

❖ **Project - 4: Global Terrorism Database Dataset : Exploratory Data Analysis**

➤ **Tools Used:** Python

Industry Context:

- Terrorism Global Terrorism Database remains a global challenge with far-reaching impacts on societies and nations. Understanding the dynamics of terrorist attacks is crucial for formulating strategies to combat terrorism and enhance security.
- The (GTD) provides comprehensive data on terrorist incidents worldwide from 1970 to 2017, offering insights into patterns, behaviours, and trends in terrorist activities.
- This case study aims to analyse this dataset to extract meaningful insights that can help in understanding terrorism's evolution, its impact on different regions, and the effectiveness of counter-terrorism strategies.

Objective:

- The primary objective of this analysis is to conduct an in-depth exploratory data analysis (EDA) on the GTD dataset to identify key trends, patterns, and insights related to terrorist activities.
- The analysis focuses on various aspects such as identifying the most and least violent years, casualty trends, regional safety, and the most targeted institutions.
- The goal is to use this analysis to provide actionable insights that can inform policy decisions and security measures.

Data Source:

The analysis utilizes the Global Terrorism Database (GTD) covering terrorist incidents from 1970 to 2017. The dataset includes over 180,000 attacks with more than 100 variables related to location, tactics, perpetrators, targets, and outcomes.

➤ **Data Preprocessing:-**

i. Data Cleaning

- **Remove Duplicate Rows:** Removed all duplicate rows using the `drop_duplicates()` method.

- ii. **Handle Missing Values:** Imputed missing values in the column with the mean and dropped column due to more than 90% missing values

Exploratory Data Analysis

1. Yearly Trends of Terrorist Attacks:

- **Objective:** Identify the most peaceful and violent years in the dataset and observe general trends in the number of attacks over time.
- **Approach:** Analyze the frequency of attacks per year, highlighting the years with the highest and lowest number of incidents.
- **Outcome:** Provides insights into the escalation or reduction of terrorist activities over the decades.

2. Casualties Over the Years:

- **Objective:** Examine trends in the number of casualties (both killed and wounded) over the years.
- **Approach:** Plot the total casualties per year to identify peaks and troughs in the data, indicating periods of heightened or reduced violence.
- **Outcome:** Helps understand the human cost of terrorism over time.

3. Country Safety Analysis:

- **Objective:** Identify and rank countries based on the frequency and impact of terrorist attacks.
- **Approach:** Create a safety index by analyzing the number of attacks and casualties in each country.
- **Outcome:** Highlights the most and least affected countries, informing international security policies.

4. Success Rate of Attacks:

- **Objective:** Analyze the success rates of terrorist attacks.
- **Approach:** Create a pie chart to compare the proportion of successful vs. unsuccessful attacks.
- **Outcome:** Provides insight into the effectiveness of terrorist strategies.

5. Top 10 Most Affected Countries:

- **Objective:** Focus on the countries most affected by terrorist activities.
- **Approach:** Filter the dataset to create a new dataframe for the top 10 countries based on the number of attacks.
- **Outcome:** Facilitates targeted analysis of high-risk countries.

6. Regional Analysis of Attacks:

- **Objective:** Analyze the distribution of terrorist attacks across different regions.

- **Approach:** Visualize the total number of attacks per region using bar charts.
- **Outcome:** Identifies regions most susceptible to terrorism, aiding regional security planning.

7. Most Targeted Cities:

- **Objective:** Identify the cities most frequently targeted by terrorist attacks.
- **Approach:** Rank cities based on the number of attacks and visualize the data.
- **Outcome:** Highlights urban centers at high risk, helping in urban security measures.

8. Weapon Type Analysis:

- **Objective:** Analyze the types of weapons most commonly used in terrorist attacks, with a specific focus on groups like the Taliban.
- **Approach:** Create visualizations to show the distribution of weapon types used in attacks.
- **Outcome:** Provides insights into the preferred methods of attack by different terrorist groups.

9. Percentage of Attacks in Each Country:

- **Objective:** Determine the percentage of global terrorist attacks occurring in each country.
- **Approach:** Calculate the percentage of attacks for each country and visualize it using pie charts.
- **Outcome:** Assists in understanding the global distribution of terrorism.

10. Analysis of Terrorist Group Effectiveness in J&K, India:

- **Objective:** Focus on terrorist activities in Jammu & Kashmir, the most attacked state in India.
- **Approach:** Analyze trends and effectiveness of terrorist groups operating in the region.
- **Outcome:** Provides localized insights for improving counter-terrorism efforts in J&K.

11. Monthly Attack Trends:

- **Objective:** Identify which months see the highest number of terrorist attacks.
- **Approach:** Analyze the frequency of attacks by month and visualize the data.
- **Outcome:** Helps in understanding seasonal trends in terrorist activities.

12. Targeted Institutions:

- **Objective:** Analyze which types of institutions are most frequently targeted by terrorists.

- **Approach:** Rank and visualize the most targeted institutions.
- **Outcome:** Informs security measures for vulnerable institutions.

13. Attack Trends in India Post-2008:

- **Objective:** Analyze terrorist attack trends in India after the year 2008.
- **Approach:** Create a new dataframe and focus on post-2008 data to identify recent trends.
- **Outcome:** Provides up-to-date insights on terrorism in India.

14. Analysis of Top 10 Terrorist Motives:

- **Objective:** Understand the primary motives behind terrorist attacks.
- **Approach:** Rank the top 10 motives and analyze their prevalence in the dataset.
- **Outcome:** Offers insights into the ideological and strategic drivers of terrorism.

Actionable Insights:

- **Targeted Security Measures:** Recommendations for enhancing security in the most vulnerable regions and for the most frequently targeted institutions.
- **Policy Formulation:** Insights to guide the development of counter-terrorism policies, focusing on high-risk areas and the most effective strategies.
- **Resource Allocation:** Data-driven recommendations for allocating resources to regions and periods with the highest need for intervention.

Key Results:

- After the Year 2003-04 there is sharp increase in the terror attacks throughout the globe.
- Year 2014 is where most attack happen considered the most most violent year for the world in terms of terror attacks.
- 89% of attacks are successfull as per data.
- United States faced most number of Casualties(Killed+ Bounded) in the world.
- Iraq is a country where most number of terrorist attack happen
- Middle East and North Africa is a region where most number of terrorist attack happen, follwed by South Asia where second most number of terrorist attack happen.
- Autralia & Oceania is the least prone to terrorist Attacks.
- After the year 2008, India sees a sharp increase of terrorist attacks ---and 2016 is most violent year for india in terms of terror attacks.
- Majority of terror attacks in india are of the kind Bombing/Explosion
- J&K is a state where most number of terrorist attack happen in india followed by Assam and Manipur---- Puducherry is a state where least

number of attack happend considered to be safest in terms of terror attacks.

- Most number of fatalities happen in armed assault and most number of injuries happen in Bombing/Explosion in J&K
- Police is most targeted when terrorist do Bombing/Explosion and Armed Assault
- Most number of attacks happen in the month of August in J&K
- Most Active Terrorist group is Hizbul Mujahideen.

Expected Interview Questions

1. **Project Scope:** What was the primary goal of your analysis project?
2. **Data Challenges:** What were the main challenges you faced during data cleaning and preprocessing?
3. **Specific Contributions:** How did your analysis directly impact the decisions for the organisations?
4. **Tool Utilization:** Which tools did you use for data visualization and why?
5. **Insight Extraction:** Can you elaborate on the process of deriving actionable insights from the data?
6. **Customer Insights:** How did you use segmentation to improve strategies?
7. **Revenue Strategies:** What strategies did you recommend based on your findings?