Project: Explore Weather Trends

This project analyzes local and global temperature data, using the SQL and Excel as an essential tool.
The exploration of the weather trends will be displayed in the line chart, from which the 10-year moving averages show smoothly the trend and the fluctuations of temperature from 1841 to 2013.

1. Extract the local and global data (SQL)

First, I looked through the `city_list` to check whether the city where I live is included in the database:

```
SELECT *
FROM city_list
WHERE city LIKE 'H%';
```

I found my city "Hangzhou" in the third row of the result table.

Then, I extracted the data (year and avg_temp) of Hangzhou and the corresponding global data by running a SQL query as below:

```
SELECT c.year, c.avg_temp AS hangzhou_temp, g.avg_temp AS global_temp
FROM city_data c
JOIN global_data g
ON c.year = g.year
WHERE c.city = 'Hangzhou';
```

I exported the result table to CSV and opened it up in Excel.

2. Analyze the data and Visualize the Trends (Excel)

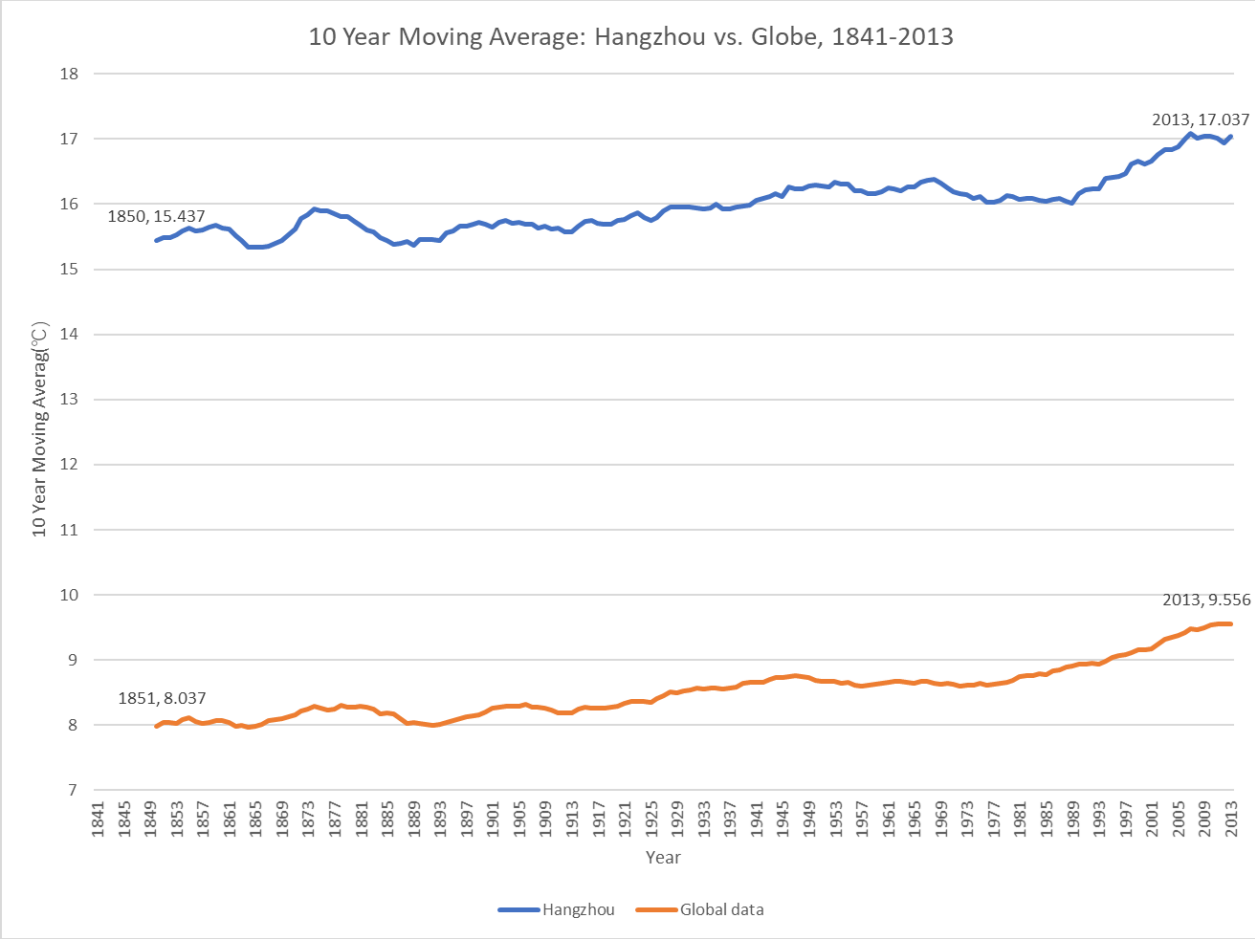
2.1 Moving averages

I created another two columns called `Hangzhou_MA_10yrs` *(column D)* and `Global_MA_10yrs` *(column E)*.

Using "10 years" as an interval to calculate moving averages, I entered `AVERAGE(B2:B11)` in `D11`.
I copied and pasted the same function in `D11:E174` *(end of the dataset)*.

2.2 Line chart

I selected all the data in columns A(*year*), D(*Hangzhou_MA_10yrs), and E()*Global_MA_10yrs*) and made a line chart as below:



3.Observations

- As shows the line chart, Hangzhou is hotter on average than the global average. The difference between global and Hangzhou's temperature maintains generally 7.45°C from 1841 to 2013.
- Compared to changes in the global average, the changes in Hangzhou show greater fluctuations.
- Obviously, the world is getting hotter. In general, the temperature of Hangzhou follows the increasing trend of global temperature. This trend has been consistent since 1840.
- Additionally, Both the global data and the local data shows the average temperature has increased faster over the past 20 years: the world spent around 70 years to realize 1°C growth while it cost only 20 years to realize 0.5°C growth; same as Hangzhou.