PROJECT: EXPLORING WEATHER TRENDS

DATA EXTRACTION

Using the tables contained in the database, the data for the global average temperature and my city which is Lagos, Nigeria was extracted using SQL query.

1. City Data:

- The first SQL query for the city was written to confirm if there was any data for the city-Lagos on the database. This was done with the query:
  SELECT *
  FROM city_list
  WHERE city = 'Lagos';
- After confirming the existence of the city, 'Lagos' in the city-list table, the average temperatures corresponding to different years for Lagos city was extracted from 0the city_data table. This was achieved using the SQL query:
  SELECT year, avg_temp
  FROM city_data
  WHERE city = 'Lagos'
  ORDER BY year;
- The query was run without errors and the data was successfully extracted. Upon closer inspection of the extracted data, there were several years with missing avg_temp values. In order not to allow these values affect the interpretation after visualising with Microsoft Excel, the above SQL query was amended to extract the data without null values. The SQL query is given as:
  SELECT year, avg_temp
  FROM city_data
  WHERE city = 'Lagos' AND avg_temp IS NOT NULL
  ORDER BY year;
  The extracted data showed valid values or avg_temp per year. The data was then downloaded as a CSV file to be analyzed.

2. Global Data:

- The first SQL query for the global data was used to extract the columns in the global_data table which is given as: SELECT *
  FROM global_data
  ORDER BY year;
- The data extracted showed valid values for every year. Upon closer observation it was noticed that the start year of the global_data was earlier than that of the Lagos city_data and the end year of the global_data was also later than that of the city_data for Lagos. It was also observed that the years with missing avg_temp values in the city_data for Lagos had valid avg_temp values in the global_data.
- In order to ensure accurate comparisons, I tried to ensure that both data had similar populations. I achieved this by writing another SQL query to only extract from the

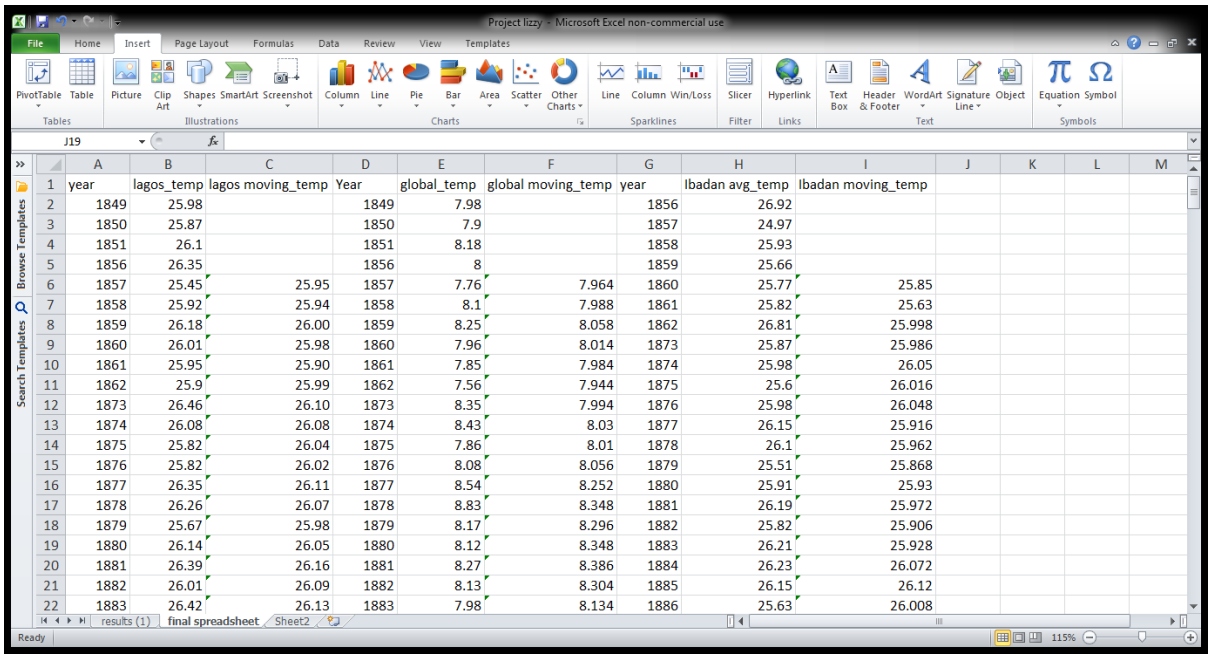
global_data table the valid years with corresponding avg_temp values extracted for Lagos city from the city_data. The SQL query is given as:

```
SELECT *
FROM global_data WHERE (year BETWEEN '1849' AND '1851') OR (year BETWEEN '1856' AND '1862') OR (year BETWEEN '1873' AND '2013')
ORDER BY year;
```

The extracted data showed the corresponding global avg-temp in for the same years as that contained in the city_data for the city of Lagos. It was therefore downloaded as a CSV file to be analyzed.

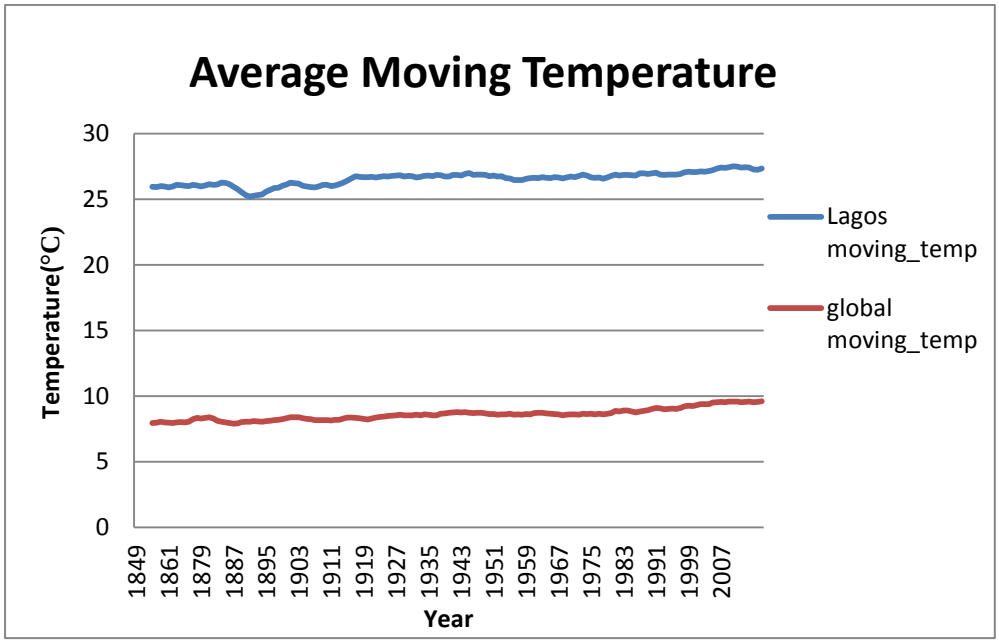
DATA MANIPULATION AND VISUALISATION

- The downloaded CSV files for the extracted data containing the global weather trends and the weather trends for the city of Lagos were both imported to google sheets. After importing, the moving average was calculated using 5 moving average for both the global and Lagos city avg-temp values. 5 moving average was used because it made it easier to identify similarities and differences between the weather trends during visualisation.



	A	B	C	D	E	F	G	H	I	J	K	L	M
1	year	lagos_temp	lagos moving_temp	Year	global_temp	global moving_temp	year	Ibadan avg_temp	Ibadan moving_temp				
2	1849	25.98		1849	7.98		1856	26.92					
3	1850	25.87		1850	7.9		1857	24.97					
4	1851	26.1		1851	8.18		1858	25.93					
5	1856	26.35		1856	8		1859	25.66					
6	1857	25.45	25.95	1857	7.76	7.964	1860	25.77	25.85				
7	1858	25.92	25.94	1858	8.1	7.988	1861	25.82	25.63				
8	1859	26.18	26.00	1859	8.25	8.058	1862	26.81	25.998				
9	1860	26.01	25.98	1860	7.96	8.014	1873	25.87	25.986				
10	1861	25.95	25.90	1861	7.85	7.984	1874	25.98	26.05				
11	1862	25.9	25.99	1862	7.56	7.944	1875	25.6	26.016				
12	1873	26.46	26.10	1873	8.35	7.994	1876	25.98	26.048				
13	1874	26.08	26.08	1874	8.43	8.03	1877	26.15	25.916				
14	1875	25.82	26.04	1875	7.86	8.01	1878	26.1	25.962				
15	1876	25.82	26.02	1876	8.08	8.056	1879	25.51	25.868				
16	1877	26.35	26.11	1877	8.54	8.252	1880	25.91	25.93				
17	1878	26.26	26.07	1878	8.83	8.348	1881	26.19	25.972				
18	1879	25.67	25.98	1879	8.17	8.296	1882	25.82	25.906				
19	1880	26.14	26.05	1880	8.12	8.348	1883	26.21	25.928				
20	1881	26.39	26.16	1881	8.27	8.386	1884	26.23	26.072				
21	1882	26.01	26.09	1882	8.13	8.304	1885	26.15	26.12				
22	1883	26.42	26.13	1883	7.98	8.134	1886	25.63	26.008				

- Visualisation was achieved by a line chart comprising the moving averages of the global and Lagos city weather trends against the years observed.



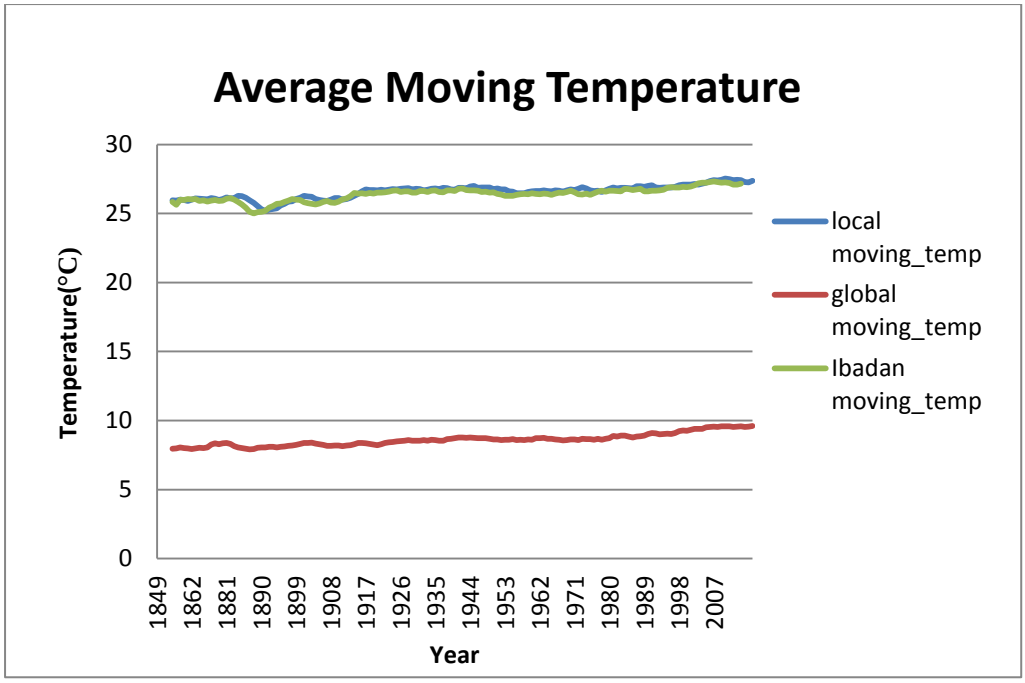
OBSERVATIONS

From the data visualised on the line chart above it can be observed that:

- The average moving temperature of Lagos city is higher and hotter than the average global temperature.
- It can be observed that the average global temperature has increased over the years. It can therefore be said that the world is getting hotter.
- It can be observed that over the years the city temperature was lowest at 25.2°C in 1891 while the average global temperature was lowest at 7.91°C in 1887.
- It can also be observed that both the global and city average moving temperature have been on the increase over the years.

FURTHER COMPARISON WITH ANOTHER CITY

The data of another city - Ibadan was extracted from the database with the same SQL query used to extract the Lagos city data. The extracted data was imported to Excel, the moving average was calculated and visualised with the use of a line chart.



From the line chart above, it can be observed that:

- The average temperature for Lagos and Ibadan cities are almost similar and are both on the increase over the years.
- The moving temperature of Ibadan City is also higher and hotter than the global average moving temperature.
- Unlike Lagos the lowest moving temperature for the city of Ibadan was observed in 1888 at a temperature of 25.01°C.