

Project 1: Explore Weather Trends

Steps made to produce a Visualization of the Data we want to analyze:

1. Acquiring the Data from the Databases:

Using the SQL Workspace provided in the Course, I extracted the global Temperatures with the following SQL Query:

```
SELECT * FROM global_data;
```

and the Temperatures for the City of Munich, i live in, with:

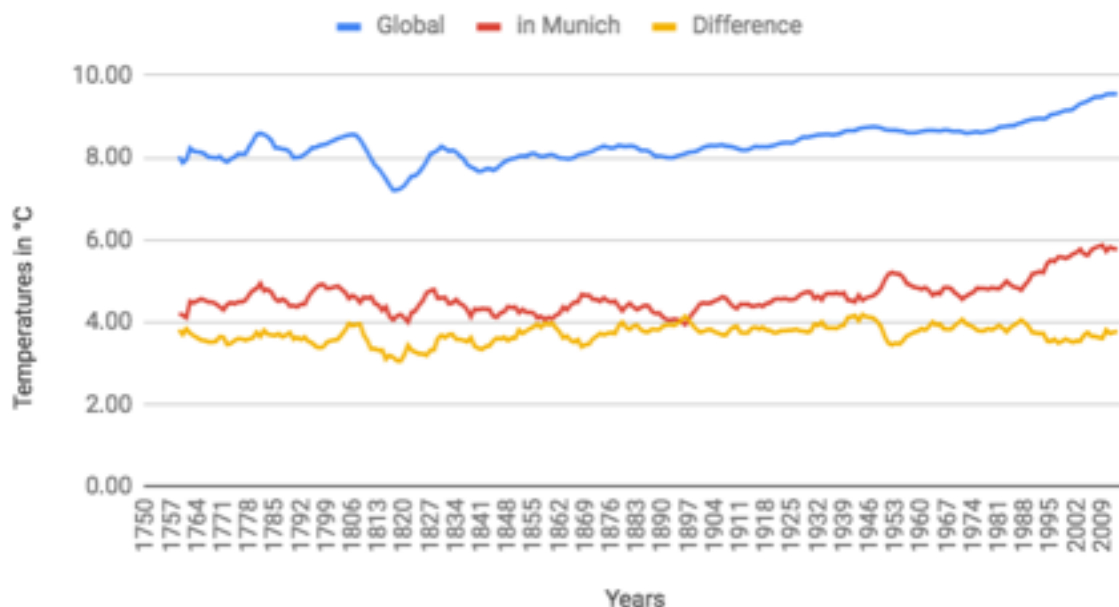
```
SELECT year, avg_temp FROM city_data WHERE city = 'Munich';
```

2. Working with the Data in Google Spreadsheets:

- I imported both CSV Files in a Spreadsheet and selected a common Range of Years to compare both global and local Temperature Values, starting in the year 1750 up to the year 2013.
- I computed several different Moving Averages (5 years, 10 years, 30 years and 50years), to be able to decide which one to choose, to best represent the Temperature Trends in a line chart. Each X-years Moving Average value being computed as the Average of the Xth value and the (Xth - 1) values before. For Instance, to calculate the first 10years-Moving Average Value for the global temperatures, we write for the 10th Value the Average of the first 10 global Temperatures. In the Spreadsheet, it means, that we write the following Formula in the Cell D11: "`=AVERAGE(B2:B11)`". We copy this Formula for the following Cells.
- I, then, inserted and formatted Line Charts in the Spreadsheet for all the different moving Averages that I had calculated, deciding to keep the 10-years moving Average to visualize the Data: It is smooth enough to see long term trends and we still see fluctuations over the centuries, that are maybe showing something interesting.

3. Visualizing global and local Temperatures in a Line Chart:

Global Temperatures and Munich Temperatures (10 years MA)



4 Observations about the Line Chart:

- the global Temperature Average has constantly been higher than the temp. Average in the city of Munich since the Data were recorded. The Ratio seems to stay about the same, about 1,8(empiric value).
- the global Line Chart is much smoother than the local one, that shows more fluctuations. Which we would expect, since global temperatures must be obtained by taking the Averages of recorded data around the world.
- Despite the local fluctuations, the Trends for both Temperatures Averages seem similar:
- we can see that there were some sort of cycles over two hundred years ago, during which the temperatures would increase and decrease again during a longer time, (for example between 1793 and 1821, between 1821 and 1862 and 1862 and 1897). The cycles seem to change over time, for both measures, in that their duration gets shorter and the temperatures decrease always less.
- we can see very clearly, that this "cycle trend", stops around the year 1988 and the temperatures increase, since then, apparently in the form of a linear progression that looks similar for local and global Data.