Udacity Project 1: Exploring Weather Trends
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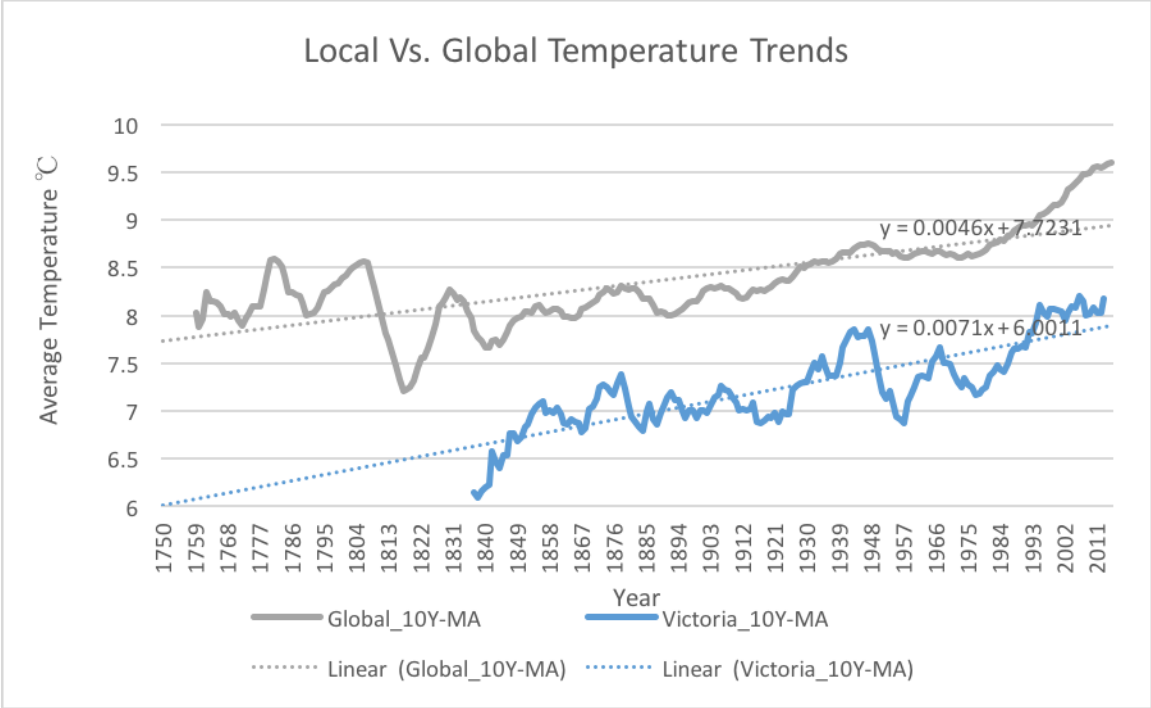
Outline:

1. From the SQL city_list, I find the city nearest to me by inputting the code select city from city_list where country = “Canada” and looking through the cities in the output.
2. Then, from the SQL city_data, select * from city_data where city = ‘Victoria’ and download CSV to extract the data of Victoria.
3. Finally, by SQL, extract the data of averaged global temperature by year by select * from global_data and download CSV.
4. Open an excel spreadsheet and import the CSV files downloaded before.
5. Calculate the 10-year moving average for both global and local (Victoria) data by using the AVERAGE() function in excel. Create a new column called 10Y-MA, at the 10^{th} year, use AVERAGE() and select the data of previous ten years to calculate the moving average for the first ten years. Click and drag the formula down to the bottom to get all moving average calculated.
6. Select the calculated 10-year moving average for both global and local as y values in two difference series. Select the year as a x-variable on the horizontal axis. Generate the graph, add axis titles and chart titles.
7. The key considerations when deciding how to visualize the trends are that the how to choose the scale of moving average and the unit of the axis. I decided to choose 10-year moving average instead of larger scales because the data of temperature in Victoria starts from year 1828 and 10 year moving average can provide more data points therefore can see more detailed fluctuations from the graph. Since the moving average is a ten-year time period, the unit on the x-axis is 10 years from 1750 to 2010.

Line Chart:



Observations:

1. There are fluctuations in both local and global average temperatures.
2. However, there are less fluctuations in global average temperature after 1840, which means the global average temperature becomes more stable.
3. Both local and global average temperature increase from 1837 till now and are having increasing trends.
4. However, the slope of increase is different. As the equations of the linear regression lines show the slope of global average temperature is 0.0046 and the slope of local average temperature is 0.0071 which means that the local average temperature is increasing in a faster speed according to the graph. Although, the local average temperature is lower than global temperature in the graph, the fast-increasing speed may result in a higher local temperature in the future.