Data Analyst Nanodegree

Exploring Weather Trends

By Tianfang Xie

Step 1. Extract the data from the database

Tools needed to be used : SQL

I live in the Indiana state of USA, so I used the SQL database to find the name of the nearest big city by inputting "SELECT * FROM city_list WHERE country = 'United States'".

Then I find the nearest big city named "Chicago".

Then I extracted the temperature data of Chicago from the database by inputting "SELECT * FROM city_data WHERE country = 'United States' AND city = 'Chicago'"

Then I clicked the "Download CSV" button to download the csv file.

Similarly, I found the temperature of global by inputting "SELECT * FROM global_data" and then clicked the "Download CSV" button.
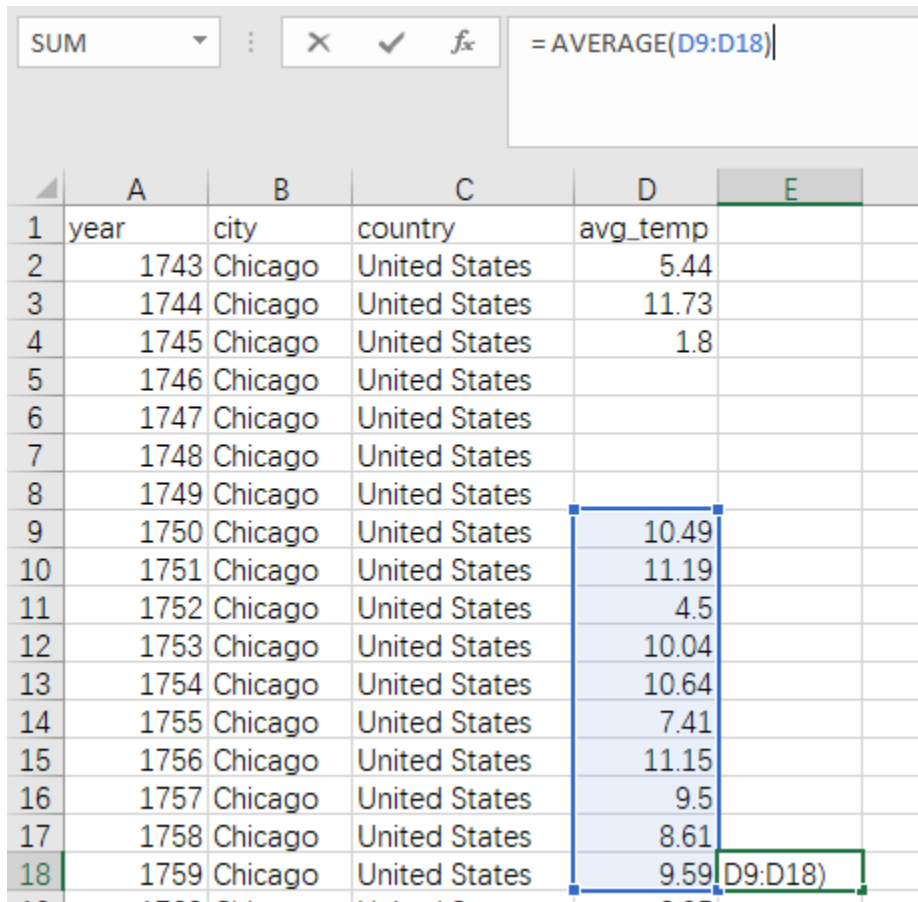
Step 2. Open the csv file and calculate the moving average temperature

Tools needed to be used : Excel

I used the software Excel to open the csv files and calculated the moving average temperature by inputting "= AVERAGE(D9:D18)".

The key considerations when deciding how to visualize the trends are:

1. Chicago lacks temperature data from 1746 to 1749, and the global temperature data begins from 1950, thus I need to begin the comparison from year 1750.

2. I used decade (10 years) as the choice of years to calculate the moving average temperature, this kind of choice fits people's custom.

| SUM | ▼ | ⋮ | ✕ | ✓ | *fx* | = AVERAGE(D9:D18) |

◢	A	B	C	D	E	F
1	year	city	country	avg_temp		
2	1743	Chicago	United States	5.44		
3	1744	Chicago	United States	11.73		
4	1745	Chicago	United States	1.8		
5	1746	Chicago	United States			
6	1747	Chicago	United States			
7	1748	Chicago	United States			
8	1749	Chicago	United States			
9	1750	Chicago	United States	10.49		
10	1751	Chicago	United States	11.19		
11	1752	Chicago	United States	4.5		
12	1753	Chicago	United States	10.04		
13	1754	Chicago	United States	10.64		
14	1755	Chicago	United States	7.41		
15	1756	Chicago	United States	11.15		
16	1757	Chicago	United States	9.5		
17	1758	Chicago	United States	8.61		
18	1759	Chicago	United States	9.59	D9:D18)	

Step 3. Create a line chart to compare Chicago's temperatures with the global temperatures

Tools needed to be used : Excel

I used the Excel to generate the line chart to visualize the temperature comparison.

Temperature change comparison between Chicago and global
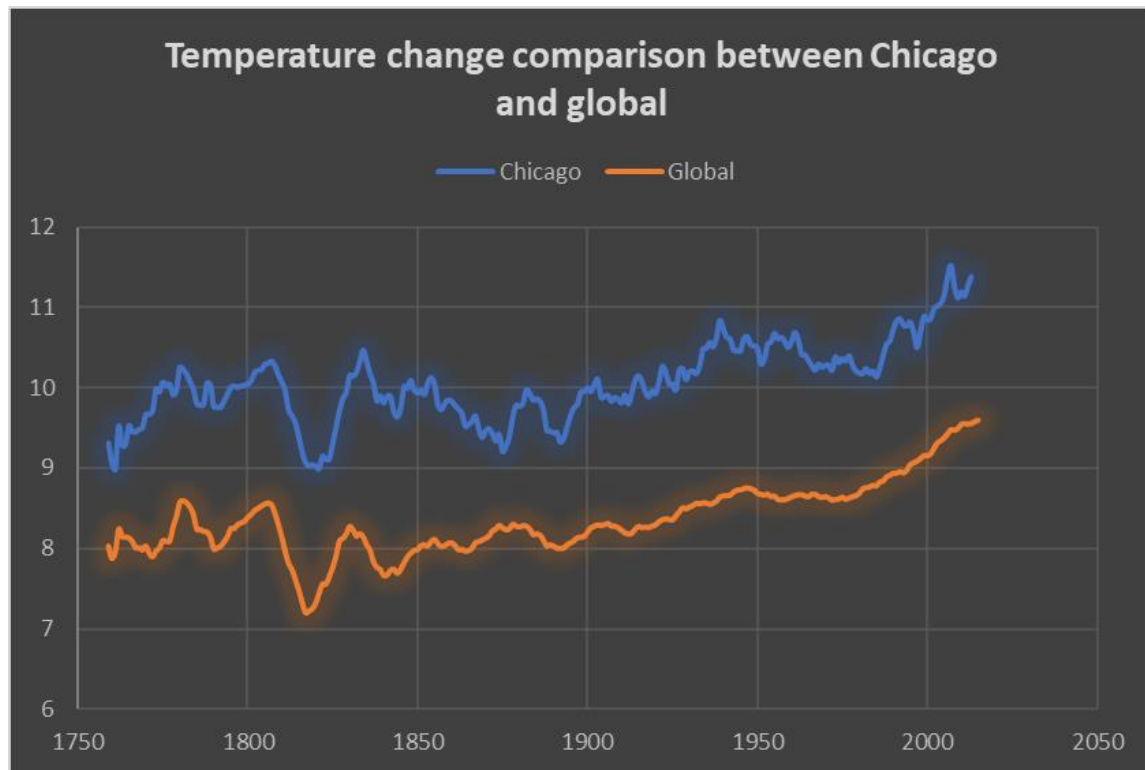
Step 4. Make observations about the similarities and differences

Tools needed to be used : Excel

Observations:

1. The global average temperature is between 7.203 to 9.594 Celsius, and the Chicago's average temperature is between 8.989 to 11.517 Celsius, the Chicago city is hotter on average compared to the global average.

2. The difference between the global average and the Chicago's average is not consistent over time. For example, during the period from 1850 to 1875, the Chicago's average temperature was decreasing and the global average temperature was increasing.

3. During the past centuries, especially from 1850 to present, the changes in Chicago city's temperatures over time compare to the changes in the global average have the same trend. The temperatures of Chicago and global share the trend of increase.

4. For the overall trend, the world is getting hotter. The trend was consisted over the past century from 1900 to present. And the global temperature also have several significantly decrease trend during the period from 1800 to 1850.