# 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**.

1. 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*).

1. 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.

1. 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.

1. 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.

1. 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.

1. 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.

1. Minimum Temperatures:

* The lowest temperature recorded in Victoria was in 1838, while the global minimum was recorded in 1841.

1. 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.

1. Variability:

* Victoria’s temperature data is more variable, as shown by a higher standard deviation (0.4681) compared to the global data (0.4457).

1. 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.