

# TECHNALYTICS

Welcome to Technalytics, the forefront of analytics and data exploration! This premier competition is not just a challenge; it's a journey for participants to showcase their skills in analytics, probability, statistics, visualization, patience, and machine learning.

Whether you're a seasoned analyst or new to the field, Technalytics offers a unique opportunity to delve into the dynamic world of data. Meticulously crafted, this competition aims to test your abilities, foster creativity, encourage teamwork, and ignite critical thinking.

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## Overview:

This machine learning competition focuses on road safety in the transportation sector. Participants are challenged to develop an end-to-end solution that utilises machine learning to accurately categorise road safety incidents. The objective is to empower stakeholders with effective risk assessment tools and promote a data-driven culture within the organisation. Success in this competition hinges on participants' ability to convert existing road safety data into actionable insights through advanced machine learning techniques.

## **Background:**

Traffic collisions can result in loss of life, serious injuries, and substantial financial burdens due to medical expenses, property damage, and lost productivity. By leveraging machine learning to predict collision severity, we aim to:

**Enhance Public Safety:** Identifying patterns and factors that contribute to severe collisions can inform preventive measures, road safety campaigns, and policy decisions aimed at reducing the occurrence of these incidents.

**Optimise Emergency Response:** Predicting the severity of collisions can help emergency services allocate resources more efficiently, ensuring timely and appropriate responses to incidents, which can be critical in reducing the impact of injuries and fatalities.

**Inform Urban Planning and Infrastructure Development:** Insights from predictive models can guide city planners and engineers in designing safer roads and implementing traffic management solutions that mitigate the risk of severe collisions.

**Raise Awareness Among Drivers:** Understanding the conditions and behaviours that lead to severe collisions can foster safer driving practices among the public, contributing to a culture of road safety.

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## Problem Statement:

Develop a predictive model that accurately classifies the severity of traffic collisions based on available features such as location, environmental conditions, and collision characteristics.

## Deliverables:

- **Code scripts and documentation:** A detailed Jupyter notebook that documents the EDA, model development process, evaluation, and interpretation of the model.
- **Predictions:** Final predictions on the test dataset.

## Evaluation Criteria:

The assessment of submissions will be based on the following criteria:

- Model predictions will undergo evaluation using the F1-Score and accuracy metrics on the test set.
- An in-depth analysis of the confusion matrix will be conducted to assess the model's performance, specifically focusing on false positives and false negatives.
- The report's quality, clarity, and depth, inclusive of visualizations and interpretations, will also be considered.

## Submission Format:

Following files with instructed format need to be submitted as final submission:

- A csv file with column name 'y' containing the predictions. File naming format to be used is "Teamname\_predictions.csv".
- An ipynb file with the codes used. File format to be used is "Teamname\_notebook.ipynb".

Link for Submission: [Submission Link](#)

Link to the dataset: [Dataset Link](#)