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CRIME ANALYSIS MAPPING AND INTRUSION DETECTION-USING ARTIFICIAL INTELLIGENCE

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Abstract- The investigation of crimes often makes extensive use of data mining. Previous research publications have made reference to a wide variety of methods, some of which include the virtual identifier, pruning strategy, support vector machines, and apriori algorithms. The purpose of VID is to establish a connection between the record and the video. The apriori method provides assistance to the fuzzy association rules algorithm, and the total time required to identify a mail bomb assault is around 600 seconds. In this piece of study, we developed a method for simplifying the procedure known as Crime Mapping Analysis, which was based on algorithms known as KNN (K – Nearest Neighbor) and ANN (Artificial Neural Network). The Office of Community-Oriented Policing Services is responsible for both the conduct and funding of crime mapping (COPS). Research that is based on evidence is helpful in assessing the crimes. Using methods from data mining, we determine the crime rate by calculating it based on the data from before. In order to solve crimes, the field of Crime Analysis employs both primary and secondary data in conjunction with analytical methods. The mapping of criminal activity is an important study topic to focus on for reasons having to do with public safety. With the use of data mining algorithms, we are able to determine which areas have the highest incidence of criminal activity. In order to bring the crime rate down, the following procedures are carried out as part of Crime Analysis Mapping:1) Collect criminal data 2) Group data 3) Grouping together 4) Making projections based on the facts. Crime mapping and analysis, both of which are aspects of crime analysis, contribute to a better knowledge of the principles and procedures of crime analysis, which in turn aids the police in their efforts to reduce and prevent criminal and crime disorders.

I. INTRODUCTION

Crime is one of the most prevalent concerns that can be seen in the metropolitan regions

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of the majority of countries across the globe. There is a wide variety of criminal activity that may take place, such as armed robbery, the theft of motor vehicles, and many more. When there is a higher overall crime rate, the investigative procedure becomes both more time consuming and difficult. The resolution of even the most complex legal matters is often aided by the use of information extraction techniques. Crime analysis combined with crime mapping is one of the most effective ways. Together, crime analysis and crime mapping contribute to a better knowledge of the principles and procedures of crime analysis, which in turn aids the police and contributes to the reduction and prevention of criminal activity and criminal disturbances. The Office of Preventing Crime Services is responsible for both the conduct and funding of crime mapping (COPS). Research that is based on evidence is helpful in assessing the crimes. Using methods from data mining, we determine the crime rate by calculating it based on the data from before. Crime analysis is a method that helps solve crimes by making use of theoretical and practical data as well as analytical tools. The mapping of criminal activity is an important study topic to focus on for reasons having to do with public safety. With the use of data mining algorithms, we are able to pinpoint the areas with the most potential for criminal activity.

II. EXISTING WORK

The number of reported crimes is rising on a daily basis, and people all over the globe are scrambling to find ways to control the crime rate and to make progress on specific instances. The vast majority of individuals are attempting to collect relevant data for use in the future. Errors resulting from human behaviour are always a possibility. There are a variety of offences that fall within the jurisdiction of law enforcement, including traffic infractions, sexual offences, theft, acts of violence, arson, offences related to gangs or drugs, and cybercrime. Among each of them, many criminal data mining strategies are offered, such as entity extraction, clustering algorithms, and Association rule mining. Crime hotspots may be used to determine which areas are prone to higher rates of criminal activity. There is a need for patrol in these high-risk regions. The application for data mining contributes to a significant decrease in the number of reported crimes [1]. As a result of the dramatic rise in the use of networks,

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security has emerged as one of the most pressing concerns about these systems. The following are some of the reasons why data mining is used in network intrusions: • To process vast volumes of data. • It is suited to detect the ignored and hidden information at any point in time. • It is suitable to detect the ignored and hidden information at any point in time. The Intrusion Detection System (IDS) is what's used to find problems that are connected to intrusions on networks. Machine learning is the process of designing and developing algorithms in a manner that enables computers to acquire knowledge from the data that is provided to the machine. This process is referred to as "machine learning." In fields such as bioinformatics, machine learning is used to detect the pattern match in DNA and to check for data connected to genes. The primary responsibility of the Intrusion Detection System is to identify both genuine threats and false positives [2]. It assists in identifying legitimate and fraudulently authentic users, which is beneficial for the maintenance of users' privacy. In recent times, there has been an increase in both false alarms and intrusions, and the methods they are using are significantly different from the conventional ones. The problem of intrusion detection may be handled by using data mining. For instance, the United States Army use it for the management of restrictions in military systems while operating in tactical contexts [3]. One of the most popular types of assaults carried out against websites is the distributed denial of service attack. DoS assaults may be thwarted utilising the information that is gleaned via intrusion detection, which aids in determining what kind of network activity is taking place. Both misuse detection, which relies on an exact pattern match, and anomaly detection, which needs further training in relation to artificial intelligence, are offered here as techniques for detecting intrusions. misuse detection is based on an exact pattern match. A Fuzzy Intrusion Recognition Engine (FIRE) is an Anomaly Intrusion Detection System (IDS) that uses fuzzy methods to identify hostile websites as being untrustworthy. In this case, a threedimensional packet count with a 15-minute interval is utilised to locate the normal network connections and to make an attempt to identify any intrusions that may have occurred at that particular moment in time [4]. A computer's health is comparable to that of a human's in that it requires protection from harmful elements. The

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usage of fuzzy cognitive maps and fuzzy rules both contribute to and are utilised for the acquisition of causal knowledge. As the number of malicious acts committed using computers continues to rise, so does the urgency with which we must safeguard our information. As part of the whole process of intrusion detection, the intelligent intrusion detection system is also built. The values on a fuzzy cognitive map shift around from time to time, and there are ties of causation between the nodes that are used to represent the directed edges [5]. In this, they identified patterns of criminal behaviour by using clustering algorithms. Clustering is a term that refers to the need of determining the location and nature of a crime at a certain moment in time within a geographical region. To locate the location of the plot, we may utilise a map. The most difficult obstacle to overcome is free text areas.

Datamining was able to overcome this problem by splitting the data in both a horizontal and vertical fashion. When the data is stored using the horizontal portioning method, it is a great deal simpler to obtain the data [8]. In today's world, the primary responsibility of any company or organisation is to protect its computer networks by using intrusion detection systems. This document provides readers with a variety of algorithms from which to choose and implement. The fields of machine learning and pattern recognition both benefit from the use of decision trees. ID3 is an algorithm that is based on machine learning and it identifies the branches of a tree by using the root of the tree as the identifying feature. Crossvalidation tests have been carried out in order to determine the patterns, and comparisons have been made between the various kinds of algorithms in order to establish the characteristics and preserve the efficiency [9]. Utilizing the system logs, we are able to conduct an investigation into the breach. Misuse of either private or public information may result in an intrusion. Through the use of Intrusion Systems, we are able to recognise illegal users. Because the logs could take up a lot of space in the system, we need to come up with ways to manage them that are both more flexible and less expensive. In order to evaluate the speed and scalability, support vector machine intrusion detection is put through its paces. A typical assault is constructed using data from 22 distinct examples in order to determine a pattern in this data. The

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training of the neural network systems is what has to be determined as the aim. The fact that neural networks have been employed in a variety of IDSs may be shown by the fact that this technology is used for several categorization categories [10].

III. PROPOSED APPROACH

Using data mining algorithms, crime mapping aids in the reduction and prevention of crimes and criminal disorders, as well as in the comprehension of the ideas and practise of crime analysis, which is of assistance to the police. We might make use of data mining technologies that incorporate artificial neural networks and knowledge discovery in databases (KDD and ANN, respectively). We gather the data from the police department and make an effort to acquire as much information as possible, including the person's name, height, age, sex, fingerprint details, and pattern identification number for instances that are similar to one another. After we have obtained the information, we will immediately begin processing the data. Along with the data that is essential, we receive a lot of data that is not necessary. However, before we begin processing the data using the strategies and tools for data mining, we need to determine which data are superfluous and then get rid of those types of data in order to lessen or completely prevent the confusion. In order to determine the pattern in the crime data, we make use of the SAM tool. We have supervised data and unsupervised data in this case. These are the two categories of data. We start with the data that has all of the specifics of the case, and utilising this supervised data as a basis for our training, we attempt to solve the other instances. We focus primarily on collecting information on traits such as eye colour, fingerprint details, characteristics, size, and any other factors that may be relevant. In its most fundamental form, neural networks are composed of three components: the engineering, often known as the model; the learning calculation; and the enactment capabilities. "...store, perceive, and cooperatively recover examples or database sections; to take care of combinatorial enhancement issues; to channel clamour from estimation information; to control not well characterised issues; in rundown, to evaluate tested capacities when we don't have a clue about the type of the capacities." Neural systems are customised or "prepared" to "...store, perceive, and

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cooperatively recover examples or database sections; to take care of combinatorial enhancement issues; to channel clamour from estimation information; to control not In order to do this, we make use of the KDD, which may be described as an information-based learning revelation. This process involves separating the interesting data from the rest of the information, which necessitates that the data be unique, well-understood (to the point that it is no longer obscure and is now useful), and extracted from a large quantity of the information.

In a similar vein, this encompasses activities such as coordinating, data collection, and general business understanding, among other things. Utilizing this tool will allow for the mining of sufficient amounts of information. Information mining is at the core of KDD and should not be overlooked.

The following is a list of the methods that are involved with the KDD: data cleansing, data putting away, crime associated documents and again design, and assessment. At long last, with the help of these resources, we will receive the data that will be valuable. We will collect the data from the various police divisions with the aid of these devices, and then we will choose the various information for the purposes of testing and compiling the information. The information, once it has been processed through these information mining steps, will then be updated at the information centre point, where the various police divisions will have access to that information. This will allow the police divisions to confirm any irregularities in the information and provide a strong link seen between information, with the goal of preventing and protecting the general public from criminal activity.

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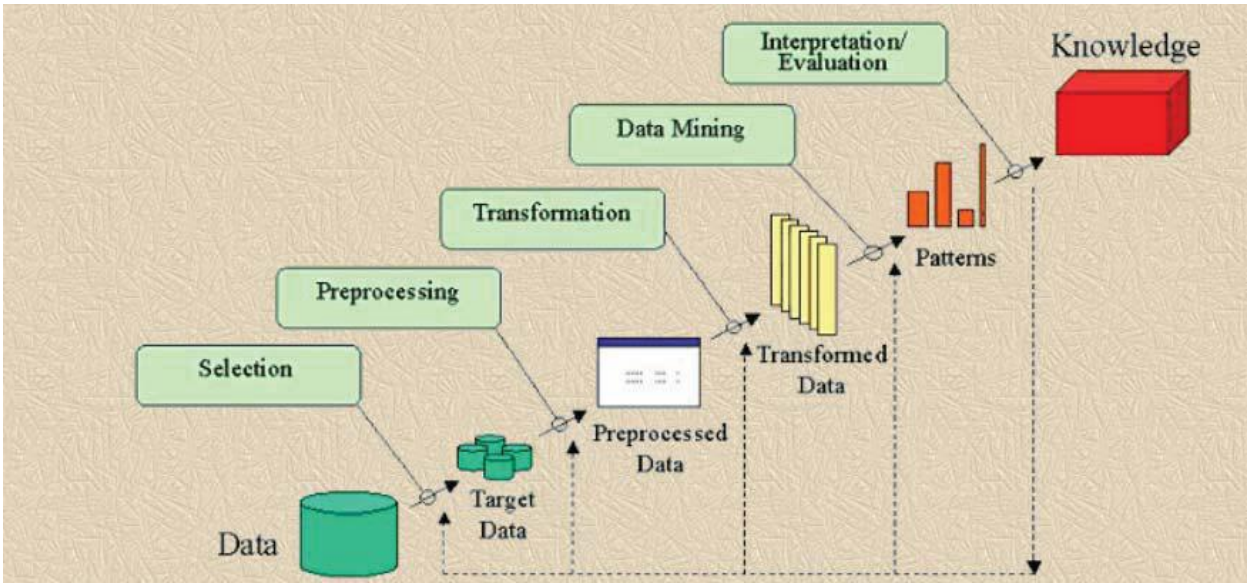

Fig 1: Extracting the knowledge from data

IV. RESULTS

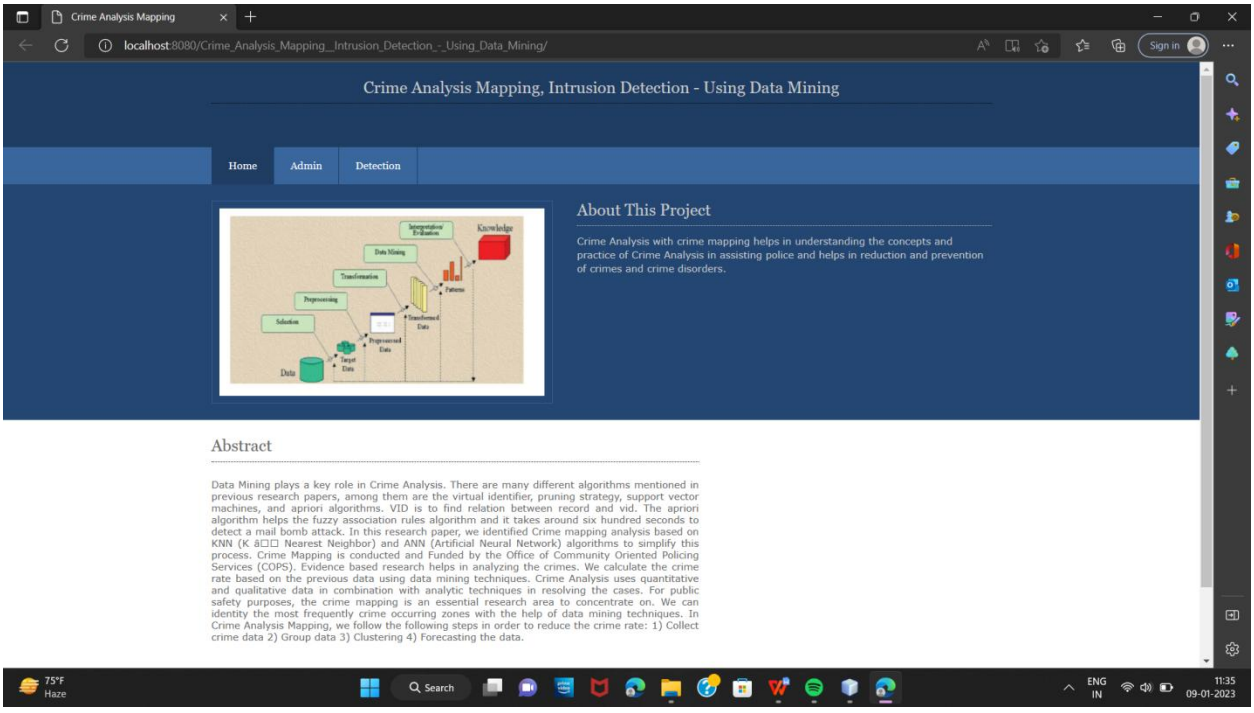

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Fig : Home page

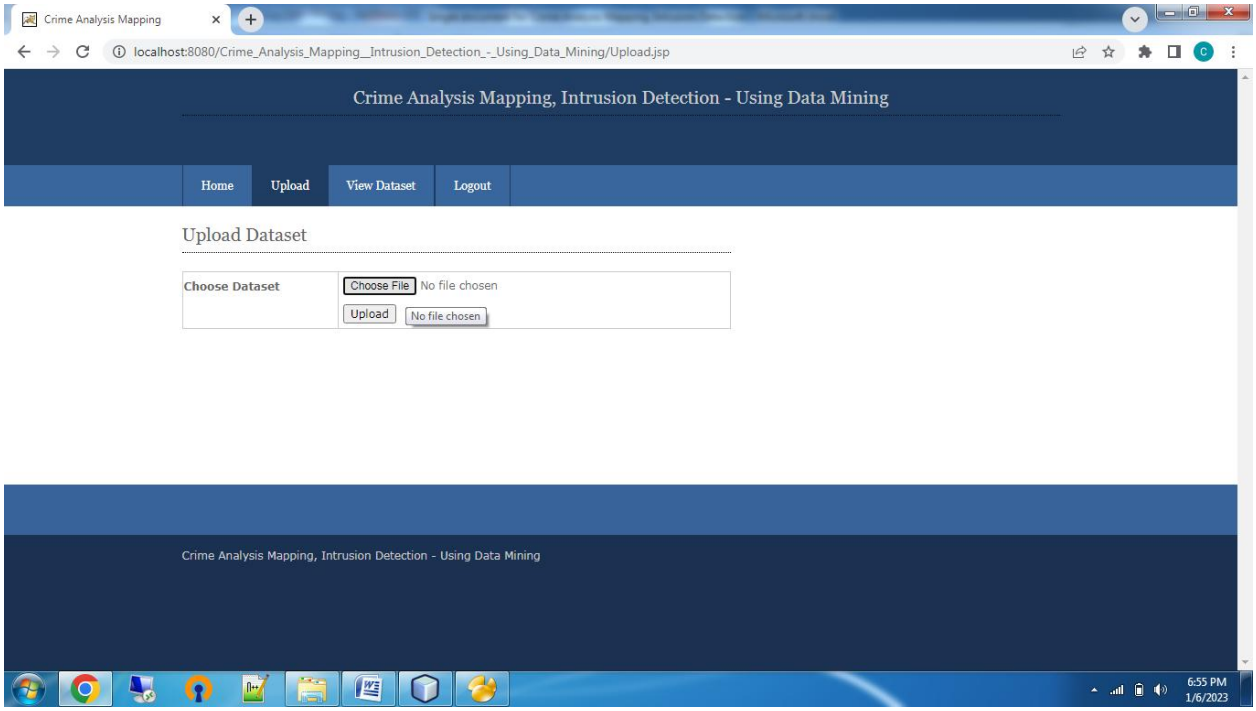

Fig: 3. Admin upload data set

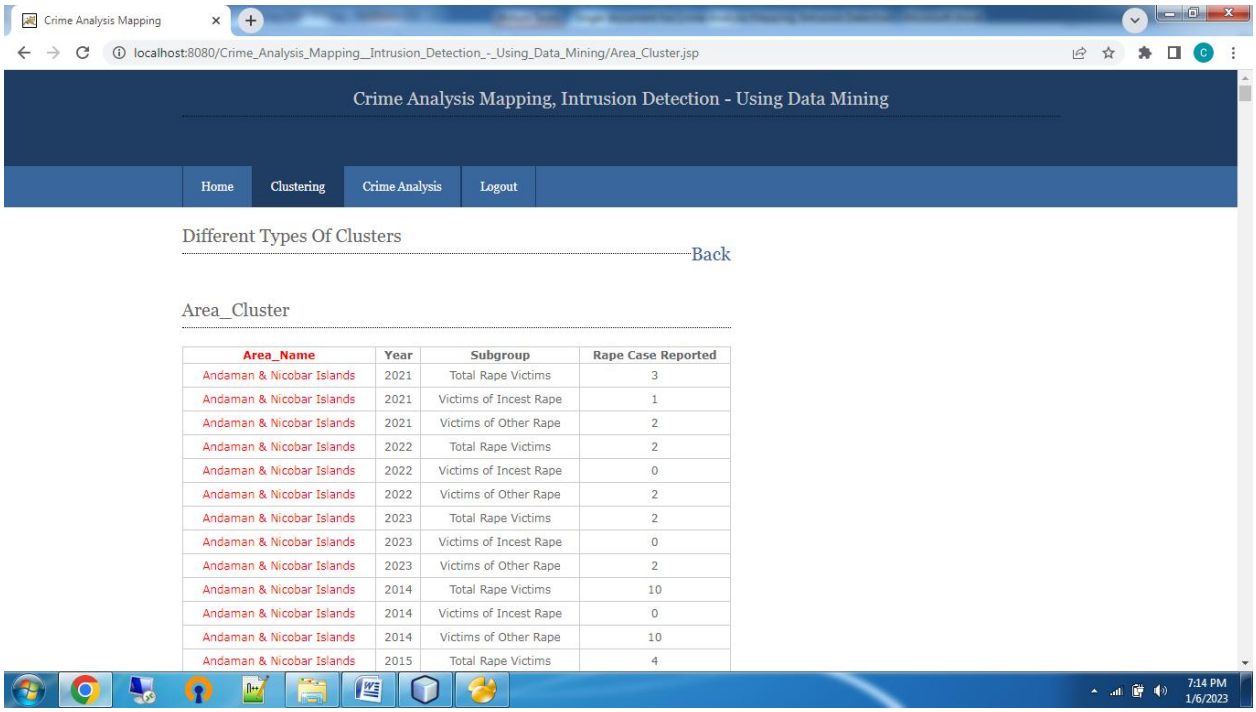

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Fig: 4. View Area Cluster Crime Data

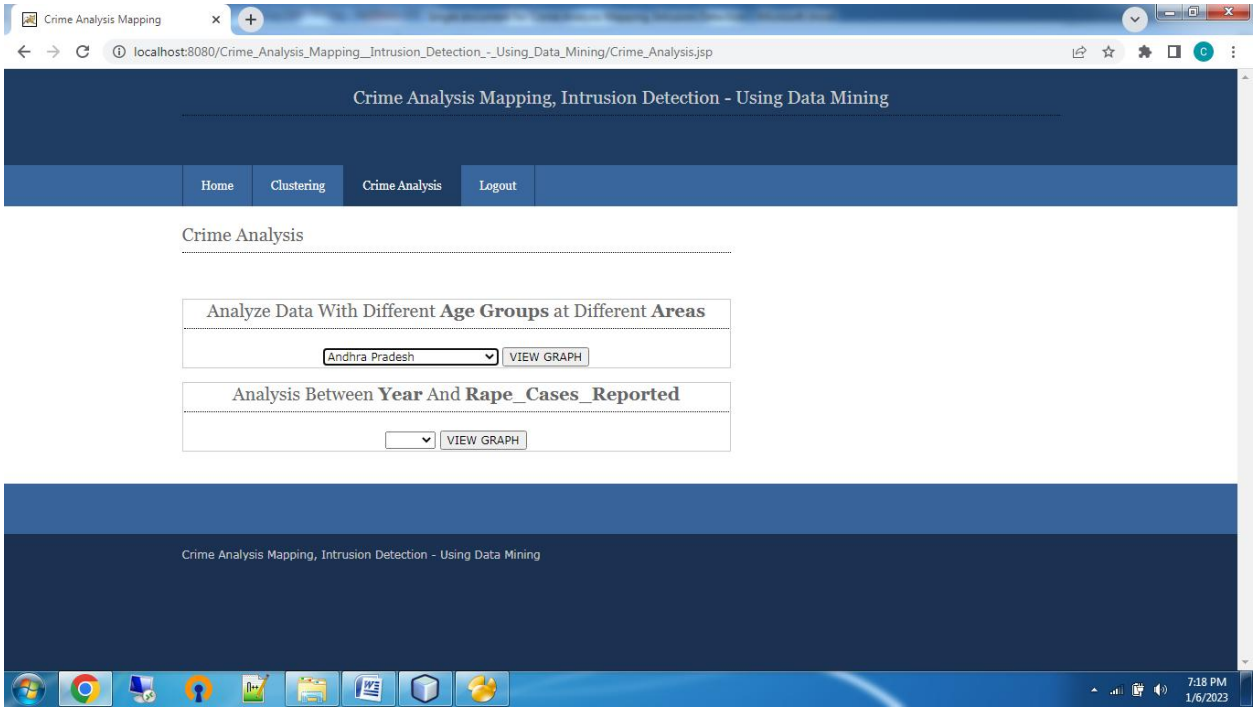

Fig: 5. Analyze data with different Age groups

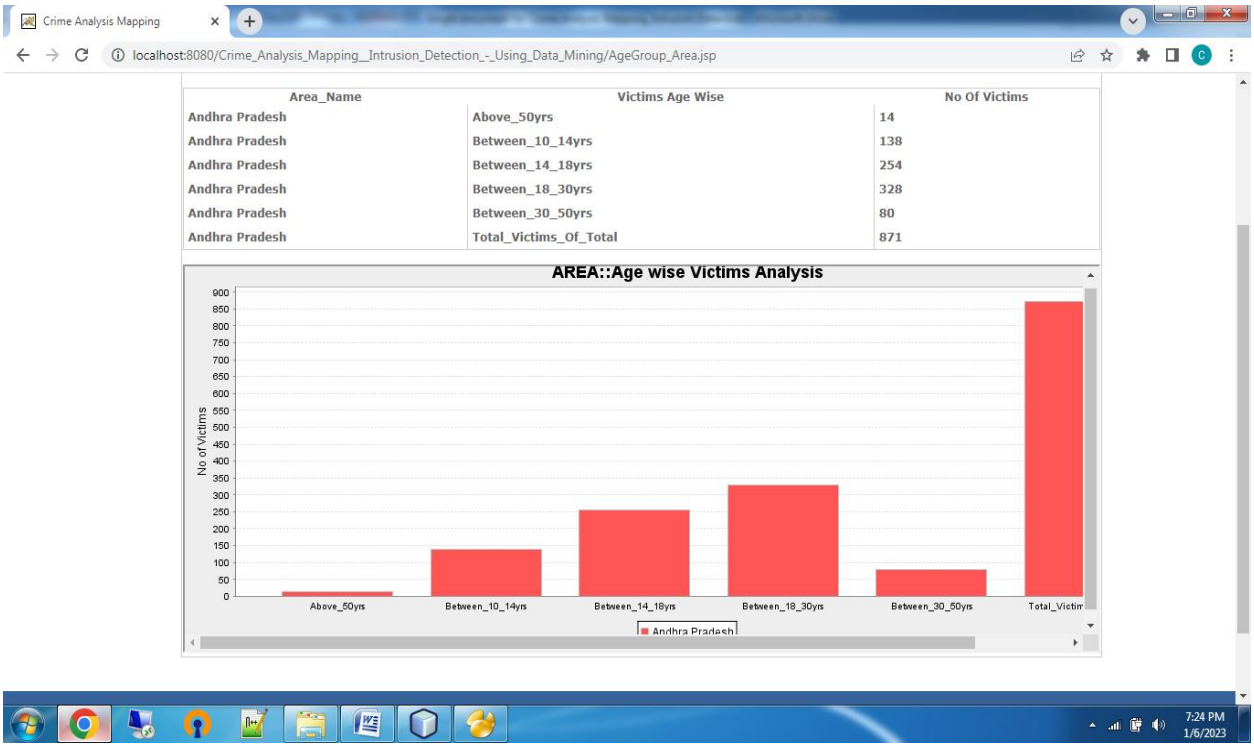

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Fig: 6. View graph

CONCLUSION

With the assistance of these devices, the wrong doing information will be nourished to the information digging device for investigation and afterward comes about for two unique models will be recorded. With the assistance of the SAM instrument/tools, we will maintain a strategic distance from the distinction in the outcome and after that the subsequent information will be utilized for the finding the relations amongst those et cetera. Along these lines we will lessen false positives and false negatives in the field of the interruption identification framework utilizing the information mining in the field of wrongdoing information examination. The operational efficiency of such system would provide automated identification of incidents and emergency response protocols. Furthermore, all information handled by the system would be recorded in the form of an aggregator to produce analytics, statistics and visualizations for gaining insights and future planning, leading to optimization of handling cybercrime incidents by the relevant agencies.

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