

Machine Learning

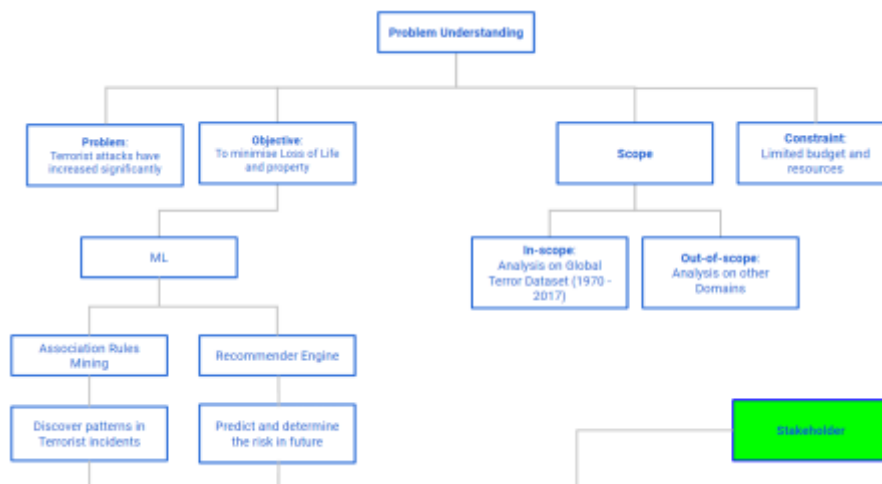
Unsupervised Learning 2

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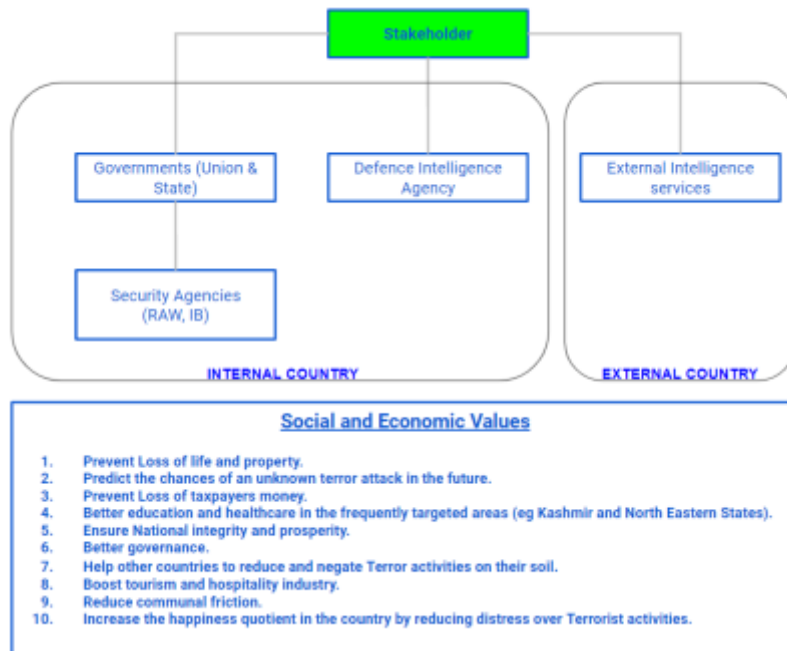
Terrorism



Objective



Stakeholder



Dataset

The **Global Terrorism Database (GTD)** is an open-source database including information on terrorist attacks around the world from **1970** through **2017**. The GTD includes systematic data on **domestic** as well as **international** terrorist incidents that have occurred during this time period and includes more than **180,000 attacks**.

The database is maintained by researchers at the National Consortium for the Study of Terrorism and Responses to Terrorism (START), headquartered at the **University of Maryland**.

Content

Geography : Worldwide

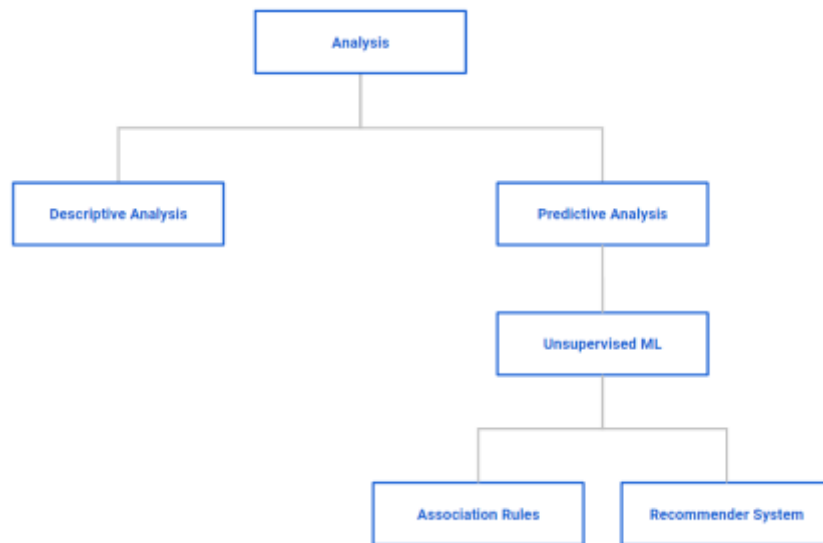
Time period : 1970-2017, except 1993

Unit of analysis : Attack

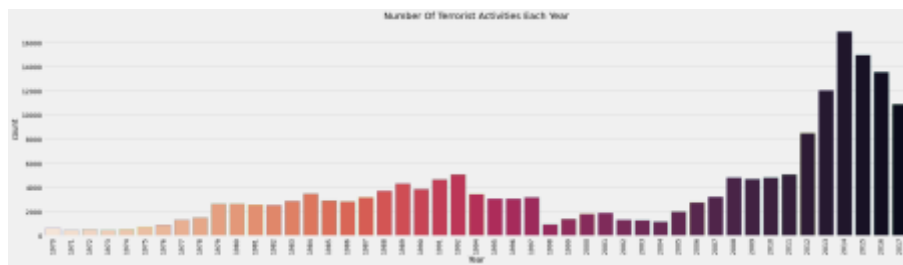
Variables : >130 variables on location, tactics, perpetrators, targets, and outcomes

Sources : Unclassified media articles

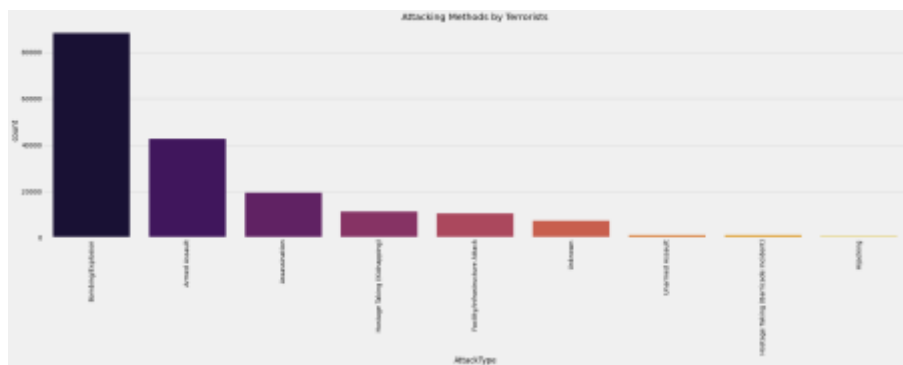
Analysis Flow



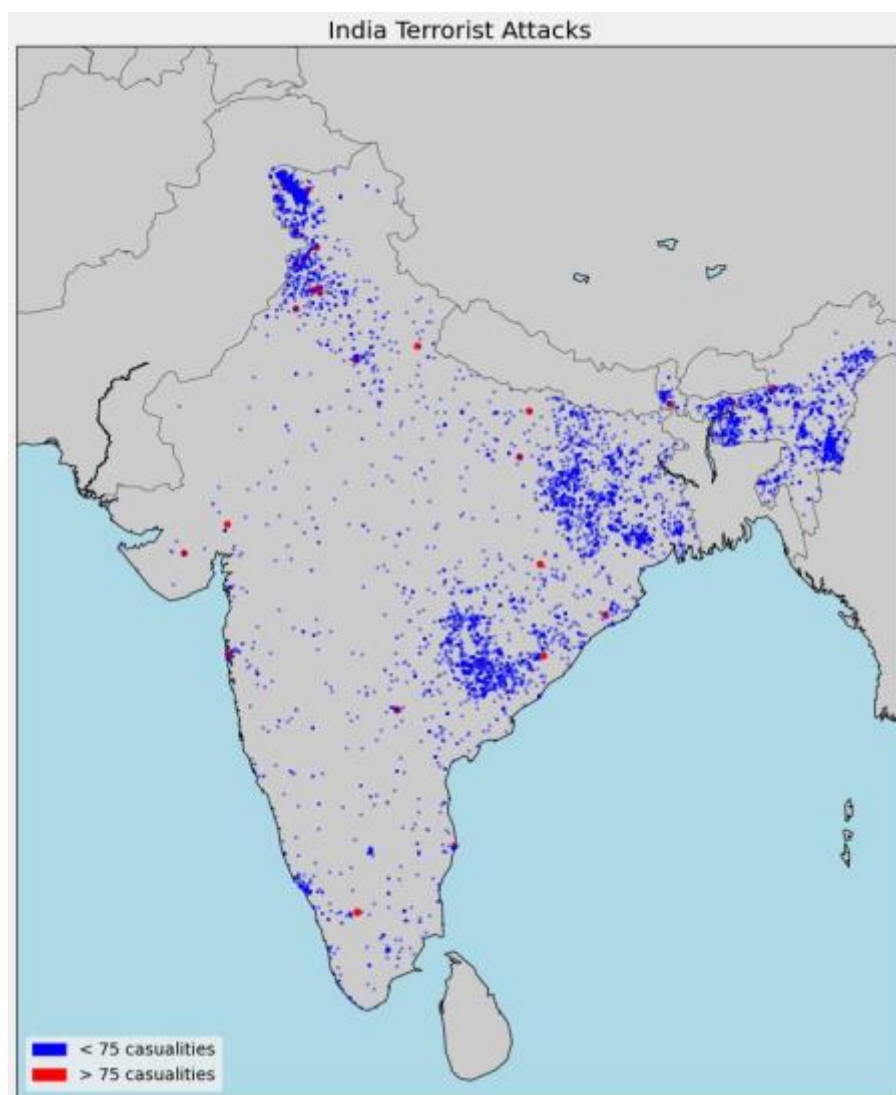
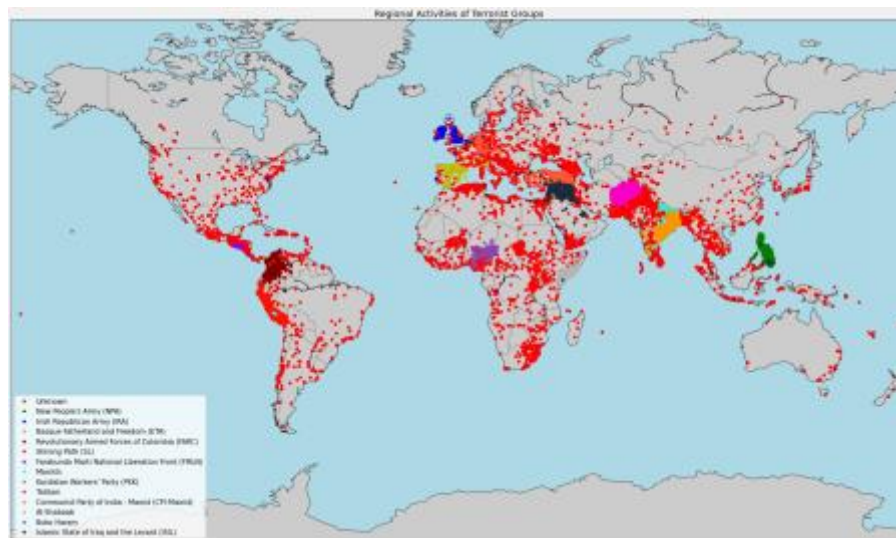
Descriptive Analysis

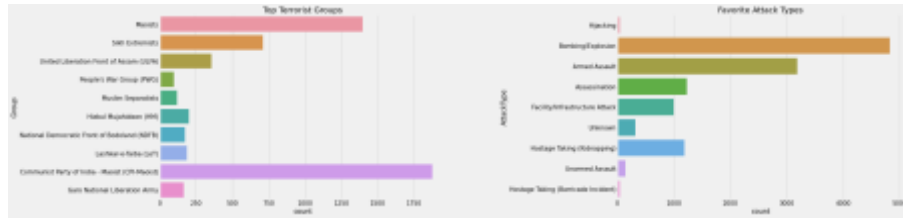


1 - The number of Terrorist activities have increased sharply post 2000.



2 - Bombing, Armed Assaults, Assassination, Kidnapping are some of the commonly employed methods utilized by these terror groups.



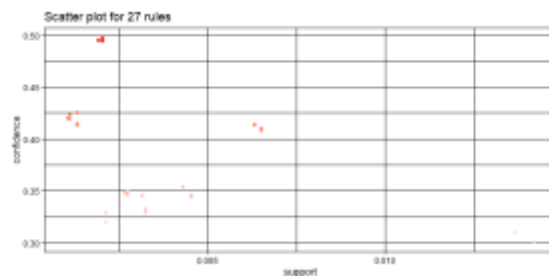


Predictive Analysis

Association Rules Mining

Factors: 1. Terror group 2. Target Type 3. Attack Type 4. suicide (Yes/No) 5. killed 6. Weapon Type
User Input: Terror group: *ISIL* (set as RHS) Support: **0.001** Confidence: **0.3** Minimum Length: **2**

Top 5 Association Rules (gathered for the Terrorist Group - ISIL)						
lhs	rhs	support	confidence	coverage	lift	count
[Target_Type=Military, Weapon_Type=Explosives, suicide=1, Killed=11 to 50 Killed]	[Group=ISIL]	0.00010703	0.4071264	0.00404771	0.961384	173
[Target_Type=Military, AttackType=Bombing/Explosion, suicide=1, Killed=11 to 50 Killed]	[Group=ISIL]	0.001894534	0.4964077	0.001879336	0.934618	183
[Target_Type=Military, suicide=1, Killed=11 to 50 Killed]	[Group=ISIL]	0.00010703	0.4942857	0.00406017	0.905481	173
[Target_Type=Military, AttackType=Bombing/Explosion, suicide=1, Killed=8 to 10 Killed]	[Group=ISIL]	0.001290543	0.4252634	0.001293579	0.519313	131
[Target_Type=Civilians, Weapon_Type=Explosives, suicide=1, Killed=11 to 50 Killed]	[Group=ISIL]	0.001902553	0.4733735	0.001902088	0.805925	184



Recommender System

Country: India **Factors:** 1. Terror group 2. Target Type 3. Attack Type 4. city 5. number of kill **User Input:** 1. Terror group: *Sikh Extremists* 2. city: *Bombay*

Country Filter: India			
UBCF	IBCF	SVD	POPULAR
Predict the highest risk City on the basis of user input Terrorist Group and no of kills			
Mumbai	Anand	Banabari	Mumbai
Chingavaram	Bengaluru	Bathe-Lakshmanpur	Banabari
Chadisinghpooa	Chennai	Chingavaram	Ranibodli
Predict most probable Attack Type on the basis of user input City and no of kills			
Hostage Taking (Kidnapping)	Hostage Taking (Barricade Incident)	Hostage Taking (Barricade Incident)	Hostage Taking (Barricade Incident)
Facility/Infra.	Hostage Taking (Kidnapping)	Hostage Taking (Kidnapping)	Hostage Taking (Kidnapping)
	Facility/Infra.	Facility/Infra.	Facility/Infra.
Predict most probable Target Type on the basis of user input City and no of kills			
Journalists & Media	Food or Water Supply	Maritime	Military
Non-State Militia	Journalists & Media	Military	Religious Figures
Military	Religious Figures	Telecommunication	Maritime

Conclusion and Inferences

The "**Association Rules Mining**" can help us to provide suggestions or recommendations to "**Stakeholders**" on a particular terrorist group's most frequent patterns.

- **ISIL:** From the top five patterns based on confidence, we can see that the use of weapon type "Explosives", attack type "Bombing/Explosion", mostly targeted one is "Military" 'turns out to be the most frequent pattern with relatively high lift value. It is also interesting to note that, the attacks on civilians are observed in top 5.
- **Taliban:** From the top five patterns based on confidence, we can see that the use of 'weapon type "Firearms", attack type "Armed Assault", mostly targeted "Police" 'this turns out to be the most frequent pattern with relatively high lift value.
- **Boko Haram:** From the top three patterns based on confidence, we can see that the use of 'weapon type "Explosion", attack type "Bombing/Explosion", mostly targeted one is "Civilians" 'turns out to be the most frequent pattern with relatively high lift value.

We have selected India as a country for our analysis. The "**Recommendation System**" can help us to provide great value in terms of specific geographical area with specific targeted one and attack type to "**Stakeholders**".

- The most at risk **geographical area (city)** is "Mumbai", **targeted ones** are "Journalists & Media", "Military", "Maritime", "Religious Figures" and **attack type** are "Hostage Taking (Barricade Incident), Facility/Infra." is from the "Sikh Extremists" **terrorist group**.

