Project Exploring Weather Trends

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Outline

Steps I took:

- Extract data from database using SQL
    - Find nearest city: After having a look at the city_list table I checked for cities in Germany with the following statement:

```
SELECT *
FROM city_list
WHERE country = 'Germany';
```

    - From the three available options, I chose Munich.
    - Get all data from global_data table via SQL:

```
SELECT *
FROM global_data;
```

    - Save data as csv file (Global.csv)
    - Get all data from city_data table for Munich via SQL:

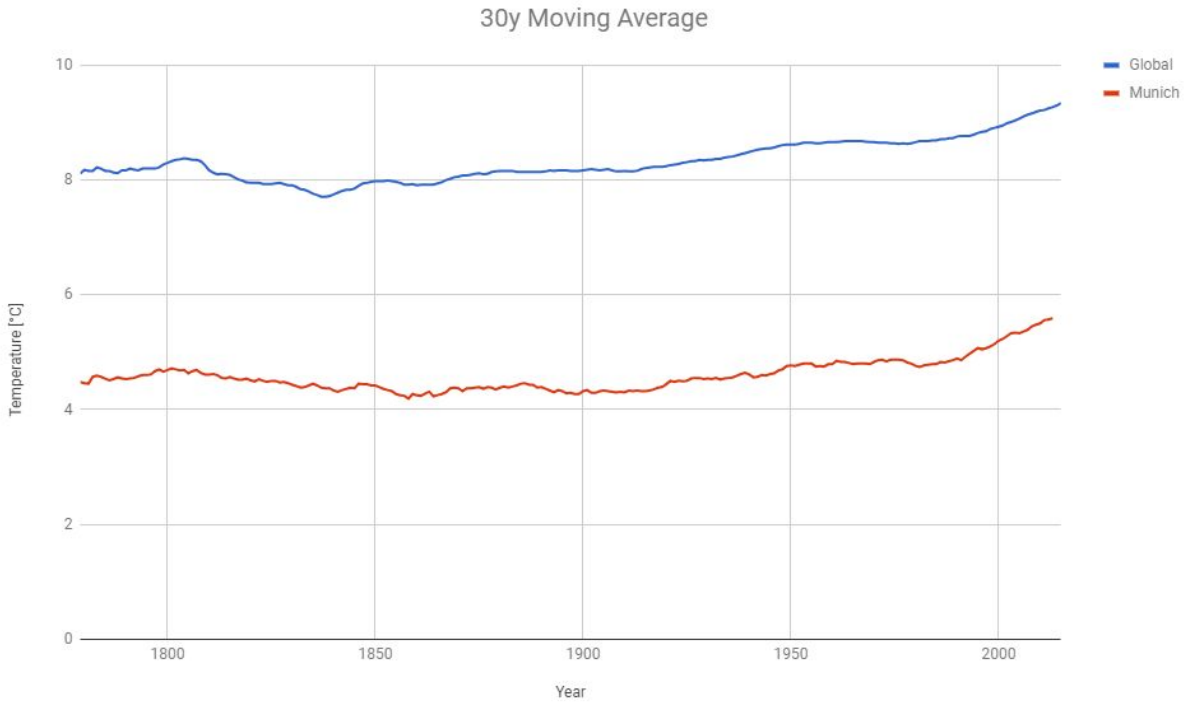
```
SELECT year, avg_temp
FROM city_data
WHERE city = 'Munich' AND country = 'Germany';
```

    - Save data as csv file (Munich.csv)

- Import data into Google Sheets by using *File → Import...*
  After selecting the corresponding files (first Global.csv, then Munich.csv), I imported the files with the “Insert new sheet(s)” setting to create a new sheet for each file.
- After having a first look at the data I saw that the start dates (the first year) do not match for the global data and Munich data. So I decided to use the complete range of years to fit both data samples (1743 to 2015) and copy the corresponding data to the “Trends” sheet.

- For the “trend time” I decided to use 30 years because this is the standard averaging period for climate[1] which means that you can see climate changes in the trend, not only weather changes. So the moving average is the average of the past 30 years.
- Therefore the usable years for the chart are 1779 to 2013. 1779 is the first year in the sampling data set with a complete 30 year history of weather data. 2013 is the last year because there is no data for Munich in the years 2014 and 2015. I omitted them because the main purpose here is a comparison between the global and Munich weather data.
- For visualizing the trend I omitted the years until 1779 and after 2013.

Line chart



https://docs.google.com/spreadsheets/d/14tuGpmpgQeG4ZCruVdWW3dDkYfXnndzF5EC9N_hYMag/edit?usp=sharing

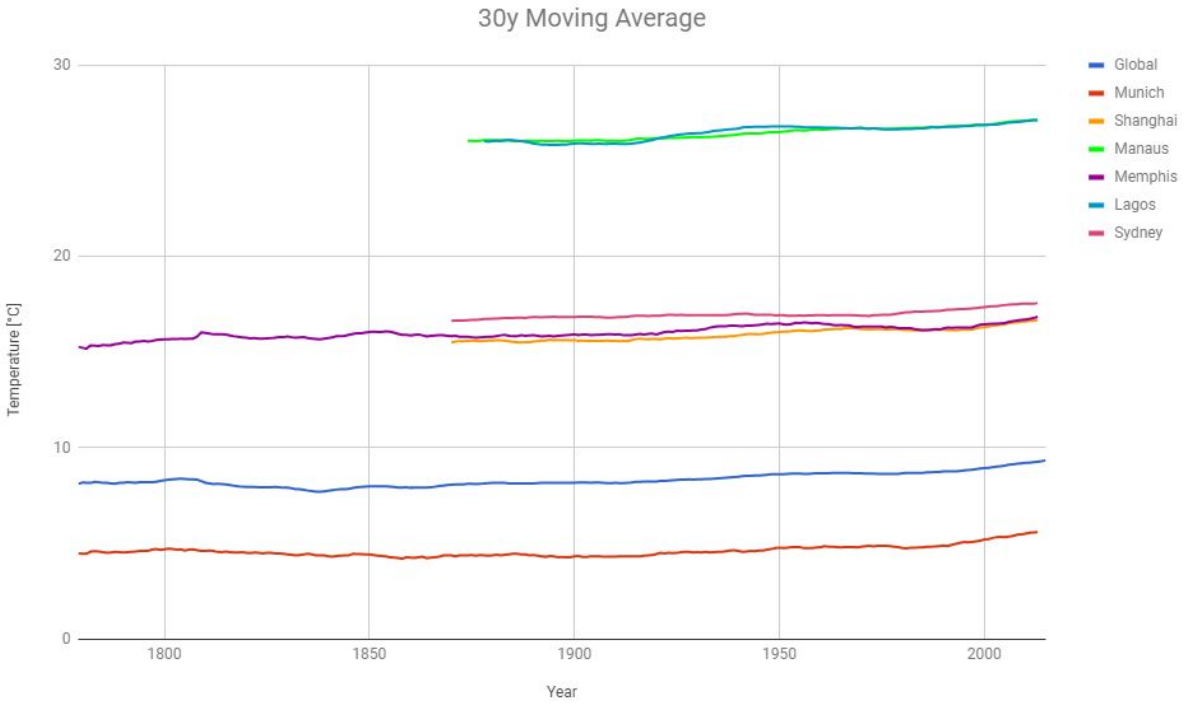
Observations

1. Both trends are similar in shape, meaning the change of temperature is roughly the same.
2. In average, the global temperature is around 4°C higher than the temperature in Munich.

[1] See https://en.wikipedia.org/wiki/Climate#Definition, 05/09/2018

3. The trend of Munich is not as “smooth” as the global trend which indicates a higher range in temperature values over the given trend time (here: 30 years).
4. The temperatures are rising since the the ~1850s.

Additional data



Observations:

- All cities have an increasing moving average of temperature, like the global moving average.
- The global temperatures are higher than the temperatures in Munich but much lower than the temperatures in e.g. Manaus or Lagos.