**Tableau & Power Bi**

Tableau Section:

1. *Introduction*

The dataset used for this analysis focuses on global terrorism incidents, capturing details such as the type of attack, number of casualties, terrorist group names, and the a ected countries. The goal of this analysis is to identify patterns in terrorist activities and provide insights into the types of attacks, key players, and trends over time.

2. *Design Choices & Explanation*

 Global Terrorism Heatmap

- *Choice:* A heatmap was chosen to provide a geographical representation of terrorist incidents across countries. The color gradient e ectively visualizes the intensity of attacks, with darker shades indicating higher frequencies.

- *Features:*

- Year filter added for temporal analysis.

- Color gradients to easily spot the most affected countries.

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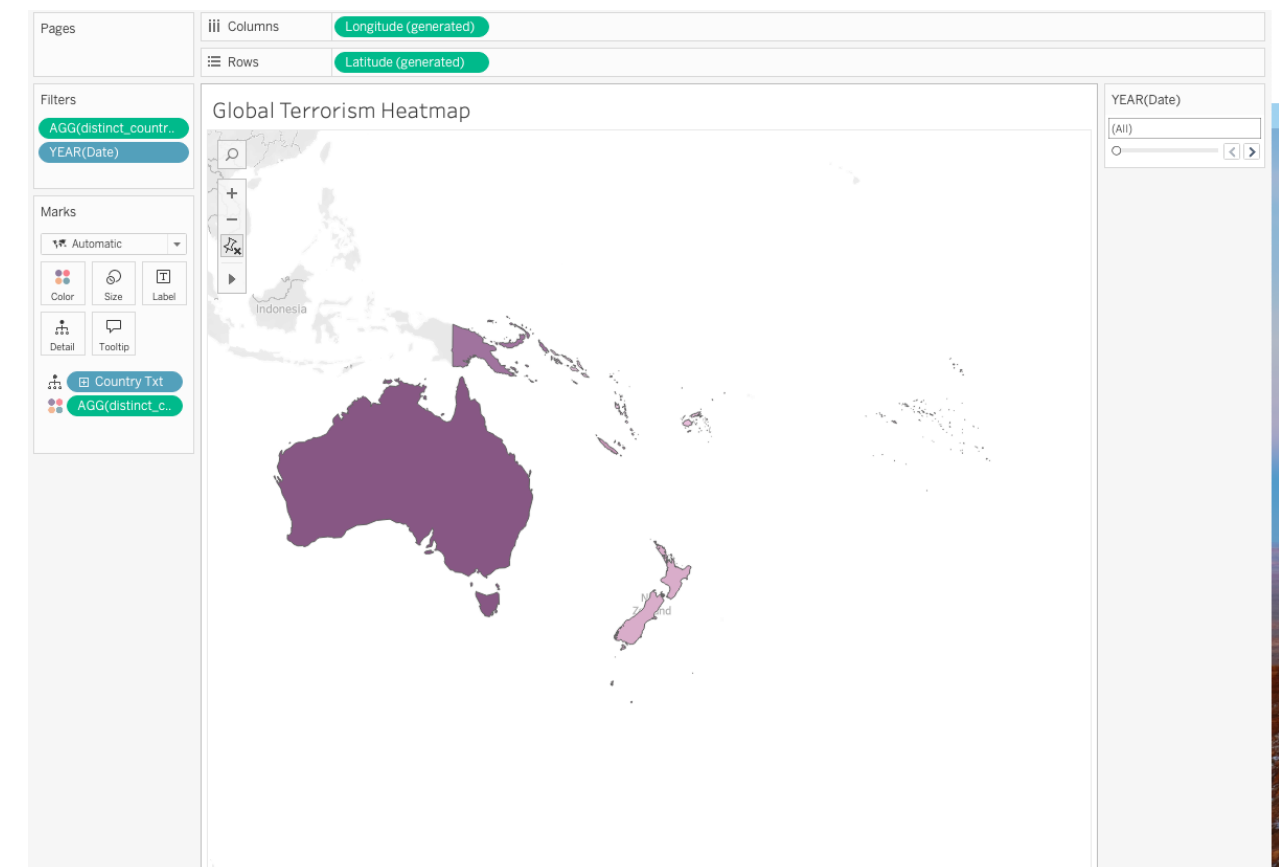
- *Top 10 Terrorist Groups Over Time (Stacked Area Chart)*

- *Choice:* A stacked area chart was used to visualize the activity of the top 10 terrorist groups by year. This chart shows both the volume of attacks and how each group's activity changes over time.

- *Features:*

- The 'gname' field represents terrorist groups, while 'iyear' shows the timeline of incidents.

- Color-coded areas for di erent groups to distinguish their contributions to the overall trend.

- *Purpose:* Allows for a comparative view of the most active terrorist groups over di erent periods, highlighting any peaks in activity.
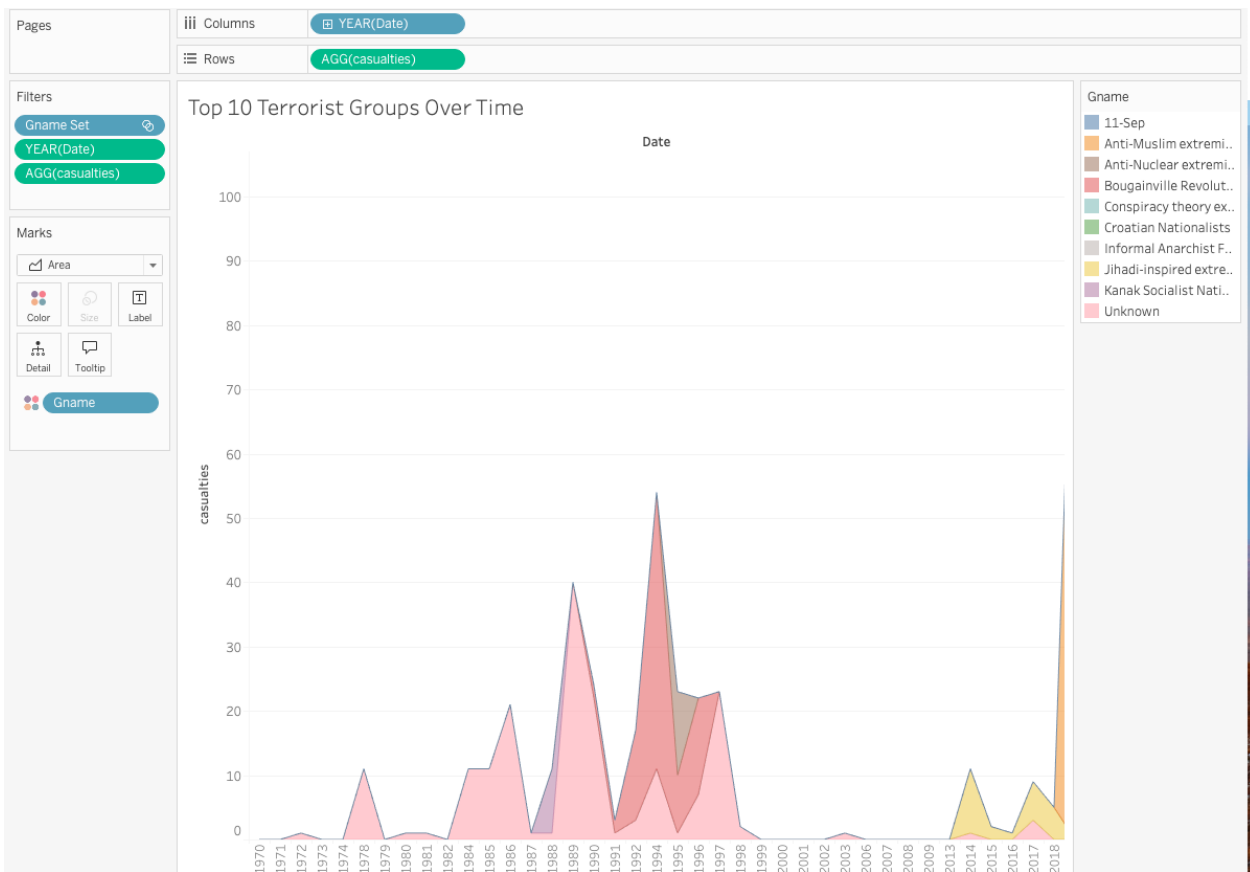
- *Attack Types and Casualties (Scatter Plot)*

- *Choice:* A scatter plot was chosen to illustrate the relationship between the number of people killed (nkill) and wounded (nwound) in di erent attack types.

- *Features:*

- Points are colored based on the type of attack (attacktype1_txt).

- The size of the points represents total casualties (sum of killed and wounded).

- Hover details were added to provide additional context.

- *Purpose:* This visualization helps in identifying attack types that cause higher casualties and comparing their impact.

- *Monthly Trend Analysis (Dashboard)*

- *Choice:* A combined dashboard was created for comprehensive monthly analysis.

- *Line Chart:* Displays the trend of incidents per month, highlighting seasonality or time-based peaks.
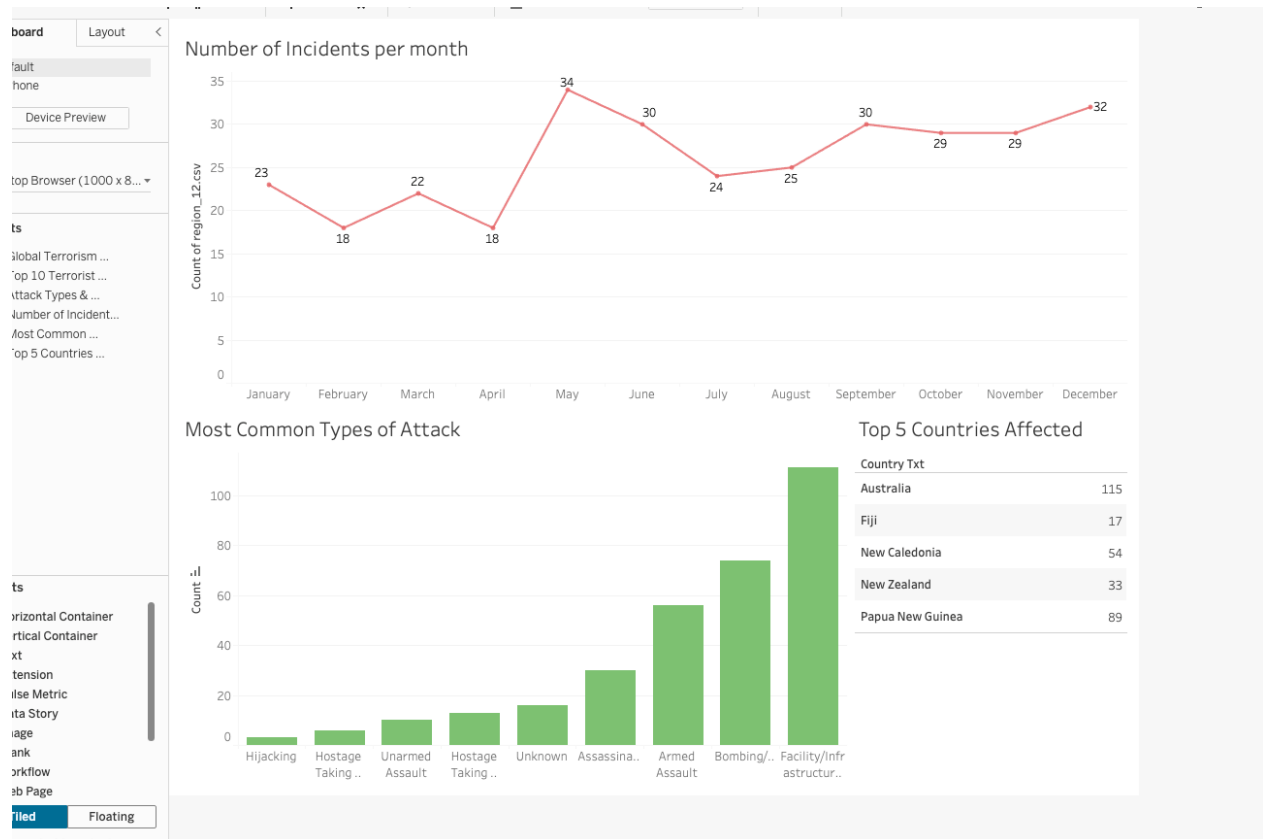
- *Bar Chart:* Shows the most common types of attacks, allowing users to quickly identify prevalent methods.

- *Text Table:* Lists the top 5 affected countries for a detailed view of impact.

- *Features:*

- Cross-filtering enables interactive exploration, allowing users to filter one chart based on selections in another.

Challenges & Solutions

Data Preparation:

Challenge: The dataset required extensive cleaning due to missing values and inconsistencies in date formats.

Solution: Performed data cleaning using Python and Tableau's data interpreter to ensure consistency and accuracy.

Handling Large Data Volume:

Challenge: The dataset was large, causing performance issues during visualization.

Solution: Used data aggregation and filters to reduce the volume and improve performance.
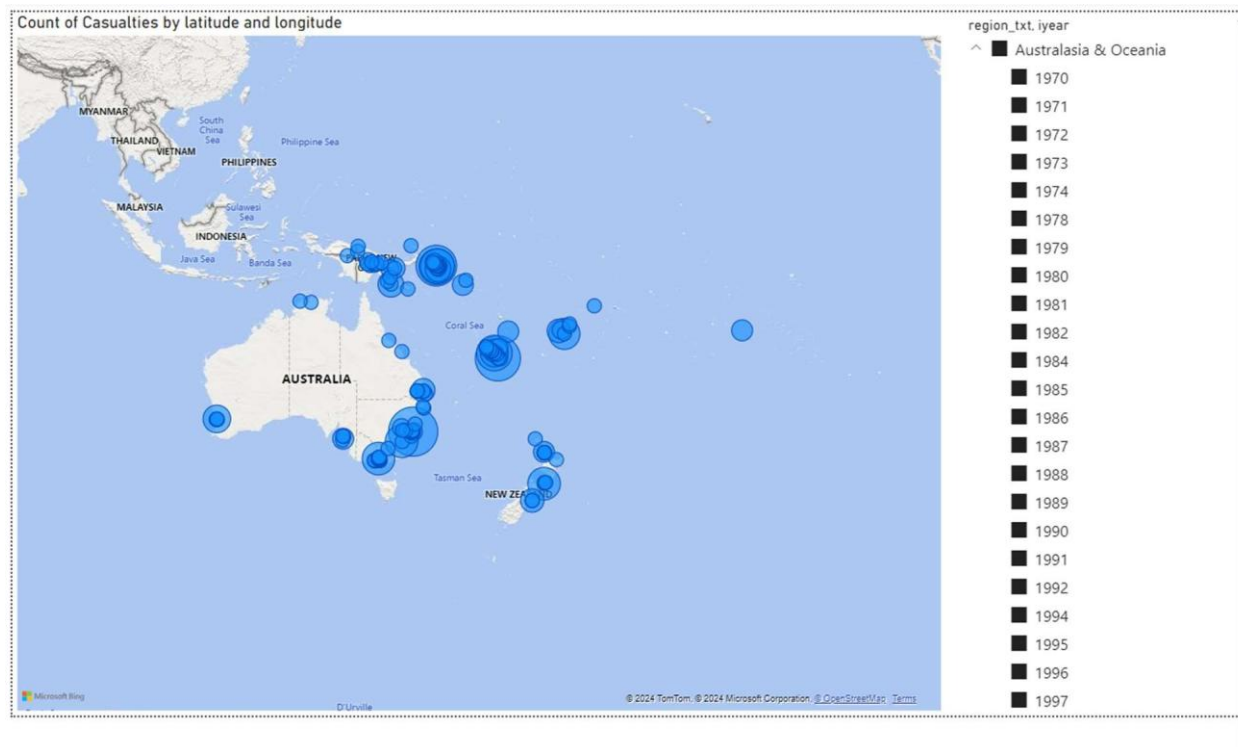
Choosing Appropriate Visualizations:

Challenge: Selecting the right type of visualization to convey the data effectively.

Solution: Tested various chart types and considered user needs before finalizing the most informative visualizations.
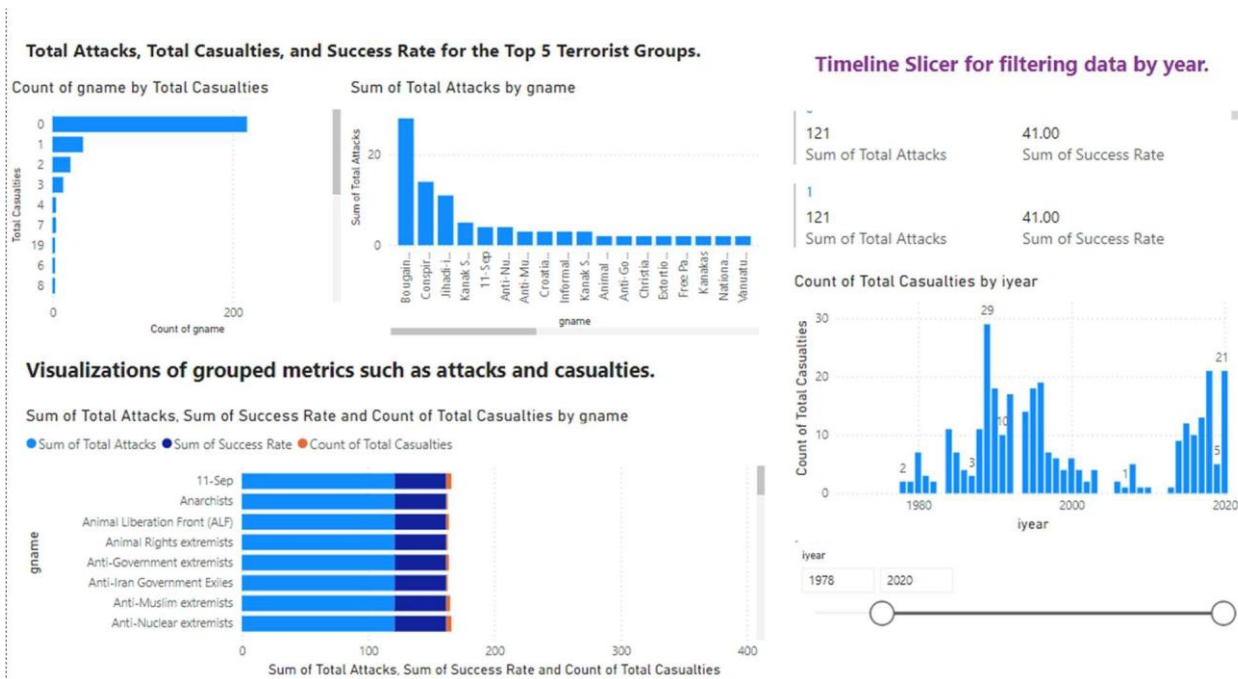
Power Bi Section:

 How to interact with the visualizations: Once the file is opened there will be 4 pages. Each of these pages are sections of we had to complete. The first page is a map that is interactable via the mouse. You can move the map anywhere you want but the data is located in one general region. To the right of the map is the slicer where it shows the sole region all terrorist attacks occur. When you click on the region it will automatically select all the years. To select a specific year, simply deselect the region, open the drop-down feature and select the year. It will also automatically select the region when doing so. That is how you interact with the first part. For the second page, ------. For the third page, by clicking a specific box in the tree map, that box will be highlighted to show its details. You can also just hover over the material and see what is going on. A drill down has been added. To activate the drill down, click on the tree map. There will be an arrow pointing downwards. Click on that to activate the drill down feature. Once you do so, clicking on a specific box will show you the sub weapons of that specific main weapon. To drill back up, click on the arrow facing upward. To deactivate the drill down feature, simply click on the arrow facing downward again. For the fourth page the one thing that interacts with the visualizations is the bookmark feature. To view the bookmarks, click on View on the top of power bi and then select Bookmarks. This will then open up the bookmarks section where you can then see four different bookmarks. This is all for di erent views of the data. It is simple but changes the data a little. That is all for the Power Bi handling.

Page 1:

Count of Casualties by latitude and longitude

region_txt, iyear

Australasia & Oceania
- 1970
- 1971
- 1972
- 1973
- 1974
- 1978
- 1979
- 1980
- 1981
- 1982
- 1984
- 1985
- 1986
- 1987
- 1988
- 1989
- 1990
- 1991
- 1992
- 1994
- 1995
- 1996
- 1997

This is the basic look at the map. We found that major spots of terrorism are found usually on the coast of Australia. Some of the challenges for this map was figuring out how to correctly plug in the Latitude and Longitude data category. Once that was found out, it was pretty simple.

Page 2:

Total Attacks, Total Casualties, and Success Rate for the Top 5 Terrorist Groups.

Count of gname by Total Casualties

Sum of Total Attacks by gname

Timeline Slicer for filtering data by year.

| 121 | 41.00 |
| Sum of Total Attacks | Sum of Success Rate |

1	
121	41.00
Sum of Total Attacks	Sum of Success Rate

Count of Total Casualties by iyear

Visualizations of grouped metrics such as attacks and casualties.

Sum of Total Attacks, Sum of Success Rate and Count of Total Casualties by gname
● Sum of Total Attacks ● Sum of Success Rate ● Count of Total Casualties

- 11-Sep
- Anarchists
- Animal Liberation Front (ALF)
- Animal Rights extremists
- Anti-Government extremists
- Anti-Iran Government Exiles
- Anti-Muslim extremists
- Anti-Nuclear extremists

Sum of Total Attacks, Sum of Success Rate and Count of Total Casualties

iyear

| 1978 | 2020 |

Filters and Interactivity

1. Timeline Slicer:

   o   Adjusts the visualizations dynamically based on the selected year range.

   o   Enables a detailed temporal analysis of terrorist group activity.

2. Top N Filter:

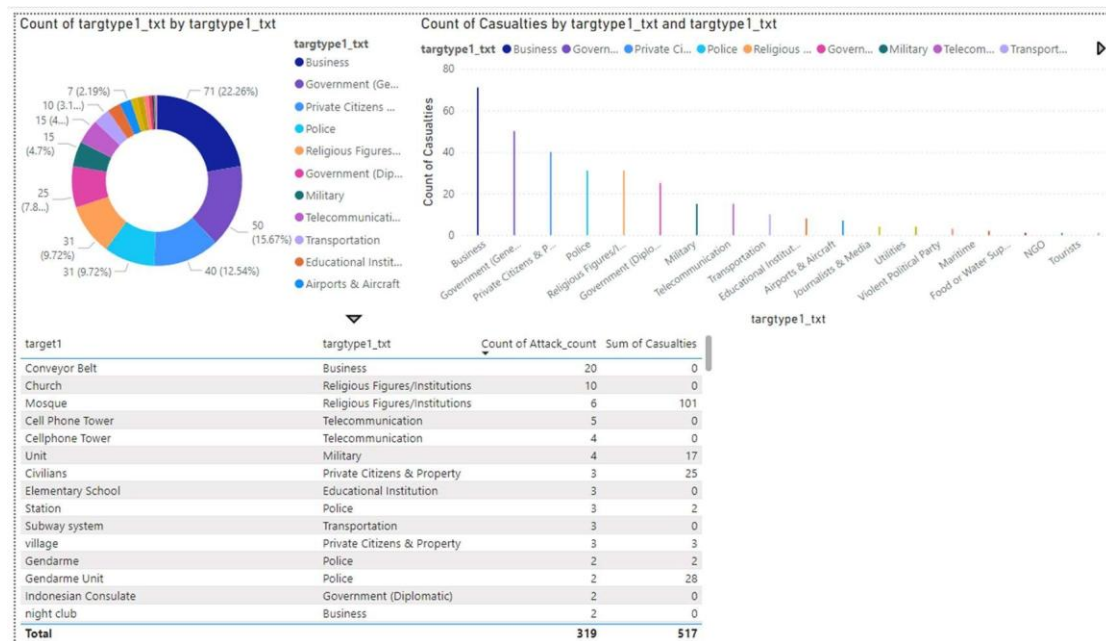   o   Ensures the analysis focuses only on the top 5 groups with the highest number of attacks.

Visual Components

1. Multi-Row Card:

   o   Displays key metrics (total attacks, total casualties, success rate) for the top 5 terrorist groups.

   o   Provides a concise and easy-to-read summary.

2. Bar Charts:

   o   Compare total attacks and total casualties for the top 5 groups.

   o   Provides a clearer understanding of group-specific impacts.

3. Timeline Slicer:

   o   Enables filtering by year. o   Helps analyze how terrorist group activity evolved over time.

4. Grouped Metrics Visualization:

   o   Combines the sum of total attacks, casualties, and success rate for different terrorist groups to give a holistic view.

Page 3:

Count of nkill by weaptype1_txt
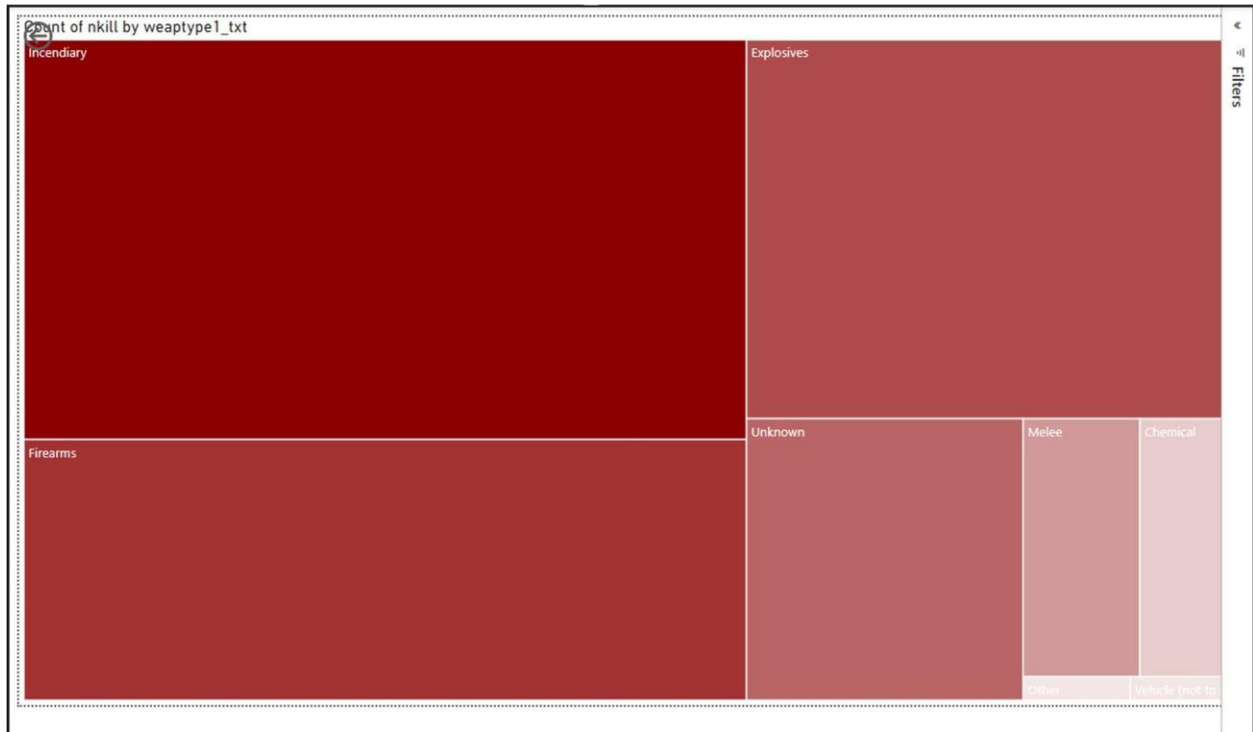
This is the top layer view of the tree map. The look is based on the instructions on canvas showing that the darker the color is, the more lethal the weapon is. It is notable that incendiary weapons are the choice of weapon for the terrorists. Some challenges found was getting the drill down function to work. It was hard to understand but by looking up tutorials, it was again, simple to learn and implement.

Page 4:

target1	targtype1_txt	Count of Attack_count	Sum of Casualties
Conveyor Belt	Business	20	0
Church	Religious Figures/Institutions	10	0
Mosque	Religious Figures/Institutions	6	101
Cell Phone Tower	Telecommunication	5	0
Cellphone Tower	Telecommunication	4	0
Unit	Military	4	17
Civilians	Private Citizens & Property	3	25
Elementary School	Educational Institution	3	0
Station	Police	3	2
Subway system	Transportation	3	0
village	Private Citizens & Property	3	3
Gendarme	Police	2	2
Gendarme Unit	Police	2	28
Indonesian Consulate	Government (Diplomatic)	2	0
night club	Business	2	0
Total		**319**	**517**

The design choice is a minimalist look. It shows key points and also makes sure that the entire data is shown rather than cut. The key insight that was found was that the most commonly attacked target was conveyor belts which seems pretty odd. It is also made known that no one died during the attacks so it is possible it was meant as a slow down action to damage a company. The challenges faced was properly getting the table to show the correct information and the bookmark function. We were able to just add new columns to the data using already filtered information to achieve the correct result. As for the bookmark, a simple video was very helpful in showing the proper way of using it.