In [1]:
```
! pip install folium=0.5.0
! pip install pivottablejs=0.9.0
```

```
ERROR: Invalid requirement: 'folium=0.5.0'
Hint: = is not a valid operator. Did you mean == ?
ERROR: Invalid requirement: 'pivottablejs=0.9.0'
Hint: = is not a valid operator. Did you mean == ?
```

In [2]:
```
import pandas as pd
import numpy as np
import matplotlib as mpl
import matplotlib.pyplot as plt
import folium
from folium import plugins
from pivottablejs import pivot_ui
%matplotlib inline
```

In [3]:
```
df_In= pd.read_csv('Police_Department_Incidents_-_Previous_Year__2016_.csv')
```

In [4]:
```
df_In.head()
```

Out[4]:

	IncidntNum	Category	Descript	DayOfWeek	Date	Time	PdDistrict	Resolution	Address	X	Y	Location	
0	120058272	WEAPON LAWS	POSS OF PROHIBITED WEAPON	Friday	01/29/2016 12:00:00 AM	11:00	SOUTHERN	ARREST, BOOKED	800 Block of BRYANT ST	-122.403405	37.775421	(37.775420706711, -122.403404791479)	120
1	120058272	WEAPON LAWS	FIREARM, LOADED, IN VEHICLE, POSSESSION OR USE	Friday	01/29/2016 12:00:00 AM	11:00	SOUTHERN	ARREST, BOOKED	800 Block of BRYANT ST	-122.403405	37.775421	(37.775420706711, -122.403404791479)	120
2	141059263	WARRANTS	WARRANT ARREST	Monday	04/25/2016 12:00:00 AM	14:59	BAYVIEW	ARREST, BOOKED	KEITH ST / SHAFTER AV	-122.388856	37.729981	(37.7299809672996, -122.388856204292)	141
3	160013662	NON-CRIMINAL	LOST PROPERTY	Tuesday	01/05/2016 12:00:00 AM	23:50	TENDERLOIN	NONE	JONES ST / OFARRELL ST	-122.412971	37.785788	(37.7857883766888, -122.412970537591)	160
4	160002740	NON-CRIMINAL	LOST PROPERTY	Friday	01/01/2016 12:00:00 AM	00:30	MISSION	NONE	16TH ST / MISSION ST	-122.419672	37.765050	(37.7650501214668, -122.419671780296)	160

In [5]:
```
limit=100
df_In = df_In.iloc[0:limit,:]
```

In [6]:
```
df_In.head()
```

Out[6]:

	IncidntNum	Category	Descript	DayOfWeek	Date	Time	PdDistrict	Resolution	Address	X	Y	Location	
0	120058272	WEAPON LAWS	POSS OF PROHIBITED WEAPON	Friday	01/29/2016 12:00:00 AM	11:00	SOUTHERN	ARREST, BOOKED	800 Block of BRYANT ST	-122.403405	37.775421	(37.775420706711, -122.403404791479)	120
1	120058272	WEAPON LAWS	FIREARM, LOADED, IN VEHICLE, POSSESSION OR USE	Friday	01/29/2016 12:00:00 AM	11:00	SOUTHERN	ARREST, BOOKED	800 Block of BRYANT ST	-122.403405	37.775421	(37.775420706711, -122.403404791479)	120
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In [7]:
```
df_In.drop(['IncidntNum','PdId'], axis=1,inplace=True)
```

In [8]:
```
df_In.rename(columns={'PdDistrict':'Region'},inplace=True)
```

In [9]:
```
df_In['Region'].value_counts()
```

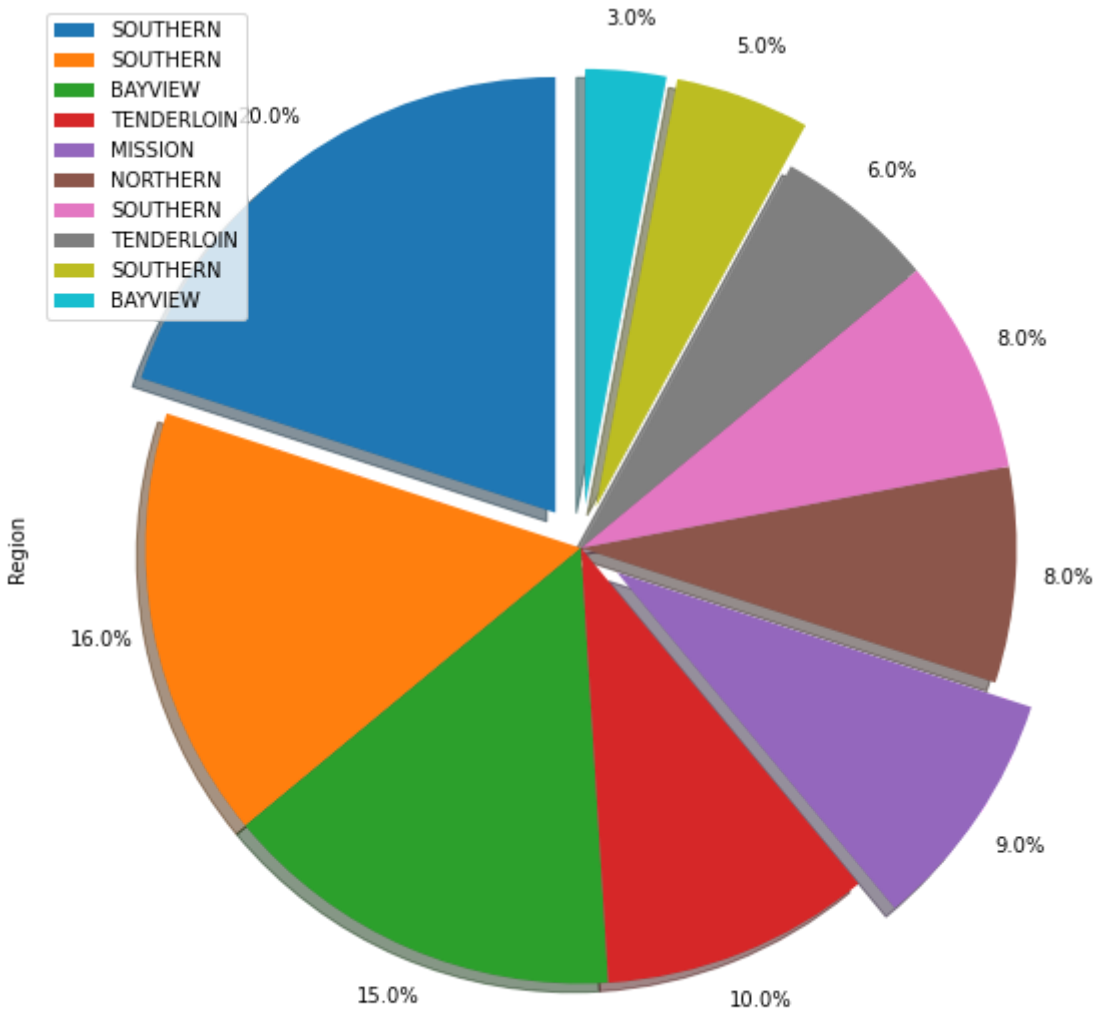
Out[9]:
```
SOUTHERN      20
MISSION       16
INGLESIDE     15
BAYVIEW       10
NORTHERN       9
TENDERLOIN     8
CENTRAL        8
TARAVAL        6
PARK           5
RICHMOND       3
Name: Region, dtype: int64
```

In [18]:
```
explode_list=[0.1,0,0,0,0.1,0,0,0,0.1,0.1]
df_In['Region'].value_counts().plot(kind='pie',
                                    figsize=(20,10),
                                   autopct='%1.1f%%',
                                   startangle=90,
```

```
                                shadow=True,
                                labels=None,
                                pctdistance=1.12,
                                explode=explode_list)
plt.axis=('equal')
plt.legend(labels=df_In['Region'], loc='upper left')
```

Out[18]:

```
<matplotlib.legend.Legend at 0x1ddab2e6ac0>
```



In [13]:

```
pivot_ui(df_In)
```

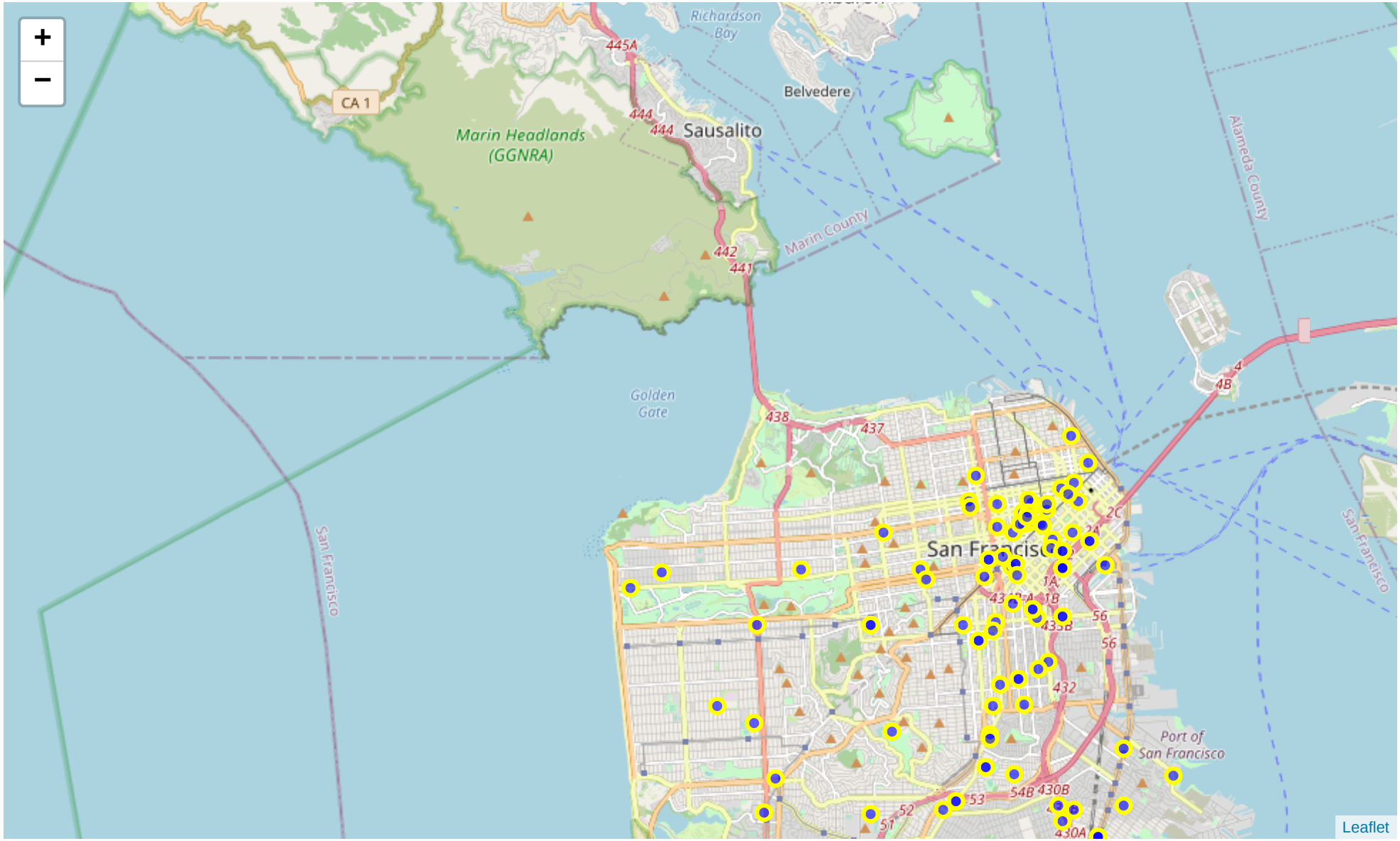
Out[13]:

In [20]:
```
longitude = -122.42
latitude =37.77
```

In [21]:
```
sanfran_map = folium.Map(location=[latitude, longitude], zoom_start=12)

# loop through the 100 crimes and add each to the map
for lat, lng, label in zip(df_In.Y, df_In.X, df_In.Category):
    folium.features.CircleMarker(
        [lat, lng],
        radius=5, # define how big you want the circle markers to be
        color='yellow',
        fill=True,
        popup=label,
        fill_color='blue',
        fill_opacity=0.6
```

```
    ).add_to(sanfran_map)

# show map
sanfran_map
```

Out[21]:

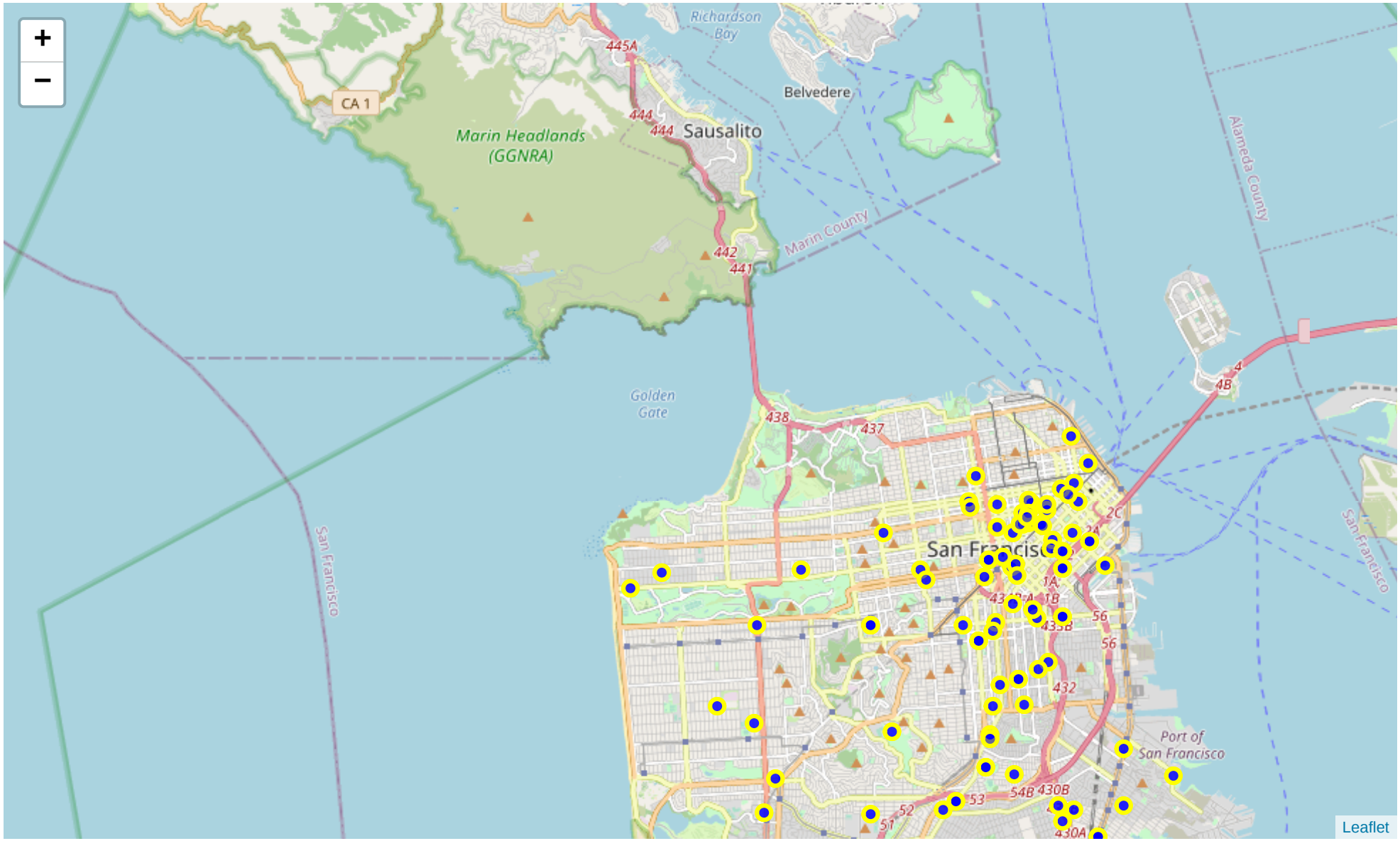


In [22]:

```
In= folium.map.FeatureGroup()
for lat,lng, in zip(df_In.Y,df_In.X):
    In.add_child(folium.features.CircleMarker([lat,lng],
                radius=5,
                color='yellow',
                fill=True,
```

```
                fill_color='blue',
                fill_opacity=0.6
                )
                )
sanfran_map.add_child(In)
```

Out[22]:

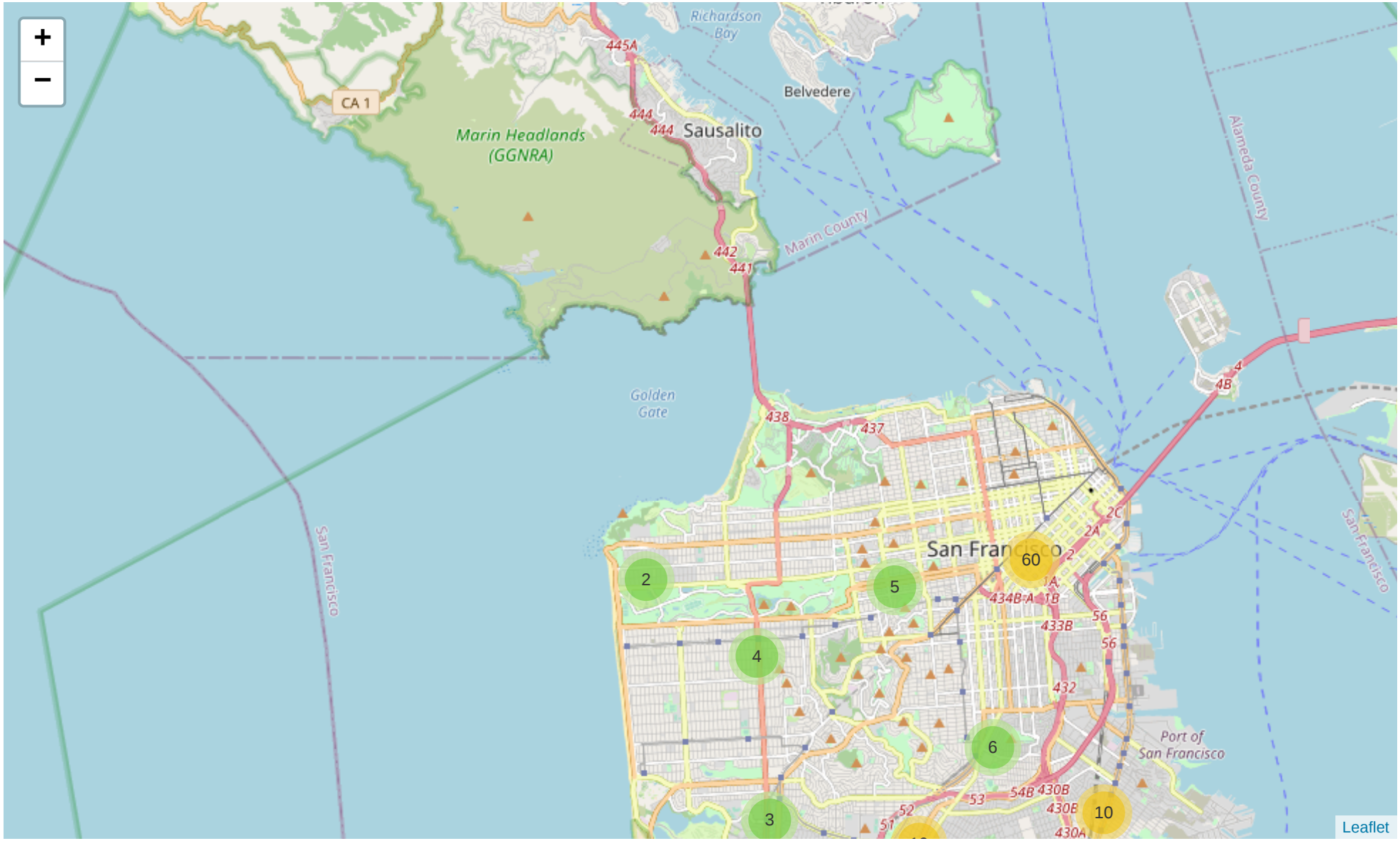


In [23]:

```
from folium import plugins

sanfran_map = folium.Map(location = [latitude, longitude], zoom_start = 12)

# instantiate a mark cluster object for the incidents in the dataframe
```

```
incidents = plugins.MarkerCluster().add_to(sanfran_map)

# loop through the dataframe and add each data point to the mark cluster
for lat, lng, label, in zip(df_In.Y, df_In.X, df_In.Category):
    folium.Marker(
        location=[lat, lng],
        icon=None,
        popup=label,
    ).add_to(incidents)

sanfran_map
```

Out[23]:



In [ ]: