Exploring Weather Trends using Excel

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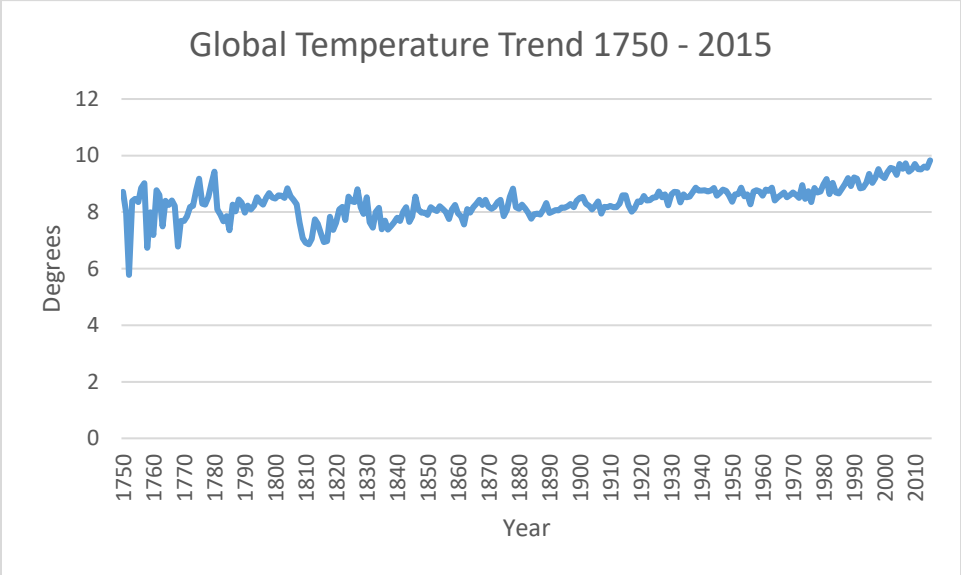
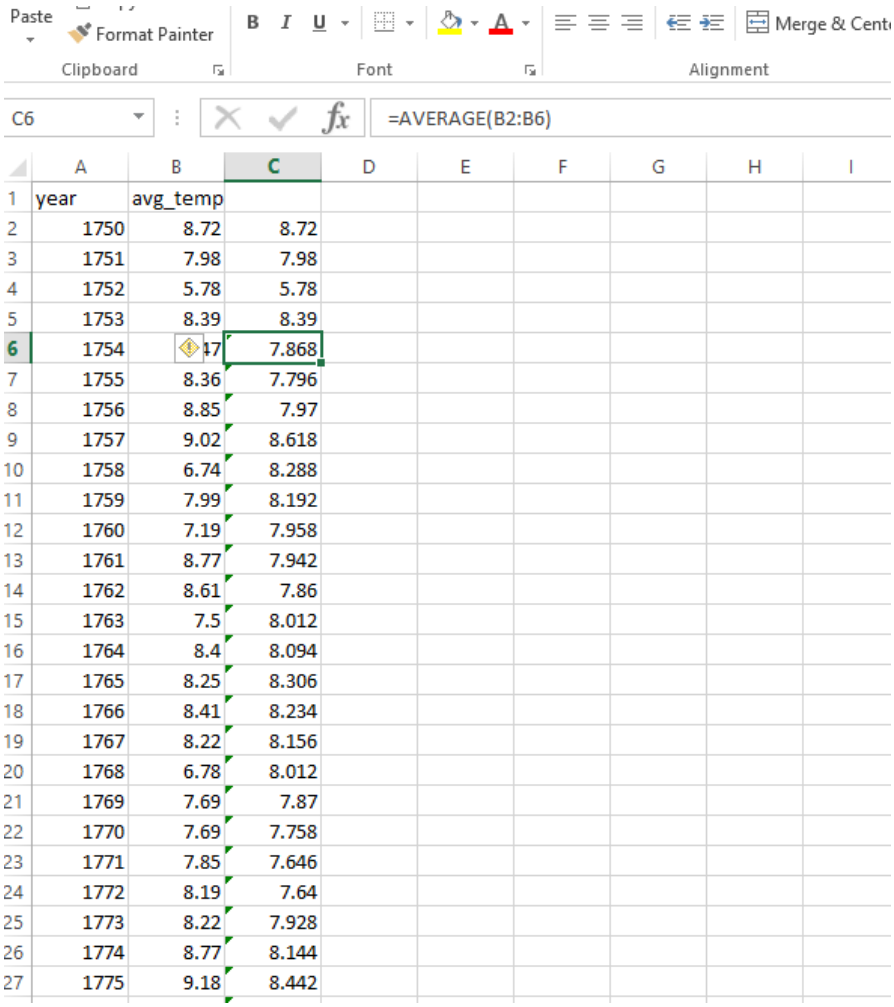
Steps Outline:

1. Since the data is in the SQL, so I use simple SQL query to pull out the data. Below are those queries:
   - SELECT * FROM city_data
     - We can actually narrow to Jakarta, which is my city by the query below:
       SELECT * FROM city_data WHERE city = 'Jakarta'
   - SELECT * FROM city_list
   - SELECT * FROM global_data
2. After I extract the data, I took a first look into the data using Microsoft Excel. So there are three files, which are the first file is about the spread of the city, country, and temperature; the second file is about the mapping between cities and countries; and the third file is about the global temperature from 1750 – 2015. Since the task is to compare between my city and the global temperature, so I only used the first and third file.
3. Before counting the moving average, I first would like to take a look on how the global temperature trend is. Below is that trend:

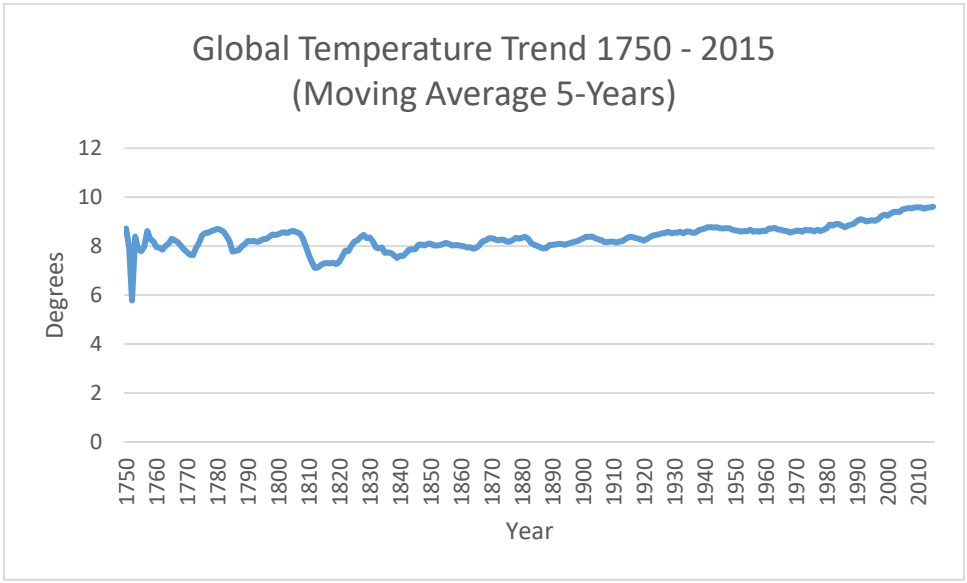


It is quite spiky. So after that, I used 5-Years moving average. I used the AVERAGE function on the B2 to B6 cells (AVERAGE(B2:B6)), and then dragged the formula down.



	A	B	C
1	year	avg_temp	
2	1750	8.72	8.72
3	1751	7.98	7.98
4	1752	5.78	5.78
5	1753	8.39	8.39
6	1754	47	7.868
7	1755	8.36	7.796
8	1756	8.85	7.97
9	1757	9.02	8.618
10	1758	6.74	8.288
11	1759	7.99	8.192
12	1760	7.19	7.958
13	1761	8.77	7.942
14	1762	8.61	7.86
15	1763	7.5	8.012
16	1764	8.4	8.094
17	1765	8.25	8.306
18	1766	8.41	8.234
19	1767	8.22	8.156
20	1768	6.78	8.012
21	1769	7.69	7.87
22	1770	7.69	7.758
23	1771	7.85	7.646
24	1772	8.19	7.64
25	1773	8.22	7.928
26	1774	8.77	8.144
27	1775	9.18	8.442

And the result is as below:



This 5-Years moving average trend is better. So I used this one to compare with my city, which is Jakarta.

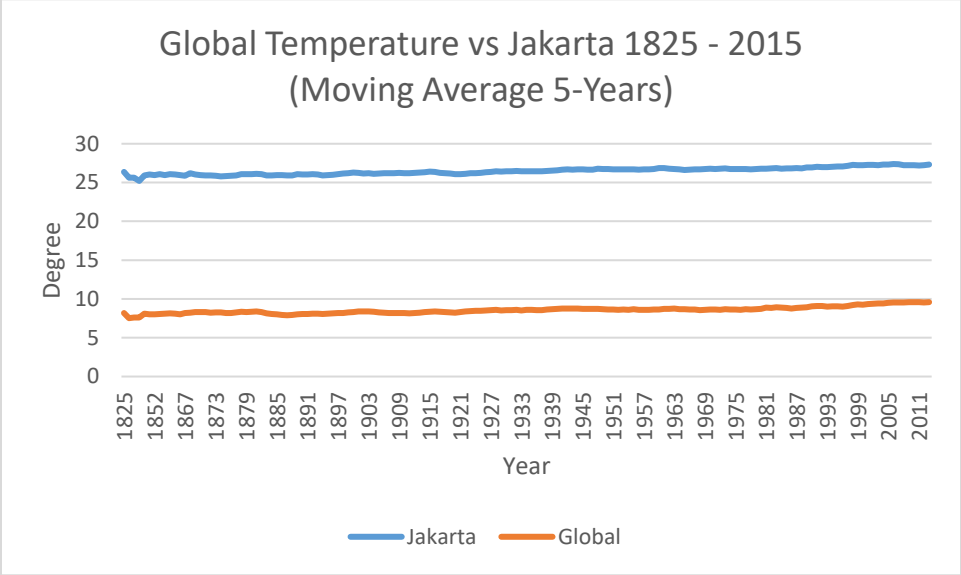
4. When I looked at the Jakarta's temperature data, I realized that the data is not complete. So in order to make a comparison, I only include the global temperature that matched the temperature data in Jakarta. I used the same 5-Years Moving Average formula as the Global Temperature Data, except I start the formula in 1870 below, since there are some missing data in the years between 1825 – 1856.

E	F	G	H	I
Year	Jakarta	Global		
1825	26.38	8.188	18.192	
1839	25.61	7.522	18.088	
1840	25.61	7.604	18.006	
1841	25.21			
1850	25.91			
1851	26.05			
1852	25.94			
1853	26.08	8.04	18.04	
1854	25.95	8.086	17.864	
1855	26.0			
1856	26.0			
1866	25.9			
1867	25.8			
1868	26.2	8.228	17.972	
1869	26.05	8.318	17.732	
1870	25.964	8.322	17.642	
1871	25.916	8.288	17.628	
1872	25.908	8.238	17.67	
1873	25.856	8.258	17.598	
1874	25.806	8.258	17.548	
1875	25.822	8.19	17.632	
1876	25.862	8.182	17.68	

Some missing data, including the year between 1826 – 1838, 1842 – 1849, and 1857 – 1865.

I start the 5-Years Moving Average here. To be precise, started at 1870 – 2015.

The result is as below:



It is time to make an observation. For the project, it is four observations.

a. Jakarta is hotter than the global temperature by around 17.5° - 18.2°. It has a mean of 17.93° with a standard deviation of 0.14, which I can conclude that the difference is quite consistent overtime.
b. Overall, Jakarta has an increase in temperature, except in 1839 – 1852. There is also some small slope around 1875. At first in 1825, it is kind of hot at 26.38°, and then in 1852, Jakarta is a little bit cooler by about 0.44° compared to 1825. This is consistent with the global temperature which also has a slope at that time.
c. We can look at the trend that the world is getting hotter shown from consistent result in observation a. and b. Although there are some mini slope, the temperature overall over time is increasing.
d. However, the global temperature increase is tend to be faster than the increased temperature in Jakarta. The range also tell us that the global is at 2.18° while in Jakarta the range is at 2.058°.

And this is the end of my mini observation. Thank you. ☺