Police Vehicle Stops Data Analysis

Group 5

Team Members -

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- Divya Sri Dodla
- Yi-yang Chen
- Yanchen Jing

Motivation -

Understanding and analyzing the temporal and demographic distributions of police vehicle stops is a critical issue that has wide-ranging implications for community safety, law enforcement practices, and the protection of civil rights. It is essential to recognize that data analysis in this context is not just a technical endeavor but a way to shed light on potentially systemic issues that could affect people's lives. This project can serve as a powerful tool to promote transparency, accountability, and fair policing practices. By revealing patterns and trends in police vehicle stops, we can help bridge the gap between law enforcement and the communities they serve.

- **Enhancing Accountability and Transparency:** Understanding when police vehicle stops occur, as indicated by the "Timestamp," "Stop_date," and "Stop_time," can lead to increased accountability within law enforcement agencies. By analyzing this temporal data, we aim to shed light on potential patterns, uncover any irregularities in the timing of stops, and promote transparency in law enforcement practices.
- **Promoting Equitable Resource Allocation:** Identifying locations where police vehicle stops frequently occur, as related to "Service_area," is crucial for effective resource allocation. By analyzing these data points, we can help law enforcement agencies target their efforts more efficiently, ensuring that resources are deployed to areas with the greatest need, thus enhancing community safety.
- **Advocating for Fair Policing:** Analyzing the relationship between "Subject_age" and the "Stop_cause" can uncover insights into the fairness and appropriateness of stops. We aim to examine age-related trends to determine if certain age groups are disproportionately affected by specific reasons for stops, promoting fair and unbiased policing practices.
- **Addressing Potential Bias and Discrimination:** Understanding the relationship between "Subject_race" and the actions taken during stops, such as "Arrested," "Searched," "Obtained_consent," and "Property_seized," is critical for addressing potential bias and discrimination. Analyzing these data points can help identify disparities and drive actions to ensure equal treatment for all individuals, regardless of their racial background.

Some types of plots and visualizations that can be generated based on your problem statement and motivation:

- **Temporal Analysis:**
    - Line plots to visualize the trends in the number of stops over time.
    - Histograms or bar plots to show the distribution of stops by day of the week or time of day.

- **Geospatial Analysis**:
    - Heatmaps or choropleth maps to identify areas with frequent police stops.
    - Scatter plots with geographical coordinates to show the distribution of stops on a map.
- **Age vs. Reason for Stops:**
    - Box plots or violin plots to compare the distribution of subject ages for different stop causes.
    - Stacked bar charts to show the proportion of stop causes for different age groups.
- **Race vs. Actions Taken:**
    - Grouped bar charts to compare actions taken during stops for different racial groups.
    - Pie charts or stacked bar charts to show the proportion of different actions taken for each racial group.

Tentative Timeline -

Week Starting	**Task**	**Param Chordiya**	**Ninad Ekbote**	**Divya Sri Dodla**	**YYi-yang Chen**	**Yanchen Jing**
Nov 7	Data Exploration and Familiarization	X	X	X	X	X
Nov 14	Data Cleaning and Preprocessing	X	X	X	X	X
Nov 21	Exploratory Data Analysis (EDA)		X	X		X
Nov 28	Feature Engineering and Selection	X	X		X	
Dec 5	Statistical Analysis and Modeling	X		X	X	X
	Results Interpretation, Plotting, and Presentation Preparation	X	X	X	X	X
Dec 12	Final Presentation	X	X	X	X	X