DS 3000 Group 34 Project Proposal

Teammates:

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Title:

Exploring Factors Contributing to Vehicle Collisions in New York City

Introduction to Topic:

New York City, a unique and densely populated city, stands apart due to its distinctive geography, with various areas separated by land and water. This geographical diversity fuels a high transportation rate within the city, making it a hub of constant movement and activity. However, this bustling urban landscape encounters daily occurrences of vehicle collisions, demonstrating the challenges that come with managing such a dynamic transportation system. The data concerning these incidents are recorded and stored in New York City's open data repository, presenting a valuable resource for data science projects. These datasets have the potential to reveal critical insights into the patterns and factors contributing to vehicle collisions, ultimately paving the way for data-driven solutions to enhance the safety of New York City residents and commuters.

Relevant Facts or Interesting Aspects:

- **Pedestrian Prevalence:** Between 2009 and 2011, a significant number of traffic-related fatalities in New York City involved pedestrians, particularly among older adults (75%) and children (65%). Manhattan had the highest percentage of pedestrian fatalities at 69% [1].
- **Borough Collision Rates:** In 2023, Queens and Brooklyn accounted for over half of all car accidents in New York City, surpassing other boroughs in collision rates [2].
- **Vision Zero Initiative:** New York City's Vision Zero initiative aims to eliminate traffic-related fatalities and injuries, emphasizing the need for data-driven solutions to improve road safety [3]
- **Impact of Speed Limits:** Utilizing the 'VZV Speed Limits" dataset, we can explore whether areas with higher speed limits experience more collisions than

those with lower speed limits. This analysis can offer insights into speed limit adjustments and their impact on road safety [4].

- **Exploring Contributing Factors:** The dataset reveals diverse contributing factors, including alcohol involvement, driver inattention, unsafe speed, aggressive driving/road rage, and driver inexperience. These factors collectively shape New York City's collision landscape, offering deeper insights into incident dynamics [5].
- **Varied Demographics:** Demographics play a significant role, with males experiencing a traffic-related fatality rate more than twice that of females (4.9 vs. 1.8 per 100,000 New Yorkers). Older New Yorkers aged 65 and above face the highest fatality rate, emphasizing the vulnerability of this age group. Interestingly, traffic-related fatality rates remain relatively consistent among different race/ethnicity groups, with disparities within narrower age brackets [1].

Clear Definition of the Problem:

What factors contribute to variations in the frequency of vehicle collisions across New York City's boroughs, considering demographics and contributing factors like alcohol and road rage?

Motivation and Explanation:

New York City is a vibrant metropolis that boasts a diverse transportation landscape, including a robust public transit system, extensive biking lanes, and personal vehicles. However, with this active environment, daily vehicle collisions serve as a stark illustration of the challenges inherent in managing such a dynamic transportation system.

The motivation behind our comprehensive analysis stems from the need to improve the safety and well-being of both residents and visitors in New York City. This need is driven by the understanding that, despite the city's impressive transportation infrastructure, accidents continue to impact the lives of numerous individuals.

Our primary goal is to explore the multifaceted nature of vehicle collisions, driven by several key reasons. Firstly, a significant portion of traffic-related fatalities in New York City involve pedestrians [1]. We plan to uncover the factors contributing to this concerning trend.

Secondly, the disparities in collision rates among New York City's boroughs, particularly Queens and Brooklyn, where accidents are most concentrated, call for our attention [2].

By investigating the underlying causes, we aim to pinpoint areas requiring the most intervention.

Furthermore, our analysis will delve into demographic influences, including gender and age, to understand how these factors impact traffic-related fatalities [1]. By examining the trends between demographics and accident rates, we can identify disparities and vulnerable groups, thereby laying the groundwork for targeted strategies to reduce accidents.

Lastly, our investigation of contributing factors, ranging from alcohol involvement to aggressive driving/road rage, represents a critical element of our analysis [5]. These factors are intertwined in New York City's vehicle collisions, influencing the dynamics of these incidents. A thorough understanding of these factors is crucial in developing effective prevention strategies.

It's worth noting that preventing accidents caused by vehicles is a priority for any city. Measures such as installing stop signs, enhancing public transportation, and expanding biking lanes can all contribute to accident prevention. However, budget constraints may limit widespread implementation. Thus, prioritizing areas for intervention becomes crucial in reducing accidents effectively. Analyzing vehicle collisions in New York City aids in this prioritization. Identifying high-accident zones allows for targeted safety measures, optimizing resource allocation, and saving city funds.

Ultimately, we aim to understand New York City's vehicle collisions and their causes, striving for a safer city with fewer accidents and preserved lives. Our mission is not only to identify areas with high collision rates, but also to thoroughly examine and understand the underlying factors that lead to these collisions, driving positive change for the city's residents and commuters.

Description of Goals and Objectives:

- Obtain extensive vehicle collision data from various sources.
- Clean and prepare the collected data, filtering out invalid entries to draw meaningful conclusions.
- Conduct thorough data analysis to uncover insightful patterns, refining the research question as needed.
- Identify factors contributing to variations in collision frequency, including demographics and contributing factors.
- Refine the question if needed and proceed on to make conclusions with the processed data.

- Examine collision rates across New York City's boroughs to pinpoint areas with high collision rates.
- Develop data-driven recommendations to improve road safety and reduce collision rates across the city.

References:

[1] "Traffic Fatalities in New York City," 2000. [Online]. Available: https://www.nyc.gov/assets/doh/downloads/pdf/epi/databrief59.pdf
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[2] "NYC Car Accident Statistics In 2023 – Forbes Advisor," *www.forbes.com*. https://www.forbes.com/advisor/legal/nyc-car-accident-statistics/#:~:text=The%20Main%20Cause%20of%20Car
[Accessed Oct. 15, 2023].

[3] City of New York. "Vision Zero - Open Data." [Online]. Available: https://www.nyc.gov/content/visionzero/pages/open-data
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[4] City of New York. "VZV_Speed limits." [Online]. Available: https://data.cityofnewyork.us/Transportation/VZV_Speed-Limits/7n5j-865y
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[5] City of New York. "Motor Vehicle Collisions - Crashes." [Online]. Available: https://data.cityofnewyork.us/Public-Safety/Motor-Vehicle-Collisions-Crashes/h9gi-nx95
[Accessed Oct. 15, 2023].