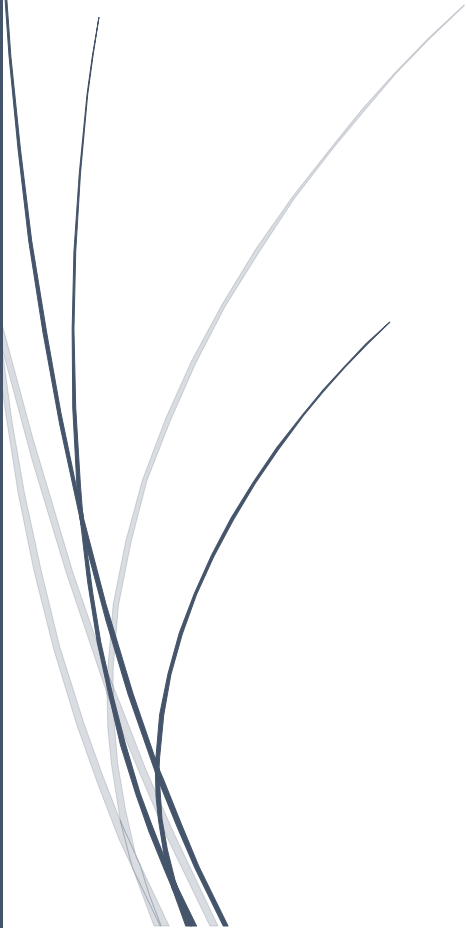


4/28/2020

# Exploring Weather Trends

Project#1



## Introduction

In this project, local and global temperature will be analyzed, and a comparison will be held between the temperature trends in the local city (Riyadh) to the overall temperature trends. The tools used in this project are the SQL and Excel spreadsheets.

## Extract the data

In the beginning, temperature data has been extracted from the database using SQL for the entire world as well as the closest city to where I live. This was achieved by two steps listed below:

### 1- Determining the closest city to where I live that does exist in the database

This was achieved by typing down this query and determining the closest city.



It was found that the database has two cities listed in Saudi Arabia-my country- which are: Mecca and Riyadh.

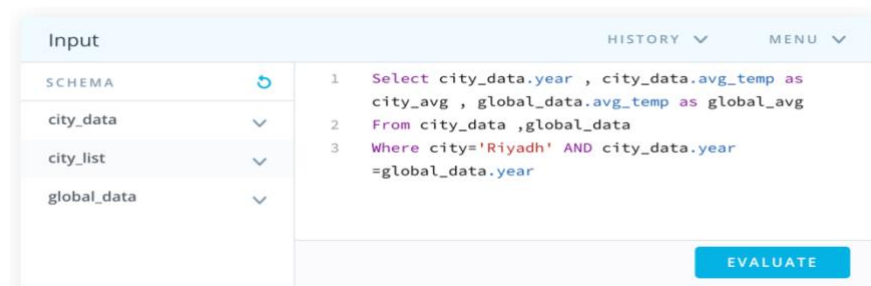
Due to the fact that I live in Riyadh, I'll be analyzing Riyadh's trends

### results

city	country
Mecca	Saudi Arabia
Riyadh	Saudi Arabia

### 2- Extracting Riyadh's city average temperature and the global's average temperature as well in the same time.

This was achieved by typing down this query and making a join between the two tables.



## Open up the CSV in excel spreadsheets

Now, all data needed to analyze the trends has been extracted successfully. But in order to manipulate the date and visualize it I exported the data set extracted to an excel spread sheet. Note that some of the data were missing. Since one of the ways of handling missing data is to keep it empty if they are-the missing data- few; I have decided to go with that option.

year	city_avg	global_avg
1843	24.74	8.17
1844	15.45	7.65
1845	20.82	7.85
1846		8.55
1847		8.09
1848	24.56	7.98
1849	24.8	7.98
1850	24.34	7.9
1851	25.03	8.18
1852	24.85	8.1
1853	24.93	8.04
1854	24.72	8.21
1855	24.92	8.11
1856	24.57	8
1857	24.26	7.76
1858	25.01	8.1
1859	24.95	8.25
1860	24.94	7.96
1861	24.13	7.85
1862	23.77	7.56
1863	24.22	8.11

## Computing Moving Average

Moving averages are used to smooth out data to make it easier to observe long term trends and not get lost in daily fluctuations. In order to calculate the moving average for both of the city and global a specific period of time must be obtained firstly. I have chosen to calculate 7 years moving average because I do think it has smoothed the results fair enough to come up with clear observations. Please note that the interval for the moving average for the both the city and the global is the same

After determining the period of time that average will be held based on it, two extra columns has been generated to record the moving average for both of city and global temperature.

As shown in the figure below , the moving average is computed through applying a specified formula which basically computes the average for the past 7 years or in other words we can say that it is about summing up all 7 previous yearly average temperature and then dividing it by 7 .This formula was generated to all cells- in the two extra columns created previously - after the 7<sup>th</sup> year.

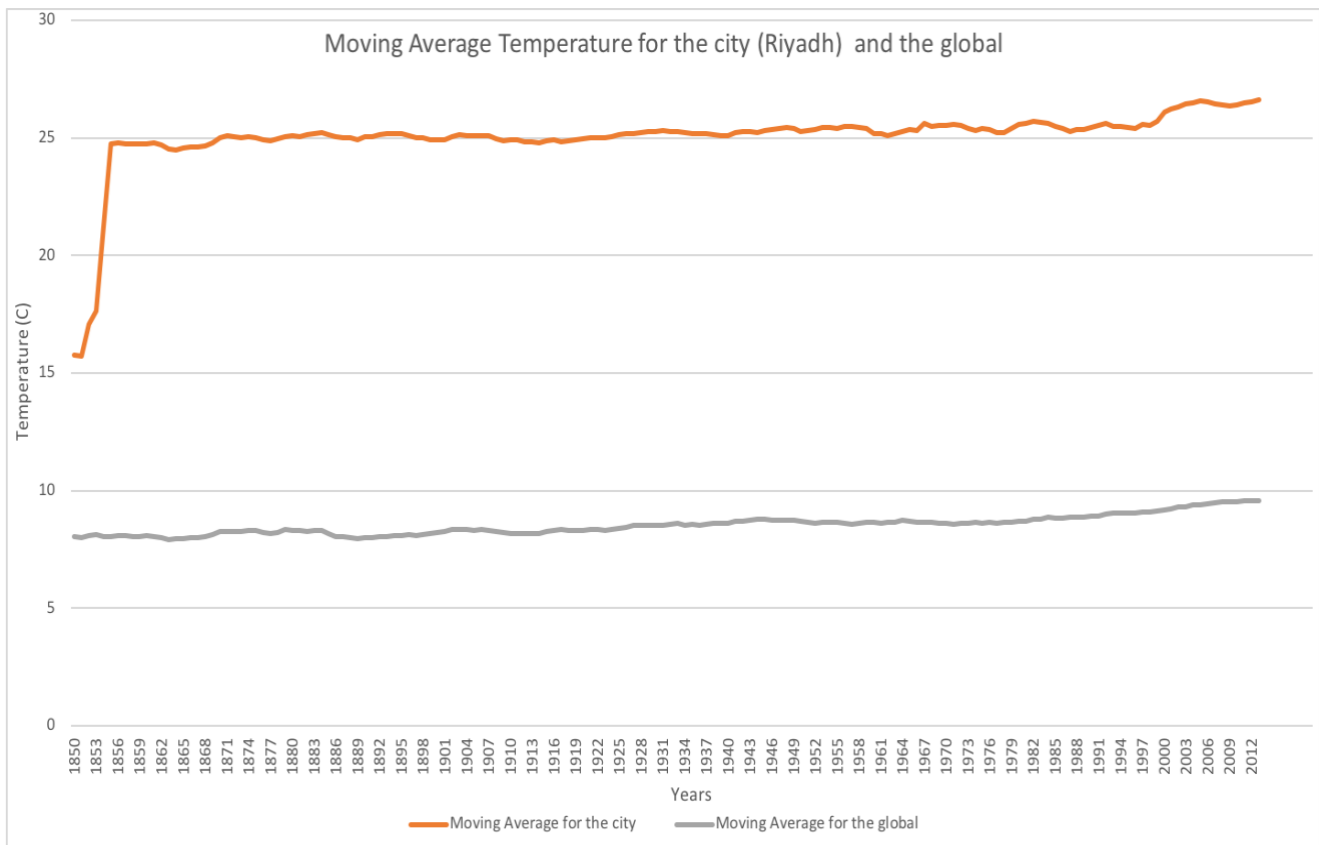
AVERAGE $\Delta$ $\times$ $\checkmark$ $f_x$ $= (B2+B3+B4+B5+B6+B7+B8)/7$					
	A	B	C	D	E
1	year	city_avg	global_avg	Moving Average for the city	Moving Average for the global
2	1843	24.74	8.17		
3	1844	15.45	7.65		
4	1845	20.82	7.85		
5	1846		8.55		
6	1847		8.09		
7	1848	24.56	7.98		
8	1849	24.8	7.98		
9	1850	24.34	7.9	$= (B2+B3+B4+B5+B6+B7+B8)/7$	8.038571429
10	1851	25.03	8.18	15.71	8
11	1852	24.85	8.1	17.07857143	8.075714286
12	1853	24.93	8.04	17.65428571	8.111428571
13	1854	24.72	8.21	21.21571429	8.038571429
14	1855	24.92	8.11	24.74714286	8.055714286
15	1856	24.57	8	24.79857143	8.074285714

AVERAGE $\Delta$ $\times$ $\checkmark$ $f_x$ $= (C2+C3+C4+C5+C6+C7+C8)/7$					
	A	B	C	D	E
1	year	city_avg	global_avg	Moving Average for the city	Moving Average for the global
2	1843	24.74	8.17		
3	1844	15.45	7.65		
4	1845	20.82	7.85		
5	1846		8.55		
6	1847		8.09		
7	1848	24.56	7.98		
8	1849	24.8	7.98		
9	1850	24.34	7.9	15.76714286	$= (C2+C3+C4+C5+C6+C7+C8)/7$
10	1851	25.03	8.18	15.71	8
11	1852	24.85	8.1	17.07857143	8.075714286
12	1853	24.93	8.04	17.65428571	8.111428571
13	1854	24.72	8.21	21.21571429	8.038571429
14	1855	24.92	8.11	24.74714286	8.055714286

## Line chart

In this section, a line chart has been created using excel charts. Making the x-axis the years and the y-axis represents the moving average temperature in Celsius.

The figure below illustrates the moving average for the local city (Riyadh) as well as the global.



## Observations

- 1- It was found that Riyadh has an average temperature greater than the global average temperature. As shown in the figure above, the moving average temperature for Riyadh has been always greater than the global's temperature.
- 2- From the figure illustrated above, It was found that global has had the greatest moving average temperature in 2012.
- 3- From the figure illustrated above, it looks like that the average temperature for Riyadh in the next upcoming years will continue to be in the range from 25-30 Celsius.
- 4- From the figure illustrated above, Riyadh has had a distinct change in the average temperature from 1850 till 1855.