A SAFE CITY

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Abstract—To have a better response towards criminal activity, it is very important that one should understand the patterns in crime. We analyze this pattern by taking into account the crime that have taken place in the City of Los Angeles from 2010 - 2019. We plan to test our hypothesis with various algorithms and try to find out the algorithm with the highest accuracy. After reading a few papers we have understood that ensembling techniques and tree based methods like Random Forest and Gradient Boosting have performed well and have given good predictions.

Index Terms—crimes, classification, clustering, machine learning

I. INTRODUCTION

Crime as the word suggests it is the violation that people does, and it is usually performed against the laws and it is punishable. Crime Analysis is a part of criminology studies where a various pattern of activities involving criminology are studied and tries to find the indicators of occurred events. Criminal activities are a regular occurrence all over the world. We use machine learning techniques to analyze the previous crimes committed try to predict the hotspots for the crime based on time and location.

II. PROBLEM STATEMENT

In this paper we try to understand the crime dynamics in a large city such as Los Angeles by visualizing the crimes with respect to the city and street they were committed in. Identifying the patterns in the crimes with respect to location, area, dates/months. Analysis of dataset for patterns related to victim data (age, gender and race) and time. For a given time/weekday/location, predict the areas where a crime is most likely to happen.

III. LITERATURE SURVEY

In [1] A few researchers worked on Crime Prediction and Analysis using Machine Learning, where they analyzed the data which helped them in predicting and solving crimes. So they had to predict the type of crime that may happen in the future depending on the various conditions.They have followed the Machine Learning pipeline-data collection (Chicago portal), data preprocessing(feature scaling, null values and outliers treatment), data analysis and then finally model building(trained and tested various classification algorithms). They have used plenty of algorithms, and compared the models based on the accuracy classification metric, and finally used

the K-Nearest Neighbors (KNN) classification to test for crime prediction as the accuracy with KNN was high.

In [2] The researchers have proposed a technique which is used to assess the criminals based on the criminal careers: the criminal activities that a single individual exhibits throughout his or her life. The criminal profile per crime per year was extracted from the database and a profile distance was calculated. After that, the distance matrix for each profile per year was created. The distance matrix including the frequency value was made to form clusters by using clustering algorithms. With this information, the large group of criminals was analyzed, and they have also predicted the future behavior of individual suspects.

In [3] The researcher's work compared the two different classification algorithms namely, Naive Bayes and Decision Tree for predicting Crime Category for different states in USA. They have experimented and compared the models based on the classification metrics such as accuracy, F1 score and concluded that Decision Tree algorithm outperformed Naive Bayesian algorithm and achieved 83.9519 % in predicting Crime category.
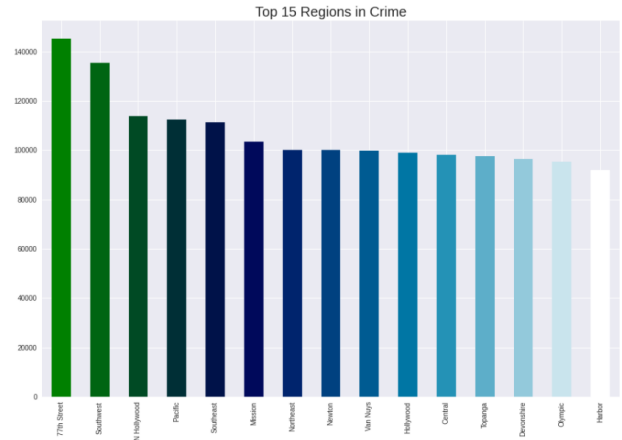
IV. VISUALIZATIONS

Fig. 1. Regions with count of crimes

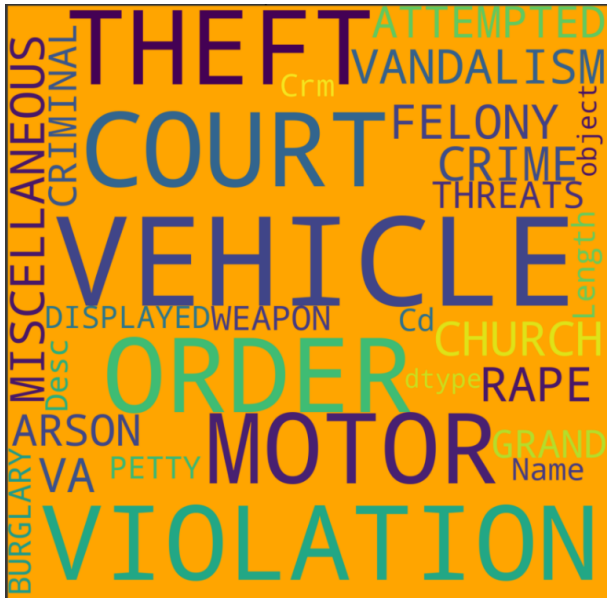We observe that the maximum number of crimes took place in the 77th street.

Fig. 2. Different types of crimes (Word Cloud)

Fig. 3. Los Angeles Map

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