Data Analyst Nanodegree - Project 1

Exploring Weather Trends

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Project Goal:

In this project, local and global temperature data has been analyzed and the temperature trends in Riyadh, Saudi Arabia has been compared to overall global temperature trends.

This project follows the following steps:

♦ Extract Data From A Database Using A SQL Query

SQL Query was used to download (CSV) files that contains yearly average temperature of the City 'Riyadh' and the global temperature. There were three tables in the database:
city_list - This contains a list of cities and countries in the database.
city_data - This contains the average temperatures for each city by year (℃).
global_data - This contains the average global temperatures by year (℃).

The used query is shown in the following table:

City	SQL command to extract data
To Look through all countries in order to find the local city	Select * from city_list where country='Saudi Arabia'
To select the city information	Select * from city_data where city='Riyadh' and country='Saudi Arabia'
To select the global data	Select * from global_data

♦ Calculate a Moving Average Using Python

Moving Averages (MA) were used to smooth out data to make it easier to observe long term trends and not get lost in daily fluctuations. So, to observe the trends in temperature I calculated moving average. I used 9 years moving average to get the smooth line chart. Rolling function that provides the feature of rolling window calculations has been used then I used Average to calculate average to the selected number. The used code is shown in the following:

```
global_data_avg = global_data['avg_temp'].rolling(9).mean()
city_data_avg = city_data['avg_temp'].rolling(9).mean()
```

◆ Create A Line Chart Using Python
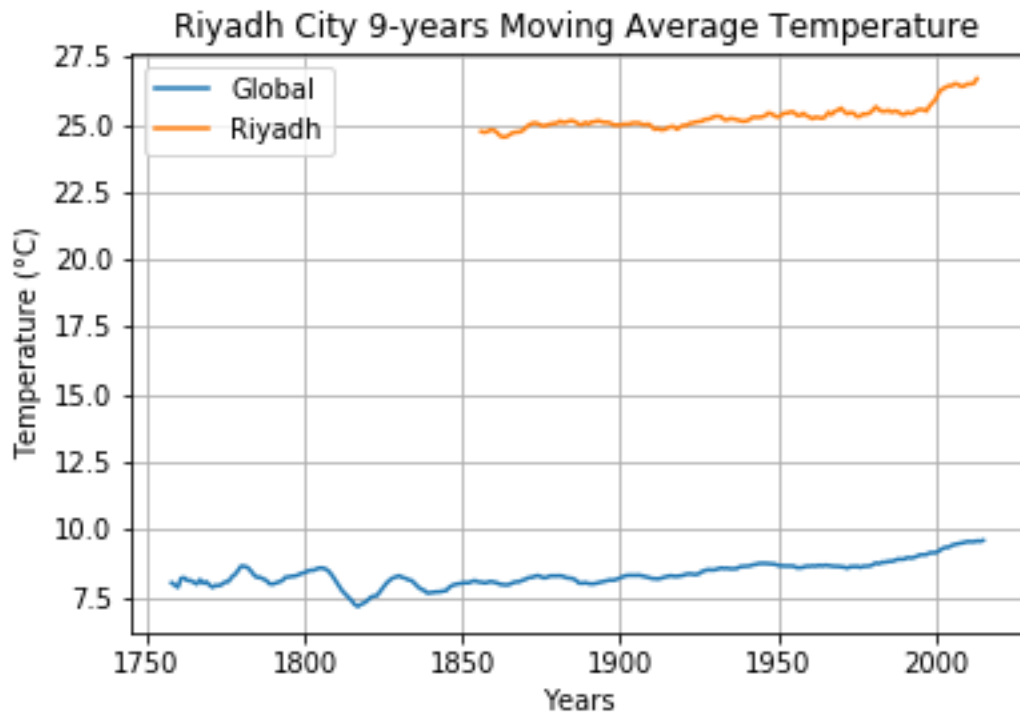
Observations

This section provides a brief overview of the similarities and differences observed between the global and local moving average temperature data:

◆ The global temperature has been in the range of 7.15 °C and 9.60 °C in the time period 1850-2013. Where Riyadh has been hotter, in the range of 24.53 °C and 26.69 °C at the same time period.

◆ Over time period, the trend of Riyadh's averages is observed to be hotter than the global average temperature.

◆ Global moving average temperature is increasing at faster rate slightly (0.5 °C) in comparison to Riyadh moving average temperature (0.2 °C).

◆ Overall, throughout the time period 1850 to 2013, the both graphs shows the world is consistently getting hotter.