Project 1: Exploring Weather Trends

The goal of this project is to explore the global weather trend and compare it to my city, to see the similarities and differences.

The tools I used: SQL, Excel, Python.

First of all, I extracted the global weather trend from the database using the below command:

Then, I extracted the weather from my city, which is **Mecca** using the bellow command:

After that, I used **Excel** to calculate the moving average, but before that, I had to delete some empty rows that I extracted from the database in my city. As in the CSV file for the weather in **Mecca**, I encountered some empty rows in the "Year" column, and it was from the year **1846** to **1860**. The picture bellow will illustrate more:

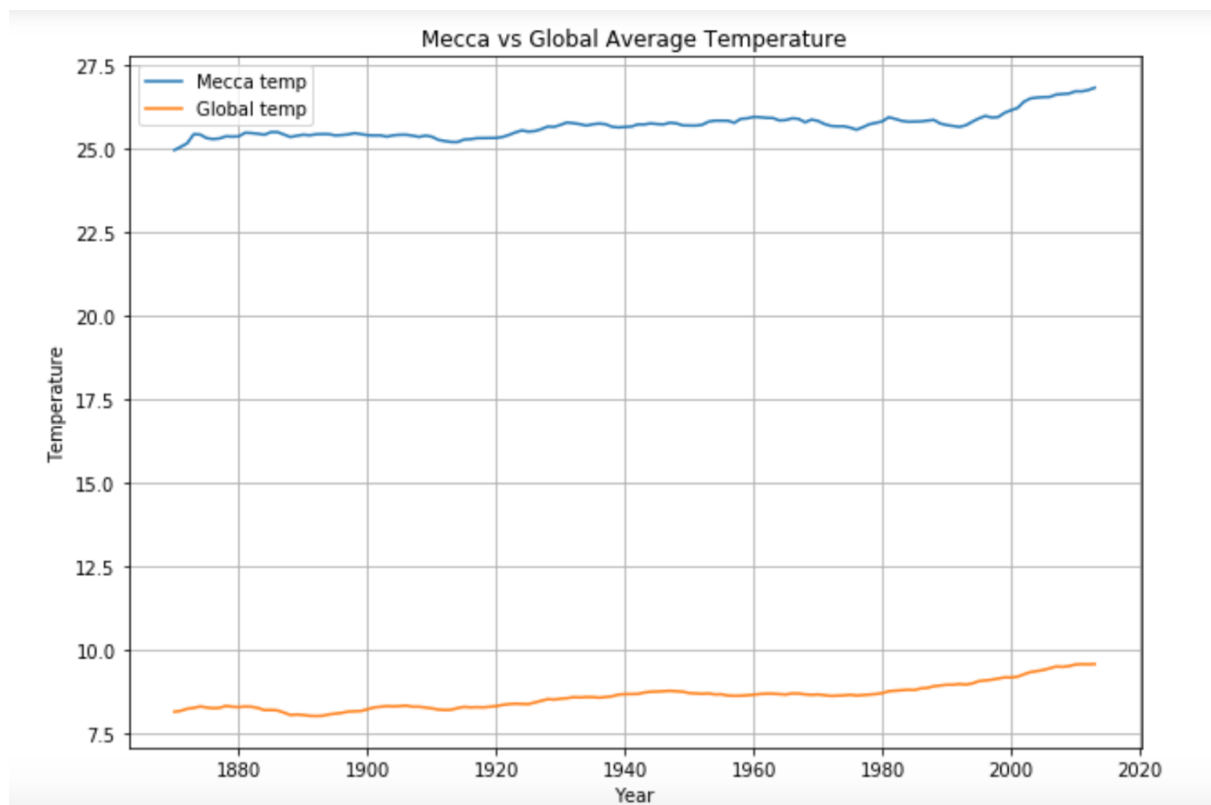|	A	B	C	D	E	F	G	H	I
1	city	year	avg_temp	Mecca_avg_temp		year	avg_temp	Global_avg_temp	
2	Mecca	1851				1851	8.18		
3	Mecca	1852				1852	8.1		
4	Mecca	1853				1853	8.04		
5	Mecca	1854				1854	8.21		
6	Mecca	1855				1855	8.11		
7	Mecca	1856				1856	8		
8	Mecca	1857				1857	7.76		
9	Mecca	1858				1858	8.1		
10	Mecca	1859				1859	8.25		
11	Mecca	1860				1860	7.96	8.071	
12	Mecca	1861	23.98			1861	7.85		
13	Mecca	1862	24.13			1862	7.56		
14	Mecca	1863	22.87			1863	8.11		
15	Mecca	1864	25.43			1864	7.98		
16	Mecca	1865	25.6			1865	8.18		
17	Mecca	1866	25.42			1866	8.29		
18	Mecca	1867	25.62			1867	8.44		

So, I had to delete these rows because they are useless. That is why I chose to begin analyzing this data set from the year **1861**, to make my observation more accurate and honest.

Finally, I calculated the moving average, using the **AVERAGE** function in **Excel**, where I chose to calculate the average temperature in **Mecca** for every 10 years, as well as the **global** average temperature.

D11 =AVERAGE(G2:G11)

	A	B	C	D	E	F	G	H	I
1	city	year	avg_temp	Mecca_avg_temp		year	avg_temp	Global_avg_temp	
2	Mecca	1861	23.98			1861	7.85		
3	Mecca	1862	24.13			1862	7.56		
4	Mecca	1863	22.87			1863	8.11		
5	Mecca	1864	25.43			1864	7.98		
6	Mecca	1865	25.6			1865	8.18		
7	Mecca	1866	25.42			1866	8.29		
8	Mecca	1867	25.62			1867	8.44		
9	Mecca	1868	25.3			1868	8.25		
10	Mecca	1869	25.65			1869	8.43		
11	Mecca	1870	25.35	24.935		1870	8.2	8.129	
12	Mecca	1871	24.97			1871	8.12		
13	Mecca	1872	25.2			1872	8.19		
14	Mecca	1873	25.57			1873	8.35		
15	Mecca	1874	25.32			1874	8.43		
16	Mecca	1875	24.53			1875	7.86		
17	Mecca	1876	25.13			1876	8.08		
18	Mecca	1877	25.81			1877	8.54		
19	Mecca	1878	25.94			1878	8.83		

	A	B	C	D	E	F	G	H
1	city	year	avg_temp	Mecca_avg_t	year	avg_temp	Global_avg_temp	
12	Mecca	1871	24.97	25.034	1871	8.12	8.156	
13	Mecca	1872	25.2	25.141	1872	8.19	8.219	
14	Mecca	1873	25.57	25.411	1873	8.35	8.243	
15	Mecca	1874	25.32	25.4	1874	8.43	8.288	
16	Mecca	1875	24.53	25.293	1875	7.86	8.256	
17	Mecca	1876	25.13	25.264	1876	8.08	8.235	
18	Mecca	1877	25.81	25.283	1877	8.54	8.245	
19	Mecca	1878	25.94	25.347	1878	8.83	8.303	
20	Mecca	1879	25.57	25.339	1879	8.17	8.277	
21	Mecca	1880	25.42	25.346	1880	8.12	8.269	
22	Mecca	1881	26.06	25.455	1881	8.27	8.284	
23	Mecca	1882	25.09	25.444	1882	8.13	8.278	
24	Mecca	1883	25.36	25.423	1883	7.98	8.241	
25	Mecca	1884	25.03	25.394	1884	7.77	8.175	
26	Mecca	1885	25.33	25.474	1885	7.92	8.181	
27	Mecca	1886	25.13	25.474	1886	7.95	8.168	
28	Mecca	1887	25.08	25.401	1887	7.91	8.105	
29	Mecca	1888	25.21	25.328	1888	8.09	8.031	
30	Mecca	1889	25.88	25.359	1889	8.32	8.046	
31	Mecca	1890	25.79	25.396	1890	7.97	8.031	

As for the visualizations, I used the **Matplotlib** library in **Python** to show a comparison of average temperatures between Mecca and the world over a century. The results were as follows:

My observation:

- The average temperature in Mecca is much hotter than the global average temperature, and the amount of temperature change has been rising slightly over the years.

- The average temperature in both Mecca and the world is gradually rising as the years progress, and it is expected to increase more than that in the coming years.

- The amount of fluctuation in temperature in Mecca was more than the global average, as the global average was more balanced and stable over the years.

- The amount of temperature increase in the last 10 years in particular was the largest in the last century, whether for Mecca or for the world.