



EXPLORE WEATHER TRENDS

Amani Abbas



PART 1 OUT OF 8 – PROJECT 1

DATA ANALYST NANODEGREE

www.Udacity.com

Outlines

Steps to Prepare Data

Outlines

To prepare data I went through these steps:

1- I extracted data from the database using SQL:

1) Used this query to find my city:

The screenshot shows a SQL query interface. On the left, under 'Input', there is a 'SCHEMA' section with a refresh icon. Below it, a list of tables is shown: 'city_data', 'city_list', 'city', and 'country'. The 'city_data' table is selected. To the right, the SQL query is displayed:

```
1 SELECT *
2 FROM city_list
3 WHERE country = 'Saudi Arabia'
```

 Below the query, there is a green 'Success!' message and a blue 'EVALUATE' button. Under the 'Output' section, it says '2 results' and has a 'Download CSV' link. The output table has two columns: 'city' and 'country'. The results are: Mecca, Saudi Arabia and Riyadh, Saudi Arabia.

city	country
Mecca	Saudi Arabia
Riyadh	Saudi Arabia

2) Used this query to show the data from city_data where city = 'Riyadh'

The screenshot shows a SQL query interface. On the left, under 'Input', there is a 'SCHEMA' section with a refresh icon. Below it, a list of tables is shown: 'city_data', 'year', 'city', 'country', and 'avg_temp'. The 'city_data' table is selected. To the right, the SQL query is displayed:

```
1 SELECT *
2 FROM city_data
3 WHERE city = 'Riyadh'
```

 Below the query, there is a green 'Success!' message and a blue 'EVALUATE' button. Under the 'Output' section, it says '171 results' and has a 'Download CSV' link. The output table has four columns: 'year', 'city', 'country', and 'avg_temp'. The results are: 1843, Riyadh, Saudi Arabia, 24.74; 1844, Riyadh, Saudi Arabia, 15.45; 1845, Riyadh, Saudi Arabia, 20.82.

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

- 3) I have noticed that years 1846 and 1847 have null values on avg_temp column , and those are the only null values I had, so decided to write a query to extract data from year 1848 and after, then I have downloaded the results as CSV file.

Input		HISTORY ▾	MENU ▾
SCHEMA	↻	<pre>1 SELECT * 2 FROM city_data 3 WHERE city = 'Riyadh' AND year >= 1848</pre>	
city_data	▾		
city_list	▾		
global_data	▾		
		Success!	EVALUATE
Output		166 results	Download CSV
year	city	country	avg_temp
1848	Riyadh	Saudi Arabia	24.56
1849	Riyadh	Saudi Arabia	24.80
1850	Riyadh	Saudi Arabia	24.34

- 4) Moved to global_data table to extract data from year 1848 to year 2013 (the last year in the city_data table for Riyadh city) so I can have the same period of time to compare the results. Then I have downloaded the results as CSV file.

Input		HISTORY ▾	MENU ▾
SCHEMA	↻	<pre>1 SELECT * 2 FROM global_data 3 WHERE year BETWEEN 1848 AND 2013</pre>	
city_data	▾		
city_list	▾		
global_data	▾		
		Success!	EVALUATE
Output		166 results	Download CSV
year	avg_temp		
1848	7.98		
1849	7.98		
1850	7.90		

- 2- Uploaded the files to google drive so I can open them using Google Spreadsheet. You can find them using the link below:

[Project Google Spreadsheet](#)

- 3- Calculated the moving average (5-Years Moving Average) by using AVERAGE function.
- 4- Created a chart for each data table (city_data and global data) using the 5-Years Moving Average.
- 5- Created a chart to compare both tables.
- 6- Found the range for 5-Years MA for each table (Max – Min).

Observations

My observations about the data

Observations

Let's have a look at the first chart:

The Average Temperatures for Riyadh City



This chart is showing the average temperatures for Riyadh city – Saudi Arabia, using 5-Years moving average, for the years between 1848 and 2013 (166 years).

We can see multiple things:

- 1- The temperatures trend is going high, which means Riyadh city is getting hotter over the years.
- 2- Minimum temperature is 24.414 °C and maximum temperature is 27.018 °C.
- 3- The range of temperatures going up and down between the minimum and maximum temperatures is around 2.604 °C temperatures.
- 4- We can see that there is a huge rise in temperatures after the year 1993, with a little drop between 2003 and 2009, then continued its way to reach its maximum with 27.018 °C in 2013.

The second chart is The Average Global Temperatures:

The Average Global Temperatures



This chart is showing the average global temperatures, using 5-Years moving average, for the years between 1848 and 2013 (166 years).

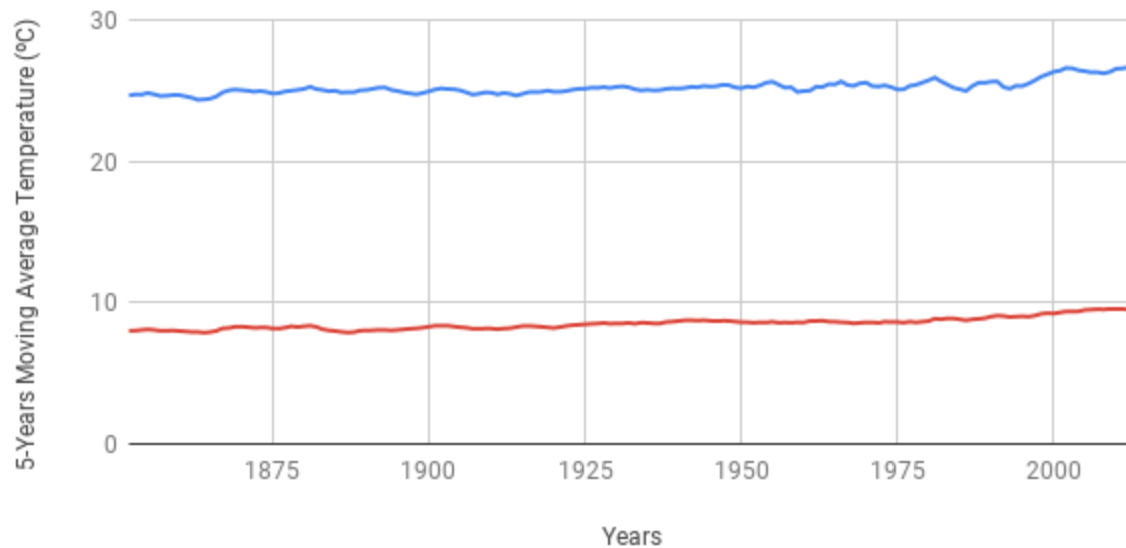
We can see multiple things:

- 1- The temperatures trend is going high, which means the world is getting hotter over the years.
- 2- Minimum temperature is 7.892 °C and maximum temperature is 9.58 °C.
- 3- The range of temperatures going up and down between the minimum and maximum temperatures is around 1.688 °C temperatures.
- 4- The biggest drop happened between the years 1881 and 1888 to reach 7.982 °C, then the temperatures trend started to keep moving up with little drops and obvious rise.

The last chart is to compare both charts (the average temperatures for Riyadh city and the average global temperatures)

Comparing Both Data

Riyadh City Average Temperature and Average Global Temperature



This chart is showing both the average temperatures for Riyadh city (in blue) and the average global temperatures (in red), using 5-Years moving average, for the years between 1848 and 2013 (166 years).

And here we can observe the next:

- 1- Both trends are going higher, which means that Riyadh city and the world are getting hotter over the years.
- 2- There is a huge difference in the temperatures between Riyadh city and the average global temperatures.
- 3- Riyadh city temperatures are higher than the average global temperatures with minimum 16.522 °C and maximum 17.438 °C temperatures.