Weather Data

The data used in this project was extracted from an SQL database and exported to three separate CSV files. The data in the files were then copied onto three sheets in a single Excel file and saved with an .xlsx file extension for editing and exploring. There are 344 cities and 137 countries in this dataset. I have used Celsius in the first chart and Fahrenheit in the other three charts following.

Here are the SQL scripts I used to gather the data. They are very simple and are used to gather all of the data. Filters are then used in Excel to filter down to city, country, and year levels.

For city data I used:

SELECT *

FROM city_data

For a list of cities I used:

SELECT *

FROM city_list
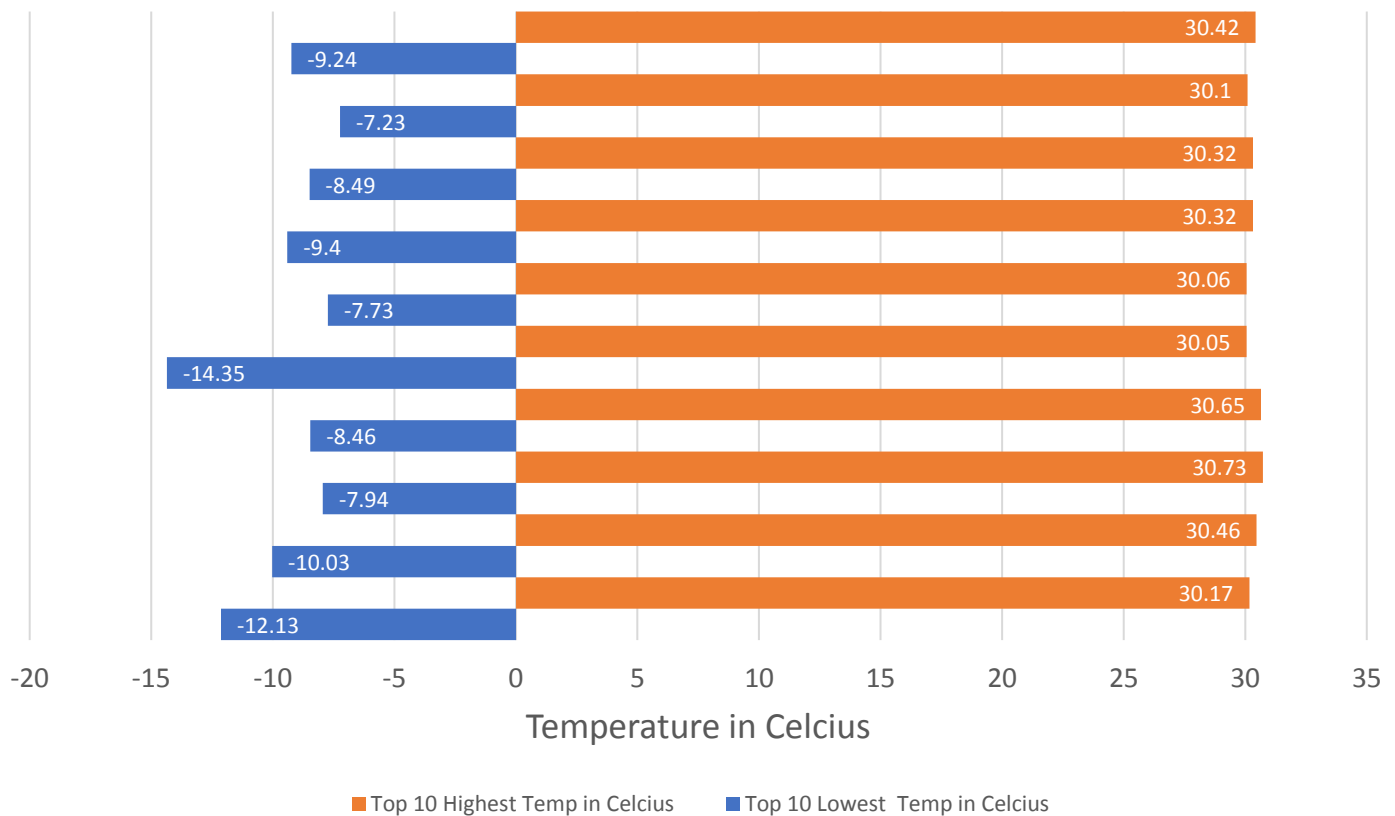
For the global data I used:

SELECT *

FROM global_data

To start off I wanted to pull the highest and lowest temperatures reported using the built-in top 10 filter in Excel. The temperatures below are in Celsius. In the top 10 highest temperatures we have the country of Niger coming in with 60 percent of the highest temperatures and Sudan with the remaining 40 percent. Russia (not surprisingly) has 80 percent of the coldest recorded average temperatures, then the United States, and finally Kazakhstan.

Top 10 Highest and Lowest Average Temperatures Recorded

Temperature in Celcius

Legend: ■ Top 10 Highest Temp in Celcius ■ Top 10 Lowest Temp in Celcius

Values shown on bars:
- 30.42 / -9.24
- 30.1 / -7.23
- 30.32 / -8.49
- 30.32 / -9.4
- 30.06 / -7.73
- 30.05 / -14.35
- 30.65 / -8.46
- 30.73 / -7.94
- 30.46 / -10.03
- 30.17 / -12.13

Average and moving averages are shown below in the chart for the city of Dallas in the United States. Excel has a built-in Data Analysis function which helps to calculate moving averages, but I decided to use the method taught in the Udacity lesson. First, I wanted to convert the Celsius temperatures to Fahrenheit since we do not normally use the metric system here in the US. I used the following code to accomplish this: = cell *(9/5) + 32. I then wrapped this code with the Round() function and set it to round 2 decimal spaces. The moving average was calculated by taking the average of the number of years I wanted to use and then populating the rest of the cells with the function by clicking on the small "+" located in the corner of the cell. The first was the average of 5 years using the =Average(cell1:cell5), next was the 10 year average using the same method, but changing the cell range from 5 to 10 cells.

In the chart below we can see that the average temperature for Dallas has steadily continued to rise. We can see this clearer when we take a look at the 10 year moving average below since it has a tighter fit. The first average temperature for Dallas was taken in 1820 at 62.38 ˚F and the last recorded average in the dataset was in 2013 at 68.81 ˚F. That's an increase of 10.3% over 193 years!

Dallas Avg Temp And Moving Averages
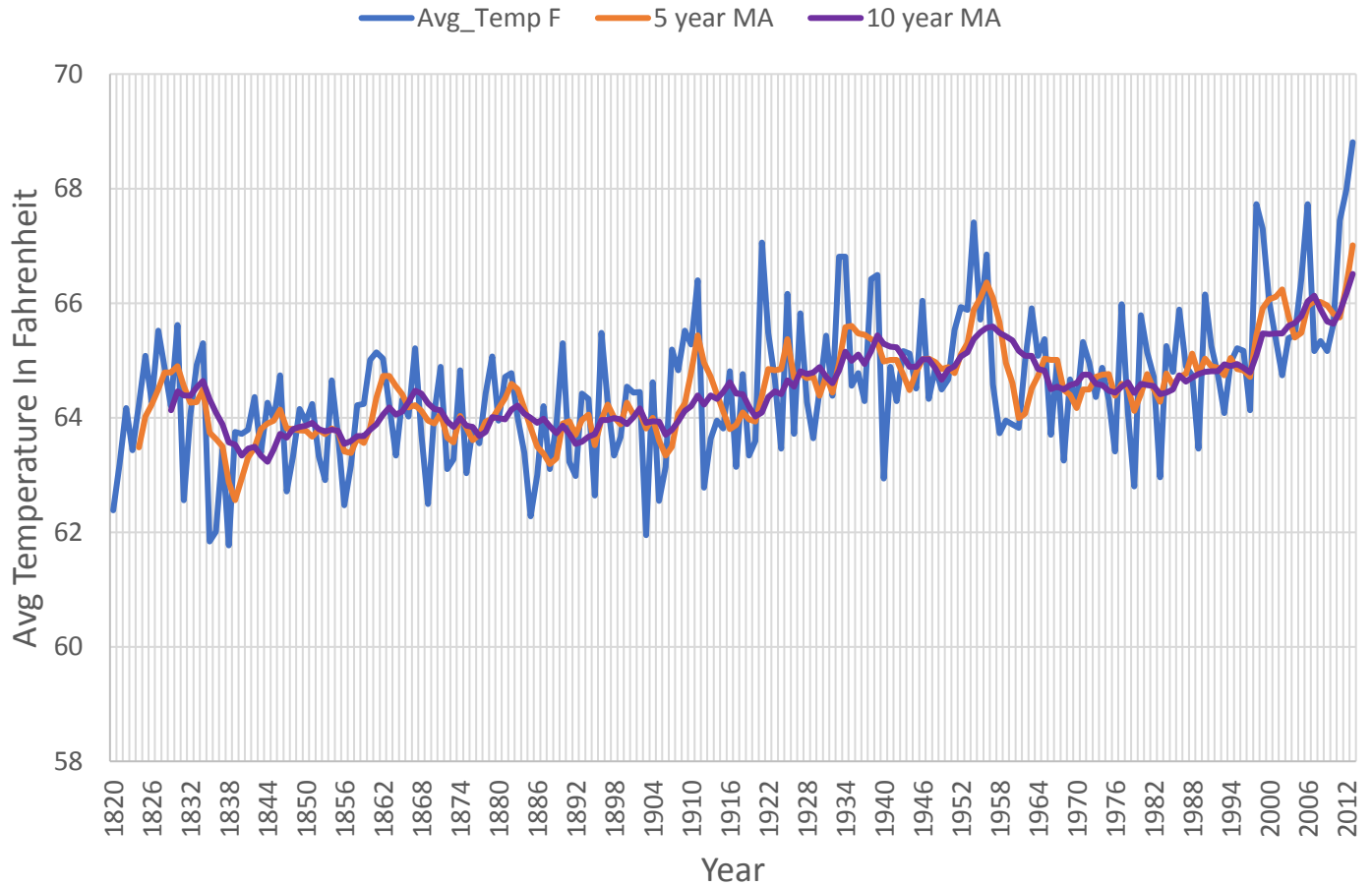
Here we are looking at a comparison between the Global and Dallas average temperatures. Both have been converted over to Fahrenheit and the range has been shortened to fit the time period between Dallas's first and latest recorded average temperature which started in 1820 and ended in 2013. Average Global temperatures for all years is 47 ˚F while Dallas has an average of 65 ˚F. Location could play a huge roll in this as well as other factors such as development level and pollution.

Global VS Dallas Temperature
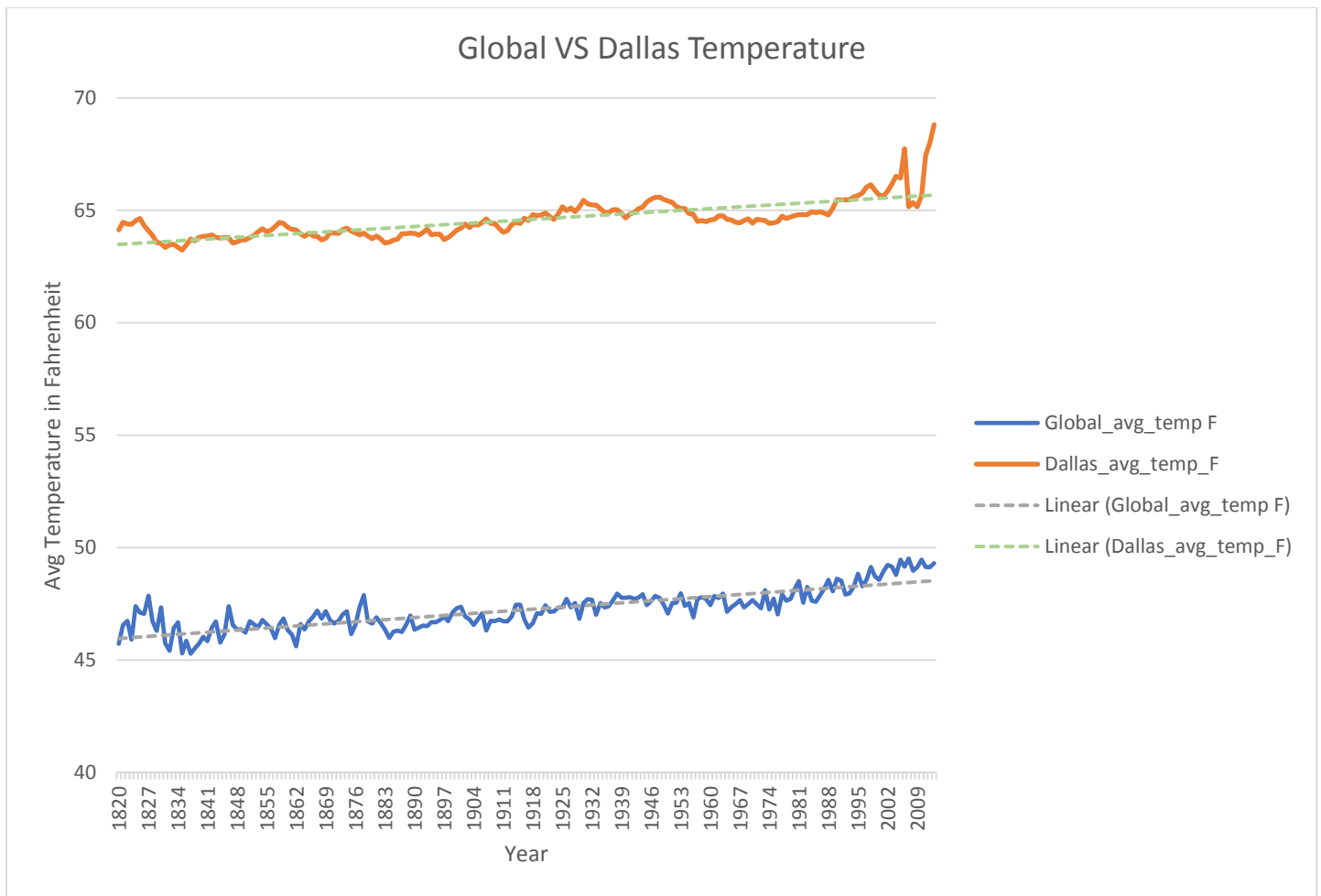
This histogram chart shows the difference in temperature (˚F) between Global and Dallas averages between the years 1820 and 2013 as well as the Frequency of the temperature occurrence. In all years the temperature in Dallas was higher than the Global temperature. The highest average temperature difference occurred 46 times with differences in temperature of 17.15 to 17.45 ˚F.

Temperature Differences Between Global And Dallas

Frequency (y-axis): 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50

Temperature Diff In Fahrenheit (x-axis):
[15.65, 15.95] — 1
(15.95, 16.25] — 6
(16.25, 16.55] — 5
(16.55, 16.85] — 23
(16.85, 17.15] — 37
(17.15, 17.45] — 46
(17.45, 17.75] — 38
(17.75, 18.05] — 21
(18.05, 18.35] — 10
(18.35, 18.65] — 5
(18.65, 18.95] — 1
(18.95, 19.25] — 0
(19.25, 19.55] — 1