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GitHub repository: Project2_Bluhm_Kim_Yeh

1. Problem Statement

The United Nationals global warming conference in Glasgow, which ran for two weeks and ended Nov.12, has made headlines across all major newspapers. With scientists warning that every fraction of a degree of warming will lead to more intense heat waves, drought, floods, and wildfires and a 100,000-people rally on Global Day for Climate Justice, the world has come to recognize the severity and urgency of climate change. One of the largest debates during the summit is whether the world's wealthiest nations are disproportionately responsible for global warming, and whether they should compensate poorer nations for increasingly severe weather (Popovish and Plumer, 2021). To further explore the climate change phenomenon, our project is extending New York Times' analysis on current emissions by visualizing the occurrence of severe weather events. **Our main research question is: How does the severe weather experience compare between high- and low- polluters in the world? Our secondary questions are: (1) Are there more severe weather events over time? (2) Are rich countries polluting more than poorer countries? (3) Is the argument that rich nations should compensate poorer nations for severe climate change valid based on our analysis?** This project defines climate change as changes in the frequency and intensity of severe weather events. We will analyze data from 1900 to 2020.

References:

Friedman, Lisa. "What Is COP26? and Other Questions about the Big U.N. Climate Summit." *The New York Times*, The New York Times, 19 Oct. 2021, https://www.nytimes.com/article/what-is-cop26-climate-change-summit.html.

Popovich, Nadja, and Brad Plumer. "Who Has the Most Historical Responsibility for Climate Change?" *The New York Times*, The New York Times, 12 Nov. 2021, https://www.nytimes.com/interactive/2021/11/12/climate/cop26-emissions-compensation.html.

2. Datasets & Variables

Our primary dataset is *Data on CO2 and Greenhouse Gas Emissions* by *Our World in Data*.

Dataset 1 - CO2

- Features include:
    - Year

    - CO2 emission
    - GHG emission
    - GDP
- Filename: co2-data.csv
- Source: https://ourworldindata.org/co2-emissions
- Columns: country, year, Co2,consumption_co2, co2_growth_prct,co2_growth_abs,trade_co2,co2_per_capita,consumption_co2_per_capita,share_global_co2,cumulative_co2,share_global_cumulative_co2,co2_per_gdp,consumption_co2_per_gdp, population, gdp, total_ghg, ghg_per_capita

Supplemental Dataset 2 - Disasters

- Features include:
    - Weather events
        - Types
        - Counts
        - Total damage amount
- Filename: disaster-data.csv
- Source: https://www.emdat.be/
- Columns: Year, Disaster Group, Disaster Subgroup,Disaster Type,Event Name,Country, Latitude,Longitude, Start Year,Start Month,Start Day,End Year,End Month,End Day,Total Deaths,No Injured,No Affected,No Homeless,Total Affected,Total Damages, Adjusted ('000 US$)

Dataset Integration

Handling Missing Information

In the disaster event datasets, some of the columns pertaining to the impact of a disaster are sparsely populated and may be inconsistently filled. Due to this, we will generate an impact score based on a combination of the columns available which will allow for aggregation and comparison between countries.

3. **Insights**
    a. Time series graph data on CO2 + GHG emissions

We will include year by year global emissions data to view trends and view if there are any specific time periods with irregular trends.

    b. Time series graph data on disasters by type

We will include year by year disaster events to view trends and view if there are any specific time periods with irregular trends.

    c. Bar graph comparison on global emission rates by country

The chart will help us understand which countries have the highest stake on emissions. This will help us identify if any countries have played a higher role in emissions and have larger responsibility for climate change.

    d. Global map with color key on severe weather

This will summarize the irregular weather patterns seen throughout the globe and highlight distributions on climate changes per geographical area. Also we will be able to contrast this with the actual countries that are contributing to pollution to see if there is a mismatch between the actual countries contributing to pollution and the countries facing the environmental consequences.

4. **What you plan to cover in the final report and how you plan to organize it**

In our final report, we plan to include these sections:

1. **Introduction**

We will include a brief overview of how climate change is becoming a rising concern around the globe due to recent abnormal weather events and why we decided to focus on analyzing data sets around climate change.

2. **Call for action**

We will include a statement on the call for action and recommendations needed to make a climate change impact based on our analysis. This will include an overview of the primary countries that have both capital to contribute to climate change and countries that are primary contributors to pollution. Additionally, we will include an overview on

any countries or geographical regions facing more severe climate change.

3. **Data visualization**

To support section 2, we will include charts and graphs to highlight the trends observed from the data sets as mentioned in the proposal.

4. **Summary of descriptive statistics**

We will include descriptive statistics (i.e. mean, median, range, etc.) to analyze the figures and trends observed from the data sets and to support the data visualization in section 3.

5. **Conclusion**

We will include a final statement on the proposal and specific action needed. Particularly, we will include the key countries needed to be involved in climate change based on our analyses in the previous sections.

6. **References**