PRINCE SHRI VENKATESHWARA PADMAVATHY ENGINEERING COLLEGE

CODE : 4117

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

CRIME RATE PREDICTION AND ANALYSIS

PROJECT DONE BY:

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ABSTRACT

➤ Crime analysis and prevention is a systematic approach for identifying and analyzing patterns and trends in crime.
➤ Crime is one of the biggest and dominating problem in our society. There are huge number of crimes committed frequently.
➤ Here the dataset consists of the date and the crime rate that has taken place in the corresponding years.
➤ We use prophet algorithm to predict the crime rate in the future by using the previous data information.
➤ This system can also be used for any crime departments for reducing the crime and solving the crimes with less time.

INTRODUCTION

- Crime is a violation of humanity, often punishable by law. Criminology is a study of crime, interdisciplinary science that investigates and investigates crime and criminal performance data.
- Criminal activity is now high and the police department is responsible for controlling and reducing criminal activity.
- There has been tremendous increase in machine learning algorithms that have made crime prediction feasible based on past data.
- The aim of this project is to perform analysis and prediction of crimes in states using machine learning models.
- In this project machine learning models to predict crimes.
- This will indirectly help reduce the rates of crimes and can help to improve securities in such required areas.

OBJECTIVES

Aim of the project:

•The aim of this project is to analyze and predict the crime rate that helps the investigator or police to solve the crime problems from the huge amount of information that is stored in database.

•Data visualization is also used to represent the output in the forms of images and charts.

Scope of the project:

•The scope of the project is to prevent crimes or control the crime activities which may occur in the future

SOFTWARE REQUIREMENT

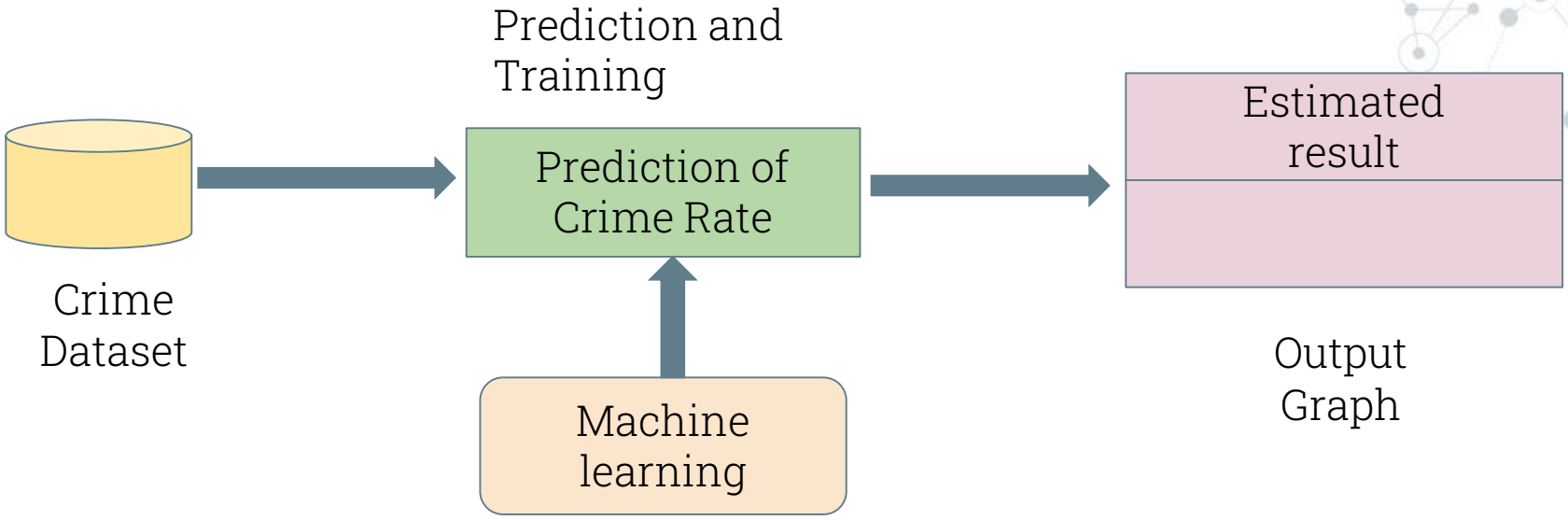
PLATFORM

- **JUPYTER NOTEBOOK**
  JupyterLab is the latest web-based interactive development environment for notebooks, code, and data.
  Its flexible interface allows users to configure and arrange workflows in data science, scientific computing, computational journalism, and machine learning.

- **ANACONDA**
  Anaconda Navigator is a desktop graphical user interface (GUI) included in Anaconda distribution that allows you to launch applications and easily manage conda packages, environments, and channels without using command-line commands.

- **COMMA SEPARATED VALUE ~ DATASET**
  CSV (Comma Separated Values) is a simple file format used to store tabular data, such as a spreadsheet or database. A CSV file stores tabular data (numbers and text) in plain text. Each line of the file is a data record. Each record consists of one or more fields, separated by commas. The use of the comma as a field separator is the source of the name for this file format.

ARCHITECTURE DIAGRAM

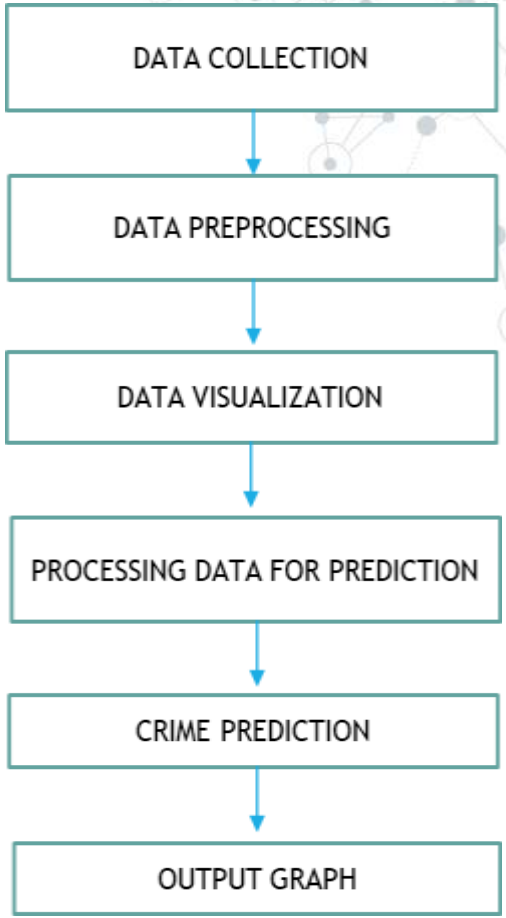


FLOW OF PROCESS

THE GENERAL METHOD OF PREDICTION:

DATA COLLECTION

- Here we used dataset that extracted from Kaggle.com
- The dataset is stored in .csv format.
- Then the dataset is loaded and go for preprocessing.



PREPROCESSING ALGORITHM

Algorithm used : pandas and Numpy

- Firstly import the the DataSet and explore it
- Then discover the unnecessary and missing values
- Date are not in DateTime data-type convert this first
- Dropping unnecessary columns in a Dataset
- Renaming columns to a more recognizable set of labels
- Skipping unnecessary rows in a CSV file

VISUALIZATION ALGORITHM

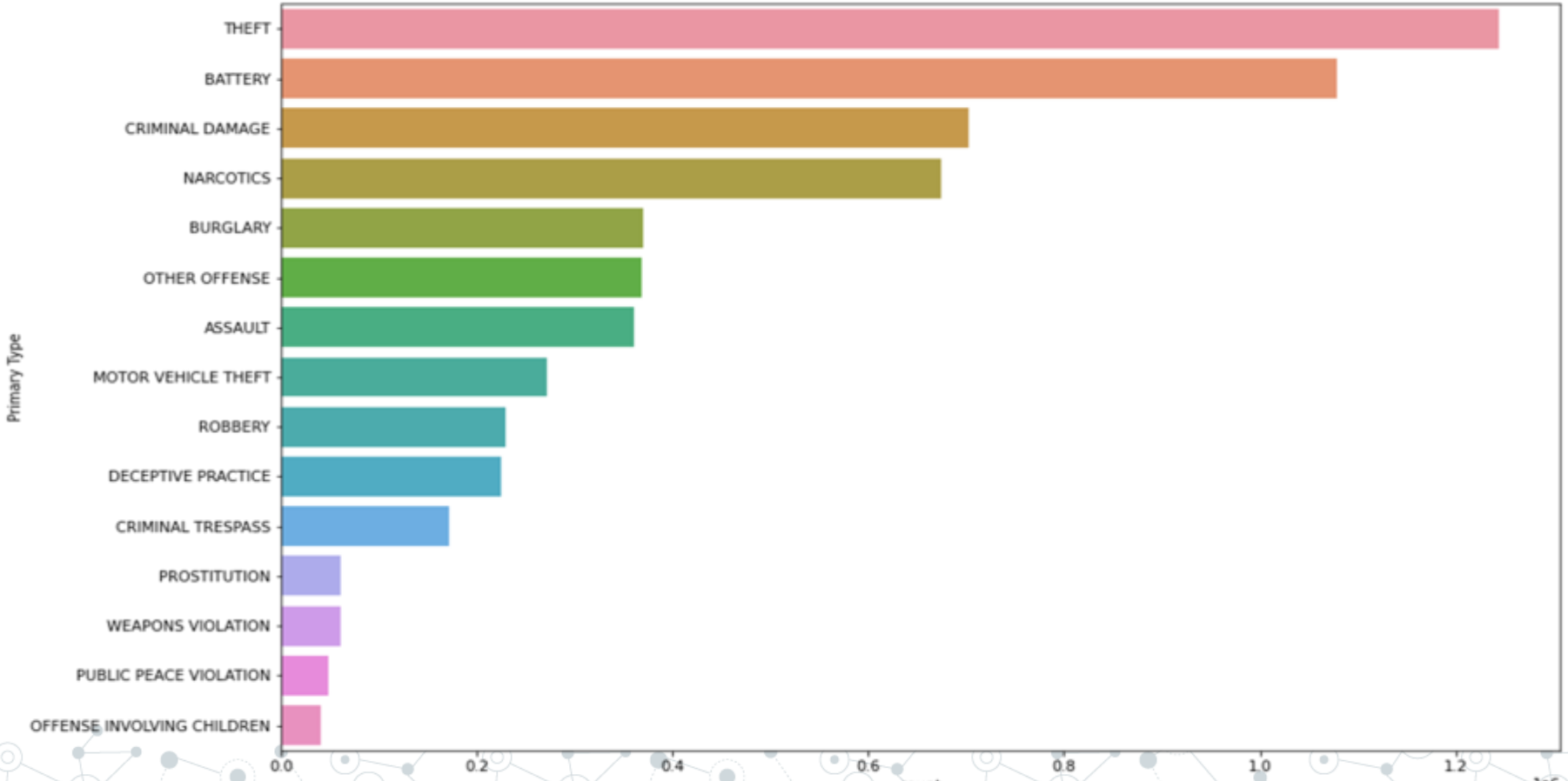
Algorithm used :Matplotlib and Seaborn

- Use Date Column as an Index for analysis based on Date
- Then select the required columns for visualization.
- Completely remove the dates we are not certain about and replace them with NumPy's NaN
- Now design the aesthetic graph using Seaborn.
- Display the required graph using Matplotlib.
- The Visualization made for Analysis

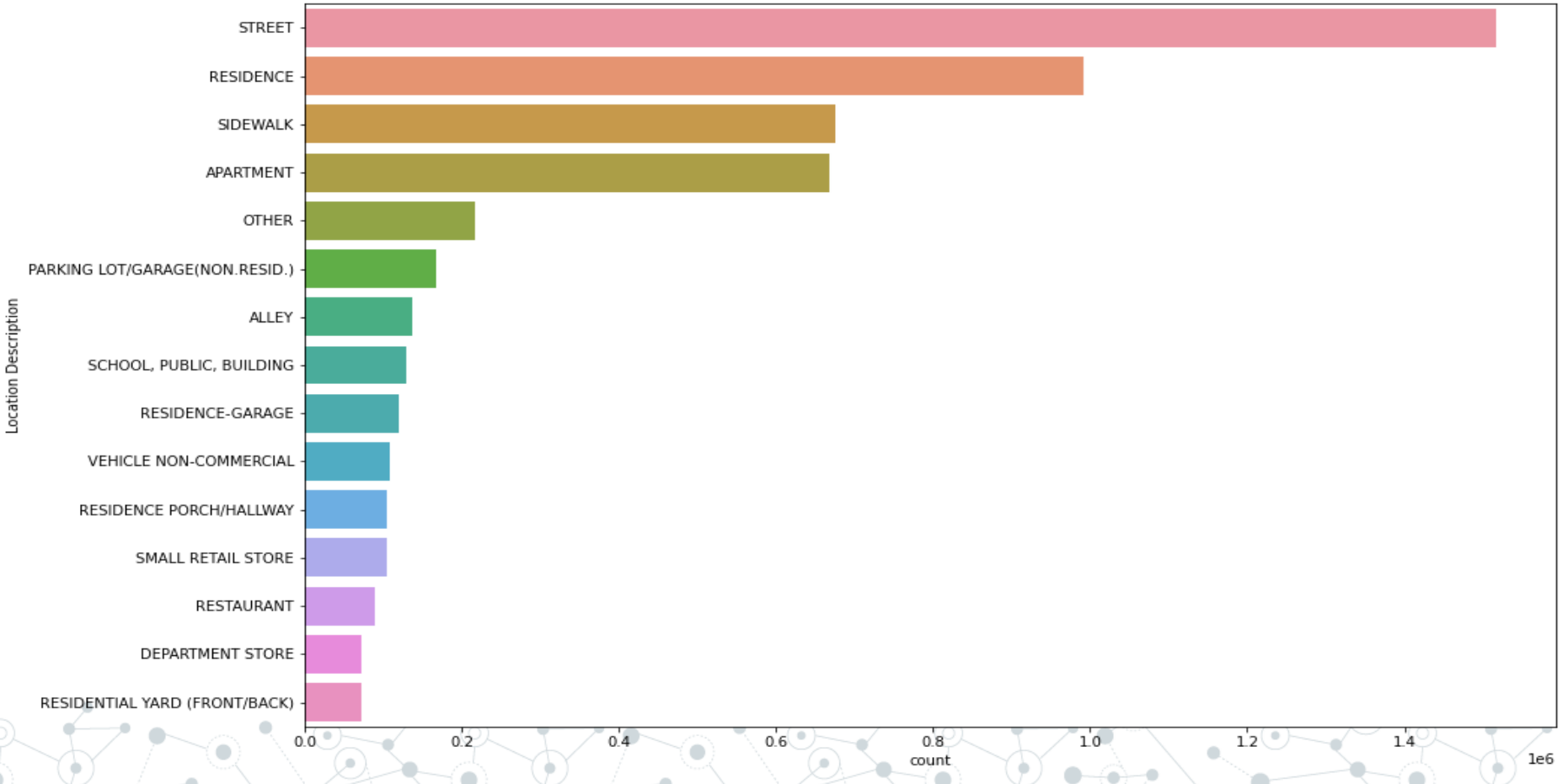
VISUALIZATION MADE FOR

- Top 15 Primary Types of Crime
- Top 15 Locations where crimes occurred
- Crimes per year
- Crimes per Month
- Visualize Crimes per Quarter

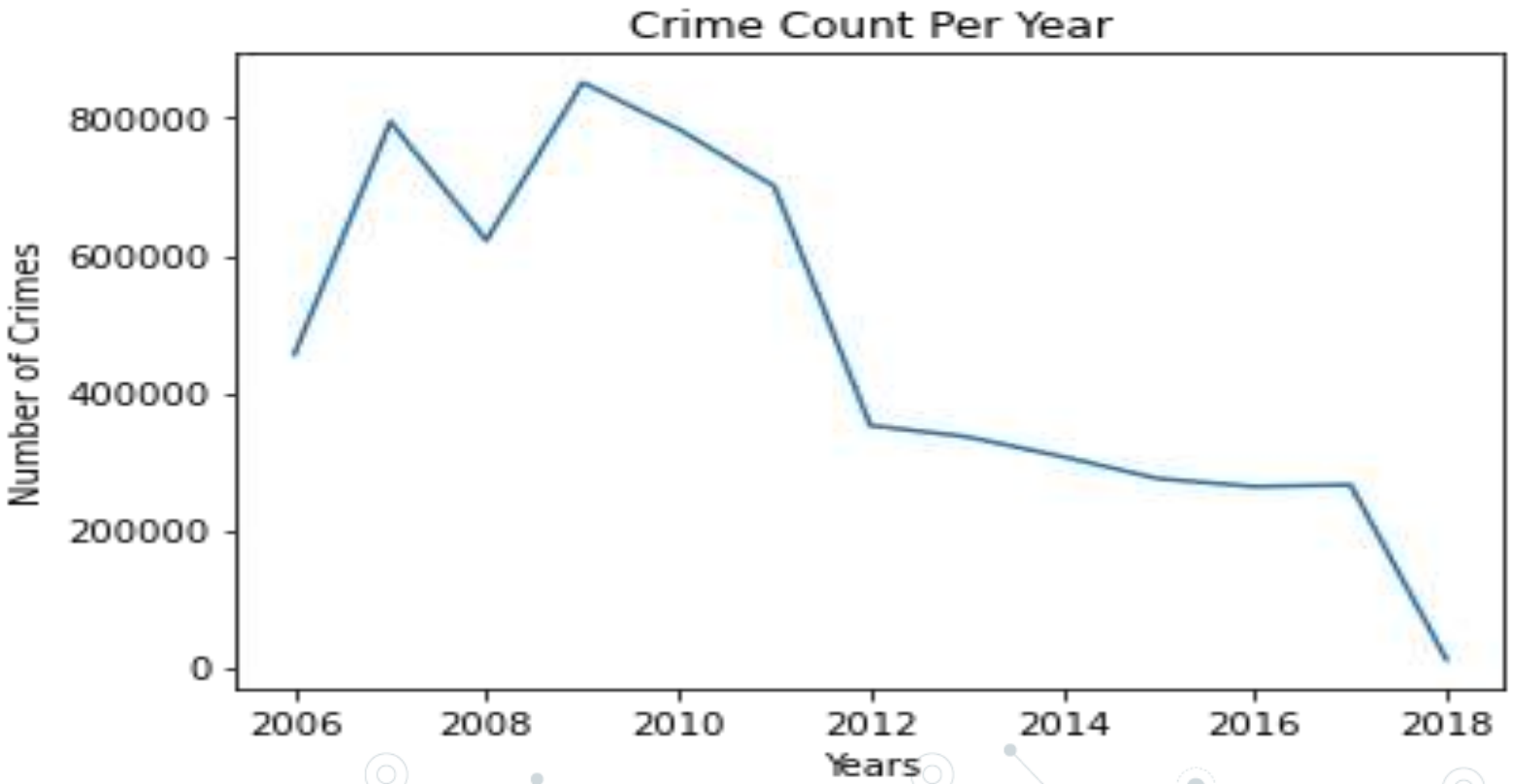
Top 15 Primary Types of Crime



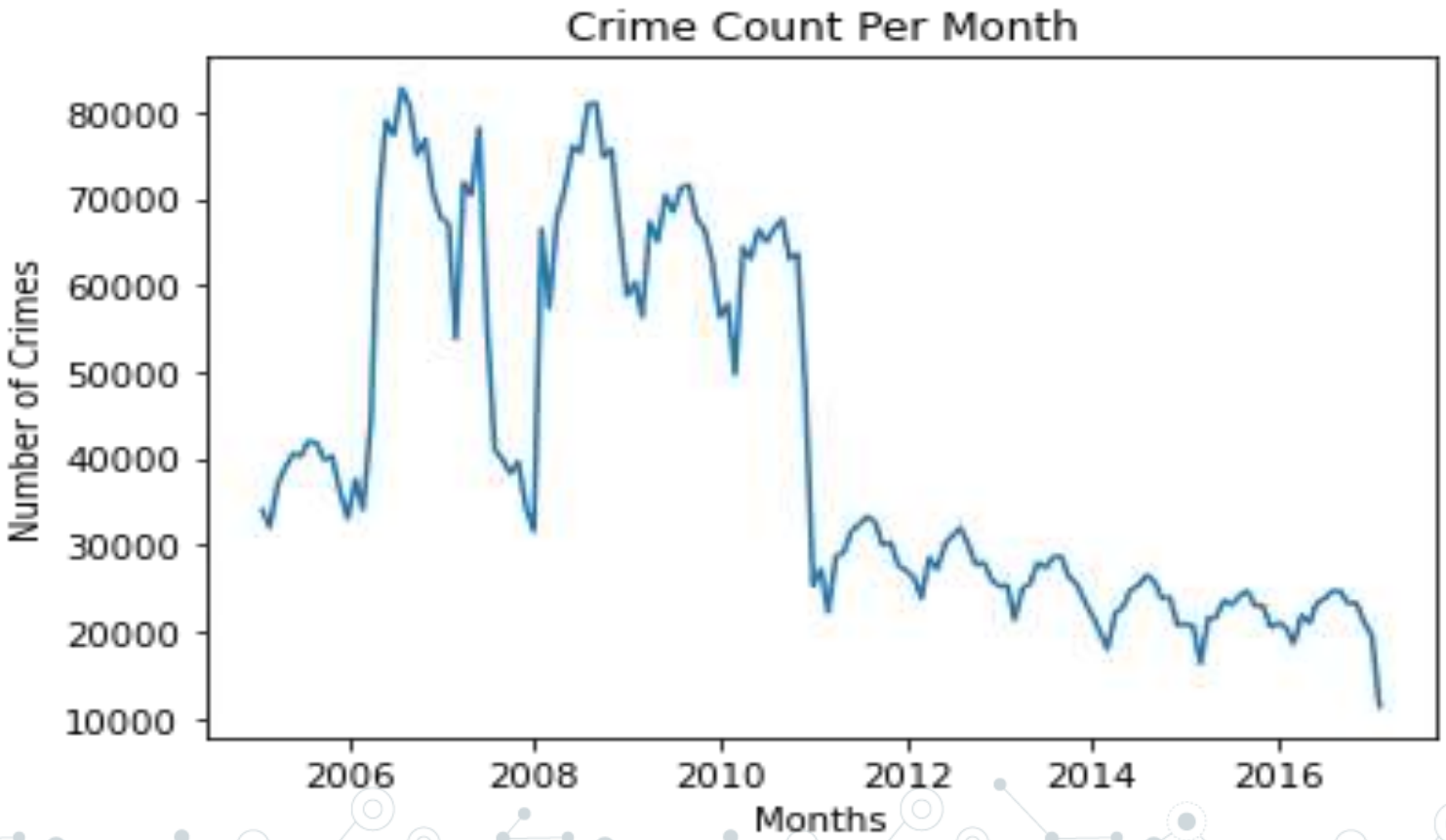
Top 15 Location where crime occurred



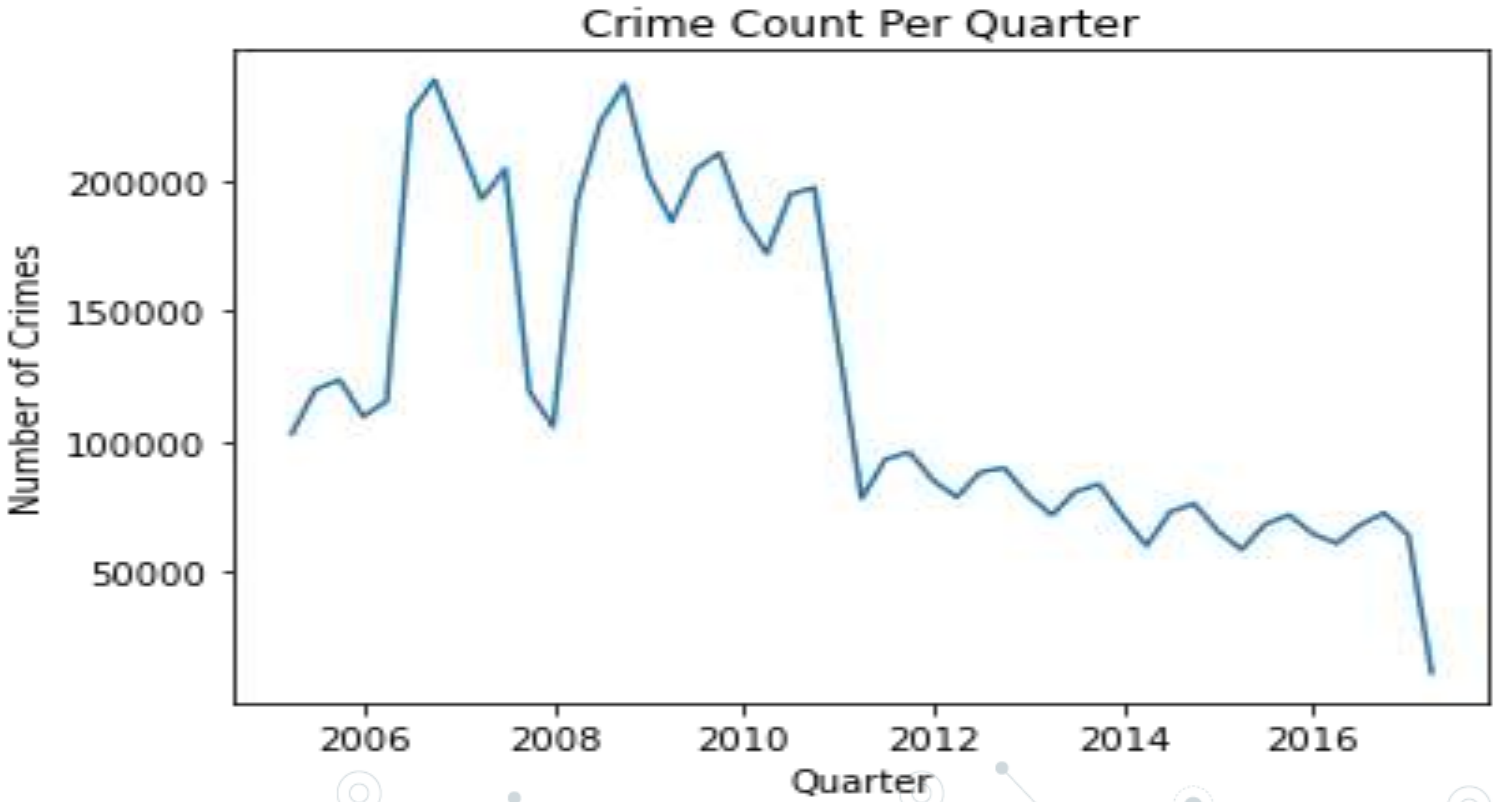
crimes per year



Crime per month



Crime per quarter

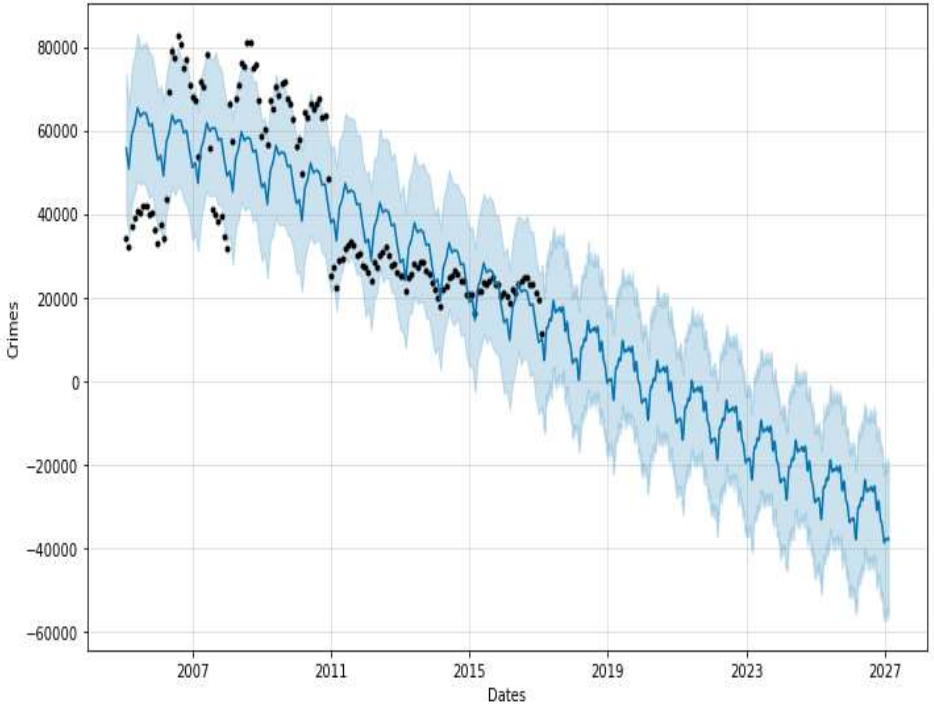


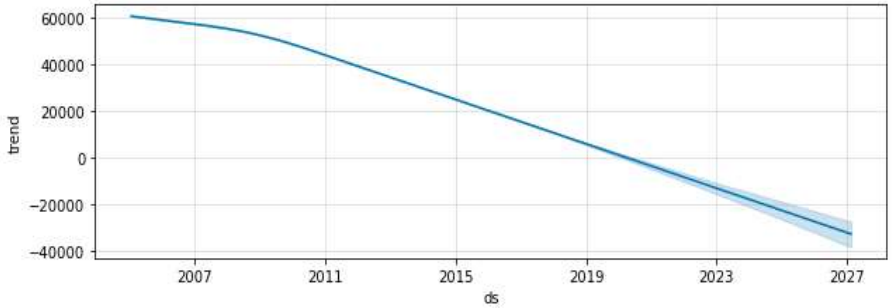
PREDICTION ALGORITHM

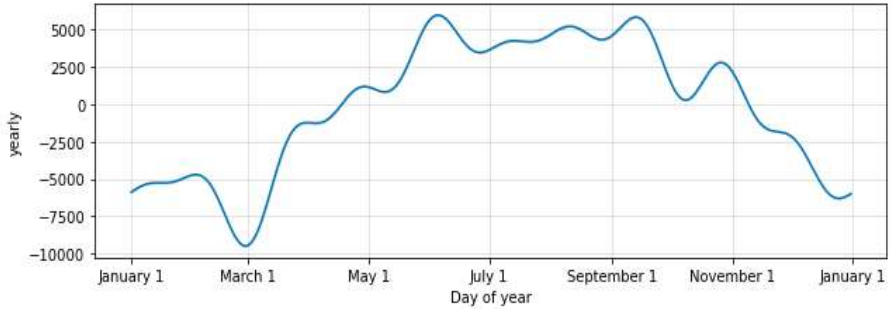
Algorithm used :Prophet

- Data processing is done for prediction.Make new dataframe with Date and it's count Monthly bases to feed the data to Prophet.
- Change Column names as the prophet takes ['ds',"y"]
- The y column must be numeric, and represents the measurement we wish to forecast.
- Predictions are then made on a dataframe with a column ds containing the dates.
- A suitable dataset that extends into the future a specified number of days using the helper method model.make_future_dataframe().
- Plot the forecast by calling the model.plot method and passing in your forecast dataframe.
- To see the forecast components use the model.plot_components method.
- The interactive forecast is made using plot_plotly method.

VISUALIZATION OF PREDICTION







OUTPUT GRAPH

FORECAST GRAPH :

THANK YOU.

ANY QUESTIONS ?