PROJECT 1: EXPLORING WEATHER TRENDS

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Overview

In this project, I have analysed local temperature trends of Wellington, New Zealand with the global temperature dataset. The reason why I chose Wellington, was because when I searched for my local city which is Auckland, it appeared that my city did not have any data available from the database on Udacity. I then compared it with the global temperature dataset provided by Udacity. The time period that was used for this project was from the period of 1853-2013. I then made pivot tables to look at the moving average from 5-year, 10-year and 15-year periods.

Tools

The following tools were used in this project:

- SQL: I used the SQL language in the Udacity environment for querying the database and extracting the data.
- Excel to make pivot tables, calculations and analysing data as well as charts to display the data.

Extracting Data

Query to extract information from city and country:

SELECT * FROM
city_data
WHERE city = 'Auckland' AND country = 'New Zealand'

First, I tried to find the average temperature of my city Auckland. Even though the command was correct, it seems that that there was no data available for Auckland. I then tried the capital city of New Zealand and found that there was a dataset available for Wellington.

SELECT * FROM
city_data
WHERE city = 'Wellington' AND country = 'New Zealand'

The next step was extracted the global dataset.

Query to extract global data:

SELECT * FROM
global_data

Then I exported that dataset into an Excel CSV file. Once I exported the dataset to a CSV.

Data Analysis

I created pivot tables from the local dataset and the global data set to calculate the average and to analyse the data patterns. I used a mixture of excel functions from calculating the average, min, max and standard deviation.

Average of Local_avg_temp	Average of Global_avg_temp
12.65	8.37
Min of Local_avg_temp	**Min of Global_avg_temp**
11.21	5.78
Max of Local_avg_temp	**Max of Global_avg_temp**
13.97	9.83
StdDev of Local_avg_temp	**StdDev of Global_avg_temp**
0.54	0.58

Average of Local_10yr_avg	Average of Global_10yr_avg
12.65	8.35
Min of Local_10yr_avg	**Min of Global_10yr_avg**
11.98	7.20
Max of Local_10yr_avg	**Max of Global_10yr_avg**
13.43	9.59
StdDev of Local_10yr_avg	**StdDev of Global_10yr_avg**
0.37	0.45

Average of Local_5yr_avg	Average of Global_5yr_avg
12.65	8.36
Min of Local_5yr_avg	**Min of Global_5yr_avg**
11.68	7.11
Max of Local_5yr_avg	**Max of Global_5yr_avg**
13.62	9.61
StdDev of Local_5yr_avg	**StdDev of Global_5yr_avg**
0.42	0.49

Average of Local_15yr_avg	Average of Global_15yr_avg
12.65	8.35
Min of Local_15yr_avg	**Min of Global_15yr_avg**
12.14	7.41
Max of Local_15yr_avg	**Max of Global_15yr_avg**
13.38	9.56
StdDev of Local_15yr_avg	**StdDev of Global_15yr_avg**
0.35	0.42

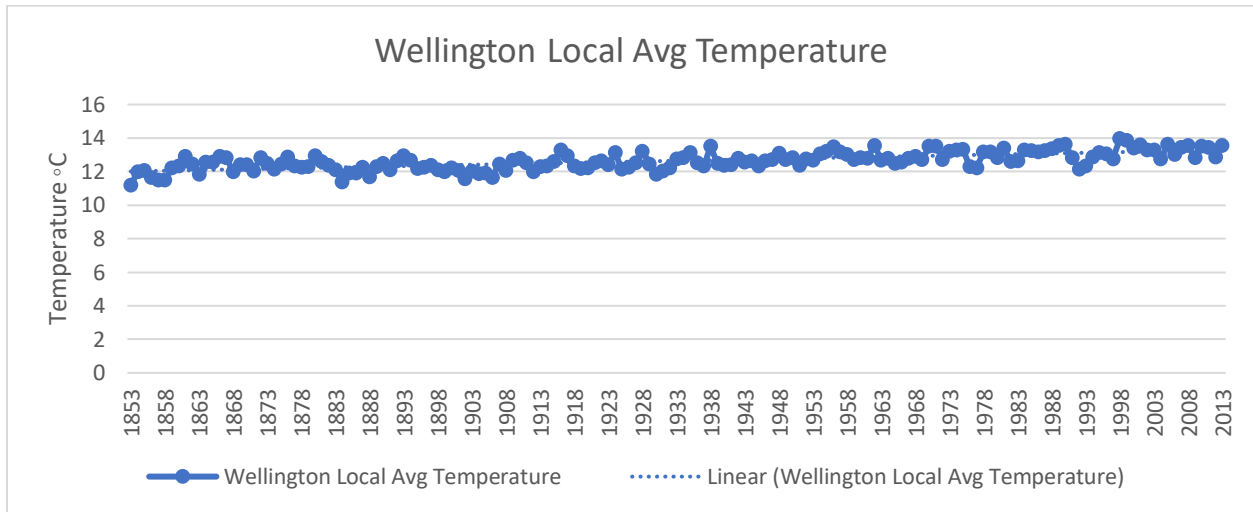| Min of Difference	Max of Difference
3.17	5.2

Line Charts

Figure 1. Wellington Local Average Temperature

Figure 1 represents the Wellington Local Average Temperature. The time period for this project was from the period of 1853-2013 for Wellington City's dataset. The average local temperature for Wellington, New Zealand was 12.65.
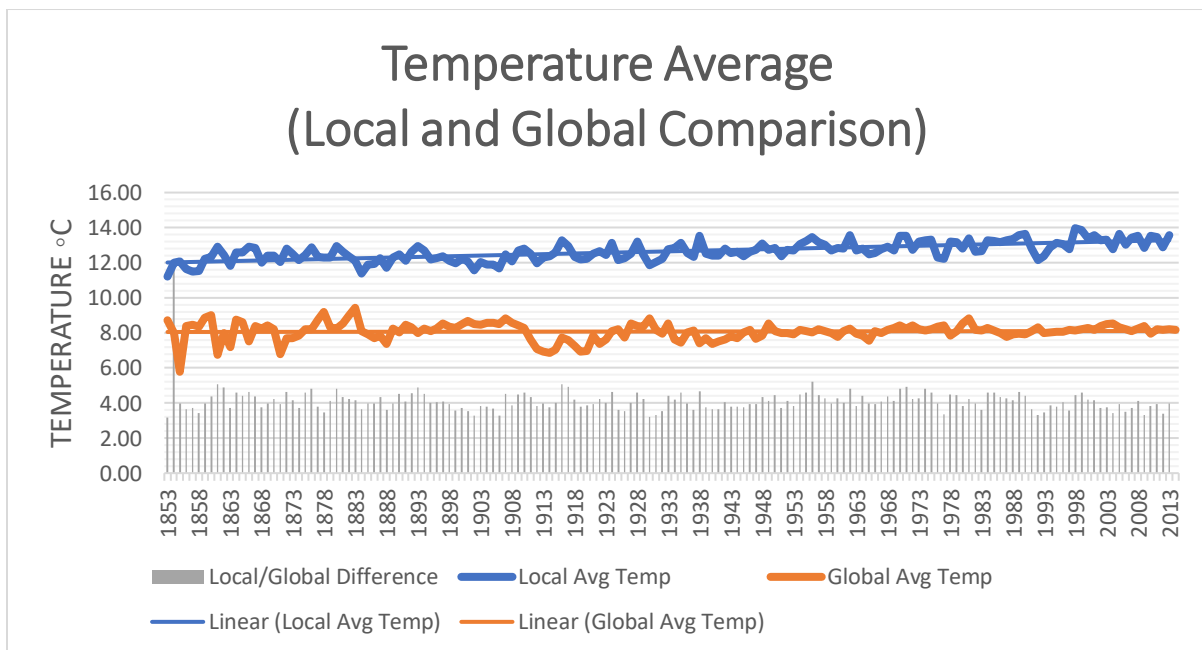

Figure 2. Local and Global Temperature Comparison Chart

Figure 2 represents a visual combined line chart of both Local and Global Temperature comparison chart between 1853-2013. The minimum local average temperature of Wellington was 11.21 while the minimum global average temperature was 5.78. The maximum local average temperature for Wellington was 13.97 while the global average temperature 9.83.
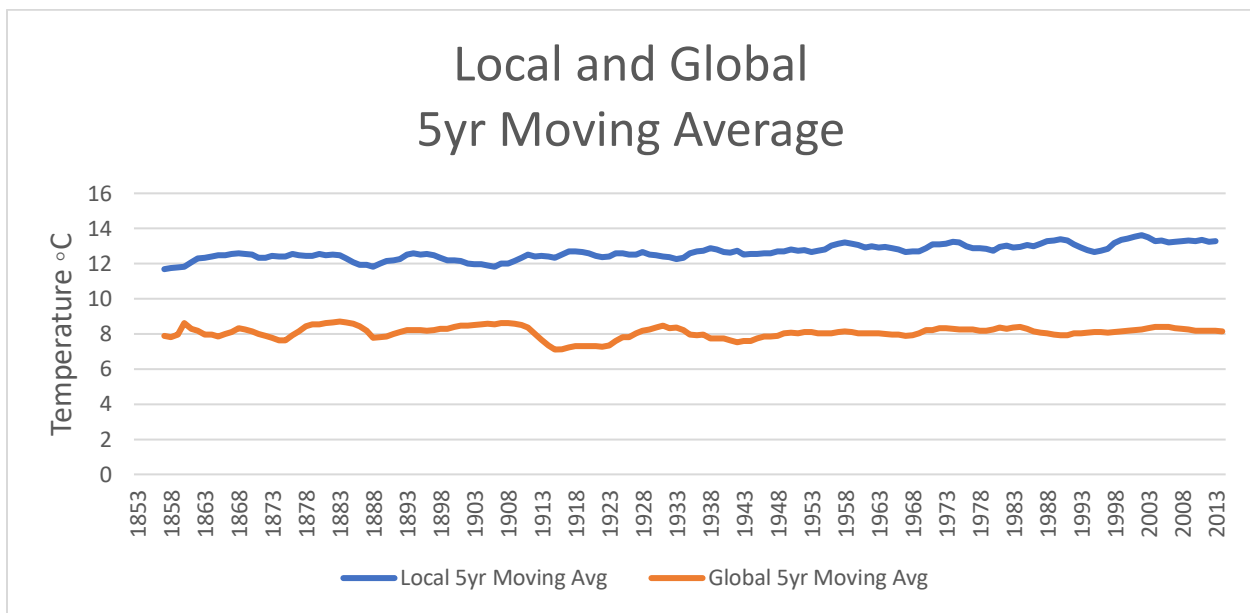
Figure 3. Local and Global 5yr Moving Average

Figure 3 represents the local and global 5 year moving average was for the time period of 1858-2013. The average local 5 year moving average for Wellington was 12.65 while the global was 8.36. The minimum local 5 year moving average was 11.68 and 7.11 for the minimum global 5 year moving average. The maximum local 5 year moving average was 13.62 while the maximum of global 5-year average was 9.61.
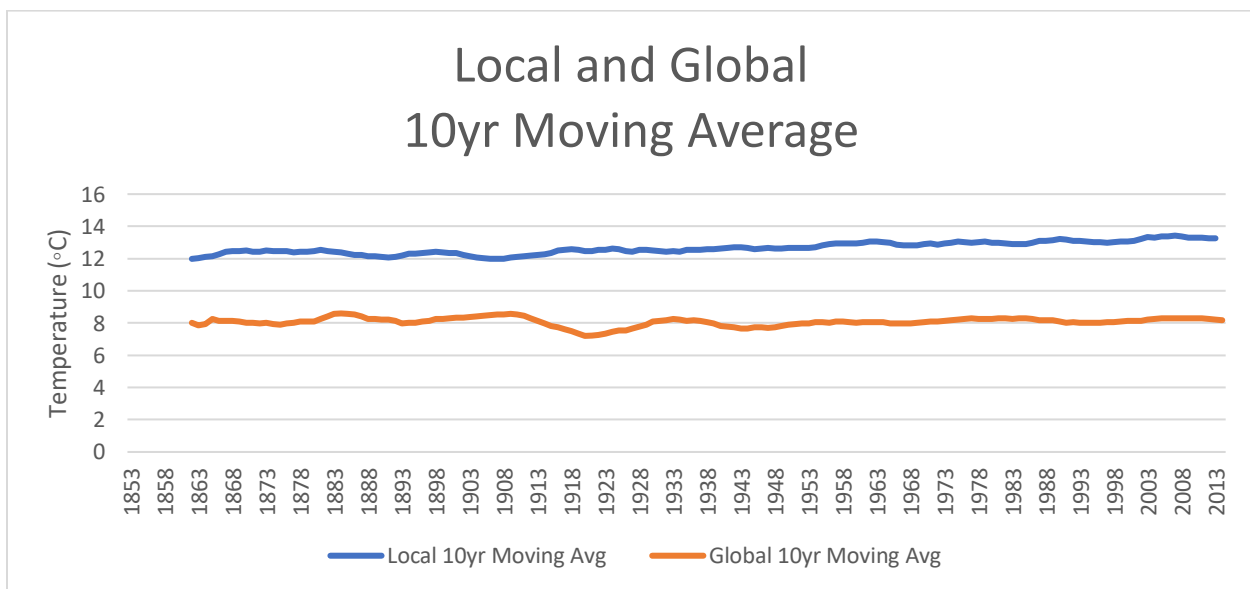

Figure 4.Local and Global 10yr Moving Average

Figure 4 represents the Local and Global 10 year moving average from the time period of 1863-2013. The local 10 year moving average was 12.65 while the global 10 year moving average was 8.35. The Min local 10 year moving average was 11.98 with a max of 13.43 while the global 10-year min was 7.20 and max of 9.59.
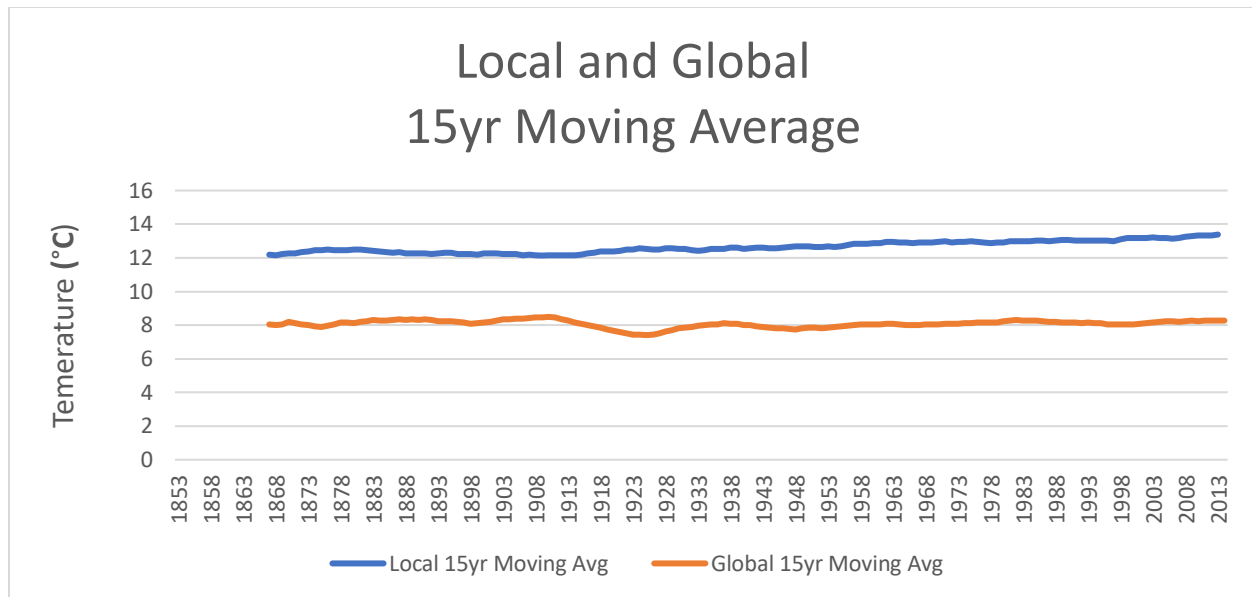
Figure 5. Local and Global 15yr Moving Average

As figure 5, the Local and Global 15 year moving average was from the time period of 1868-2013. The local 15 year moving average for Wellington City was 12.14 while the global average was 8.35. The min local 15-year average was 12.14 and the max was 13.38. The min global 15-year average was 7.41 while the max was 9.56.

Observations

1. The time period for this project was from the period of 1853-2013 for Wellington City's dataset. The global dataset period had data from 1750 – 2015. The average local temperature was 12.65. While the global average temperature was 8.37 (Figure 1).
2. The minimum local average temperature of Wellington was 11.21 while the minimum global average temperature was 5.78. The maximum local average temperature for Wellington was 13.97 while the global average temperature 9.83 (Figure 2).
3. The local and global 5 year moving average was for the time period of 1858-2013. The average local 5 year moving average for Wellington was 12.65 while the global was 8.36. The minimum local 5 year moving average was 11.68 and 7.11 for the minimum global 5 year moving average. The maximum local 5 year moving average was 13.62 while the maximum of global 5-year average was 9.61 (Figure 3).
4. The Local and Global 10 year moving average from the time period of 1863-2013. The local 10 year moving average was 12.65 while the global 10 year moving average was 8.35. The Min local 10 year moving average was 11.98 with a max of 13.43 while the global 10-year min was 7.20 and max of 9.59 (Figure 4).
5. The Local and Global 15 year moving average was from the time period of 1868-2013. The local 15 year moving average for Wellington City was 12.14 while the global average was 8.35. The min local 15-year average was 12.14 and the max was 13.38. The min global 15-year average was 7.41 while the max was 9.56 (Figure 5).

References:

[1] Helpful DIY, *How To Make A Line Graph In Excel-EASY Tutorial,* 2017:
https://www.youtube.com/watch?v=3PwVWX28dEE.

[2] Goodwill Community Foundation, "Excel 2013 Pivot Tables," 2020. [Online]. Available:
https://edu.gcfglobal.org/en/excel2013/pivottables/1/.