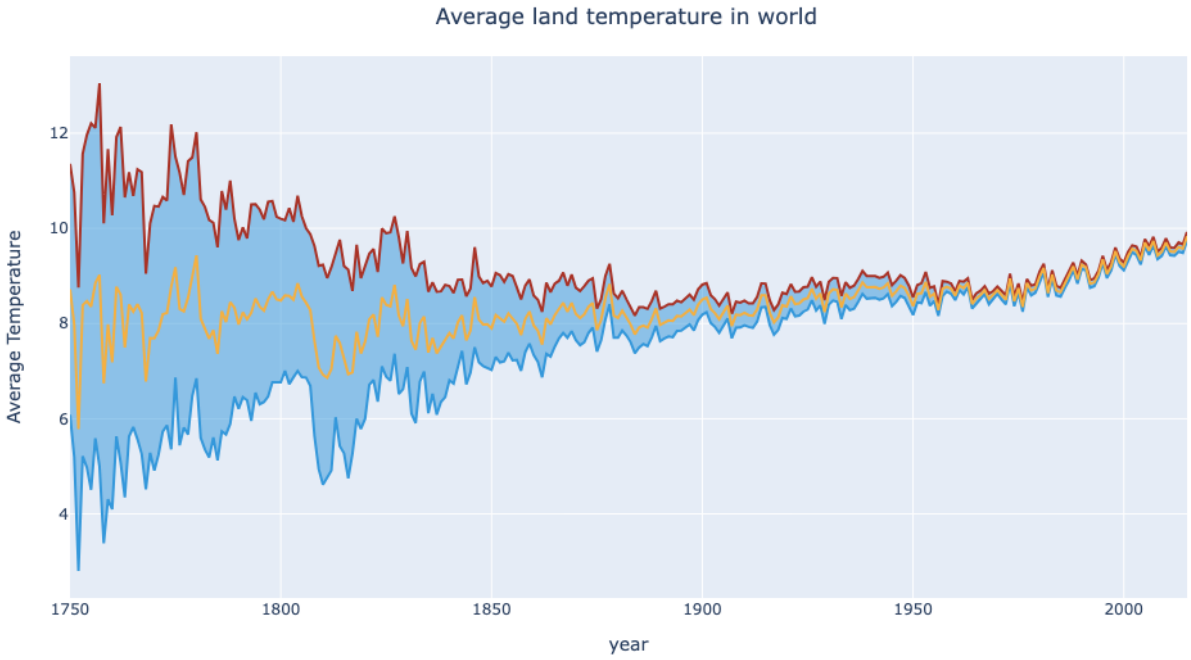
INFSCI 2310 Final Report
Global climate change from 1743 to 2013

Figure1: Line Chart



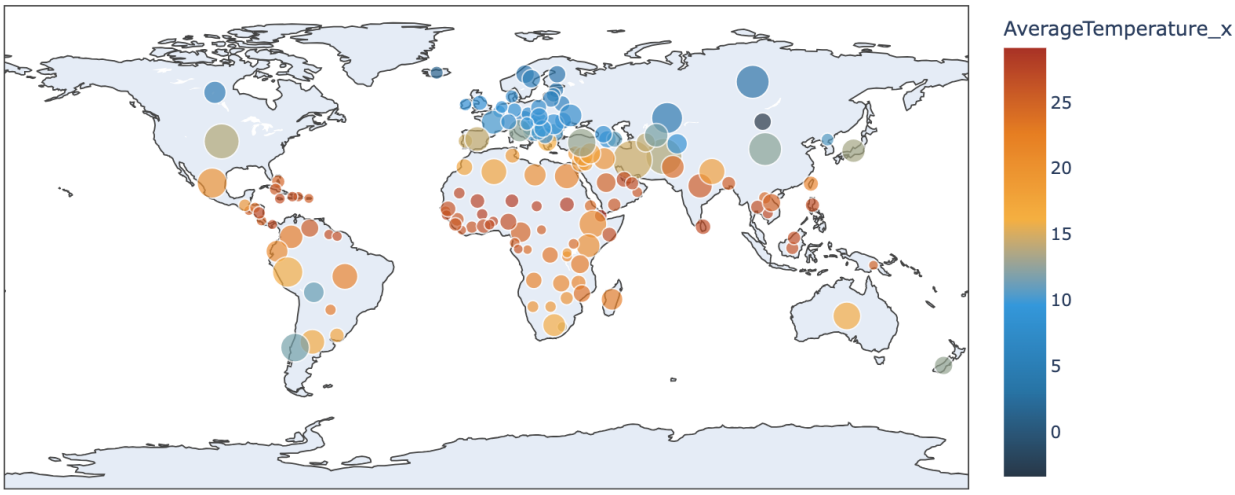
Legend Explained:

- The Red Line represented the upper bounds of uncertainty.
- The Orange Line represented the average temperature.
- The Blue Line represented the lower bounds of uncertainty.

Findings text introducing highlights of the produced figure in bulletin points.

- This chart shows the average land temperature from 1743 to 2013.
- The orange line represents the average temperature, indicating a slight upward trend in temperature over time.
- The blue shaded area represents the bounds of uncertainty, with its size decreasing in more recent times. This suggests that the data is more accurate and precise in recent periods.

Figure2: Global Map



Legend Explained:

- The dots' size showed how much the temperature increased.
- The bigger size of the dots shows the higher scale.
- The red dot indicates a higher temperature.
- The blue dot indicates a lower temperature.
- The color bar on the left signifies the average of temperatures.

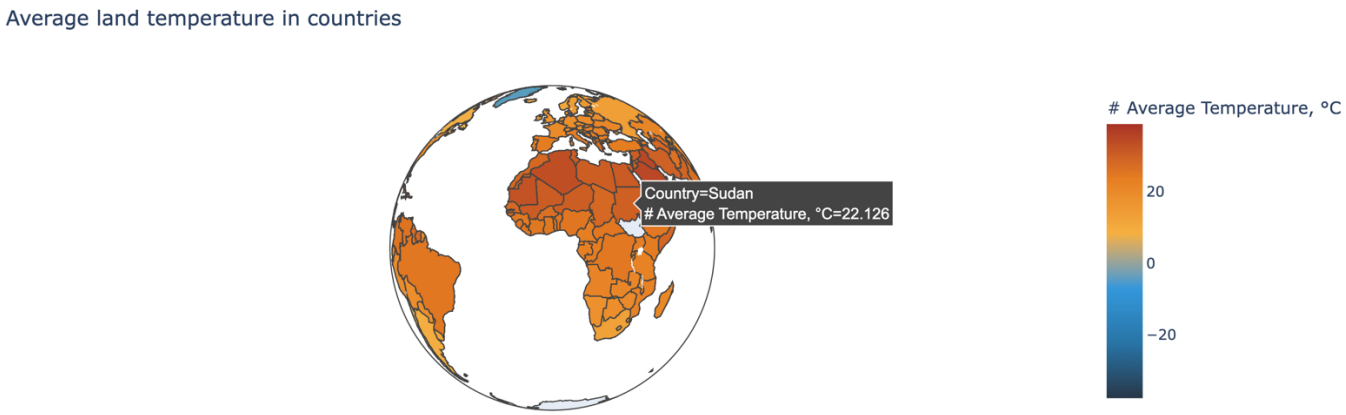
Findings text introducing highlights of the produced figure in bulletin points:

- The largest dot corresponds to the Middle East, suggesting that the temperature in this area is showing a noticeable increase.
- Many countries in Europe are experiencing a rise in temperatures.

Data and method text describing the data and method used in this process:

- The original dataset is grouped by region, country, and alpha-3 code. For each group, the mean and maximum average temperatures are calculated based on the 'Average Temperature' column.
- A new column 'difference_temp' is created to represent the difference between the maximum and mean average temperatures.
- The processed data is visualized using a geographical scatter plot.

Figure3: Global Map



Legend Explained:

- The blue color shows the lower temperature.
- The red color shows the higher temperature.

The Findings text introduces highlights of the produced figure in bulletin points.

- Russia, Canada, and Greenland have the lowest average temperatures.
- The warmest country is located in Africa, situated along the equator.

Data and method text describing the data and method used in this process.

- The processed data is visualized using a choropleth map, with each country represented by a color indicating its average land temperature.
- The map utilizes an orthographic projection, providing a three-dimensional perspective.
- I employed the Python libraries Plotly Express and Plotly (Graph Objects) for visualization.

Significance statement on why the presented figure is important:

- The visualization can help us understand long-term climate trends.
- The figure offers compelling evidence of human activities influencing climate, highlighting the need for collective action to address anthropogenic factors.

Data from: https://www.kaggle.com/datasets/joebeachcapital/global-earth-temperatures/data
https://github.com/megcheng/visualization-final.git