Explore Weather Trends

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Overview

Analyzing the global temperature over the past centuries and relating that to how Cairo was affected over the year using SQL and Excel Sheets.

Steps:

1- Data Extraction using SQL:

Data was extracted by the following SQL queries and exported to 4 CSV files:

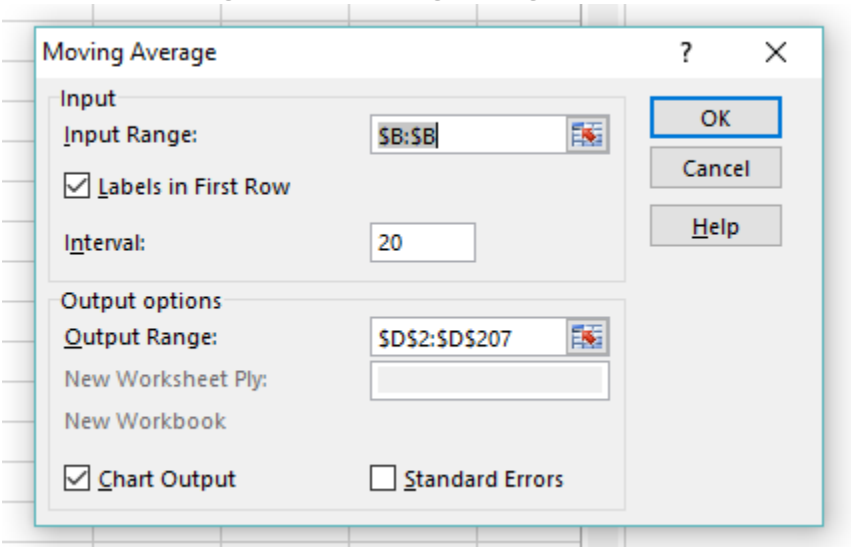
```
select * from global_data;
select * from city_data where city = 'Cairo'; -- Extracting Cairo's data separately.
select * from city_list;
select * from city_data;
```

2- Run basic queries for data inspection using SQL:

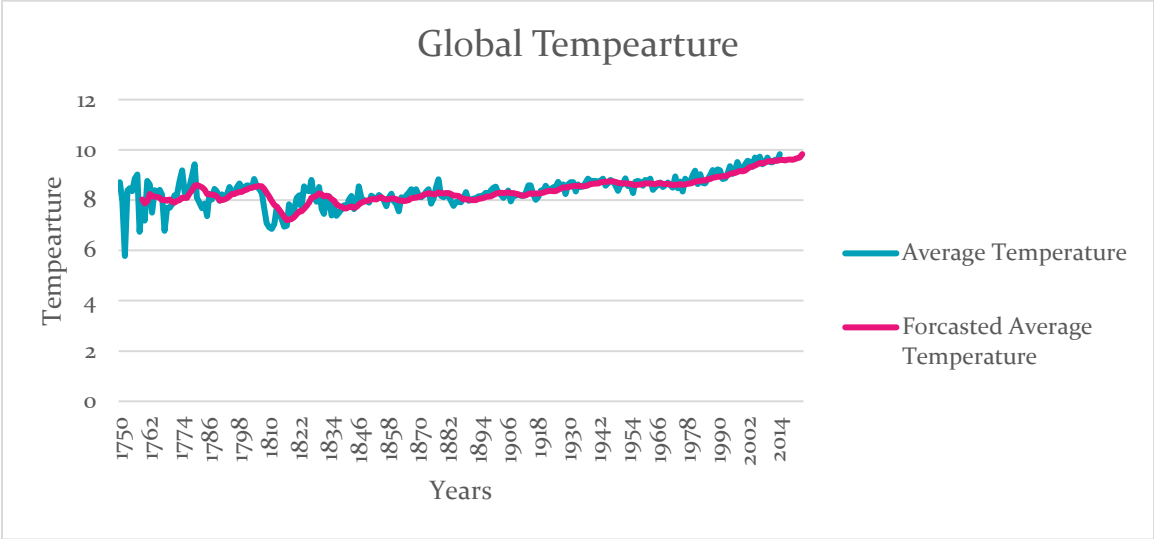
```
select count (*) from city_list; --345
select count (city) from city_list; --345
select avg(avg_temp) from city_data where city ='Cairo';--21.1696116504854369
select avg(avg_temp) from global_data; --8.3694736842105263
select max (year) from global_data; --2015
select min(year)from global_data; --1750
select max (year) from city_data; --2013
select min(year) from city_data; --1743
```

3- Appling the moving average to the global temperature data to view the trends and I noticed the gradual increases in the temperature which might be due the global warming effect.

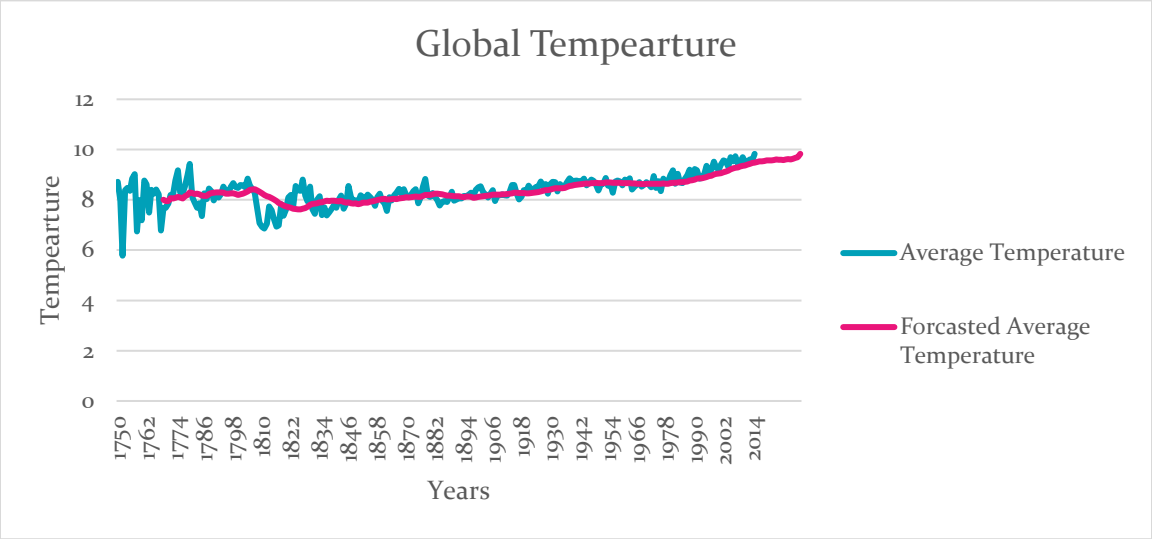
4- Moving Averages are calculated using Microsoft Excel 2013 Data Analysis tool and the function being used is “Moving Average” as shown below:



5- Moving averages were applied over the years 1750-2015 with a 10 year interval as shown in the chart below

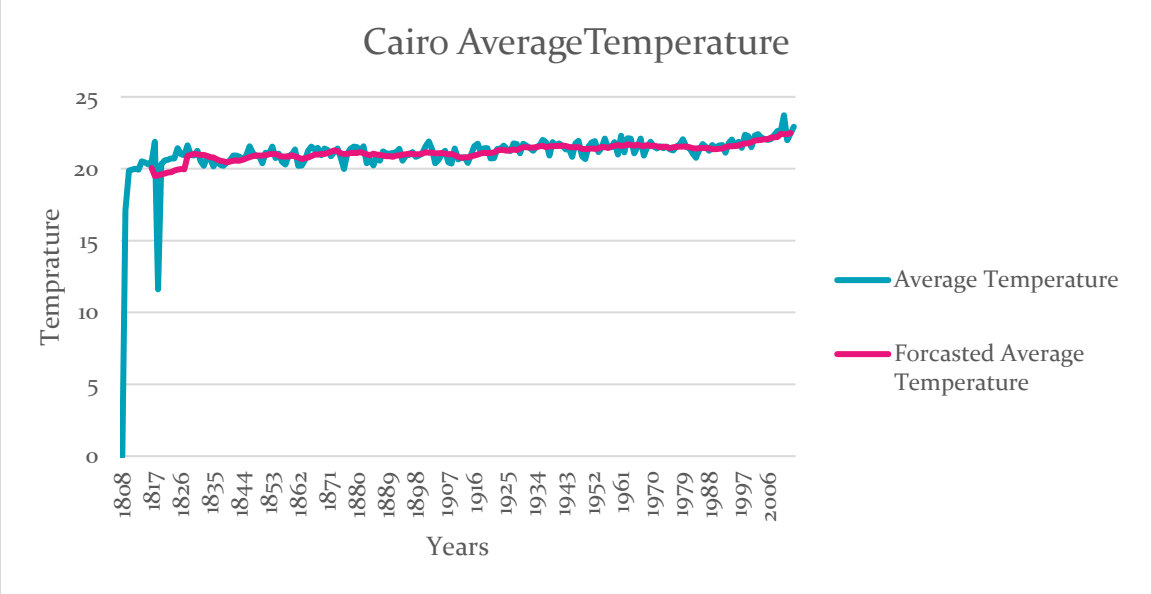


6- Increasing the interval to a 20 year interval



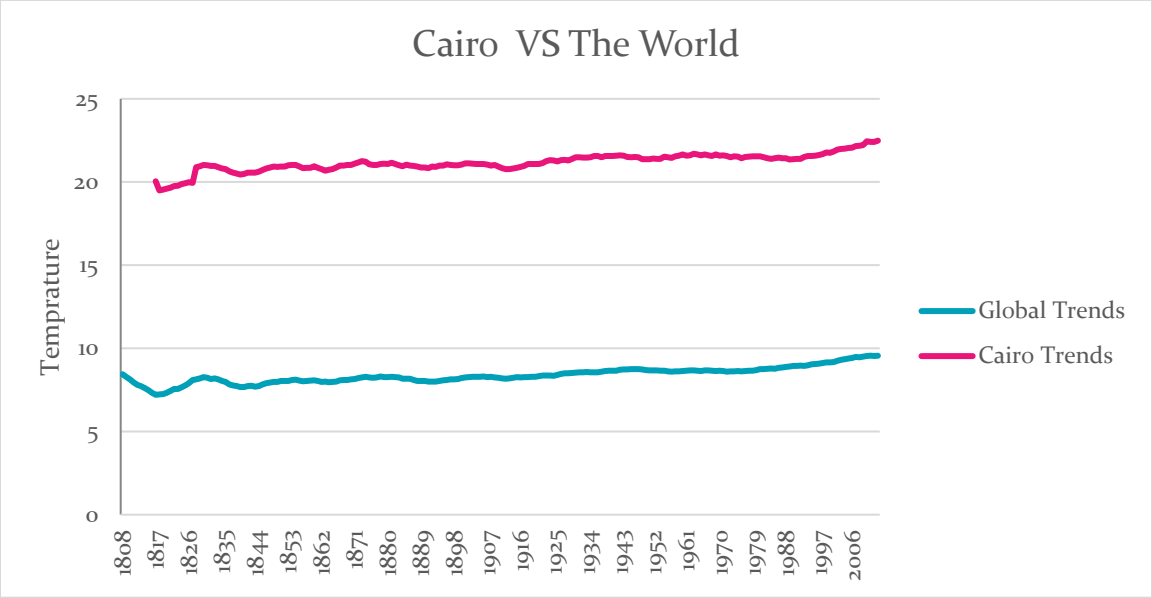
7- Increasing the interval used while calculating the moving average makes the line chart looks smoother and the trend looks more obvious regardless of the fluctuations.

8- Analyzing Cairo's Temperature over the years:



9- Cairo against the global temperature trends:

And by merging both analysis from the trends perspectives, we will find that the average temperature in Cairo always exceeds the global temperature by a steady amount almost equals 10 degrees on a yearly basis.



Observations:

1- In regards to the analysis performed on the data gathered over the past 3 centuries, there might be some errors specially in the earlier years due to diminution of technology and the ability to record data without losses over the years, therefore the data gathered over the later years is a way accurate.

2- The increase of carbon dioxide levels in the atmosphere is obvious due to the gradual increase of temperature as an effect of the global warming.

3- In regards to temperature ranges in Cairo, it has been always higher than the average global temperature by 10 degrees in average and the gradual increase is obvious as well.

4- In regards to the moving average calculation, I first chose a 10 year interval, the trend was kind of obvious but the fluctuations on the line chart specially on the earlier years made it a bit hard to decide the regular increase in the temperature but by increasing the interval the fluctuations decreased and I observed a semi straight line with a positive slope of 0.75% increase in temperature on an annual basis