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Nanodegree Data Analysis

Project "1"

Exploring Weather Trends:

Definition:

temperature: is a physical quantity that expresses hot and cold. It is the manifestation of thermal energy, present in all matter, which is the source of the occurrence of heat, a flow of energy.

Riyadh: is the capital of Saudi Arabia and the largest city on the Arabian Peninsula, and Riyadh had a population of 7.6 million people in 2019, making it the most-populous city in Saudi Arabia, 3rd most populous in the Middle East.

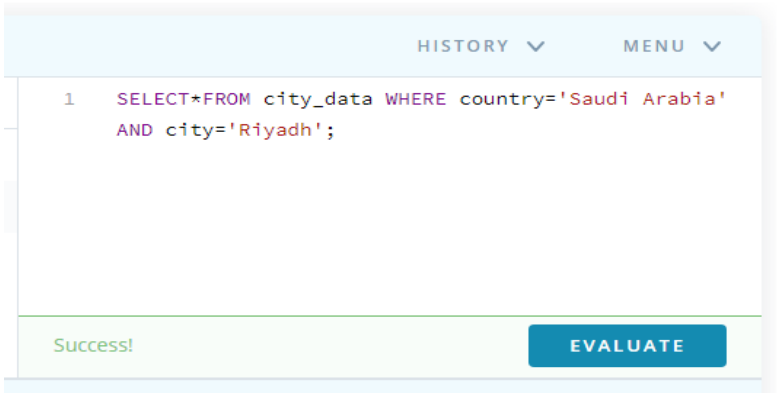
global: relating to or involving the entire world.

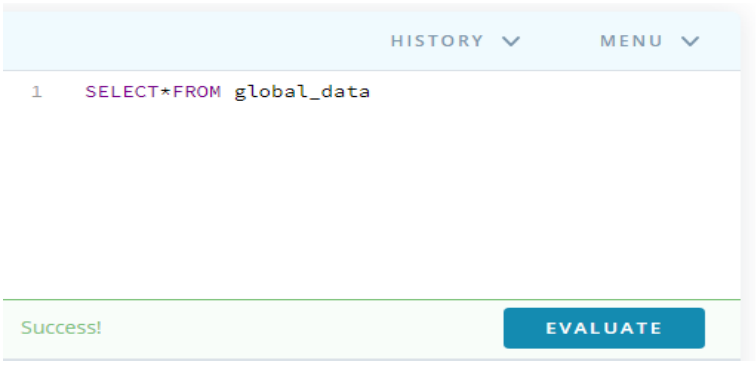
In this Project we use SQL, Excel.

SQL Code:

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

SELECT*FROM global_data





First: Data Cleaning.

1- Data Order.

Three columns have been created, Years: It starts from 1843 to 2013, Global: It contains the average yearly temperature for the world, Riyadh: It contains the average yearly temperature for Riyadh.

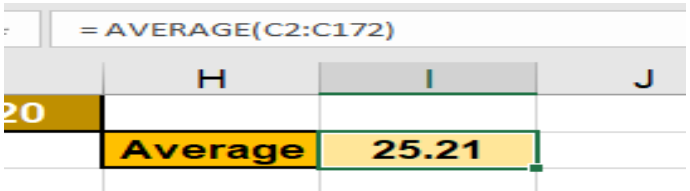
	A	B	C
1	Years	Global	Riyadh_KSA
2	1843	8.17	24.74
3	1844	7.65	15.45
4	1845	7.85	20.82
5	1846	8.55	
6	1847	8.09	
7	1848	7.98	24.56
8	1849	7.98	24.8
9	1850	7.9	24.34
10	1851	8.18	25.03
11	1852	8.1	24.85

2- Missing Values.

We have 2 missing value in 1846 and 1847.

	A	B	C
1	Years	Global	Riyadh_KSA
2	1843	8.17	24.74
3	1844	7.65	15.45
4	1845	7.85	20.82
5	1846	8.55	
6	1847	8.09	
7	1848	7.98	24.56
8	1849	7.98	24.8
9	1850	7.9	24.34
10	1851	8.18	25.03
11	1852	8.1	24.85
12	1853	8.04	24.93

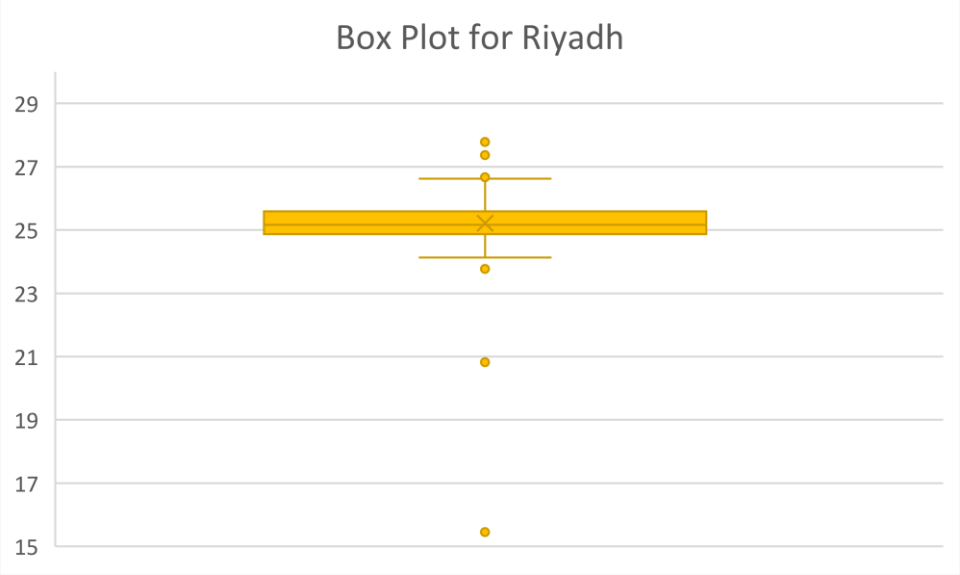
As we know when one of the appropriate methods of dealing with the missing values in these average data, the average data for the temperatures of Riyadh was taken.



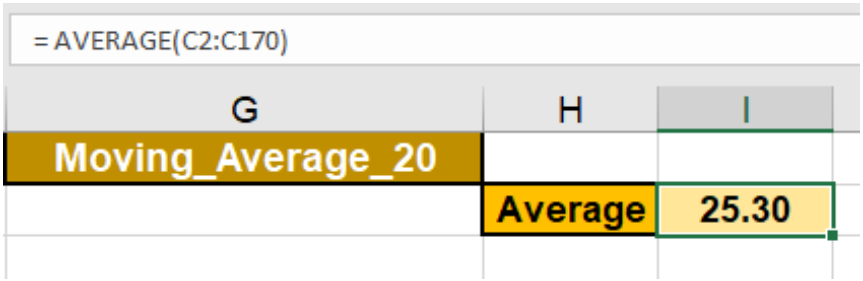
We use =AVERAGE() function for calculate mean of Riyadh temperatures and we conclusion the mean equals 25.21.

3- Outliers.

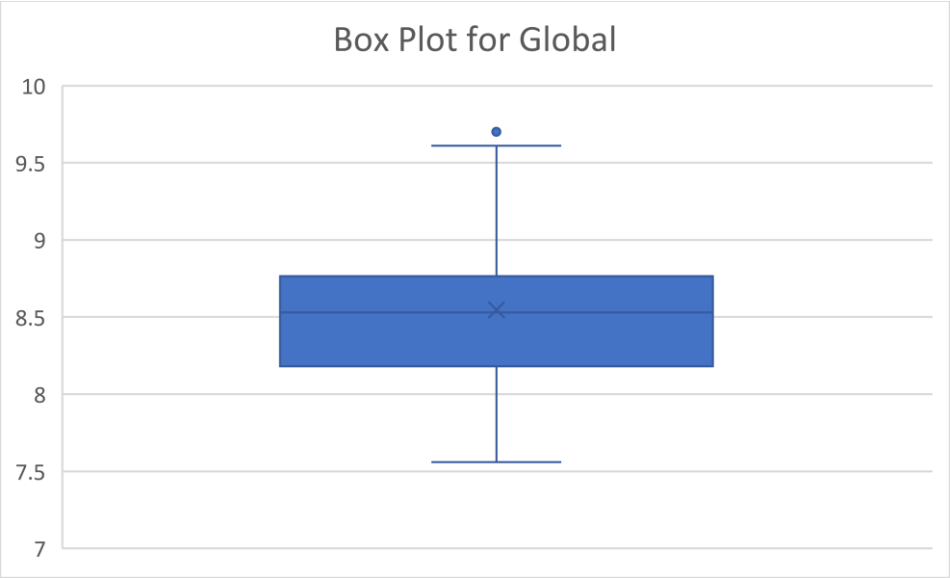
We are draw the Box Plot for Riyadh and the global.



When we see the point in Box Plot we see 7 points are outliers , but 5 point is very close to mean and it don't have effect of the mean, we conclusion we have 2 point (15.45,20.82) we most be delete it because is have effect of mean and we most be calculate the mean again for the missing value.



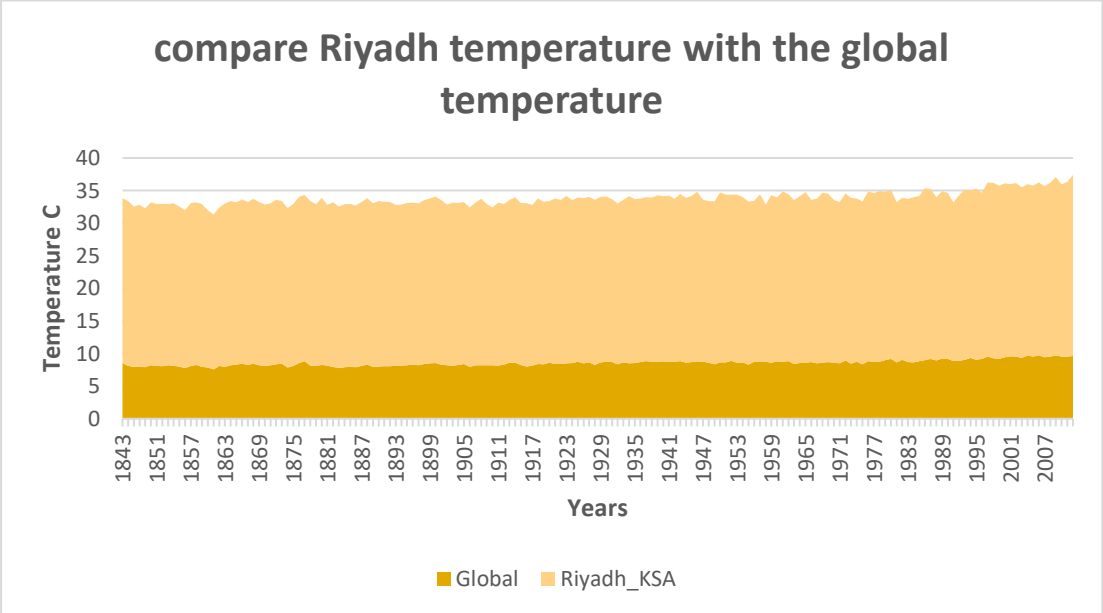
We use =AVERAGE() function for calculate mean of Riyadh temperatures and we conclusion the mean equals 25.3.



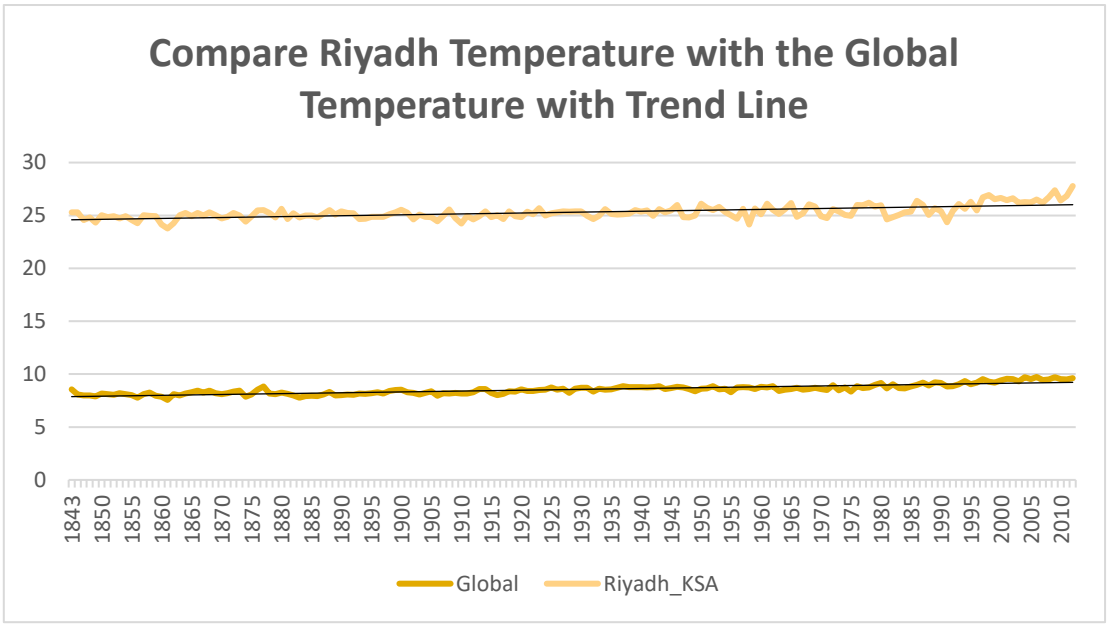
In the global data we have 1 point is outliers but we not need delete it because it is very close to the mean and it isn't have effect of the mean.

Second: Data Visualization.

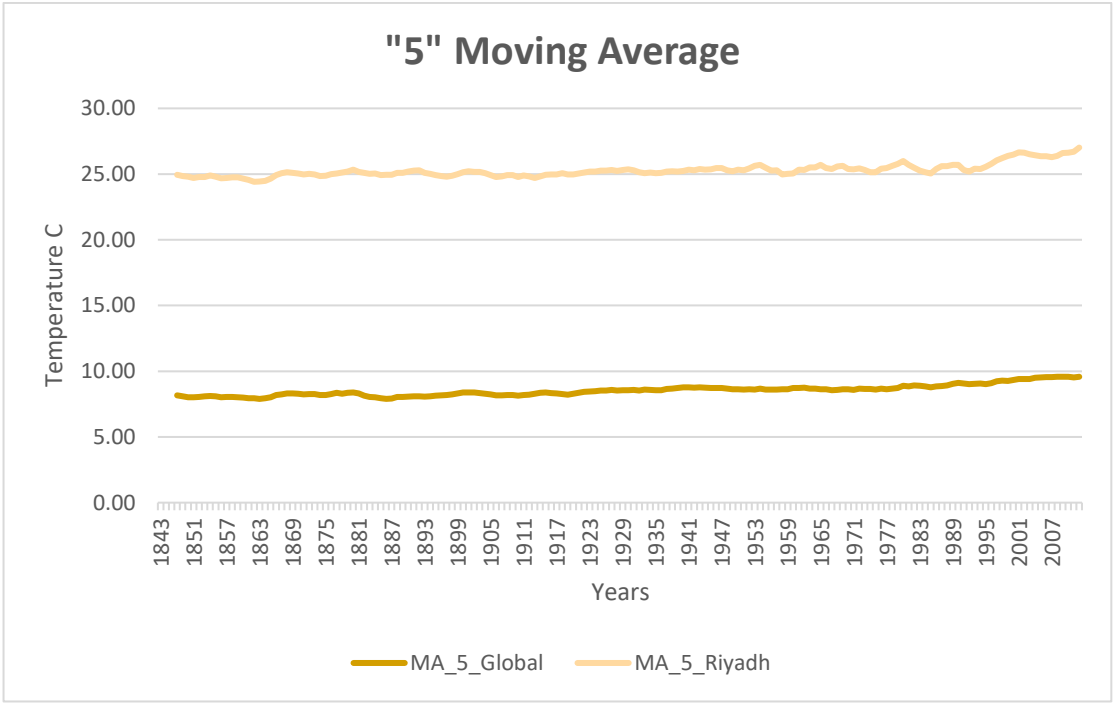
1- Temperature Comparison Plot.



2- Temperature Comparison Plot with Trend Line.



3- Moving Average Plot.



Third: **Result.**

1- Is your city hotter or cooler on average compared to the global average?

The average degrees of Riyadh is 25.3, and the average of the world's degrees is 8.5. We reach that the temperatures of my city are higher than the global average by a difference of up to 17 degrees Celsius.

This becomes clear when seeing the difference in the Temperature Comparison Plot.

2- Has the difference been consistent over time and, How do the changes in your city's temperatures over time compare to the changes in the global average?

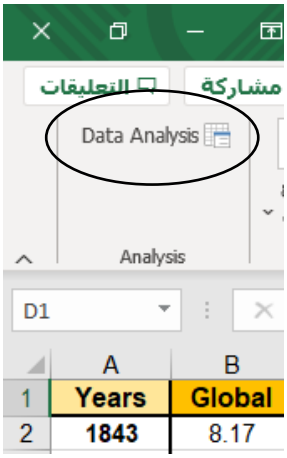
No, it is not constant.

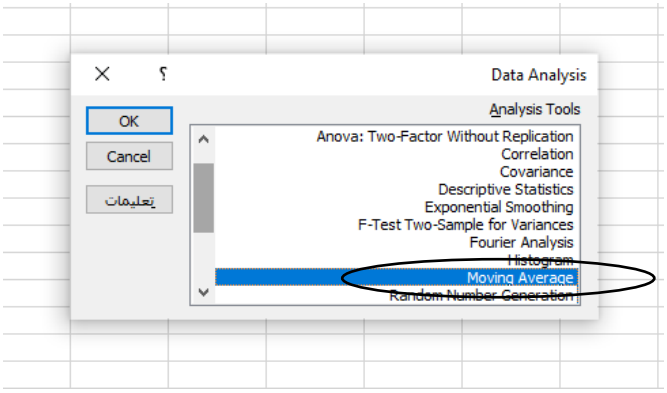
We have used compare to changes the "difference" and represented it graphically, and we discovered that they fluctuate clearly and their fluctuation expands during the time.

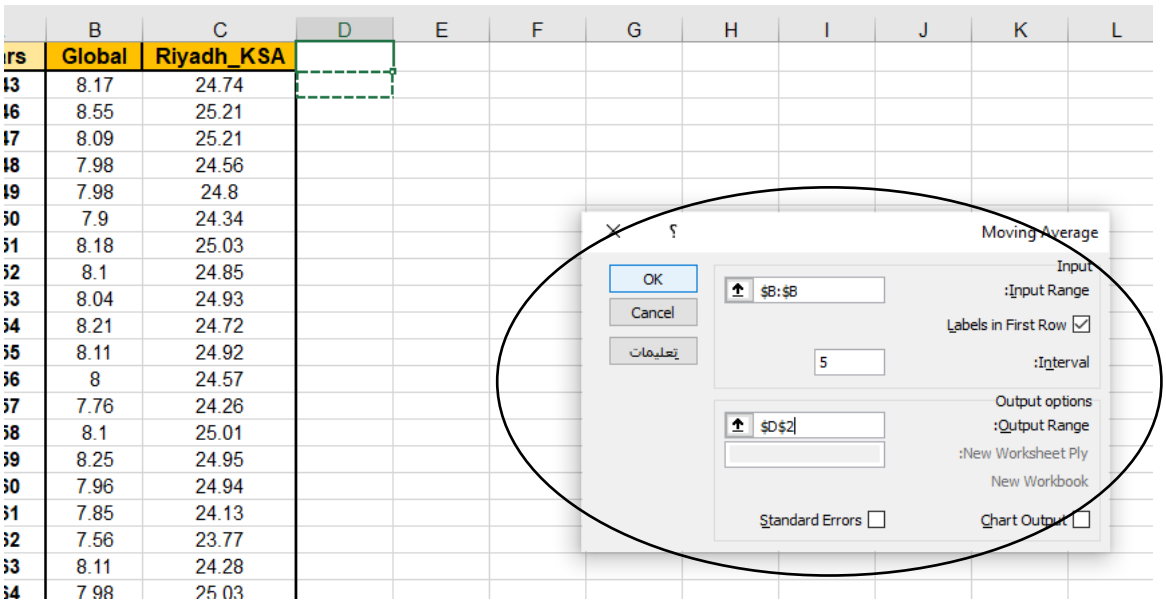
3- What does the general trend look like, is the world getting hotter or colder, and has the trend been consistent over the past few hundred years?

When we see Temperature Comparison Plot with Trend Line., we see that the general temperature trend is increasing significantly. Yes, the movement is constant and it is linear upward, so we conclude that the world is getting hotter.

4- How did you calculate the moving average?







	B	C	D	E	F	G	H	I	J	K	L
rs	Global	Riyadh_KSA									
43	8.17	24.74									
46	8.55	25.21									
47	8.09	25.21									
48	7.98	24.56									
49	7.98	24.8									
50	7.9	24.34									
51	8.18	25.03									
52	8.1	24.85									
53	8.04	24.93									
54	8.21	24.72									
55	8.11	24.92									
56	8	24.57									
57	7.76	24.26									
58	8.1	25.01									
59	8.25	24.95									
60	7.96	24.94									
61	7.85	24.13									
62	7.56	23.77									
63	8.11	24.28									
64	7.98	25.03									

D1 | MA_5_Global

	A	B	C	D	E
1	Years	Global	Riyadh_KSA	MA_5_Global	
2	1843	8.17	24.74	#N/A	
3	1846	8.55	25.21	#N/A	
4	1847	8.09	25.21	#N/A	
5	1848	7.98	24.56	#N/A	
6	1849	7.98	24.8	8.154	
7	1850	7.9	24.34	8.1	
8	1851	8.18	25.03	8.026	
9	1852	8.1	24.85	8.028	
10	1853	8.04	24.93	8.04	
11	1854	8.21	24.72	8.086	
12	1855	8.11	24.92	8.128	
13	1856	8	24.57	8.092	
14	1857	7.76	24.26	8.024	
15	1858	8.1	25.01	8.036	

5- What were your key considerations when deciding how to visualize the trends?

The trend of the moving average of the data.