

Project: Exploring Weather Trends

By Oyinloye Oluwasola Abdullahi

Date: 01/04/2022

Q1. What tools did you use for each step? (SQL, Excel, Python etc)

These steps were use to extract dataset from the database using SQL queries.

Step 1: I used two SQL queries to extract my data.

- For Global Data;

```
SELECT *  
FROM global_data
```
- For Local data (For Lagos);

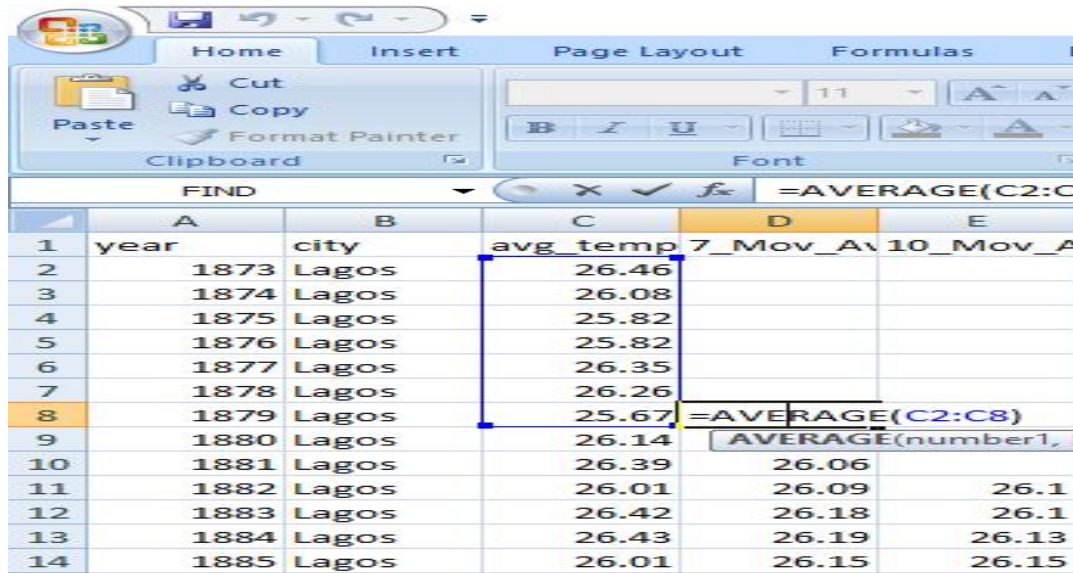
```
SELECT year, city, avg_temp  
FROM city_data  
WHERE city = 'lagos'
```

Step 2: I downloaded the data as CSV file using the “[Download CSV](#)” button and converted it to XSLX file via MS Excel.

Input		HISTORY ▾	MENU ▾
SCHEMA	↻	<pre>1 SELECT year,city,avg_temp 2 FROM city_data 3 WHERE city = 'Indore'</pre>	
city_data	▾		
city_list	▾		
global_data	▾		
		Success!	EVALUATE
Output		218 results Download CSV	
year	city	avg_temp	
1796	Indore	24.71	
1797	Indore	25.92	
1798	Indore	23.95	
1799	Indore	24.99	

Q2. How did you calculate the moving average?

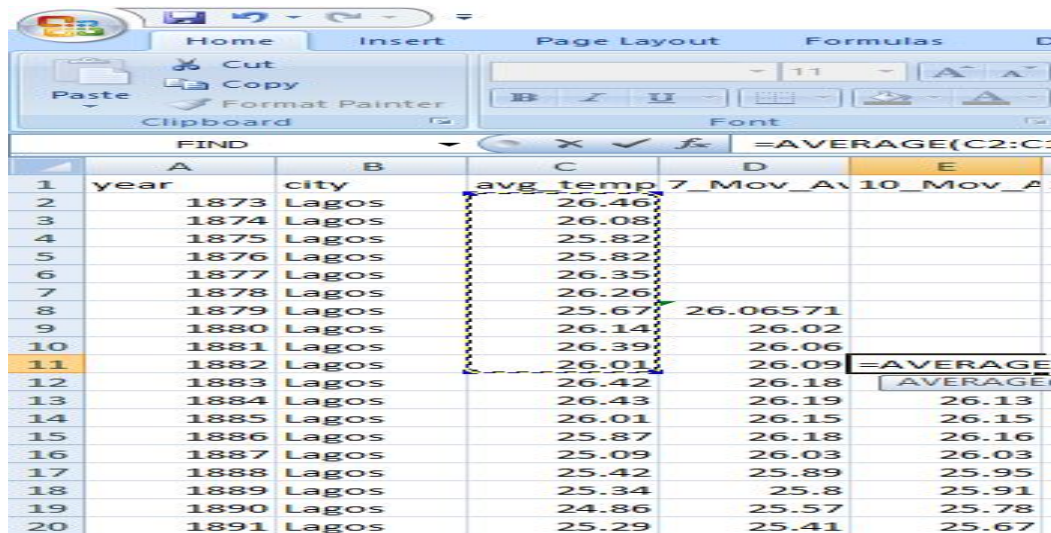
To calculate the moving average in MS Excel, I tried 7, 10, 20 year moving average to see which average is better to smooth out data. (as shown below)



The screenshot shows an Excel spreadsheet with the following data and formula:

	A	B	C	D	E
1	year	city	avg temp	7_Mov_Av	10_Mov_Av
2	1873	Lagos	26.46		
3	1874	Lagos	26.08		
4	1875	Lagos	25.82		
5	1876	Lagos	25.82		
6	1877	Lagos	26.35		
7	1878	Lagos	26.26		
8	1879	Lagos	25.67	=AVERAGE(C2:C8)	
9	1880	Lagos	26.14	AVERAGE(number1,)	
10	1881	Lagos	26.39	26.06	
11	1882	Lagos	26.01	26.09	26.1
12	1883	Lagos	26.42	26.18	26.1
13	1884	Lagos	26.43	26.19	26.13
14	1885	Lagos	26.01	26.15	26.15

Fig: Local Average of 7 year.



The screenshot shows an Excel spreadsheet with the following data and formula:

	A	B	C	D	E
1	year	city	avg temp	7_Mov_Av	10_Mov_Av
2	1873	Lagos	26.46		
3	1874	Lagos	26.08		
4	1875	Lagos	25.82		
5	1876	Lagos	25.82		
6	1877	Lagos	26.35		
7	1878	Lagos	26.26		
8	1879	Lagos	25.67	26.06571	
9	1880	Lagos	26.14	26.02	
10	1881	Lagos	26.39	26.06	
11	1882	Lagos	26.01	26.09	=AVERAGE
12	1883	Lagos	26.42	26.18	AVERAGE
13	1884	Lagos	26.43	26.19	26.13
14	1885	Lagos	26.01	26.15	26.15
15	1886	Lagos	25.87	26.18	26.16
16	1887	Lagos	25.09	26.03	26.03
17	1888	Lagos	25.42	25.89	25.95
18	1889	Lagos	25.34	25.8	25.91
19	1890	Lagos	24.86	25.57	25.78
20	1891	Lagos	25.29	25.41	25.67

Fig: Local Average of 10 year.

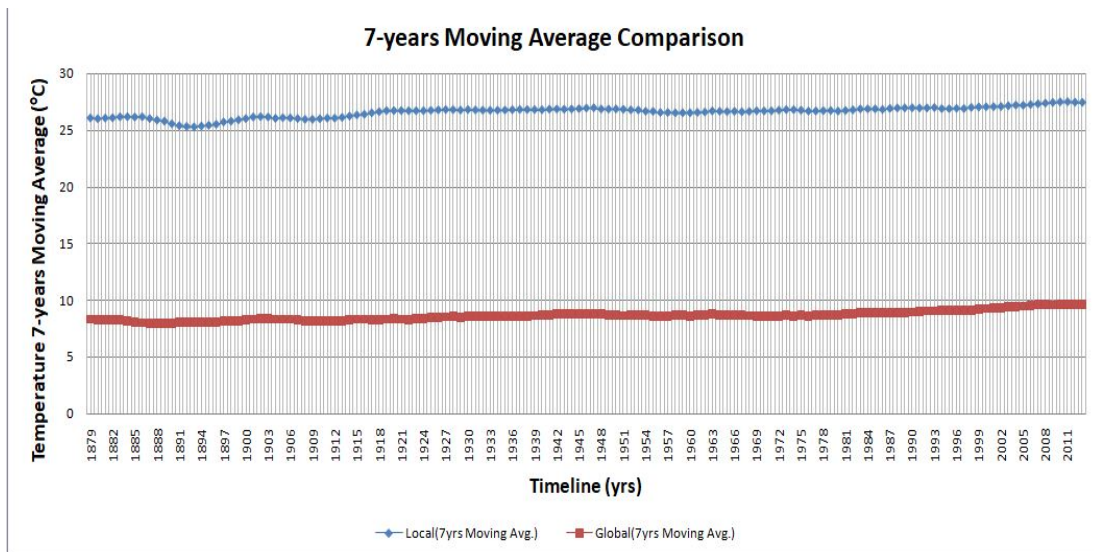
year	city	avg temp	7 Mov_Avg	10 Mov_Avg	20 Mov_Avg
1873	Lagos	26.46			
1874	Lagos	26.08			
1875	Lagos	25.83			
1876	Lagos	25.8			
1877	Lagos	26.35			
1878	Lagos	26.26			
1879	Lagos	25.6	26.06571		
1880	Lagos	26.14	26.02		
1881	Lagos	26.35	26.06		
1882	Lagos	26.01	26.09	26.1	
1883	Lagos	26.4	26.18	26.1	
1884	Lagos	26.4	26.19	26.13	
1885	Lagos	26.01	26.15	26.15	
1886	Lagos	25.8	26.18	26.16	
1887	Lagos	25.05	26.03	26.03	
1888	Lagos	25.43	25.89	25.95	
1889	Lagos	25.34	25.8	25.91	
1890	Lagos	24.86	25.57	25.78	
1891	Lagos	25.29	25.41	25.67	
1892	Lagos	25.45	25.34		
1893	Lagos	25.67	25.31		
1894	Lagos	25.59	25.38	25.46	
1895	Lagos	25.92	25.45	25.45	25.8
1896	Lagos	25.87	25.53	25.45	25.8

Fig: Local Average of 20 year.

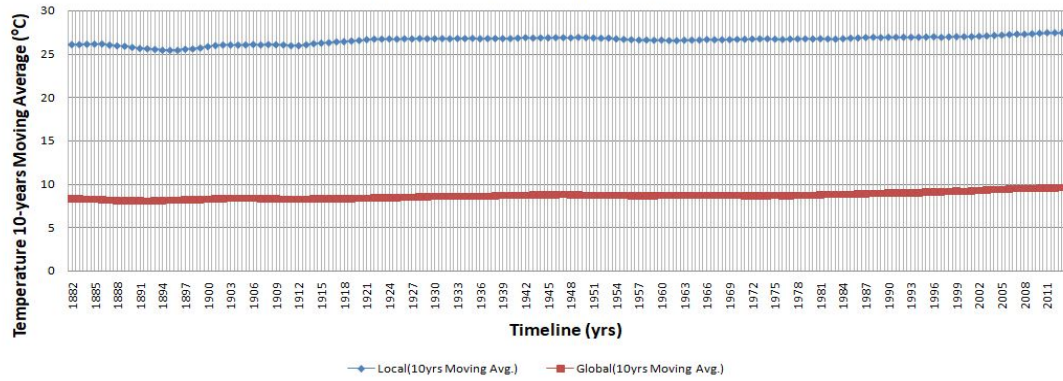
Q3. What were your key considerations when deciding how to visualize the trends?

The key consideration was to determine the timeframe for data visualization. Looking at the local temperature data for Lagos, the data covers the period between 1873 to 2013, where in the global temperature data covers the period between 1750 to 2015. Therefore, the analysis was performed for the range between 1873 to 2013.

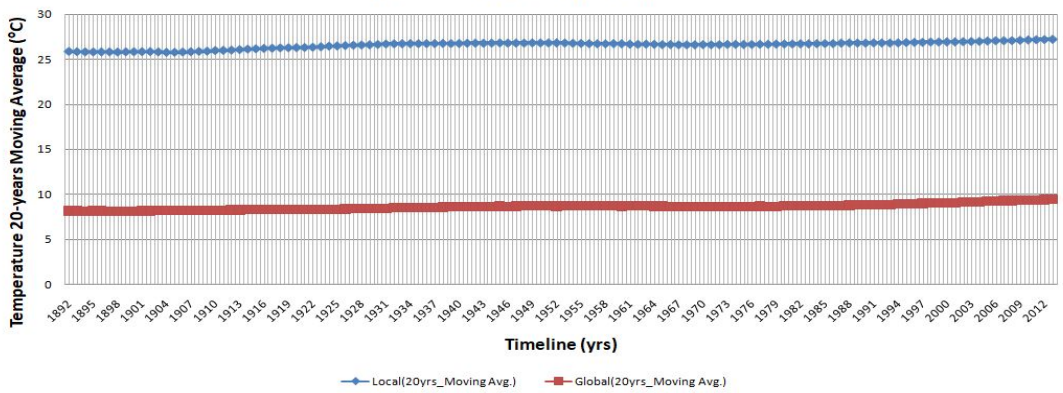
To make sure local and global temperature data is mapped correctly, we have to use VLOOKUP to retrieve the global temperature data worksheet into the local data worksheet.



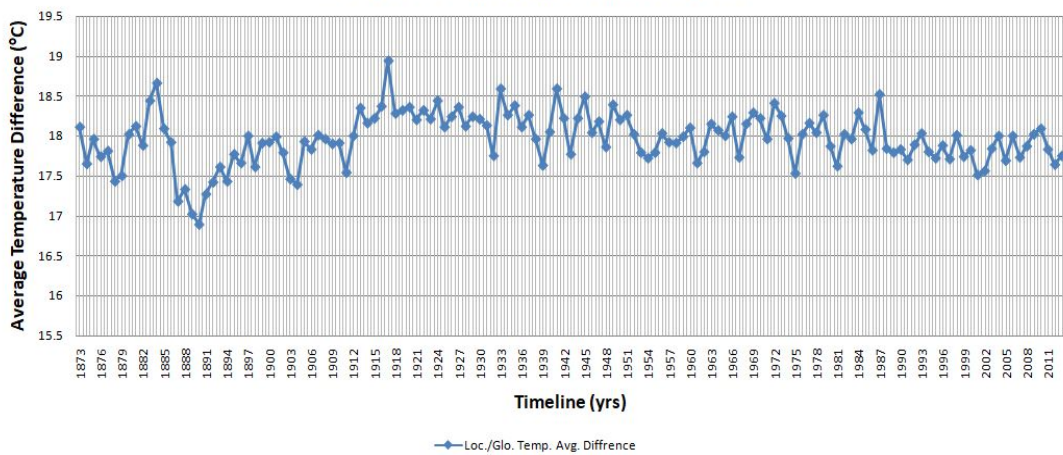
10-years Moving Average Comparison



20-years Moving Average Comparison



Global and Lagos Avg. Temp. Difference



Observations:

According to the line charts the following observations may be deduced;

1. Lagos city average temperature for 7, 10, 20 years Moving Average varies between 25.8 °C to 27.48 °C, 25.45 °C to 27.3 °C, 25.75 °C to 27.25 °C respectively.
2. Global average temperature for 7, 10, 20 years Moving Average varies between 7.96 °C to 9.57 °C, 8.00 °C to 9.56 °C, 8.09 °C to 9.44 °C respectively.
3. Both global and local graphs shows increase in average temperature with time.
4. The highest difference between the local and global temperature is 18.94°C and the lowest difference between the local and global temperature is 16.89°C.

Conclusion:

These are evidence which suggests that the global temperature is raising over the years which support the case of climate change.