

# Project

## Explore Weather Trends

- **An outline** of steps taken to prepare the data to be visualized in the chart, such as:
  - What tools did you use for each step? (Python, SQL, Excel, etc)
  - SQL ( Extraction data from the database )
  - Excel ( Calculate the Moving Averages of global temperatures and city temperatures + Create line chart with local and global temperature trends )
  - How did you calculate the moving average?  
By Excel sheet I used AVERAGE function
  - What were your key considerations when deciding how to visualize the trends?

To capture my observations on the moving average temperatures of my city vs the world.

## Extracting Data: (SQL)

### First Step:

I wrote a SQL query to find my city ( Riyadh ), If I don't find it I'll replace the city with country and chose the nearest city to me.

Input

HISTORY ▾

MENU ▾

SCHEMA ↻

city\_data ▾

city\_list ▾

global\_data ▾

1 select \*

2 from city\_list

3 where city = 'Riyadh'

Success!

EVALUATE

Output 1 results

[Download CSV](#)

city	country
Riyadh	Saudi Arabia

## Second Step:

To extract the average temperatures of my city Riyadh by year, I've chosen two columns ( Year + Avg\_temp ) from city\_data table.

Input

HISTORY ▾

MENU ▾

SCHEMA ↺

city\_data ▾

city\_list ▾

global\_data ▾

1 select year, avg\_temp

2 from city\_data

3 where city = 'Riyadh'

4

Success!

EVALUATE

Output

171 results

Download CSV

year	avg_temp
1843	24.74
1844	15.45
1845	20.82
1846	
1847	

### Third Step:

To extract the average global temperatures by year, I've chosen all of the data of `global_data` table, because it has only two columns `year` and `avg_temp`.

Input

HISTORY ▾

MENU ▾

SCHEMA ↻

city\_data ▾

city\_list ▾

global\_data ▴

year

avg\_temp

1 `select *`

2 `from global_data`

3

4

5

Success!

EVALUATE

Output 266 results

[Download CSV](#)

year	avg_temp
1750	8.72
1751	7.98
1752	5.78

## Moving Averages: (Excel)

### First Step:

There's two missing values of avg\_temp in the city data temperatures.

So, I found the mean of these two missing values in year 1846 and 1847 to refill the empty cells.

D2

$\Delta$

$\times$

$\checkmark$

$f_x$

=AVERAGE(B2:B172)

	A	B	C	D	E	F	G
1	year	avg_temp	MA_temp	Mean			
2	1843	24.74		25.21			
3	1844	15.45					
4	1845	20.82					
5	1846	25.21					
6	1847	25.21	22.29				
7	1848	24.56	22.25				
8	1849	24.80	24.12				
9	1850	24.34	24.82				
10	1851	25.03	24.79				
11	1852	24.85	24.72				
12	1853	24.93	24.79				
13	1854	24.72	24.77				
14	1855	24.92	24.89				
15	1856	24.57	24.80				
16	1857	24.26	24.68				
17	1858	25.01	24.70				
18	1859	24.95	24.74				
19	1860	24.94	24.75				
20	1861	24.13	24.66				
21	1862	23.77	24.56				
22	1863	24.28	24.41				
23	1864	25.03	24.43				
24	1865	25.23	24.49				
25	1866	24.92	24.65				
26	1867	25.22	24.94				
27	1868	25.00	25.08				
28	1869	25.30	25.13				
29	1870	25.02	25.09				
30	1871	24.73	25.05				
31	1872	24.87	24.98				
32	1873	25.24	25.03				
33	1874	24.98	24.97				
34	1875	24.43	24.85				
35	1876	24.89	24.88				

CityData

GlobalData

Line chart

+

## Second Step:

I created third column called MA\_temp, which is where the moving average field will be stored, Then I go down to the fifth year (1847) and used the AVERAGE() function to calculate the average temperatures for the first five years of the city. as seen in the below spreadsheet.

C6							
	A	B	C	D	E	F	G
1	year	avg_temp	MA_temp	Mean			
2	1843	24.74		25.21			
3	1844	15.45					
4	1845	20.82					
5	1846	25.21					
6	1847	2	22.29				
7	1848	24.36	22.25				
8	1849	24.80	24.12				
9	1850	24.34	24.82				
10	1851	25.03	24.79				
11	1852	24.85	24.72				
12	1853	24.93	24.79				
13	1854	24.72	24.77				
14	1855	24.92	24.89				
15	1856	24.57	24.80				
16	1857	24.26	24.68				
17	1858	25.01	24.70				
18	1859	24.95	24.74				
19	1860	24.94	24.75				
20	1861	24.13	24.66				
21	1862	23.77	24.56				
22	1863	24.28	24.41				
23	1864	25.03	24.43				
24	1865	25.23	24.49				
25	1866	24.92	24.65				
26	1867	25.22	24.94				
27	1868	25.00	25.08				
28	1869	25.30	25.13				
29	1870	25.02	25.09				
30	1871	24.73	25.05				
31	1872	24.87	24.98				
32	1873	25.24	25.03				
33	1874	24.98	24.97				
34	1875	24.43	24.85				
35	1876	24.89	24.88				

CityData

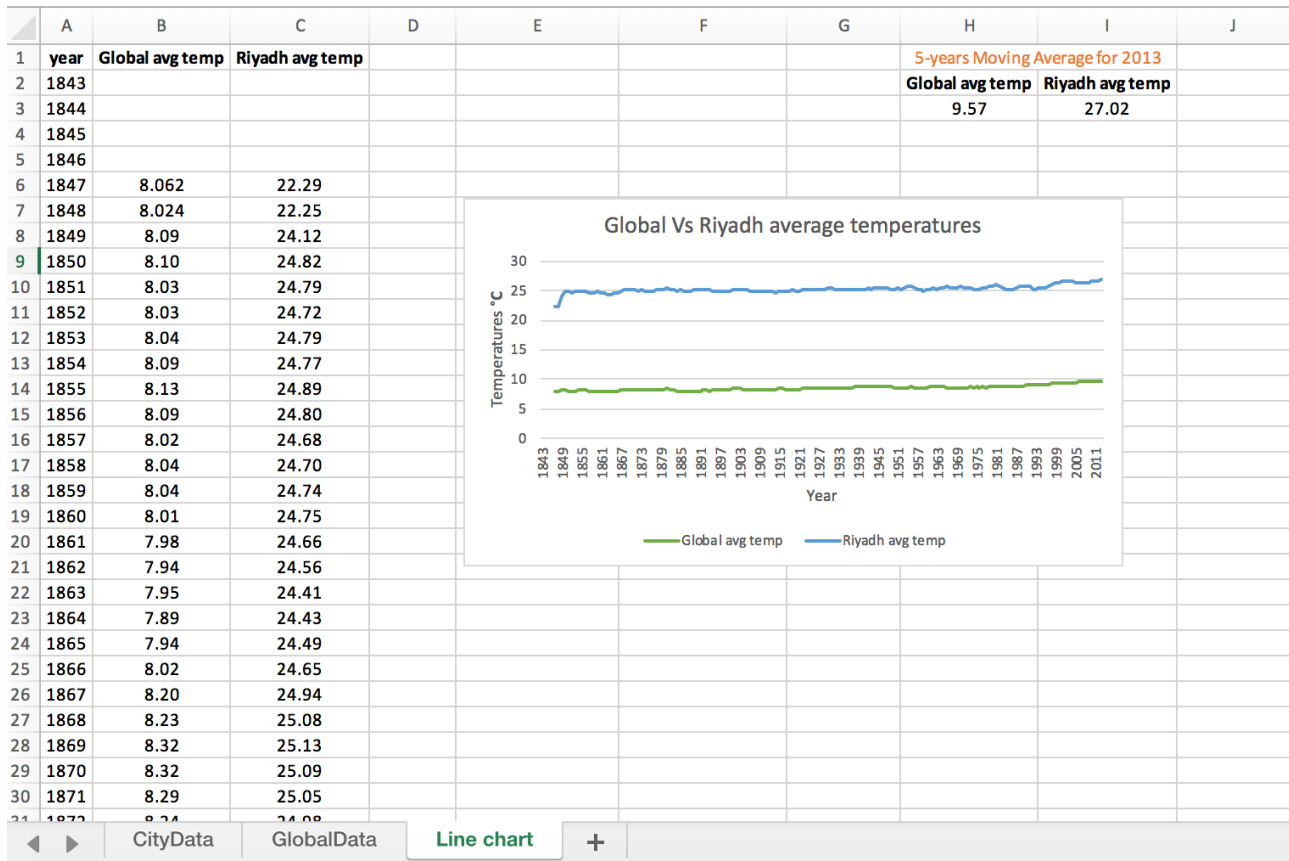
GlobalData

Line chart

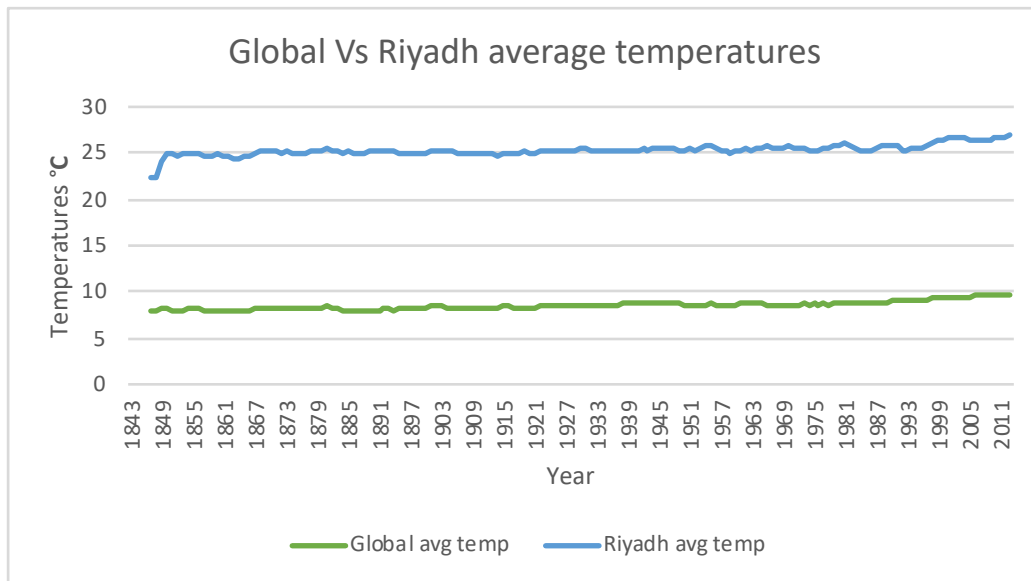
+

### Third Step:

I did the same of second step to Global data. Now I've the 5-Years Moving Averages temperatures of city data and global data. as seen in the below spreadsheet.



## Observation:



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

We can notice that from the above chart, my city's hotter than the global average temperatures with a big difference.

- How do the changes in your city's temperatures over time compare to the changes in the global average?"

The changes in my city's temperature is significantly increasing and we can notice that when we look at the temperature of 1847 and compare it with 2011! there's almost five degrees difference, on the contrary global temperatures is consistently increasing but not remarkably (small difference between the years).

- What does the overall trend look like? Is the world getting hotter or cooler? Has the trend been consistent over the last few hundred years?

Overall the world is getting hotter because the trend of average temperatures has been constantly increased every 5 years over the last few hundred years.