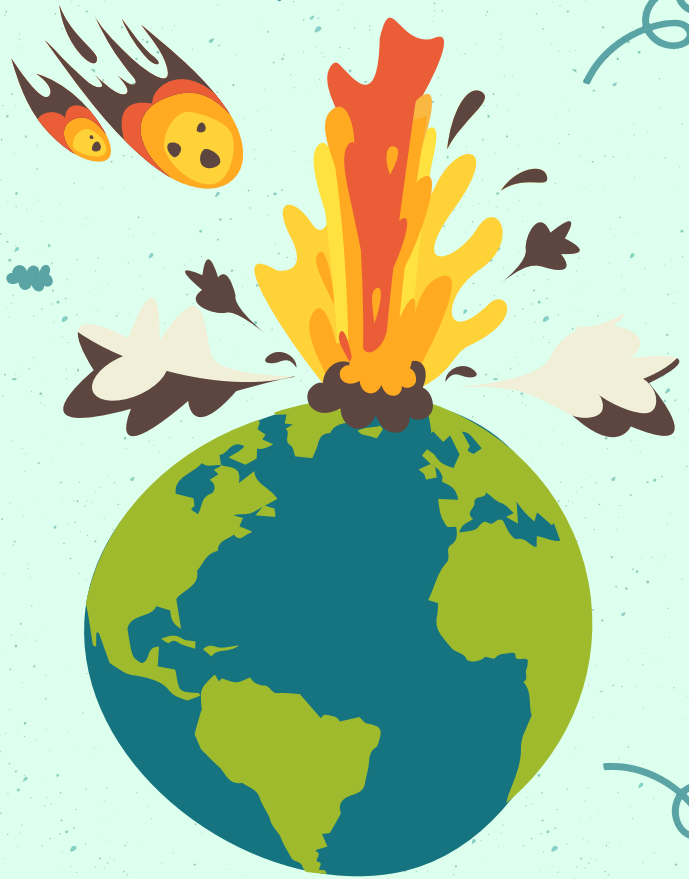
A DISASTROUS PROJECT:
Time series analysis of all natural disasters since 1900



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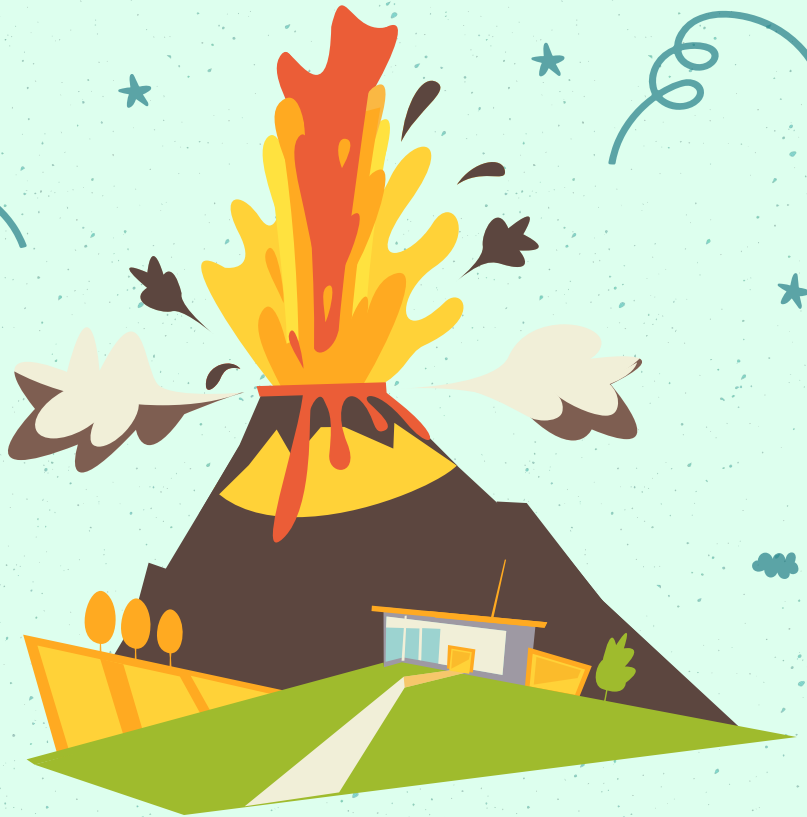
CONTEXT

Background information and Introduction to the idea



- UN Office for Disaster Risk Reduction recorded 7,348 natural disasters from 2010-2019, causing 1.23 million deaths and affecting 4.2 billion people.
- Web resources like EM-DAT, GHCN-D, and NOAA contain databases on climate, natural disasters, and their impact
- The impact of these disasters depends on a **variety of factors** such as the type of the disaster, the location and population density of the affected areas, and the level of preparedness and response efforts

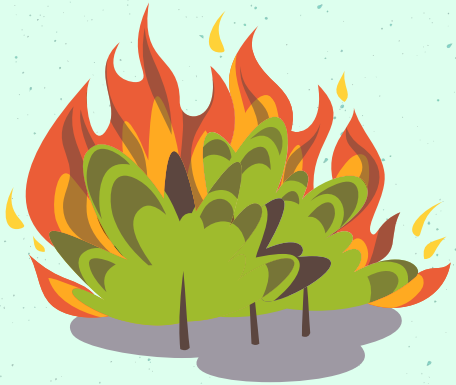
02

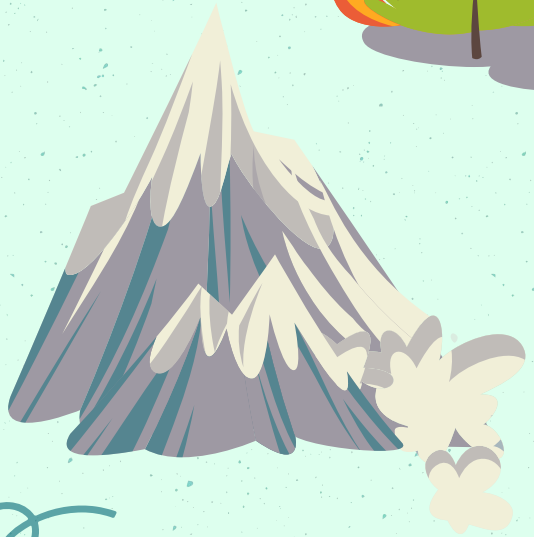
Problem Definition

Here is what we should be doing!

This project aims to achieve the following objectives in accordance to the dataset considered:

- Group the data into various types according to the types and subtypes of disasters and study them over various periods and geographical locations
- Track the data to find cyclic patterns and seasonal trends along with outliers in each category of trends
- To find the high impact locations and forecast the type of disasters and impact in terms of monetary damage and community preparedness indices





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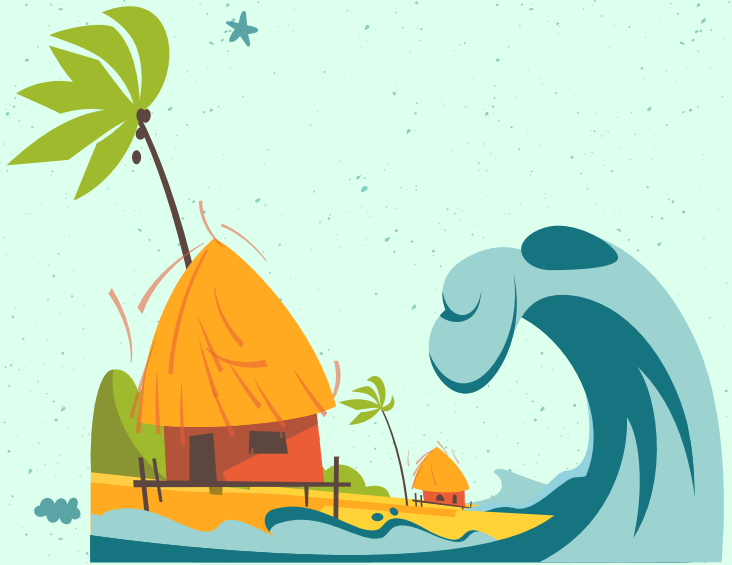
Motivation

And we should do all this because...

- This project aims to study disaster data to improve preparedness and response, comprehend disaster impact on communities, and identify ways to mitigate its effects.
- Disaster data can inform policy decisions related to disaster risk reduction, emergency response, and recovery efforts
- It can also aid in implementing early warning systems and remote sensing tools, and exploring new approaches to disaster risk reduction, such as nature-based solutions
- Time series analysis is important for learners and practical coding helps understand the concept better. Using datasets with over 100 years of data, like the one we currently use, is ideal for implementation.

04 Proposed Methodology



1

Basic statistical analysis

Descriptive and inferential statistic methods like central tendencies and hypothesis testing

2

EDA

Identifying patterns and relationships in the data and visualizing them

3

Stationarity analysis

Test for stationarity of data using mean, variance and autocorrelation

4

Causality Analysis

Regression analysis to check if any features are affecting others

5

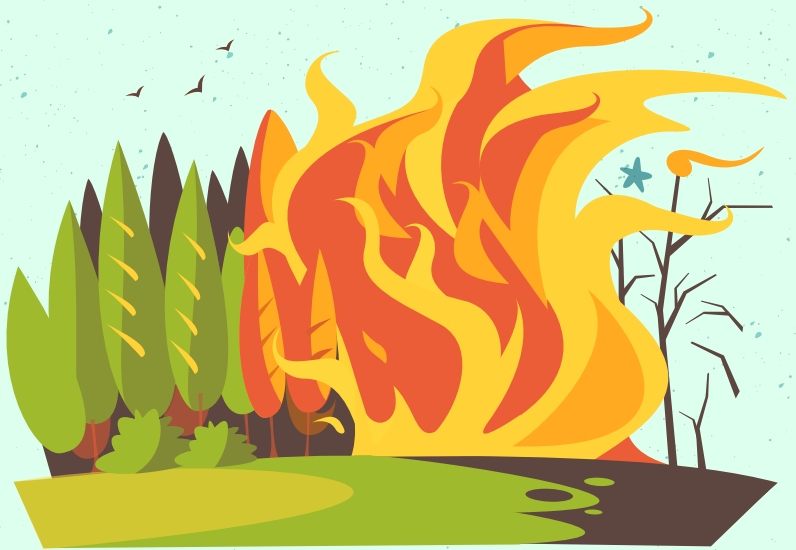
Anomaly/Outlier detection

Check for unusual behaviors and rule out outliers with correlation matrix and boxplots

6

Forecasting

Observe trends that help make predictions using a Machine Learning model



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Data Source

We got this information from...

- Emergency Events Database (EM-DAT): EM-DAT is a global database that provides information on natural disasters, technological accidents, and complex emergencies. It also includes the location, type, date, and impact of disasters

- https://public.emdat.be/data is the link for the dataset

- This dataset consists of all disasters(natural and man-made) that occurred between 1900 and 2022. It has 44 columns and 16,500 rows which gives us plenty of information to work with

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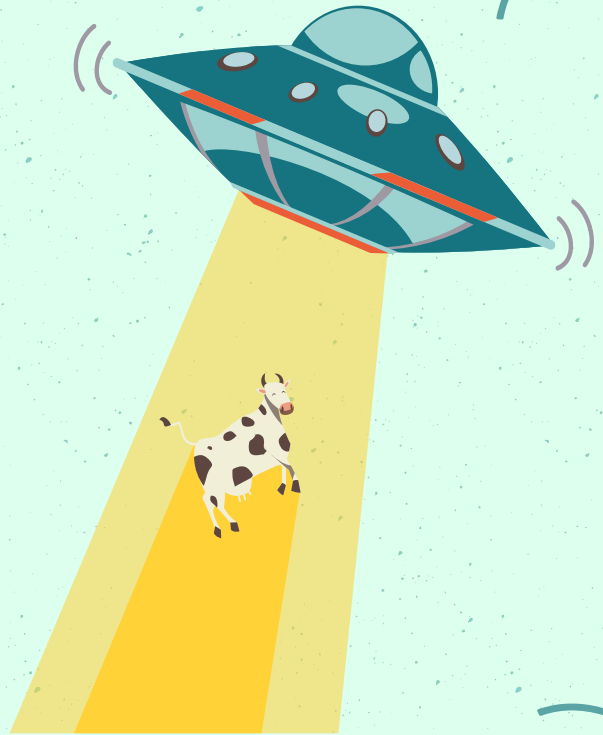
Applications

Potentially, the real world Applications are..



- Disaster risk assessment including development of disaster risk reduction strategies and disaster management plan.
- Forecasting and implementing early warning systems by analyzing historical data on disasters, we can develop models to predict the likelihood and severity of future disasters
- Analyzing the impact of disasters on communities and economies, including loss of life, infrastructure damage, and economic disruption, can assist policymakers in evaluating the effectiveness of response and recovery efforts.
- The data can be used to inform planning and resource allocation decisions for disaster response and recovery efforts
- Public education and awareness about the risks and impacts of disasters

THANKS!

Do you have any questions?

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