

UDACITY Data Analysis Nanodegree Program - Project 1

Almutairi,Muhammed

muhammed.almutairi@gmail.com

1. Extract the data

To interact with the given database, we write a SQL query.

- Write a SQL query to extract the city level data. Then, export to CSV.

```
1  /*
2  This file has the commands that i used to download the CSV files
3  from an online database using SQL.
4  PS : because my hometown was not in the city_list, I have downloaded the information for "Riyadh" instead.
5  */
6  SELECT * FROM global_data;
7  SELECT * FROM city_data
8  WHERE city = 'Riyadh' AND country = 'Saudi Arabia';
```

- Write a SQL query to extract the global data. Then, export to CSV.

```
1  /*
2  This file has the commands that i used to download the CSV files
3  from an online database using SQL.
4  PS : because my hometown was not in the city_list, I have downloaded the information for "Riyadh" instead.
5  */
6  SELECT * FROM global_data;
```

2. Open up the CSV & Create a line chart

To do that, we import libraries, as below

```
In [1]: # Importing necessary libraries for the project

import pandas as pd # for dealing with data!
import matplotlib.pyplot as plt # for visualizing the data!
import numpy as np# for calculating the moving average!
```

then read the data, as below

```
In [2]: #Importing the data
|
gt = pd.read_csv('global_temp.csv') # importing 'global tempreature data'
ct = pd.read_csv('Riyadh_temp.csv') # importing 'city tempreature data'
```

Then use the [rolling](#) function and calculate the mean as below

```
In [3]: #Moving averages are used to smooth out data and to make it easier to observe long term trends
        #and not get lost in daily fluctuations

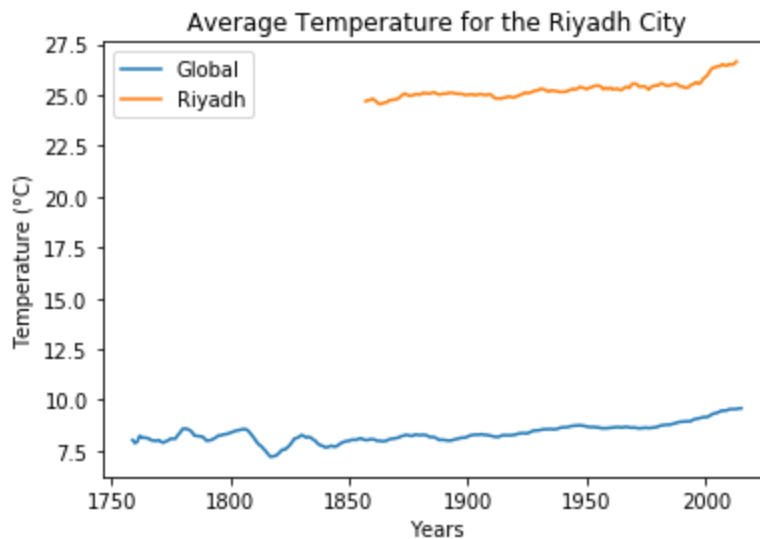
        gt['g_avg'] = gt['avg_temp'].rolling(10).mean()
        ct['c_avg'] = ct['avg_temp'].rolling(10).mean()
```

Then use matplotlib library to visualize

```
In [4]: #Visualizng Data using matplotlib Library

        plt.plot(gt['year'],gt['g_avg'],label='Global')
        plt.plot(ct['year'],ct['c_avg'],label='Riyadh')
        plt.legend()
        plt.xlabel("Years")
        plt.ylabel("Temperature (°C)")
        plt.title("Average Temperature for the Riyadh City")
        plt.show()
```

Here below the figure shows the average temperature for the Riyadh vs global.



3. Make observations

- Is your city hotter or cooler on average compared to the global average? Has the difference been consistent over time?

The figure shows obviously the Riyadh is hotter on average compared to the global average and the difference has been consistent over time

- b. **“How do the changes in your city’s temperatures over time compare to the changes in the global average?”**

Both Riyadh's average temperatures and global average have been increasing over time.

- c. **What does the overall trend look like? Is the world getting hotter or cooler? Has the trend been consistent over the last few hundred years?**

Overall trends look serious and the line is not fluctuating and is just increasing over time. And this reflects global warming for this century.

To add one more observation and this in regards to the data, the data shows no data records for Riyadh temperature before nearly 1850 as shown in the figure above. Indeed, the increase of temperature is roughly about 2- 3 degrees between 1850 and 20++ .