ECE 143 Group 9 Project Proposal

Problem:

Motivation: Meteorites that land on Earth provide valuable insights into the materials that shaped planets in the distant past. Studying meteorites allows us to explore the early history of our solar system, including the ages and compositions of different planetary building blocks [1]. Additionally, meteorite hunters such as Roberto Vargas of Bristol find meteorites that are worth over $100,000. He has a personal collection of 500+ meteorites [2]. Our data-driven results could be helpful to the collectors to find more meteorites.

Thus, we are interested in the geographic hotspots for meteorite fall and mass variation by type. Are there any specific geographic regions or coordinates that have experienced a higher number of falls? How does the mass of meteorites vary across different classifications?

[1] https://science.nasa.gov/solar-system/meteors-meteorites/facts/
[2] https://www.youtube.com/watch?v=IDvkbsTcuVE

Dataset:

https://urldefense.com/v3/__https://catalog.data.gov/dataset/meteorite-landings__;!!Mih3wA!Hd08YAuxPfMw9Aq0REGhTCUVq6oSV1ykEDkGUO6aRpEaztgLmKBRgzVr0BWbfUpxhU-q8FohTTRuQnJQI65-$

Description: The dataset contains the name, ID, name type, class, mass (g), fall year, latitude, longitude, and GeoLocation of meteorites.

Proposed Solution and Real world Application :

Meteorites fall onto Earth and meteors streak across the sky, and we want to find if there is any correlation between meteorites and geological location (further from the equator or closer) and how the different types of meteorites come from different classes of asteroids. To solve the proposed problem, we can first classify different meteorites types. Next, we can predict the mass of a meteorite based on other features in the dataset. Hence, we can look at the type of the meteorite and find some correlation between type and mass and between where the meteors fall

through regression. We would also be interested in combining to see if certain types of meteorites are more prevalent in certain latitudinal regions through geospatial analysis.

Project steps

Step	Estimated completion time	Person(s) in charge (among the group of 5)
1. Extracting and cleaning up data	One week	Everyone works together in all phases of the project
2. Regression / Classification / Clustering / Geospatial Tasks	One week	Everyone works together in all phases of the project
3. Data visualization	One week	Everyone works together in all phases of the project
4. Presentation and Report	One week	Everyone works together in all phases of the project