USA TRAFFIC ACCIDENT ANALYSIS

POWER BI PROJECT

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Introduction

- This project aims to analyze traffic accidents data to identify patterns related to road conditions, weather, and time of the day and visualize accidents hotspots and contributing factors

- It aims to analyze the provided dataset to discover insights that can be visually expressed through the data

Data Source

US Accidents dataset(February 2016 to March 2023)

Dataset Description

US Accidents dataset

- This is a countrywide car accident dataset that covers 49 states of the USA.

- The accident data were collected from February 2016 to March 2023, using multiple APIs that provide streaming traffic incident (or event) data.

- This dataset consists of 45 columns

Objectives

- Identify 5 states have the highest number of accidents?

- Clean and organize the data to ensure consistency and integrity of information.

- Conduct exploratory data analysis to identify patterns, trends, and potential anomalies.

- To determine the time of day with the most frequent accidents

- Identify the days of the week with the most accidents

- Identify the month have the most accidents?

- Analyze the year-over-year trend in accidents

Overview

- Data Loading
- Data Transformation
- Time Series Analysis
- Trend Analysis
- Dashboard
- Summary and Key Insights
- Reference and Acknowledgements

Data Loading
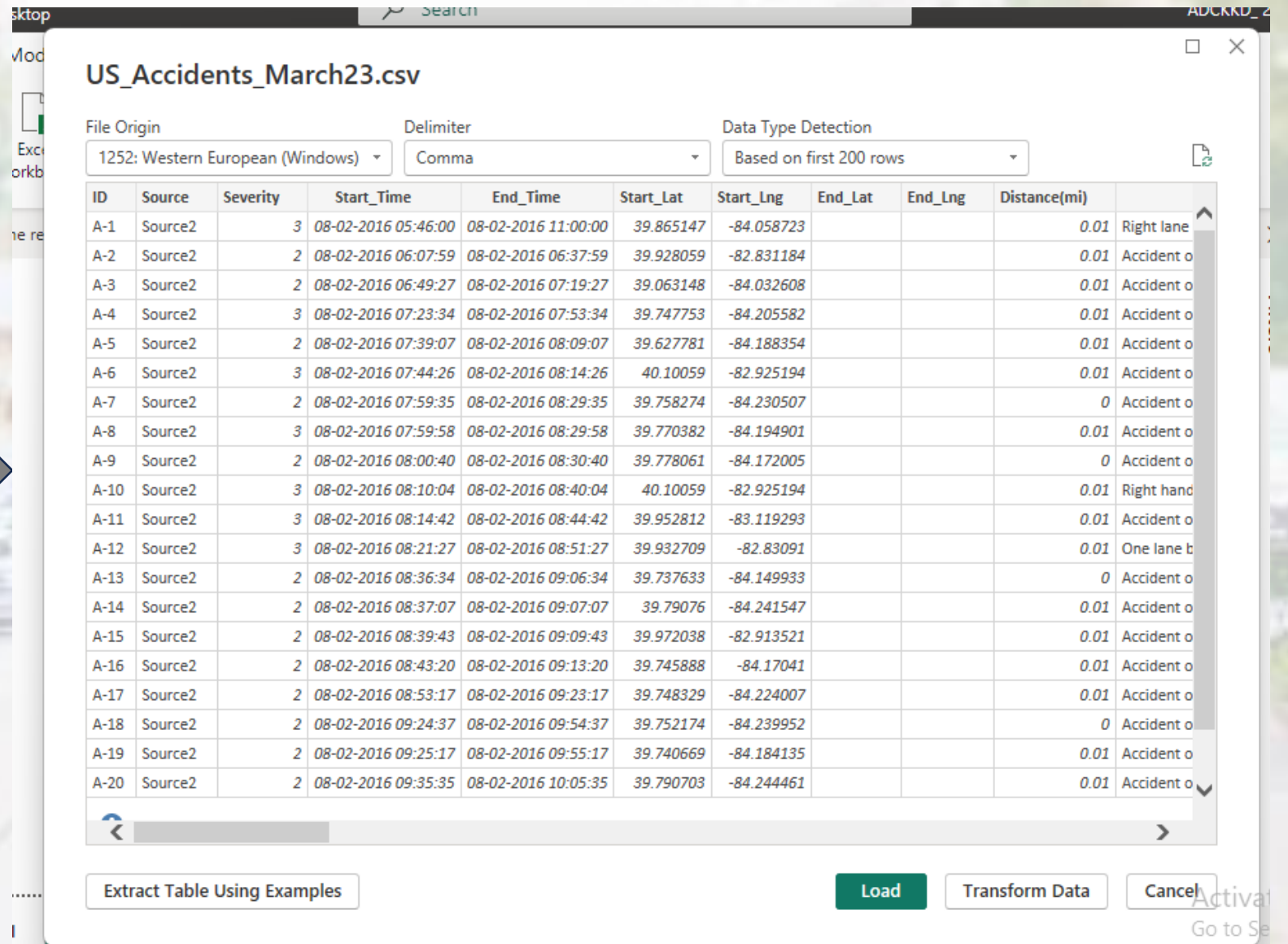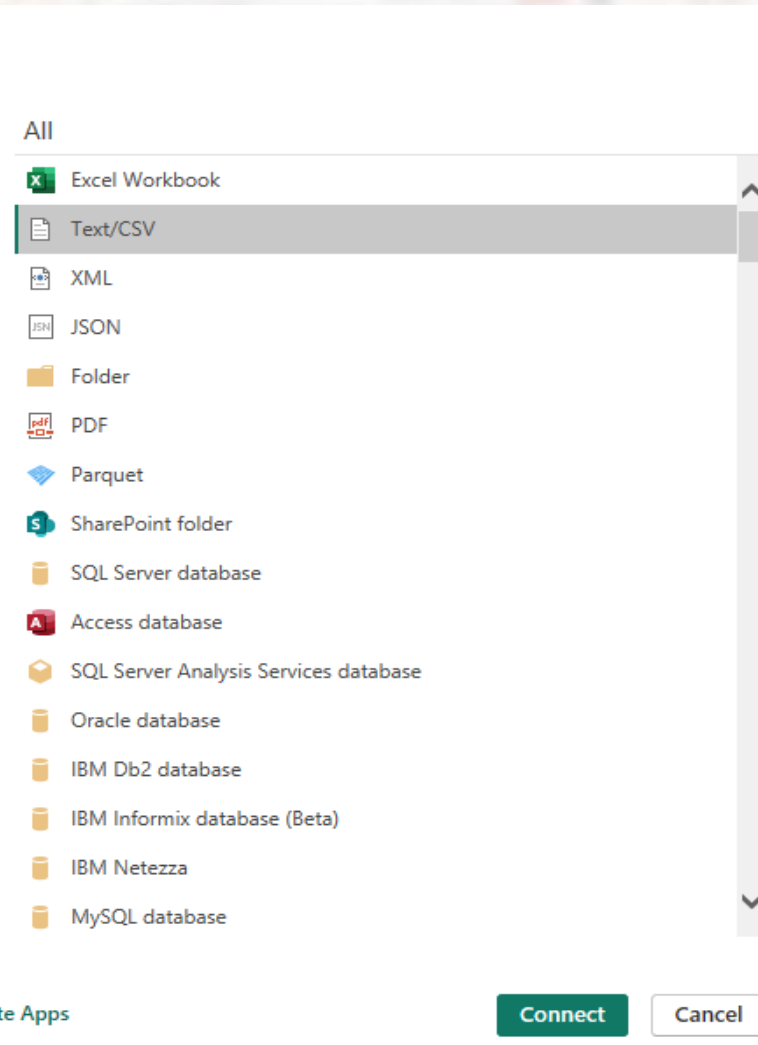
Data Transformation

- Filtered Rows
- Removed unnecessary Columns
- Changed Data type of some of the columns
- Removed Blank Rows

- Loading transformed data
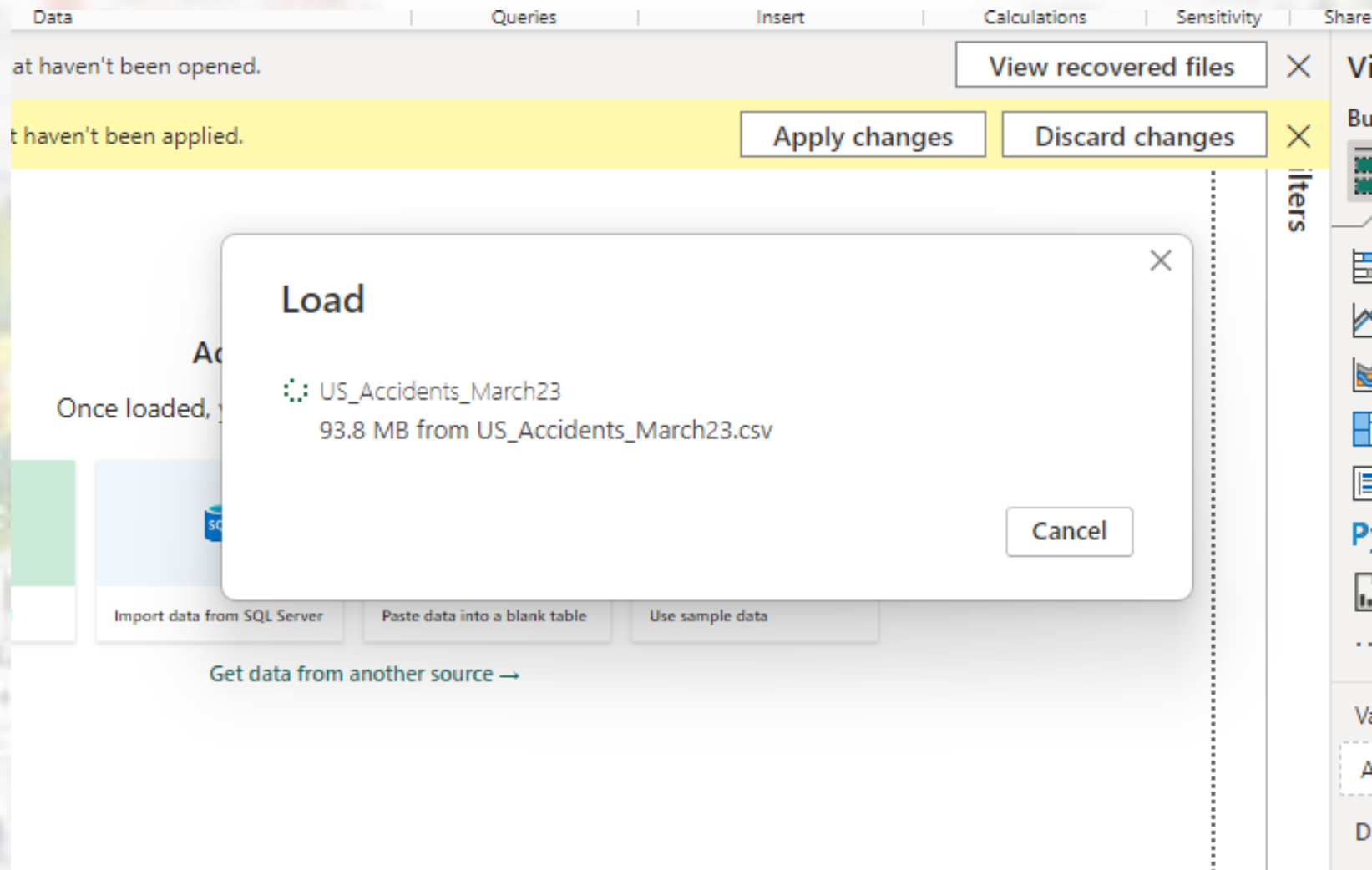
Time Series Analysis

- Analyzed the number of accidents over time

Chart Type: Line Chart

Conclusion:
The year 2022 had the highest number of accidents
From 2018 to 2022 there has been an exponential increase in the number of accidents in USA
The occurrence of accidents decreases significantly in 2023, likely due to data availability only until March 2023.
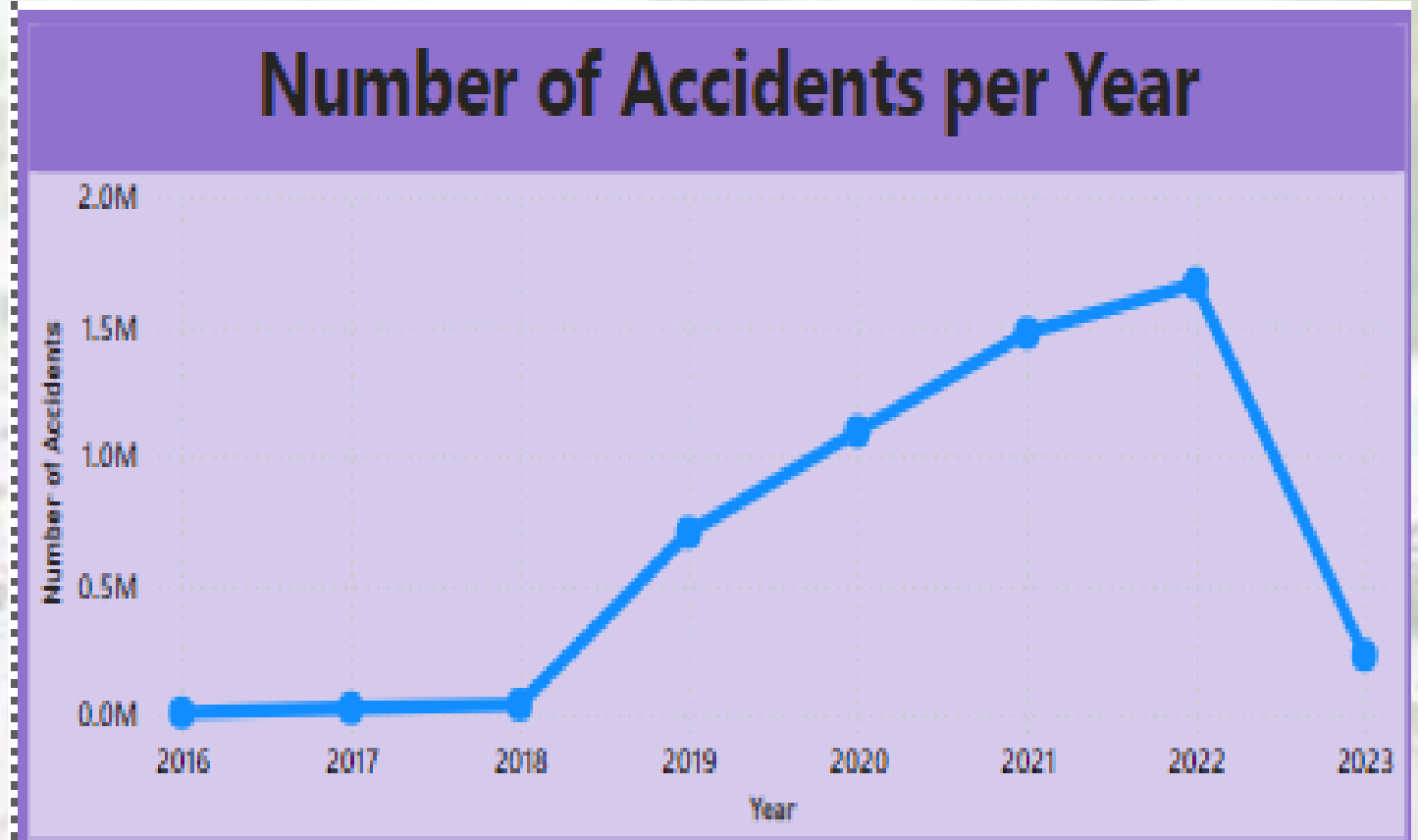
Analyzed the number of accidents monthly

Chart Type: Line Chart

Conclusion:
From the graph, most accidents occurred in the month of December with 62K total accidents followed by January with 52.8 K accidents. This may have been caused by the festive season

Accidents per Month
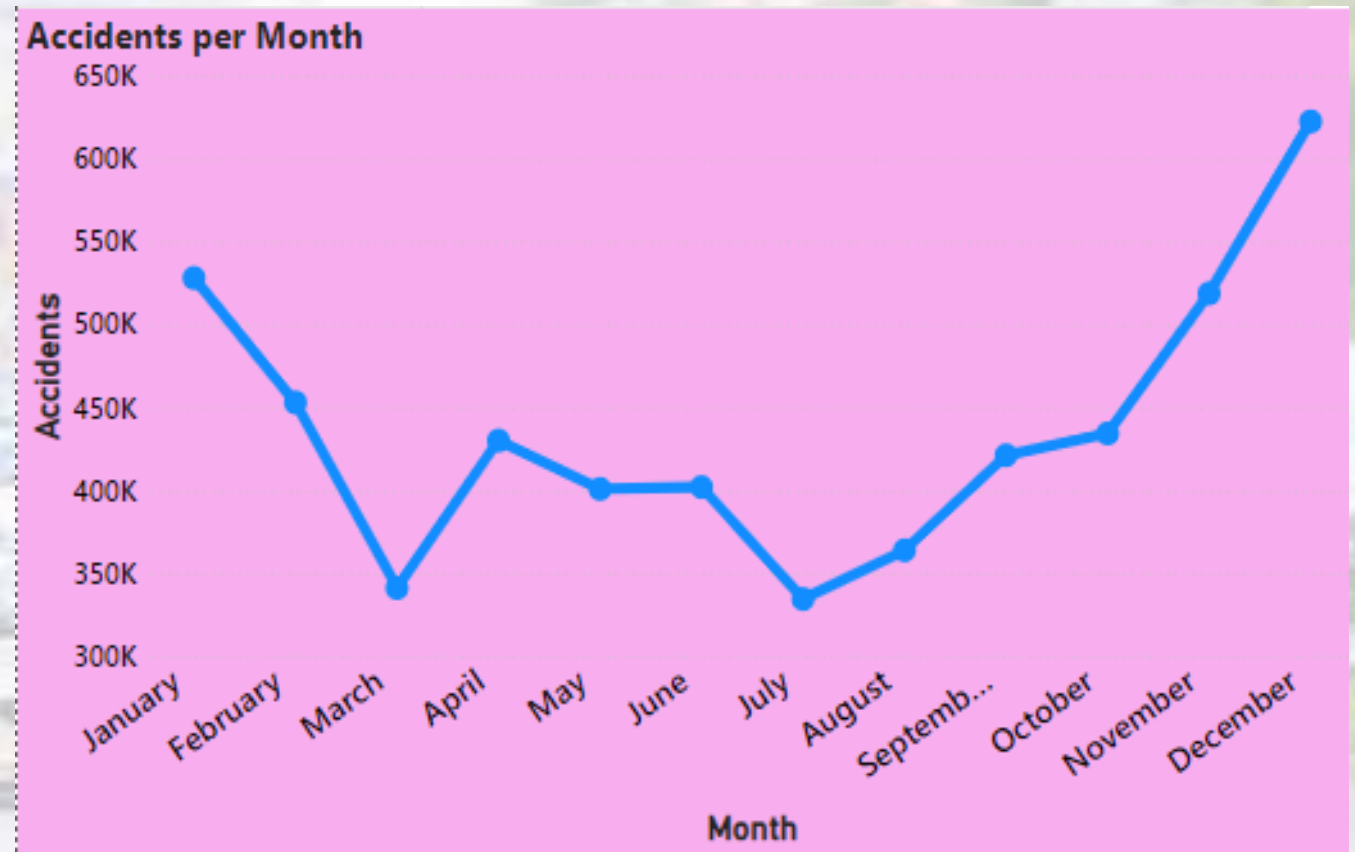
Analyzed the number of accidents daily

Chart Type: Column Chart

Conclusion:
From the graph, 91.9K accidents occurred on Friday followed by Thursday with 87.6K accidents
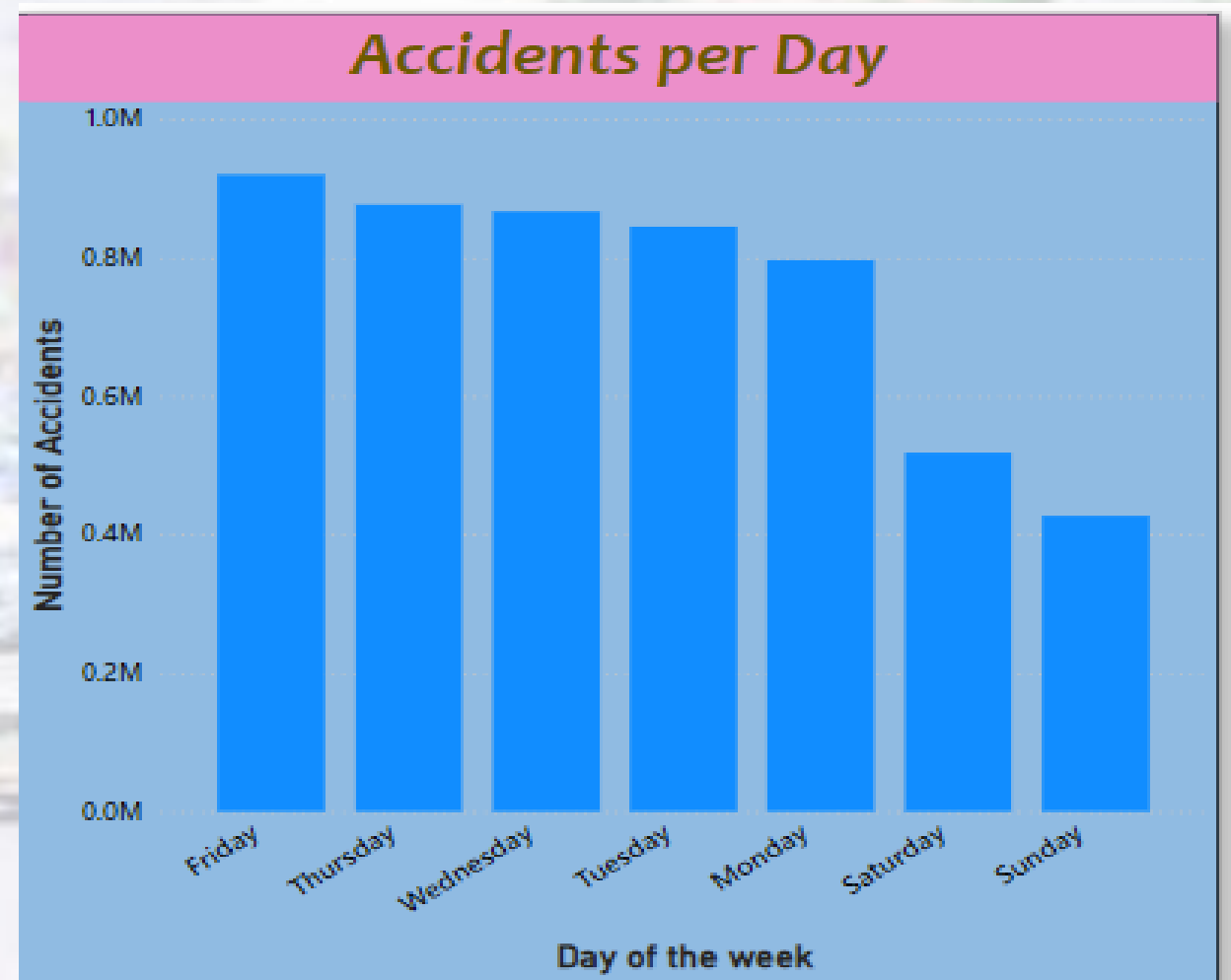
Time of day with the most frequent accidents

Chart Type: Area Chart

Conclusion:
From the graph, the time of the day with the most frequent accidents is between 15:15 and 16:00

Number of Accidents by Time and Day of the week
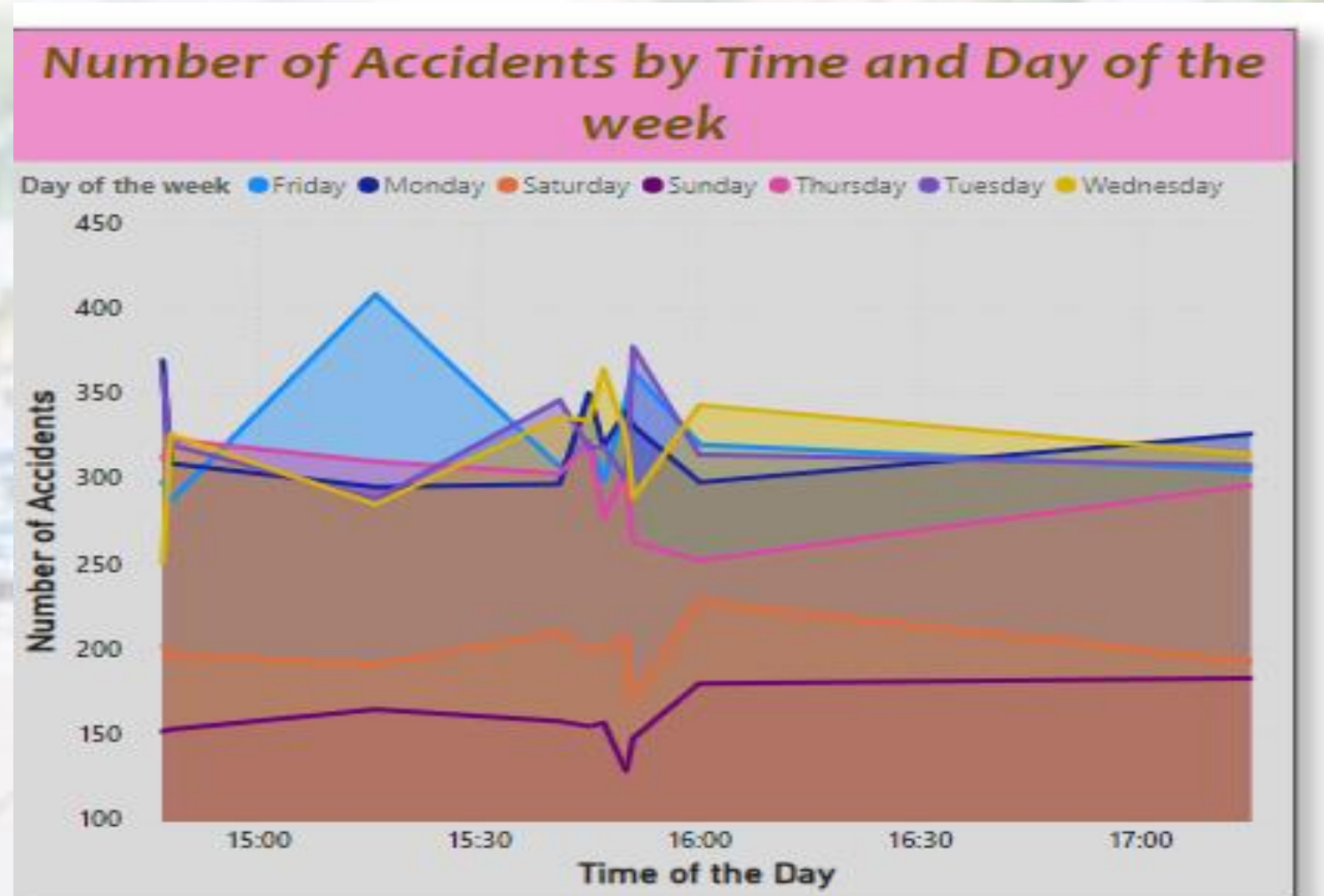
Trend Analysis

Chart Type: Bar Chart

Conclusion:
 The top 3 states with most accidents are CA with 1.12M accidents followed by Florida with 67.7K accidents and Texas with 33K accidents

Top 20 States with the Most Accidents
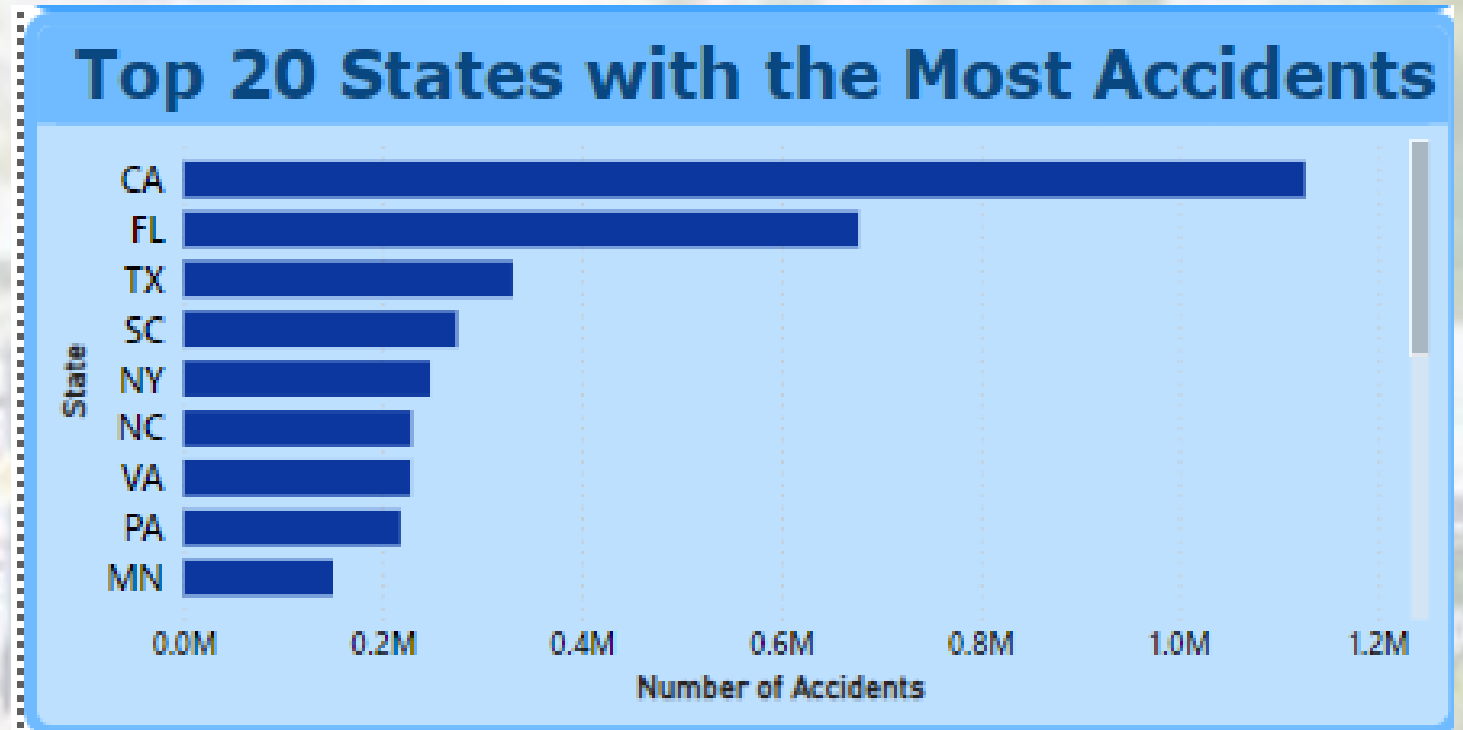
Cities with the most Accidents

Chart Type: Bar Chart

Conclusion:
 The top 5 cities with most accidents are Miami with 159K accidents, Los Angeles with 104K accidents, Houston with 92K accidents, Charlotte with 88K accidents and Orlando with 87K accidents

Top 20 Cities with the Most Accidents
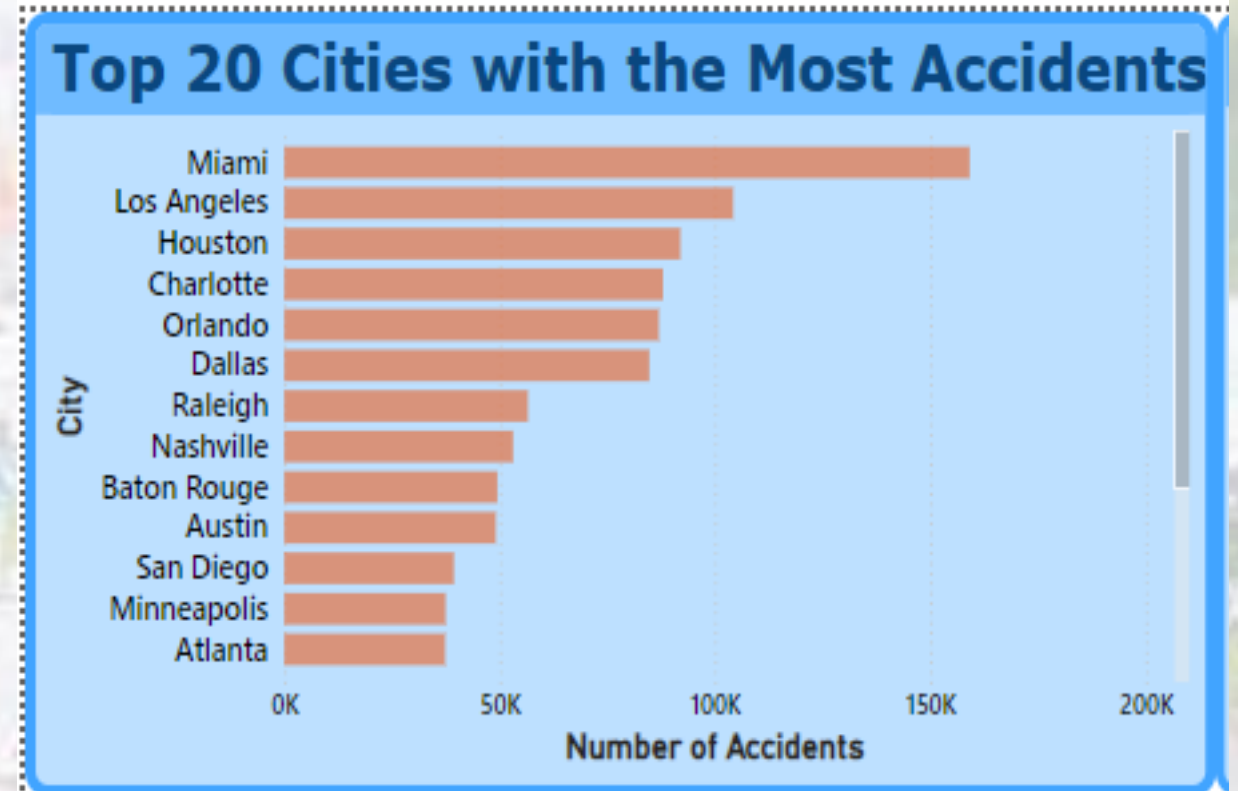
Top 5 Cities with the most accidents in California

Chart Type: Bar Chart

Conclusion:
 From the graph, Los Angeles has the most accidents - 104K followed by San Diego with 39K accidents,

Top 5 Cities with the Most Accidents

State: California
• CA

Los Angeles
San Diego
Sacramento (City)
Bakersfield
Riverside

0.0M   0.1M
Number of Accidents

Top 5 Cities with the most accidents in Texas

Chart Type: Bar Chart

Conclusion:
From the graph, Houston has the most accidents - 92K followed by Dallas with 84K accidents,

Top 5 Cities with the most accidents in Florida

Chart Type: Bar Chart

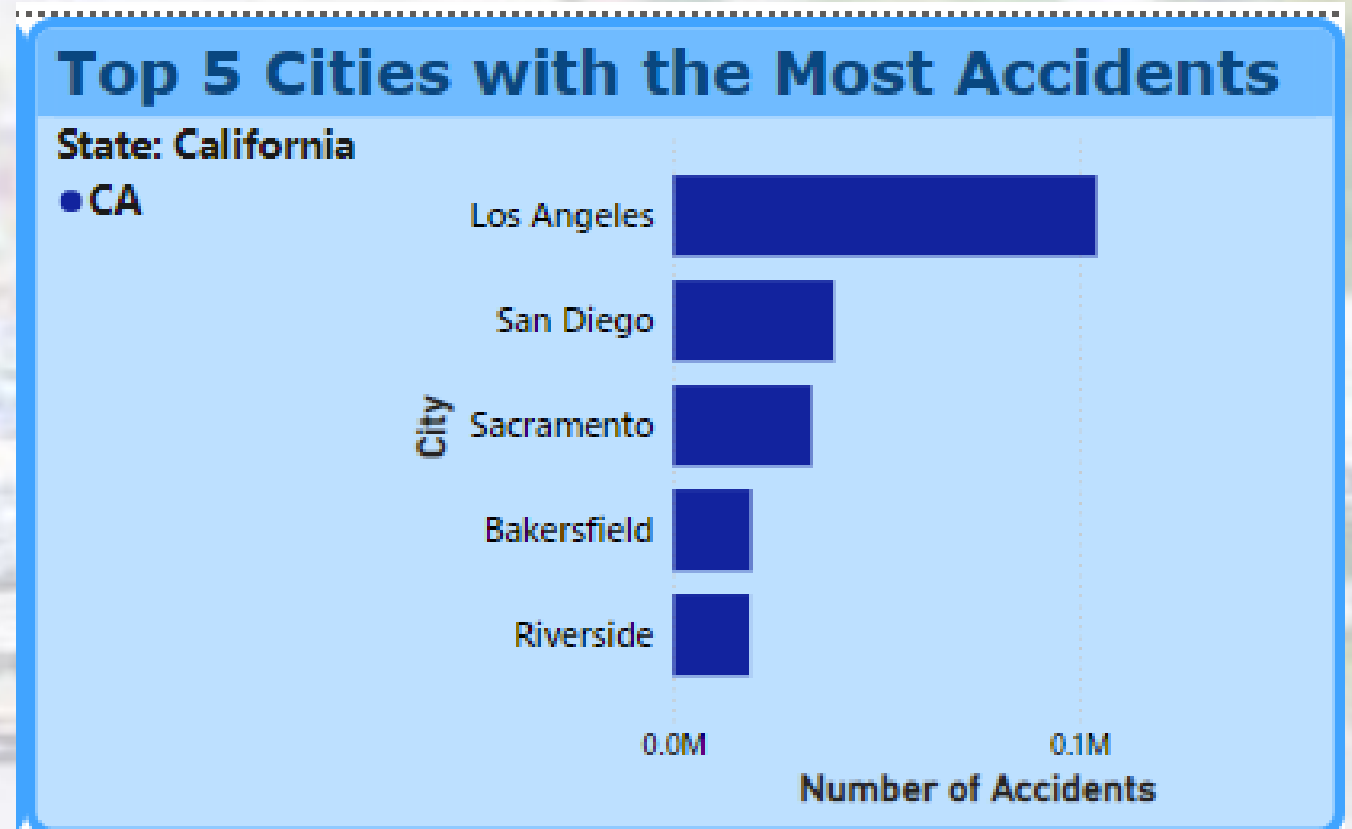**Conclusion**:
From the graph, Miami has the most accidents - 159K followed by Orlando with 87K accidents,

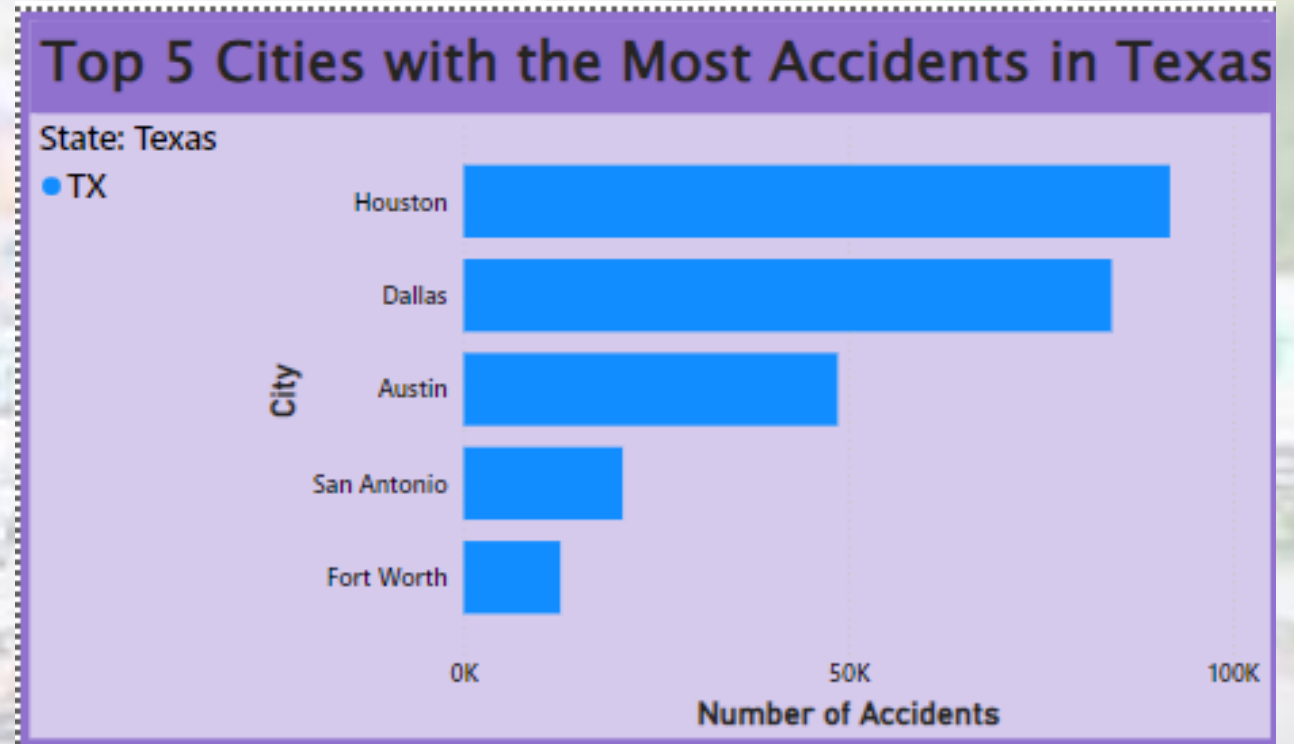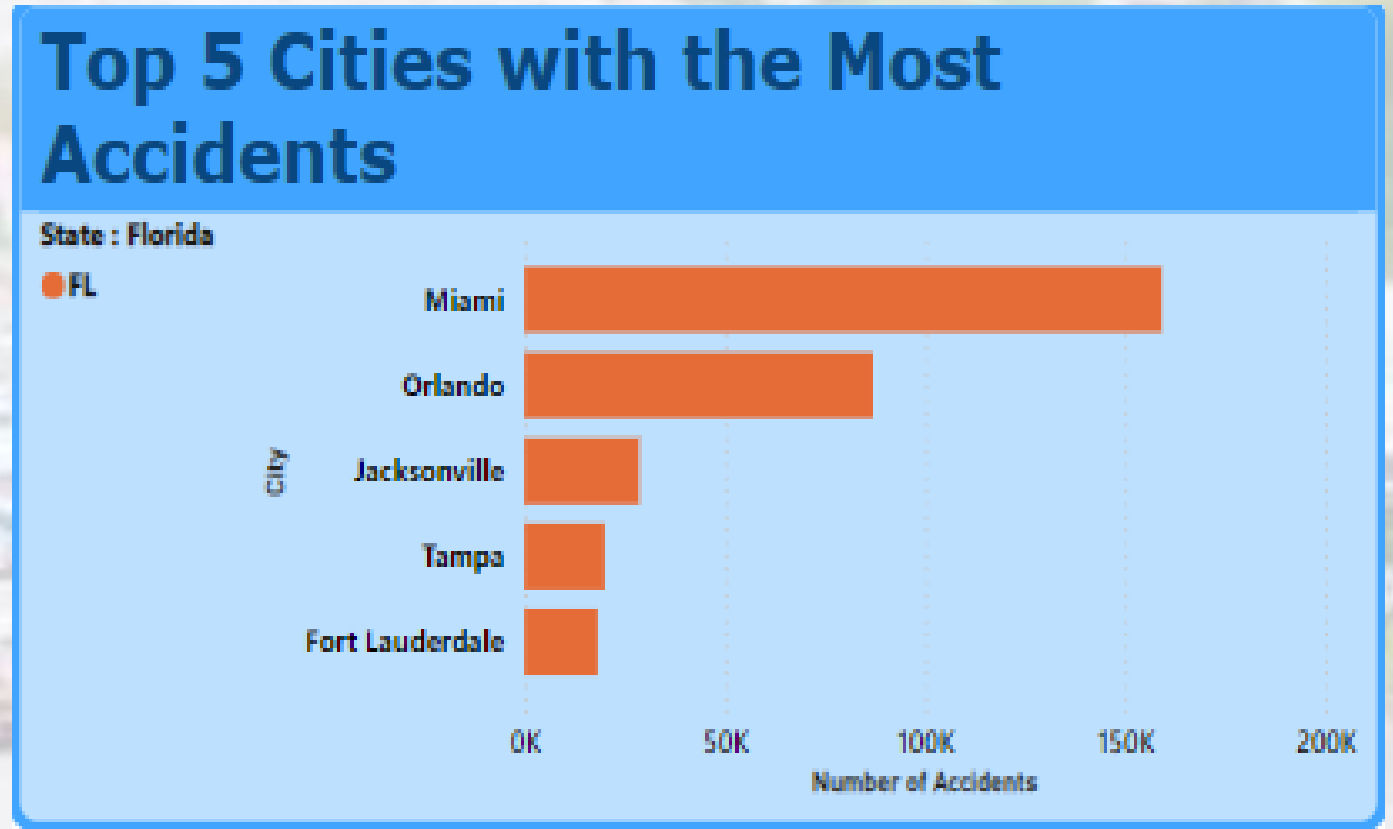# Top 5 Accidents by Month and City

Chart Type: Area Chart

Conclusion:

From the graph, most accidents occurred in December. Miami has 19.2K accidents, followed by Los Angeles with 11.9K accidents

Top 5 Accidents by Month and City
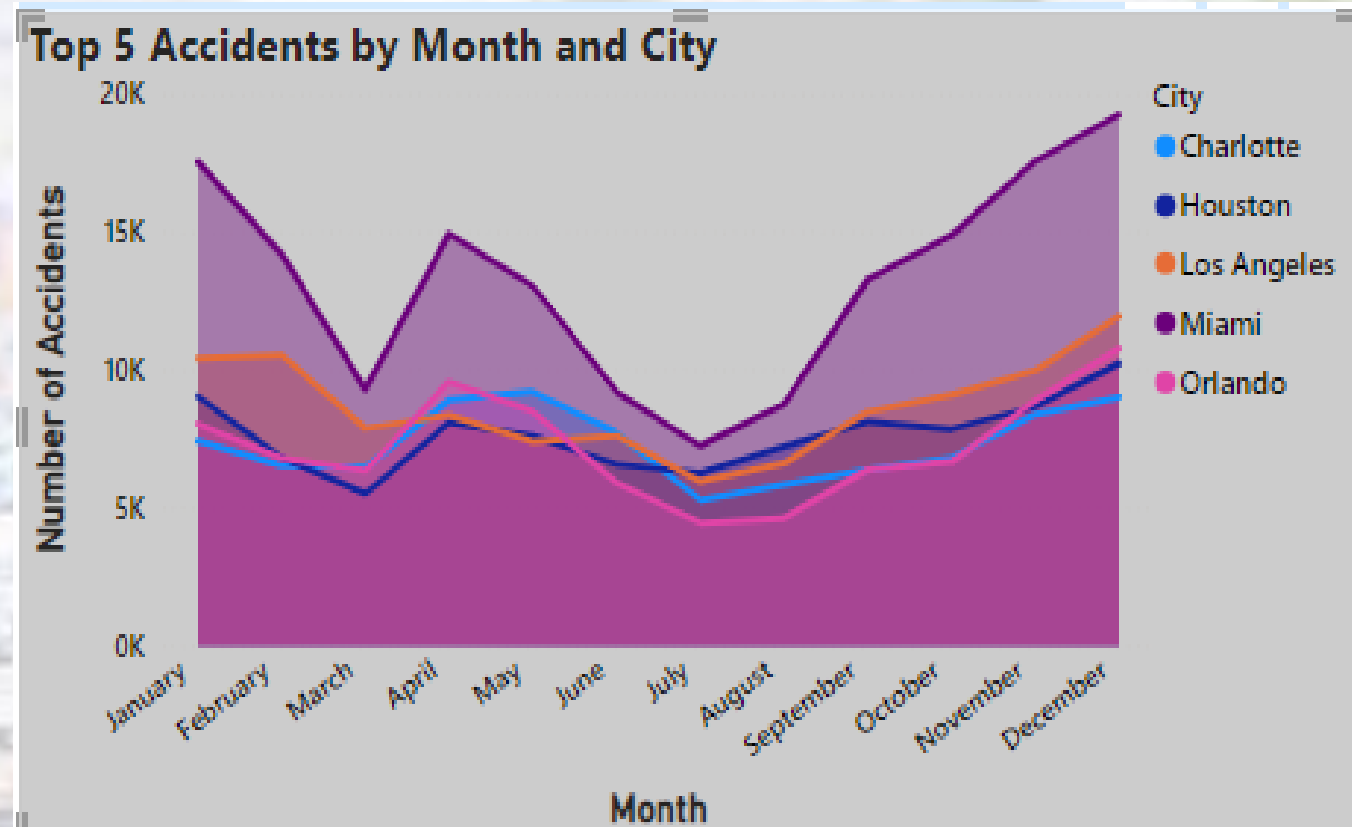
Distribution of Weather Conditions

Chart Type: Tree Map

Conclusion:

Most accidents occurred in fair conditions – 48.84%, Cloudy conditions – 15.1% and Mostly Cloudy conditions – 13.78%

Top 10 Weather Conditions

- Fair 48.84%
- Cloudy 15.81%
- Partly Cloudy 9.43%
- Mostly Cloudy 13.78%
- Light Rain 5.25%
- Lig... 2.37...
- Fog 1.68%
- Rain

Distribution of Traffic Conditions

Chart Type: Pie Chart

Conclusion:
The majority of accidents involve traffic signals, crossings, or junctions.

Distribution of traffic conditions
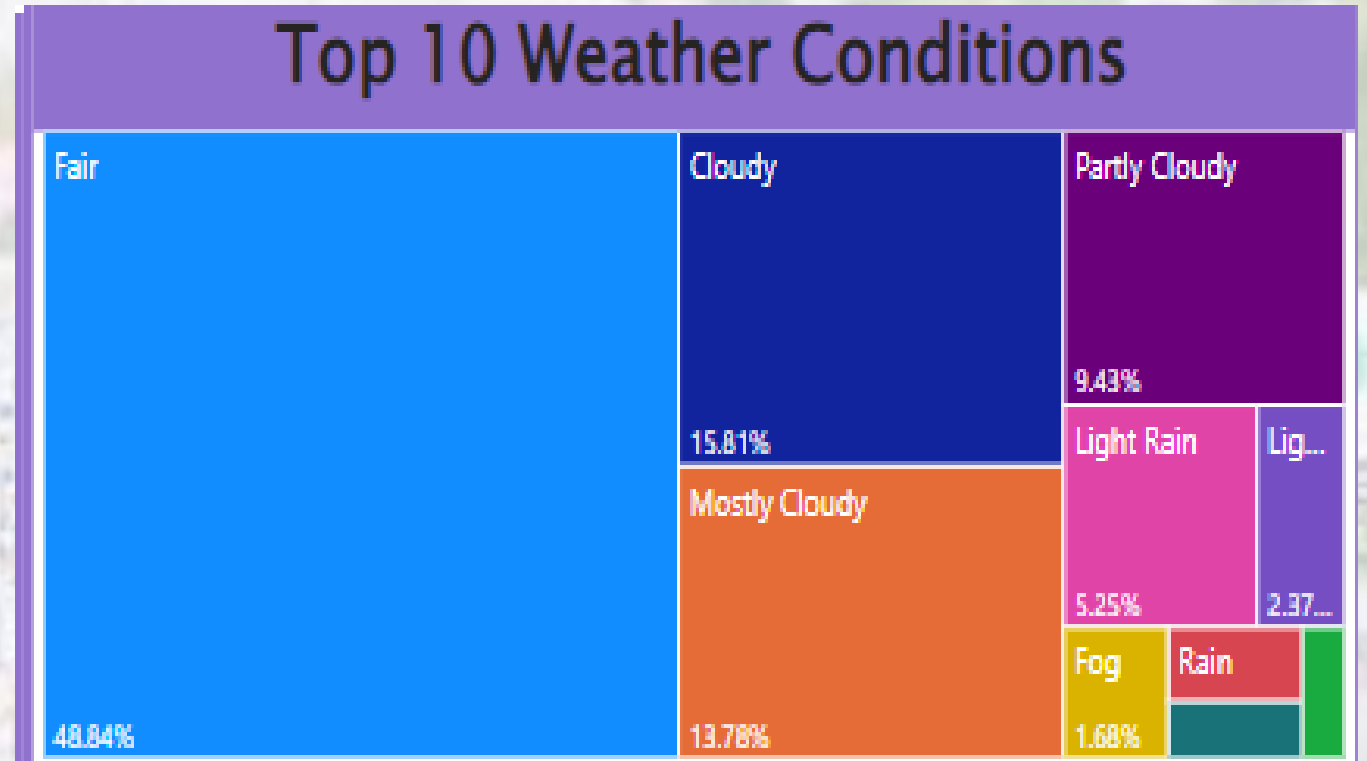
564K (27.78%)
359K (17.68%)
14K (0.67%)
23K (1....)
62K (3.07%)
5K (0.27%)
140K (6.87%)
145K (7.13%)
673K (33.13%)

Legend:
- Junction
- No_Exit
- Railway
- Give_Way
- Amenity
- Bump
- Roundabout
- Station
- Stop
- Traffic_Signal
- Traffic_Calming
- Turning_Loop
- Crossing
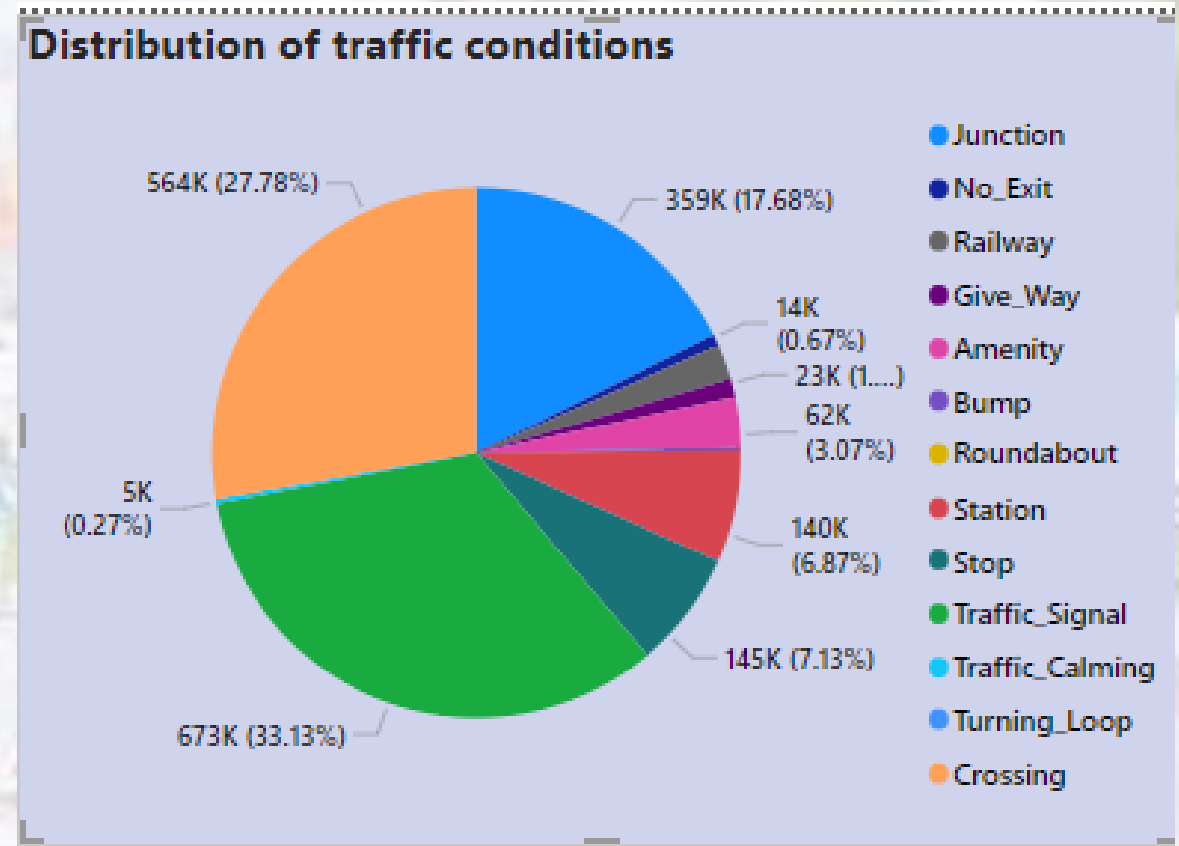
Accident occurrence by Time of the day

Chart Type: Tree Map

Conclusion:
From the graph, we can observe that a significant number of accidents occur during the day
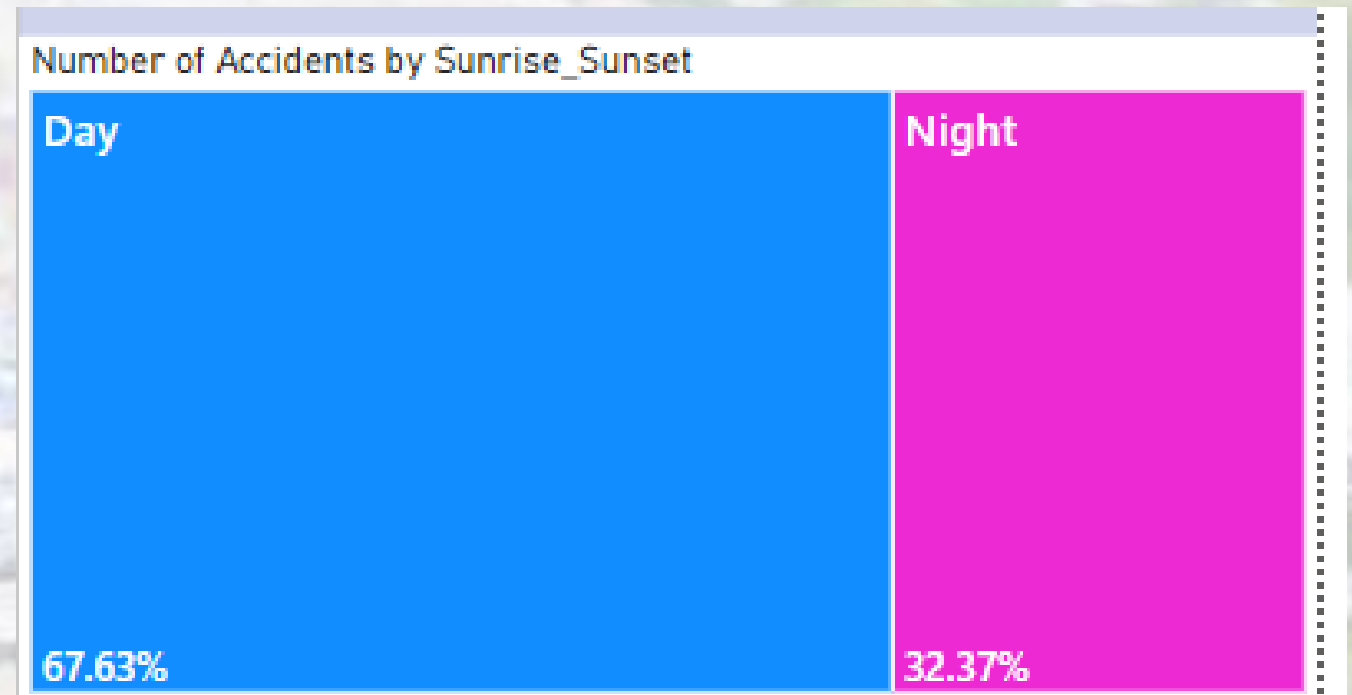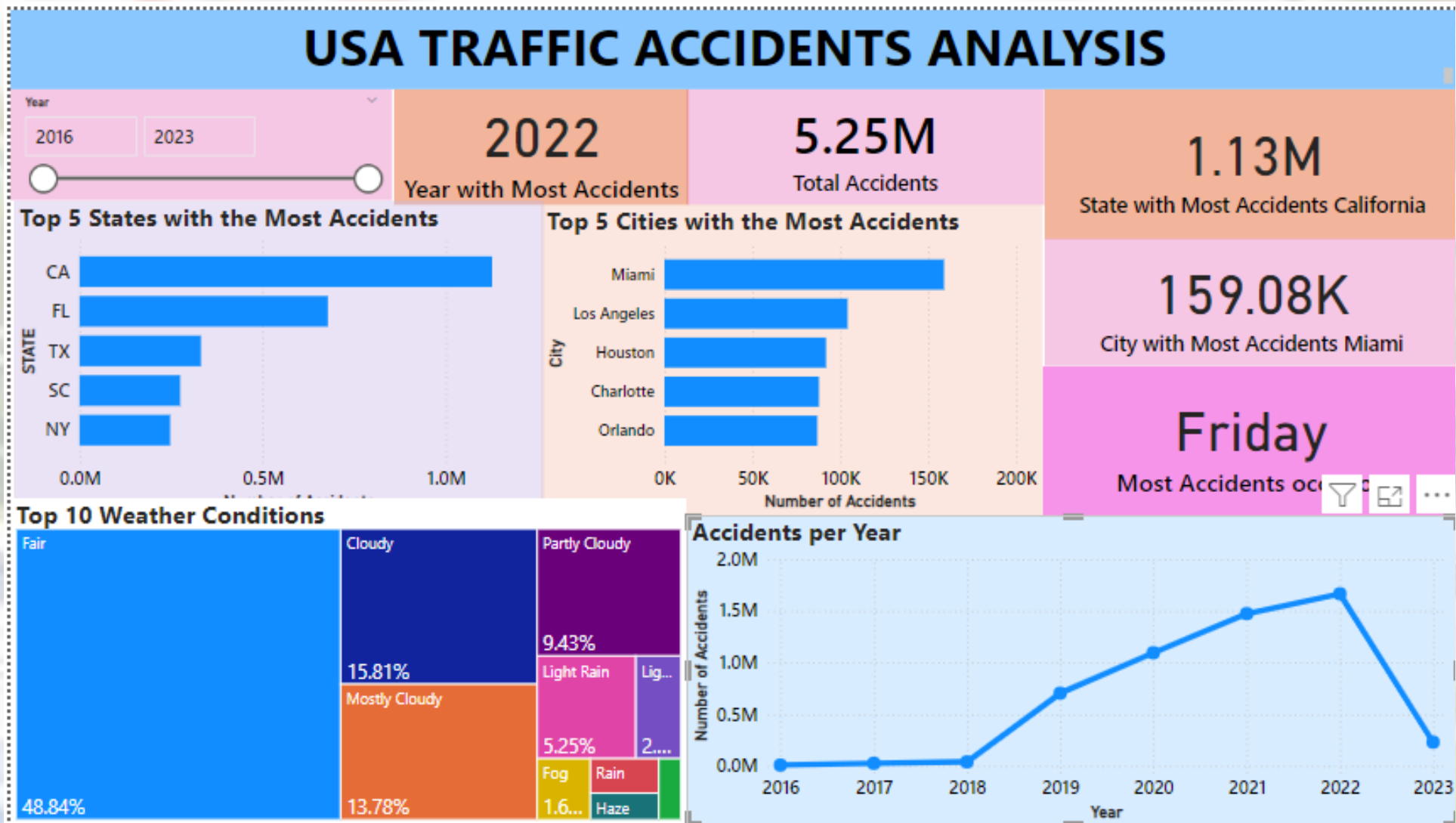
Number of Accidents by Sunrise_Sunset

Day

Night

67.63%

32.37%

Dashboard

Summary and Key Insights

1. The states with the highest number of accidents in the dataset are California, Florida and Texas. In California, the city with the most accidents is Los Angeles, in Texas, the city with the most accidents is Houston. In Florida, the city with the most accidents is Miami..

2. The five cities with the highest number of accidents in the dataset are Miami, Houston, Los Angeles, Charlotte, and Dallas.

3. The occurrence of accidents decreases significantly in 2023, likely due to data availability only until March 2023

4. A significant number of accidents occur during the day

5. The majority of accidents involve traffic signals, crossings, or junctions.

6. Majority of accidents occur under fair weather conditions

REFERENCE AND ACKNOWLEDGEMENTS

- **References**:

US Accidents dataset(February 2016 to March 2023)

- **Acknowledgements**:

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