Exploring Weather Trends

Introduction

In this project, I analyzed local (Austin, TX, USA) and global temperature data and compared the temperature trends over hundreds of years.

Outline of Procedure

In order to prepare the data to be visualized in the chart below, I first extracted the data from a database.

Using the following SQL command, I first looked up the closest major city to where I am currently living:

```
SELECT * FROM city_list
WHERE country = 'United States' AND city = 'Austin'
```

After confirming that Austin was in the database, I then used another SQL command to select all the temperature data for this city and exported it to a CSV file. I did the same with the global temperature data.

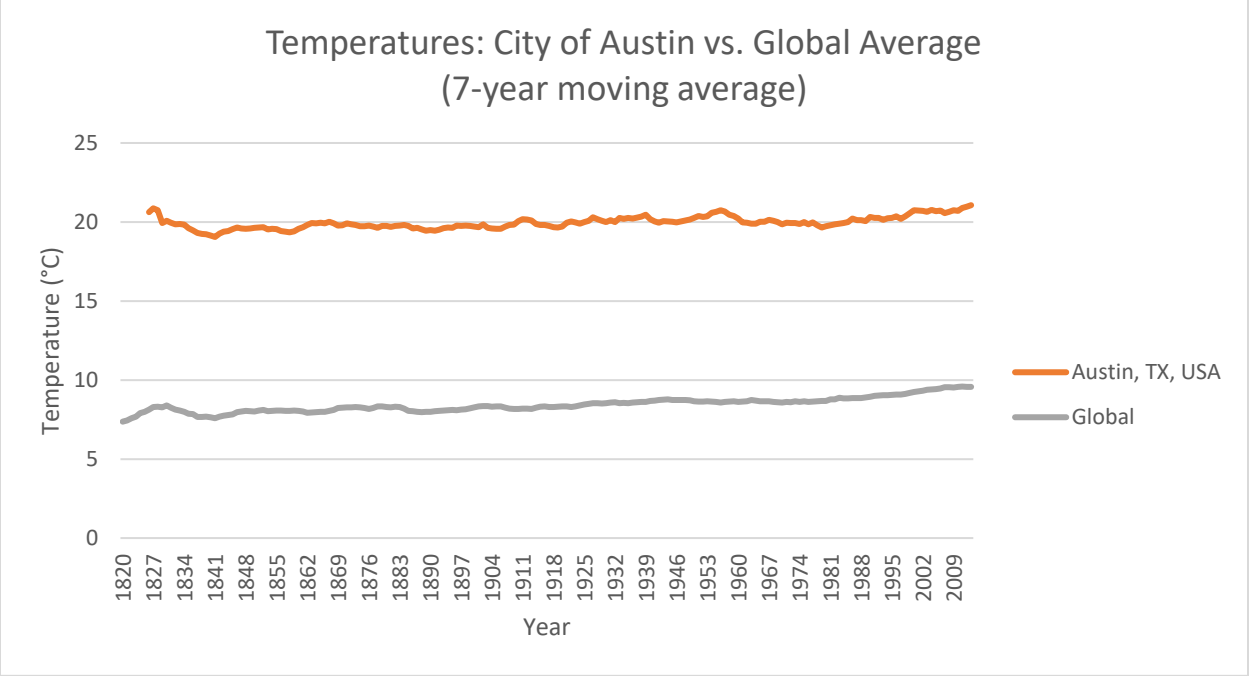
```
SELECT * FROM city_data
WHERE city = 'Austin'

SELECT * FROM global_data
```

Opening the CSV files in Excel, I calculated the 7-year moving average of both the local and global temperatures using the "=AVERAGE()" function, with the temperatures of the past 7 years in the function. For example, the moving average for the year 1826 was calculated with the cells containing the temperatures of 1820-1826 within the function.

I then created the following line chart (next page) to visualize the trends in temperature, since line charts are best for time series data.

Visualization and Observations



Line chart exploring weather trends in Austin, TX and globally

NOTE: The extracted data for Austin only provides temperatures for the years 1820-2013, while the global temperature data has a broader range. For this reason, the moving average for Austin on the chart starts at 1826, but the moving average of global temperatures for 1820-1826 is available.

Here are a few observations about the temperature trends:

Insight #1. Austin's average temperatures are consistently about 11 to 12 degrees warmer than the global average temperatures.

Insight #2. There is a slight positive correlation between temperature and year both in Austin and globally, suggesting that the world has been getting slightly warmer in the past two hundred years. (February 2021 notwithstanding!)

Insight #3. Temperatures in 1827 were at a high peak both locally and globally, with the Austin temperature only about 0.2 degrees lower than in was in 2013. Both trends take a dive after this, there is a dip in temperatures between the years 1827 and 1862.

Insight #4. The trend line for Austin goes up and down more erratically than the global trend line, suggesting that it has a more volatile climate than other places in the world.