Analysis of Crime in Boston

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Background

- The social security and personal safety have always been the primary concern of our life.
- According to a reliable online report, there is 1 in 37 chance of being a victim in a violent crime in Boston.
- Based on the crime historical data, we can understand what happened over the past years.

Motivation

We tried to emphasis on the following question while analysing

1. How has crime changed over the years?
2. Is it possible to predict where or when a crime will be committed?
3. Which areas of the city have evolved over this time span?
4. In which area most crimes are committed?

We tried to analyse the causes, timings, latitude and longitude affecting the crime scenes in Boston with provided 303371 instances of crime with 17 columns of data ranging from 2015 to 2018.

Objective

- Clean data and divide it to generate patterns.
- Analyse the dataset and derive similar trends from other related data.

Dataset

Crime Incidents in Boston

Dataset Extracted from Kaggle

The dataset consists of 303371 instances of crime incidents and 17 columns of attributes from 2015 to 2018.

```
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')
```

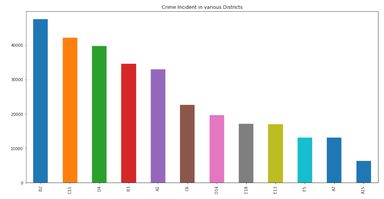
Fire Incidents in Boston

Dataset Extracted from Government Website

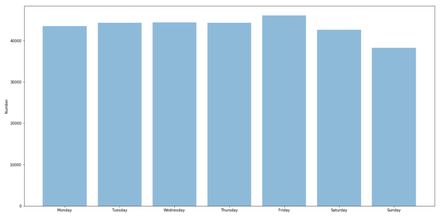
The dataset consists of 191822 instances of fire incidents and 17 columns of attributes from 2015 to 2018.

```
Index(['Address 2', 'Alarm Date', 'Alarm Time', 'City Section', 'District',
'Estimated Content Loss', 'Estimated Property Loss', 'Exposure Number',
'Incident Description', 'Incident Number', 'Incident Type', 'Neighborhood',
'Property Description', 'Property Use', 'Street Name','Street Number',
'Street Prefix', 'Street Suffix', 'Street Type', 'XStreet Name', 'XStreet Prefix',
'XStreet Suffix', 'XStreet Type', 'Zip', 'day', 'month', 'xStreet Name', 'xStreet Prefix',
'xStreet Suffix', 'xStreet Type'], dtype='object')
```

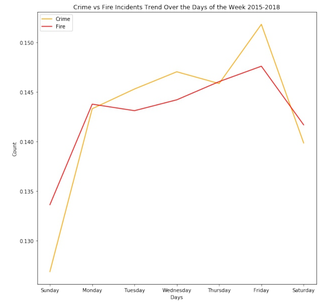
Analysis



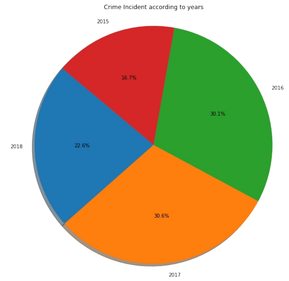
A simple statistics on the crime data and a bar plot modelling with district wise committed crime.



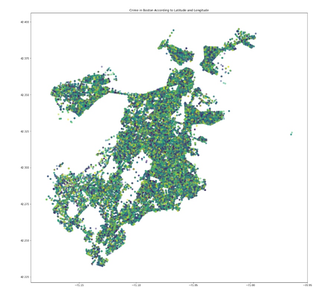
Crime data represented on weekly basis using bar graph.

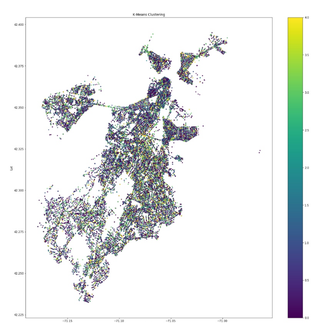


The line-chart representing the trend of crime and fire incidents from 2015 to 2018.



A pie chart representation of crime incidents taken place from 2015-2018.



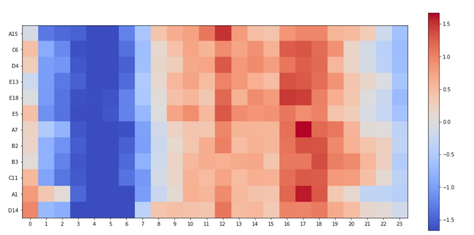


Kmeans Clustering Using Location and Offense Code. The data is divided into 5 clusters

Crime in boston plotted against Latitude and Longitude

Result

As noted from analysis, the crime trends are related to many factors and quite dependent on hours of the day.



Heat map displaying crime rate according to hours of a day ranging from 2015 - 2018.