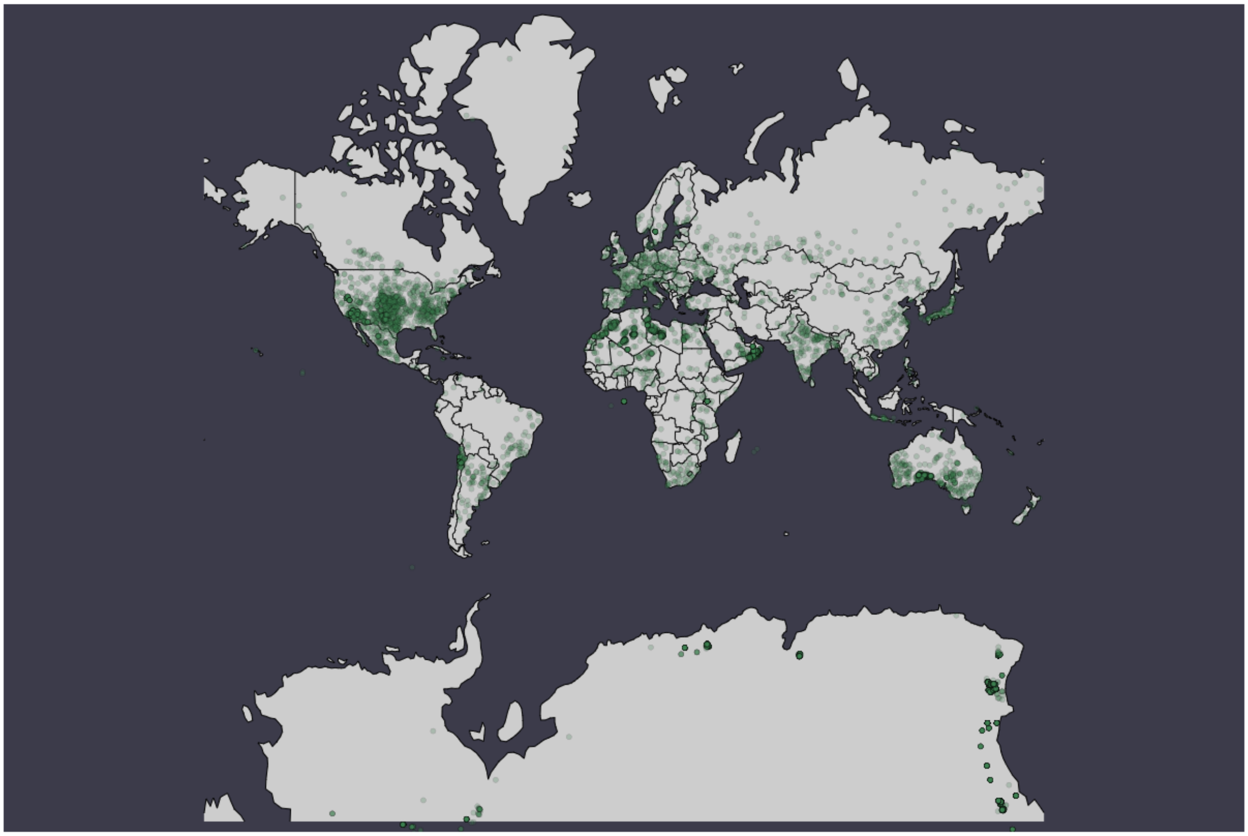
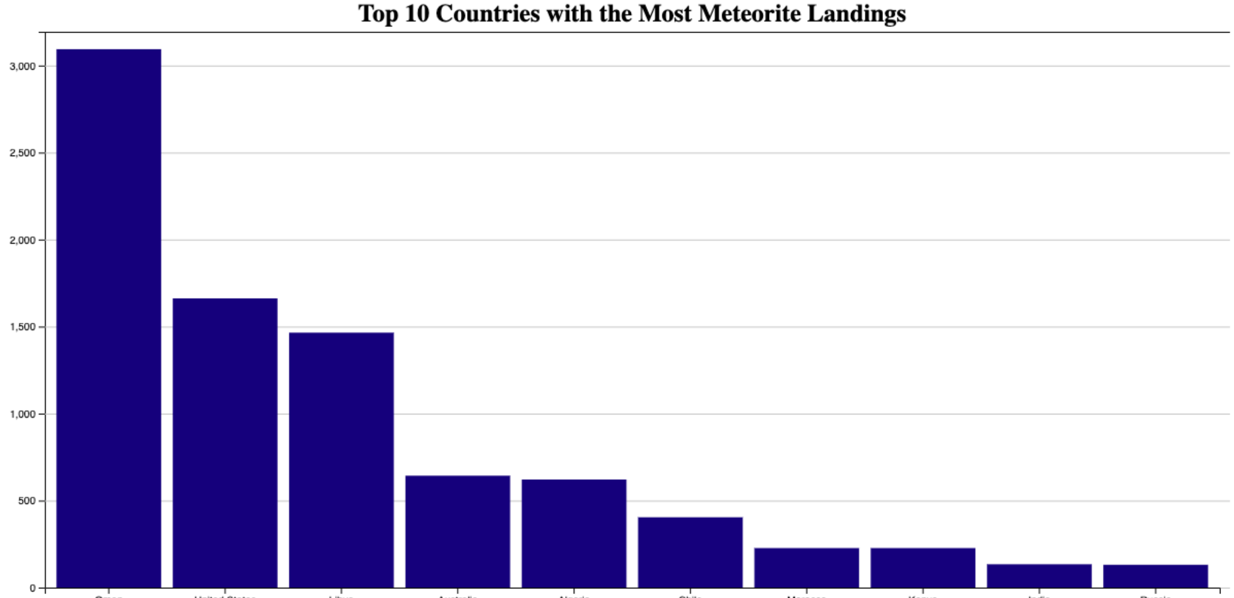
Screenshots

Map Visualization of Meteorite Landings



Top 10 Countries with the Most Meteorite Landings



Description of Data

The dataset employed for our analysis is titled "Meteorite Landings" and is sourced from data.gov. This dataset comprises the following variables: name, id, nametype, recclass, mass (g), fall, year, reclat, reclong, and GeoLocation. For the purposes of our visualizations, we focused solely on the reclat and reclong variables. Both reclat and reclong are float values, representing the recorded latitude and longitude of meteorite discoveries, respectively. In preparation for creating the bar graph, we first parsed the we implemented the following data-cleaning steps to ensure the accuracy of our visualization:

```
data = data.filter((d) => !isNaN(d.reclat));

data = data.filter((d) => !isNaN(d.reclong));
```

These procedures were put in place to exclude any rows that lacked recorded latitude and longitude values for the meteorites.

For our map visualization, we also used “Meteorite Landing”. Our data cleaning followed a similar procedure, in which we removed data points with null/NaN reclat or reclong values. For the map itself, we downloaded “world-110m.v1.json” from an open source and used it to draw the world map.

Design Rationale

In our map visualization, we created a world map, and each circle represents the location at which the meteorite was discovered. Our marks are the green circles, and the visual channels are aligned horizontal and vertical positions (longitude and latitude), as well as opacity. The GeoLocation of meteorite landings is read from the “Meteorite Landing” file, and the circles are placed according to the extracted latitude and longitude. The continents are colored light-gray while the ocean is purple-gray. Since most of the meteorites are discovered on the continent, this color scheme would make the continent stand out more and give it more contrast with the circles. Because of the large volume of meteorites discovered, the circles have a reduced opacity to better showcase overlap. Places such as the southern US, Europe, and South Australia have a saturated cluster of circles, meaning that they have relatively concentrated meteorite landings. Places like Russia and South America have relatively fewer landings.

In our bar graph visualization, the marks are the blue rectangles, and the visual channels are aligned vertical and horizontal positions. The bars' vertical positions are proportionate to the count of meteorite landings, and they offer a direct comparison between countries. These bars are arranged from left to right in decreasing order of recorded landings, meaning countries with fewer landings appear further to the right. A single shade of blue was chosen for the bars to maintain uniformity and to let the height of the bars convey the primary information. Different colors could introduce unnecessary visual complexity. Although our initial intent was to showcase meteorite landings for all countries, the latitude and longitude recorded in the dataset translated to too many countries for them to be effectively displayed in one bar graph. Therefore, we chose to feature only the top 10 countries with the most meteorite landings. We used a linear scale for the y-axis and a band scale for the x-axis. Note that the y-axis maximum value exceeds the highest displayed value, which was a deliberate choice to leave white space at the top to ensure the graph doesn't appear to be cut off at the top.

The Story

Our visualization tells a story about the distribution of meteorite landings across the globe. One might commonly expect that meteorite landings are distributed uniformly at random around the world. However, a surprising fact conveyed by our first map visualization is that meteorite landings are not evenly scattered. Certain regions have a higher concentration of landings. This naturally leads to the question: Which countries witness the most meteorite landings? Surprisingly, Oman, despite being only the 70th largest country, tops the list with the highest number of recorded landings. It has almost twice as many landings as the US, which occupies the second spot. Another intriguing fact is that Russia, the largest country by land area, ranks only tenth. Through this visualization, we aim to challenge viewers' expectations and shed light on the patterns of meteorite landings worldwide.

Work Distribution

Jackson and Jenny were primarily responsible for the coding as well as the report of the map visualization. Jessie and Peter were in charge of the bar graph visualization.

Map Visualization:

Jackson:

- Brainstormed how to use the dataset given by NASA, decided that the .CSV file would be easier to clean and use.
- Cleaned the dataset to be more suitable for use by removing all datapoints that had null or NaN for geoJson latitude and longitude.
- Found a suitable world map to be used for the map projection of meteorite landing locations, downloaded at world-110m.v1.json

- Coded map visualization including path country elements and the datapoints
- Worked with Jenny to make sure final visualization was correct and looked as presentable as possible
- Spent around 5 hours total on researching implementation strategies and coding the map

Jenny:

- Discovered possible libraries that can be used for map visualization
- Coded implementation for the map (final visualization used Jackson's version)
- Wrote the report for map visualization
- Proposed ideas regarding adjusting colors
- Spent around 5 hours, time spent mainly on coding map implementation.

Bar graph visualization:

Jessie:

- Implemented code for the bar graph
- Spent around 4 hours, mainly on code implementation

Peter:

- Modified the code after Jessie's implementation to adjust a few features
- Wrote the report for the map visualization
- Spent around 4 hours on the project, time spent evenly across fixing the features and the report