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Project 1: Global vs. City Data

Gathering the Data:

My first step on this project was getting the data from the SQL database. I first decided to check which cities are available in the database:

```
SELECT *  
  
FROM city_list;
```

Next, I found that Boston, MA, the city closest to where I live, was in the database, so I retrieved all data for that city:

```
SELECT *  
  
FROM city_data  
  
WHERE city = 'Boston';
```

I then had to gather the global temperature data:

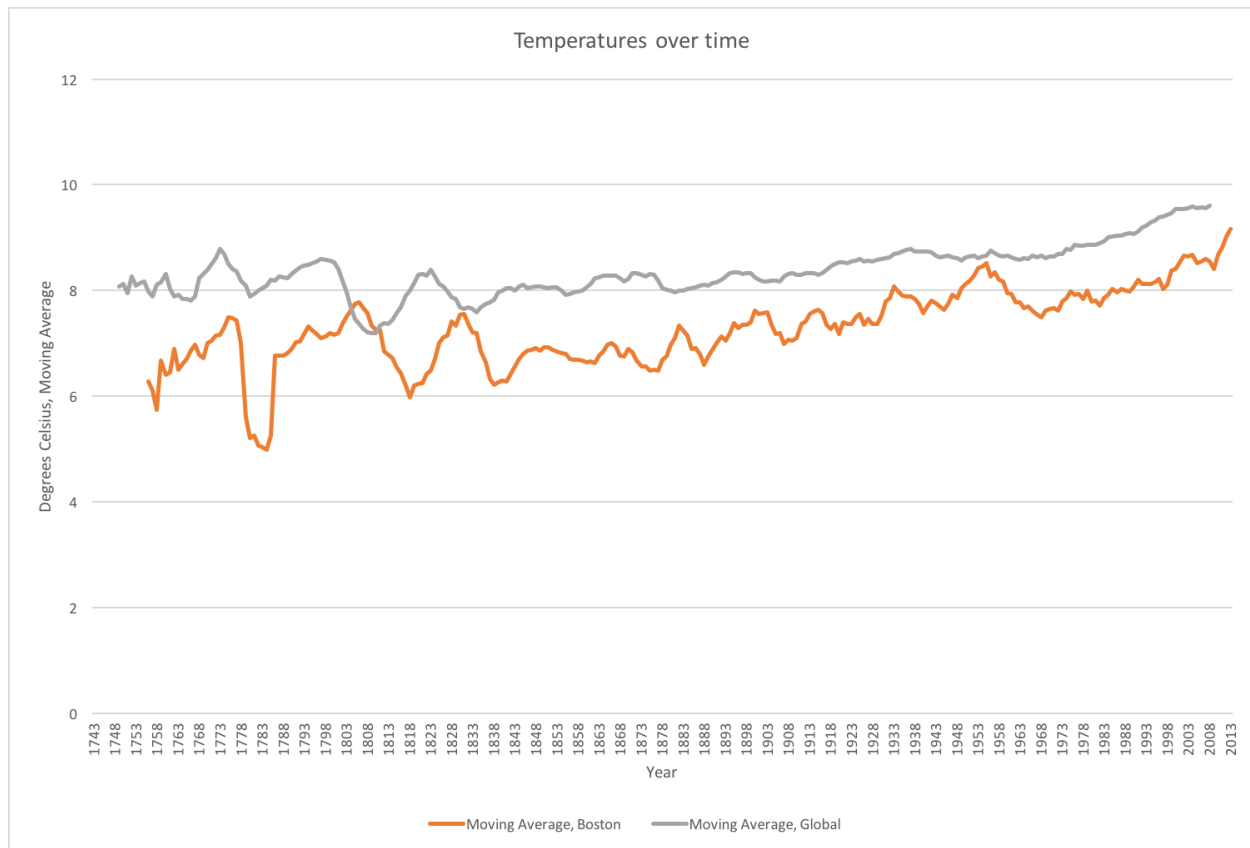
```
SELECT *  
  
FROM global_data;
```

After each of these steps, I exported the result to a .csv file.

Formatting the Data:

I analyzed the data using Microsoft Excel. First, I had put all the data from the global_data file into the city_data file, to more easily access and compare it. Then, I added two columns, for both the moving averages (Boston and global). I calculated the moving average by taking the row with the seventh data point, and typing “=AVERAGE(H2:H8)”, where H is the column with the average temperatures, and 2 and 8 are the endpoints of seven years of temperature data. This process was completed for both the global data and the Boston data.

Next, I created a line graph, with time (in years) on the x-axis and temperature in degrees Celsius on the y-axis. Both the global and Boston's moving average were plotted on this graph. I was then able to analyze the change in the moving average over time. The graph can be found below.



Analyzing the Data:

I had a few considerations when analyzing the data and visualizing trends. First, I tried to find trends, an upward trend, downward trend, or a constant temperature. I then tried to find differences in these trends. I made sure to look at both short term trends as well as long term trends.

The following are four observations about the data:

1. Over time, for the most part, yearly temperatures in Boston have been lower than global temperatures, except between 1805 and 1810. During those years, the average yearly temperature in Boston was above the global temperature. After about 1843, this temperature difference seems to be consistently lower. Around 1950, Boston's yearly temperature crept up again to be close to the global temperature, but it decreased again. Before 1838, temperatures both in Boston and overall global temperatures seemed to fluctuate a lot in the short-term but seemed fairly constant in the long-term.
2. The overall changes in the temperature in Boston seem to be consistent with the changes in global temperature, which seems to be rising over time, starting around 1843, and speeding up starting around 1970.
3. Though the overall trends of increase between global and Boston temperatures seem similar, the global trends seem to be more consistent -- slowly increasing over time, while Boston temperatures seem to increase quickly between 1840 and 1950, decrease between 1950 and 1970, and the increase quickly again. This makes intuitive sense, since data at a single point vary much more than an average.

4. A drastic drop in temperature in Boston in the 1770s, occurred at about the same time as a slightly less drastic drop in global temperature.