



BHARATIYA VIDYA BHAVAN'S
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Empowered Autonomous Institute Affiliated to Mumbai University)
Department Of Computer Engineering

Name	Manish Shashikant Jadhav Mayur Krishna Solankar Adwait Shrikant Shesh
UID	2023301005 2023301018 2023301016
Subject	Big Data Analysis and Visualization Lab
Experiment No.	1
Aim	To generate insights from the case study.
TITLE	UK Road Accident Analysis
Introduction	<p>The UK Department for Transport's Stats19 dataset delivers exhaustive information about road traffic incidents that allows analysis of extensive variables to create meaningful traffic safety insights. Analyzing these variables helps us detect recognizable patterns which guide road safety approach development.</p> <p>https://data.gov.uk/dataset/road-accidents-safety-data</p>
Key Variables in the Dataset	<p>The dataset includes several relevant columns, each offering unique perspectives on road accidents:</p> <ul style="list-style-type: none">• Date and Time: Records the specific date and time when each accident occurred.• Location: Provides geographical data, including latitude and longitude, enabling spatial analysis of accident hotspots.• Weather Conditions: Details the weather at the time of the accident, such as clear, rainy, or foggy conditions.• Road Surface Conditions: Indicates whether the road was dry, wet, or affected by substances like oil or mud.• Light Conditions: Specifies the lighting during the accident, distinguishing between daylight, darkness with street lighting, or darkness without street lighting.• Accident Severity: Classifies accidents into categories like slight, serious, or fatal.• Vehicle Types Involved: Lists the types of vehicles involved, such as cars, motorcycles, or bicycles.• Casualty Information: Provides details about the individuals affected, including the number of casualties and their severity.



BHARATIYA VIDYA BHAVAN'S
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Empowered Autonomous Institute Affiliated to Mumbai University)
Department Of Computer Engineering

**Insights and
Visualization
Strategies**

By analyzing these columns, we can derive several insights:

1. Temporal Analysis:

- **Insight:** Identifying peak times and dates for accidents can highlight periods requiring increased safety measures.
- **Visualization:** A heatmap displaying accident frequencies across different times of day and days of the week can effectively illustrate temporal patterns.

2. Geographical Analysis:

- **Insight:** Mapping accident locations can reveal clusters or hotspots, indicating areas that may benefit from infrastructural improvements or increased monitoring.
- **Visualization:** A geographical map plotting accident points, with varying colors or sizes representing severity levels, can provide clear spatial insights.

3. Weather and Road Conditions Correlation:

- **Insight:** Understanding how adverse weather and road conditions contribute to accidents can inform the development of targeted safety campaigns or road maintenance schedules.
- **Visualization:** Bar charts or stacked bar charts comparing accident counts under different weather and road surface conditions can elucidate these relationships.

4. Accident Severity Distribution:

- **Insight:** Assessing the distribution of accident severities helps prioritize resource allocation for emergency response and medical facilities.
- **Visualization:** Pie charts or bar graphs depicting the proportion of accidents by severity category can succinctly convey this information.

5. Vehicle Type Involvement:

- **Insight:** Analyzing which vehicle types are most frequently involved in accidents can guide targeted interventions, such as specialized driver training programs.
- **Visualization:** A bar chart showing the number of accidents involving different vehicle types can highlight high-risk categories.

6. Casualty Analysis:

- **Insight:** Examining casualty numbers and their severity can assist in evaluating the effectiveness of current safety measures and identifying areas



BHARATIYA VIDYA BHAVAN'S
SARDAR PATEL INSTITUTE OF TECHNOLOGY
(Empowered Autonomous Institute Affiliated to Mumbai University)
Department Of Computer Engineering

	<p>for improvement.</p> <ul style="list-style-type: none">• Visualization: Stacked bar charts illustrating the number of casualties by severity for each accident can provide a clear overview.
Visualization Techniques	Through Big Data processing tools like Hadoop and visual tools like Tableau valuable insights can be extracted which enable effective communication. The distributed computation of Hadoop easily processes big data alongside Tableau's visual dashboards that make it simple for stakeholders to research the data for improved road safety decisions.
Conclusion	Hence by completing this experiment we came to know how the insights of our case study.