**Meteorite Landings**

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DSC 540: Data Preparation

Week 1 Assignment

6/04/2024.

**Project Subject Area**

The project will focus on analyzing meteorite landings around the world. This analysis will include the geographical distribution, time trends, and classification of meteorites.

**Data Sources**

**1. Flat File (CSV)**

**Description**: This dataset contains detailed information about meteorite landings, including names, mass, fall status, year, and geographical coordinates. **Link**: [Meteorite Landings Dataset](https://data.nasa.gov/Space-Science/Meteorite-Landings/gh4g-9sfh)

**2. API**

**Description**: This API provides data on weather conditions, which includes temperature, humidity, wind speed, and weather conditions at various locations worldwide. **Link**: [OpenWeatherMap API](https://openweathermap.org/api)

**3. Website**

**Description**: This website contains tabular data on the population of cities around the world, including city names, population figures, and geographical coordinates. **Link**: [World Population Review](https://worldpopulationreview.com)

**Relationships**

The datasets will be connected based on geographical coordinates (latitude and longitude). The meteorite landing data and the weather data can be linked through the coordinates to analyze the weather conditions at the time and location of meteorite landings. The population data from the website can be linked to analyze the population density in the areas where meteorites landed, providing insights into potential impacts on populated areas.

**Example Relationships:**

* **Meteorite Landings (CSV)**: Contains latitude and longitude of meteorite landings.
* **Weather Data (API)**: Contains weather information based on latitude and longitude.
* **Population Data (Website)**: Contains population information based on city coordinates.

**Project Approach/Plan**

The approach for this project will involve:

1. **Data Collection**: Downloading the meteorite landings dataset, setting up API requests to gather weather data, and scraping the population data from the website.
2. **Data Cleaning and Preparation**: Cleaning the datasets to ensure consistency, handling missing values, and formatting the data for analysis.
3. **Data Integration**: Creating relationships between the datasets based on geographical coordinates to merge the data.
4. **Data Analysis**: Performing statistical and geospatial analysis to identify patterns and insights.
5. **Visualization**: Creating visualizations to effectively communicate the findings.

**Concerns/Challenges**

* **Data Integration**: Ensuring accurate matching of geographical coordinates between datasets.
* **Data Quality**: Handling missing or inconsistent data, particularly from the API and website scraping.
* **Data Volume**: Managing and processing large volumes of data efficiently.

**Ethical Implications**

The analysis of meteorite landings has minimal ethical implications as it deals with natural events. However, ensuring the privacy and accuracy of population data is crucial, especially when communicating findings related to populated areas. It is important to present data responsibly to avoid any undue alarm or misinformation regarding meteorite impacts.