

Explore Weather Trends

Data Analyst Nanodegree Program First Project

1. Project Overview

This is a project that aims to help us to analyze and compare local and global temperature trends. The project includes extracting data, calculating custom averages, visualizing data and making observations about outputs.

2. Outline

Extracting Data

As the first step, I started by extracting data from the given dataset interface. I wrote a query to get the dataset that I needed and then downloaded the table to use with Google Sheets. First I have selected the data which belongs to the city I live and then I joined it with the global values. I used inner join to eliminate empty values.

The query is below:

```
select cd.year, cd.city, cd.avg_temp city_temp, gd.avg_temp
global_temp
from city_data cd
inner join global_data gd on gd.year = cd.year
where city = 'Istanbul'
```

After getting the data, all project steps have been carried out with Google sheets.

Calculating Moving Average

For the moving average, I used the standard moving average with the reference of the project document. I have calculated 10-Years MA by taking the average of the previous ten years for each year. I did this process for both local and global temperature values.

	A	B	C	D	E	F
1	year	city	city_temp	global_temp	10-Years MA City_Temp	10-Years MA Global_Temp
2	1750	Istanbul	13.83	8.72		
3	1751	Istanbul	14.14	7.98		
4	1752	Istanbul	9.48	5.78		
5	1753	Istanbul	13.42	8.39		
6	1754	Istanbul	13.58	8.47		
7	1755	Istanbul	13.36	8.36		
8	1756	Istanbul	14.1	8.85		
9	1757	Istanbul	13.9	9.02		
10	1758	Istanbul	12.1	6.74	13.48 ×	
11	1759	Istanbul	13.13	7.99	=AVERAGE(C2,C11)	8.355
12	1760	Istanbul	12.57	7.19	13.355	7.585
13	1761	Istanbul	13.76	8.77	11.62	7.275
14	1762	Istanbul	13.66	8.61	13.54	8.5
15	1763	Istanbul	12.72	7.5	13.15	7.985

Calculation of 10 years moving average for local temperature

	A	B	C	D	E	F
1	year	city	city_temp	global_temp	10-Years MA City_Temp	10-Years MA Global_Temp
2	1750	Istanbul	13.83	8.72		
3	1751	Istanbul	14.14	7.98		
4	1752	Istanbul	9.48	5.78		
5	1753	Istanbul	13.42	8.39		
6	1754	Istanbul	13.58	8.47		
7	1755	Istanbul	13.36	8.36		
8	1756	Istanbul	14.1	8.85		
9	1757	Istanbul	13.9	9.02		
10	1758	Istanbul	12.1	6.74		
11	1759	Istanbul	13.13	7.99	13.48	8.355
12	1760	Istanbul	12.57	7.19	13.355	7.585
13	1761	Istanbul	13.76	8.77	11.62	=AVERAGE(D4,D13)
14	1762	Istanbul	13.66	8.61	13.54	8.5
15	1763	Istanbul	12.72	7.5	13.15	7.985

Calculation of 10 years moving average for global temperature

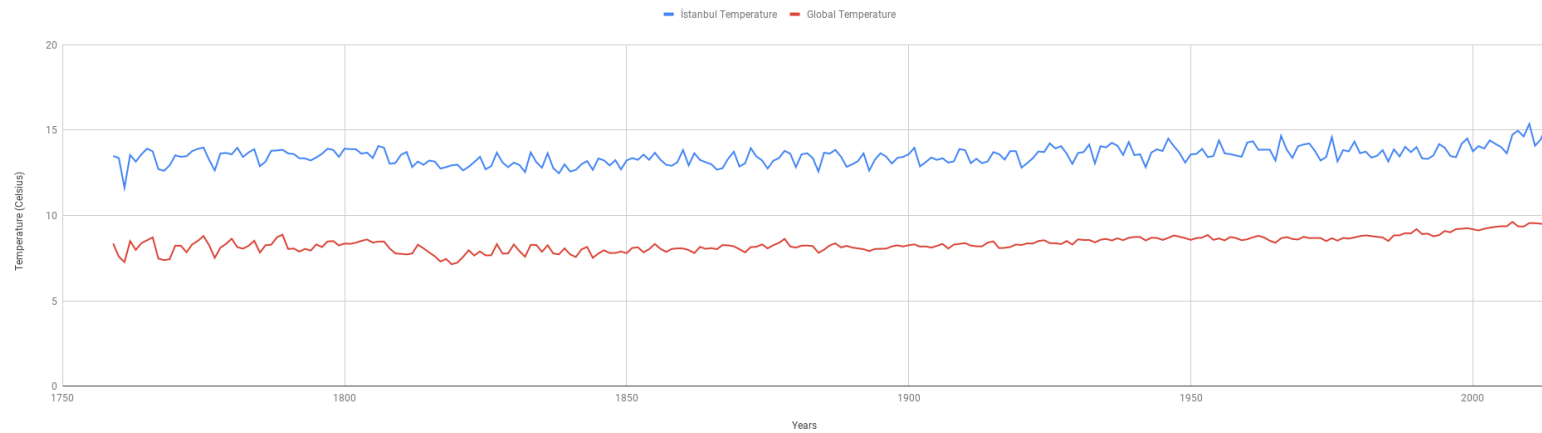
Creating the Line Chart

With the new values I calculated, I started to create a Line Chart using Google Sheets again. I needed to show both global and local values to make an easier comparison and also wanted to be sure that the legend was clear enough to make healthy observations. I used the x-axis for years and the y-axis for moving average temperature.

Since the years range was wider than the temperature, I wasn't able to create a more readable chart. I also didn't add the value labels, since the chart would be too crowded and normally it can be read when you bring the curser above the points.

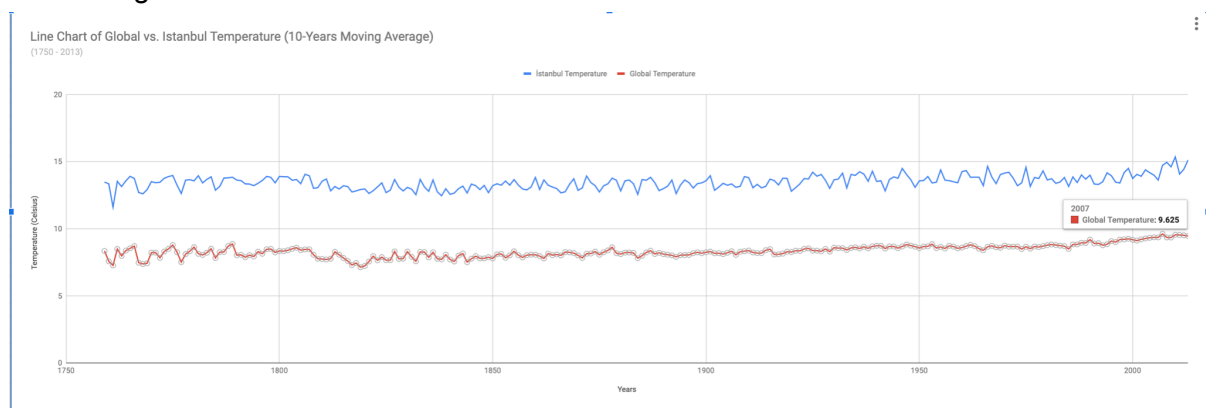
3. Line Chart

Line Chart of Global vs. Istanbul Temperature (10-Years Moving Average)
(1750 - 2013)

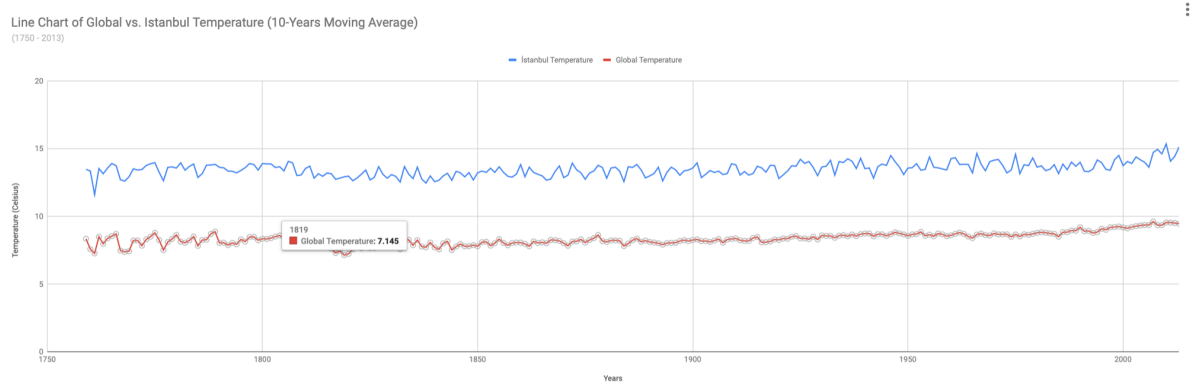


4. Observations

1. After the 1800s, the temperature is more consistent for global temperature than local temperature. There is more fluctuation in values.
2. After the 2000s, the average temperature rises more for local temperature than local temperature.
3. The highest temperature for global was achieved in 2007 with an average of 9.625 degrees.



4. The lowest temperature for global was achieved in 1819 with an average of 7.145 degrees



6. Global temperature isn't below 5 degrees in all years.
7. Local temperature was higher than 15 degrees only two times in 2010 and 2013.

The sheet link that I used for all of the calculations and the line chart also can be found below:

https://docs.google.com/spreadsheets/d/1jzdkTD9q_Jo5Wz26_3eaXcBmBYri-giW6UvEylSkIGw/edit#gid=763778234