

EXPLORING WEATHER TRENDS

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Prepared By

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Data Analyst – Udacity Nanodegree program



Overview

In this project, I was analyze and compare the temperature trends between my closest big city "Riyadh" to overall global temperature trends.

Tools used

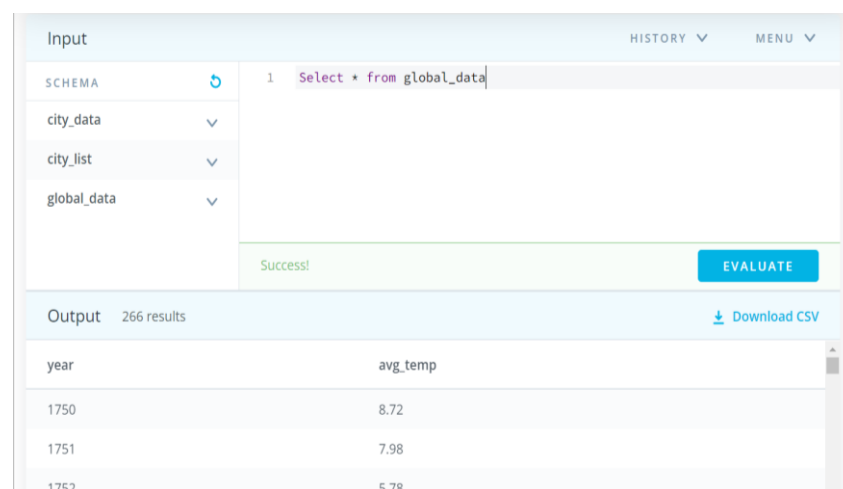
SQL: To retrieve the data from the database.

Microsoft Excel: To cleaning the dataset, calculating moving average and visualization.

Executing Steps

1- Extract the data:

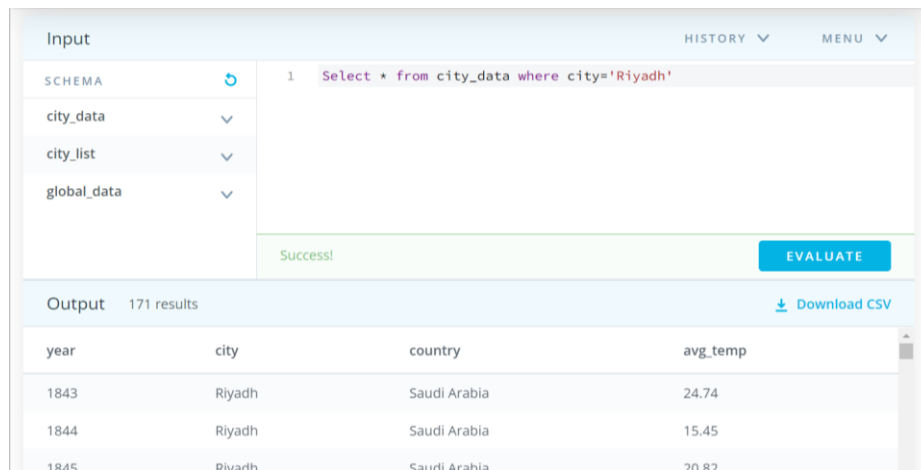
First, I wrote SQL query to extract the global temperature data.



The screenshot shows a web-based SQL interface. On the left, under 'Input', there is a 'SCHEMA' dropdown menu with options: 'city_data', 'city_list', and 'global_data'. The main query editor contains the SQL statement: '1 Select * from global_data'. Below the query editor, a green bar indicates 'Success!'. To the right of this bar is a blue button labeled 'EVALUATE'. Below the success message, the 'Output' section shows '266 results' and a 'Download CSV' link. The output is displayed as a table with two columns: 'year' and 'avg_temp'. The first three rows of data are visible: 1750 with avg_temp 8.72, 1751 with avg_temp 7.98, and 1752 with avg_temp 5.78.

year	avg_temp
1750	8.72
1751	7.98
1752	5.78

Then I used SQL query to extract my closest city "Riyadh" temperature data.



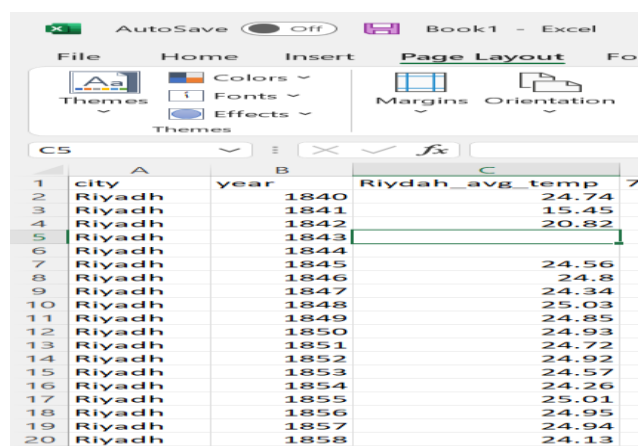
The screenshot shows a SQL query interface with the following components:

- Input:** A schema dropdown menu with options: city_data, city_list, and global_data. A query editor contains the SQL query: `Select * from city_data where city='Riyadh'`. A green bar below the query indicates "Success!". An "EVALUATE" button is on the right.
- Output:** A table with 171 results. The table has columns: year, city, country, and avg_temp. The first three rows are visible:

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

2- Cleaning and merge the data

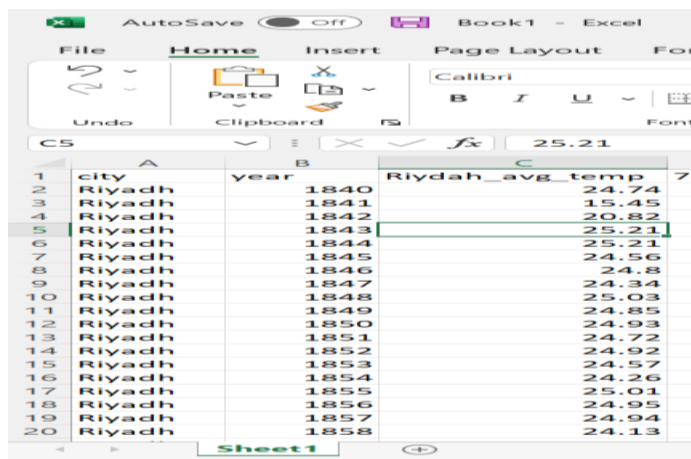
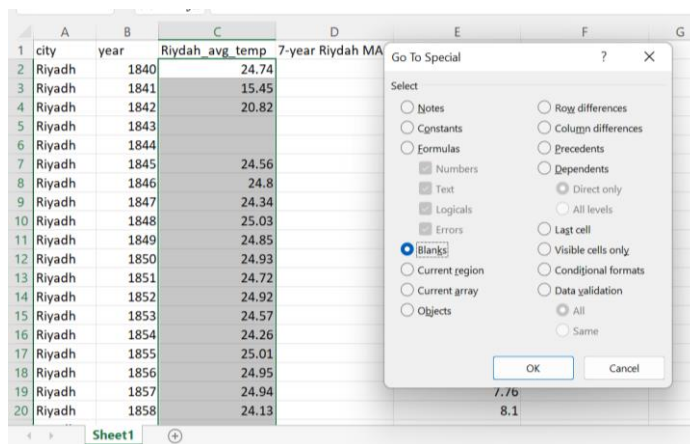
- I export to csv and combine both data in one csv file, due to the different years in both datasets and to provide more accurate results, only the common years from 1840 to 2015 were taken.
- I handled the missing values in my city data by calculate the mean.



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C
	city	year	Riydah_avg_temp
2	Riyadh	1840	24.74
3	Riyadh	1841	15.45
4	Riyadh	1842	20.82
5	Riyadh	1843	
6	Riyadh	1844	
7	Riyadh	1845	24.56
8	Riyadh	1846	24.8
9	Riyadh	1847	24.34
10	Riyadh	1848	25.03
11	Riyadh	1849	24.85
12	Riyadh	1850	24.93
13	Riyadh	1851	24.72
14	Riyadh	1852	24.92
15	Riyadh	1853	24.57
16	Riyadh	1854	24.26
17	Riyadh	1855	25.01
18	Riyadh	1856	24.95
19	Riyadh	1857	24.94
20	Riyadh	1858	24.13





3- Calculate Moving Average (7-year MA)

I used Excel to find moving averages (7-years) for Riyadh and global temperatures to make it easier to observe long term trends during data visualization.

temp_Riydah vs Global - Saved

city	year	Riyadh_avg_temp	7-year Riyadh MA
Riyadh	1840	24.74	
Riyadh	1841	15.45	
Riyadh	1842	20.82	
Riyadh	1843	25.21	
Riyadh	1844	25.21	
Riyadh	1845	24.56	
Riyadh	1846	24.8	
Riyadh	1847	24.34	
Riyadh	1848	25.03	
Riyadh	1849	24.85	
Riyadh	1850	24.93	
Riyadh	1851	24.72	
Riyadh	1852	24.92	
Riyadh	1853	24.57	
Riyadh	1854	24.26	
Riyadh	1855	25.01	
Riyadh	1856	24.95	
Riyadh	1857	24.94	
Riyadh	1858	24.13	



temp_Riydah vs Global - Saved

city	year	Riyadh_avg_temp	7-year Riyadh MA
Riyadh	1840	24.74	
Riyadh	1841	15.45	
Riyadh	1842	20.82	
Riyadh	1843	25.21	
Riyadh	1844	25.21	
Riyadh	1845	24.56	
Riyadh	1846	24.8	22.07
Riyadh	1847	24.34	22.91
Riyadh	1848	25.03	24.28
Riyadh	1849	24.85	24.86
Riyadh	1850	24.93	24.82
Riyadh	1851	24.72	24.75
Riyadh	1852	24.92	24.80
Riyadh	1853	24.57	24.77
Riyadh	1854	24.26	24.75
Riyadh	1855	25.01	24.75
Riyadh	1856	24.95	24.77
Riyadh	1857	24.94	24.77
Riyadh	1858	24.13	24.68

Global_avg_temp vs Global - Saved

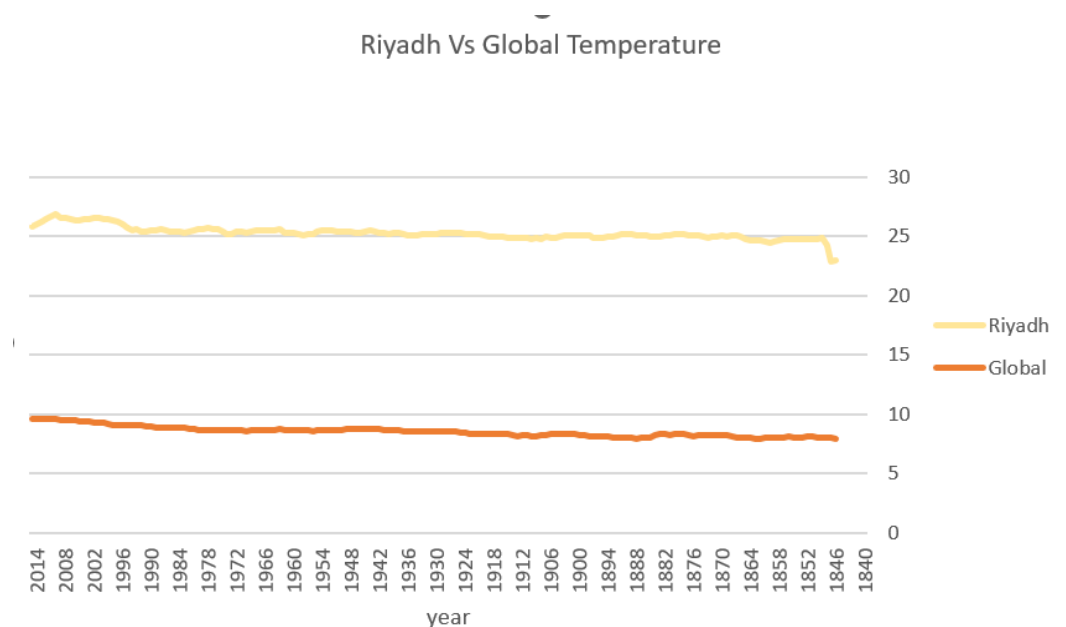
Global_avg_temp	7-year Global MA
7.8	
7.69	
8.02	
8.17	
7.65	
7.85	
8.55	
8.09	
7.98	
7.98	
7.9	
8.18	
8.1	
8.04	
8.21	
8.11	
8	
7.76	
8.1	



Global_avg_temp vs Global - Saved

Global_avg_temp	7-year Global MA
7.8	
7.69	
8.02	
8.17	
7.65	
7.85	
8.55	7.96
8.09	8.00
7.98	8.04
7.98	8.04
7.9	8.00
8.18	8.08
8.1	8.11
8.04	8.04
8.21	8.06
8.11	8.07
8	8.08
7.76	8.06
8.1	8.05

The line chart below shows a comparison between Riyadh and global temperature across the years:



Observations

- As shown in the chart , Riyadh temperature is hotter compare to average global temperature.
- We can observed that the global average temperature and Riyadh average temperature has changed over time.
- The average temperature for Riyadh ranges from 22.90°C to 26.55°C.
- The average temperature for global ranges from 7.12°C to 9.90°C.
- The global average temperature has been increasing abnormally in the past hunder years, that means the world is getting warmer.