Explore weather Trends

By Abdullrahman AlShamma'a

Overview

In this report, I have investigated the local temperature of Riyadh, Saudi Arabia in compare with the global temperature. The temperature data used in this report was extracted from a database using Structured Query Language (SQL) and was subsequently handled using different formulas in Excel. The temperature data have been extracted using Udacity portal. The data extracted, manipulated and visualized to achieve the following aims:

1. Extract the data and export to a CSV file

2. Present the extracted data in a chart visualization

3. Draw Observations based on chart lines

Tools Used:

1. SQL: To extract the data from the database

2. Excel: For plotting line chart, calculating moving average and correlation coefficient

STEP 1 - Data Extraction

1. Scan which cities are available for "Saudi Arabia" in the given database.

```sql
SELECT *
FROM city_list
        WHERE country LIKE 'Saud%';
```

2- Query to extract Riyadh data:

```sql
SELECT *
FROM city_data
        WHERE city = 'Riyadh' AND country = 'Saudi Arabia';
```

3. Query to extract global data:

```sql
SELECT *
FROM global_data;
        WHERE year> 1842 and year<2014;
```

STEP 2 - Open up the CSV and create a line chart

Since moving averages are to be used, initial step was to calculate moving average for different intervals using the following formula:

AVERAGE(Cellx:Celly), where x and y represent the start and the end of each interval.

The correlation coefficient calculated using the following formula:

CORREL(Array1; Array2)

STEP 3 -Results and Observations

1. It was found that the average global temperature is increasing over time as can be depicted line chart where the beginning of the rising trend coincides with the start of the industrial revolution where humans started to burn the fossil fuels as a kind of energy causing in the increase of greenhouse gas releases.

2. Riyadh city observed to have temperature higher than the global average. This is true using different moving average intervals plots.

3. In a year by year evaluation, the max and mins appear to be coincide.

4. Both Riyadh city and global temperatures show a rising trend.

5. In the early years, Riyadh city shows high jump in temperature while the global temperatures increase slowly. While a deficiency of data is found for a few years producing a lower average, year sensible temperature deviations require further analysis.

6. The correlation coefficient for global and Riyadh temperatures is 0.791047

7. The positive value of the correlation coefficient demonstrated the observation in points 3&4.