

Project 1

Explore Weather Trends



Data Analyst

Presented by:

Abdulaziz Alqumayzi

Table of Content:

1	Introduction	3
2	Software Tools	3
3	Work Process	3
3.1	Extract the Data	3,4
3.2	Choosing the Samples	4
3.3	Implementation	5,6,7,8,9
4	Similarities and Differences	10
5	Conclusion	10

1 Introduction

Explore Weather Trends is the first project at Udacity Data Analyst program. Project 1 focuses on how to extract the data from database by using SQL language and how to smooth the data by using a technique called moving average. After that I should prepare the data to analyze it, then visualize the result with Udacity.

Goal of the project 1 is to visualize and prepare a write up description between local temperature trends of the closest city to where I live with global temperature trends to find similarities and differences.

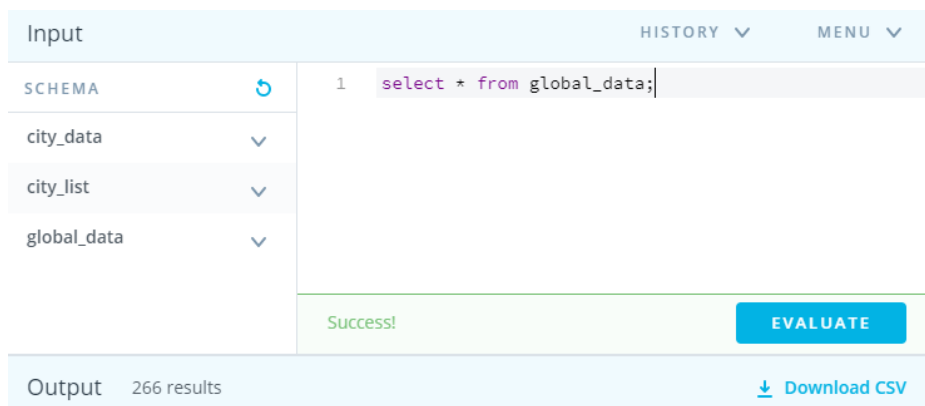
2 Software Tools

I used Excel software to open the data files that downloaded from Udacity database to prepare and visualize the project.

3 Work Process

3.1 Extract the Data

I extract the data by using SQL language. SQL codes that I execute are shown below:



Input		HISTORY ▾	MENU ▾
SCHEMA	🔄	1 select * from global_data;	
city_data	▾		
city_list	▾		
global_data	▾		
		Success!	EVALUATE
Output 266 results		Download CSV	

This query in the picture I used to extract the data in that table. And the same I used to extract data from city_data table and city_list table as shown below.

Input		HISTORY ▾	MENU ▾
SCHEMA	↻	1 <code>select * from city_data;</code>	
city_data	▾		
city_list	▾		
global_data	▾		
		Success!	EVALUATE
Output 70792 results		Download CSV	

Input		HISTORY ▾	MENU ▾
SCHEMA	↻	1 <code>select * from city_list;</code>	
city_data	▾		
city_list	▾		
global_data	▾		
		Success!	EVALUATE
Output 342 results		Download CSV	

3.2 Choosing the Samples

I'm from Riyadh so I choose my city to this project to compare it with global temperature. Also, I add two samples to the comparison which are Tokyo and Washington.

3.3 Implementation

First, I put all tables in one Excel file and create new sheet to work on the project.

1887	Riyadh	Saudi Arabia	24.81		
	city_data	global_data	city_list	comparison	+

Second, I put my chosen samples in a table in the comparison sheet. Global temperature putted in city column.

	A	B	C	D
1	year	city	country	avg_temp
2	1843	Riyadh	Saudi Arabia	24.74
3	1844	Riyadh	Saudi Arabia	15.45
4	1845	Riyadh	Saudi Arabia	20.82
5	1846	Riyadh	Saudi Arabia	25.21
6	1847	Riyadh	Saudi Arabia	25.21
7	1848	Riyadh	Saudi Arabia	24.56
8	1849	Riyadh	Saudi Arabia	24.8

Above you can see the table I put all cities. Global in next picture below.

609	2010	Washington	United States	13.28
610	2011	Washington	United States	13.56
611	2012	Washington	United States	14
612	2013	Washington	United States	14.19
613	1750	global		8.72
614	1751	global		7.98
615	1752	global		5.78
616	1753	global		8.39

There were missing values in Riyadh city and Washington city. To fix this problem. I put the value of the Mean temperature to each individual city by using the function of **=AVERAGE()** Excel and fill the cell with yellow to notice that the value in yellow cells were missing values as shown below:

 **=AVERAGE(D2:D172)**

5	1846	Riyadh	Saudi Arabia	25.21
6	1847	Riyadh	Saudi Arabia	25.21

The Mean of each city in the picture below:

City	Mean
Riyadh	25.21
Tokyo	12.57
Washington	11.84

Third, I created new table to make the comparison between cities in same period of time from 1845 to 2013, I chose this period of time because I want to compare the same period of time among all cities due to the data recorded in Tokyo started from 1845 and all of them end at 2013.

R	S	T	U	V
year	Riyadh	Tokyo	Washington	global
1845	20.82	11.95	12.03	7.85
1846	25.21	12.4	12.34	8.55
1847	25.21	12.21	11.65	8.09
1848	24.56	12.14	11.88	7.98
1849	24.8	12.14	11.38	7.98
1850	24.34	11.71	11.77	7.9
1851	25.03	11.76	12.01	8.18
1852	24.85	11.73	11.5	8.1

After that I made a moving average of 9 years to all cities and global temperature to smooth the data in the line chart. I tried 3 and 6 years but still there is noisy sparks.

[illegible]

The function that used to calculate moving average of 9 years for Riyadh city is shown below:

f_x `=AVERAGE(S2:S10)`

All cities were use the same function `=AVERAGE()` individually. After that I calculated the minimum and the maximum temperature of each city and global to know the range between the highest and lowest temperature degree of each city and global. This information used to make the boundaries of the vertical axis to visualize the line clearly.

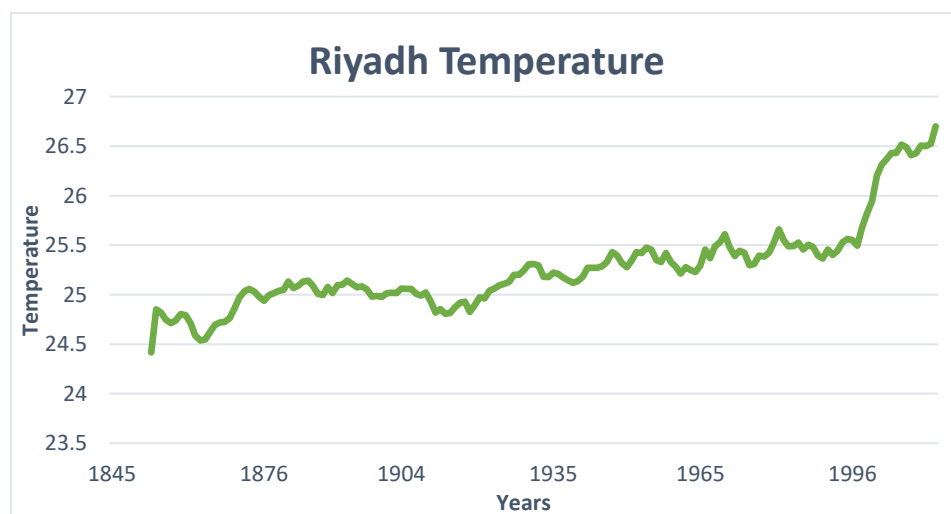
AD	AE	AF	AG	AH	AI
		Riyadh	Tokyo	Washington	global
Minimum degree =		24.42	11.93	11.22	7.95
Maximum degree =		26.70	13.46	13.31	9.58

And the function that used to calculate the minimum and maximum are in pictures below:

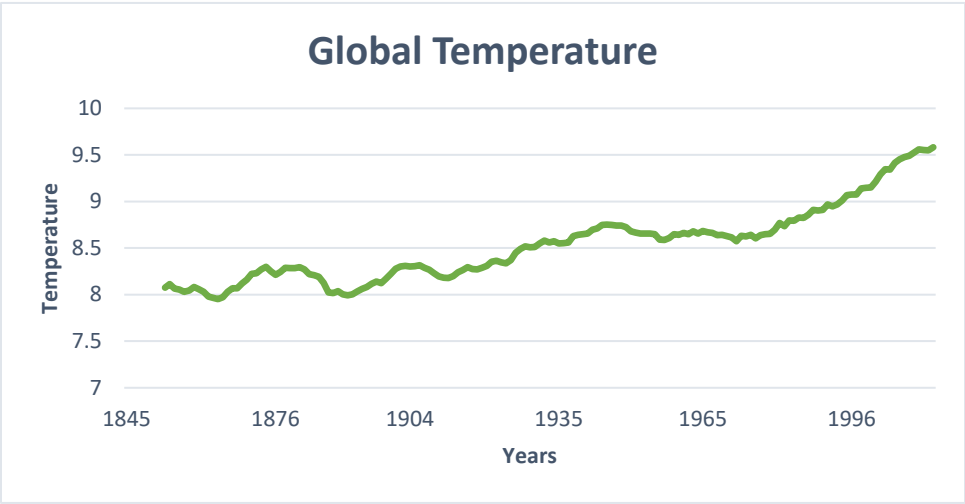
f_x `=MIN(Y10:Y170)`

f_x `=MAX(Y10:Y170)`

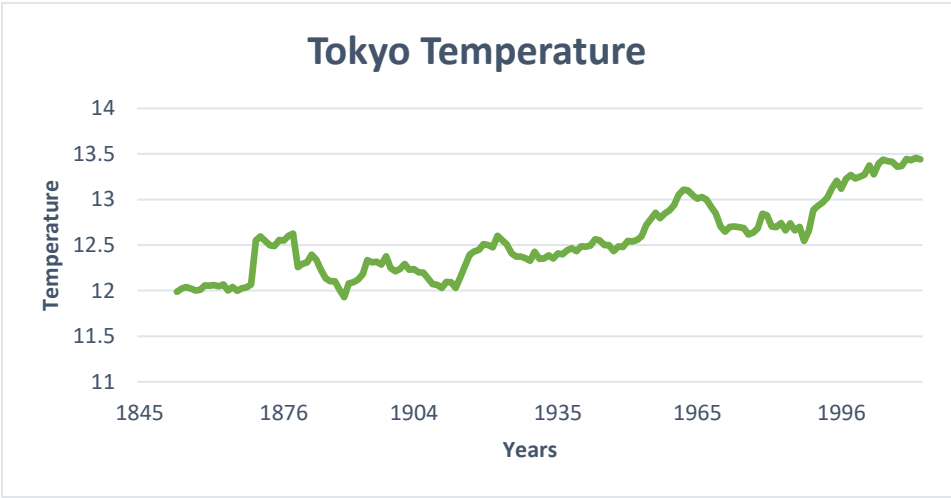
Finally, the line charts of Riyadh city temperature, global temperature and comparison temperature of all cities with Global.



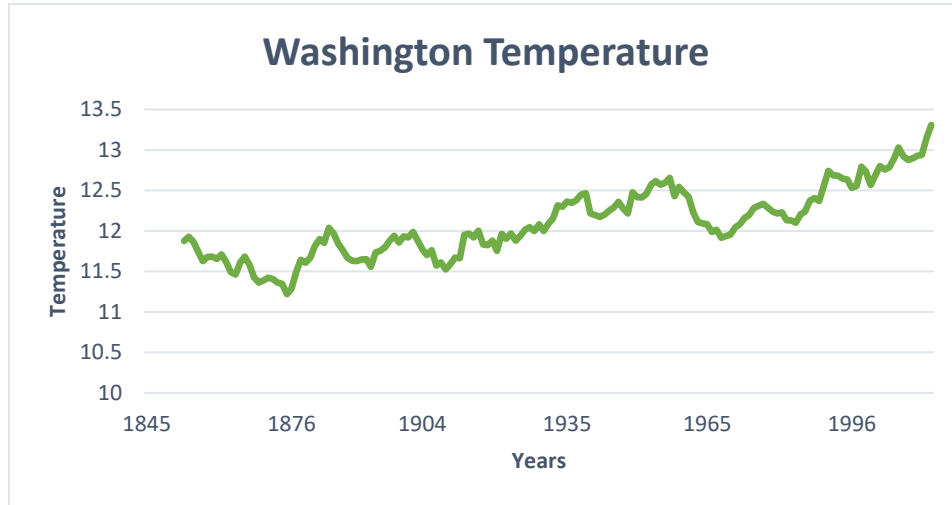
Riyadh line chart



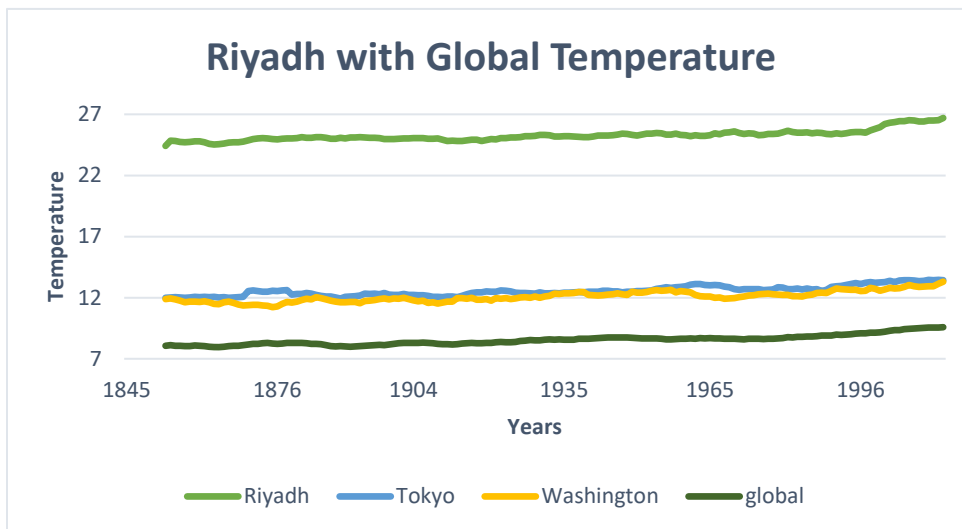
Global line chart



Tokyo line chart



Washington line chart



Riyadh with Global line chart

4 Similarities and Differences

Similarities:

- All cities and global temperatures are increased in latest years.
- In 1980 and above there is high increase in temperature in all cities and global, I think because the Third Industrial Revolution, computers made many industries work faster and efficient.
- Tokyo and Washington temperatures were closest to each other.
- With moving average of 9 years. Riyadh and Washington raised about two (2) degrees from the period of 1845 to 2013.
- With moving average of 9 years. Tokyo and Global raised about one and half (1.5) degree from the period of 1845 to 2013.

Differences:

- Riyadh temperature is varied to the global and the two cities. Temperature is hotter than global temperature.
- With moving average of 9 years. Riyadh and Washington are varied of raised degree from Tokyo and Global in the period of 1845 to 2013.

5 Conclusion

It is good to know that temperature in my city with global is vary a lot and hotter. Also, temperature in my city and global is getting hotter than before. Something not good and should the world consider that.