Connect - Udacity Data Analysis Nanodegree

Project 0: Explore Weather Trends

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Introduction:

This project's objective is to explore and analyze weather trends in your city and compare them with global weather trends, in order to gain some insight and make observations regarding your analysis. The following are the tools and steps taken to achieve the objective.

Steps:

1- Extract data for Riyadh city and globally using SQL, and then saved as .csv file:

-   Extracting Riyadh's weather data:

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

-   Extracting global weather data:

    ```
    SELECT * FROM global_data
    ```
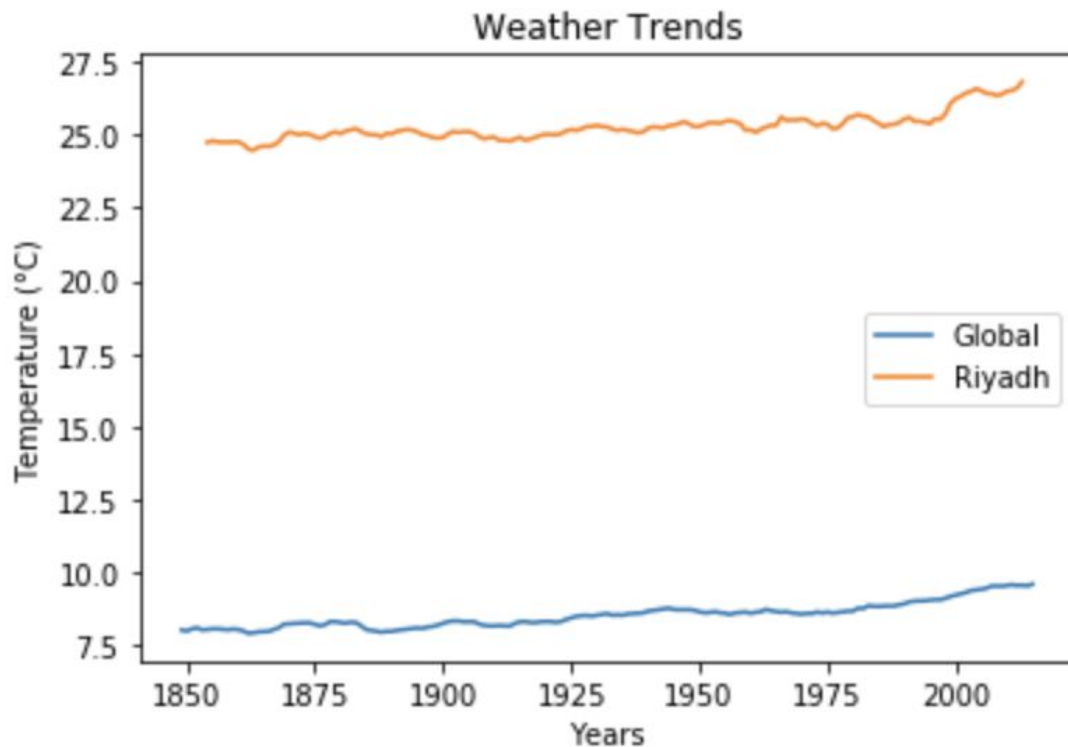
2- After saving the data in .csv files, I have used Python in Jupyter Notebook to work on the data. Firstly, I needed to filter the global data with regards to years, since the data for Riyadh city starts with year 1843 and the global data has older years. So, I needed the global data to start from 1843 using the following statement in Python:

```
globalTemp = globalTemp[(globalTemp['year']) >= 1843]
```

3- To calculate the moving average I have used the built-in rolling and mean functions, and the chosen period for the moving average is *7 years* as shown in the statements below:

```
globalMA = globalTemp['avg_temp'].rolling(7).mean()
cityMA = cityTemp['avg_temp'].rolling(7).mean()
```

4- Finally, to plot the line chart I have used matplotlib library, and below is the final chart result:

Figure 1: Weather Trends Comparison Between Riyadh and Globally

Observations:

- Riyadh's city temperature over the years would be considered somehow consistent, since it is mostly moving in a straight line consistently, although there are some fluctuations. Also, from the graph, I believe that Riyadh is heading towards higher temperatures in the upcoming years.

- The changes in Riyadh's temperatures as well as the global temperatures have been mostly consistent, however, it looks like the whole world is heading towards warmer temperatures in the future.

- When comparing the global weather trends and Riyadh weather trends, you can easily recognize the significant differences. Globally the temperatures are way cooler than they are in Riyadh, even going back in the years. In addition, you can observe from the graph that Riyadh is not on the same range in the average temperatures globally.

- The graph shows that in the last hundreds of years the change in temperatures have been mostly consistent, with Riyadh being on the warmer side compared to global temperatures. However, it seems that with the start of 2000's overall world temperatures are increasing and getting hotter as illustrated at the end of both line charts. Which indicates the rising issues of climate change and global warming.

References:

[1]: Pandas, M. and Poudel, B., 2020. *Moving Average Pandas*. [online] Stack Overflow. Available at: <https://stackoverflow.com/questions/40060842/moving-average-pandas> [Accessed 30 September 2020].