Project 2

Final Report

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Group 14

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Chicago Crime Analysis

Introduction:

In recent years, cities across the United States have faced ongoing challenges related to crime and public safety. Chicago, as one of the nation's largest metropolitan areas, has been no exception to this trend. Crime has always been a problem in Chicago, with issues ranging from minor thefts to more serious crimes like killings. Comprehending and tackling these patterns of criminal activity is essential not only for the security and welfare of its citizens, but also for the advancement and expansion of the city. This dashboard gathers and displays a plethora of data about criminal incidents, providing insights into hotspots, patterns, and trends in the city. We examine the Chicago Crime Dashboard in this analysis to get a better grasp of the crime situation in the city, pinpoint significant issues, consequently suggesting viable fixes to enhance public safety.

Problem Statement:

Chicago's crime rate has fluctuated recently, causing policymakers, law enforcement, and community members to express their concerns and engage in debates. The challenge at hand is to thoroughly analyse the Chicago crime data in order to find trends, patterns, and other factors influencing these fluctuations in crime. The purpose of this analysis is to respond to important queries like:

1. Are there any neighbourhoods or areas where certain kinds of crimes are more common?

2. Is there any need to address seasonal or cyclical variations in crime?

3. What are Chicago's crime patterns, both temporally and spatially?

We hope to offer insightful information that can guide the development of evidence-based policies and tactics to increase public safety, lower crime, and improve the standard of living for all city dwellers by tackling these issues through a thorough analysis of Chicago crime data.

Methodology:

Through this analysis, crime trends, hotspots, understanding demographic impacts, crime types that are most frequent in Chicago.

The analysis was carried out in following way:

1. Data Pre-Processing: We handled missing values from the dataset, especially in the "Community Areas" Column. We then aimed at transforming the data into standardized format for date and time fields. Finally we grouped the data. For instance, similar crime types and locations were clubbed together for better analysis.
2. Analysis – Once the data was processed we analysed the data from different aspects. First, we performed descriptive analysis wherein the frequency and trends of different crime types are displayed followed by identifying areas in Chicago with higher crime rates.
   Second, we also implemented Comparative Analysis which aimed at comparing crime statistics across different years and also across different community areas. Last, evaluation of the relationship between crime types and arrest rates is visualized.
3. We then used graphs and charts to visualize key aspects of the data, aiding in the identification of patterns or anomalies thereby making sure that the analysis is legitimate, consistent and valuable so that it is easy to gain insights.

Data Description:

- The dataset is a union of data acquired from various data sources including Chicago Crimes, Chicago Police Department and Chicago Atlas. It provides a comprehensive view of different crime types and their occurrences in various locations within Chicago. The range of years allows for an analysis over a 6 year period. The data was initially grouped by the 'Years' field. We merged several datasets and primarily worked with 7 columns including Description, Primary Type, Location, Arrest, Domestic, Community Area, Year.
- There are 34 distinct categories in the dataset that cover a broad range of crime types. This diversity makes it possible to analyse individual crime categories in great detail, comprehending their frequency as well as how they vary with respect to time, place, and frequency.
- The 412 distinct crime descriptions in the dataset offer a detailed perspective of criminal activity. Understanding the subtleties of each type of crime can be aided by this level of detail, which may also highlight sub-patterns within larger categories.
- Rich data for spatial analysis is available in the "Community Area" and "Location Description" fields. Possible analytical paths include locating crime hotspots, comprehending how crime distribution differs between neighbourhoods, and connecting particular crime types with particular locations.
- The six-year data set makes it possible to analyse both yearly fluctuations in crime rates and short-term trends. This can assist in spotting any cyclical patterns and show whether a given crime is rising or falling over time. The 'Domestic' field demonstrates how well the dataset can discriminate between crimes that are domestic and those that are not. This is essential knowledge for comprehending the types, frequencies, and characteristics of domestic crimes in Chicago.

Key Insights:

Based on the initial analysis of the Chicago crime data, here are some key insights:

- Theft accounts for 426,661 of all crimes, with Battery coming in second with 314,488 cases, Criminal Damage with 208,883 cases, Assault with 127,675 cases, and Deceptive Practice with 100,440 cases.
- This distribution indicates that property-related crimes—like theft and criminal damage—occur more frequently than violent crimes. Area West Garfield Park had the greatest number of crimes (113,411 cases), followed by Fuller Park (82,394 cases), North Lawndale (67,237 cases), Kenwood (65,912 cases), and Grant Boulevard (65,754 cases) following in order.
- 'Public Indecency' and 'Gambling' have the highest arrest rates (nearly 100%), closely followed by 'Prostitution' (approx. 99.83%), 'Liquor Law Violation' (approx. 99.7%), and 'Narcotics' (approx. 99.64%). These high arrest rates in certain categories might reflect law enforcement priorities or the nature of these crimes being more likely to result in arrests.
- The most frequent location for crimes is 'Street' (467,491 cases), followed by 'Residence' (324,842 cases), 'Apartment' (299,423 cases), and 'Sidewalk' (151,497 cases). The prevalence of crimes in public spaces like streets and sidewalks suggests a focus area for public safety measures.
- The most common domestic-related crimes are 'Battery' (180,092 cases) and 'Domestic Assault'. This high incidence of domestic violence calls for targeted interventions and support systems for affected individuals.

Policymakers can use the insights to help them allocate resources more wisely by concentrating on public safety and drugs in high-crime areas, for example. The need for strong community support and intervention programs is highlighted by the high rates of domestic crimes. These conclusions from a more thorough examination of the data can help Chicago make more focused and sensible policy choices regarding crime prevention. These locations might be the focus of community intervention initiatives or more police presence if they are determined to be crime hotspots.