Temperature-trends-analysis:

In this project, I compared temperature data for Victoria, British Columbia (Canada) with global temperature trends. I used SQL to extract the data and Excel for cleaning, processing, and visualization. Here's an overview of my approach and findings:

Data Extraction

1. City Data (Victoria, Canada):

   - SQL Query:

     I extracted Victoria's data using:

     ```
     SELECT * FROM city_data
     WHERE country = 'Canada' AND city = 'Victoria';
     ```

   - Excel:

     The results were saved in an Excel file (temp_data) on a worksheet named **city_data**.

2. Global Data:

   - SQL Query:

     Since Victoria's temperature data begins in 1828, I filtered the global data to match by using:

     ```
     SELECT * FROM global_data
     WHERE year >= 1828;
     ```

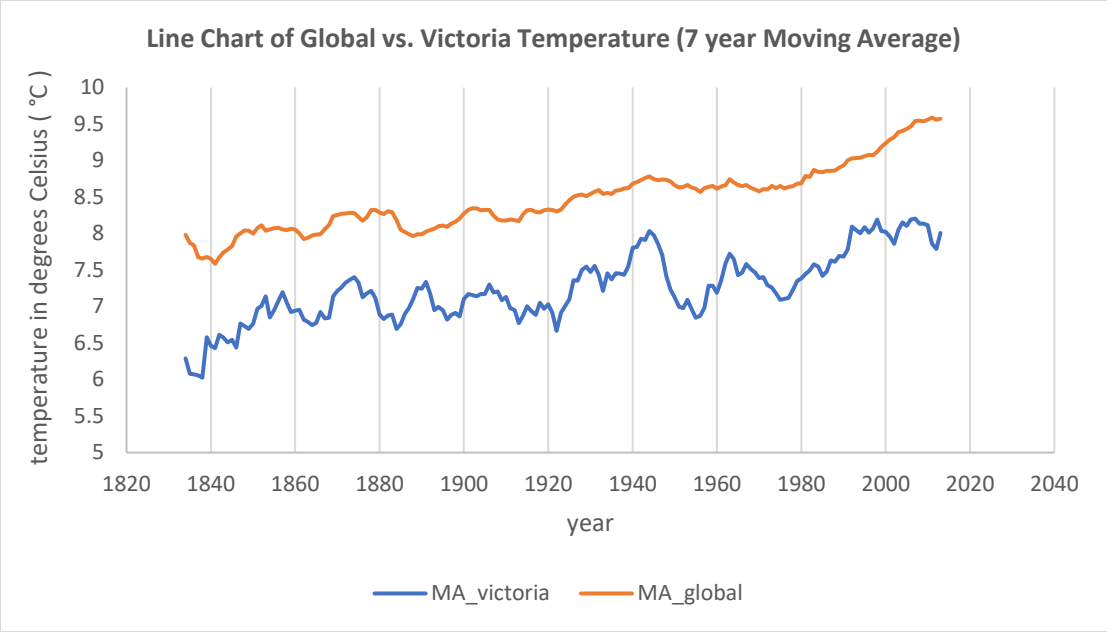
   - Excel:

     The filtered global data was placed on a second worksheet in the same Excel file,

     named **global_data**.

Data Cleaning and Processing

1. Handling Missing Values (City Data):
    - I identified missing average temperature values for the years 1830, 1831, and 1846 by filtering for blank entries in the *avg_temp* column.
    - These missing cells were filled by calculating the average of the two preceding years' temperatures (calculated in column *E*).
2. Creating Moving Averages:
    - City Data:
    - A 7-year moving average was calculated in column *F*, starting from 1834.
    - Global Data:
    - Similarly, a 7-year moving average was computed in column *C*, beginning in 1834.
3. Data Consolidation:
    - I copied the relevant data from the **city_data** sheet to the result sheet.
    - I then used the VLOOKUP function to pull the corresponding global temperature values from the **global_data** sheet.



Analysis and Findings

Using a line chart to compare the two datasets, I observed the following:

1. Overall Temperature Levels:
    - Global temperatures have consistently been higher than those recorded in Victoria.
2. Trend Fluctuations:
    - The global temperature trend is smoother and less variable compared to Victoria's, indicating that Victoria's temperatures experience greater fluctuations over time.
3. Specific Year Comparisons:
    - In some years (e.g., around 1920, 1955, and 1975), Victoria's temperature deviated significantly from the global average.
    - In other years, such as 1945, the temperatures were very similar.

4. Average Temperature Comparison:
    - The overall global average temperature is 8.46, whereas Victoria's average is 7.24. This indicates that, on average, global temperatures are about 1.22 degrees higher.
5. Minimum Temperatures:
    - The lowest temperature recorded in Victoria was in 1838, while the global minimum was recorded in 1841.
6. Maximum Temperatures:
    - Given the upward trend, the highest temperatures are expected near the end of the data series. The global maximum occurred in 2011, while Victoria's maximum was in 2007.
7. Variability:
    - Victoria's temperature data is more variable, as shown by a higher standard deviation (0.4681) compared to the global data (0.4457).
8. Trend Projections:
    - The global trend appears stable and is projected to continue increasing, potentially reaching an average of 10 degrees sooner.
    - Victoria's trend is more volatile, suggesting that its future temperature could either increase or decrease.