Crime Prediction & Monitoring Framework Based on Spatial Analysis

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1) Data Collection & preprocessing

2) Data Visualization

→ form of visual Communication

→ Includes Creation & Study of the visual representation of Data.

→ Primary Goal of Data Visualization is to Communicate data clearly & effectively via Statistical Graphics & plots.

→ To Analyze & Reason about Data & Evidence.

3) Module 1 ⇒ Visualization of Crime Data using Google Maps

Module 2 ⇒ Visulazation of Exact Location of Crime with 3D view

Module 3 ⇒ Visualization based on type of Crime

Module 4 ⇒ Visualization of Crime Hotspots

Module 5 ⇒ Crime Frequency Report

Module 6 ⇒ Interactive Crime Frequency Report using Graph & Bar Chart

4) Crime Prediction:

- K-Nearest Neighbour. → used for classification

$$d_i = \sqrt{(x_i - x)^2 + (y_i - y)^2}$$

- Naive Bayes

→ Independency of Attributes.

$$y = \max_{d \in d} \left(p[d_i) \cdot \prod_{k=1}^{n} p\left(\frac{x_k}{d_i}\right) \right)$$

K- Nearest Neighbour:

⇒ The Output is a class Membership.

⇒ An Object is classified by a Majority vote of its neighbour, with the Object being assumed to the class Most Common, among its K- nearest neighbours.

→ Algorithm can be applied to the Crime Dataset.

The problem with the KNN is the Computation. Every time it Computes the Euclidean Distance which Involves squaring and Square root.

$$d_i = |x_i - x| + |y_i - y| + |z_i|.$$