Project Concept: Exploring WorldRiskReport Dataset

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1 Introduction

1.1 Background

The *WorldRiskReport* is an annual technical report on global disaster risks. The yearly issues of the WorldRiskReport focus on varying critical topics related to disaster risk management and are published in German and English. The report includes the *WorldRiskIndex*, which identifies the risk of an extreme natural event becoming a disaster for numerous countries worldwide. The collected dataset contains the WorldRiskIndex for 193 countries from annual reports spanning the years 2000 to 2023.

1.2 Objectives

The primary objective is to analyze the data and find trends across countries. We would also look into identifying the factors that contribute to the risk of natural disasters.

2 Dataset Overview

2.1 Data Source

Initially, the WorldRiskIndex was developed by the United Nations University Institute for Environment and Human Security (UNU-EHS) in 2011 for Bündnis Entwicklung Hilft to analytically link and relate the two factors of disaster risks: exposure to natural hazards such as earthquakes, storms or droughts, and societal capacities to respond to this kind of events. The methodology of the WorldRiskIndex has been continuously revised and developed by the IFHV since 2018[2]. In 2022, a new, fully revised model of the WorldRiskIndex was published, enabling more accurate analyses of disaster risks by incorporating more than 100 indicators, new data sources, and more robust statistical methods[1].
We collect our dataset, containing data obtained by the latest revised model from the Humanitarian Data Exchange: https://data.humdata.org/dataset/worldriskindex.

2.2 Data Description

Each of the dataset per year contains 7 important columns of data:

Country - Name of the country

W - WorldRiskIndex (From E and V)

E - Exposition (From 7 domains: earthquakes, tsunamis, floods etc.)

V - Vulnerability (From S, C, A)

S - Susceptibility (From 5 socio-economic components)

C - Lack Of Coping Capacities (From 3 components: Recent Societal Shocks, State And Government and Health Care Capacities)

A - Lack Of Adaptive Capacities (From 3 components: Research And Educaction, Long-Term Health And Deprivation Effects and Investment Capacities)

Each component above is also comprised of several indicators, all of which are also available in the raw dataset. A full description of the data can be found at the metadata of the report[2].

3 Project Methods

The overall scope of the project is detailed as follows.

3.1 Data Processing

- **Data Cleaning:** Handle missing values, outliers, and any inconsistencies in the data.
- **Feature Engineering:** Create new features or transform existing ones to improve model performance.

3.2 Data Exploration

- **Statistical Analysis:** Present summary statistics and visualizations to understand the distribution of key variables.
- **Correlation Analysis:** Explore relationships between variables to identify potential patterns or insights.

3.3 Data Mining

- **Pattern Mining:** Apply frequent pattern / association rule mining to discover interesting relationships within the dataset.
- **Anomaly Detection:** Utilize anomaly detection techniques to identify unusual patterns or outliers.

3.4 Clustering

Implement suitable clustering methods and interpret their results.

3.5 Time Series Analysis

Apply time series forecasting techniques to analyze trends in the data for each country.

4 Conclusion

The WorldRiskReport, a collaborative annual publication by IFHV and Bündnis Entwicklung Hilft, systematically examines global disaster risks. Emphasizing the intricate interplay between extreme natural events, climate change impacts, societal inequities, and disaster risk reduction, the report offers a comprehensive assessment of global disaster risks. Upon analyzing the data, it is possible provide nuanced perspectives and recommendations to address challenges in disaster risk reduction, climate change adaptation, and development policy.

References

[1] IFHV. Worldriskreport, Sep 2023. URL: `https://www.ifhv.de/publications/world-risk-report`.

[2] RUF and IFHV. *WorldRiskReport 2023 Focus: Diversity.* Sep 2023. URL: `https://weltrisikobericht.de/wp-content/uploads/2024/01/WorldRiskReport_2023_english_online.pdf`.