

PROJECT 1 – EXPLORING WEATHER TRENDS

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BACKGROUND / OBJECTIVE:

My objective for this project is to demonstrate my use of SQL in extracting data, ability to calculate moving average and to use Excel in visualizing my data.

I will be comparing data between my local city (Lagos, Nigeria; Tucson, United States; Toronto, Canada; and the global average) within the period 1873 and 2013.

I chose this period because that is the period common to the three cities without null data. I decided to compare my city (Lagos) with Toronto because of its cold weather which very low compared to my city and also selected Tucson because it is one of the hottest cities in United States.

The data will be compared using a 5years moving average so as to see the variations as much as possible while avoiding the use of individual average.

SCRIPT USED IN EXTRACTING THE DATA:

The data was extracted using the SQL query below:

```
select g.year, g.avg_temp global_temp,
(select c.avg_temp from city_data c where c.year = g.year and c.country = 'Nigeria' and c.city =
'Lagos'
and c.avg_temp is not null) local_temp,
(select c.avg_temp from city_data c where c.year = g.year and c.country = 'United States' and
c.city = 'Tucson' and c.avg_temp is not null) Tucson_temp,
(select c.avg_temp from city_data c where c.year = g.year and c.country = 'Canada' and
c.city = 'Toronto' and c.avg_temp is not null) Toronto_temp
from global_data g
where g.avg_temp is not null
and g.year between '1873' and '2013';
```

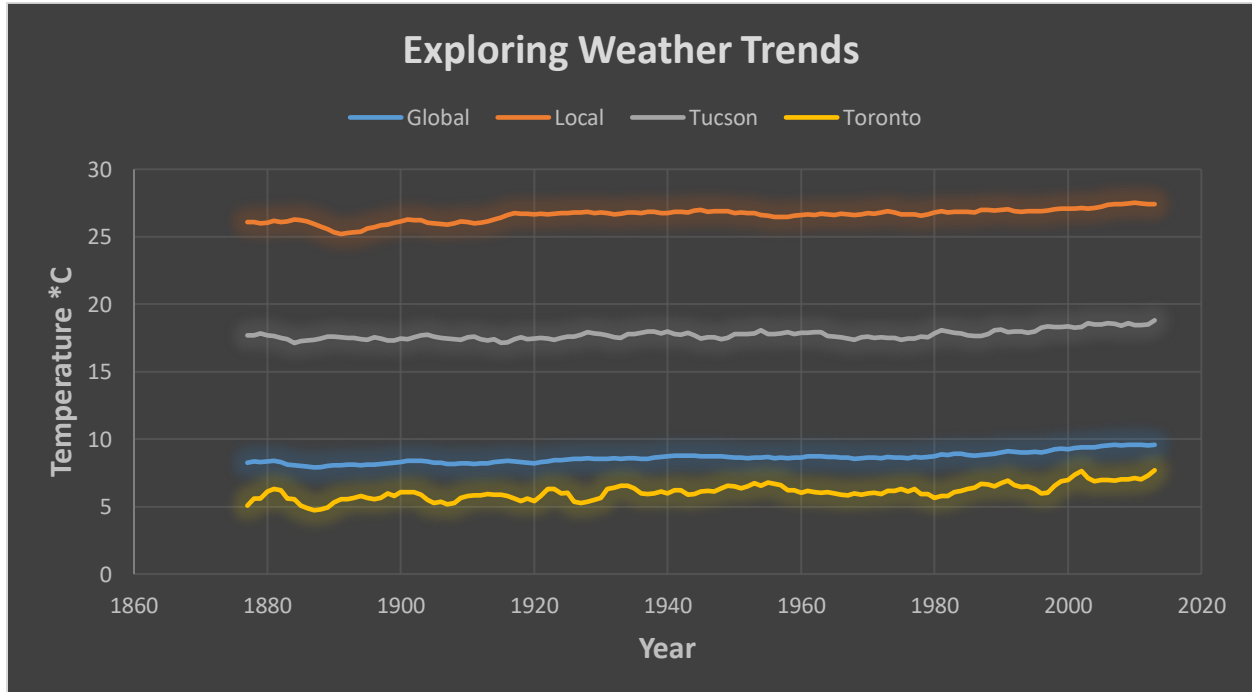
MOVING AVERAGE:

5 years moving average was used for all three cities and the global temperature. This was chosen so as to see the variations as much as possible while avoiding the use of individual average. The calculation was done using Microsoft excel. For each city, on the 5th row, I calculated the average of the first 5 data using the average function in excel, then replicated the formula across other rows to the last. Same was done for the global data.

VISUALIZATION:

I used Line Chart on Microsoft Excel for this. I highlighted all the 4 columns required for the chart (Year, Global, Local, Tucson and Toronto), then clicked on “insert” and selected the line graph.

Thereafter, I used “Chart Elements” tool to add Chart Title and Axis Labels. Font tools were used to format the title and the labels.



OBSERVATIONS:

1. My Local City's average temperature is higher than the global average and also higher than the two cities included (Tucson and Toronto).
2. The data is uniformly distributed.
3. The correlation coefficient between my local city's temperature and the global data is 0.8 which implies that for every increment in the local temperature, there will be an increment in the global data.
4. The Global average gets slightly higher as the year increases. From about 8°C around 1880 to about 10°C around 2013. This can also be noticed from the three cities' data, they are also increasing slightly as the year increases.
5. The difference between Local temperature average and Global temperature average is about 18°C, this can be used to estimate the local temperature average from the global data.
6. Toronto's temperature is below the global average.
7. There was a temperature drop around 1890 both in my local city (Lagos) and Toronto, Canada.
8. While the variation remains between 5°C and about 7.5°C, Toronto's weather is quite unstable compared to the other cities on the graph.