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**26/10/2020**

**Cairo, Egypt**

## Explore Weather Trends Project

### Introduction and steps

In this project, I analyze local and global temperature data and compare the temperature trends where i live to overall global temperature trends.

I live in Cairo so I complete this project by using SQL and Python(Jupyter notebook) and I will talk about steps now .

1. First I use SQL to export Data for Database in udacity website so I use sql to know nearest city to me and I write query and I screenshot it.

The screenshot shows a web-based SQL interface. On the left, under the 'Input' tab, there is a 'SCHEMA' section with a refresh icon and a list of tables: 'city\_data', 'city\_list', and 'global\_data', each with a dropdown arrow. To the right of the schema is a text area containing a SQL query: 

```
1 select* from city_list
2 where country='Egypt';
3
4
```

 Below the query area is a green 'Success!' message and a blue 'EVALUATE' button. At the top right of the input section are 'HISTORY' and 'MENU' dropdowns. Below the input section is the 'Output' section, which shows '2 results' and a 'Download CSV' link. The output is displayed as a table with two columns: 'city' and 'country'. The first row shows 'Alexandria' and 'Egypt'. The second row, highlighted in blue, shows 'Cairo' and 'Egypt'.

city	country
Alexandria	Egypt
Cairo	Egypt

2. Then I export city data and my condition was this city is cairo at egypt to download this csv

Input

HISTORY ▾

MENU ▾

SCHEMA ↻

city\_data ▾

city\_list ▾

global\_data ▾

1 `select* from city_data`

2 `where city='Cairo' And country='Egypt';`

3

Success!

EVALUATE

Output 206 results

Download CSV

year	city	country	avg_temp
1808	Cairo	Egypt	17.11
1809	Cairo	Egypt	19.87
1810	Cairo	Egypt	19.93
1811	Cairo	Egypt	20.00

3. Finally I export global data and download it

Input

HISTORY ▾

MENU ▾

SCHEMA ↻

city\_data ▾

city\_list ▾

global\_data ▾

1 `select* from global_data`

2

3

Success!

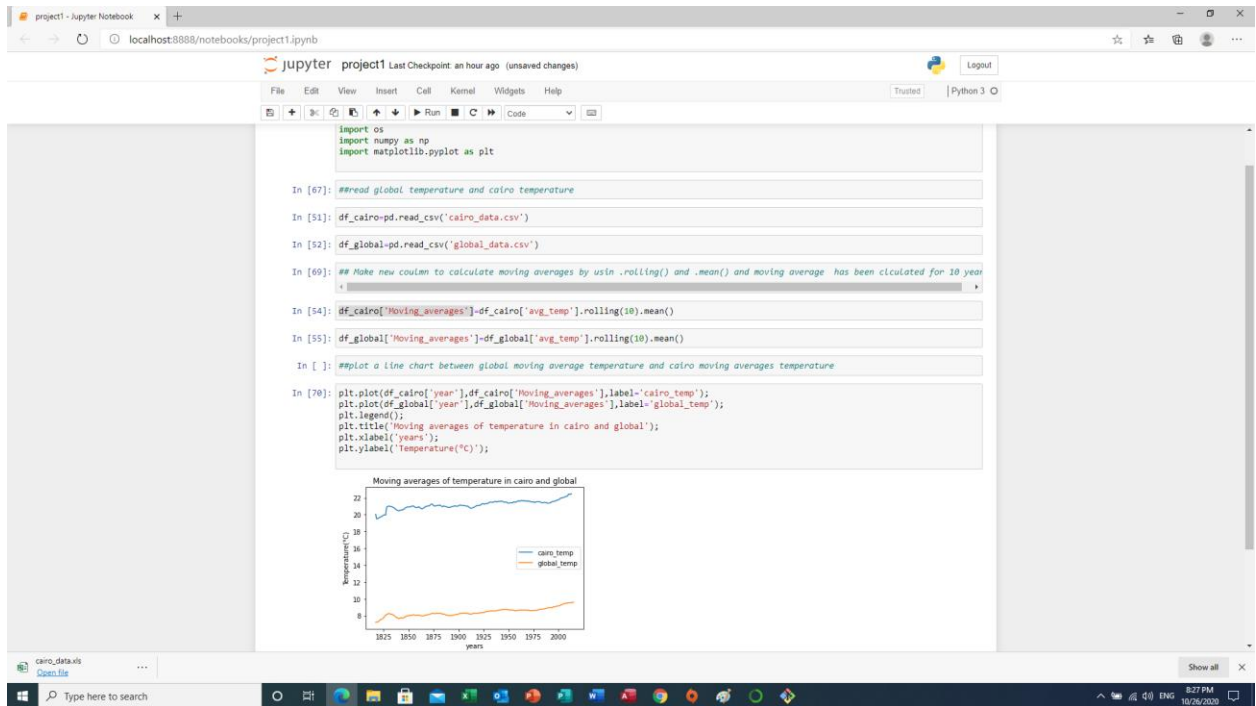
EVALUATE

Output 266 results

Download CSV

year	avg_temp
1750	8.72
1751	7.98
1752	5.78
1753	8.39
1754	8.47
1755	8.36

4. After downloading I use jupyter notebook to read this data and Analysis data and that is my code.



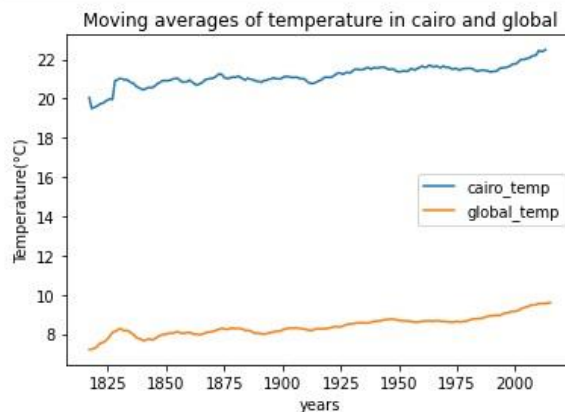
5. Moving Average , in this step in know that we make it to smooth out data to make it easier to observe long term trends and not get lost in daily fluctuations, and I use `.rolling().mean()` to calculate moving averages and I calculate it for **10 years**

```
In [54]: df_cairo['Moving_averages']=df_cairo['avg_temp'].rolling(10).mean()
```

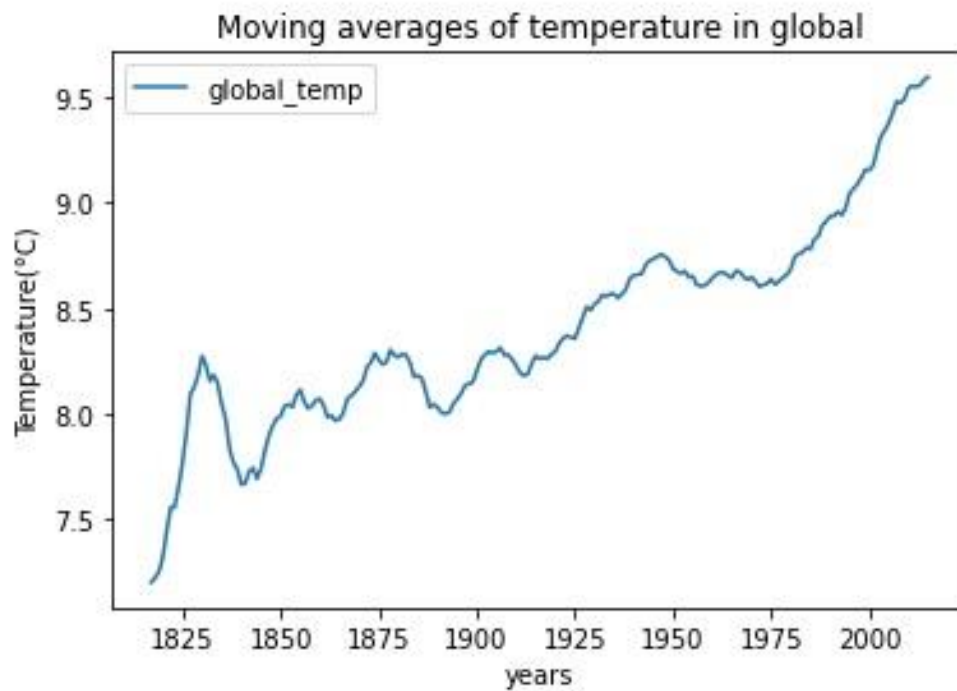
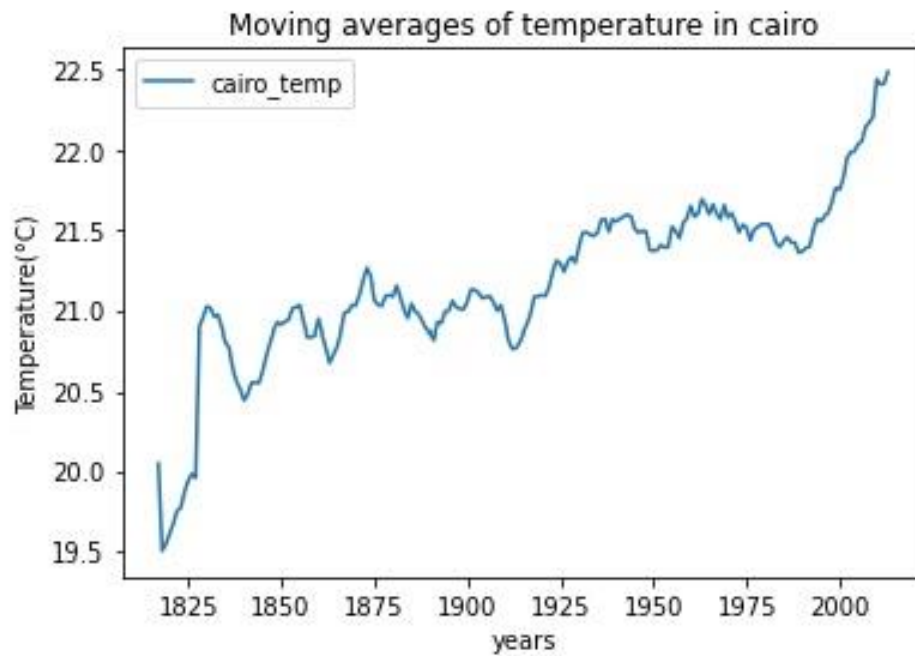
```
In [55]: df_global['Moving_averages']=df_global['avg_temp'].rolling(10).mean()
```

6. Then I plot line chart that compares cairo temperatures with the global temperatures.

```
In [70]: plt.plot(df_cairo['year'],df_cairo['Moving_averages'],label='cairo_temp');
plt.plot(df_global['year'],df_global['Moving_averages'],label='global_temp');
plt.legend();
plt.title('Moving averages of temperature in cairo and global');
plt.xlabel('years');
plt.ylabel('Temperature(°C)');
```



7. And this is line chart for cairo only and global only.



**8. Making observations:**

- By looking at the two charts in step number 7 we easily find that cairo hotter on average than the global average.
- By looking in charts we find that the temperature increases by the time that is mean the world getting hotter by time.
- By comparing the temperature in 1825 at cairo and global then in 2000 at cairo and global I find that the difference between them been consistent or difference be lower by 0.1 degree.
- From 1975 Temperature in global chart raising only.
- Both of average temperature in cairo and average on global are increase by time