Explore Weather Trends

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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 intendt 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, Riyad, 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**.