CRIME ANALYSIS USING MACHINE LEARNING

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ABSTRACT

Crimes are the significant threat to the humankind. as crimes are increasing at a rapid rate approach for identifying trends in crime. Our project can predict regions which have high probability for crime occurrence and can visualize crime prone areas by visual representation of data by bar graphs, pie charts etc. It speed up the classification of criminal activities by calculating the average accuracy rate .It uses crime data set and predicts the types of crimes in a particular area which help in Accurate results based on the predictive analysis of logistic regression. The objective would be train a model for prediction using logistic regression classification algorithm. Logistic regression used for classification problems and it is a predictive analysis algorithm based on concept of probability. Crime analysis project is a systematic approach for identifying trends in crime. .It uses crime data set and predicts the types of crimes in a particular area which help in Accurate results based on the predictive analysis of logistic regression.

Keywords – *Predictive classification algorithm, logistic regression, binomial regression, probabilistic machine learning algorithm , visualization techniques, GUI.*

1.INTRODUCTION

Crime is really a major problem nowadays in our system and its prevention is really important Day by day huge number of crimes taking place. This needs to keep track of all records which need to be used for future reference in case solving. The current problem we are facing is proper maintenance of the dataset of different crimes and analyzing the dataset to use in prediction and solving various crimes in the future. The project aims to analyze data that has various crimes and predict the type of crime that will happen in the future depending on various conditions of the dataset. In this paper, we use the technique of machine learning for crime analysis for the given dataset. For this, we used a logistic regression algorithm that uses the probabilistic approach for pattern identification and visualizes ineffective tools like matplotlib,squarify, folium, etc. The use of past crime data helps to relate parameters that help in understanding the scope of future crimes. good quality street cleaning

service in a city provides and contributes the good environmental quality in its communities and neighborhoods, which can help urban development makes places attractive in development, make places attractive to tourists, investors, and mobile workers Moreover, effective street cleanliness could reduce the costs of cleaning underground water systems for cities. For this reason, researchers around the world are studying automated

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parameters that help in understanding the scope of future crimes. In this various visualization methods and tools along with machine learning algorithms are used for the analysis of the crime distribution over the area.

2.LITERATURE SURVEY:

crime prediction is done on an area of data set in which different kinds of machine learning models and techniques are used. Compared with models like KNN, Naïve Bayes, random forests algorithm used in earlier models.in this research paper, we work with logistic regression algorithm. It is seen that the prediction varies and differs depending on the dataset and features that are selected. The prediction accuracy found for KNN, naive Bayes, and random forest are improved for better accuracy using logistic regression. regressive models are used in machine learning algorithms to forecast and identify crime trends in different areas. major problems that we face in crimes are to detect and analyze the pattern of various crimes. Understanding datasets is also an important factor in this aspect of the case. We really want accurate predictable results so that we won't waste our resources due to any aspect. Also proposed a method that classifies the crime rate as high, medium, or low. None has classified the type of crime that will happen and its probability of happening of crime. prediction and analysis of crime are important factors that will be optimized further using various techniques and advanced tools. visualization is used to visually represent the crime-prone areas by representing them in various forms like graphs, histograms, pie charts, bar graphs, line graphs, heat maps, etc. Using various

libraries like matplotlib, squarify, and folium in learning. so crime is predicted visually which gives how that particular crime is over there and by this information, we can provide security alerts by we can reduce the crime rates.

3. PROPOSED SYSTEM

In the proposed system, we are introducing an application that will analyze the crime that criminals did in the past in a particular region or area. This prediction is based on attributes like a criminal record, time, place, which could represent the whole crime in form of bar graphs. We could further take this idea ahead and even make predictions of the crime in particular places or regions.

4. ARCHITECTURE
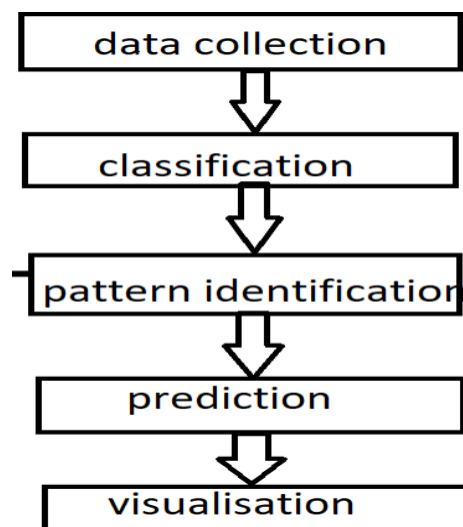
The above flow chart gives a clear vision of how data is collected, classified, and divided firstly the data is collected from different sectors, and later it is classified into various patterns based on the identification of the pattern. Later it is predicted and visualized by using graphical representations like pie charts and bar graphs.

5. IMPLEMENTATION

crimes are being analyzed based on some of the parameters such as:

Project Objectives

The main objective of our project is to classify crime in a particular place. To analyze and interpret crimes at all places uniquely. To provide clear information about its environment to intelligent agents. Predictive modeling is a way of building a model that can make predictions. This includes the process in which a machine-learning algorithm learns certain properties from various training Data Sets to make accurate predictions.

Project Outcomes Benefits:

The police can use the system in two ways: The system will be alert that a criminal offense is imminent (in the subsequent 4 hours)based on any new weather event/s. The police can run the system once every day and support the predictions, deciding how to deploy resources(policemen) in each community/district. Longitude–X coordinates on the map where the crime has occurred.

• Latitude–Y coordinates on the map where the crime occurred.

• Address: – The place where the crime incident has taken place.

• Day of Week: – The day of the week (i.e. Monday)

• Date: – on which date the crime has taken place.

crimes are being analyzed based on some of the parameters such as• District: – Police district to which the crime is assigned.

• Resolution: – The resolution which needs to be taken to address the crime in a given area.

• Category: – The type of the crime. This is the label that we need to predict.

We have many important files used in this project: MATPLOTLIB: It is a multi-platform visualization library in Python for 2D plots of NumPy arrays and is designed to work with the broader SciPy stack. sklearn: it is used in statistical modeling including classification, regression, and clustering and dimensionality reduction. SEABORN: it is data visualization library based on matplotlib which provides the best interface for drawing informative and attractive statistical graphical designs. TensorFlow: TensorFlow is of a Python library mainly used for fast numerical Computations for better accuracy. FOLIUM: it is used for visualizing geospatial data of a given area. SQUARIFY: Squarify is a Processing library that implements the squarify treemap layout algorithm.
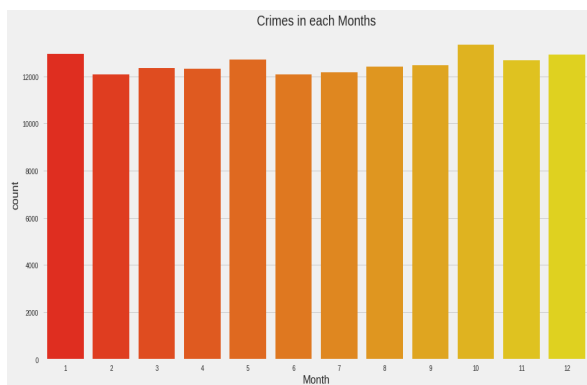
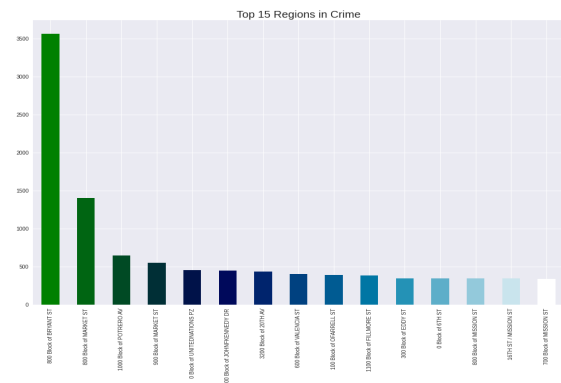## 6. RESULT:

Figure 1: crimes in each month
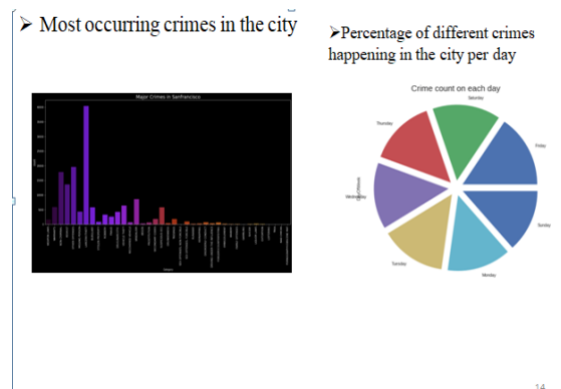

Figure 1: bar graphs
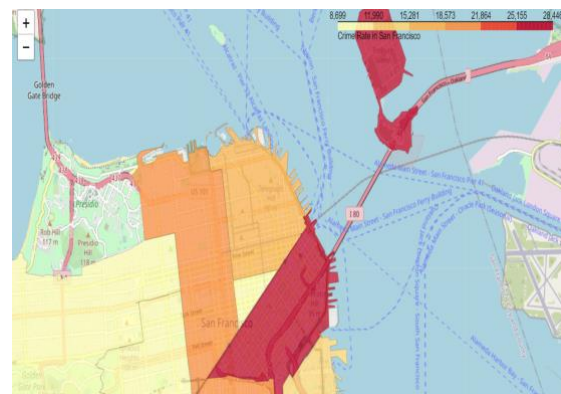

Figure 2: Representation of pie charts

Figure 3: map over veiw

7. CONCLUSION:

Using advanced technologies like machine learning we built a model using training, Dataset that undergoes data cleaning and data transformation. This model predicts the type of crime with its maximum accuracy. Data visualization is shown by many graphical representation methods like maps, pie charts, bar graphs e. t. c and found

interesting statistical facts that help in identifying various factors that will help in keeping society safe and alert. here the paper represented a framework stating how all the aspects of machine learning techniques have helped to create a system that is much more useful to the police in solving cases to create a safe community or society using logistic regression. Our proposed system consists of a collection of technologies and methods that perform each and Everything from monitoring crime hot spot areas to recognition of people from different parameters such as their voice notes is one of its best examples. visualization of the world where we collaborate on a system Into a police department that creates tips or techniques that identify crime patterns which is much more reliable and achieved success in eradicating crimes at a faster rate

8. FUTURE SCOPE:

Crime analysis provides useful information in operational crimes and also provides prevention objectives in identifying and analyzing methods of operations of individual criminals and identifying crime pattern recognition and giving an analysis of data from various field interrogations and arrests. Crime analysis can be used in the department for long-term planning efforts by providing an estimate of future crime trends and assisting in the identification of prior crime-prone areas with alerts to build a safe and secure society.

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