Exploring Weather Trends Project

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The steps I've taken to make "Exploring Weather Trends" project:

SQL Query:

1. I've exported the three tables using SQL to have a thorough look into them. The SQL queries used were:

```
/*To extract city data*/
SELECT *
FROM city_data;

/*To extract city list*/
SELECT *
FROM city_list

/*To extract global data*/
SELECT *
FROM global_data
```

2. Then I wrote a query to extract the required data to be analyzed. The main columns I focused on were: year, city, country and avg_temp from city_data table, and avg_temp from global_data table.
   The query is as follow:

```
SELECT cd.year, cd.city, cd.country, cd.avg_temp AS City_Avg_Temp, gd.avg_temp AS Global_Avg_Temp
FROM city_data AS cd
JOIN global_data AS gd
ON cd.year = gd.year AND cd.city = 'Cairo';
```

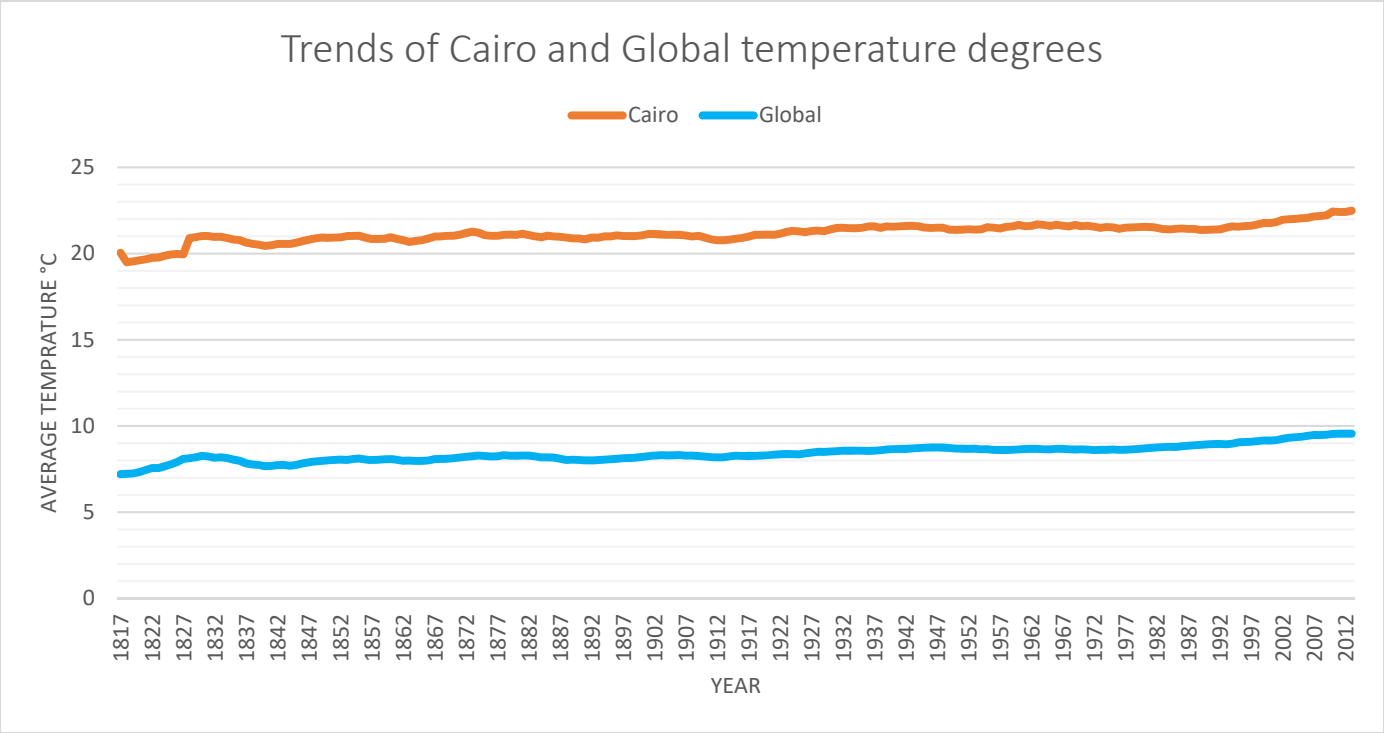
3. Then I exported the resulted table as a CSV file to deal with.

Data manipulation:

1. I've used **Excel** software to manipulate the data in the CSV file resulted from the previous steps.
2. I've added two additional columns to the table to calculate the 10-year moving averages of Cairo temperatures and Global ones respectively within them.
3. The moving averages were calculated for a 10-year interval. I wrote the following function in the 10^{th} cell from above, AVERAGE(1^{st} cell coordinates:10^{th} cell coordinates) then I dragged and applied the function to the rest of the cells vertically.

Data visualization:

1. I've used the line chart to visualize the data in Excel.
2. I chose the line chart to make a clear interpretation for the temperature degrees change over the time. The key columns under study were: Year, City 10- year moving temperature averages and the Global ones.
3. The resulted chart was the next:



The interpretation:

1. The line chart above shows the 10-year moving average Temperature values of Cairo (orange line) and World (blue line) over the years.
2. The chart shows that the Average temperature degrees of Cairo are **higher (hotter)** than the global average ones **consistently** along the years.
3. It also shows that the Temperature degrees of Cairo showed a **high fluctuation** in the older times (from 1817 to 1838 in particular), however the fluctuation was less in the rest of the time under study.
4. On the other hand, the global Temperature degree averages **didn't show much fluctuations** in value.
5. The overall trend gets **higher** over a time-span of 200 hundred years, which means that the world is getting **hotter**.
6. Noticeably, the increase in Temperature degree shows a **consistent trend** although the increasing wasn't that large.
7. It is interesting to find out that the **correlation coefficient** between Cairo averages and Global ones is **0.93** which shows a **strong positive correlation** between them.

The End