Problem Statement

Every year ~ 6 million car accidents happen in U.S.A. All these accidents impact the traffic of a location.

`The task is to predict the impact of accident on traffic from January 2020 to June 2020.`

Impact on traffic is categorized into multiple severity levels (column: 'Severity') of the accident on a scale of 1-4, where 1 indicates the least impact on traffic (i.e., short delay as a result of the accident) and 4 indicates a significant impact on traffic (i.e., long delay).

Why is it important to model severity of accident?

1. Understanding what environmental factor/s cause accidents
2. Understanding what external factor/s should be considered in planning construction of roads
3. Real-time accident prediction
    - Drivers could be alerted about external factors
    - First responders could be put on alert on prior

What can cause accidents?

- Manual errors (by driver)
- External Factors
    - Temporal factors
        - time of the day
    - Geographical factors
        - location
            - state
            - city
            - streets
        - weather
    - Road descriptors
        - condition of road
        - nature of path (U-turns, crossing, etc)

Brief understanding of data

Table 3: US-Accidents: details as of March 2019.

Total Attributes	45
Traffic Attributes (10)	id, source, TMC [23], severity, start_time, end_time, start_point, end_point, distance, and description
Address Attributes (8)	number, street, side (left/right), city, county, state, zip-code, country
Weather Attributes (10)	time, temperature, wind_chill, humidity, pressure, visibility, wind_direction, wind_speed, precipitation, and condition (e.g., rain, snow, etc.)
POI Attributes (13)	All cases in Table 1
Period-of-Day (4)	Sunrise/Sunset, Civil Twilight, Nautical Twilight, and Astronomical Twilight
Total Accidents	2,243,939
# MapQuest Accidents	1,702,565 (75.9%)
# Bing Accidents	516,762 (23%)
# Reported by Both	24,612 (1.1%)
Top States	California (485K), Texas (238K), Florida (177K), North Carolina (109K), New York (106K)

source : https://arxiv.org/pdf/1906.05409.pdf