Capstone Project

I. Data Wrangling

1. Primary Exploratory Data Analysis

1.1. Dataset

I have chosen to work on an interesting dataset that I found on the NASA's website (https://data.nasa.gov/Space-Science/Meteorite-Landings/gh4g-9sfh), encompassing the complete list of around 45000 meteorite landings on earth since the year 601. Each meteorite is further described by the 10 columns listed below:

- **name**: the name of the meteorite (typically a location, often modified with a number, year, composition, etc)
- **id**: a unique identifier for the meteorite
- **nametype**: one of: -- *valid*: a typical meteorite -- *relict*: a meteorite that has been highly degraded by weather on Earth
- **recclass**: the class of the meteorite; one of a large number of classes based on physical, chemical, and other characteristics
- **mass**: the mass of the meteorite, in grams
- **fall**: whether the meteorite was seen falling, or was discovered after its impact; one of: -- *Fell*: the meteorite's fall was observed -- *Found*: the meteorite's fall was not observed
- **year**: the year the meteorite fell, or the year it was found (depending on the value of fell)
- **reclat**: the latitude of the meteorite's landing
- **reclong**: the longitude of the meteorite's landing
- **GeoLocation**: a parentheses-enclose, comma-separated tuple that combines reclat and reclong

1.2. Data Exploration

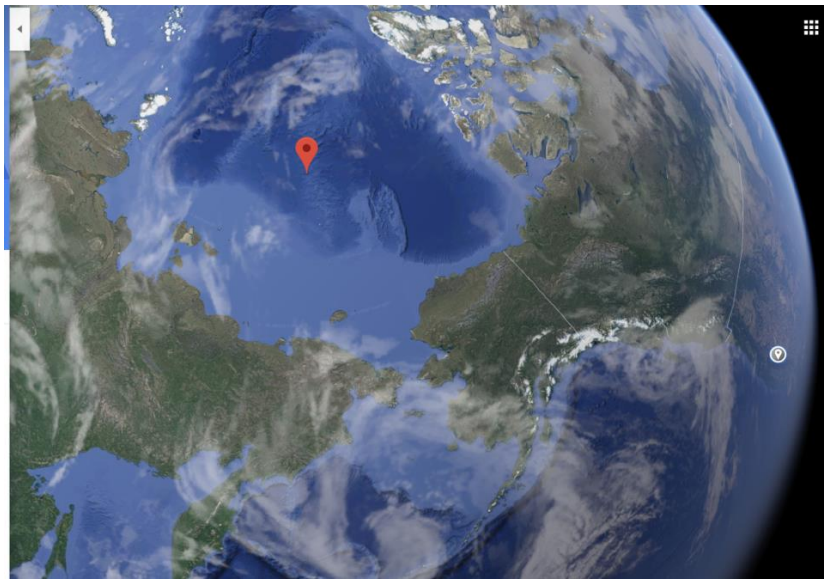
The row dataset is a csv file that I imported using the Jupyter Notebook. The imported file was quite clean, with, however, a lot of missing values (around 17%). The cleaning process is detailed in a separate ipynb file. Below is a preview of the steps that I took to make the data more readable:

- Used the head() method to briefly inspect the data
- Looked for missing values using the isnull() method
- Checked the unicity of the critical column ID
- Dropped duplicated rows
- Checked the percentage, per column, of the missing values
- Dropped the missing values that I could not retrieve
- Did some statistical analysis (mean, median, std...) to make sure that the data is accurate

- Looked for outliers by fact-checking the mass, the name and the geographical locations of certain meteorites
- Grouped the meteorites by classes

1.3. Looking for Outliers

In order to verify the accuracy of the data, I googled the names of random meteorites and checked if their mass or the geographical location of their landing matched the information provided by Wikipedia. For example: I checked the maximum longitude and saw whether the location existed or not. The result seemed logical.



Screenshot from Google Maps

I also selected the heaviest meteorite, Hoba, and verified all the information related to it, and once again, the results were completely satisfying. I couldn't, for obvious reasons, fact-check all the 45000 rows but for a primary analysis I think the dataset is for the most part accurate.