**Road Accident Analysis Report**

**Project Overview**

This project involves cleaning, analyzing, and visualizing road accident data to understand accident patterns and severity. The dataset includes accident details, road conditions, vehicle types, and other attributes that contribute to accidents. The client wanted to create a Road Accident Dashboard for 2021 and 2022 to gain insights into the following requirements:

Primary KPI: Total Casualties.

Primary KPIs: Total Casualties & percentage of total with respect to accident severity and maximum casualties by type of vehicle.

Secondary KPIs: Total Casualties with respect to vehicle type.

Other Requirements: Monthly trend comparison, maximum casualties by road type, distribution of casualties by road surface, and the relation between casualties by area/location and by day/night.

**Objectives**

* Clean and preprocess the road accident dataset.
* Create pivot tables to summarize key accident insights.
* Design a dashboard with graphs to visualize accident trends.

**Data Source**

The dataset used in this project was obtained from Kaggle.

**Dataset Description**

The dataset comprises road accident data encompassing key attributes such as date, time, road type, surface conditions, lighting, location (urban/rural), vehicle type, casualty count, and severity (fatal, serious, or slight). This rich dataset provides valuable insights into accident patterns and contributing factors.

**Data Cleaning Steps**

* The data was filtered to remove blank cells to ensure data integrity.
* Date formats were verified and standardized.
* Duplicate entries were removed.
* Spelling mistakes were corrected.
* New columns for "Month" and "Year" were created from the "Accident Date" column.

**Pivot Tables & Insights**

The following pivot tables were created to summarize key accident insights:

* Casualties by Vehicle Type: This pivot table shows the number of casualties for each vehicle type, highlighting which vehicles are most often involved in accidents.
* Casualties by Road Type: This pivot table shows the number of casualties for each road type, identifying high-risk roads.
* Casualties by Road Surface: This pivot table shows the number of casualties for each road surface condition, revealing the impact of road conditions on accidents.
* Casualties by Location: This pivot table shows the number of casualties in urban and rural areas, providing insights into location-based accident patterns.
* Casualties by Light Condition: This pivot table shows the number of casualties under different light conditions, indicating the influence of lighting on accidents.
* Key performance indicators: Displays the Sum of number of casualties, monthly trends, secondary KPI showing casualties by vehicle type, road type, road surface, urban/rural and light condition.

**Key Findings**

* Specific vehicle types are more frequently involved in accidents.
* Certain road types have higher accident rates.
* Road surface conditions significantly impact accident occurrence.
* Accident patterns differ between urban and rural areas.
* Light conditions play a role in accident frequency.

**Dashboard Overview**

The dashboard provides an interactive and visual summary of the road accident data. Key elements include:

Key Metrics: Total Casualties, Fatal Casualties, Serious Casualties, Slight Casualties, Casualties by Car.

Visualizations:

* Current Year Casualties vs Previous Year Casualties Monthly Trend (line chart).
* Casualties By Road Type (bar chart).
* Casualties By Road Surface (visual bar).
* Casualties By Location/Area (Donut Chart).
* Casualties By Light Condition (Donut Chart).
* Total Casualties by Vehicle Type (Visual Bar).
* Filter Panel: Slicers for Accident Date and Urban/Rural.

Overall Dashboard: Provides a comprehensive overview of the key performance indicators and trends related to road accidents.

**Conclusion**

This project provides insights into road accident patterns, highlighting key trends and factors contributing to accidents. The interactive dashboard allows users to explore the data and identify opportunities for improvement in road safety.

**How to Use**

Open the Excel file and navigate to the Pivot Table and Dashboard sheets.

Modify filters in pivot tables to analyze different factors.

Use the dashboard for a quick visual summary of insights and to interact with the data through the slicers.