Project Proposal: US Tornado Dataset 1950-2021

1. Dataset and Its Relevance

- **Dataset**: The **US Tornado Dataset (1950-2021)** is a comprehensive collection of tornado data, including details such as tornado magnitude, location, date, injuries, fatalities, and other relevant factors. This dataset is publicly available at:
  US Tornado Dataset 1950-2021 on Kaggle
- **Reason for Choosing the Dataset**: Tornadoes are frequent natural disasters in the United States, and the country experiences more tornadoes than any other nation. This makes the dataset particularly valuable for understanding tornado behavior, patterns, and trends. The goal of this project is to visualize tornado data in a meaningful way to provide insights into the frequency, intensity, and impact of tornadoes, benefiting researchers, disaster management professionals, and anyone interested in understanding the destructive potential of tornadoes.

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2. Inspiration

- Tornadoes occur most frequently in the United States and Canada compared to other countries. This fact, coupled with the tornadoes' devastating impact on communities, makes studying them essential.
- The inspiration for this project stems from the need to analyze and understand tornado occurrences, their increasing or decreasing trends over the years, and the impact on human lives, property, and infrastructure.

By analyzing this dataset, the project aims to:

- Highlight the areas most affected by tornadoes.
- Show trends and changes in tornado frequency and intensity.
- Provide important insights for both researchers and disaster response teams.

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3. Possible Visualizations

To represent the tornado data effectively, the following visualizations will be used:

- **Map Visualizations**:

    - Tornado occurrences over time, categorized by **year** with exact dates.
    - Map based on tornado **magnitude** to highlight stronger tornadoes.
    - Map showing **injuries**, with particular focus on fatalities.
- **Line Chart**:
    - A line chart depicting tornado occurrences over the years, showcasing trends in frequency and magnitude.
- **Bar Charts**:
    - Bar charts representing the highest **magnitude tornadoes**.
    - Bar charts showing the **highest number of injuries** and **fatalities** across various years or regions.
- **Pie Chart**:
    - Pie chart visualizing the **states with the most tornado occurrences**, highlighting areas that are most vulnerable.

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4. Color Theme

- The color theme for the project will be based on **Morph** by Bootswatch, which provides a clean and modern design to make the visualizations more engaging.
  Morph Theme

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5. Roles and Responsibilities

- **Tyler Beringer**:
    - Responsible for setting up the **SQLite database** to store and manage the tornado data.
    - Developing the **Flask backend** to handle data processing and interactions.
- **Cassidy Bell**:
    - Creating the **Home** page for the project, providing an introduction and overview of the dataset.
    - Designing the **About Us** page to describe the team and the project's objectives.
- **Aaron Suarez**:
    - Designing and implementing the **Map** page to visualize the tornado data geographically.

    - Creating the **Works Cited** page to list references and sources used in the project.

- **Neelam Prasad**:
    - Responsible for building the **Dashboard** page, where users can interact with and explore the tornado data visualizations.

- **Group (Collaborative Tasks)**:
    - The entire group will collaborate on the **writeup** and prepare **slides** for the final presentation.