

# Exploring Weather Trends

## Project 1

### 1- Extract Global Data

Using the following sql command, data from table global\_data will be selected:

```
select * from global_data order by year
```

Output:

The screenshot shows a SQL query interface. The 'Input' section contains a schema dropdown with 'global\_data' selected, a query editor with the command 'select \* from global\_data order by year', and a 'Success!' message. The 'Output' section shows 266 results with a 'Download CSV' link. The first three rows of the output table are visible:

year	avg_temp
1750	8.72
1751	7.98
1752	5.78

Figure 1 Sql Global data

#### a. CSV File Output:

The file looks like the screen shot below.

	A	B
1	year	avg_temp
2	1750	8.72
3	1751	7.98
4	1752	5.78
5	1753	8.39
6	1754	8.47
7	1755	8.36
8	1756	8.85
9	1757	9.02
10	1758	6.74
11	1759	7.99
12	1760	7.19

Figure 2 CSV file

### b. Calculating Moving Average

To calculate moving average, we first need to calculate the average of the first set using the defined period (7 days) in our case, then moving the average formula to the end of the dataset. As shown in the figures below:

#### Step 1: Moving average for 7 days

	A	B	C
1	year	avg_temp	Global
2	1750	8.72	
3	1751	7.98	
4	1752	5.78	
5	1753	8.39	
6	1754	8.47	
7	1755	8.36	
8	1756	8.85	=AVERAGE(B2:B8)

Figure 3 Moving Average 1

#### Step 2: Moving average for the rest of dataset

	A	B	C
1	year	avg_temp	Global
2	1750	8.72	
3	1751	7.98	
4	1752	5.78	
5	1753	8.39	
6	1754	8.47	
7	1755	8.36	
8	1756	8.85	8.08
9	1757	9.02	8.12
10	1758	6.74	7.94
11	1759	7.99	=AVERAGE(B5:B11)
12	1760	7.19	AVERAGE(B5:B11)
13	1761	8.77	8.13
14	1762	8.61	8.17
15	1763	7.5	7.97
16	1764	8.4	7.89
17	1765	8.25	8.10
18	1766	8.41	8.16
19	1767	8.22	8.31
20	1768	6.78	8.02
21	1769	7.69	7.89
22	1770	7.69	7.92
23	1771	7.85	7.84
24	1772	8.19	7.83

Figure 4 Moving Average 2

### c. Global Line Chart

Using the moving average data column, the following trend shows up.

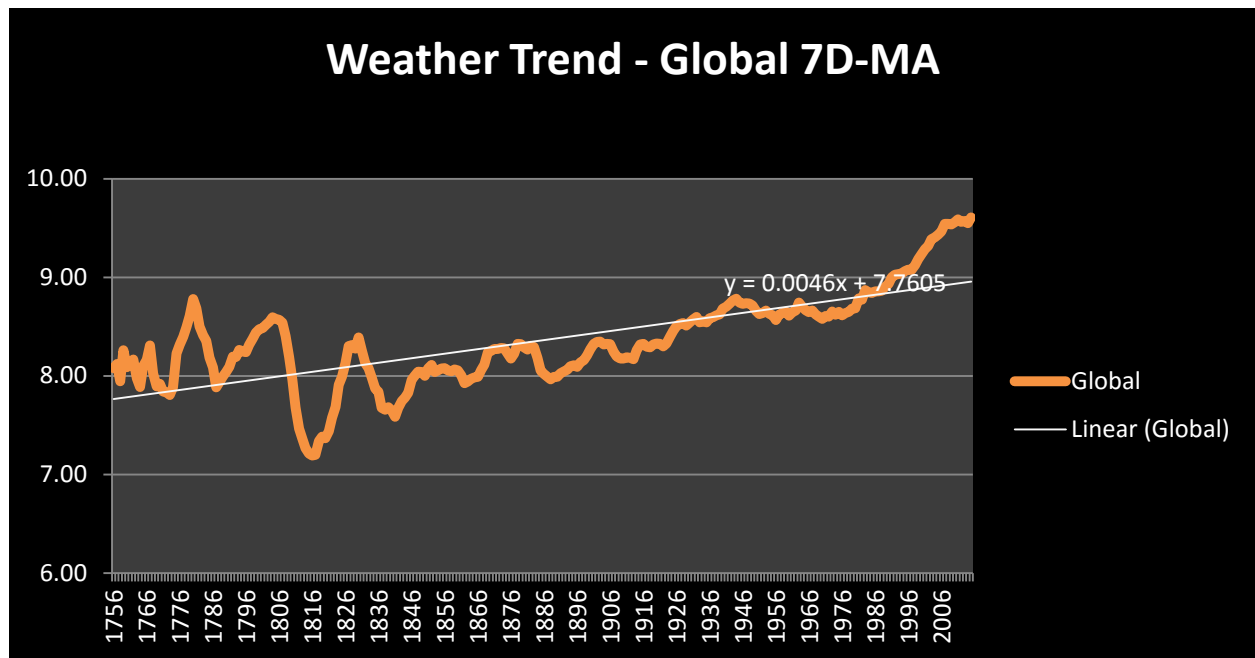


Figure 5 Global weather trend

## 2- Riyadh City

Using the following sql code:

```
select year,avg_temp from city_data where city like 'Riyadh'
```

Input		HISTORY	MENU
SCHEMA		<pre>1 select year,avg_temp from city_data where city like 'Riyadh'</pre>	
city_data			
city_list			
global_data			
Success!		EVALUATE	
Output		171 results	
		Download CSV	
year	avg_temp		
1843	24.74		
1844	15.45		
1845	20.82		
1846			

Figure 6 Sql query Riyadh

### a. Riyadh City Line Chart

Following the same steps of moving average calculation in the previous step, and then making the line chart, the following is the trend of Riyadh city:

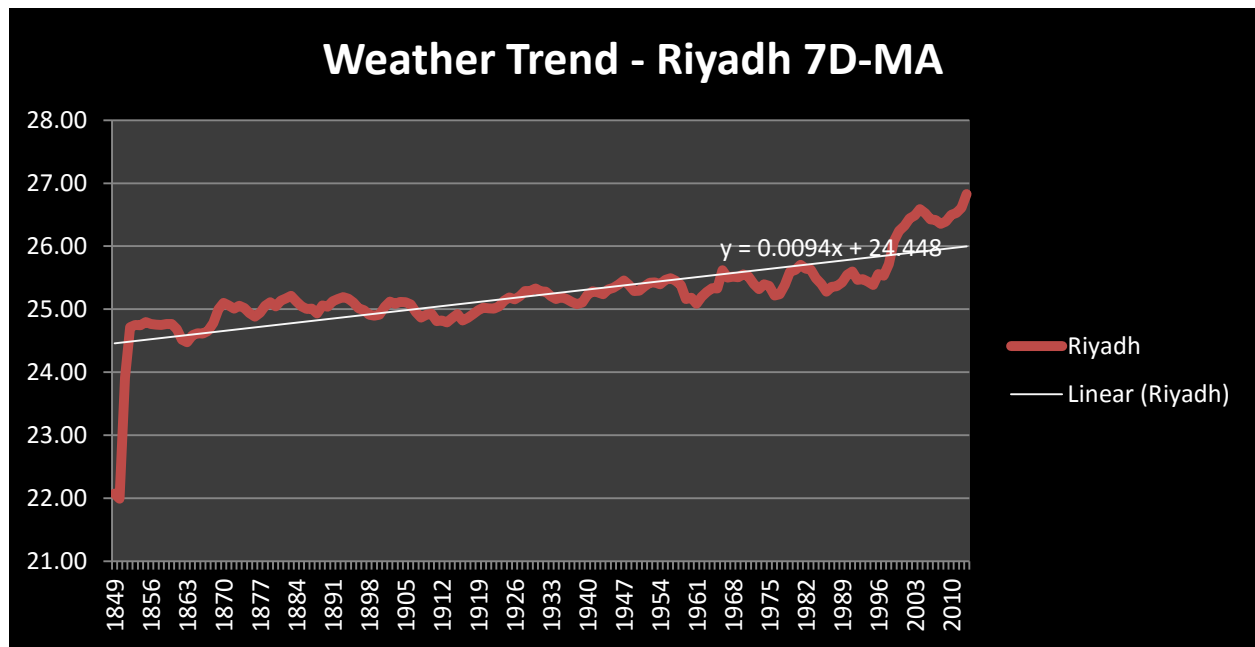


Figure 7 Weather trend Riyadh

#### b. Trends for Comparison

The range of data have been adjusted to fit the two datasets which in this case is from 1849-2013, then the following trend is produced.

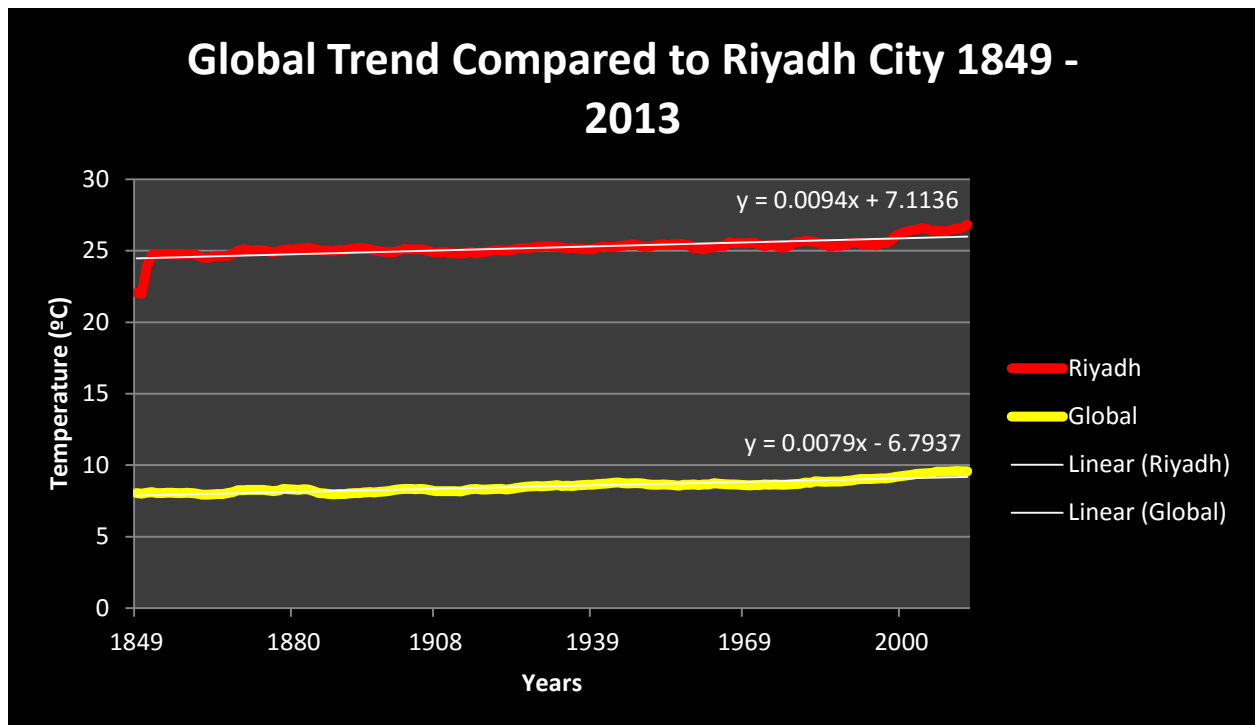


Figure 8 Global weather trend vs Riyadh

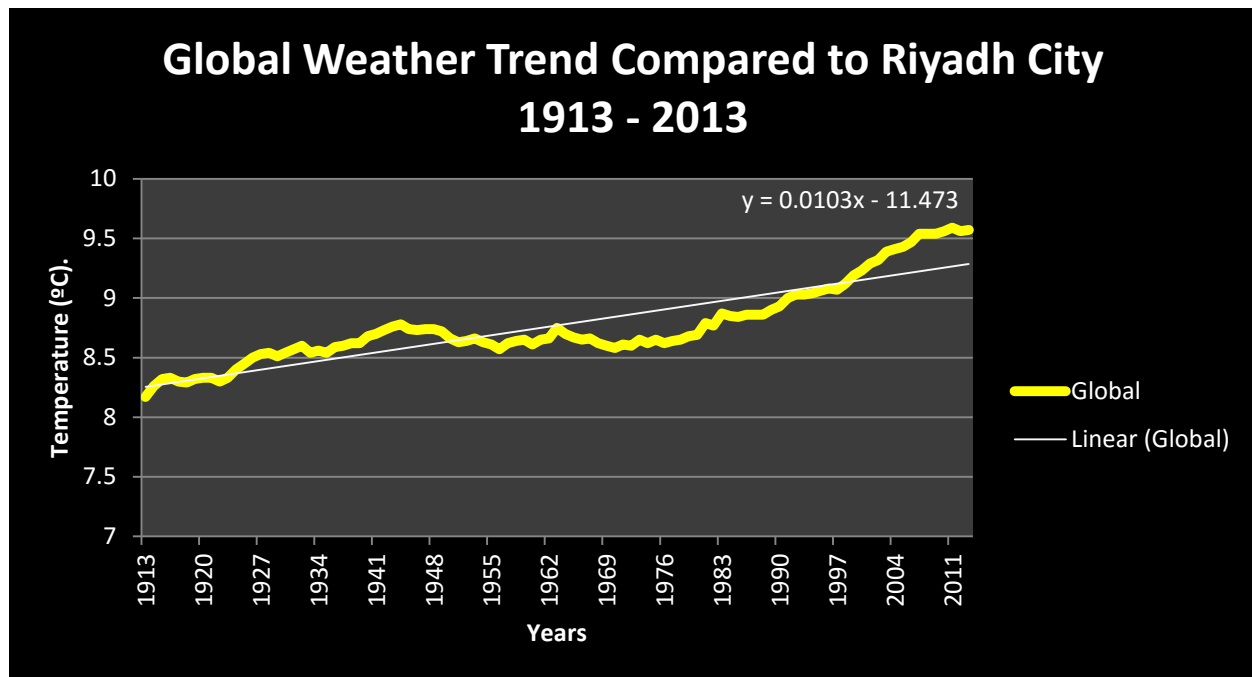


Figure 9 Global Trends last 100 years

### 3- Observations:

From the charts shown above, Riyadh average temperature tends to be hotter than global average, almost to double rate. The difference is consistent as shown in figure 8 for the same period of time. Change in weather in Riyadh city is steady as it is globally, both they are following the same pattern of rising. Globally, the weather is getting hotter with a slight increase overtime. As shown in last hundred years the global weather has risen at a higher rate of the previous time, Riyadh city trend show a similar pattern.

Tools used:

Excel : for CSV file read and modifications, analysis and charting.

Udacity Sql : <https://classroom.udacity.com/nanodegrees/nd002-connect/parts/bd6e033d-c59e-4309-86bf-9af7f688b38b/modules/e8455c07-092a-4b76-ba12-018cb53d0526/lessons/d551938c-d004-4801-a269-4b8dd784cc3b/concepts/530f21c0-2f37-4390-aaab-3ce440e56d80>

Word: for editing

Hint: Trendline equations added to indicate the rising on a trend.

End of File