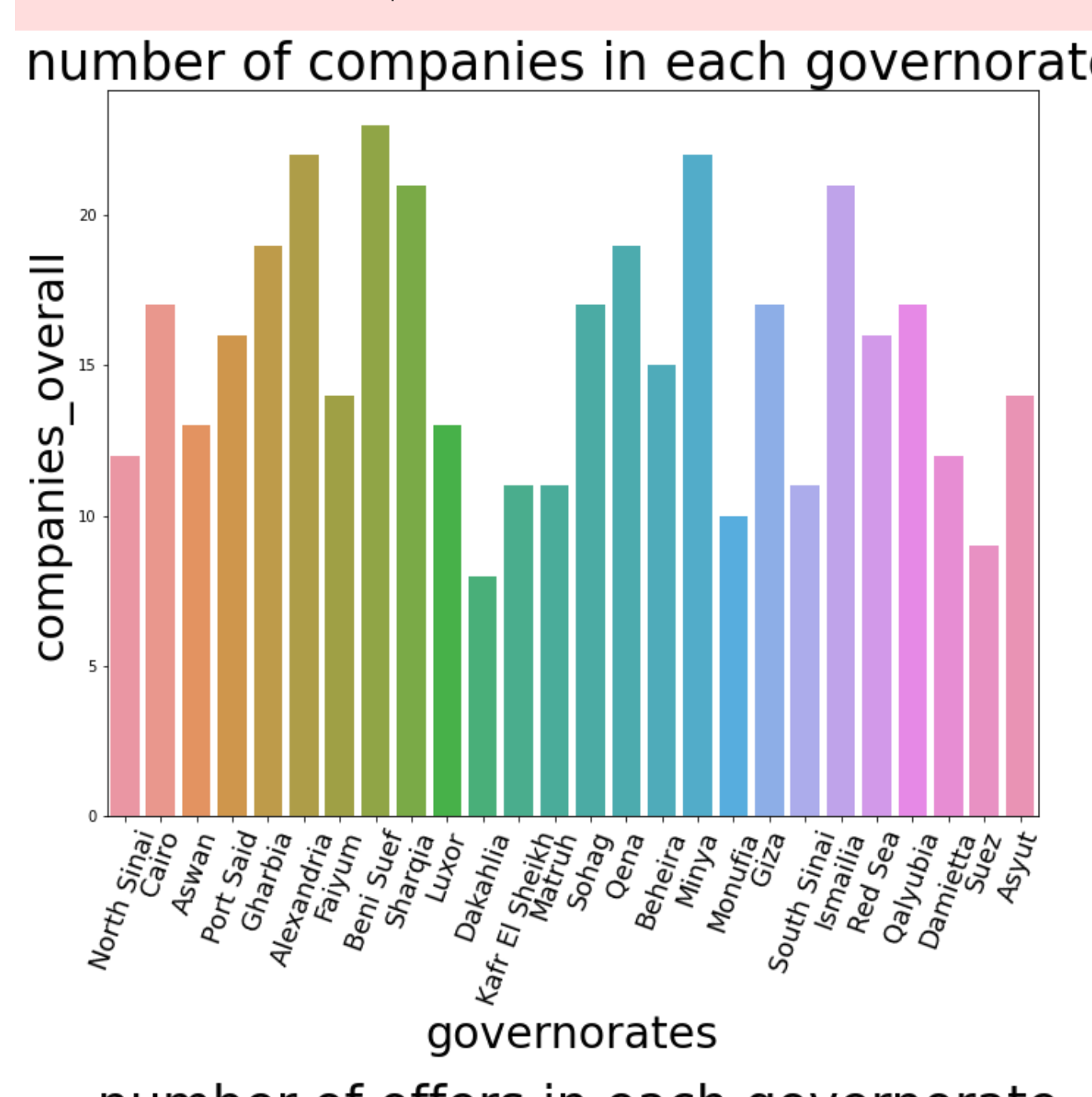
In [16]:

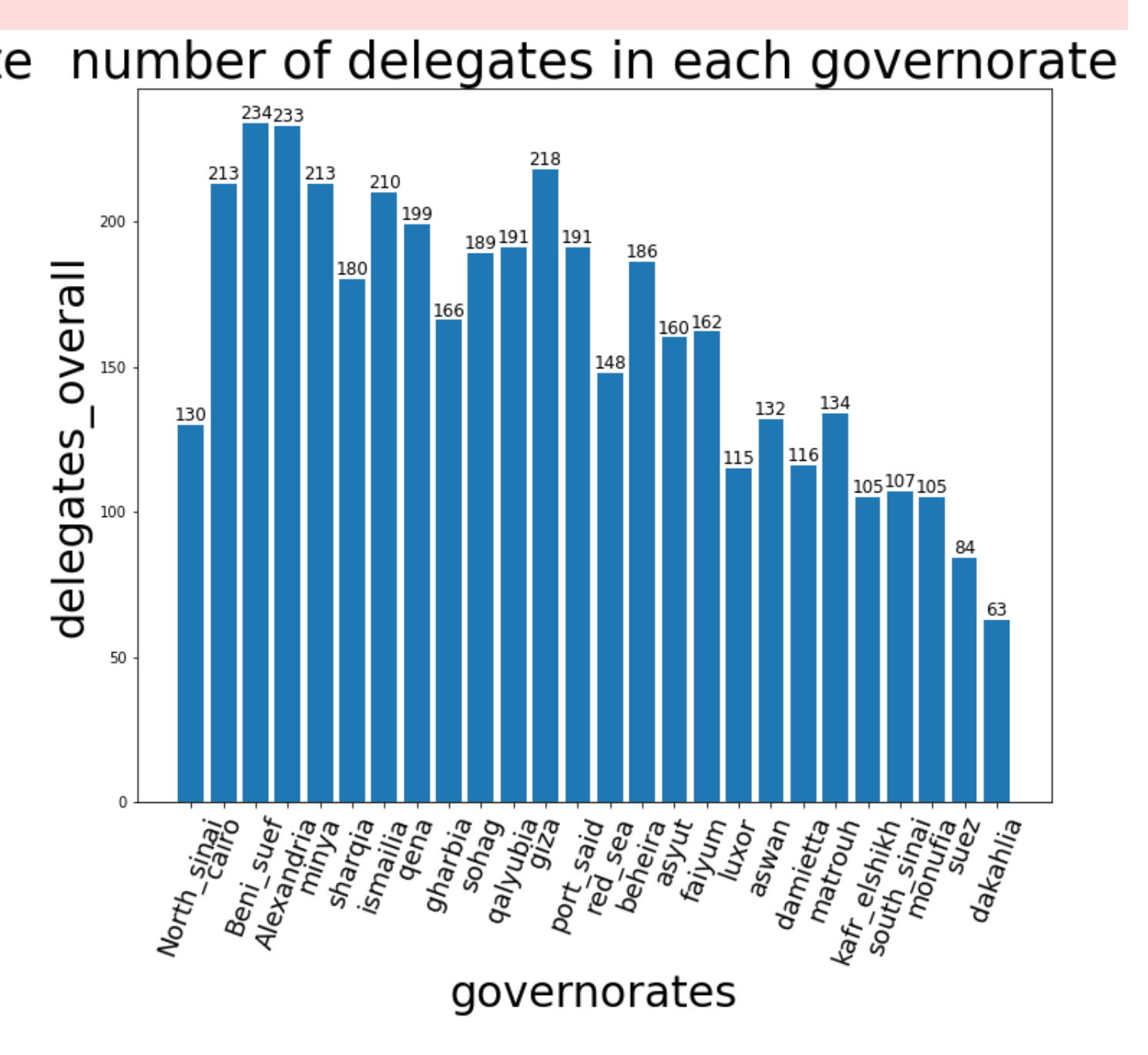
```
#extract the number of delegates for each governorate
North_sinai_delegates = sum(comp.loc[comp['governorate'] == 'North Sinai','number_of_delegates'])
cairo_delegates  = sum(comp.loc[comp['governorate'] == 'Cairo','number_of_delegates'])
Beni_suef_delegates = sum(comp.loc[comp['governorate'] == 'Beni Suef','number_of_delegates'])
Alexandria_delegates = sum(comp.loc[comp['governorate'] == 'Alexandria','number_of_delegates'])
minya_delegates  = sum(comp.loc[comp['governorate'] == 'Minya','number_of_delegates'])
sharqia_delegates  = sum(comp.loc[comp['governorate'] == 'Sharqia','number_of_delegates'])
ismailia_delegates  = sum(comp.loc[comp['governorate'] == 'Ismailia','number_of_delegates'])
qena_delegates  = sum(comp.loc[comp['governorate'] == 'Qena','number_of_delegates'])
gharbia_delegates  = sum(comp.loc[comp['governorate'] == 'Gharbia','number_of_delegates'])
sohag_delegates  = sum(comp.loc[comp['governorate'] == 'Sohag','number_of_delegates'])
qalyubia_delegates  = sum(comp.loc[comp['governorate'] == 'Qalyubia','number_of_delegates'])
giza_delegates  = sum(comp.loc[comp['governorate'] == 'Giza','number_of_delegates'])
port_said_delegates  = sum(comp.loc[comp['governorate'] == 'Port Said','number_of_delegates'])
red_sea_delegates  = sum(comp.loc[comp['governorate'] == 'Red Sea','number_of_delegates'])
beheira_delegates  = sum(comp.loc[comp['governorate'] == 'Beheira','number_of_delegates'])
asyut_delegates  = sum(comp.loc[comp['governorate'] == 'Asyut','number_of_delegates'])
faiyum_delegates  = sum(comp.loc[comp['governorate'] == 'Faiyum','number_of_delegates'])
luxor_delegates  = sum(comp.loc[comp['governorate'] == 'Luxor','number_of_delegates'])
aswan_delegates  = sum(comp.loc[comp['governorate'] == 'Aswan','number_of_delegates'])
damietta_delegates  = sum(comp.loc[comp['governorate'] == 'Damietta','number_of_delegates'])
matrouh_delegates  = sum(comp.loc[comp['governorate'] == 'Matruh','number_of_delegates'])
kafr_elshikh_delegates  = sum(comp.loc[comp['governorate'] == 'Kafr El Sheikh','number_of_delegates'])
south_sinai_delegates  = sum(comp.loc[comp['governorate'] == 'South Sinai','number_of_delegates'])
monufia_delegates  = sum(comp.loc[comp['governorate'] == 'Monufia','number_of_delegates'])
suez_delegates  = sum(comp.loc[comp['governorate'] == 'Suez','number_of_delegates'])
dakahlia_delegates  = sum(comp.loc[comp['governorate'] == 'Dakahlia','number_of_delegates'])

#extract the number of offers for each governorate
North_sinai_offers = sum(comp.loc[comp['governorate'] == 'North Sinai','number_of_offers'])
cairo_offers  = sum(comp.loc[comp['governorate'] == 'Cairo','number_of_offers'])
Beni_suef_offers = sum(comp.loc[comp['governorate'] == 'Beni Suef','number_of_offers'])
Alexandria_offers = sum(comp.loc[comp['governorate'] == 'Alexandria','number_of_offers'])
minya_offers  = sum(comp.loc[comp['governorate'] == 'Minya','number_of_offers'])
sharqia_offers  = sum(comp.loc[comp['governorate'] == 'Sharqia','number_of_offers'])
ismailia_offers  = sum(comp.loc[comp['governorate'] == 'Ismailia','number_of_offers'])
qena_offers  = sum(comp.loc[comp['governorate'] == 'Qena','number_of_offers'])
gharbia_offers  = sum(comp.loc[comp['governorate'] == 'Gharbia','number_of_offers'])
sohag_offers  = sum(comp.loc[comp['governorate'] == 'Sohag','number_of_offers'])
qalyubia_offers  = sum(comp.loc[comp['governorate'] == 'Qalyubia','number_of_offers'])
giza_offers  = sum(comp.loc[comp['governorate'] == 'Giza','number_of_offers'])
port_said_offers  = sum(comp.loc[comp['governorate'] == 'Port Said','number_of_offers'])
red_sea_offers  = sum(comp.loc[comp['governorate'] == 'Red Sea','number_of_offers'])
beheira_offers  = sum(comp.loc[comp['governorate'] == 'Beheira','number_of_offers'])
asyut_offers  = sum(comp.loc[comp['governorate'] == 'Asyut','number_of_offers'])
faiyum_offers  = sum(comp.loc[comp['governorate'] == 'Faiyum','number_of_offers'])
luxor_offers  = sum(comp.loc[comp['governorate'] == 'Luxor','number_of_offers'])
aswan_offers  = sum(comp.loc[comp['governorate'] == 'Aswan','number_of_offers'])
damietta_offers  = sum(comp.loc[comp['governorate'] == 'Damietta','number_of_offers'])
matrouh_offers  = sum(comp.loc[comp['governorate'] == 'Matruh','number_of_offers'])
kafr_elshikh_offers  = sum(comp.loc[comp['governorate'] == 'Kafr El Sheikh','number_of_offers'])
south_sinai_offers  = sum(comp.loc[comp['governorate'] == 'South Sinai','number_of_offers'])
monufia_offers  = sum(comp.loc[comp['governorate'] == 'Monufia','number_of_offers'])
suez_offers  = sum(comp.loc[comp['governorate'] == 'Suez','number_of_offers'])
dakahlia_offers  = sum(comp.loc[comp['governorate'] == 'Dakahlia','number_of_offers'])


#extract the plastics quantity for each governorate
North_sinai_plastic = sum(comp.loc[comp['governorate'] == 'North Sinai','plastic_quantity'])
cairo_plastic  = sum(comp.loc[comp['governorate'] == 'Cairo','plastic_quantity'])
Beni_suef_plastic = sum(comp.loc[comp['governorate'] == 'Beni Suef','plastic_quantity'])
Alexandria_plastic = sum(comp.loc[comp['governorate'] == 'Alexandria','plastic_quantity'])
minya_plastic  = sum(comp.loc[comp['governorate'] == 'Minya','plastic_quantity'])
sharqia_plastic  = sum(comp.loc[comp['governorate'] == 'Sharqia','plastic_quantity'])
ismailia_plastic  = sum(comp.loc[comp['governorate'] == 'Ismailia','plastic_quantity'])
qena_plastic  = sum(comp.loc[comp['governorate'] == 'Qena','plastic_quantity'])
gharbia_plastic  = sum(comp.loc[comp['governorate'] == 'Gharbia','plastic_quantity'])
sohag_plastic  = sum(comp.loc[comp['governorate'] == 'Sohag','plastic_quantity'])
qalyubia_plastic  = sum(comp.loc[comp['governorate'] == 'Qalyubia','plastic_quantity'])
giza_plastic  = sum(comp.loc[comp['governorate'] == 'Giza','plastic_quantity'])
port_said_plastic  = sum(comp.loc[comp['governorate'] == 'Port Said','plastic_quantity'])
red_sea_plastic  = sum(comp.loc[comp['governorate'] == 'Red Sea','plastic_quantity'])
beheira_plastic  = sum(comp.loc[comp['governorate'] == 'Beheira','plastic_quantity'])
asyut_plastic  = sum(comp.loc[comp['governorate'] == 'Asyut','plastic_quantity'])
faiyum_plastic  = sum(comp.loc[comp['governorate'] == 'Faiyum','plastic_quantity'])
luxor_plastic  = sum(comp.loc[comp['governorate'] == 'Luxor','plastic_quantity'])
aswan_plastic  = sum(comp.loc[comp['governorate'] == 'Aswan','plastic_quantity'])
damietta_plastic  = sum(comp.loc[comp['governorate'] == 'Damietta','plastic_quantity'])
matrouh_plastic  = sum(comp.loc[comp['governorate'] == 'Matruh','plastic_quantity'])
kafr_elshikh_plastic  = sum(comp.loc[comp['governorate'] == 'Kafr El Sheikh','plastic_quantity'])
south_sinai_plastic  = sum(comp.loc[comp['governorate'] == 'South Sinai','plastic_quantity'])
monufia_plastic  = sum(comp.loc[comp['governorate'] == 'Monufia','plastic_quantity'])
suez_plastic  = sum(comp.loc[comp['governorate'] == 'Suez','plastic_quantity'])
dakahlia_plastic  = sum(comp.loc[comp['governorate'] == 'Dakahlia','plastic_quantity'])

#North_sinai_satutes = comp.loc[comp['governorate'] == 'North Sinai','status'])
North_Sinai_IN_APPROVAL = comp.query('governorate == "North Sinai" and status=="IN_APPROVAL"').shape[0]
North_Sinai_APPROVED = comp.query('governorate == "North Sinai" and status=="APPROVED"').shape[0]
North_Sinai_SUSPENDED = comp.query('governorate == "North Sinai" and status=="SUSPENDED"').shape[0]

Cairo_IN_APPROVAL = comp.query('governorate == "Cairo" and status=="IN_APPROVAL"').shape[0]
Cairo_APPROVED = comp.query('governorate == "Cairo" and status=="APPROVED"').shape[0]
Cairo_SUSPENDED = comp.query('governorate == "Cairo" and status=="SUSPENDED"').shape[0]

Beni_Suef_IN_APPROVAL = comp.query('governorate == "Beni Suef" and status=="IN_APPROVAL"').shape[0]
Beni_Suef_APPROVED = comp.query('governorate == "Beni Suef" and status=="APPROVED"').shape[0]
Beni_Suef_SUSPENDED = comp.query('governorate == "Beni Suef" and status=="SUSPENDED"').shape[0]

Alexandria_IN_APPROVAL = comp.query('governorate == "Alexandria" and status=="IN_APPROVAL"').shape[0]
Alexandria_APPROVED = comp.query('governorate == "Alexandria" and status=="APPROVED"').shape[0]
Alexandria_SUSPENDED = comp.query('governorate == "Alexandria" and status=="SUSPENDED"').shape[0]

Minya_IN_APPROVAL = comp.query('governorate == "Minya" and status=="IN_APPROVAL"').shape[0]
Minya_APPROVED = comp.query('governorate == "Minya" and status=="APPROVED"').shape[0]
Minya_SUSPENDED = comp.query('governorate == "Minya" and status=="SUSPENDED"').shape[0]

Sharqia_IN_APPROVAL = comp.query('governorate == "Sharqia" and status=="IN_APPROVAL"').shape[0]
Sharqia_APPROVED = comp.query('governorate == "Sharqia" and status=="APPROVED"').shape[0]
Sharqia_SUSPENDED = comp.query('governorate == "Sharqia" and status=="SUSPENDED"').shape[0]

Ismailia_IN_APPROVAL = comp.query('governorate == "Ismailia" and status=="IN_APPROVAL"').shape[0]
Ismailia_APPROVED = comp.query('governorate == "Ismailia" and status=="APPROVED"').shape[0]
Ismailia_SUSPENDED = comp.query('governorate == "Ismailia" and status=="SUSPENDED"').shape[0]

Qena_IN_APPROVAL = comp.query('governorate == "Qena" and status=="IN_APPROVAL"').shape[0]
Qena_APPROVED = comp.query('governorate == "Qena" and status=="APPROVED"').shape[0]
Qena_SUSPENDED = comp.query('governorate == "Qena" and status=="SUSPENDED"').shape[0]

Gharbia_IN_APPROVAL = comp.query('governorate == "Gharbia" and status=="IN_APPROVAL"').shape[0]
Gharbia_APPROVED = comp.query('governorate == "Gharbia" and status=="APPROVED"').shape[0]
Gharbia_SUSPENDED = comp.query('governorate == "Gharbia" and status=="SUSPENDED"').shape[0]

Sohag_IN_APPROVAL = comp.query('governorate == "Sohag" and status=="IN_APPROVAL"').shape[0]
Sohag_APPROVED = comp.query('governorate == "Sohag" and status=="APPROVED"').shape[0]
Sohag_SUSPENDED = comp.query('governorate == "Sohag" and status=="SUSPENDED"').shape[0]

Qalyubia_IN_APPROVAL = comp.query('governorate == "Qalyubia" and status=="IN_APPROVAL"').shape[0]
Qalyubia_APPROVED = comp.query('governorate == "Qalyubia" and status=="APPROVED"').shape[0]
Qalyubia_SUSPENDED = comp.query('governorate == "Qalyubia" and status=="SUSPENDED"').shape[0]

Giza_IN_APPROVAL = comp.query('governorate == "Giza" and status=="IN_APPROVAL"').shape[0]
Giza_APPROVED = comp.query('governorate == "Giza" and status=="APPROVED"').shape[0]
Giza_SUSPENDED = comp.query('governorate == "Giza" and status=="SUSPENDED"').shape[0]

Port_Said_IN_APPROVAL = comp.query('governorate == "Port Said" and status=="IN_APPROVAL"').shape[0]
Port_Said_APPROVED = comp.query('governorate == "Port Said" and status=="APPROVED"').shape[0]
Port_Said_SUSPENDED = comp.query('governorate == "Port Said" and status=="SUSPENDED"').shape[0]

red_sea_IN_APPROVAL = comp.query('governorate == "Red Sea" and status=="IN_APPROVAL"').shape[0]
red_sea_APPROVED = comp.query('governorate == "Red Sea" and status=="APPROVED"').shape[0]
red_sea_SUSPENDED = comp.query('governorate == "Red Sea" and status=="SUSPENDED"').shape[0]

Beheira_IN_APPROVAL = comp.query('governorate == "Beheira" and status=="IN_APPROVAL"').shape[0]
Beheira_APPROVED = comp.query('governorate == "Beheira" and status=="APPROVED"').shape[0]
Beheira_SUSPENDED = comp.query('governorate == "Beheira" and status=="SUSPENDED"').shape[0]

Asyut_IN_APPROVAL = comp.query('governorate == "Asyut" and status=="IN_APPROVAL"').shape[0]
Asyut_APPROVED = comp.query('governorate == "Asyut" and status=="APPROVED"').shape[0]
Asyut_SUSPENDED = comp.query('governorate == "Asyut" and status=="SUSPENDED"').shape[0]

Faiyum_IN_APPROVAL = comp.query('governorate == "Faiyum" and status=="IN_APPROVAL"').shape[0]
Faiyum_APPROVED = comp.query('governorate == "Faiyum" and status=="APPROVED"').shape[0]
Faiyum_SUSPENDED = comp.query('governorate == "Faiyum" and status=="SUSPENDED"').shape[0]

Luxor_IN_APPROVAL = comp.query('governorate == "Luxor" and status=="IN_APPROVAL"').shape[0]
Luxor_APPROVED = comp.query('governorate == "Luxor" and status=="APPROVED"').shape[0]
Luxor_SUSPENDED = comp.query('governorate == "Luxor" and status=="SUSPENDED"').shape[0]

Aswan_IN_APPROVAL = comp.query('governorate == "Aswan" and status=="IN_APPROVAL"').shape[0]
Aswan_APPROVED = comp.query('governorate == "Aswan" and status=="APPROVED"').shape[0]
Aswan_SUSPENDED = comp.query('governorate == "Aswan" and status=="SUSPENDED"').shape[0]

Damietta_IN_APPROVAL = comp.query('governorate == "Damietta" and status=="IN_APPROVAL"').shape[0]
Damietta_APPROVED = comp.query('governorate == "Damietta" and status=="APPROVED"').shape[0]
Damietta_SUSPENDED = comp.query('governorate == "Damietta" and status=="SUSPENDED"').shape[0]

Matruh_IN_APPROVAL = comp.query('governorate == "Matruh" and status=="IN_APPROVAL"').shape[0]
Matruh_APPROVED = comp.query('governorate == "Matruh" and status=="APPROVED"').shape[0]
Matruh_SUSPENDED = comp.query('governorate == "Matruh" and status=="SUSPENDED"').shape[0]

Kafr_El_Sheikh_IN_APPROVAL = comp.query('governorate == "Kafr El Sheikh" and status=="IN_APPROVAL"').shape[0]
Kafr_El_Sheikh_APPROVED = comp.query('governorate == "Kafr El Sheikh" and status=="APPROVED"').shape[0]
Kafr_El_Sheikh_SUSPENDED = comp.query('governorate == "Kafr El Sheikh" and status=="SUSPENDED"').shape[0]

South_Sinai_IN_APPROVAL = comp.query('governorate == "South Sinai" and status=="IN_APPROVAL"').shape[0]
South_Sinai_APPROVED = comp.query('governorate == "South Sinai" and status=="APPROVED"').shape[0]
South_Sinai_SUSPENDED = comp.query('governorate == "South Sinai" and status=="SUSPENDED"').shape[0]

Monufia_IN_APPROVAL = comp.query('governorate == "Monufia" and status=="IN_APPROVAL"').shape[0]
Monufia_APPROVED = comp.query('governorate == "Monufia" and status=="APPROVED"').shape[0]
Monufia_SUSPENDED = comp.query('governorate == "Monufia" and status=="SUSPENDED"').shape[0]

Suez_IN_APPROVAL = comp.query('governorate == "Suez" and status=="IN_APPROVAL"').shape[0]
Suez_APPROVED = comp.query('governorate == "Suez" and status=="APPROVED"').shape[0]
Suez_SUSPENDED = comp.query('governorate == "Suez" and status=="SUSPENDED"').shape[0]

Dakahlia_IN_APPROVAL = comp.query('governorate == "Dakahlia" and status=="IN_APPROVAL"').shape[0]
Dakahlia_APPROVED = comp.query('governorate == "Dakahlia" and status=="APPROVED"').shape[0]
Dakahlia_SUSPENDED = comp.query('governorate == "Dakahlia" and status=="SUSPENDED"').shape[0]


governorates_IN_APPROVAL = [North_Sinai_IN_APPROVAL,Cairo_IN_APPROVAL,Beni_Suef_IN_APPROVAL,Alexandria_IN_APPROVAL,Minya_IN_APPROVAL,Sharqia_IN_APPROVAL,Ismailia_IN_APPROVAL,Qena_IN_APPROVAL,
Gharbia_IN_APPROVAL,Sohag_IN_APPROVAL,Qalyubia_IN_APPROVAL,Giza_IN_APPROVAL,Port_Said_IN_APPROVAL,red_sea_IN_APPROVAL,Beheira_IN_APPROVAL,
Asyut_IN_APPROVAL,Faiyum_IN_APPROVAL,Luxor_IN_APPROVAL,Aswan_IN_APPROVAL,Damietta_IN_APPROVAL,Matruh_IN_APPROVAL,
Kafr_El_Sheikh_IN_APPROVAL,South_Sinai_IN_APPROVAL,Monufia_IN_APPROVAL,Suez_IN_APPROVAL,Dakahlia_IN_APPROVAL]

governorates_APPROVED = [North_Sinai_APPROVED,Cairo_APPROVED,Beni_Suef_APPROVED,Alexandria_APPROVED,Minya_APPROVED,Sharqia_APPROVED,Ismailia_APPROVED,Qena_APPROVED,
Gharbia_APPROVED,Sohag_APPROVED,Qalyubia_APPROVED,Giza_APPROVED,Port_Said_APPROVED,red_sea_APPROVED,Beheira_APPROVED,
Asyut_APPROVED,Faiyum_APPROVED,Luxor_APPROVED,Aswan_APPROVED,Damietta_APPROVED,Matruh_APPROVED,
Kafr_El_Sheikh_APPROVED,South_Sinai_APPROVED,Monufia_APPROVED,Suez_APPROVED,Dakahlia_APPROVED]

governorates_SUSPENDED = [North_Sinai_SUSPENDED,Cairo_SUSPENDED,Beni_Suef_SUSPENDED,Alexandria_SUSPENDED,Minya_SUSPENDED,Sharqia_SUSPENDED,Ismailia_SUSPENDED,Qena_SUSPENDED,
Gharbia_SUSPENDED,Sohag_SUSPENDED,Qalyubia_SUSPENDED,Giza_SUSPENDED,Port_Said_SUSPENDED,red_sea_SUSPENDED,Beheira_SUSPENDED,
Asyut_SUSPENDED,Faiyum_SUSPENDED,Luxor_SUSPENDED,Aswan_SUSPENDED,Damietta_SUSPENDED,Matruh_SUSPENDED,
Kafr_El_Sheikh_SUSPENDED,South_Sinai_SUSPENDED,Monufia_SUSPENDED,Suez_SUSPENDED,Dakahlia_SUSPENDED]


governorates = ['North_sinai', 'cairo', 'Beni_suef', 'Alexandria', 'minya',
                'sharqia', 'ismailia', 'qena', 'gharbia', 'sohag',
                'qalyubia', 'giza', 'port_said', 'red_sea', 'beheira',
                 'asyut', 'faiyum', 'luxor', 'aswan', 'damietta',
                 'matrouh', 'kafr_elshikh', 'south_sinai', 'monufia', 'suez',
                 'dakahlia']


governorates_delegates = [North_sinai_delegates, cairo_delegates, Beni_suef_delegates, Alexandria_delegates, minya_delegates,
                sharqia_delegates, ismailia_delegates, qena_delegates, gharbia_delegates, sohag_delegates,
                qalyubia_delegates, giza_delegates, port_said_delegates, red_sea_delegates, beheira_delegates,
                 asyut_delegates, faiyum_delegates, luxor_delegates, aswan_delegates, damietta_delegates,
                 matrouh_delegates, kafr_elshikh_delegates, south_sinai_delegates, monufia_delegates, suez_delegates,
                 dakahlia_delegates]

governorates_offers = [North_sinai_offers, cairo_offers, Beni_suef_offers, Alexandria_offers, minya_offers,
                sharqia_offers, ismailia_offers, qena_offers, gharbia_offers, sohag_offers,
                qalyubia_offers, giza_offers, port_said_offers, red_sea_offers, beheira_offers,
                 asyut_offers, faiyum_offers, luxor_offers, aswan_offers, damietta_offers,
                 matrouh_offers, kafr_elshikh_offers, south_sinai_offers, monufia_offers, suez_offers,
                 dakahlia_offers]

governorates_plastics = [North_sinai_plastic, cairo_plastic, Beni_suef_plastic, Alexandria_plastic, minya_plastic,
                sharqia_plastic, ismailia_plastic, qena_plastic, gharbia_plastic, sohag_plastic,
                qalyubia_plastic, giza_plastic, port_said_plastic, red_sea_plastic, beheira_plastic,
                 asyut_plastic, faiyum_plastic, luxor_plastic, aswan_plastic, damietta_plastic,
                 matrouh_plastic, kafr_elshikh_plastic, south_sinai_plastic, monufia_plastic, suez_plastic,
                 dakahlia_plastic]
```

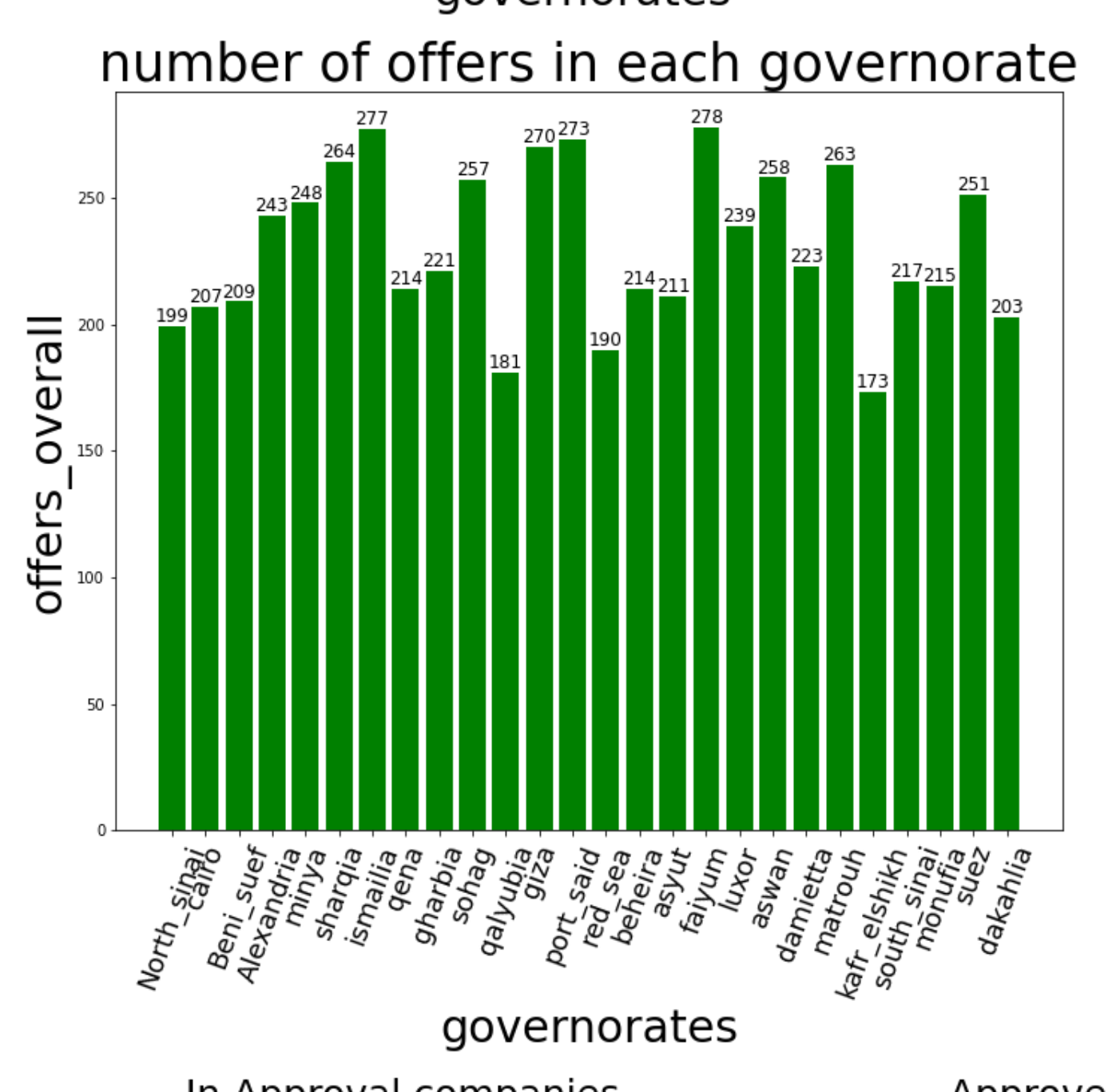
In [14]:

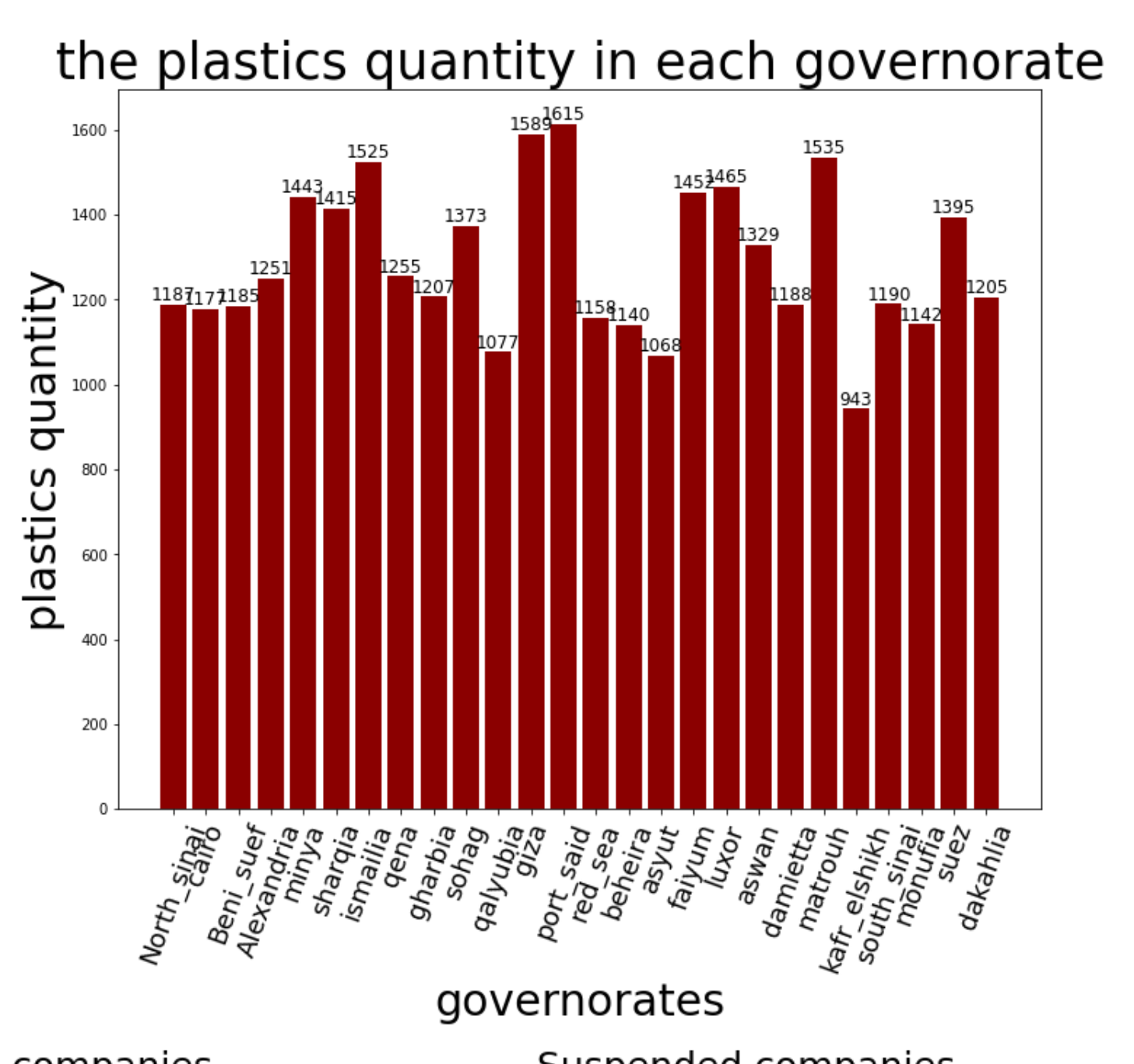
```
plt.figure(figsize = (25,20))
plt.subplot(2,2,1)
sns.countplot(comp["governorate"])
plt.xticks(size=18,rotation=70)
plt.xlabel("governorates",size=30)
plt.ylabel("companies_overall",size=30)
plt.title("number of companies in each governorate",size=35)


plt.subplot(2,2,2)
x=['North_sinai', 'cairo', 'Beni_suef', 'Alexandria', 'minya',
                'sharqia', 'ismailia', 'qena', 'gharbia', 'sohag',
                'qalyubia', 'giza', 'port_said', 'red_sea', 'beheira',
                 'asyut', 'faiyum', 'luxor', 'aswan', 'damietta',
                 'matrouh', 'kafr_elshikh', 'south_sinai', 'monufia', 'suez',
                 'dakahlia']

y=[North_sinai_delegates, cairo_delegates, Beni_suef_delegates, Alexandria_delegates, minya_delegates,
                sharqia_delegates, ismailia_delegates, qena_delegates, gharbia_delegates, sohag_delegates,
                qalyubia_delegates, giza_delegates, port_said_delegates, red_sea_delegates, beheira_delegates,
                 asyut_delegates, faiyum_delegates, luxor_delegates, aswan_delegates, damietta_delegates,
                 matrouh_delegates, kafr_elshikh_delegates, south_sinai_delegates, monufia_delegates, suez_delegates,
                 dakahlia_delegates]

plt.bar(x,y)
plt.xticks(size=18,rotation=70)
plt.xlabel("governorates",size=30)
plt.ylabel("delegates_overall",size=30)
plt.title("number of delegates in each governorate",size=35)
for i in range(len(x)):
    plt.text(i,y[i],y[i], ha="center", va="bottom",size=12)

plt.figure(figsize = (25,20))
plt.subplot(2,2,1)
x=['North_sinai', 'cairo', 'Beni_suef', 'Alexandria', 'minya',
                'sharqia', 'ismailia', 'qena', 'gharbia', 'sohag',
                'qalyubia', 'giza', 'port_said', 'red_sea', 'beheira',
                 'asyut', 'faiyum', 'luxor', 'aswan', 'damietta',
                 'matrouh', 'kafr_elshikh', 'south_sinai', 'monufia', 'suez',
                 'dakahlia']

y=[North_sinai_offers, cairo_offers, Beni_suef_offers, Alexandria_offers, minya_offers,
                sharqia_offers, ismailia_offers, qena_offers, gharbia_offers, sohag_offers,
                qalyubia_offers, giza_offers, port_said_offers, red_sea_offers, beheira_offers,
                 asyut_offers, faiyum_offers, luxor_offers, aswan_offers, damietta_offers,
                 matrouh_offers, kafr_elshikh_offers, south_sinai_offers, monufia_offers, suez_offers,
                 dakahlia_offers]

plt.bar(x,y,color="green")
plt.xticks(size=18,rotation=70)
plt.xlabel("governorates",size=30)
plt.ylabel("offers_overall",size=30)
plt.title("number of offers in each governorate",size=35)
for i in range(len(x)):
    plt.text(i,y[i],y[i], ha="center", va="bottom",size=12)

plt.subplot(2,2,2)
x=['North_sinai', 'cairo', 'Beni_suef', 'Alexandria', 'minya',
                'sharqia', 'ismailia', 'qena', 'gharbia', 'sohag',
                'qalyubia', 'giza', 'port_said', 'red_sea', 'beheira',
                 'asyut', 'faiyum', 'luxor', 'aswan', 'damietta',
                 'matrouh', 'kafr_elshikh', 'south_sinai', 'monufia', 'suez',
                 'dakahlia']

y=[North_sinai_plastic, cairo_plastic, Beni_suef_plastic, Alexandria_plastic, minya_plastic,
                sharqia_plastic, ismailia_plastic, qena_plastic, gharbia_plastic, sohag_plastic,
                qalyubia_plastic, giza_plastic, port_said_plastic, red_sea_plastic, beheira_plastic,
                 asyut_plastic, faiyum_plastic, luxor_plastic, aswan_plastic, damietta_plastic,
                 matrouh_plastic, kafr_elshikh_plastic, south_sinai_plastic, monufia_plastic, suez_plastic,
                 dakahlia_plastic]

plt.bar(x,y,color="darkred")
plt.xticks(size=18,rotation=70)
plt.xlabel("governorates",size=30)
plt.ylabel("plastics quantity",size=30)
plt.title("the plastics quantity in each governorate",size=35)
for i in range(len(x)):
    plt.text(i,y[i],y[i], ha="center", va="bottom",size=12)


plt.figure(figsize = (25,20))
plt.subplot(2,3,1)
x=['North_sinai', 'cairo', 'Beni_suef', 'Alexandria', 'minya',
                'sharqia', 'ismailia', 'qena', 'gharbia', 'sohag',
                'qalyubia', 'giza', 'port_said', 'red_sea', 'beheira',
                 'asyut', 'faiyum', 'luxor', 'aswan', 'damietta',
                 'matrouh', 'kafr_elshikh', 'south_sinai', 'monufia', 'suez',
                 'dakahlia']
y=[North_Sinai_IN_APPROVAL,Cairo_IN_APPROVAL,Beni_Suef_IN_APPROVAL,Alexandria_IN_APPROVAL,Minya_IN_APPROVAL,Sharqia_IN_APPROVAL,Ismailia_IN_APPROVAL,Qena_IN_APPROVAL,
Gharbia_IN_APPROVAL,Sohag_IN_APPROVAL,Qalyubia_IN_APPROVAL,Giza_IN_APPROVAL,Port_Said_IN_APPROVAL,red_sea_IN_APPROVAL,Beheira_IN_APPROVAL,
Asyut_IN_APPROVAL,Faiyum_IN_APPROVAL,Luxor_IN_APPROVAL,Aswan_IN_APPROVAL,Damietta_IN_APPROVAL,Matruh_IN_APPROVAL,
Kafr_El_Sheikh_IN_APPROVAL,South_Sinai_IN_APPROVAL,Monufia_IN_APPROVAL,Suez_IN_APPROVAL,Dakahlia_IN_APPROVAL]
plt.pie(y, labels=x,autopct='%2.1f%%',shadow=True, startangle=0)
plt.axis('equal')
plt.legend(loc='upper left')
plt.title("In Approval companies",size=25)


plt.subplot(2,3,2)
x=['North_sinai', 'cairo', 'Beni_suef', 'Alexandria', 'minya',
                'sharqia', 'ismailia', 'qena', 'gharbia', 'sohag',
                'qalyubia', 'giza', 'port_said', 'red_sea', 'beheira',
                 'asyut', 'faiyum', 'luxor', 'aswan', 'damietta',
                 'matrouh', 'kafr_elshikh', 'south_sinai', 'monufia', 'suez',
                 'dakahlia']
y=[North_Sinai_APPROVED,Cairo_APPROVED,Beni_Suef_APPROVED,Alexandria_APPROVED,Minya_APPROVED,Sharqia_APPROVED,Ismailia_APPROVED,Qena_APPROVED,
Gharbia_APPROVED,Sohag_APPROVED,Qalyubia_APPROVED,Giza_APPROVED,Port_Said_APPROVED,red_sea_APPROVED,Beheira_APPROVED,
Asyut_APPROVED,Faiyum_APPROVED,Luxor_APPROVED,Aswan_APPROVED,Damietta_APPROVED,Matruh_APPROVED,
Kafr_El_Sheikh_APPROVED,South_Sinai_APPROVED,Monufia_APPROVED,Suez_APPROVED,Dakahlia_APPROVED]
plt.pie(y, labels=x,autopct='%2.1f%%',shadow=True, startangle=270)
plt.axis('equal')
plt.title("Approved companies",size=25)


plt.subplot(2,3,3)
x=['North_sinai', 'cairo', 'Beni_suef', 'Alexandria', 'minya',
                'sharqia', 'ismailia', 'qena', 'gharbia', 'sohag',
                'qalyubia', 'giza', 'port_said', 'red_sea', 'beheira',
                 'asyut', 'faiyum', 'luxor', 'aswan', 'damietta',
                 'matrouh', 'kafr_elshikh', 'south_sinai', 'monufia', 'suez',
                 'dakahlia']
y=[North_Sinai_SUSPENDED,Cairo_SUSPENDED,Beni_Suef_SUSPENDED,Alexandria_SUSPENDED,Minya_SUSPENDED,Sharqia_SUSPENDED,Ismailia_SUSPENDED,Qena_SUSPENDED,
Gharbia_SUSPENDED,Sohag_SUSPENDED,Qalyubia_SUSPENDED,Giza_SUSPENDED,Port_Said_SUSPENDED,red_sea_SUSPENDED,Beheira_SUSPENDED,
Asyut_SUSPENDED,Faiyum_SUSPENDED,Luxor_SUSPENDED,Aswan_SUSPENDED,Damietta_SUSPENDED,Matruh_SUSPENDED,
Kafr_El_Sheikh_SUSPENDED,South_Sinai_SUSPENDED,Monufia_SUSPENDED,Suez_SUSPENDED,Dakahlia_SUSPENDED]
plt.pie(y, labels=x,autopct='%2.1f%%',shadow=True, startangle=190)
plt.axis('equal')
plt.title("Suspended companies",size=25)

plt.show()
```

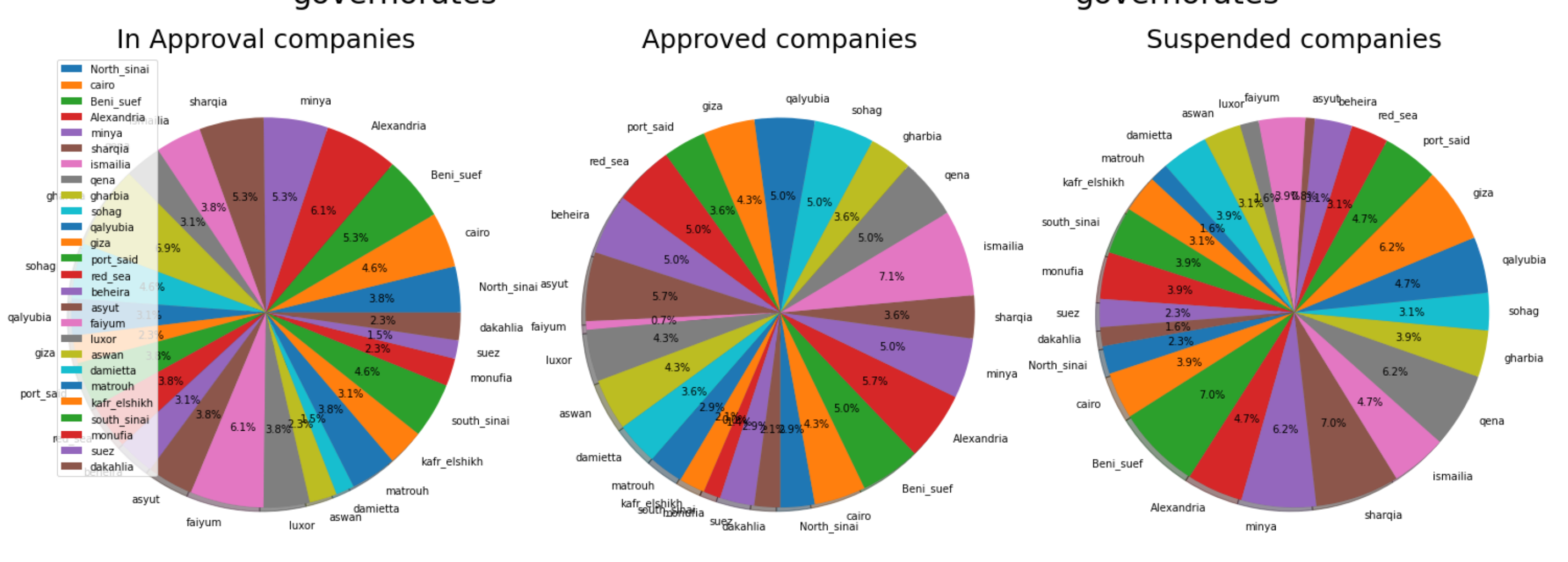
```
c:\users\c l\appdata\local\programs\python\python38\lib\site-packages\seaborn\_decorators.py:36: FutureWarning:

Pass the following variable as a keyword arg: x. From version 0.12, the only valid positional argument will be `data`, and passing other arguments without an explicit keyword will result in an error or misinterpretation.
```











insights about plastics' types and points and delegates table

In [4]:

```
dele.head()
```

Out[4]:

	_id	birth_date	company_location	company_name	company_status	gender	name	number_of_offers	plastic_quantity	rating
0	762630815067802280312	1987-01-03	Cairo	Schmitt - Jacobi	SUSPENDED	FEMALE	خلود العلايمي - Khalod Alalaaiamai	1	2	5
1	770648210988500697161	1987-01-03	Cairo	Schmitt - Jacobi	SUSPENDED	MALE	بتول السقا - Btol Alsqa	2	18	5
2	334254520261964655360	1987-01-03	Cairo	Schmitt - Jacobi	SUSPENDED	FEMALE	نوف بن عمر - Nof Bn Omar	2	5	5
3	383974573902489762407	1987-01-03	Cairo	Schmitt - Jacobi	SUSPENDED	FEMALE	دكتور عنود النقاش - Dktoar Anod Alnqlsh	2	12	5
4	946428165264951945716	1987-01-03	Cairo	Schmitt - Jacobi	SUSPENDED	FEMALE	سيد عنود الدنوني - Said Anod Aldnoni	4	26	5

In [5]:

```
itm = pd.crosstab(items['name'], items['type'], values=items['points'],aggfunc=sum)
item = ['Alain','Aquafina','Arwa','Dasani','Evian','Hayat','Nestle','Nestle Pure Life']


#Analytical view on Plastics
data = [
    go.Bar(
        x=item ,
        y=itm['LARGE_BOTTLE'],
        name='LARGE_BOTTLE'
    ),
    go.Bar(
        x=item ,
        y=itm['MEDIUM_BOTTLE'],
        name='MEDIUM_BOTTLE'
    ),
    go.Bar(
        x=item ,
        y=itm['SMALL_BOTTLE'],
        name='SMALL_BOTTLE'
    )
]

layout = go.Layout(
    barmode='stack',
    title='Distribution of Plastics points and types'
)

fig = go.Figure(data=data, layout=layout)
py.iplot(fig)


#Ratio of Males and Females
fig = {
  "data": [
    {
      "values": [1072,1062],
      "labels": [
        "Females",
        "Males"
      ],
      "domain": {"column": 0},
      "name": "Ratio of Delegates Males and Females",
      "hoverinfo":"label+percent+name",
      "hole": .6,
      "type": "pie"
    }],
  "layout": {
        "title":"Ratio of Delegates Males and Females",
        "grid": {"rows": 1, "columns": 1},
        "annotations": [
            {
                "font": {
                    "size": 36
                },
                "showarrow": False,
                "text": "Gender",
                "x": 0.5,
                "y": 0.5
            }
        ]
    }
}
py.iplot(fig)

plt.figure(figsize = (25,20))
plt.subplot(2,2,1)
x=['Blsam Alshtioi', 'Anod Alohaishi', 'Said Blsam Aliqlshanei', 'Fatmuah Aldnoni Alambjl', 'Btol Aliqlshanei',
                    'Blsam Faqosah', 'Said Baraaah Alanabi', 'Anod AldrqIsh', 'Saidah Aroi Alalaanei', 'Blsam Alsghir']
y=[221, 201, 165, 154, 144, 131, 130, 127, 124, 120]

plt.bar(x,y,color="lightblue")
plt.xticks(size=18,rotation=70)
plt.xlabel("delegates",size=30)
plt.ylabel("plastic_quantity",size=30)
plt.title("Top 10 delegates",size=35)
for i in range(len(x)):
    plt.text(i,y[i],y[i], ha="center", va="bottom",size=12)

plt.subplot(2,2,2)
x=['Aroi Azomah', 'Baraaah Bn Abad', 'Riam Azomah', 'Baraaah Alhajij Hfzah', ' Anod Bn Abad Alsalam',
                    'Aroi Ghoilah', ' Anod Jaballah', 'Anod Altriqai', 'Riam Yafa Alamuhtrm', 'Riam Lkhshin']
y=[1, 1, 1, 1, 1, 1, 1, 1, 1, 1]

plt.bar(x,y,color="lightgreen")
plt.xticks(size=18,rotation=70)
plt.xlabel("delegates",size=30)
plt.ylabel("plastic_quantity",size=30)
plt.title("Less 10 delegates",size=35)
for i in range(len(x)):
    plt.text(i,y[i],y[i], ha="center", va="bottom",size=12)
```