Assignment 2 Writeup

Yunxuan Xiao

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1 Introduction

In this assignment, we designed and deployed an interactive data science application focusing on the history of global terrorism attacks over the past 50 years. We collected data from Kaggle Global Terrorism Database (GTD) and used Streamlit and Plotly library to implement and launch our app.

The objective of this project is to explore the time and geographic distribution of terrorist activities around the world. Specifically, we try to help users answer the following questions:

- In a specific historical period, what is the geographical distribution of terrorist organizations in different regions?
- What are the major terrorism groups in a certain area and how their activities have changed over time?
- What is the detailed profile of terrorist activity within a certain country? (who, where, when and how)

Project Links: [Application URL], [Github repo], [Dataset source]

2 Design Desicions

2.1 Choropleth Map Chart

We are happy to launch this powerful tool, which uses the pyplot choropleth component to visualize the geographic distribution of terrorist activities. Users can *pan, zoom, and brush* the world map to investigate their areas of interest. Compared with ordinary static charts, users can easily obtain a large amount of information here. We also provide *dynamic query filters* on the sidebar to help users explore a subset of data.

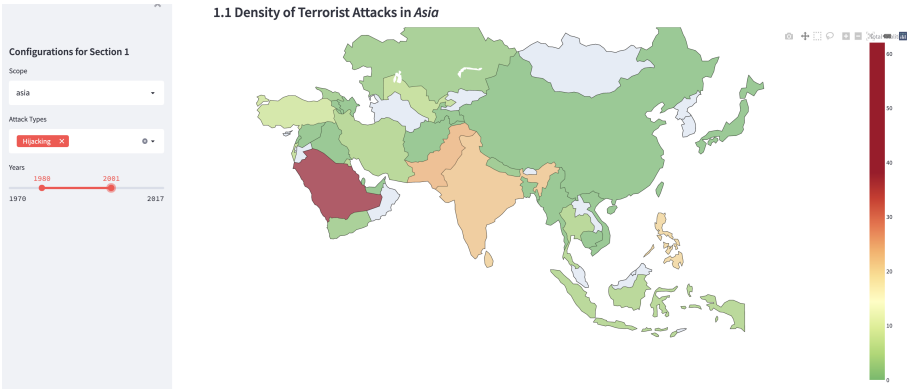

Figure 1: Example of our Choropleth Map Chart

For example, if a user wants to know all **hijacking** events that happened during **1980-2001** in **Asia**, he can simply set the double-end slider to 1980 and 2001 and set the select box values to Asia and Hijacking.

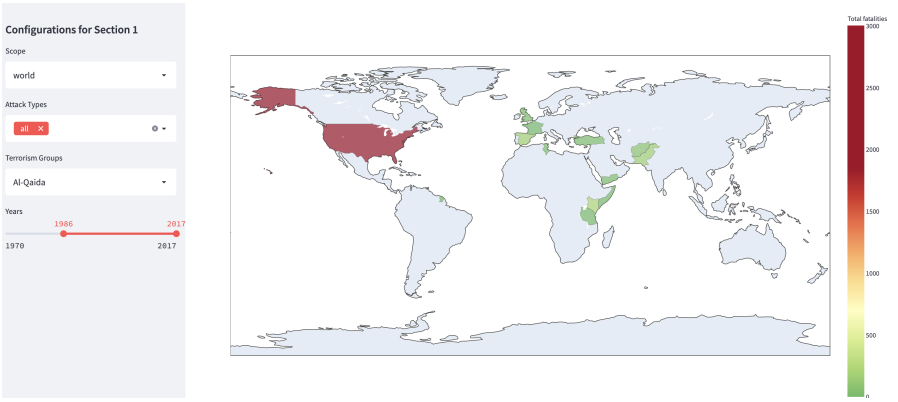

Figure 2: Activity of Al-Qaida from 1986-2017

Another powerful feature is that users can investigate the activities of a single terrorist organization. It will help us better understand their origins and areas of activity. Fig 2 shows the activity of Al-Qaida from 1986 to 2017, it shows that they have rampant terrorist activities in North America, the Middle East, Europe and East Africa.

At the same time, the application will simultaneously update the bar chart in Section 1.2, which shows the top 15 terrorist organizations in the region within the time frame you selected. Users do not have to take duplicated interactions.

2.2 Country-level Terrorism Profiler

In this section, we implemented a fine-grained map indicating all locations of historical terrorist attacks. We can know which area in a country is more dangerous and more likely to have terrorism attacks. Users can choose a country of interest in the select box above.

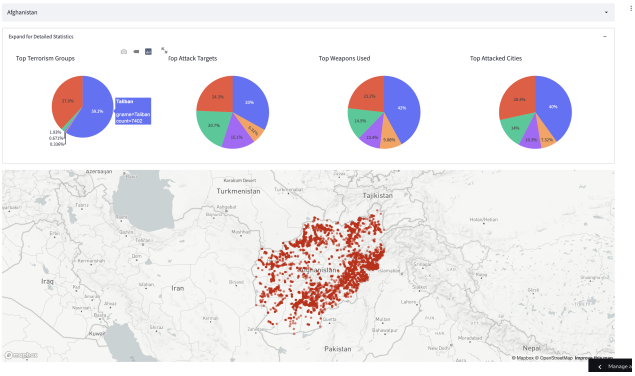

Figure 3: Country-level Terrorism Profiler

Since many users need more than just geographic information, here we also have a expander to provide *details-on-demand*. Four pie charts depict the portion of major terrorism groups, weapons, cities and the form of attacks.

2.3 Composition of terrorist activities

In the last section, we provide more quantitative analysis on the evolution of global terrorism. We charted the number of attacks per year grouped by attack type and top terrorist organizations. Users can freely browse the chart by zooming in/out and showing/hiding lines in the legend.

3 Development Process Overview

I finished this project by myself. In this project, I spent about 2 hours to find suitable datasets, 2 hours to decide the contents to show, 12 hours to implement the app and 2 hours for deployment.

The most time-consuming part is the app implementation. I took quite a long time to read the documentation of Streamlit and try different features on the web. In addition, since I did not design the layout well at the beginning, I made a lot of changes during the implementation process, which wasted a lot of time. In addition, choosing a good visualization format for a given data set is a challenging but interesting process.