Project 1 – Exploring weather trends

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I. Outline of steps

This project was mainly done in Microsoft Excel. I have downloaded the given raw data as csv-files via short SQL queries:

i.   First, I checked whether my city Amsterdam is available. Using the function *Select * from city_list* I figured out, that Amsterdam as a city was available in the datasets provided (table 'city_list').

ii. I have downloaded the full table 'global_data' using the query *Select * from global_data*.

iii. In order to extract the data for the city of Amsterdam as comparison data, I used the query *Select * from city_data where city = 'Amsterdam'*.

The queries created the output which I could download as csv-files. Afterwards I combined the csv-files into one Excel file and used the function 'text to columns' in order to prepare proper Excel tables. Further on, all calculations and charts have been prepared in Excel.

I compared the local average temperature of Amsterdam with the average global temperature. In order to analyze and compare the data points, I used the moving average by creating a series of averages of the subset for the global as well as Amsterdam temperatures. Using the moving average enabled me to smooth out the data points over time and observe long term trends more easily.

I calculated the moving average based on 25 years for each dataset. This calculation method uses the average of the current and the previous 24 years data points (in total 25 data points for each year). Considering a total amount of years available of 264 years I was able to calculate 240 moving averages for each dataset.

In order to visualize the trends in the data provided, I had to take some key considerations into account:

- Availability of data
  The number of available years had to be the same for both data sets. For both datasets data was consistently available for the years 1750 to 2013, i.e. a total amount of years available of 264. Having the year 1750 as a starting point, I was able to calculate the first 25 year moving average for the year 1774.

- Type of chart
  For analyzing historical data for several years, I used a classic line chart as this one is a proper chart for the graphical representation of a series of data points with a continuous timeline.

- Design of the chart
  As the historical average temperatures for both datasets are relatively similar, I cut the y-axis on the bottom to represent the line charts bigger and hence point it out better to the reader. Further, I used basic coloring, titles for the y-axis and a short legend in order to create a clear and simple-to-read chart.

II.   Line chart
The line chart below shows the historical average temperature for Amsterdam in comparison with the average global temperature between 1774 and 2013.

Comparison of historical average temperature between 1774 and 2013
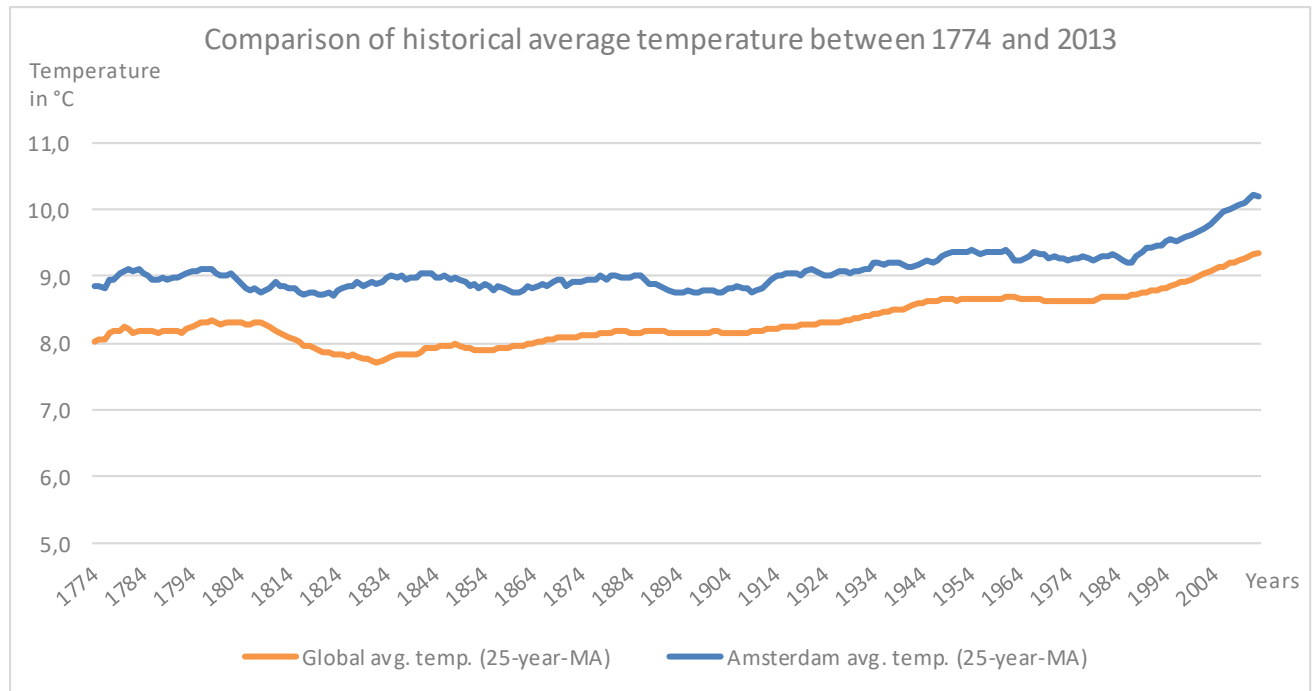
III.   Observations
a) Between 1774 and 2013, the average temperature in Amsterdam has been consistently higher than the average global temperature.
b) Both the historical average data for Amsterdam as well as the global average data shows an overall trend of increasing temperature with an increase from ~ 9°C in 1774 to 10°C in 2013 in Amsterdam and ~ 8 °C to 9.4°C for the global temperature.
c) Historical average global temperature shows a significant declining trend between ~1810 and ~1830. This trend is not observable for the average temperature in Amsterdam.
d) The increase in temperature seems to be stronger between 1990 and 2013 compared to previous years for both the average temperature in Amsterdam as well as the global average temperature.