Visualizing Trends in Car Accidents in the US from 2016 to 2023

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***Abstract*—The abstract goes here. On multiple lines eventually.**

***Index Terms*—car accidents; data visualization; R**

Introduction

The primary objective of this project is to identify and visualize meaningful trends in US car accidents from 2016 to 2023. Our goal is to uncover when accidents occur most frequently, whether by time of day, day of the week, or month of the year, and determine if specific holidays are associated with increased accident rates. We also aim to explore geographic trends by identifying which states experience the highest and lowest number of accidents and assessing whether environmental factors such as weather, visibility, or road conditions contribute to accident severity. Additionally, we will examine long term trends in accident frequency to understand how they have changed over the years. By presenting our findings through a series of targeted visualizations, we hope to provide insights that could be valuable for public safety efforts, transportation planning, or future academic research.

Methods

Dataset

Several entities, such as the U.S. Department of Transportation and local law enforcement agencies, collect and store data related to car crashes. This data is gathered through various means, including traffic cameras, traffic sensors, and police reports. The dataset compiled by Sobhan Moosavi contains records of approximately 1.5 million car accidents that occurred between February 2016 and March 2023. This extensive dataset includes detailed information about each crash, such as the severity of the accident, the date it occurred, the weather conditions, the location of the accident, among other factors.

The raw dataset contains x observations (rows) of y variables (columns).

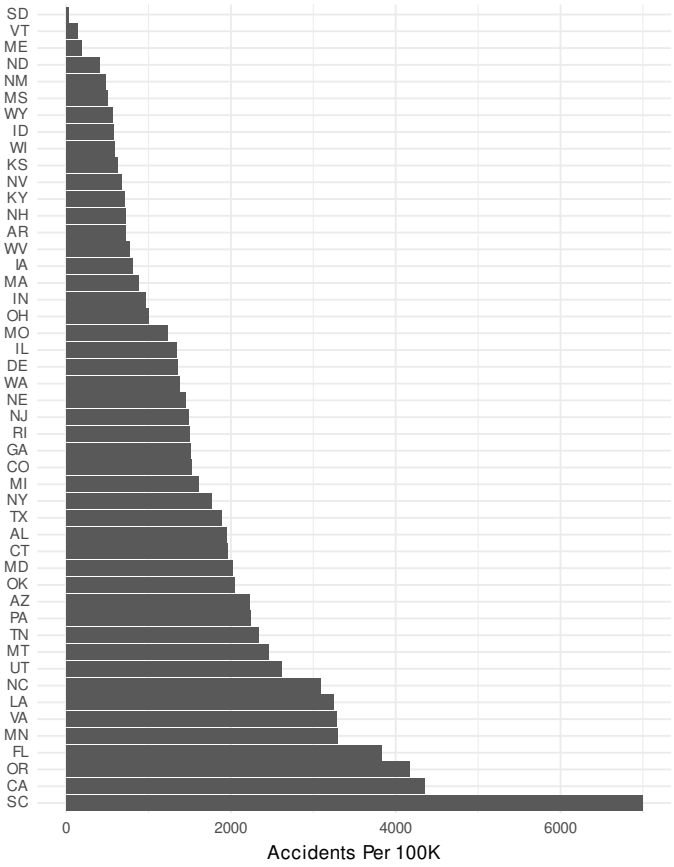

Fig. 1. Bar Chart Displaying Total Accidents Per 100K by State (2016 – 2023)

Data Preparation

Data Analysis

Results

Geographic Analysis

Total Number of Accidents Per State: As seen in Figures 1, 2, and 3, we can observe that, when adjusted for population, the following states: South Carolina, California, Oregon, Florida, Minnesota, had the most accidents from 2016 to 2023.

Average Accident Severity Per State: As shown in Figure 2, ...

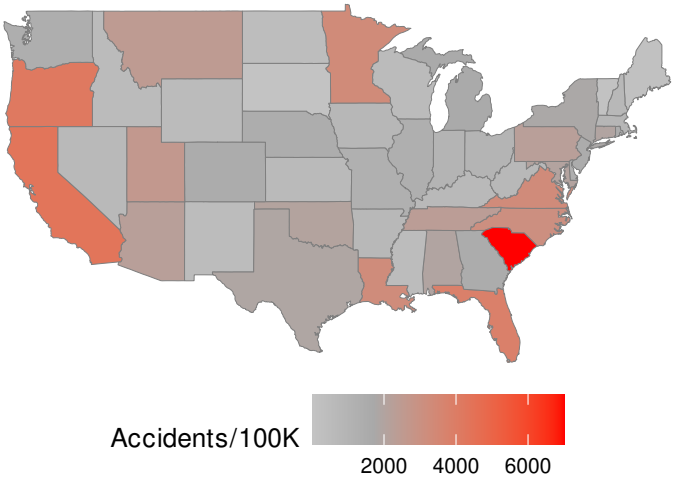

Fig. 2. Choropleth Map Displaying Total Accidents Per 100K by State (2016 – 2023)

Top 5 States with Most Accidents

State	Accidents Per 100K
South Carolina	6992.596
California	4351.219
Oregon	4167.566
Florida	3831.624
Minnesota	3300.101

Fig. 3. Choropleth Map Displaying Total Accidents Per 100K by State (2016 – 2023)

Top 5 States with Worst Average Severity

State	Average Accident Severity
Georgia	2.507235
Wisconsin	2.473455
Rhode Island	2.459224
Kentucky	2.452863
Colorado	2.441580

Fig. 4. Choropleth Map Displaying Total Accidents Per 100K by State (2016 – 2023)

Discussion

Conclusion

The conclusion goes here.

References