

**Final Assignment White Paper**

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# **Exploring Crime Trends in New York City: A Comprehensive Data Analysis:**

# **Introduction:**

In this team paper, we present a detailed analysis of crime trends in New York City (NYC) using the NYC Crimes dataset. Our analysis aims to gain a comprehensive understanding of crime dynamics in the city, identify key trends, and provide insights that can inform decision-making processes.

**Questions Explored:**

* What are the overall crime trends in NYC over the past decade?
* Are there specific types of crimes that are more prevalent in certain boroughs or precincts?
* How do crime rates vary by demographic factors such as age, gender, and race?
* Are there temporal patterns in crime occurrence, such as seasonality or time of day?
* What are the hotspots of crime in NYC, and how have they changed over time?

**Variables Utilized for Analysis:**

* Crime Type (e.g., Felony Assault, Robbery, Burglary)
* Borough
* Precinct
* Age Group
* Gender
* Race
* Date/Time of Crime

**Methods Employed:**

* Data Cleaning: We cleaned the dataset to remove any inconsistencies or missing values.
* Descriptive Statistics: We calculated summary statistics to understand the distribution of crime across different variables.
* Temporal Analysis: We examined how crime rates vary over time, including daily, monthly, and yearly trends.
* Spatial Analysis: We mapped crime incidents to identify hotspots and spatial patterns.
* Demographic Analysis: We analyzed crime rates by demographic factors such as age, gender, and race.

**Potential Insights and Visualizations:**

Our analysis encompasses various visualizations and summaries, providing comprehensive insights into crime trends in New York City (NYC). These findings are instrumental in understanding the multifaceted nature of crime dynamics within the city. Below are the key areas of investigation and their corresponding visual representations:

* Overall Crime Trends: The line chart illustrates the overall trend of arrests in NYC for the year 2023. Notably, February recorded the lowest number of arrests at 16,774. However, there was a significant peak in May, with 20,918 arrests, followed by a dip in September to 16,744. Overall, the trend line exhibits an upward trajectory throughout the year.
* Crime Distribution by Borough: A visually striking stacked bar chart reveals the distribution of offenses across NYC's boroughs. Notably, the majority of arrests are related to burglary and theft offenses, with Manhattan recording the highest number of arrests in this category.
* Demographic analysis: A pie chart reveals that individuals of Black ethnicity account for the highest number of arrests, with a peak of 82,041, emphasizing the need to address racial disparities in law enforcement practices.
* Bar Chart for Arrests by Age Group and Gender: A bar chart displaying arrests by age group and gender reveals intriguing patterns within the dataset. Notably, the age group of 25-44 stands out as the period with the highest number of arrests for both males and females. However, there is a notable discrepancy in arrest numbers between genders within this age range. While males in the 25-44 age group account for a substantial 79,000 arrests, females in the same age bracket have significantly fewer arrests, totaling approximately 17,000. Interestingly, the age group of 18-24 also exhibits a high number of arrests for males, approximately 24,000, surpassing the number of arrests for females in the 25-44 age group. This disparity underscores the need for further examination of gender-specific factors influencing arrest rates and highlights potential areas for targeted intervention and support initiatives.

**Design Decisions:**

* Color Scheme: A minimalist color scheme has been adopted for the dashboard to ensure clarity and coherence in visual presentation, avoiding distractions and enhancing readability.
* Stacked Bar Chart for Offenses by Boroughs: Stacked bar chart was chosen to analyze arrests for various offenses across different boroughs of NYC. This choice allows for clear visualization of the total number of arrests in each borough, while also showcasing the composition of offenses within each borough. Grouping offenses into similar categories helped streamline the visualization and reduce clutter, making it easier for viewers to identify trends and patterns across boroughs.
* Grid Lines Removal: Grid lines were intentionally removed from the stacked bar chart to minimize cognitive load and improve the focus on the data. By eliminating unnecessary visual elements, such as grid lines, the chart becomes cleaner and more visually appealing, enhancing overall readability.
* Trend Line in Arrests Over Timeline Chart: A trend line was added to the line chart depicting arrests over time to illustrate the overall trajectory of arrests. This addition provides viewers with a clear understanding of the general trend in arrest rates over the specified time-period, aiding in trend analysis and interpretation.
* Bar Chart for Arrests by Age Group and Gender: A bar chart was selected to visualize arrests by age group and gender, with age groups represented on the x-axis and separate bars for each gender. This choice allows for easy comparison between different age groups and genders. Similar to the stacked bar chart, grid lines were removed from this visualization to reduce cognitive load and improve focus on the data points. This design decision enhances clarity and readability, making it easier for viewers to interpret the information presented.

**Conclusion:**

In conclusion, the analysis of the New York City (NYC) crime dataset has provided valuable insights into the complex dynamics of criminal activity within the city. Through the utilization of various visualizations, including stacked bar charts, line charts, and bar charts, we have been able to discern trends and patterns across different dimensions of crime, such as offenses by boroughs, temporal variations, and demographic distributions. These findings underscore the importance of data-driven approaches in understanding crime trends and informing strategic decision-making for law enforcement agencies and policymakers. By leveraging these insights, stakeholders can develop targeted interventions and initiatives aimed at addressing crime hotspots, reducing disparities, and fostering safer communities in NYC. Moving forward, continued analysis and exploration of the dataset will be essential for gaining deeper insights and driving impactful solutions to combat crime and enhance public safety in the city.

**References**

<https://www.tableau.com/support/help>