

Monash University: Assessment Cover Sheet

Student name	Chew	Yu	
School/Campus		Student's I.D. number	32022166
Unit name	FIT3179 Data visualisation - S2 2023 MUM		
Lecturer's name	Dr Grace	Tutor's name	Dr Grace
Assignment name	Data Visualisation II Report	Group Assignment: No Note, each student must attach a coversheet	
Lab/Tute Class: Tutorial 06	Lab/Tute Time: Fri 12pm-2pm	Word Count: 898	
Due date: 15-10-2023	Submit Date: 14/10/2023	Extension granted <input type="checkbox"/>	

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Chewyuhuan

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Data Visualization Project 2

Name: Chew Yu Han

Student ID: 32022166

Tutorial: Tutorial 06

GitHub: [Click Here](#)

Web-Visualization: [Click Here](#)

Number of words: 898 Words

Domain

The domain that I have chosen is Global Terrorism Insight (2012-2022)

Why

Visualising global terrorism insights serves a crucial need in international security. By distilling complex data into visual insights, it empowers users to identify trends and hotspots and informs decision-making in counter-terrorism strategies. The visualisation addresses the specific domain of international security, promoting understanding, awareness, and data-driven approaches.

What

The Global Terrorism Index (GTI) delves into the repercussions of terrorism across 163 countries, collectively representing 99.7% of the global population.

To compile the GTI report, data was meticulously gathered from sources such as Terrorism Tracker by the Institute for Economics and Peace (IEP). The dataset that I found comes from three different authors with the same domain: Global Terrorism Index 2023 (Dee, 2023), Global Terrorism (Mexwell, 2023), and Global Terrorism Catalogue (KŁAPEYE FOUNDATION, 2023).

- Categorical
 - Region, Country, CATEGORY
- Ordered
 - Ordinal
 - Rank
 - Quantitative
 - Year, Score, Incidents, Fatalities, Injuries, Hostage, Terrorist_attacks

In the pre-processing phase, a series of cleaning procedures take place. This encompasses the elimination of redundant variables, aligning country names with the correct terminology from the map's topojson file, and the consolidation of both datasets into a comprehensive CSV file. Furthermore, regions are integrated into the dataset alongside their corresponding countries. Additionally, I employed power query in Excel to compute the sum of indicators and terrorist scores.

Why and How

Figure 1: (Entire Dashboard Visualisation)

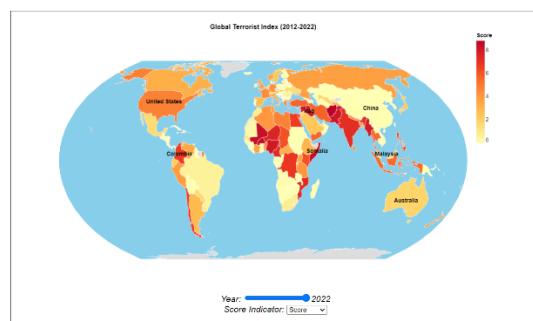


From 2012 to 2022, the global landscape has witnessed a sobering reality marked by **47,873** terrorist incidents resulting in a staggering **193,738** fatalities. This tumultuous period has been characterized by diverse forms of violence, ranging from bombings and assaults to hostage situations. The sheer magnitude of incidents underscores the persistent threat posed by terrorism worldwide. Examining this tumultuous decade reveals intricate patterns, regional disparities, and the evolving nature of these attacks.

Geographical Distribution on Global Terrorist Index

*Year Slider can control the year that shows an interesting trend regarding the Global Terrorist Score.

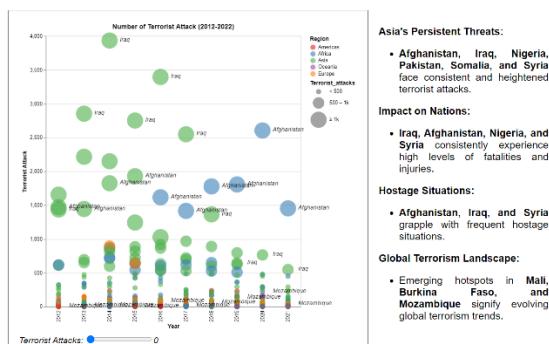
In the turbulent narrative of global terrorism spanning the years 2012 to 2022, our interactive map unveils a chilling tale. Afghanistan, Iraq, and Syria emerge as perennial protagonists in this saga of unrest, their consistent high scores painting a vivid picture of enduring challenges.



Number of Terrorist Attack Per Country

*Terrorist Attack Slider can be used to control the parameter of the Number of Terrorist Attack

*Region in the legend can be used to filter out region



Asia's Persistent Threats:

- Afghanistan, Iraq, Nigeria, Pakistan, Somalia, and Syria face consistent and heightened terrorist attacks.
- Iraq, Afghanistan, Nigeria, and Syria consistently experience high levels of fatalities and injuries.
- Afghanistan, Iraq, and Syria grapple with frequent hostage situations.

Global Terrorism Landscape:

- Emerging hotspots in Mali, Burkina Faso, and Mozambique signify evolving global terrorism trends.

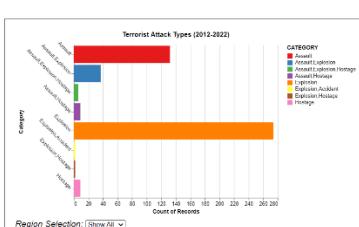
Type of Terrorist Attack

*Region can be selected using the "Region Selection"

Regionally, the following incidents were prominent:

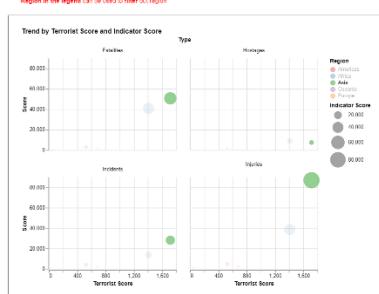
- **Explosion and Assault:** Americas, Asia, Africa, Europe, and Oceania.
- **Asia:** 195 Explosion incidents
- **Europe:** 32 Assault incidents
- **Oceania:** Limited Incidents - 2 Assault and 1 Hostage

This summary provides insights into the varied nature of terrorist attacks across regions during the specified period.



Relationship between Terrorist Attack Score and other Indicators

*Region in the legend can be used to filter out region



Injuries:

- Africa and Asia show elevated Terrorist Scores, indicating heightened terrorist activities resulting in injuries.

Hostages:

- Africa and Asia experience significant impacts in the realm of hostages.

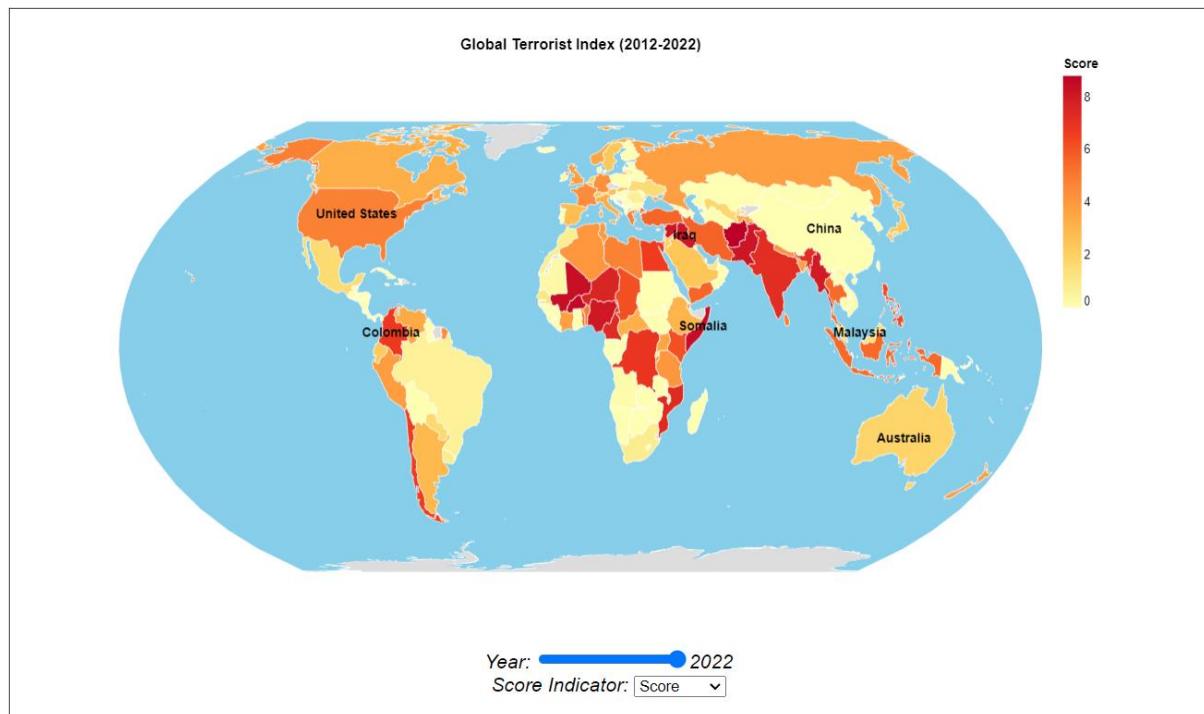
Fatalities:

- Africa leads in the severity of terrorist incidents, particularly in terms of fatalities.

Incidents:

- Africa's higher overall impact in the broader spectrum of terrorist activities.

Figure 2: Global Terrorism Index Choropleth Map



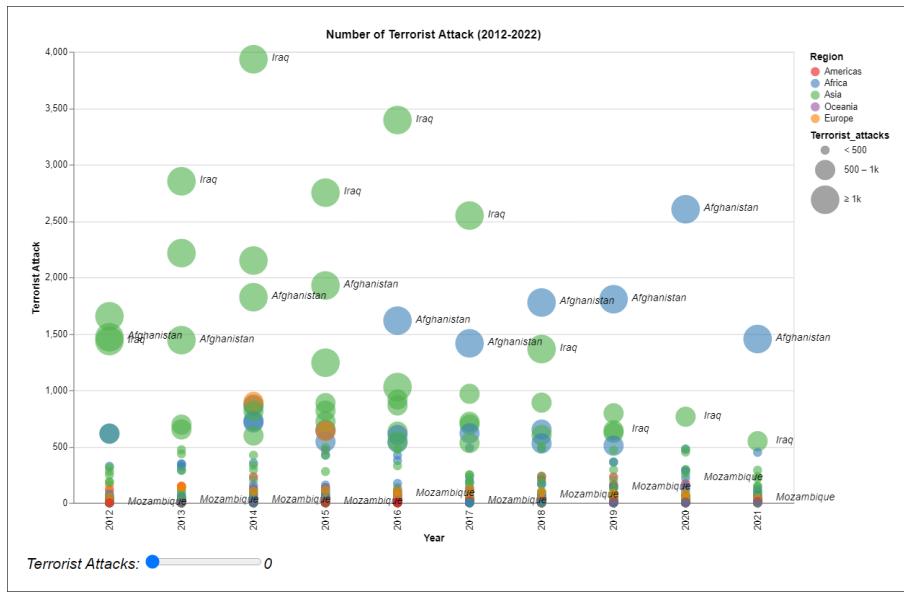
Why

- Choropleth maps are used to visualize spatial patterns and variations. They provide an overview of how the selected indicator varies across geographical regions.

How

- Data Integration:
 - Integrates country boundaries (topojson) and Global Terrorism Index data (CSV).
- Filtering Data:
 - Filters data based on selected year.
 - Filters data based on selected indicators.
- Colour Encoding:
 - Applies a colour scale (#fffffb2 to #bd0026) based on selected indicator values.
- Tooltip Information:
 - Configures tooltips for country details on hover.
- Text Annotation:
 - Adds text annotations for specific countries (Iraq, Australia, US, etc).

Figure 3: Terrorist attack bubble plot



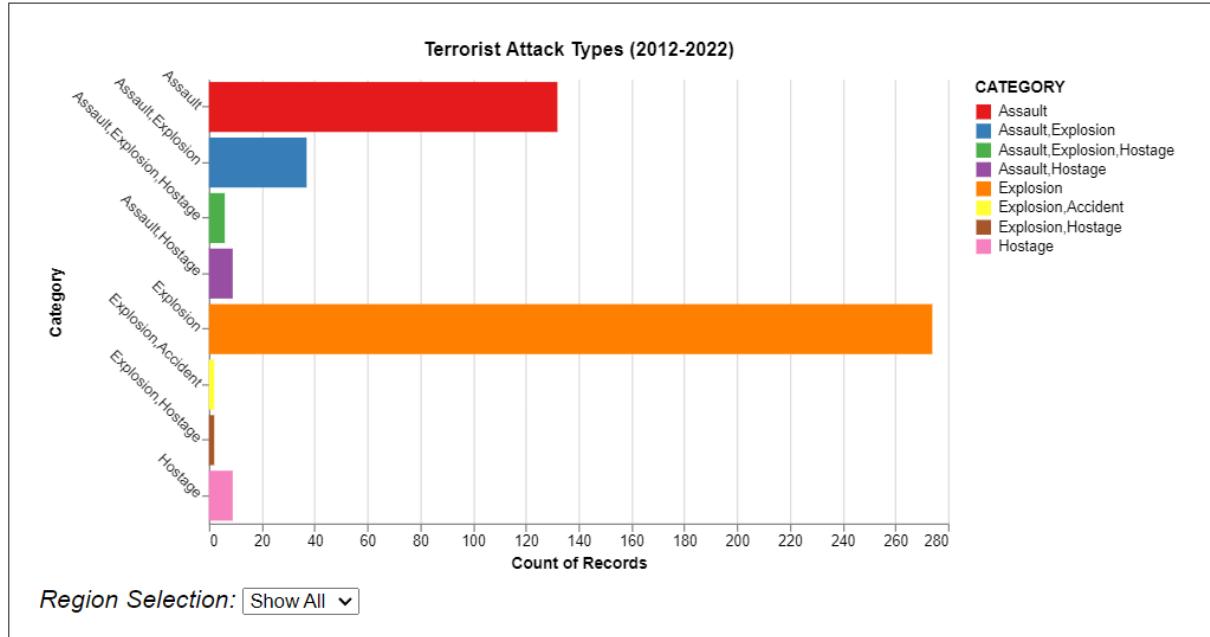
Why

- Highlights trends in global terrorist attacks from 2012 to 2022.

How

- Interactive Parameter:
 - Implements a range slider (Terrorist_attacks) for user-defined attack count filtering.
- Circle Marks for Regions:
 - Utilizes circular marks, color-coded by region.
- Circle Size Encoding:
 - Adjusts circle size based on attack counts with a threshold scale
- Opacity for Highlighting:
 - Uses opacity to highlight selected regions when interacting with the legend.
- Tooltip Information:
 - Provides detailed tooltips about each country, including attack counts, incidents, fatalities, injuries, and hostages.
- Text Annotations:
 - Adds text annotations for specific countries (Iraq, Afghanistan, Mozambique).

Figure 4: Terrorist Attack Type Bar Chart



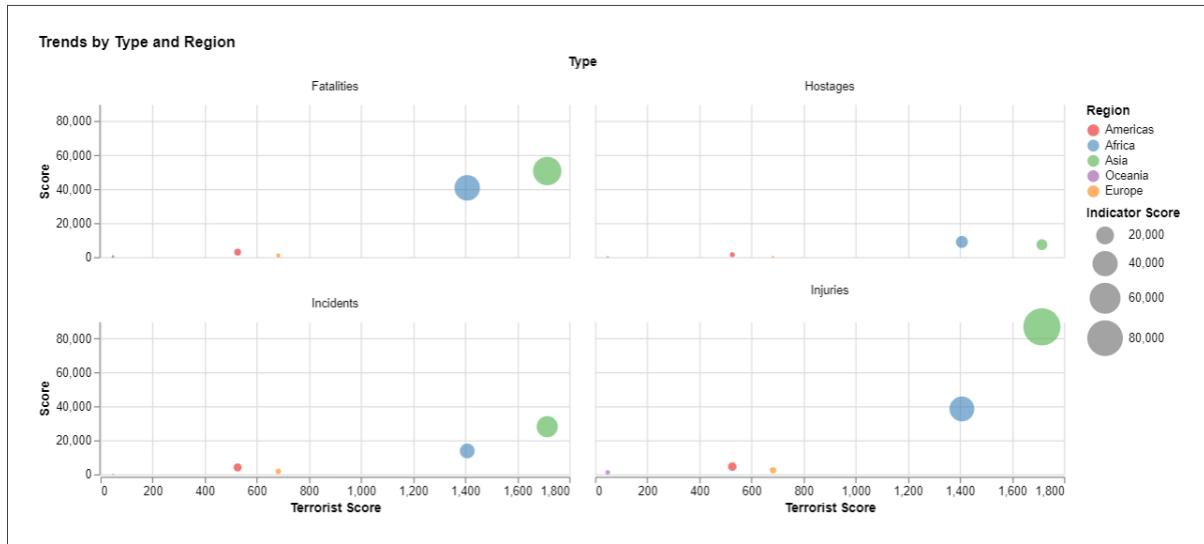
Why

- Visualizes the distribution of terrorist attack types from 2012 to 2022.

How

- Interactive Parameter:
 - Implements a dropdown (Region_selection) for users to select specific regions.
- Bar Chart Layer:
 - Using a bar chart with attack categories on the y-axis and the count on the x-axis.
- Colour Encoding:
 - Color-codes bars based on attack categories using the "set1" colour scheme.
- Tooltip Information:
 - Tooltips provide details on attack categories and their respective counts.

Figure 5: Trend by Terrorist Score and Indicator Score



Why

- Illustrates trends in both terrorist scores and indicator scores, providing insights into their relationship.

How

- Interactive Highlighting:
 - Implements a legend-based multi-selection (`region_highlight`) for interactive highlighting of regions.
- Size Encoding:
 - Sizes circles based on the indicator score, using a linear scale ranging from 0 to 1000.
- Small Multiple:
 - Facets the plot by the "Type" field, organizing data into two columns for better readability.
- Tooltip Information:
 - Tooltips provide detailed information including region, terrorist score, and indicator score.
- Opacity for Highlighting:
 - Adjusts opacity to highlight selected regions when interacting with the legend.

Design:

The dashboard's design is meticulously crafted for user guidance, utilising a left-to-right, top-to-bottom progression. A responsive single-column layout ensures a straightforward reading experience. Figure 2's Choropleth Map strategically centres attention, maintaining an uninterrupted experience within a unified, invisible frame. Symmetrical division of containers enhances visual organisation.

Colour:

The global theme prioritises visual consistency with a unified colour palette extending to charts and headings. Distinct yet interconnected colours are chosen for different regions, using warm hues like reds and oranges to convey urgency in terrorism-related charts. Black text ensures readability, while strategic red text cues prompt users in areas like the year slider and region selection. Contrasting text colours against lighter backgrounds enhance overall legibility for a user-friendly experience.

Figure-Ground:

In the design realm, graphical elements take centre stage, commanding attention through strategic emphasis. Generously sized and vibrant charts effortlessly draw focus, with designated elements standing out distinctly during filtering. A clear hierarchy is established through bold fonts for headings and smaller fonts for descriptive text, facilitating intuitive information consumption.

Typography:

The 'Arial' sans-serif typeface is deliberately selected for its clean, modern appearance and optimal readability. The text layout follows a structured approach with justified alignment, contributing to a professional aesthetic. Varying font sizes for headings and subheadings establish a clear hierarchy, enhancing visual organisation and readability.

Storytelling:

The dashboard adopts a narrative storytelling approach, leading viewers through a well-organised sequence. Chart progression follows a logical left-to-right, top-to-bottom flow, enhanced by Gestalt principles for grouping and clarity. Each section is introduced with descriptive text, guiding the reader through visualizations. Informative tooltips and interactive elements enrich user engagement, creating a comprehensive and engaging narrative about the global terrorist landscape in a succinct design.

Reference List

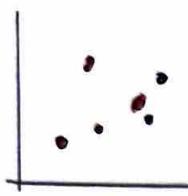
dee, dee. (2023). Global Terrorism Index 2023. Retrieved October 12, 2023, from Kaggle.com website: <https://www.kaggle.com/datasets/ddosad/global-terrorism-index-2023>

KŁAPEYE FOUNDATION. (2023). Global Terrorism Catalogue. Retrieved October 12, 2023, from Kaggle.com website: <https://www.kaggle.com/datasets/klapeyefoundation/global-terrorism>

mexwell. (2023). 🌐 Global Terrorism. Retrieved October 12, 2023, from Kaggle.com website: <https://www.kaggle.com/datasets/mexwell/global-terrorism>

1. Ideas

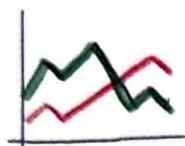
① Dotted plot



② Pie chart



③ Line Graph



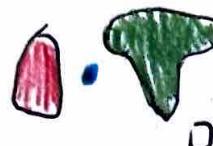
④ Radar chart



⑤ Histogram



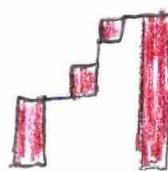
⑥ Choropleth map



⑦ Area chart



⑧ Waterfall



2. Filter

⑨ Pie chart

⑩ area chart

The data don't have
cumulative data.

⑪ histogram : The data didn't show any distribution

⑫ waterfall : Not suitable for this data-type

⑬ radar chart : Not suitable for data have Time range .

3. Categorize

⑭ To show relationship between X & Y axis.
Eg. (Terrorist score vs other indicators)

⑮ ⑯ : To show trend over year.

⑰ Bar chart : To compare value of different type (Eg - Type of terrorist attack)

4. Combine and Refine

⑱ ⑲ By combine it, we can create a choropleth map with a year slider to Show trend over year.

⑳ ; we can create a small multiple view to show different relationship between Terrorist score and indicators.

㉑ Bar chart shows the number of attack type by attack type .

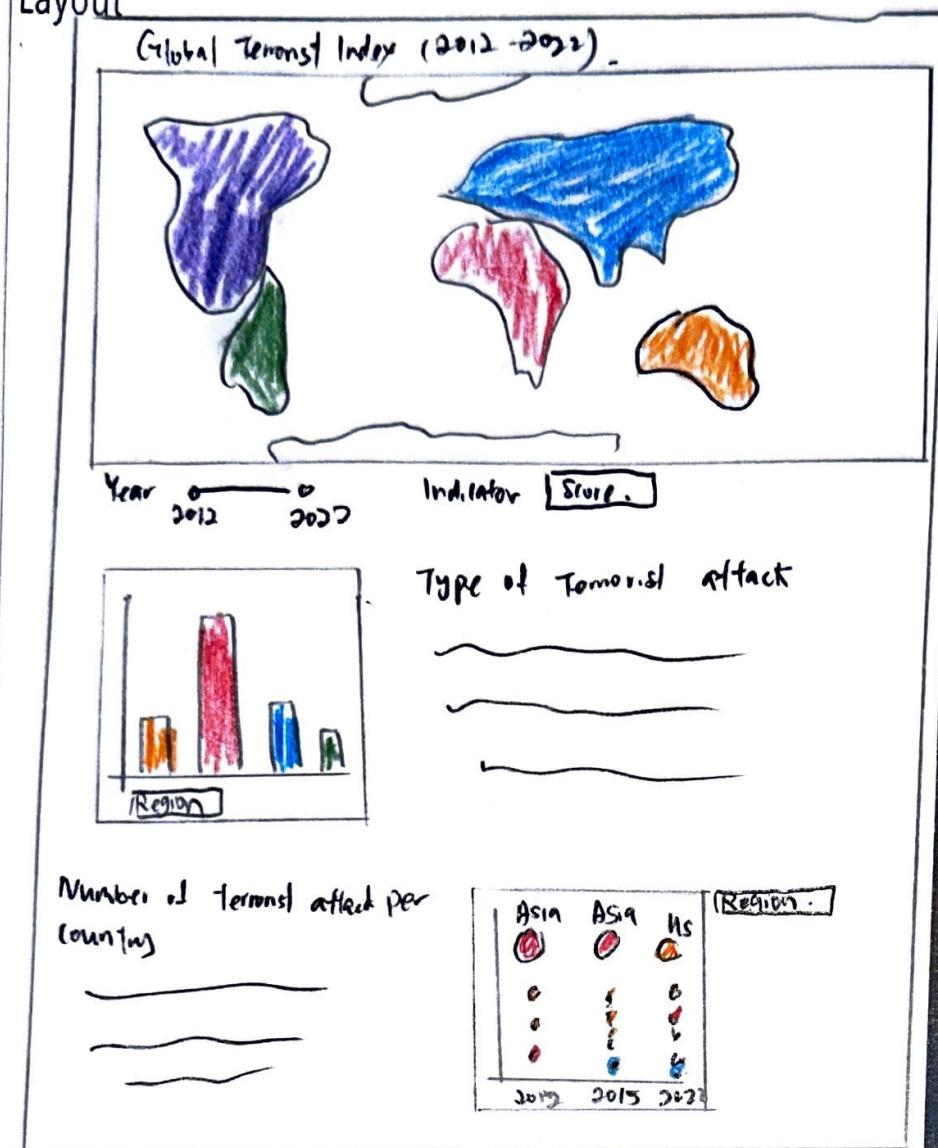
5. Question

㉒ Does it show trend on terrorist score ?

㉓ Does it show relationship between terrorist score and injuries ?

㉔ Can user filter out regions ?

Layout



Title: Visualization Project 2

Author: Chew Yutian

Date: 5/10/23

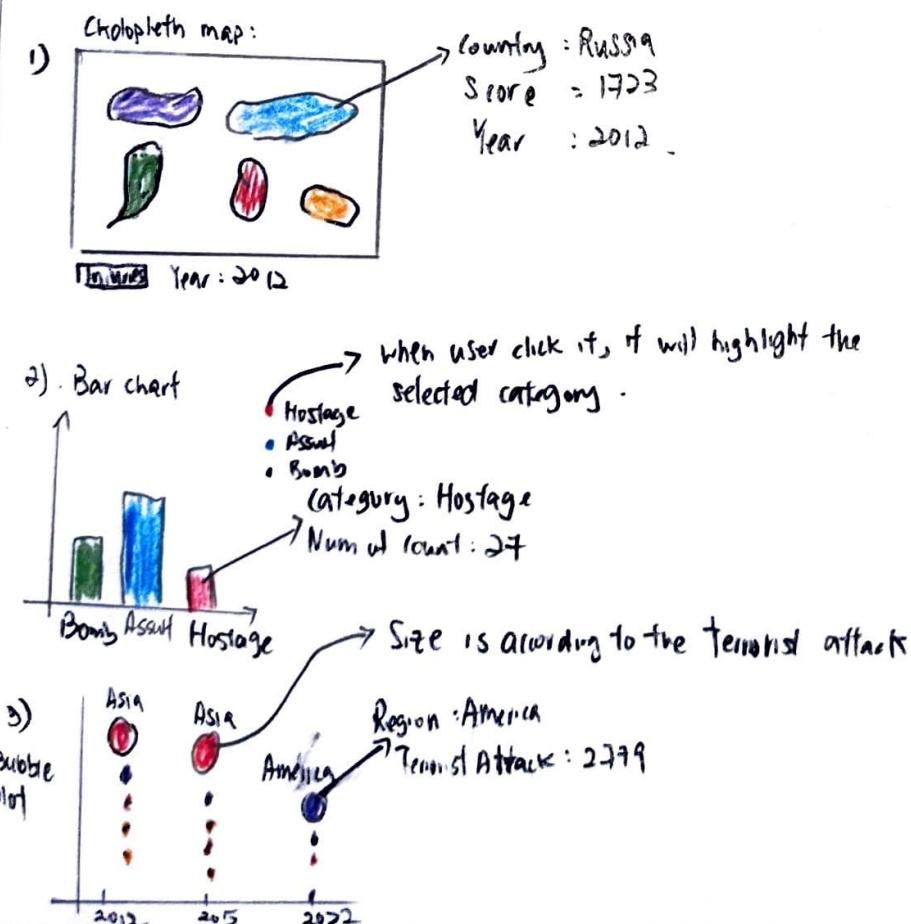
Sheet: ②

Task: long format Global Terrorist Index

Operations

- 1) The webpage is scrollable along years
- 2) Year, indicator and region can be selected to filter out selected data
- 3) Each point of the idiom will show the details using tooltips.
- 4) Text annotation on the bubble plot show the selected country that I focus on in the visualizations.

Focus



Discussion

Positive

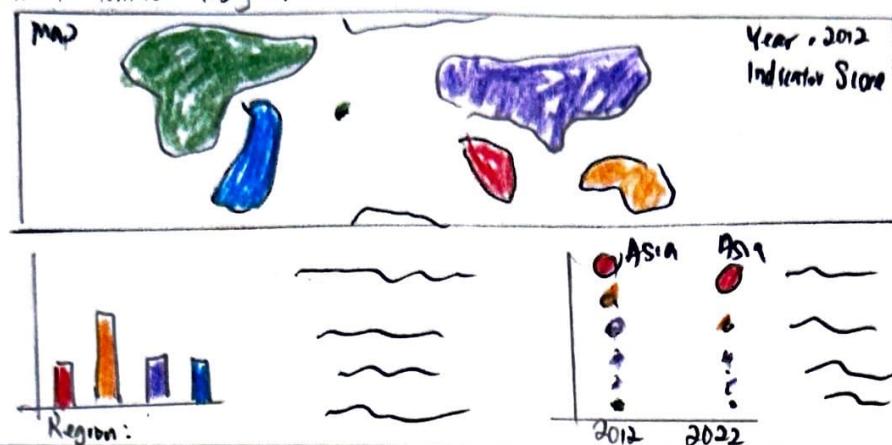
- 1) The layout have unlimited space where it can add more idioms in below
- 2) Idioms are dynamic where user can filter out what they need
- 3) having tooltip will show more details to the users.

Disadvantages.

- 1) If the website too long, user will feel hard to read the visualization
- 2) There is too many country in the bubble plot that cause messy.

Layout

Global Terrorist Insight.



Title: Visualization Project 2

Author: Chew Yu Han

Date: 6/10/23

Sheet: ③

Task: Dashboard.

Operations

- 1) A dashboard that use the entire screen size
- 2) Each point of the idioms will show the details of it using tool tips
- 3). Text annotation on bubble plot to show focus country.

FOCUS

1) Choropleth map.

- point on either one of the region will show the region name, score, and year selected

2). Bar chart

- hover on each bar will show details of current bar.

3) Bubble plot .

- hover on each bubble will show current bubble details.

Discussion

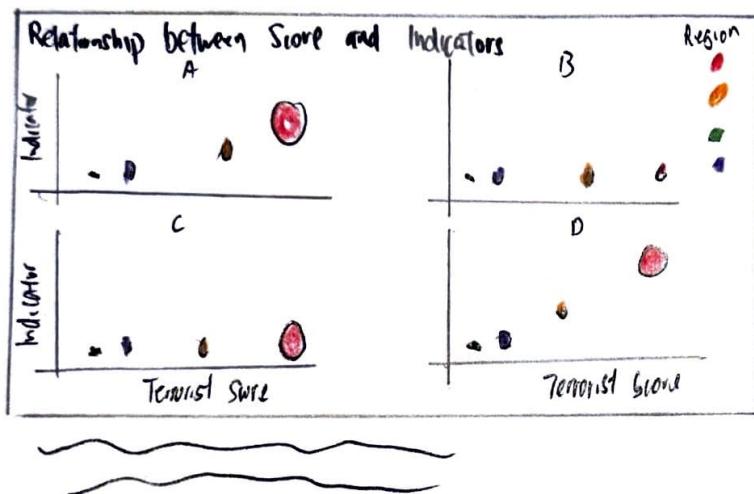
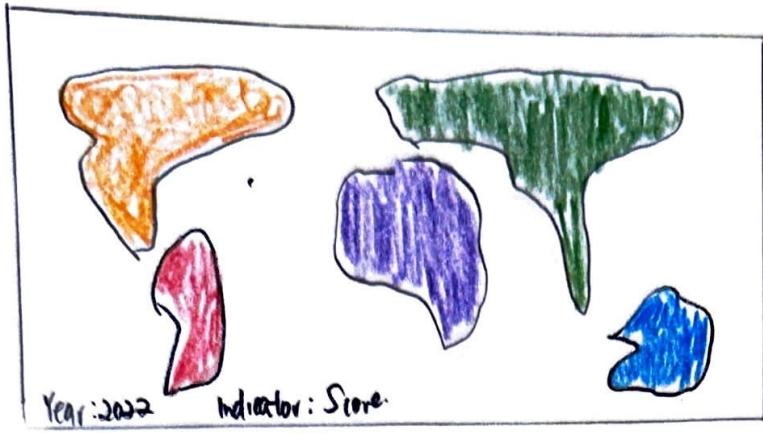
Positive

- 1) Give entire view of dashboard in one insight
- 2). Idioms are dynamic where region, year can be selected
- 3) Tooltips give additional info to users on the current spot.

Disadvantages

- 1) It will look pack and untidy when the dashboard layout is bad.
- 2) Limited idioms can be shown in the dashboard if using the entire screen without scrollable function.

Layout



Focus

- 1) choropleth map
 - each location shows region name, score & year
- 2) small multiple bubble plot.
 - each bubble show region, Terrorist score & Indicator score.

Title: Visualization project 2
Author: Chew Yulin
Date: 6/10/23
Sheet: 44
Task: Small multiple with map.

Operations

- 1) Dynamic idioms to filter out gear and region
- 2) tooltips to show details at current point

Discussion

Advantages

- 1) Small multiple bubble plot show details relationship in a entire view.
- 2) tooltips give additional info to users
- 3). Idioms are dynamic where indicator can be changed

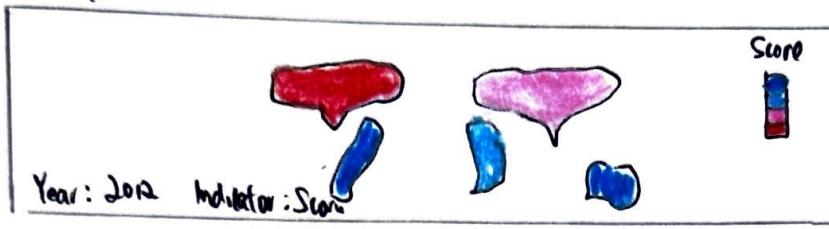
Disadvantages

- 1). If indicators are many, it will look messy in small multiple.

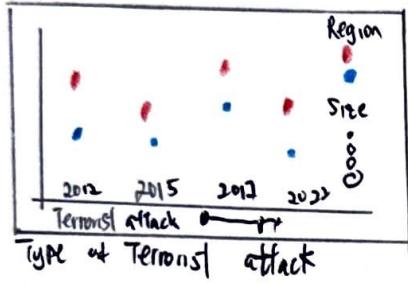
Layout

Global Terrorism Insight (2012 - 2022)

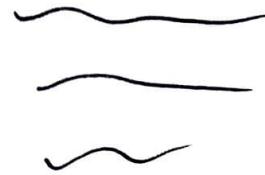
Introduction



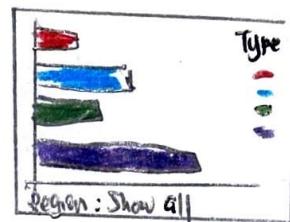
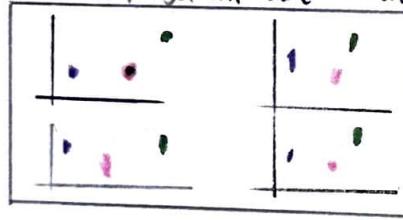
Number of Terrorist Attack



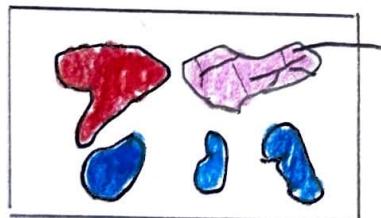
Type of Terrorist attack



Relationship between Score & Indicators

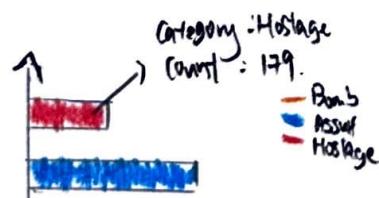


Focus

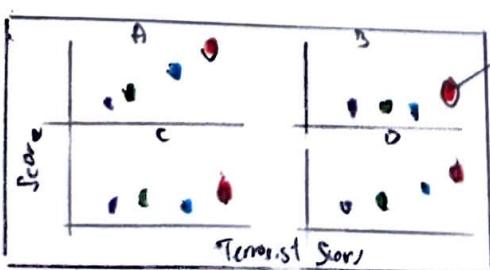
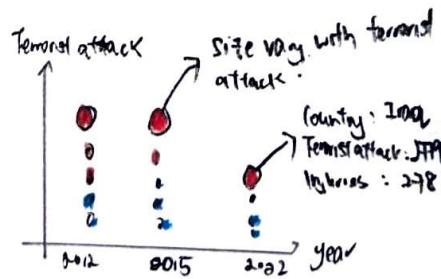


Year: 2012 Indicator: Score.

Country: Russia.
Score: 9.27
Year: 2012.



Number of Attack



Title: Visualization project 2

Author: Chew Yu Han

Date: 7/10/23

Sheet: 5

Task: Global Terrorism Insight

Operations

- 1) Hover any point of the graph will show details at current panel
- 2) Option bar can be selected for indicator & region
- 3) Year Slider can be used to control year
- 4) Legend region also can highlight region
- 5) Terrorist attack slider can config number of attack to show.

Detail

- 1) Two different Data Set collected to visualize.
- 2) Time estimated build 15 hours. Include html & css.
- 3) Dataset taken from kaggle.
- 4) Query editing is needed for small multiple bubble plot and can be done in excel
- 5) data manipulation & cleaning is needed for this dataset.