**GLOBAL TERRORISM ANALYSIS**

**Snehal Gaddime**

**Data Science Trainer**

**Edureka, Hyderabad**

**ABSTRACT**

The Global Terrorism Data Project presents a comprehensive dataset covering terrorism incidents worldwide from 1970 to 2010. This dataset compiles information from diverse sources, including government reports, academic studies, and news articles, providing a rich resource for analysing and understanding the dynamics of global terrorism. Key features include incident date, geographical coordinates, attack types, casualty counts, perpetrator details, motivations, and counterterrorism efforts. Through geospatial mapping, temporal analysis, and predictive modelling, the GTDP offers valuable insights into terrorism trends, risk assessment, and policy recommendations. This dataset serves as a vital tool for researchers, policymakers, and security experts committed to countering the threat of terrorism on a global scale.

***Keywords : Exploratory Data Analysis, Numpy, Pandas, Visualizations***

1. **PROBLEM STATEMENT**

The global proliferation of terrorism from 1970 to 2010 demands a comprehensive dataset to understand trends, root causes, and counterterrorism strategies. The absence of such data hinders informed decision-making and proactive efforts to combat terrorism. The problem is to create and analyse this dataset to provide insights for evidence-based policies and enhance international security.

1. **INTRODUCTION**

The United Nations was founded with the core objective of promoting global peace. However, terrorism has emerged as the foremost barrier to achieving this goal, often overlooked by those not directly affected. Terrorism is perceived as unpredictable and disproportionately affects specific regions, leading to varying responses. This project analyses data from the START Consortium to unveil significant patterns and statistics related to terrorism.

Defining terrorism remains a contentious issue, with the UN General Assembly unable to reach a consensus on a single definition. Consequently, governments and organizations have devised their interpretations, creating divergent criteria for what constitutes terrorism. This lack of clarity leads to conflicts over categorizing events as terrorism or not, resulting in differences in terrorism datasets collected by various organizations. Hence, the analysis and results presented in this study may vary from those based on different datasets.

1. **DATA DISTRIBUTION**

|  |  |
| --- | --- |
| Attributes | Desription |
|  |  |
| Attacktype1\_txt | The type of attack happened. Attacktype1\_txt consists of categories like explosion, armed assault, assassination, kidnapping, unarmed assaults. |
| Target1\_txt | Type of target involved in the attack. Target1\_txt consists of categorical values like private citizens, military, police, government officials, transportation, education, religious institution, airports, etc. |
| Success | ‘1’ if attack was a success. ‘0’ if attack was a failure. |
| Multiple | Value for the number of attacks conducted in a single terrorist event. |
| Natlty1 | Nationality of the attacker. |
| Weaptype1 | Type of weapon used in the attack. Weaptype1 contains values like firearms, explosives, melee, vehicles etc. |
| Nkill | Number of people killed in any event. |
| Nwonded | Number of people wounded in any even |
| Region\_txt | Name of the region where the attack happened. Region\_txt consists values like East Asia, South Asia, Western Europe, etc. |
| Longitude | Longitude of the location. |
| Latitude | Latitude of the location. |
| Property | Total property damage happened in any event |
| Suicide | ‘1’ if attack was a suicide attempt. ‘0’ if attack was not a suicide attempt. |
| Motive | Known motive of the attacker |
| Age | Estimated age of the attacker |
| Day, month, year | Calendar details of the event. |

1. **DATASET CHALLENGES**

major challenge while working on this dataset is that individual studies lead to different conclusions. Current shortcomings and limitations in data collection techniques, definition debates, irregularity in coding and analysis give rise to disagreements among researchers and in turn ruling out their conclusions.

An acceptable level of theoretical and empirical analysis is required to prove a heuristic casual model showing links between globalization and terrorism. One of the issues is critical disagreement over the definitional debates around various terrorist events exerts a detrimental influence on this field’s development.

1. **FACTORS AFFECTING GLOBAL TERRORISM**

One of the project's goals is to identify terrorism's dependent factors. While the dataset lacks parameters like religion or nationalism, these factors significantly influence contemporary terrorism. The role of religion in terrorism has been a subject of debate, but evidence indicates that religious beliefs can shape and fuel terrorism. Religious idealization is a major motivating factor leading to fanaticism and, ultimately, terrorism. Thus, exploring the contribution of religion to terrorism is a compelling aspect of this analysis.

1. **TOP MOTIVE OF TERRORIST ATTACKS**

**Political Goals:** Terrorist groups may seek to achieve political objectives, such as overthrowing governments, gaining independence for a specific region, or promoting a particular ideology.

**Religious Extremism:** Religious extremism can motivate acts of terrorism, with individuals and groups using religious beliefs to justify their actions. This can include religious radicalization and the desire to establish religious-based governance.

1. **STEPS INVOLVED**
2. **Project Design-** Data operations are primarily conducted using Python scripts within Jupyter Notebook, an open-source web-based Python development environment. Python serves as the core tool for data preprocessing, modeling, analysis, and visualization. Anaconda, an open-source Python distribution, manages dependencies and provides a suitable environment for code development. The website showcases visualizations and offers detailed explanations to aid users in contextual understanding.
3. **Data preprocessing -** Data preprocessing is a crucial initial step in handling the Global Terrorism dataset. Raw data often lacks organization and contains irrelevant information. This project aims to convert raw data into a more meaningful and focused format. The Global Terrorism dataset suffers from incompleteness, inconsistencies, errors, missing values, outliers, incorrect tags, and duplicate entries. Data preprocessing addresses these issues by performing data cleaning. This process involves filling missing values, removing irrelevant fields (e.g., 'motives' or 'responsible organizations'), and eliminating fields with excessive missing values (e.g., 'weapsubtype2' and 'weaptype3\_txt') to enhance data quality and analysis efficiency.
4. **Visualizations -** Visualization plays a crucial role in understanding and analyzing global terrorism data in several ways:

**Geospatial Analysis:** Mapping terrorism incidents using tools like geographic information systems (GIS) helps identify hotspots and geographic trends. Heatmaps, choropleth maps, and point maps visualize the concentration of incidents, aiding in the allocation of resources and counterterrorism efforts.

**Temporal Trends:** Time series visualizations, such as line charts and bar graphs, illustrate how terrorism incidents have evolved over time. Patterns and fluctuations become apparent, enabling the identification of temporal trends and seasonality.

**Attack Types:** Visualizing the distribution of different attack types (e.g., bombings, shootings, kidnappings) provides insights into the preferred tactics of terrorist groups. Pie charts and bar charts can be used to convey this information effectively.

**Target Types:** Visual representations of target types (e.g., civilians, government, military) help identify the most frequently targeted entities. Stacked bar charts or donut charts illustrate the proportions of attacks against different targets.

**Casualty Analysis:** Charts and graphs displaying casualties (deaths and injuries) over time or by region help gauge the human impact of terrorism. These visualizations can inform emergency response and healthcare planning.

**Perpetrator Analysis:** Visualizing data on terrorist group affiliations and ideologies can reveal patterns in group activity. Network diagrams or word clouds can be employed to display these relationships.

**Motivations:** Word clouds and bar charts can visualize the stated or inferred motivations behind terrorist acts, aiding in understanding the underlying factors that drive terrorism.

**Social Media Analysis:** Visualization tools can analyse social media data to identify trends in online extremist activity and recruitment efforts.

**Heatmaps:** Heatmaps can visualize the density of terrorism incidents across geographic regions, highlighting areas with higher concentrations of attacks. This information informs risk assessments and resource allocation.

**Interactive Dashboards:** Interactive dashboards allow users to explore the data dynamically, adjusting filters and parameters to gain insights into specific aspects of global terrorism. These dashboards are invaluable for policymakers and analysts.

Overall, visualization enhances the accessibility and interpretability of complex global terrorism data, helping researchers, policymakers, and security professionals make informed decisions, spot patterns, and develop effective counterterrorism strategies.

1. **CONCLUSION**

* **Summary**

This project's primary objective was to develop a user-friendly tool for comprehending the nature of terrorism using the Global Terrorism dataset. The tool features interactive visualizations that allow users to calculate total attack counts, casualty figures, and incident locations based on their selected criteria, such as region and year. Through these visual representations and accompanying explanations, users can gain insights into various patterns, trends, and correlations within the realm of terrorism.

Moreover, the tool serves as a valuable resource for additional research, making it pertinent to a wide range of users, including curious civilians, security policymakers, international organizations planning global events, foreign investors assessing risks, and academic researchers conducting in-depth studies on terrorism and its dynamics. By offering accessible and meaningful insights, this tool contributes to a better understanding of terrorism, which is vital for informed decision-making, security planning, and academic exploration in this critical domain.

* **Future work**

Following is a list of directions which can enhance the quality and quantity of this current project work:

**1.** **Improve dataset quality:** Dataset needs to be populated more by adding the missing values. Many historical terrorist events are yet to be documented because of conflict in information from multiple sources or lack of credibility from the 42 source providing information. Resolving this conflict will increase the scope of analysis of new attributes that are mostly sparse at the moment.

**2. Prediction:** Different prediction methodologies can be used to make a system that can predict various parameters like attack count, rate of a successful attack, prospective casualties, type of attack, types of weapons used, etc. Currently, prediction models are difficult to achieve high accuracy because of the relatively small dataset size.

**3. Enhance current work:** More techniques can be added in this project like classification and regression. Design sophisticated patterns like how terrorist groups act and react over the years. Add more visualizations to make user interface more interactive.

**4. Connections with other datasets:** Exploring impacts of terrorism on other fields like country’s Development index, stock market, international investments, happiness rating, tourism, etc. can reveal new patterns and relationships among them. These correlations will help understand how terrorism influences other domains.

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