DATA ANALYST NANODEGEEE

UDACITY

Exploring Weather Trends

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Contents

1 Tools

- SQL: extract the data from the database.
- Python: calculating moving average and plotting line chart.
- ANACONDA - Jupyter Notebook: for writing python code.
- Latex - Overleaf: writing the report.

2 Extract the data

I used three SQL queries to extract my data from the database:

1. **city list:**

   ```
   SELECT * FROM city_data
   ```

   It displays the list of cities and finds the city nearest.

2. **local data (Riyadh, Saudi Arabia)**

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

3. **global data**

   ```
   SELECT * FROM global_data
   ```

After that, I downloaded the data in the CSV format.

3 Moving Average

- Calculated the moving average for five-years.
- Python was used for calculating the Moving Average Using rolling() and mean() function [1] as shown in Figure 1 .

```
local_avg = RiyadhCity['avg_temp'].rolling(5).mean() # Five-year moving average.
global_avg = globalData['avg_temp'].rolling(5).mean()# Five-year moving average.
```

Figure 1: Moving Average

4 Line chart

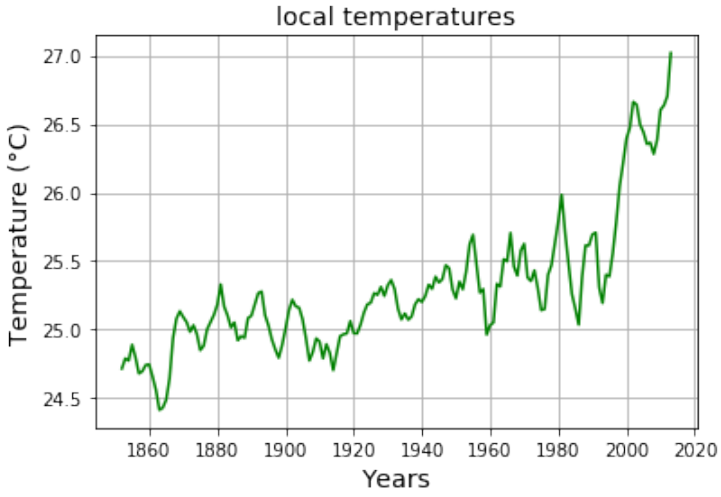


Figure 2: Riyadh Temperature.

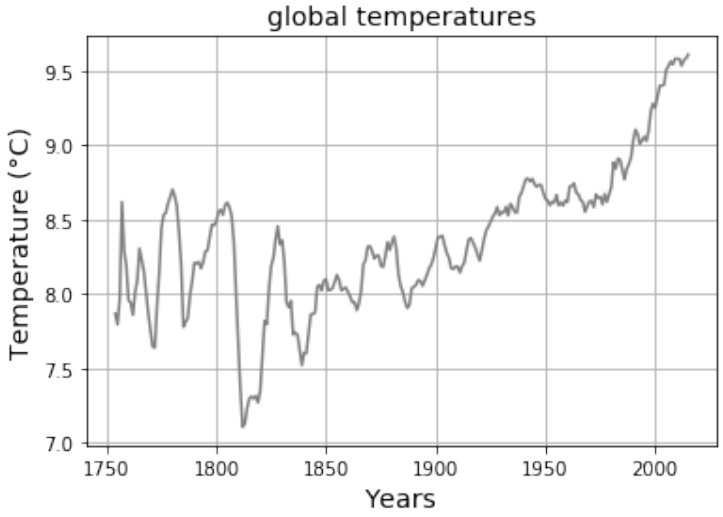


Figure 3: Global Temperature.

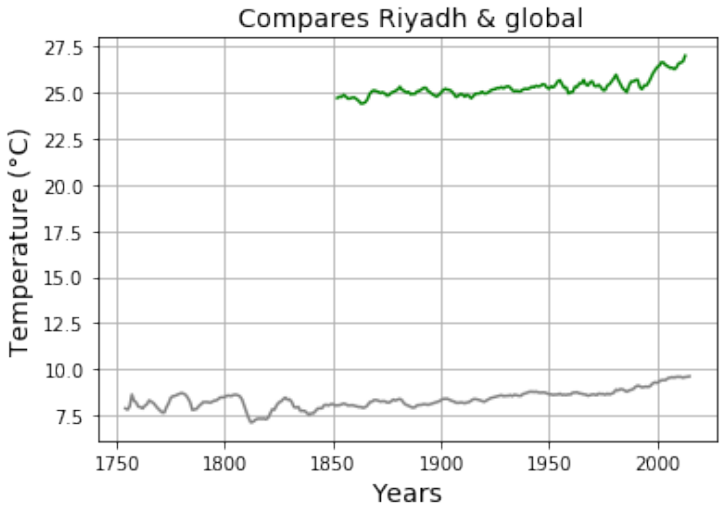


Figure 4: Compares your Riyadh temperatures with global temperatures.

5 key considerations

X: years.
Y: Temperature (°C).
Grey represent Global.
Green represent Riyadh.

6 Observations

- Global average temperature for five years Moving Average varies between 7.0 °C to 9.6 °C.
- Riyadh city average temperature for five years Moving Average varies between 24.6 °C to 27.0 °C.
- There was a big difference between the temperature between the globe and Riyadh and both of them are raising.
- The graph shows the difference between global and Riyadh Average Temperatures. thus, Riyadh is hotter than the global average temperature.

References

[1] "Moving average trading strategy." https://www.learndatasci.com/tutorials/python-finance-part-3-moving-average-trading-strategy/. (Accessed on 28/09/2020).

[2] "How to plot a line chart in python using matplotlib." https://datatofish.com/line-chart-python-matplotlib/. (Accessed on 28/09/2020).

7 Appendices

libraries

In [37]:
```
import pandas as pd
import matplotlib.pyplot as plt
```

Importing the data

In [5]:
```
#importing city tempreature data
RiyadhCity = pd.read_csv('/Users/batoul/Desktop/RiyadhCity.csv')
#importing global tempreature data
globalData = pd.read_csv('/Users/batoul/Desktop/globalData.csv')
```

In [6]:
```
RiyadhCity.head()
```

Out[6]:

	avg_temp	country	city	year
0	24.74	Saudi Arabia	Riyadh	1843
1	15.45	Saudi Arabia	Riyadh	1844
2	20.82	Saudi Arabia	Riyadh	1845
3	NaN	Saudi Arabia	Riyadh	1846
4	NaN	Saudi Arabia	Riyadh	1847

In [7]:
```
globalData.head()
```

Out[7]:

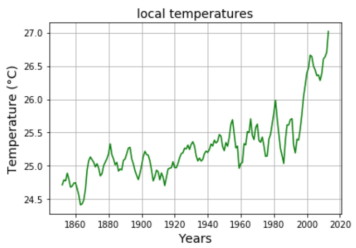
	avg_temp	year
0	8.72	1750
1	7.98	1751
2	5.78	1752
3	8.39	1753
4	8.47	1754

¶ Moving Average

In [45]:
```
local_avg = RiyadhCity['avg_temp'].rolling(5).mean() # Five-year moving average.
global_avg = globalData['avg_temp'].rolling(5).mean()# Five-year moving average.
```

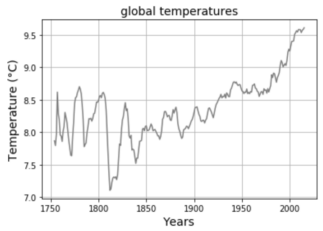
line charts

:
```
# line chart for Local temperature.
plt.plot( RiyadhCity['year'], local_avg ,color='g',label="local")
plt.title('local temperatures', fontsize=14)
plt.xlabel('Years', fontsize=14)
plt.ylabel("Temperature (°C)", fontsize=14)
plt.grid(True)
plt.show()
```



:[47] In

```
#line chart for global temperature.
plt.plot( globalData['year'],global_avg ,color='grey')
plt.title('global temperatures', fontsize=14)
plt.xlabel('Years', fontsize=14)
plt.ylabel("Temperature (°C)", fontsize=14)
plt.grid(True)
plt.show()
```



years

:[49] In

```
# a line chart that compares your Riyadh temperatures with the global temperatures.
plt.plot( RiyadhCity['year'], local_avg ,color='g')
plt.plot( globalData['year'],global_avg ,color='grey')
plt.title(" Compares Riyadh & global", fontsize=14)
plt.xlabel('Years', fontsize=14)
plt.ylabel("Temperature (°C)", fontsize=14)
plt.grid(True)
plt.show()
```