

Project 1: Exploring Weather Trends

First: Extracting the data

➡ *Using SQL statements to extract the data*

- SQL query to extract the city level data (Alexandria, Egypt):

```
SELECT year , avg_temp  
  
FROM city_data  
  
WHERE city like '%Alexandria%' AND country like '%Egypt%'  
  
ORDER BY year;
```

- SQL query to extract the global data :

```
SELECT *  
  
FROM global_data  
  
ORDER BY year;
```

Second: Open up the CSV

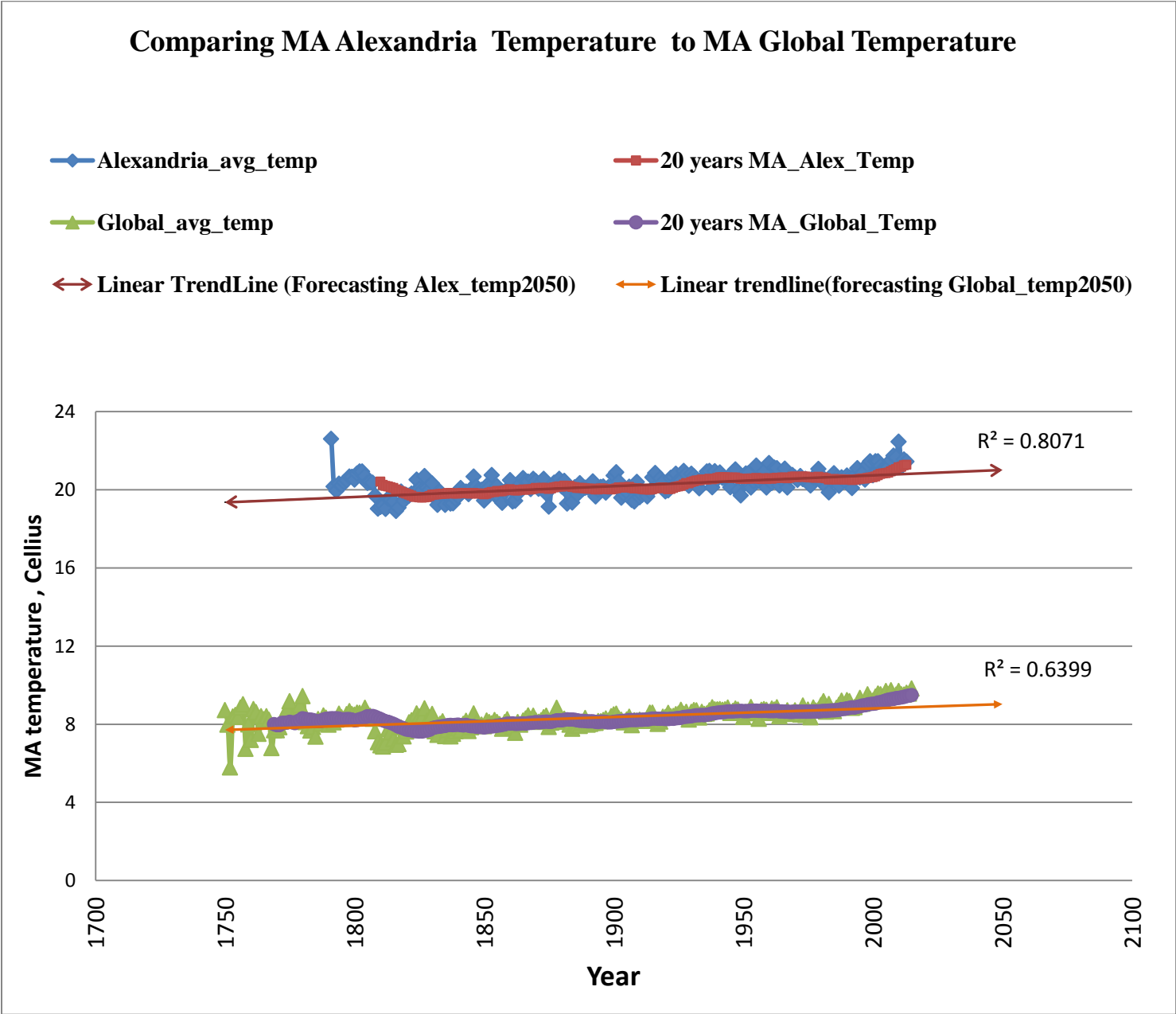
➡ *Using MS Excel for:*

- Comparing my city's temperatures (Alexandria) with the global temperatures .
- Calculate the 20 years moving average for each using MS excel adds in (Analysis data in data tab).
- Creating data visualization using scatter chart with smooth lines and markers. I choose this chart to compare pair of dataset to reflect two trends over time.

Third: Create a line chart:

Chart (1)

Comparing the moving average of Alexandria temperature to the moving average of the Global temperature



Also, using MS Excel functions to calculate the following:

Statistic/temps	Alex_Avg_temp	Global_Avg_temp	20 years MA_Alex_temp	20 years MA_Global_Temp
Mean(Average)	20.32	8.37	20.25	8.34
Max temp.	22.60	9.83	21.28	9.49
Min temp.	18.91	5.78	19.59	7.62
Standard deviation	0.60	0.58	0.36	0.39
Correlation coefficient R			0.898	0.800
R ²			0.807	0.640
Forecast temp in 2050	22.31	10.65	21.12	9.51

Fourth: Observations:

→ On average Alexandria is hotter that the global average of temperature:

The average of Alexandria temperature = 20.3.

The average of global temperature = 8.3

We also notice from chart (1) which is shown above, that the difference between my city temperature and the global temperature is consistent over time.

→ Similarities

- In general, we can notice from the moving average line chart that both of Alexandria and global temperature are increasing linearly over years.
- Both of them have outliers :

Alexandria → (year: 1791, temperature: 22.6)

Global → (year:1752, temperature:5.78).

- Both have positive correlation coefficient- (R for Alex=0.9, R for Global=0.8)- which emphasis what we mentioned at the first point, that the temperature is increasing linearly over time.
- Both have small standard deviation (around 0.6) , that means on average the difference between average temperature and any data points is around 0.6 which reflect the stability in temperature over years .

(Standard deviation for Global temperature is 0.58 and the standard deviation for Alexandria temperature is 0.60)

→Differences

- *According to the calculation of the forecasted temperature in 2050*

I choose the last 50 years (from 1965 to 2015) to calculate the forecasted temperature in 2050.

I found that forecasted temperature for Alexandria in 2050= 22.31

Comparing this value to **the average temp (20.32)** and to **the maximum temperature (22.60)**,

I notice that the temperature is increasing slightly and gradually, also it is not exceeding the max temperature and that seems good which reflect more stability in temperature in average .

On the other hand, I found that forecasted temperature for global in 2050=10.65

By comparing this value to **the average temp (8.37)** and **the maximum temperature (9.83)**,

I notice that the temperature is increasing faster globally because temperature in 2050 is higher than the maximum temperature.

- There are missing values for Alexandria average temperature from 1750 to 1790 and for the last 2 years (2014-2015). On contrary there are values for Global average temperature at this period.

