

Explore Weather Trends

Data Analyst Nanodegree Project #1

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Extract the data from the database:

At first I wanted to see what are the cities mentioned in the database from my country. So, I wrote this SQL query:

The screenshot shows a SQL query interface. On the left, a 'SCHEMA' panel lists tables: 'avg_temp', 'city_list', 'city', 'country', and 'global_data'. The 'city_list' table is selected. The main area displays the SQL query: `SELECT * from city_list where country='Saudi Arabia';`. Below the query, a green bar indicates 'Success!'. On the right, there is an 'EVALUATE' button. The 'Output' section shows '2 results' and a 'Download CSV' link. The results are displayed in a table with two columns: 'city' and 'country'.

city	country
Mecca	Saudi Arabia
Riyadh	Saudi Arabia

Figure 1 (SQL query to display cities)

I choose Riyadh because it's the city that I'm living in. Then retrieved its information from the database using this SQL query:

The screenshot shows a SQL query interface. On the left, a 'SCHEMA' panel lists tables: 'year', 'city', 'country', 'avg_temp', and 'city_list'. The 'city_list' table is selected. The main area displays the SQL query: `SELECT * from city_data where city='Riyadh';`. Below the query, a green bar indicates 'Success!'. On the right, there is an 'EVALUATE' button. The 'Output' section shows '171 results' and a 'Download CSV' link. The results are displayed in a table with four columns: 'year', 'city', 'country', and 'avg_temp'.

year	city	country	avg_temp
1843	Riyadh	Saudi Arabia	24.74
1844	Riyadh	Saudi Arabia	15.45
1845	Riyadh	Saudi Arabia	20.82
1846	Riyadh	Saudi Arabia	
1847	Riyadh	Saudi Arabia	

Figure 2 (SQL query to display Riyadh Weather data)

After that I wrote SQL query to retrieve the global data

Input		HISTORY	MENU
SCHEMA		1 SELECT * from global_data;	
avg_temp		2	
city_list		3	
city			
country			
global_data		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		

Figure 3(SQL query to display global Weather data)

All the data from previous tables extracted to .CSV files. I used Microsoft Excel to analyze them.

To keep the analysis proper I have to not include some data like global data between (1750-1842) due to unavailable information in Riyadh in these years. And Riyadh data in (1846 and 1847) due to null values. Then the included years will be (1843-1845,1848-2013) 169 years in total.

I decided to make moving average for 13 years bases for both Global and Riyadh temperatures using "Average" function.

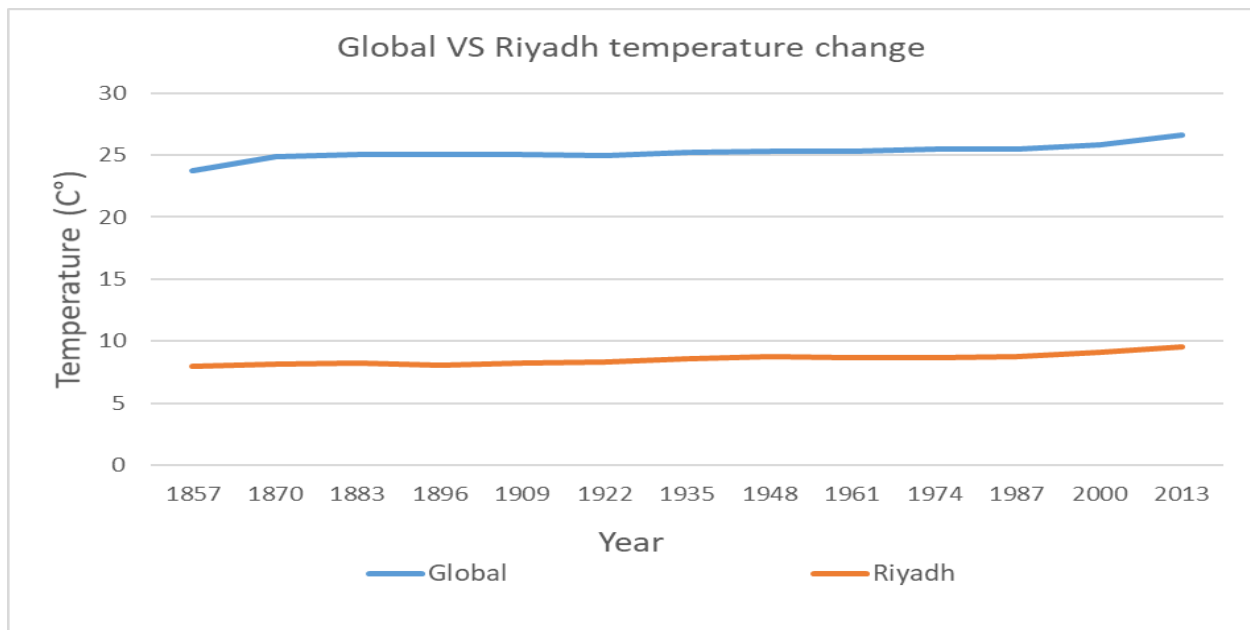


Figure 4 (13- Years Moving average for Global and Riyadh temperature)

Other charts to show clearer view of the global and Riyadh average changes in the passing decades.

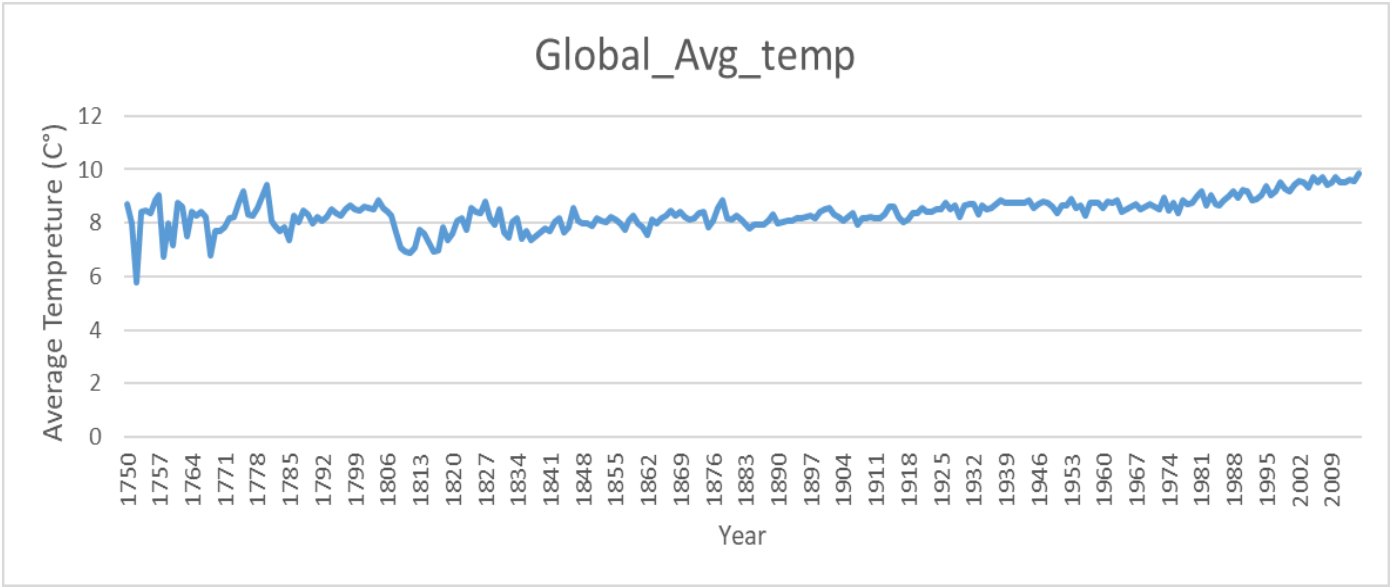


Figure 5 (One-Year moving average for the Global temperature)

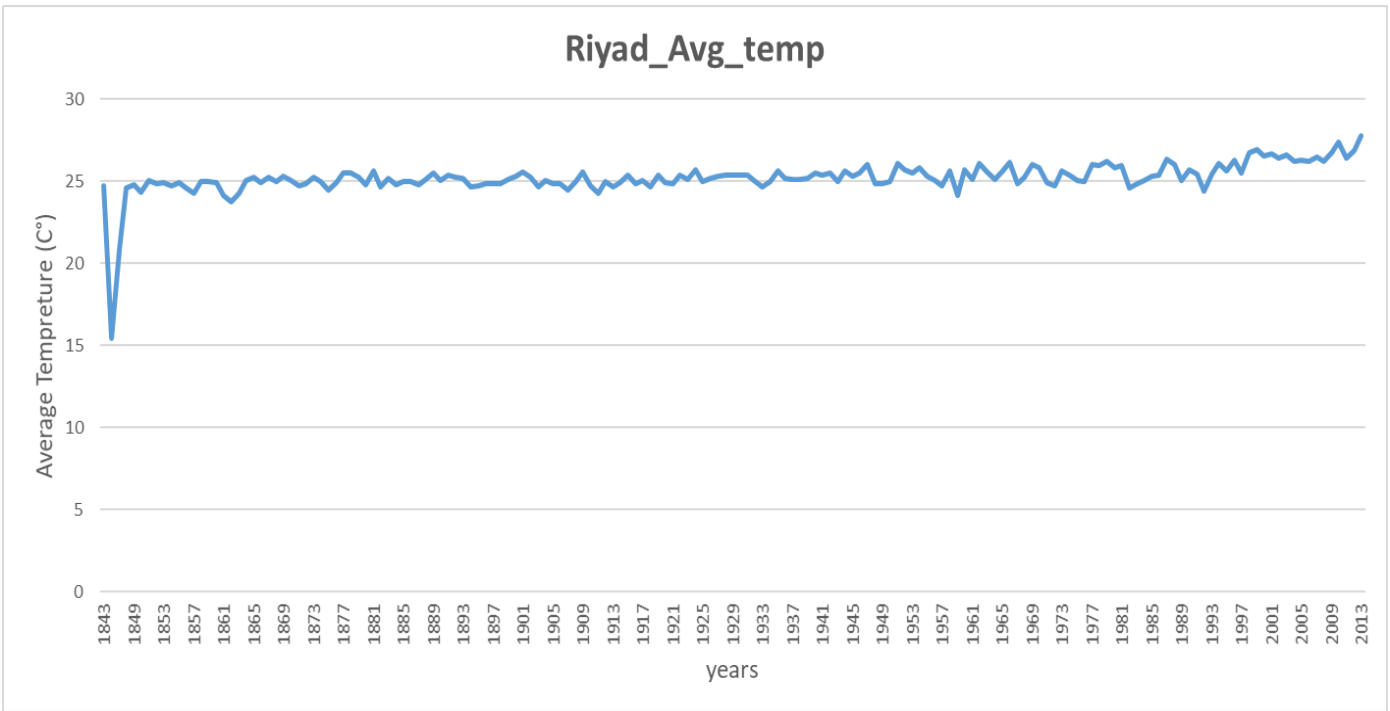


Figure 6 (One-Year moving average for Riyadh temperature)

From the previous chart and the information extracted from the Database I conclude to some observation:

- 1) Riyadh is way hotter than the global average considering that Riyadh's temperature is always greater than the global temperature in the last couple hundred years. This is attributed to the location of Riyadh which is near by the Equator where the weather is hot and dry.
- 2) In both moving averages of Global and Riyadh temperatures we see rapidly incrementing temperature.
- 3) The coldest year Riyadh ever seen is 1843 and I wondered why is it so cold lower than the average by 10 degrees I searched for what happened in that year and the most convincing explanation I think is the great storms that stroke the northern side of the equator as mentioned in the theory of storms. (The North American Review, Apr., 1844, Vol. 58, No. 123 (Apr., 1844), pp. 335- 371)
- 4) The temperature changes are clearly larger in Riyadh rather than the global changes.
- 5)

Global		Riyadh	
Average=	8.369474	Average=	25.21414
Max=	9.83	Max=	27.78
Min=	5.78	min=	15.45
Δ =	4.05	Δ =	12.33

Figure 7 (Average, max, min and Δ for Globale and Riyadh temperature)