📘 Project Documentation: Road Safety Analytics

Title :

Road Safety Analytics: Understanding Accident Patterns and Casualty Factors for Prevention Planning

1. Project Overview

Road accidents are a serious public health issue that leads to substantial injuries and fatalities every year. This project uses a multi-year dataset to uncover accident trends, determine high-risk conditions, and generate recommendations for safer roads.

2. Problem Statement

Despite numerous road safety measures, accident rates remain high. Identifying the conditions under which accidents occur most severely can help in planning better interventions. This project aims to provide data-driven insights that can inform road safety strategies and policies.

3. Business Objective

To identify critical factors influencing road accident severity and frequency, enabling data-driven decision-making for policymakers and transportation authorities to improve infrastructure, set regulations, and launch targeted awareness campaigns.

4. Tools Used

- Microsoft Excel (Pivot Tables, Charts)
- Power BI (for visual storytelling and dashboarding)

5. Dataset Details

- Type: Government-collected road accident dataset
- Duration: 2 years
- Variables: Accident Index, Accident Date, Junction control, Junction type, Accident severity, Latitude, Longitude, Light conditions, local authority, Carriage Hazardous, Number of casualties, number of vehicles, ploce force, Road surface condition, Road type, Speed limit, Time, urban or rural, weather condition, vehicle type

6. Methodology

- Data Cleaning and Preprocessing in Excel
- KPI Definition: Fatality rate, serious injury rate, total casualties
- Cross-tabulation and pivot table analysis
- Month-wise, area-wise, and vehicle-wise segmentation
- Creation of visual insights in Excel and Power BI
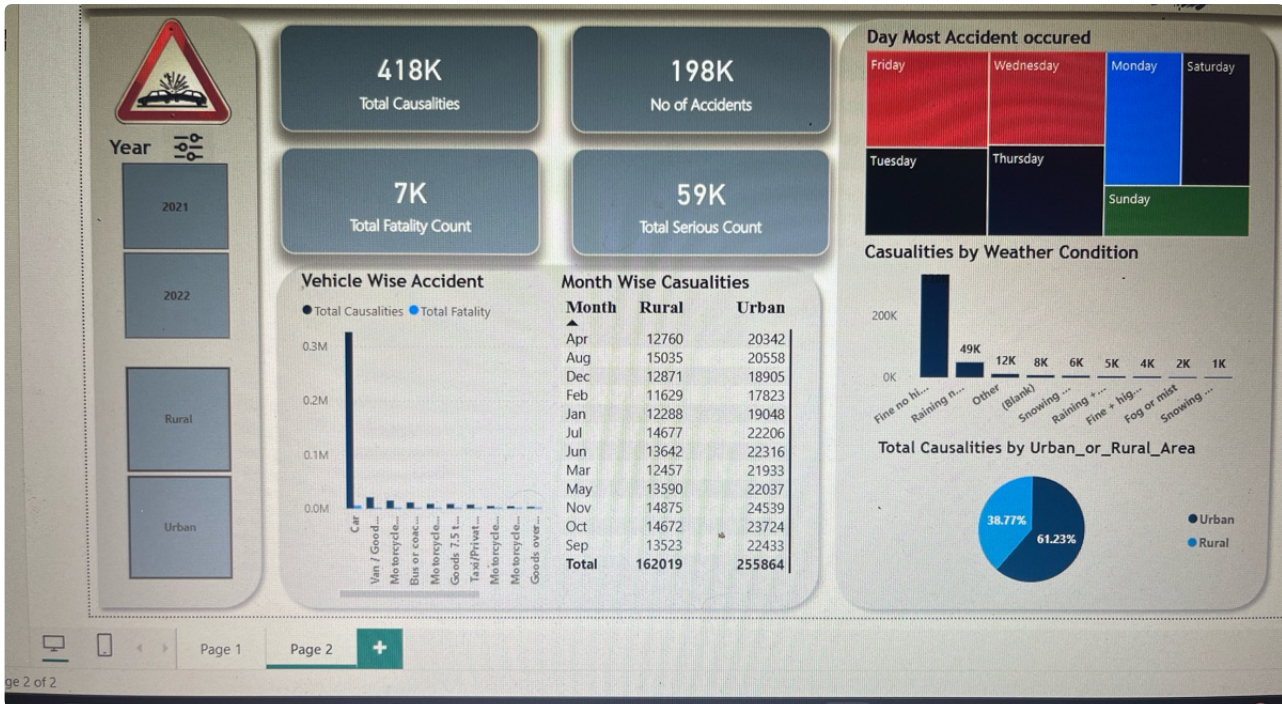
- Addressed 8 key research questions

7. Project Milestones

- Day 1 : Data Cleaning
- Day 2 : KPI Design and Initial Insights
- Day 3 Power BI Dashboard Design
- Day 4 : Final Report and Documentation

8. Challenges Faced

- Large dataset required filtering by relevance
- Making sense of multiple factors (weather, time, speed, lighting)
- Visualizing multi-variable relationships effectively

9. Outcome & Deliverables

- Cleaned dataset

- Excel-based analysis tables and graphs
- Power BI dashboard: Urban vs Rural Accident Insights
- Final project report with actionable recommendations

10. Conclusion

The project not only highlights accident patterns but also presents a model for future safety analysis projects across different regions and timelines.