PROJECT DOCUMENTATION

Extraction of Data:
The query **SELECT * FROM global_data** was used to extract the global data consisting of the year and average temp.

The city list was queried using **SELECT * FROM city_list** to enable me know which cities to select in my project analysis. It consists of cities and countries.

The city data was queried using **SELECT * FROM city_data**
WHERE city = 'Ibadan'
SELECT * FROM city_data
WHERE city = 'Abuja'
SELECT * FROM city_data
WHERE city = 'Lagos'
SELECT * FROM city_data
WHERE city = 'London' AND country = 'United Kingdom' respectively to extract the data for Analysis.

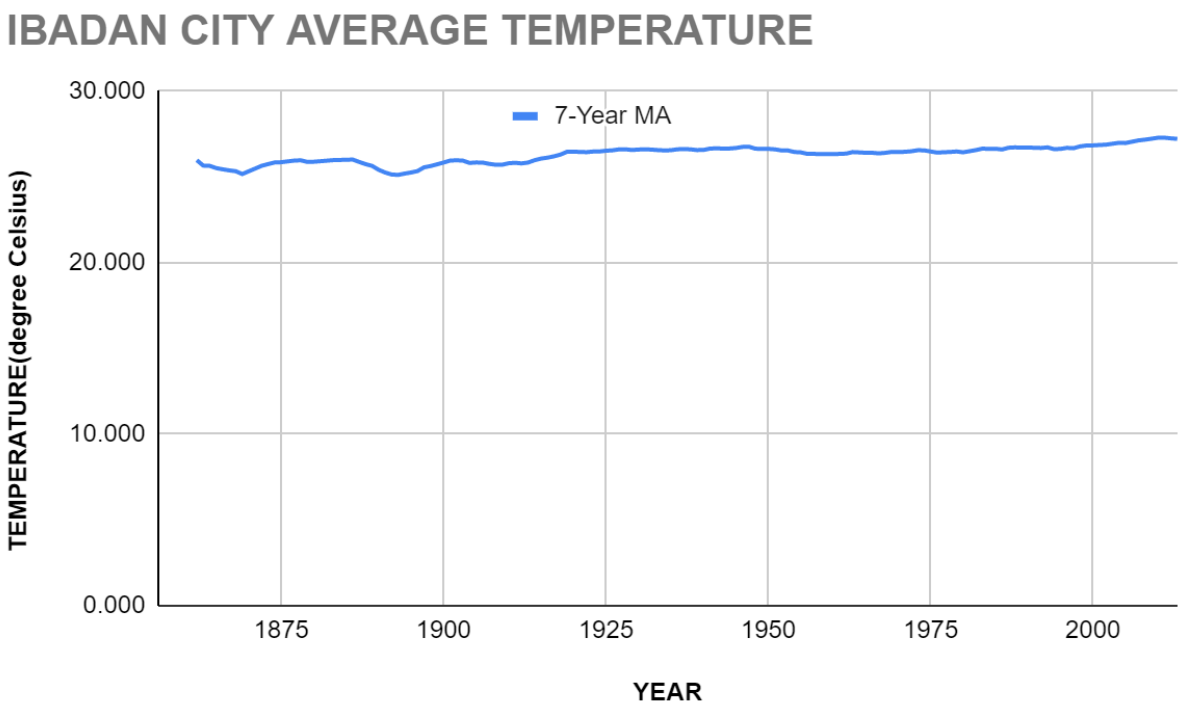
Tool Used for Analysis
The tool I used for the analysis and Visualization of the city's temperature as well as the global temperature was Google Sheets.

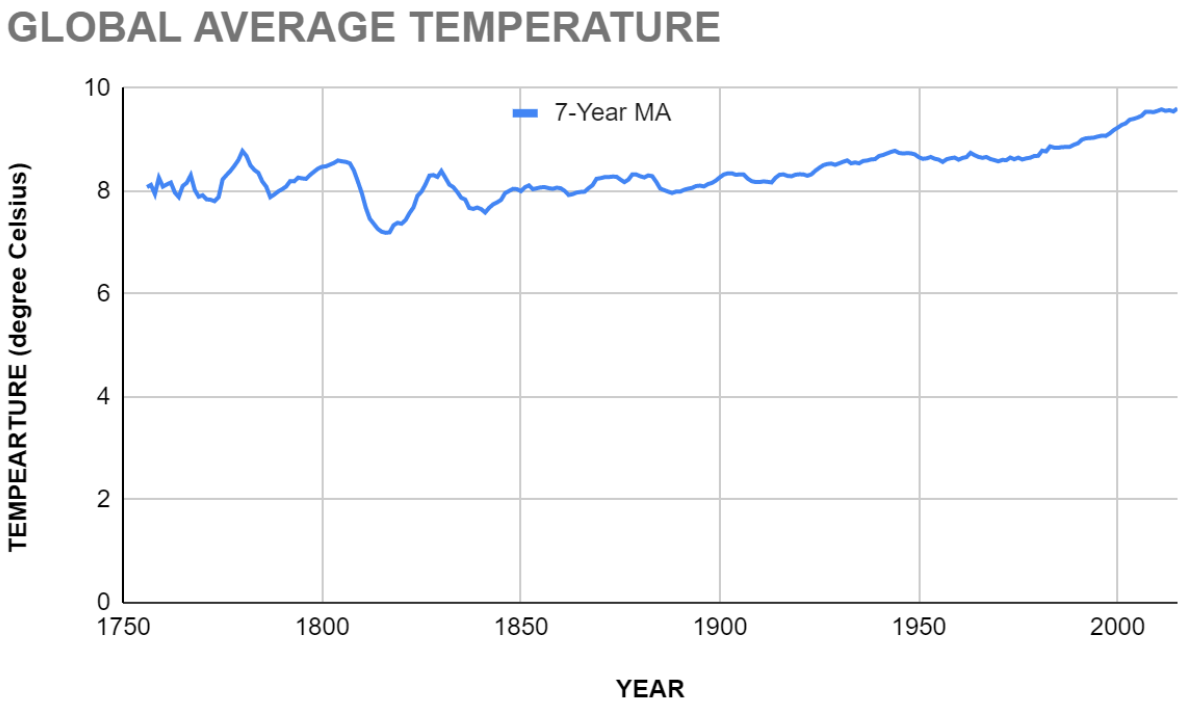
Moving Average Calculation
In the course of the analysis. I realized some average temperatures don't have values for some specific years in the ibadan city temperature data which were 10 cells in total. Initially, I replaced the empty cell with zero values after which I calculated the year average temperature into a cell in a new column. Afterwards, I inputted the calculated average temperature into the first cell replacing the previous zero value with it. After inputting the value in the first cell, the calculated average temperature changed into a new value and then I inputted the new value into the second cell and the process was repeated until the last cell which was the tenth cell replacing all the initial zero values with the new calculated average temperature values.
The average temperature was calculated as **=AVERAGE(D2:D159)**. The empty cell values replaced with calculated average values are highlighted in cell color pink.
Furthermore, the *moving average* was calculated on a 7th year basis as **=AVERAGE(D2:D8)**, this was calculated on the 8th cell. The result was then used to fill other cells below till the last cell with values.

Key Considerations

My key considerations when deciding how to visualize the trends were ensuring I calculated the moving average which are used to smooth out data to make it easier to observe long term trends and not get lost in yearly fluctuations as well as reducing the volatility that comes with not using a moving average. I also considered replacing the empty cell with values in order to make my visualizations smooth and accurate.

Line Chart Visualizations





Observations.

1. My city's average temperature over the years was 26.31 while the global average temperature over the years was 8.37 hence, it can be deduced that my city is hotter on average than the global temperature and the difference in these temperatures has been consistent over time.

2. It can be shown that there was a sharp increase in the global temperature for some years within 1750 and 1800 after which it started decreasing again till it fell back to the initial temperature it started with in 1750. The temperature started to rise again in the late 1700 into the early 1800's and decreased again towards the middle 1800. Basically there were fluctuations in the global temperatures up until 1900's when it started to maintain a steady rise in temperature up until 2015.
   However, in the case of the city temperature, the temperature was consistent on a level between 1856 and 1913 upon which there were few fluctuations in between. The temperature became hotter and went into a new level from 1913 and was again consistent with very few fluctuations up until 2003 when it rose again to another level. The temperature rise from 2003 up until 2013 has been consistent.

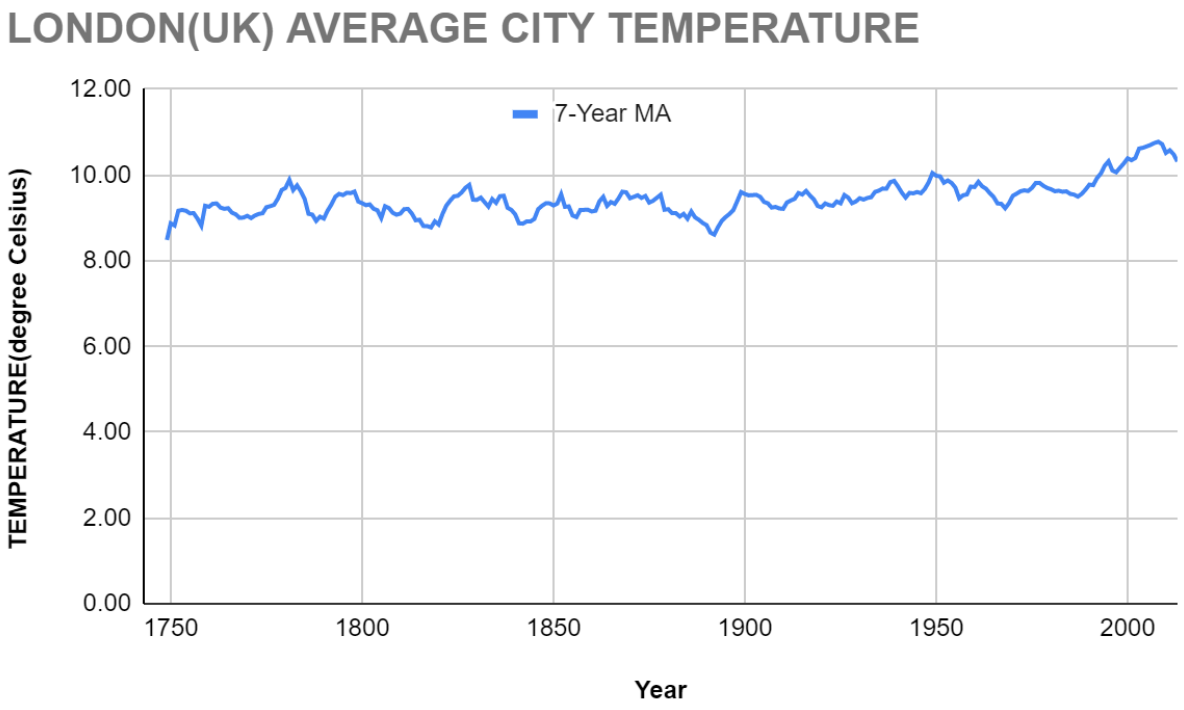
3. Overall, the world is getting hotter and cities all around the world are also getting hotter on a yearly basis and these trends have been consistent over the last hundred years with very few fluctuations in their average temperatures.

4. The global temperature data was collected over a period of 265 years while the ibadan city temperature data was collected for a period of 157 years. The global temperature has maintained a steady rise since the 1900's while the ibadan city has maintained a closely straight line pattern (consistent) since the 1900's.

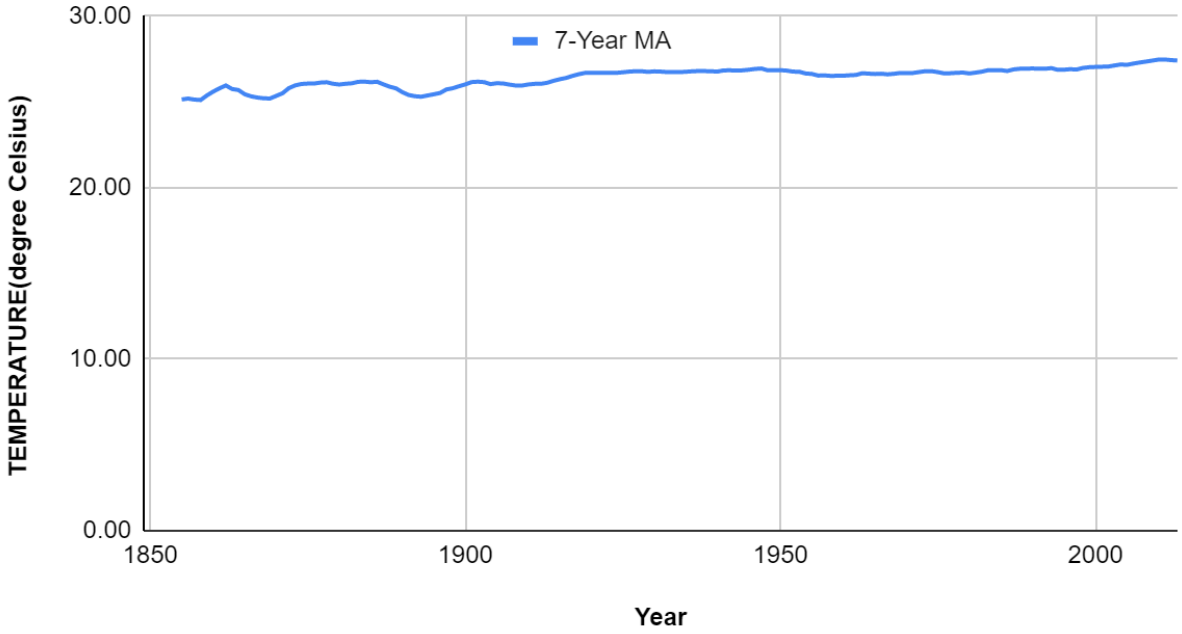
Note: The calculations of the global data temperature and city data temperature were made on a single spreadsheet inserted into different sheets.

Conclusively, I plotted visualizations for other cities such as Lagos and Abuja Nigeria as well as London (United Kingdom). It was observed that Lagos and Abuja showed a similar weather pattern trend with Ibadan Nigeria. However, London (United Kingdom) showed a completely different pattern from Nigerian cities and even the global data with high intensity of fluctuations in the weather pattern makes it inconsistent over the years.

Other city Visualizations are shown below.



LAGOS CITY AVERAGE TEMPERATURE



ABUJA CITY AVERAGE TEMPERATURE