

Explore Weather Trends

Prepared by: Nadeem Tabbaa

Udacity Connect - Data Analyst

This project is to visualize, analyze and compare Riyadh city average temperature with overall global average temperature.

Firstly, I had to check if my city, Riyadh, has any temperature data recorded. I had to use (QUERY1) to assure my city is available in the city list of Saudi Arabia.

QUERY1:

```
SELECT * FROM city_list WHERE country = 'Saudi Arabia'
```

RESULT OF QUERY1:

city	country
Mecca	Saudi Arabia
Riyadh	Saudi Arabia

Based on the result above, Riyadh is available and it has temperature data.

I have used (QUERY2) to extract average temperature of Riyadh city considering renaming of avg_temp field to riyadh_avg_temp to distinguish it from global average temperature. I have ordered my result ascending by the year.

QUERY2:

```
SELECT year, avg_temp AS riyadh_avg_temp FROM city_data WHERE city = 'Riyadh' ORDER BY year
```

RESULT OF QUERY2:

year	riyadh_avg_temp
1843	24.74
1844	15.45
1845	20.82
1846	
1847	
.....
2011	26.4
2012	26.83
2013	27.78

Based on the result above, there are two observations have to be noted.

- 1- The result data of Riyadh city is between 1843 and 2013.
- 2- There are some missing data for years 1846 and 1847.

To deal with the findings above I had to choose between either of the approaches bellow:

- 1- To make my study to be after 1847, or
- 2- Expecting that moving average is going to smooth my data for these years.

I have chosen the second approach. Hence, I have applied (QUERY3) to extract the for global temperature between 1843 and 2013. Also, ordered ascending by the year.

QUERY3:

```
SELECT year, avg_temp AS global_avg_temp FROM global_data WHERE year  
>= 1843 AND year <= 2013 ORDER BY year
```

RESULT OF QUERY3:

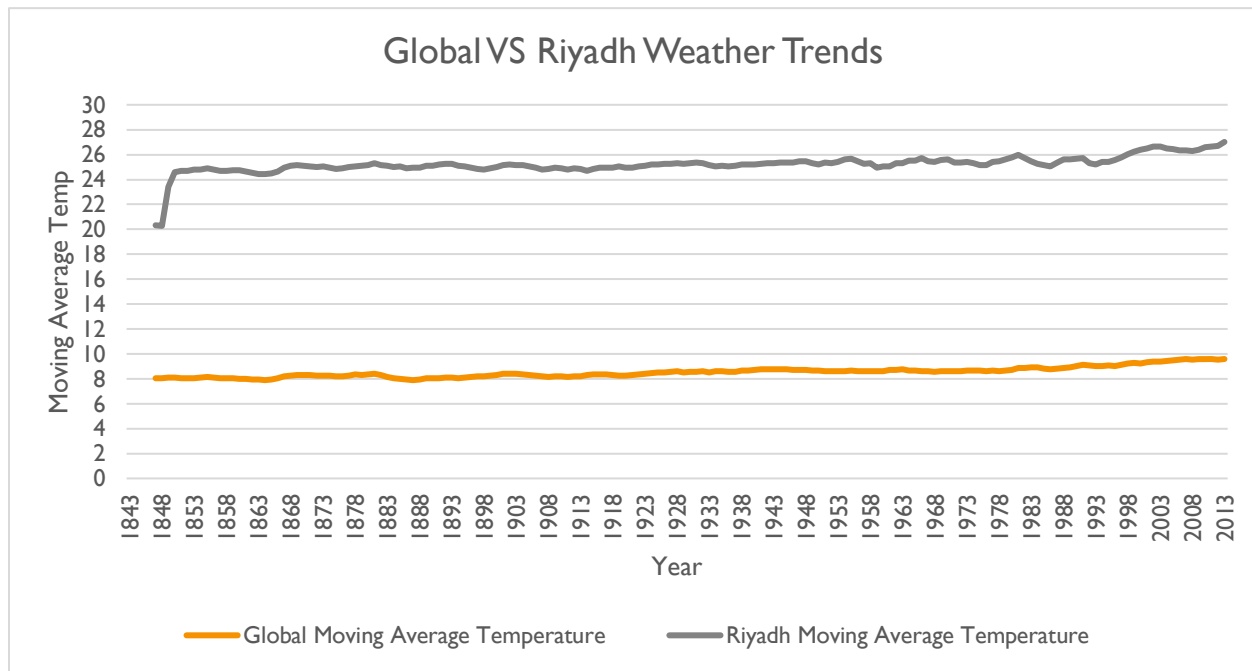
year	global_avg_temp
1834	8.15
1835	7.39
1836	7.7
1837	7.38
1838	7.51
.....
2011	9.52
2012	9.51
2013	9.61

I have joined both data together accordingly to the year. I have achieved this by using Excel formula, VLOOKUP, which adding global temperature beside city temperature by matching the year. Then I have applied moving average for an interval of 5 years, by using Excel formula, AVERAGE, which intend to calculate the average of selected cells.

Year	Global Avg Temp	Riyadh Avg Temp	Global Moving Average Temperature	Riyadh Moving Average Temperature
1843	8.17	24.74	#N/A	#N/A
1844	7.65	15.45	#N/A	#N/A
1845	7.85	20.82	#N/A	#N/A
1846	8.55		#N/A	#N/A
1847	8.09		8.062	20.33666667
1848	7.98	24.56	8.024	20.27666667
1849	7.98	24.8	8.09	23.39333333
1850	7.9	24.34	8.1	24.56666667

1851	8.18	25.03	8.026	24.6825
1852	8.1	24.85	8.028	24.716
1853	8.04	24.93	8.04	24.79
1854	8.21	24.72	8.086	24.774
1855	8.11	24.92	8.128	24.89
.....
2010	9.7	27.37	9.58	26.604
2011	9.52	26.4	9.578	26.636
2012	9.51	26.83	9.534	26.704
2013	9.61	27.78	9.57	27.018

I have plotted the data of year, global moving average and Riyadh moving average on a line chart as it shown below:



By looking at this chart, I can state the following:

- There is a slight increase in the average temperature globally and in my city, Riyadh, during the years.
- The increase of temperature can be measured to be within 2.0 °C. Except that Riyadh average temperature exceeded that on year 1998 and onward.
- Riyadh city considered to be hotter than global average temperature with a difference around 16 °C.
- 2013 considered to be the hottest year. Where the average temperature of Riyadh reached 27.78 °C and globally it was 9.61 °C.