**UK Road Safety Analysis Project:**

**Project Background**

**Road safety is a critical concern for policymakers, urban planners, and transportation authorities. By leveraging data analytics, one can** **uncover patterns in road accidents, identify high-risk demographics, and develop strategies to improve road safety. This project analyzes the UK's 2024 Road Safety dataset, sourced from the** [UK Government's Open Data portal](https://www.data.gov.uk/dataset/cb7ae6f0-4be6-4935-9277-47e5ce24a11f/road-accidents-safety-data) **to extract meaningful insights into accident trends, casualty demographics, and environmental factors influencing road safety.**

**Methodology**

A diagram of data safety

AI-generated content may be incorrect.

**Key Insights**

**Here are key points analyzed using the 2024 UK road safety data in MySQL:**

1. **Accident Severity Trends by Vehicle Type: Cars dominate accident statistics across all severity levels, accounting for 505 fatal, 8,221 serious, and 31,529 slight accidents. This high number likely correlates with cars being the most common vehicle type on roads. Notably, pedal cycles rank second in both fatal (50) and serious (1,011) accidents, highlighting the vulnerability of cyclists. Motorcycles, particularly those 125cc and under, show a concerning trend with 24 fatal, 588 serious, and 2,425 slight accidents. Large goods vehicles (7.5 tons and over) contribute significantly to fatal accidents (11) relative to their numbers, suggesting potential severe outcomes in collisions involving these vehicles.**
2. **Casualty Age and Severity Correlation: The 26-35 age group consistently leads in casualties across all severity levels (122 fatal, 2,019 serious, 9,675 slight), possibly due to higher exposure through frequent driving. Alarmingly, the over-75 age group ranks second in fatal accidents (118) but lower in serious and slight categories, indicating a higher fatality risk when involved in accidents. Young drivers (16-20) show a high vulnerability with 66 fatal and 1,380 serious casualties, suggesting a need for targeted safety measures. The data also reveals a concerning number of child casualties, with 23 fatalities in the 0-15 age range, emphasizing the importance of child safety in traffic environments.**
3. **Impact of Weather and Road Conditions:**

* **Clear weather dominates: The majority of accidents occur in "Fine no high winds" conditions across all severity levels (392 fatal, 7,234 serious, 29,204 slight). This suggests that most accidents happen in seemingly ideal driving conditions, possibly due to higher traffic volumes or driver contentment.**
* **Rain's impact: "Raining no high winds" is the second most common condition for accidents (59 fatal, 1,120 serious, 4,617 slight), highlighting the increased risk during wet weather.**
* **High winds factor: While less common, accidents in windy conditions (both fine and rainy) show a notable presence, indicating the potential danger of strong winds.**
* **Severe weather rarity: Accidents in extreme conditions like snow or fog are relatively rare but still occur, emphasizing the need for extra caution in these situations.**

1. **Casualty and Collision Hotspots:**

* **High-risk areas: Kent, Surrey, and Essex consistently appear among the top districts for fatal accidents (19, 21, and 12 fatalities respectively), suggesting a need for targeted safety measures in these regions.**
* **Urban centers: Major cities like Birmingham, Leeds, and Manchester show high numbers of serious and slight accidents, likely due to higher population density and traffic volumes.**
* **Rural-urban divide: While urban areas generally have more accidents overall, some rural counties like Norfolk and Suffolk feature prominently in fatal accident statistics.**

1. **Collision Patterns by Time and Day of the Week:**

* **Friday danger: Friday emerges as the most dangerous day, with the highest number of slight (6,040) and serious (1,450) accidents, as well as the most fatalities (87). This suggests increased risk due to a combination of rush-hour traffic and weekend anticipation.**
* **Midweek stability: Tuesday to Thursday show relatively consistent accident rates across all severity levels, indicating a baseline risk during typical workdays.**
* **Weekend: While Saturday has fewer slight accidents than weekdays, it maintains high serious accident numbers. Sunday shows the lowest accident counts across all categories, likely due to reduced traffic volume.**

1. **Gender and Collision Outcomes:**

* **Male presentation: Male drivers are involved in an excessively high number of accidents across all severity levels (21,624 slight, 5,394 serious, 277 fatal), more than double the rate of female drivers.**
* **Female driver statistics: Female drivers show lower involvement in accidents (8,536 slight, 2,096 serious, 124 fatal), but still represent a significant portion of total incidents.**
* **Severity ratio consistency: The ratio of male to female involvement remains relatively constant across severity levels, suggesting that gender-related factors influence accident likelihood more than severity.**
* **Data gaps: A substantial number of accidents have unknown driver gender (6,982 slight, 1,581 serious, 92 fatal), indicating potential areas for improved data collection.**

**Business Impact & Interpretation for Decision Making**

1. **Road Safety Campaigns: Insights used to design targeted awareness programs for high-risk groups.**
2. **Policy Recommendations: Provided data-backed guidance on improving infrastructure and law enforcement.**
3. **Resource Allocation: Helped emergency services prioritize high-risk areas for faster response.**
4. **Public Awareness & Reporting: Shared findings to educate the public on road safety risks.**