Exploring Weather Trends – Project No.1

- **Extracting the data:**

1. To extract the data from SQL to export it to CSV for the city level data,

I have been used the following SQL query

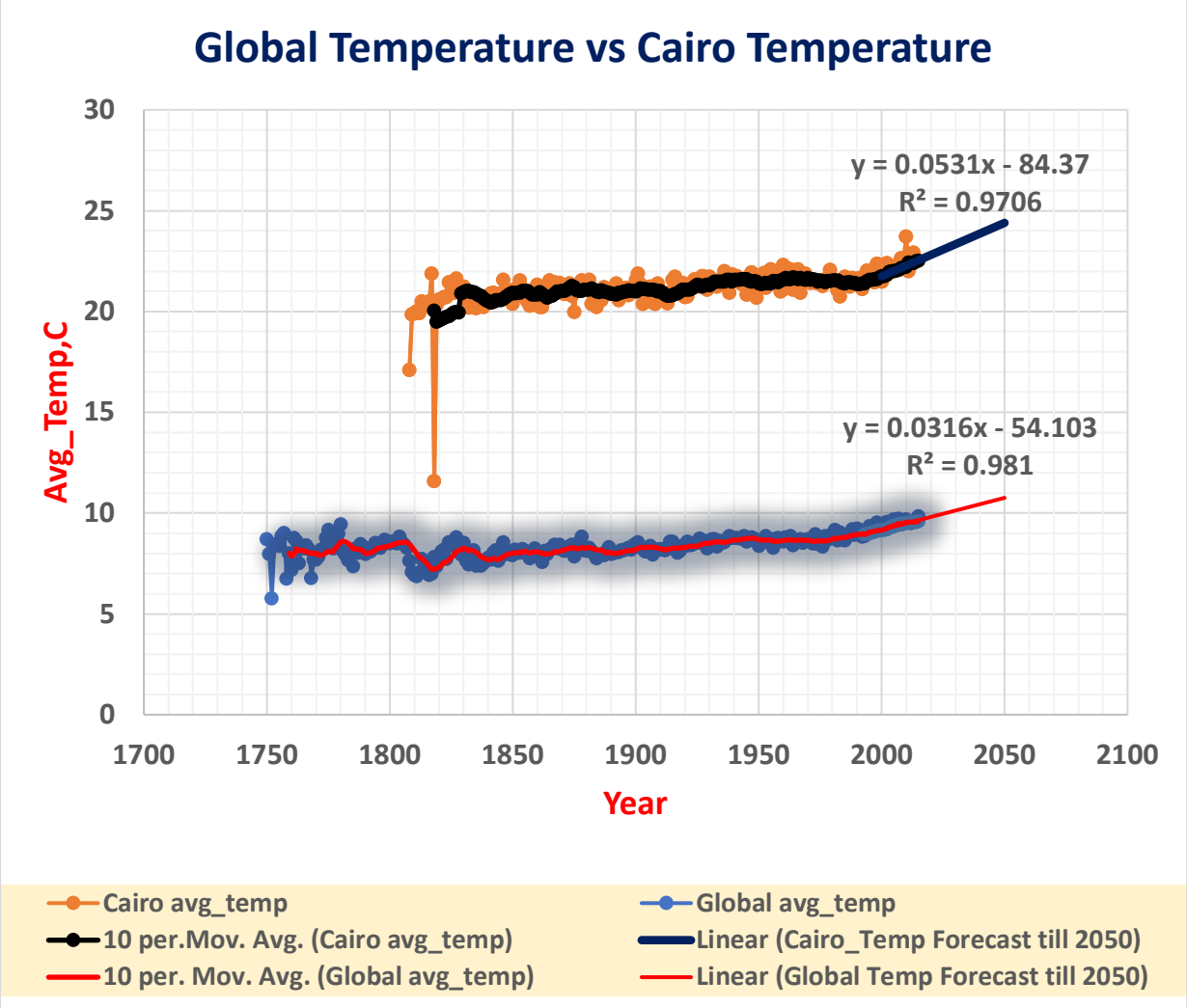
```
SELECT *
FROM city_data
WHERE city LIKE'%Cairo%' AND country LIKE'%Egypt%'
```

2. To extract the data from SQL to export it to CSV for the global data,

I have been used the following SQL query

```
SELECT *
FROM global_data
```

- **The tools that have been used for analysis & visualization is MS Excel**
- **Calculate the moving average based on 10 years average for temperature records.**



Statistics

Method	Global avg_temp	Cairo avg_temp	Global MA_temp	Cairo MA_temp
Min Temp	5.78	11.6	7.24	19.50
Max Temp	9.83	23.72	9.60	22.53
Average Temp	8.37	21.17	8.35	21.18

Global Temperature at 2050: this calculation based on this observation starting from 1993, the global temperature start increasing linearly and based on adding the trendline and fitting the line and use the equation to estimate the temperature at 2050, the estimated temperature value at this year will be 10.677 C, also the changing in the global temperature become very high and increase very quickly

Cairo Temperature at 2050 : this calculation based on this observation starting from 2000, the Cairo temperature start increasing linearly and based on adding the trendline and fitting the line and use the equation to estimate the temperature at 2050 , the estimated temperature value at this year will be 24.485 C , this change is huge change specially when the increasing the temperature in only 35 years is equal to the changes in the temperature in the whole period of the study.

Observation

1- **Is your city hotter or cooler on average compared to the global average? Has the difference been consistent over time?**

Answer:

My city is hotter compared to the global temperature in whole time period, the difference between my city and global temperature over time almost constant around 12.77 based on the average difference between moving average for Cairo and Global temperature

2- **How do the changes in your city's temperatures over time compare to the changes in the global average?**

Answer:

- **Differences**

1. Global temperature has records for the whole period while there is difference between Cairo & Global in the reading records in first (first 57 years) and last period (the last 2 years) are missing in Cairo.

2. Through the period (1810 to 1830) the trend does not the same in Cairo and Global, if the temperature increase in Cairo it will decrease in Global and vice versa, also there is outlier reading (year 1818) in Cairo outside the trend.
3. The reading in the last period in Cairo is fluctuated to much compared to Global records reading but they have the same trend both of them increasing with time lineally and very fast.
4. In Global temperature we have major four cycle with temperature fluctuation in early readings through the period (1750-1835) and after that the temperature records become stable trend and gently increase continuously with time till 1985 after that the temperature increase rapidly.

- **Similarity**

1. It is clearly noticing the fluctuation and the data not accurate in the first period for temperature records in Cairo & Global.
2. Generally , the temperature profile in both trend almost the same , increasing with time but we have 57 years of temperature values are missing in Cairo temperature records, we don't know the temperature values at this period of time , also we have values outlier , causing change in the trend on the Moving Average calculation around 21 years in Cairo temperate records , also we have outlier in global temperature in early readings but not has big impact on the moving average like what happened on Cairo Moving Average trend.
3. Averaging Moving Average is quite close to the total average of all temperature records as explained in Statistics part and Excel sheet for Cairo & Global, which we can depend on these readings and this Moving Average in the future to predict the temperature.
4. In the last period for Cairo & Global the temperature will increate rapidly but the increase in Cairo will be almost double the increase for Global based on the difference in reading on 2050 and the Moving Average value for the last reading of the temperature records for Cairo and Global.

3- What does the overall trend look like? Is the world getting hotter or cooler? Has the trend consistent over the last few hundred years

Answer:

The overall trend shows the temperature increase with time for both temperature readings for Cairo and Global , observation on late time in Cairo temperature (starting from 2000 to 2015) and in Global temperature (Starting from 1993 to 2015) , the temperature increase dramatically and linearly based on that, I create a trendline to fit this period and use linear equation to estimate the temperature in the future for Cairo and Globally as explain above in statistics part and Global Temperature at 2050 & Cairo Temperature at 2050.