

Exploring Weather Trends

❖ Outline

Step 1: What tools did you use for each step?

- A. I am using SQL to extract the city level data (Toronto) and the global data from the database.

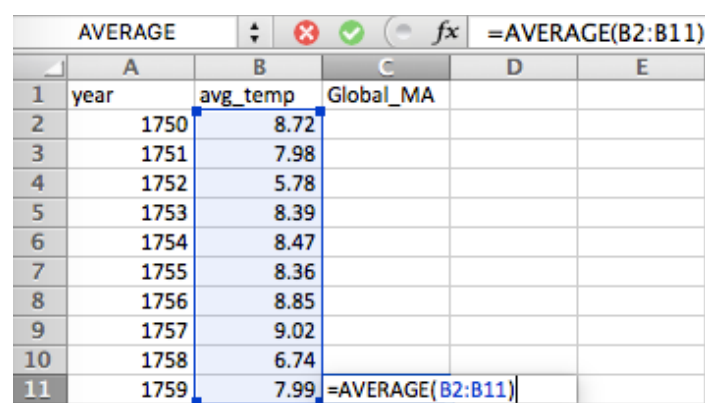
Input		HISTORY ▾	MENU ▾
SCHEMA	↺	1 select year, city, avg_temp from city_data	
city_data	▾	2 where city = 'Toronto'	
city_list	▾	3	
global_data	▴	4	
year			
avg_temp		Success!	EVALUATE

Input		HISTORY ▾	MENU ▾
SCHEMA	↺	1 select year, avg_temp from global_data	
city_data	▾	2	
city_list	▾	3	
global_data	▴		
year			
avg_temp		Success!	EVALUATE

- B. I am using Excel to open up the CSV file.
- C. I use AVERAGE formula to calculate the moving average for both the city and the global temperatures throughout the year.
- D. I am using Excel to set up a line chart and interpret results to Word.

Step 2: How did you calculate the moving average?

The data contains yearly average records for both Toronto and global temperatures from 1750 to 2013. The moving average I presented is calculated using average formula builder in units of ten years in Excel. For instance, the first moving average calculates the average temperature between 1750 and 1759 as shown in the figure below.

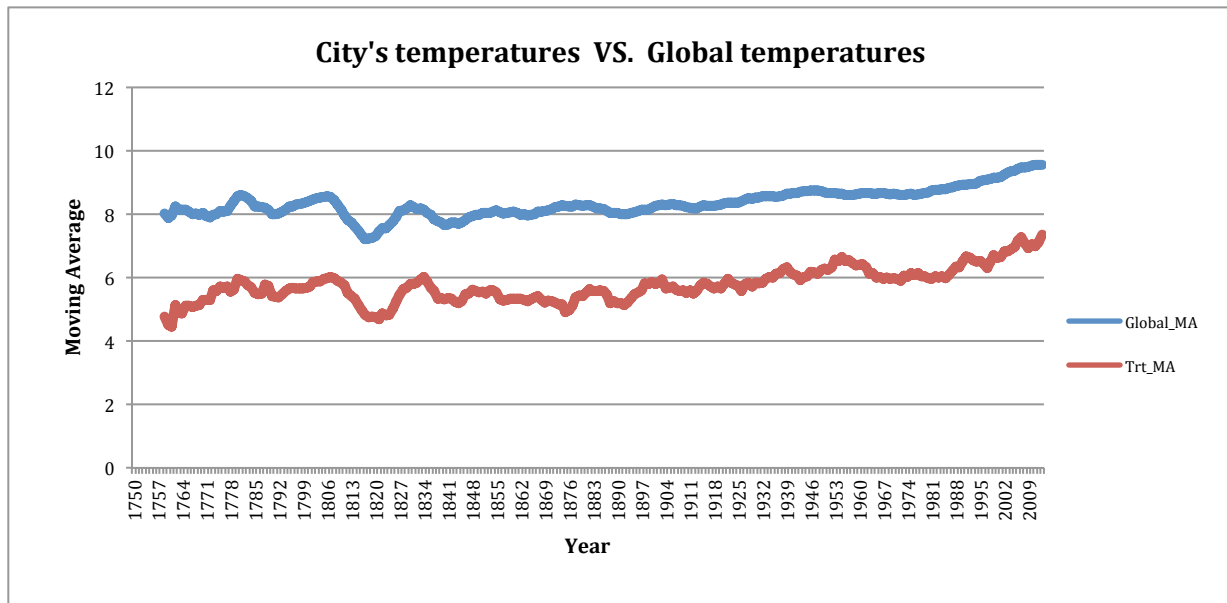


	A	B	C	D	E
1	year	avg_temp	Global_MA		
2	1750	8.72			
3	1751	7.98			
4	1752	5.78			
5	1753	8.39			
6	1754	8.47			
7	1755	8.36			
8	1756	8.85			
9	1757	9.02			
10	1758	6.74			
11	1759	7.99	=AVERAGE(B2:B11)		

Step 3: What were your key considerations when deciding how to visualize the trends?

When I presented the line chart, I first considered the year as my x-axis and put the moving average temperature on the y-axis. In this way, it can be clearly displayed the trend of the moving average temperatures with time. Next, I considered using different colors to distinguish the linear trend of the city and the global temperature and placed the label on the right side of the graph. Finally, I added a title at the top to convey the function of the chart to the reader.

❖ Line Chart



❖ Observations

The graph illustrates the moving average for both Toronto and global temperatures between 1750 and 2013. Overall, the temperature in Toronto has been two to three degrees Celsius lower than the global temperature for the entire period of time. Toronto's moving average and the globe's moving average have a very similar trend with the difference has been consistent over time. They both experienced a rapid decline around 1806 and reached a trough in 1820, followed by the temperature rise and back to the average level around 1834. Between 1841 and 2013, Toronto and the global temperatures both rose slowly by 2 degrees Celsius. However, the upward trend of the global temperature is more stable, while the Toronto temperature got through several fluctuated stages after 1876. In summary, the world is getting hotter. The trend has been consistent over the last hundred years.