

Project: Explore Weather Trends

Summary

In this project, I will analyze local (Toronto) and global temperature data and compare their temperature trends.

Instructions

- **Extract the data** from the database by using SQL query.
- **Open up the CSV** in Excel.
- **Create a line chart** to plot the moving average that compares your city's temperatures with the global temperatures.
- **Make observations** about the similarities and differences between the world averages and your city's averages, as well as overall trends.

An Outline of Steps

Step 1: View and make sure "Toronto, Canada" is the one and the only one in the city_list to avoid duplication, as seen in the below screenshot.

The screenshot shows a SQL query interface. On the left, there is a schema explorer with a tree view containing 'city_data', 'city_list', 'city', 'country', and 'global_data'. The 'city_list' table is selected. The main area displays the following SQL query:

```
1 SELECT * FROM city_list
2 WHERE city = 'Toronto'
```

Below the query, a green bar indicates 'Success!'. To the right of this bar is a blue button labeled 'EVALUATE'. Below the query area, there is an 'Output' section showing '1 results'. A link 'Download CSV' is visible. The output table has two columns: 'city' and 'country'. The single row of data shows 'Toronto' for the city and 'Canada' for the country.

city	country
Toronto	Canada

Step 2: Write SQL queries to combine and extract the city (Toronto) level data and the global data, then export/download them to CSV files.

Input

HISTORY ▾

MENU ▾

SCHEMA

city_data

city_list

global_data

1

2

3

4

5

6

7

8

SELECT

local.year,

local.avg_temp as toronto_temp,

global.avg_temp as global_temp

FROM city_data AS local

JOIN global_data AS global

ON local.year = global.year

WHERE local.city = 'Toronto'

Success!

EVALUATE

Output

264 results

[Download CSV](#)

year	toronto_temp	global_temp
1750	6.29	8.72
1751	6.84	7.98
1752	-1.10	5.78

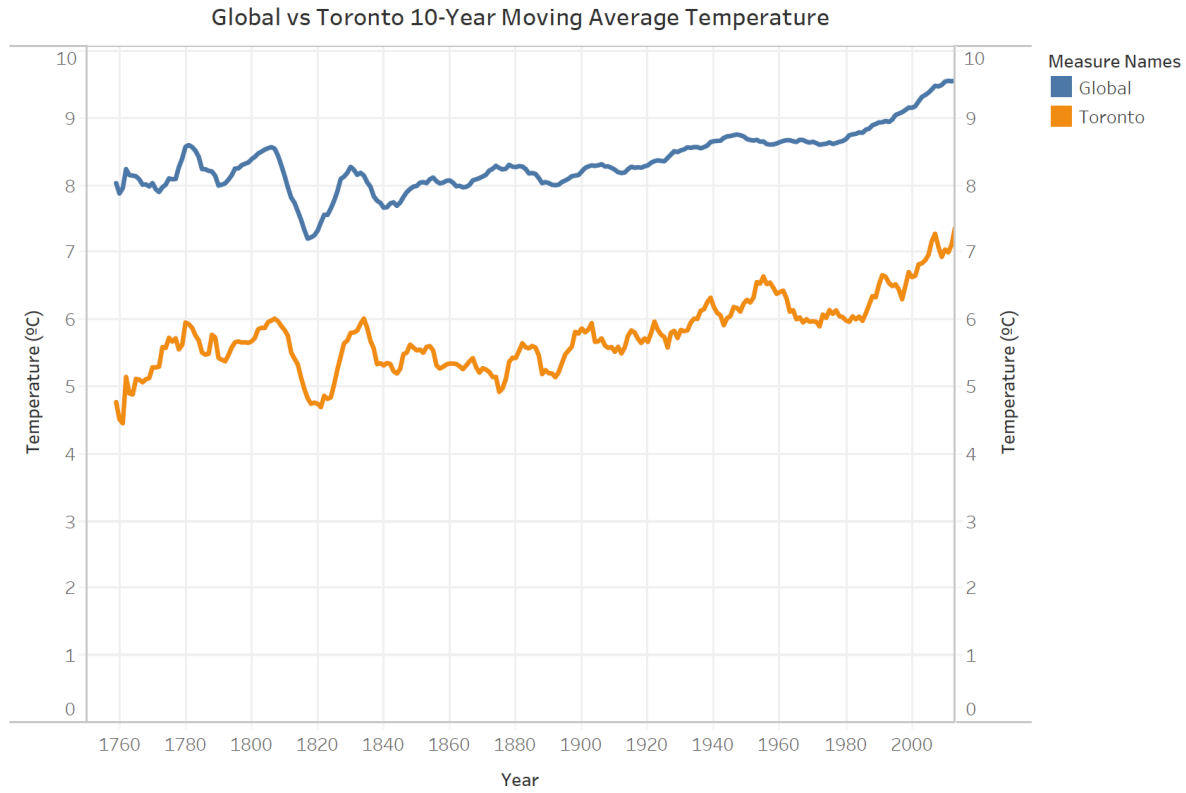
Step 3: Open the CSV file in Excel. For data consistency, clean the spreadsheets by removing rows that missing any temperature values, which only keep rows/data from year 1750 to 2013.

Step 4: Create a new column call “G-10-Year MA”, which is where the moving average field will be stored. Go down to the tenth year (1759) and use the AVERAGE() function to calculate the global average temperature value for the first 10 years of global temperature values, as seen in the screenshot below. Complete the same process for Toronto.

SUM					
fx =AVERAGE(B2:B11)					
	A	B	AVERAGE(number1, [number2], ...)		
1	year	G_avg_temp	G-10-Year MA	T_avg_temp	T-10-Year MA
2	1750	8.72		6.29	
3	1751	7.98		6.84	
4	1752	5.78		-1.10	
5	1753	8.39		5.76	
6	1754	8.47		5.94	
7	1755	8.36		2.81	
8	1756	8.85		6.37	
9	1757	9.02		5.13	
10	1758	6.74		4.37	
11	1759	7.99	=AVERAGE(B2:B11)	5.27	
12	1760	7.19	7.88	3.74	
13	1761	8.77	7.96	6.25	
14	1762	8.61	8.24	5.79	
15	1763	7.50	8.15	3.32	

fx =AVERAGE(D2:D11)					
	AVERAGE(number1, [number2], ...)				
	G-10-Year MA	T_avg_temp	T-10-Year MA		F
72		6.29			
98		6.84			
78		-1.10			
39		5.76			
47		5.94			
36		2.81			
35		6.37			
02		5.13			
74		4.37			
39	8.03	5.27	=AVERAGE(D2:D11)		
19	7.88	3.74	4.51		
77	7.96	6.25	4.45		
51	8.24	5.79	5.14		
50	8.15	3.32	4.90		

Step 5: Create a line chart by using Tableau



Observations

1. Both Toronto and global temperatures have increased over the years, and the trend seems to be continued (global warming).
2. Both Toronto and global temperatures have a dramatic drop and then raising between year 1805 to 1835.
3. Toronto is cooler on average compared to the global average, and this has been consistent over time.
4. The increase of Toronto temperature was more fluctuating than global temperature over the last few hundred years.
5. Global average temperature had a big drop between year 1763 to 1777 while Toronto average temperature steadily increased.