

Road Accident Fatalities Analysis

Task 1: Handling Missing Values in the Dataset

Question

Some records in the dataset have N/A values in the Helmet Used column. Replace all N/A values with "Unknown" in Tableau.

Step-by-Step Explanation

1. Open the dataset in Tableau and locate the Helmet Used field in the Data Pane.
2. Right-click on the Helmet Used field and select Create → Calculated Field.
3. Name the calculated field as Helmet Used (Cleaned).
4. Enter the following calculation to handle missing values:

```
IF ISNULL([Helmet Used]) OR [Helmet Used] = "N/A" THEN  
"Unknown"  
ELSE [Helmet Used]  
END
```

5. Click OK to save the calculated field.
6. Use the new Helmet Used (Cleaned) field in your analysis or visualization instead of the original field.

Task 2: Visualizing Road Accident Trends Over Time

Question

Use a Line Chart in Tableau to analyze how road accident occurrences fluctuate over time. Use a dual axis to display circle markers and synchronize the chart.

Step-by-Step Explanation

1. The Date / Year field is placed on the Columns shelf to represent time on the X-axis.
2. The Accident ID (or Record ID) field is placed on the Rows shelf and aggregated as CNT(Accident ID) to calculate the number of accidents over time.
3. A Line Chart is selected to visualize the trend of road accidents across different time periods.
4. The CNT(Accident ID) measure is dragged again to the Rows shelf to create a Dual Axis.
5. On the first axis, the Marks type is kept as Line to show the continuous trend.
6. On the second axis, the Marks type is changed to Circle to highlight individual data points on the line.
7. The secondary axis is synchronized with the primary axis to ensure both measures align correctly.
8. One of the axes is hidden to keep the chart clean and easy to read.

Task 3: Impact of Weather Conditions on Accidents

Question

Use a Heatmap in Tableau to analyze how different weather conditions impact the number of road accidents.

Step-by-Step Explanation)

The Weather Condition field is placed on the Rows shelf to list different weather types Clear, Rainy, Foggy, Stormy The Time field is placed on the Columns shelf to represent different time periods on the X-axis, while accident counts are analyzed across these time intervals for each weather condition.

1. The Accident ID field is placed on the Marks card and aggregated as CNT(Accident ID) to calculate the total number of accidents for each weather condition.
2. A Heatmap visualization is selected.
3. The CNT(Accident ID) measure is mapped to the Color shelf, where darker shades represent higher accident counts and lighter shades represent lower counts.
4. The Weather Condition field is added to the Marks card under Label to clearly identify each row.
5. The CNT(Accident ID) measure is also added to the Marks card under Label so that the exact number of accidents is displayed within each heatmap cell.

Task 4: Compare Accidents with and without Safety Measures

Question

Analyze the impact of seat belt and helmet usage on accident outcomes. Use color coding to differentiate safety measure usage as follows:

Step-by-Step Explanation

The Helmet Used (Cleaned) field is placed on the Columns shelf to categorize accidents based on helmet usage status (Used, Not Used, Unknown).

1. The Accident ID field is placed on the Rows shelf and
2. aggregated as CNT(Accident ID) to calculate the number of accidents for each safety measure category.
3. A Bar Chart is selected to clearly compare accident counts across different helmet usage conditions.
4. The Helmet Used (Cleaned) field is added to the Marks card under Color.
5. Custom colors are assigned manually:
 - Green for *Helmet Used*
 - Red for *Helmet Not Used*
 - Grey for *Unknown*
6. Data labels are enabled to display the accident count on each bar for better clarity.

Task 5: Comparing Fatality Rates by Road Type and Speeding Cases

Question

Analyze road accident fatalities by comparing different road types and the impact of speeding using a Tree Map visualization.

Goal

Use a Tree Map to compare fatality rates across different road types and analyze how speeding contributes to fatalities.

Step-by-Step Explanation

The Road Type field is used as the primary dimension to divide the Tree Map into different sections, where each section represents a specific type of road.

1. The Fatalities field is placed on the Marks card under Size and aggregated as SUM(Fatalities). This ensures that the size of each rectangle reflects the total number of fatalities for that road type.
2. The Speeding field is placed on the Marks card under Color. This visually differentiates accidents involving speeding from those without speeding, helping to analyze its impact.
3. The Road Type and Fatalities fields are added to the Marks card under Label so that each rectangle clearly displays the road type along with the corresponding fatality count.
4. The Tooltip is customized to include Road Type, Speeding, Fatalities, and Injuries, providing detailed information when hovering over each section of the Tree Map.
5. The Tree Map chart type is selected to effectively compare fatality rates across road types while simultaneously showing the influence of speeding.

Task 6: Analyzing Accidents by Emergency Response Time

Question

Analyze how emergency response time affects accident fatalities using a parameter and a Bar Chart.

A parameter named Response Time Threshold (mins) is created to allow users to set a custom response time limit. Based on this

parameter, a calculated field called Response Category is created to classify accidents into Fast Response and Delayed Response.

```
IF [Emergency Response Time (mins)] <= [Response Time  
Threshold (mins)] THEN
```

```
"Fast Response"
```

```
ELSE
```

```
"Delayed Response"
```

```
END
```

The Response Category field is placed on the Columns shelf, and SUM(Fatalities) is placed on the Rows shelf. A Bar Chart is used to compare fatalities under each response category. Labels are added to show total fatalities.

For better visualization, Fast Response is colored Green and Delayed Response is colored Red. The chart title is set as Fatalities by Emergency Response Time Category.

This visualization helps analyze the impact of emergency response time on accident fatalities in a clear and interactive way.

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