**CONCEPT NOTE**

**Analyzing World Disater Risk** (SDG 11 : Disaster Risk Reduction )

**Concept of the Project -**The World Risk Index (WRI) is a measure that assesses the risk of natural disasters and their potential impact on countries. It typically evaluates factors like exposure to natural hazards (such as earthquakes, floods, and hurricanes), vulnerability of the population, and the ability of the country to cope with and recover from these events. The index provides a way to gauge how at risk different regions are and helps in understanding and comparing the resilience of countries against natural disasters The goal of this project is to analyze the World Risk Index (WRI) to understand the distribution of risk across different countries, identify trends over time, and predict future risk levels based on historical data.By leveraging data analysis tools and methodologies, the project seeks to propose actionable solutions that align with Sustainable Development Goal 11 (SDG 11): Sustainable Cities and Communities. This SDG aims to make cities inclusive, safe, resilient, and sustainable.

**Problem Statement**:The World Risk Index (WRI) provides insight into the risk levels faced by different countries due to natural disasters. Understanding these risks is crucial for disaster preparedness and response. This project aims to analyze the WRI to identify patterns, assess factors influencing risk levels, and predict future risk trends.

**Objective of the Project**:

* To analyze the distribution of WRI scores across different countries.
* To investigate factors that correlate with high or low WRI scores.
* To develop predictive models for forecasting future WRI scores based on historical data.
* To provide actionable insights and recommendations for disaster management.

**Data Sources Used**:

* **World Risk Report**: Contains WRI scores, hazard exposure, and vulnerability data for various countries.
* **World Bank Database**: Provides additional features like GDP and population for countries.
* **United Nations Data**: Offers demographic and environmental factors that could influence WRI scores.

**Features**:

* **Country**: Name of the country.
* **WRI Score**: The World Risk Index score.
* **Year**: Year of data recording.
* **Population**: Population of the country.
* **GDP**: Gross Domestic Product of the country.
* **Hazard Exposure**: Level of exposure to natural hazards.
* **Vulnerability**: Vulnerability score based on infrastructure, healthcare, etc.
* **Climate Variables**: Temperature, rainfall, and other climate-related factors (if available).

**Tool for Analysis**:

* **Python**: For advanced statistical analysis and machine learning (using libraries like Pandas, NumPy, Matplotlib, Seaborn, and Scikit-learn).
* **Excel**: For preliminary data exploration, visualization, and basic statistical analysis.

**Hypothesis**:

1. There is a significant correlation between a country’s GDP and its WRI score, with lower GDP countries having higher risk levels.
2. Countries with higher hazard exposure and vulnerability scores will have higher WRI scores.
3. Trends in WRI scores will show an increase or decrease over time based on changes in hazard exposure and vulnerability.

**Methodology**:

1. **Data Collection**: Gather data from the specified sources and compile it into a unified dataset.
2. **Data Cleaning**: Handle missing values, outliers, and inconsistencies in the dataset.
3. **Exploratory Data Analysis (EDA)**:
   * Calculate descriptive statistics (mean, median, standard deviation).
   * Visualize the distribution of WRI scores using histograms and box plots.
   * Explore correlations using scatter plots and heatmaps.
4. **Time Series Analysis**: Analyze trends in WRI scores over time.
5. **Predictive Modeling**:
   * Develop regression models or machine learning algorithms to predict future WRI scores.
   * Evaluate model performance using metrics such as R-squared, MAE, and RMSE.
6. **Visualization**:
   * Use geospatial maps to display WRI scores by country.
   * Create visualizations to show trends and correlations.
7. **Interpretation**: Analyze the results to identify significant findings and trends.

**Probable Outcome**:

* **Insights**: Understanding which factors most significantly impact WRI scores and identifying high-risk countries.
* **Trends**: Observing whether risk levels have increased or decreased over time.
* **Predictions**: Forecasting future WRI scores and identifying potential risk areas.
* **Recommendations**: Providing actionable insights for disaster management and policy-making based on the analysis.