Importing Libraries

```
import pandas as pd
import folium
import math
from folium.plugins import MarkerCluster,HeatMap
import plotly.graph_objects as go
import plotly.express as px
import datetime
from plotly.subplots import make_subplots
import seaborn as sns
```

Importing Dataset

```
df = pd.read_csv('tmp5ed25jfh.csv')
df.head(20)
```

```
C:\Users\hp\anaconda3\lib\site-packages\IPython\core\interactiveshell.py:3063:
  interactivity=interactivity, compiler=compiler, result=result)
```

	INCIDENT_NUMBER	OFFENSE_CODE	OFFENSE_CODE_GROUP	OFFENSE_DESCRIPTION	DI
0	TESTTEST2	423	NaN	ASSAULT - AGGRAVATED	I
1	S97333701	3301	NaN	VERBAL DISPUTE	
2	S47513131	2647	NaN	THREATS TO DO BODILY HARM	
3	I92102201	3301	NaN	VERBAL DISPUTE	
4	I92097173	3115	NaN	INVESTIGATE PERSON	
5	I92094519	3126	NaN	WARRANT ARREST - OUTSIDE OF BOSTON WARRANT	
6	I92089785	3005	NaN	SICK ASSIST	
7	I90583827	1402	NaN	VANDALISM	
8	I20233365	3831	NaN	M/V - LEAVING SCENE - PROPERTY DAMAGE	

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 516331 entries, 0 to 516330
Data columns (total 17 columns):
 #   Column               Non-Null Count   Dtype  
---  ------               --------------   -----  
 0   INCIDENT_NUMBER      516331 non-null  object 
 1   OFFENSE_CODE         516331 non-null  int64  
 2   OFFENSE_CODE_GROUP   426839 non-null  object 
 3   OFFENSE_DESCRIPTION  516331 non-null  object 
 4   DISTRICT             513885 non-null  object 
 5   REPORTING_AREA       516331 non-null  object 
 6   SHOOTING             91238 non-null   object 
 7   OCCURRED_ON_DATE     516331 non-null  object 
 8   YEAR                 516331 non-null  int64  
 9   MONTH                516331 non-null  int64  
 10  DAY_OF_WEEK          516331 non-null  object 
 11  HOUR                 516331 non-null  int64  
 12  UCR_PART             426729 non-null  object 
 13  STREET               495944 non-null  object 
 14  Lat                  487153 non-null  float64
 15  Long                 487153 non-null  float64
 16  Location             516331 non-null  object 
dtypes: float64(2), int64(4), object(11)
memory usage: 67.0+ MB
```

```
df.describe()
```

	OFFENSE_CODE	YEAR	MONTH	HOUR	Lat	4
count	516331.000000	516331.000000	516331.000000	516331.000000	487153.000000	
mean	2333.160306	2017.548877	6.639818	13.079563	42.239252	
std	1182.526686	1.546180	3.315948	6.347315	1.889233	
min	111.000000	2015.000000	1.000000	0.000000	-1.000000	
25%	1102.000000	2016.000000	4.000000	9.000000	42.296861	
50%	3005.000000	2018.000000	7.000000	14.000000	42.325029	
75%	3201.000000	2019.000000	9.000000	18.000000	42.348300	
max	3831.000000	2020.000000	12.000000	23.000000	42.395042	

```
df.shape
```

```
(516331, 17)
```

```
df.columns
```

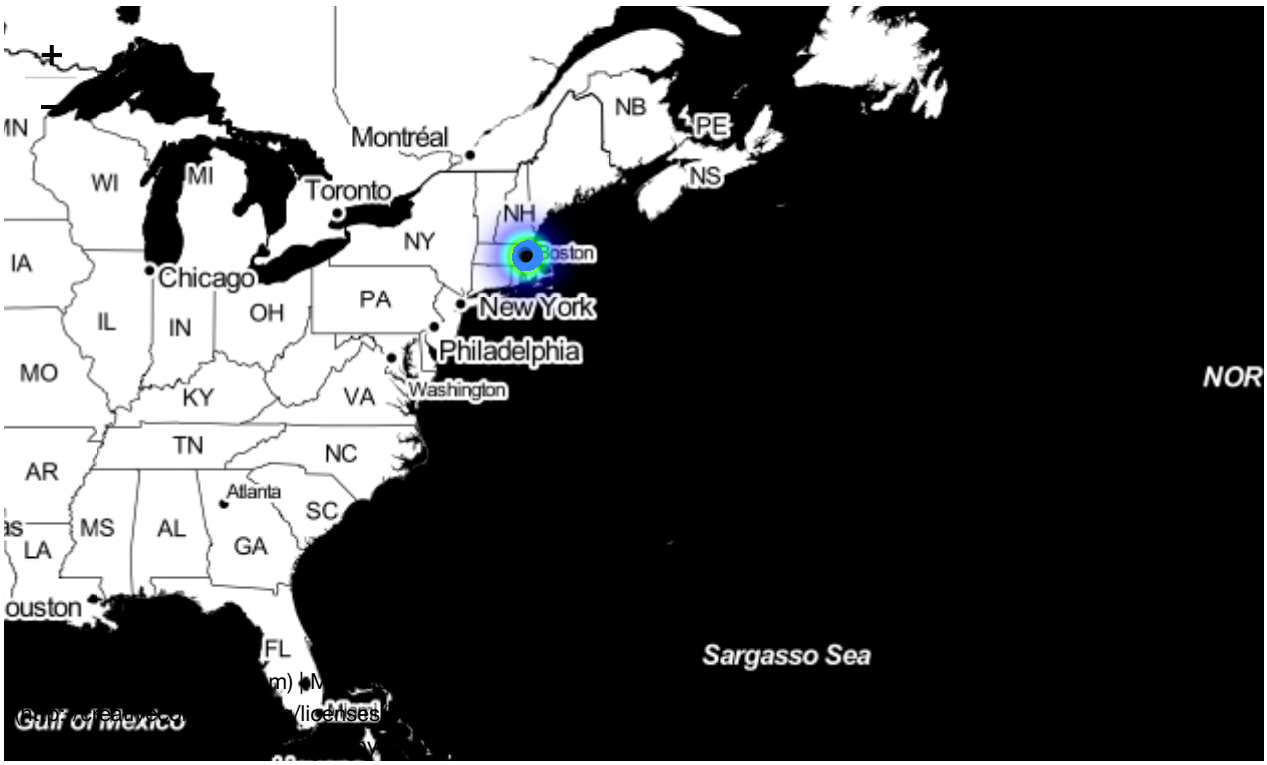
```
Index(['INCIDENT_NUMBER', 'OFFENSE_CODE', 'OFFENSE_CODE_GROUP',
       'OFFENSE_DESCRIPTION', 'DISTRICT', 'REPORTING_AREA', 'SHOOTING',
       'OCCURRED_ON_DATE', 'YEAR', 'MONTH', 'DAY_OF_WEEK', 'HOUR', 'UCR_PART',
       'STREET', 'Lat', 'Long', 'Location'],
      dtype='object')
```

```
boston = (42.358443,-71.05977)
m = folium.Map(location=boston,tile='Stamen terrain',zoom_start=12)
m
```


```
crime = df.groupby(['DISTRICT','STREET','REPORTING_AREA','Lat','Long']).sum().reset


crime.update(crime['DISTRICT'].map('District:{}'.format))
crime.update(crime['REPORTING_AREA'].map('Reports:{}'.format))


m2=folium.Map(location=boston,tiles='stamentoner',zoom_start=12)
HeatMap(data=crime[['Lat','Long']],radius=15).add_to(m2)
def plotDot(point):
    folium.CircleMarker(location=[point.Lat,point.Long],
                        radius=5,
                        weight=2,
                        popup=[point.DISTRICT,point.REPORTING_AREA],
                        fill_color='#000000').add_to(m2)
crime.apply(plotDot,axis=1)
m2.fit_bounds(m2.get_bounds())
m2
```



Plot of Simple Assault Crime in Boston

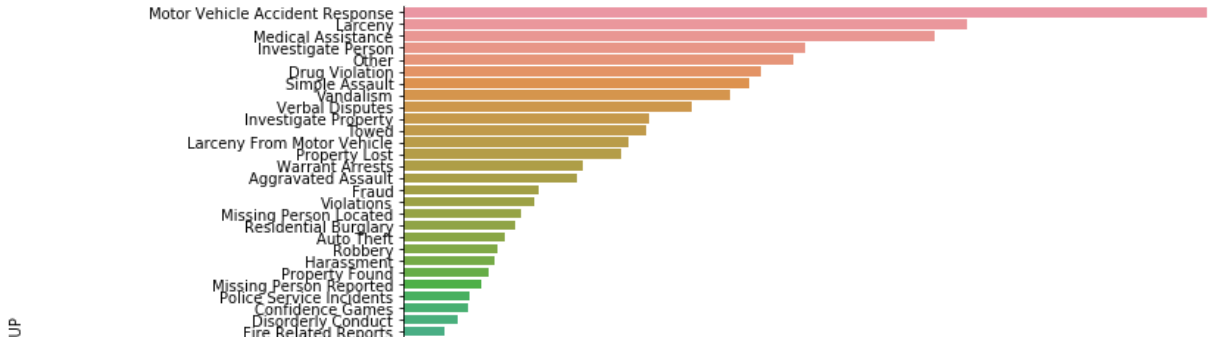
```
la=df.loc[df.OFFENSE_CODE_GROUP=='Simple Assault'][['Lat','Long']]
la.fillna(0,inplace=True)
la.Lat.fillna(0,inplace=True)
la.Long.fillna(0,inplace=True)
m00 = folium.Map(location=boston,tiles='openstreetmap',zoom_start=11)
HeatMap(data=la,radius=16).add_to(m00)
m00
```

Make this Notebook Trusted to load map: File -> Trust Notebook

Graph depicting different crime rates in Boston

```
sns.catplot(y='OFFENSE_CODE_GROUP',kind = 'count',height=8,aspect=1.5,order=df.OFFE
```

```
<seaborn.axisgrid.FacetGrid at 0x37d64348>
```



Plot of Motor Vehicle Accident Responce crime


```
mv=df.loc[df.OFFENSE_CODE_GROUP=='Motor Vehicle Accident Response'][['Lat','Long']]
mv.fillna(0,inplace=True)
mv.Lat.fillna(0,inplace=True)
mv.Long.fillna(0,inplace=True)
m4 = folium.Map(location=boston,tiles='openstreetmap',zoom_start=11)
HeatMap(data=mv,radius=16).add_to(m4)
m4
```

Plot of Larency crime

```
lar=df.loc[df.OFFENSE_CODE_GROUP=='Larceny'][['Lat','Long']]
lar.fillna(0,inplace=True)
lar.Lat.fillna(0,inplace=True)
lar.Long.fillna(0,inplace=True)
m5 = folium.Map(location=boston,tiles='openstreetmap',zoom_start=11)
HeatMap(data=lar,radius=16).add_to(m5)
m5
```

Plot of Medical Assistance crime

```
mv1=df.loc[df.OFFENSE_CODE_GROUP=='Medical Assistance'][['Lat','Long']]
mv1.fillna(0,inplace=True)
mv1.Lat.fillna(0,inplace=True)
mv1.Long.fillna(0,inplace=True)
m8 = folium.Map(location=boston,tiles='openstreetmap',zoom_start=11)
HeatMap(data=mv1,radius=16).add_to(m8)
m8
```

Plot of Drug Violation Crime

```
a = df.loc[df.OFFENSE_CODE_GROUP=='Drug Violation'][['Lat','Long']]
a.Lat.fillna(0,inplace=True)
a.Long.fillna(0,inplace=True)
m0=folium.Map(location=boston,tiles='openstreetmap',zoom_start=11)
HeatMap(data=a,radius=16).add_to(m0)
m0
```

Plot of Vandalism crime


```
b = df.loc[df.OFFENSE_CODE_GROUP=='Vandalism'][['Lat','Long']]
b.Lat.fillna(0,inplace=True)
b.Long.fillna(0,inplace=True)
mm=folium.Map(location=boston,tiles='openstreetmap',zoom_start=11)
HeatMap(data=b,radius=16).add_to(mm)
mm
```

Plot of Warrant Arrests Crime

```
c = df.loc[df.OFFENSE_CODE_GROUP=='Warrant Arrests'][['Lat','Long']]
c.Lat.fillna(0,inplace=True)
c.Long.fillna(0,inplace=True)
mb=folium.Map(location=boston,tiles='openstreetmap',zoom_start=11)
HeatMap(data=c,radius=16).add_to(mb)
mb
```


Estuaire
maritime
Saint-Laurent /
Gulf of Saint
Lawrence
Saguenay
Campbellton
Caraquet
Bathurst
Edmundston
Québec
Montmagny
Miramichi
Prince Edward
New Brunswick /
Leaflet (https://leafletjs.com) | Data by © OpenStreetMap (http://openstreetmap.org), under ODbL (http://www.openstreetmap.org/copyright).