Exploring Weather Trends Project

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Phase 1: Extract The Data

Write a SQL query to extract the city level data. Export to CSV.
Write a SQL query to extract the global data. Export to CSV.

SOLUTION
SQL queries were written to extract the data from databases for the first step.

View the table structure:
SELECT * FROM city_list LIMIT 5

Query to view details of city:
SELECT * FROM city_list
WHERE country = 'Germany';

Query to extract city level data for 'Berlin':
SELECT * FROM city_data
WHERE city='Berlin' AND country='Germany';

Query to extract temperatures for the world:
SELECT * FROM global_data;

The results of the queries extracted the data from the database and exported to CSV.

Phase 2: Open up to CSV

Firstly, data is downloaded to the local computer. Then, the CSV files were uploaded to *Google Sheets.*
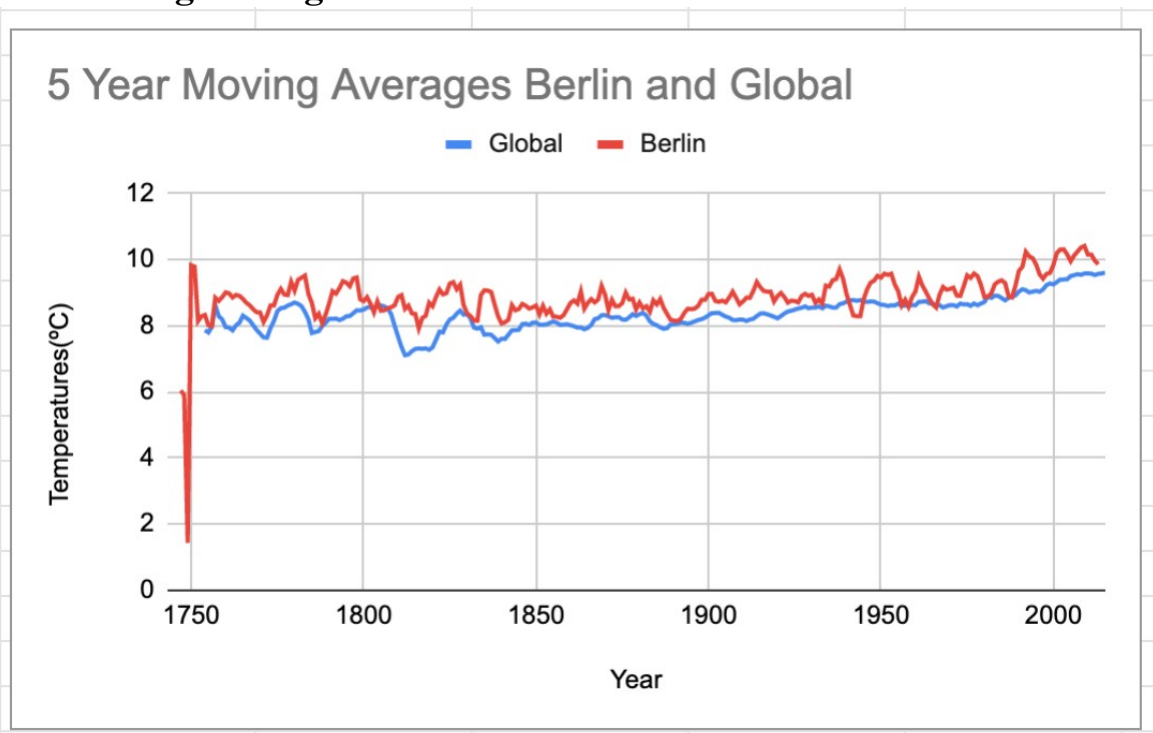
Phase 3: Create a Line Chart

The moving average is calculated for five and ten years by using these formulas below.
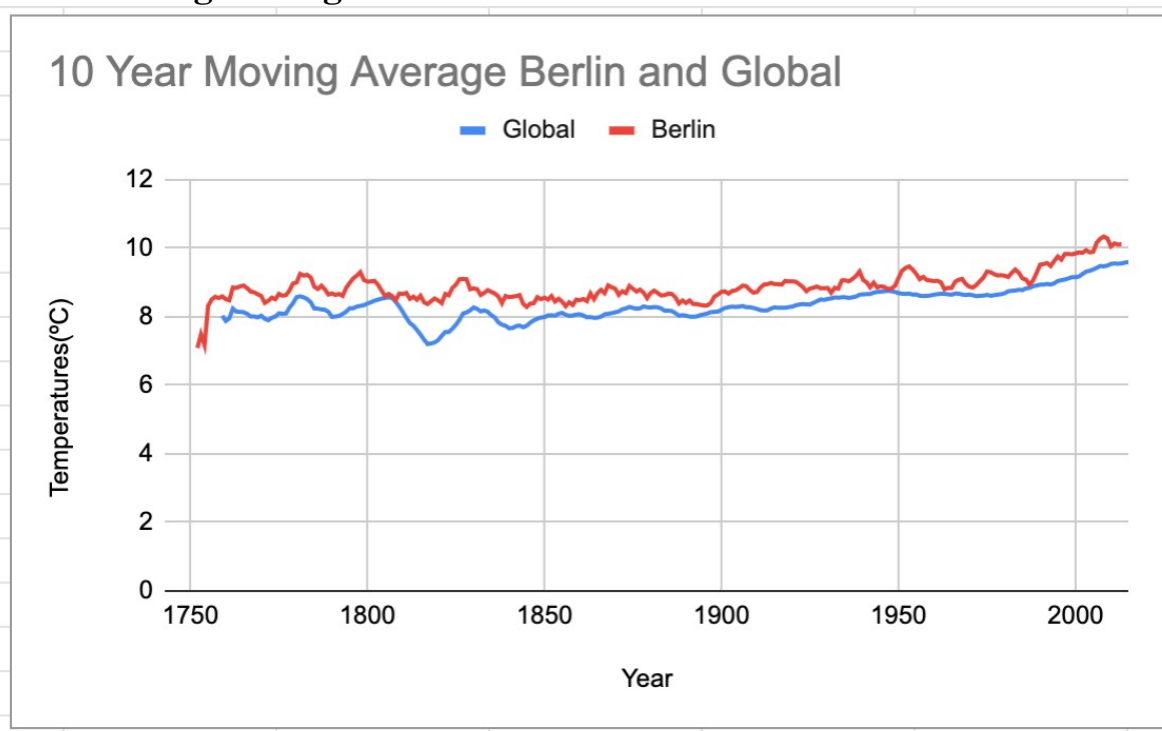
5 years MA: *AVERAGE(Cell2:Cell6)*
10 years MA: *AVERAGE(Cell2:Cell11)*

Line charts were created using Google sheets.

5 Year Moving Averages

10 Year Moving Averages

Phase 4: Make Observations:

1) Berlin is observed to have higher temperature than global temperatures except for a few data points. Furthermore, the amount of difference between two temperatures is not stable over the time. This can be seen in both charts(5 Years Moving Averages and 10 Years Moving Averages).

2) In the first graph (5 Year Moving Averages), it is observed that Berlin and global temperatures follow a similar trend until the 1850. The degree of temperature is generally different but the trend is quite similar. After the 1850, it is observed Berlin temperature is less correlational to global temperature.

3) In the second graph (10 Year Moving Averages), it is observed that Berlin and global temperatures follow a similar trend approximately from 1760 to 1800 and approximately from 1820 to 1900. After 1900, global temperature follows an increasing trend. However Berlin does not have an increasing trend until the end of 1900s.

4) When overall trend is examined, it is observed that the world is getting hotter. Until 1850, the global temperature does not regularly follow an increasing trend, but especially after 1850, it is observed that global temperature is increasing.

Key Consideration

1. I have to compare only 2 different datas for project and I used Google Sheets to visualize the data because Google Sheet is easy to use and to provide enough flexibility for this project.
2. Google sheet provides edit functionality for the graph.
3. It is also easy to access.

Additional Insights:

- What is the correlation coefficient?
The correlation coefficient between Berlin average temperature and global average temperature is 0.515946421 using Pearson method.

The correlation coefficient is 0.741052434 for 5 years moving averages and the correlation coefficient is 0.8576164622 for 10 years moving averages.

We have positive correlation between Berlin temperature and global temperature, they have positive relationship between each other.

- Multiple cities

5 year Moving Averages
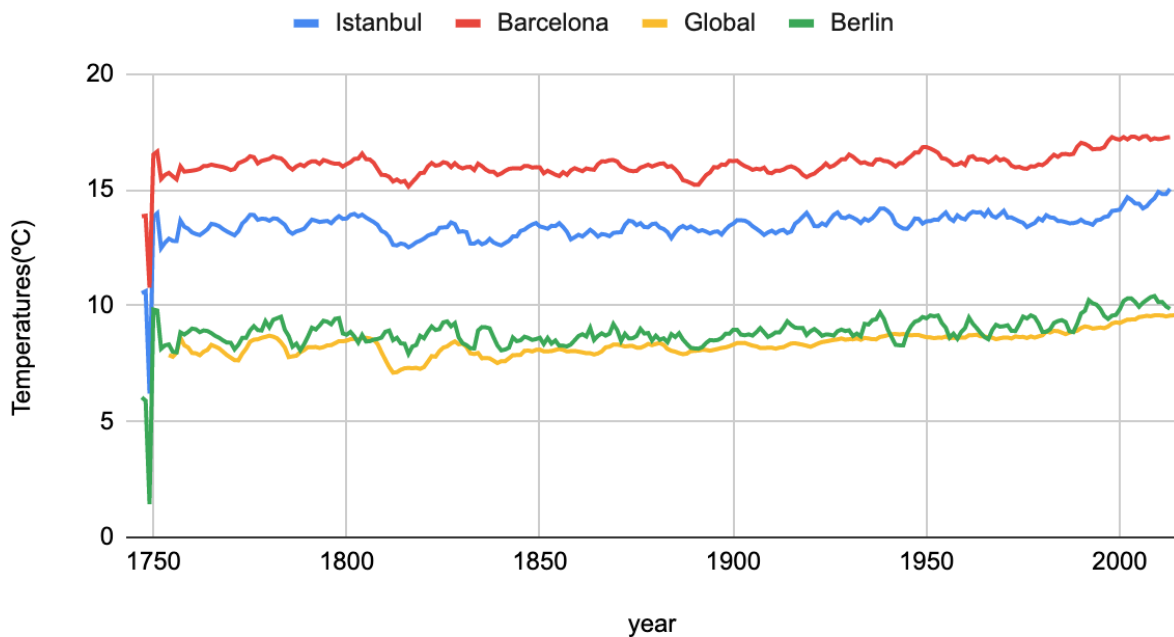
1. Istanbul and Barcelona have higher temperature than Berlin and global. In addition, it is observed that Barcelona is the hottest city in this graph.

2. In recent years, it has been observed that average temperatures have increased in Barcelona and Istanbul, such as Berlin and global temperatures.

3. It is observed Barcelona temperature and Istanbul temperature are follow the similar trend with global temperatures.

4. Istanbul temperature and Barcelona temperature are always higher than global temperature.