

CRIME RATE ANALYSIS USING MACHINE LEARNING

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ABSTARCT: Crime is one of the biggest problem in today's world and its increasing at the fire pace which is a major cause for concern. There is a need to track of all the crimes so that it can be used by police department to investigate the crime cases easily. In this experiment, a machine learning K-means algorithm is used to analyze the crime in any area. The dataset of crimes in India is available at the kaggle website, that is used as the dataset to make to visualize the patterns and trends of different crimes. The other purpose of this project is to evaluate how much k – means algorithm is helpful to determine and solve the current problems.

1. INTRODUCTION

Machine learning based Crime Analysis usually involves identification, patterns, prediction, classification and visualization. Deffers approach, each never would and crime category was given unique number when a particular crime happens in a particular neighbourhood .Machine learning mainly focuses on the development of computer programs that can access data and use it learn for themselves.The process of learning begins with observations, such as examples, direct experience, in order to look for patterns in data and by providing examples we can make better decisions in the future .The primary aim is to allow the computers learn automatically without human interaction and adjust actions accordingly.

2.ABOUT THE PROPOSED WORK

A. Literature Survey

Crime is a part of social system and known to human communities since its origins. It is different from community to another, even within one community it doesn't occur equally in all places and not by the same way. It is also focuses in some places more than others,

sometimes increases and decreases, etc. Previous researchers have proved that crime rate has significant relation with different social factors: education levels, poverty rates and lack of social organization, while others have drawn the attention to its relation with the built environment. They proposed that crime occurs in places where all opportunities and criminals are available. The role of this paper is to identify near places related to crime occurrence within the Greater Cairo Region, and to propose different ways to reduce these crimes. The main districts are scrutinized according to social analysis, street-network pattern and land-use.

B. Proposed Work

It is a act of entire humanity and an obstacle in the way of development. The definition of crime introduces us with a vast number of hardships and complexities as it is a social construction that we consider a crime. crime differs over time and location. Crime is just like a toxic which spoils the entire growth of a nation. Simply, a crime can be defined as a criminal offense against any person with an intent to harm them directly or indirectly that is illegal and punishable under the country law. Crimes like robberies, looting, sexual harassment, rape, and killings are one of the major crimes which are happening with high speed starting from rural to urban areas. As these crimes are lifting very highly so there is a need to control them and thus creating huge pressure on the investigation department.

System Architecture

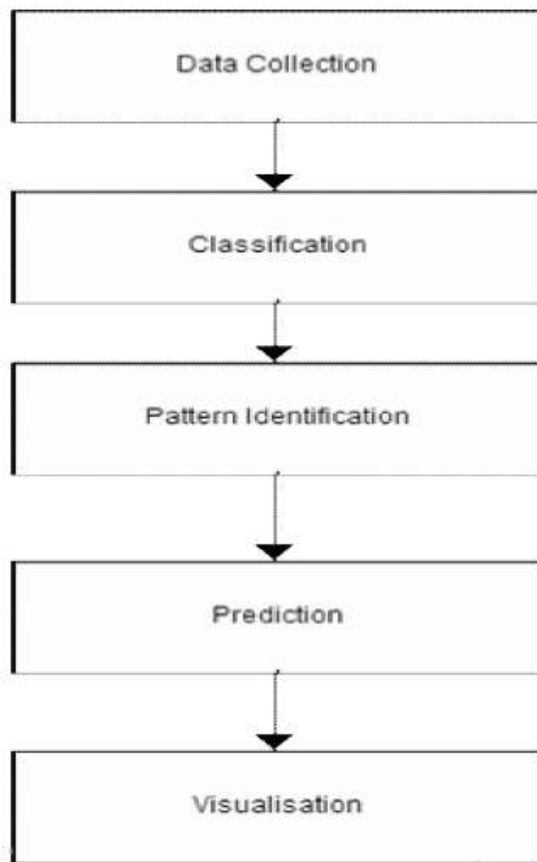


Fig.1 Architecture Model

3. ALGORITHM

K MEANS CLUSTERING ALGORITHM:

Kmeans algorithm is an iterative algorithm that tries to partition the dataset into K predefined different non-overlapping clusters where each data point belongs to one group

$$J(V) = \sum_{i=1}^c \sum_{j=1}^{c_i} (\|x_j - v_i\|)^2$$

Where,

‘xi’ is the each data point and ‘vj’ is the centroid.

‘||xi - vj||’ is the distance between xi and vj.

‘ci’ be the number of data points in i th cluster.

‘c’ is the number of cluster centers.

Algorithmic Steps for K-Means Clustering:

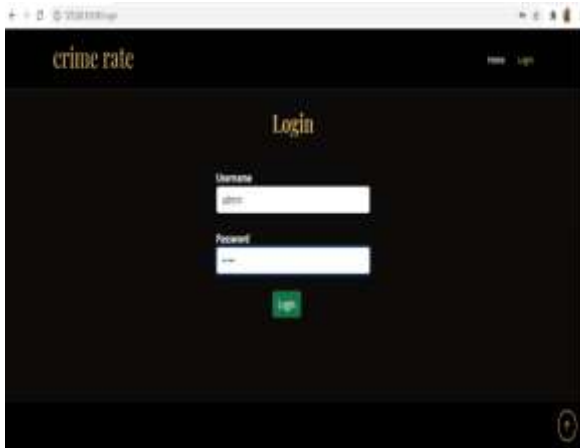
- 1) Specify number of clusters K.
- 2) Let $X = \{x_1, x_2, x_3, x_4, x_5, \dots, x_n\}$ are the set of data points and $V = \{v_1, v_2, \dots, v_c\}$ be the set of centers.
- 3) Randomly select ‘c’ number of cluster centers.
- 4) Calculate the distance between each data point and to every cluster centers.
- 5) Assign the data points to the cluster center which distance from the cluster center is minimum of all the remaining cluster centers.
- 6) Recalculate the new cluster center using:
Where, ‘ci’ represents the data points in i th cluster.
- 7) Again calculate the distance between each data point and new obtained cluster centers.
- 8) If any reassignment occurs means centroid of the previous iteration and current iterations are same then stop, otherwise repeat step 4.

$$v_i = (1 / c_i) \sum_{j=1}^{c_i} x_j$$

4.RESULTS AND OBSERVATIONS

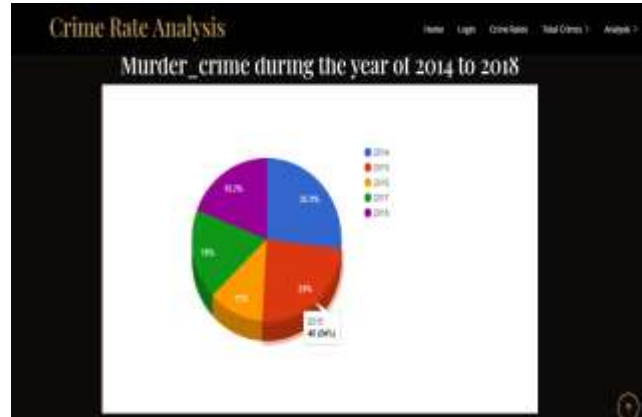


Above Fig is Home Page



Above Fig shows Login Page of Admin

Above Fig shows Graph of crime



Above Fig is Pie Chart of crime



Above Fig shows Total Crimes



Above Fig shows clustering



5.CONCLUSION

Here we conclude that for Crime analysis in any area implemented using python and k-means clustering algorithm. Few preprocessing are applied to datasets to make them precise to workout very faster and easily. Crimes has been analyzed by using clusters. Results are to be found to be fine and accurate. Overall, this technique proves to be feasible in investigation process and model is deployed quickly and efficiently.

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