

30/04/2020

EXPLORING WEATHER TRENDS

TOOL TO PREPARE THE DATA

- I have installed pgAdmin to deal with dataset easily using SQL.
- I have added the three required tables (city_list, city_data, global_data) to the pgAdmin App.
- I have used SQL statements to query the required information.
- I have downloaded the user result from pgAdmin to CSV file.

The screenshot displays the pgAdmin 4 web interface in a browser window. The left sidebar shows the database structure with 'public' schema selected, containing tables 'city_data', 'city_list', and 'global_data'. The central 'Query Editor' shows the following SQL query:

```
1 SELECT city_data.*, global_data.*
2 FROM city_data
3 JOIN global_data
4 ON city_data.year = global_data.year
5 where city_data.city = 'Mecca';
```

The 'Data Output' tab at the bottom shows the query results in a table with 7 rows and 7 columns. The columns are: year (bigint), city (text), country (text), avg_temp (double precision), year (bigint), and avg_temp (double precision). The data is as follows:

	year	city	country	avg_temp	year	avg_temp
	bigint	text	text	double precision	bigint	double precision
1	1843	Mecca	Saudi Arabia	25.16	1843	8.17
2	1844	Mecca	Saudi Arabia	19.05	1844	7.65
3	1845	Mecca	Saudi Arabia	22.46	1845	7.85
4	1846	Mecca	Saudi Arabia	[null]	1846	8.55
5	1847	Mecca	Saudi Arabia	[null]	1847	8.09
6	1848	Mecca	Saudi Arabia	[null]	1848	7.98
7	1849	Mecca	Saudi Arabia	[null]	1849	7.98

CALCULATE THE MOVING AVERAGE

- I converted the (csv) result file to (xlsx) file.
- I decided to use 16 files moving average for cleaning data and to ignore the Zeros values.
- I used the command (`=AVERAGEIFS(D2:D17,D2:D17,">0")`) to defin the 16 files moving average and ignoring Zeeros values.

Query_Result.xlsx - Excel

File Home Insert Page Layout Formulas Data Review View Help Power Pivot Tell me what you want to do

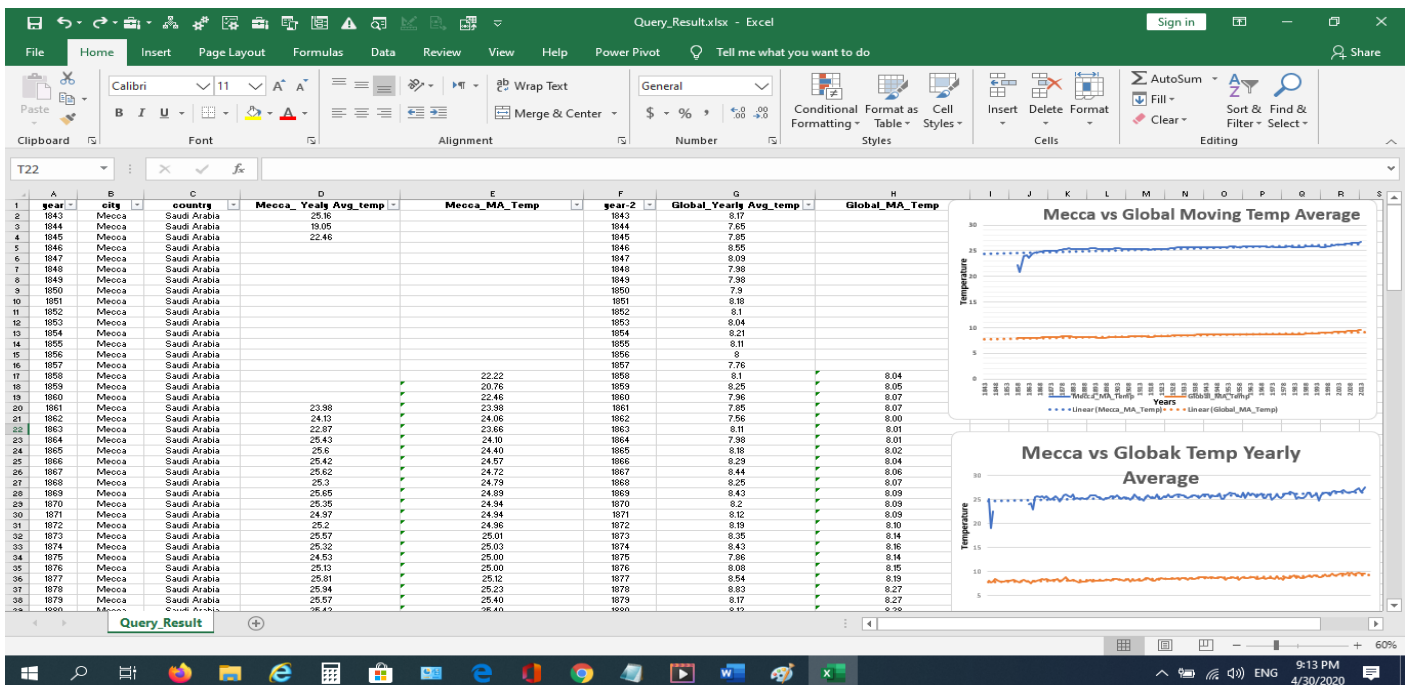
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Conditional Formatting Format as Table Cell Styles Insert Delete Format AutoSum Fill Sort & Find & Filter Clear

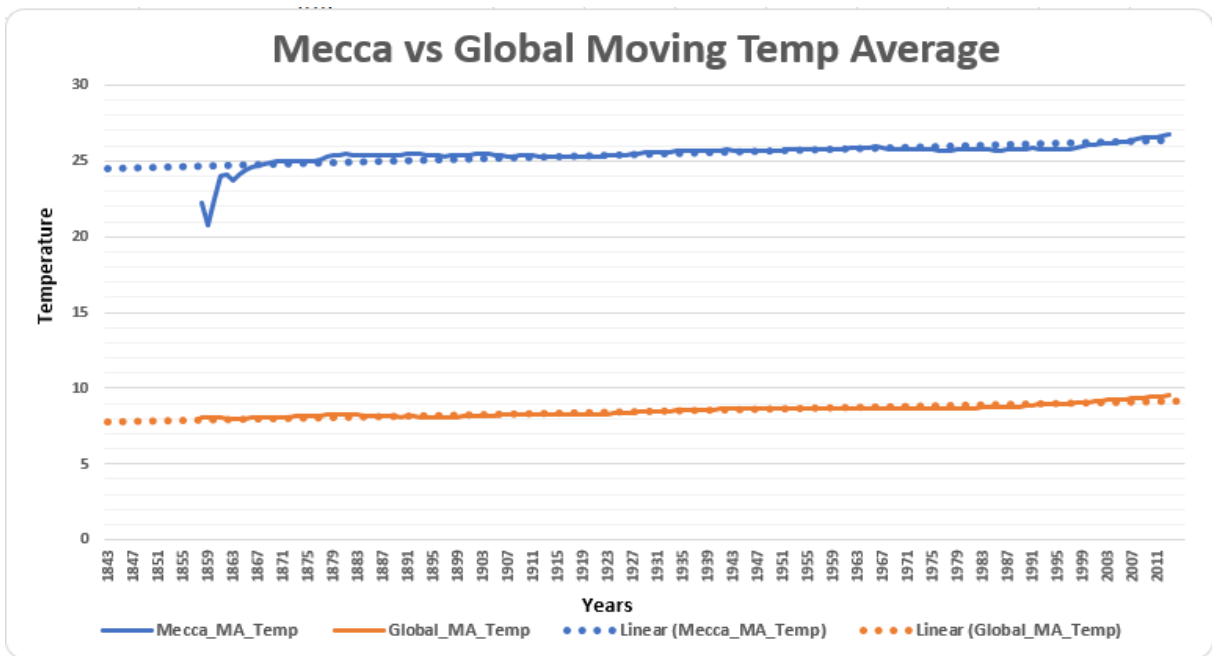
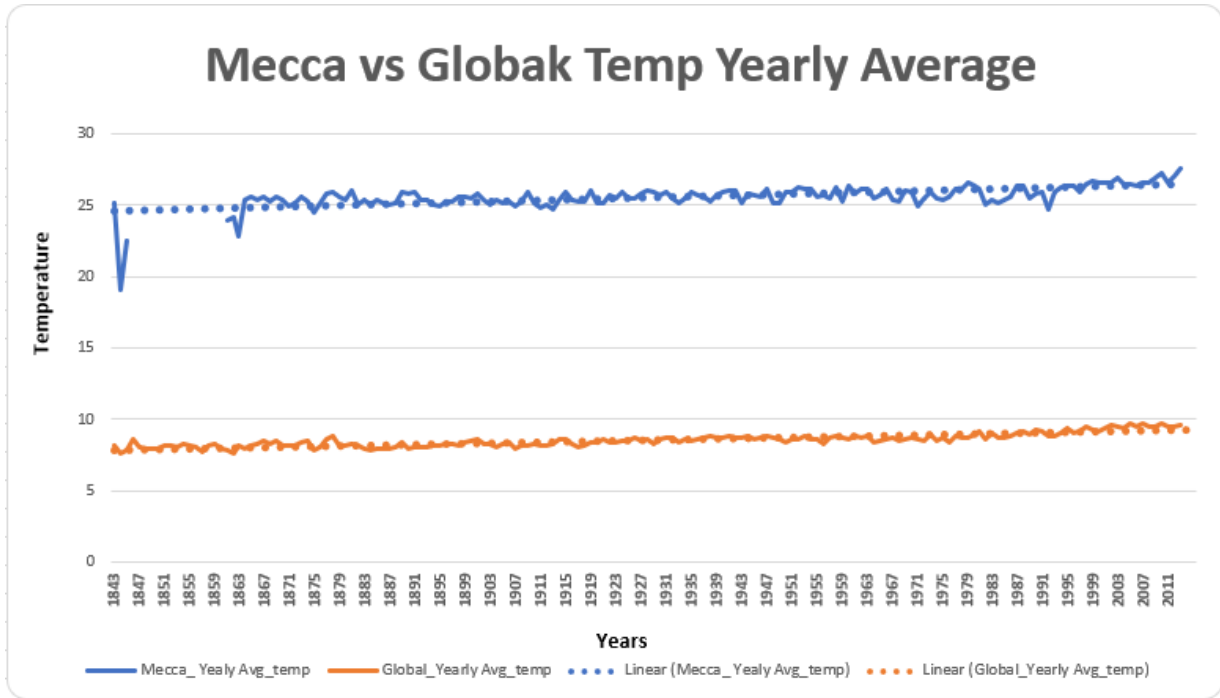
	A	B	C	D	E	F	G	H	I	J	K	L	M
	year	city	country	Mecca_ Yealy Avg_temp	Mecca_MA_Temp	year-2	Global_Yearly Avg_temp	Global_MA_Temp					
1	1843	Mecca	Saudi Arabia	25.16		1843	8.17						
2	1844	Mecca	Saudi Arabia	19.05		1844	7.65						
3	1845	Mecca	Saudi Arabia	22.46		1845	7.85						
4	1846	Mecca	Saudi Arabia			1846	8.55						
5	1847	Mecca	Saudi Arabia			1847	8.09						
6	1848	Mecca	Saudi Arabia			1848	7.98						
7	1849	Mecca	Saudi Arabia			1849	7.98						
8	1850	Mecca	Saudi Arabia			1850	7.9						
9	1851	Mecca	Saudi Arabia			1851	8.18						
10	1852	Mecca	Saudi Arabia			1852	8.1						
11	1853	Mecca	Saudi Arabia			1853	8.04						
12	1854	Mecca	Saudi Arabia			1854	8.21						
13	1855	Mecca	Saudi Arabia			1855	8.11						
14	1856	Mecca	Saudi Arabia			1856	8						
15	1857	Mecca	Saudi Arabia			1857	7.76						
16	1858	Mecca	Saudi Arabia		22.22	1858	8.1	8.04					
17	1859	Mecca	Saudi Arabia		20.76	1859	8.25	8.05					
18	1860	Mecca	Saudi Arabia		22.46	1860	7.96	8.07					
19	1861	Mecca	Saudi Arabia	23.98	23.98	1861	7.85	8.07					
20	1862	Mecca	Saudi Arabia	24.13	24.06	1862	7.56	8.00					
21	1863	Mecca	Saudi Arabia	22.87	23.66	1863	8.11	8.01					
22	1864	Mecca	Saudi Arabia	25.43	24.10	1864	7.98	8.01					
23	1865	Mecca	Saudi Arabia	25.6	24.40	1865	8.18	8.02					
24	1866	Mecca	Saudi Arabia	25.42	24.57	1866	8.29	8.04					
25	1867	Mecca	Saudi Arabia	25.62	24.72	1867	8.44	8.06					
26	1868	Mecca	Saudi Arabia	25.3	24.79	1868	8.25	8.07					
27	1869	Mecca	Saudi Arabia	25.65	24.89	1869	8.43	8.09					
28	1870	Mecca	Saudi Arabia	25.35	24.94	1870	8.2	8.09					
29	1871	Mecca	Saudi Arabia	24.97	24.94	1871	8.12	8.09					
30	1872	Mecca	Saudi Arabia	25.2	24.96	1872	8.19	8.10					
31	1873	Mecca	Saudi Arabia	25.57	25.01	1873	8.35	8.14					
32	1874	Mecca	Saudi Arabia	25.32	25.03	1874	8.43	8.16					

Query_Result



VISUALIZING THE TRENDS & THE RESULT

- Drawing line chart to show Mecca vs Global temperature yearly average.
- Drawing line chart to show Mecca vs Global moving average using 16 filed for each movment.



OBSERVATIONS ABOUT THE DATA VISUALIZATION

- i. The temperature in Makkah is approximately 20 °C higher than the global temperature.
- ii. Meccah temperature changing gradually, the trend is up, so it is an increasing linear forecast.
- iii. Global temperature changing slightly, the trend is up, so it is a very somewhat linear increasing forecast.
- iv. The temperature relation between Mecca temperature average and the Global temperature average is directly proportional.