PROBLEM STATEMENT

Introduction:

With the growing number of vehicles on roads, accidents are becoming a serious issue, especially in densely populated urban areas. Road accidents have become a major public safety concern, with varying degrees of severity ranging from minor injuries to fatal crashes. Accurate prediction of crash severity based on factors such as driver behavior, vehicle characteristics, and road conditions is essential for developing effective road safety strategies and improving emergency response.

Participants will be provided with a dataset that includes historical accident records, road geometries, traffic volumes, weather conditions, and related demographic data. The task is to analyze this data using machine learning techniques.

Project Scope:

- Build a machine learning model to predict Accident Severity.
- Data Insights**:** Highlight key risk factors such as road design, traffic volume, and weather.
- Offer actionable suggestions to enhance road safety and reduce accidents.

Values for crash severity:

- Minor injury
- Major injury
- Fatal Crash

Data Set Overview:

Factor	Data Type	Example
Speed of the vehicle	Continuous	20,30,50,80
Crash Time	Interval	24-hour clock
Age	Continuous	20,22,56
Gender	Binary	Male/Female
Vehicle type	Categorical	T.W, Car, Heavy Vehicle

Number of lanes	Continuous	1,2,3
Lane width	Continuous	3,3.5
Road type	Binary	Urban/Rural
Alcohol consumption	Binary	Yes/No
Type of crash	Categorical	Head-on, Rear-end
Seatbelt usage	Binary	Yes/No
Speed Limit on the road	Continuous	
Road surface condition	Categorical	Dry, Wet, Icy

What is expected from participants:

- A model that predicts the severity of a crash based on the given features.
- Identification of the most important factors contributing to severe crashes.
- Recommendations for road safety improvements and policy interventions based on the model's insights.

Dataset Link: Data Sheet

Rules:

- Open to all graduating students.
- A team must consist of a minimum of 1 member and a maximum of 5 members.
- Only one member from each team is permitted to submit the final solution.
- Each solution must include a link to the model's functional code, a PowerPoint presentation (max 10 slides, including team member names and a closing slide), and a 5-minute video explaining the algorithm.
- The presentation should include sections on the introduction, problem analysis, proposed solution, model performance and impact, and conclusion.
- Solutions must achieve a minimum accuracy level of 50% to qualify for judging.
- The decision of the judges shall be final.
- Any sort of plagiarism will lead to direct disqualification

Judging Criteria:

- Understanding the Data: 15%
- Building the Prediction Model: 40%
- Efficiency of Algorithm: 20%
- Safety Improvement Suggestion: 10%
- Clear Presentation (Video): 15%

Video Presentation (Maximum 5 minutes):

- Introduction
- Problem Analysis
- Proposed Solution
- Model Performance & Impact
- Conclusion