

Udacity_Project_1st

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Exploring Weather Trends

Purpose of this Project. In this Project I analysed local and global temperature data and compared the temperature trends where I live to overall to global temperature trends

1. Extract the data. There are three tables in database:

city_list - This contains a list of cities and countries in the database. Look through them in order to find the city nearest to you.

city_data - This contains the average temperatures for each city by year (°C).

global_data - This contains the average global temperatures by year (°C)

1.a) Write a SQL query to extract the city level data. Export to CSV

```
1 SELECT * FROM city_list WHERE city='Amsterdam';
```

1b) Write a SQL query to extract the global data. Export to CSV

```
1 SELECT * FROM global_data;
```

2. Export the data to Google sheets

2a) In the first part I worked with the local temperature in Amsterdam. The data contains the values from 1750 to 2013. Since I had 6 NaN (missing) values in data I decided to drop such values because the data from global temperature has begun from 1750 year. In this case, it was easy to combine both average line charts in one single line chart.

The moving average (MA) is a technical analysis tool that smooths out value data by creating a constantly updated average value. For better understanding and visualization of our global and local temperatures have been applied 5-years, 10-years, and 15-years moving average.

1	year	avg_temp	5-year MA	10-year MA	15-year MA	city	country
2	1750	10.04				Amsterdam	Netherlands
3	1751	9.63				Amsterdam	Netherlands
4	1752	5.97				Amsterdam	Netherlands
5	1753	9.08				Amsterdam	Netherlands
6	1754	8.72	8.69			Amsterdam	Netherlands
7	1755	8.55	8.39			Amsterdam	Netherlands
8	1756	9.17	8.30			Amsterdam	Netherlands
9	1757	9.05	8.91			Amsterdam	Netherlands
10	1758	8.79	8.86			Amsterdam	Netherlands
11	1759	9.64	9.04	8.86		Amsterdam	Netherlands
12	1760	9.14	9.16	8.77		Amsterdam	Netherlands
13	1761	9.41	9.21	8.75		Amsterdam	Netherlands
14	1762	8.58	9.11	9.01		Amsterdam	Netherlands
15	1763	8.44	9.04	8.95		Amsterdam	Netherlands
16	1764	9.07	8.93	8.98	8.89	Amsterdam	Netherlands
17	1765	8.87	8.87	9.02	8.81	Amsterdam	Netherlands
18	1766	8.85	8.76	8.98	8.76	Amsterdam	Netherlands
19	1767	8.50	8.75	8.93	8.92	Amsterdam	Netherlands

257	2005	10.48	10.38	10.19	10.12	Amsterdam	Netherlands
258	2006	10.97	10.53	10.46	10.23	Amsterdam	Netherlands
259	2007	11.04	10.61	10.56	10.27	Amsterdam	Netherlands
260	2008	10.42	10.64	10.58	10.34	Amsterdam	Netherlands
261	2009	10.33	10.65	10.54	10.33	Amsterdam	Netherlands
262	2010	8.84	10.32	10.35	10.24	Amsterdam	Netherlands
263	2011	10.73	10.27	10.40	10.40	Amsterdam	Netherlands
264	2012	10.08	10.08	10.34	10.40	Amsterdam	Netherlands
265	2013	9.54	9.90	10.27	10.36	Amsterdam	Netherlands

fx =AVERAGE(B2:B6)

	A	B	C	D
1	year	avg_temp	5-year MA	10-year
2	1750	10.04		
3	1751	9.63		
4	1752	5.97		
5	1753	9.08		
6	1754	8.72	8.69	
7	1755	8.55	8.39	

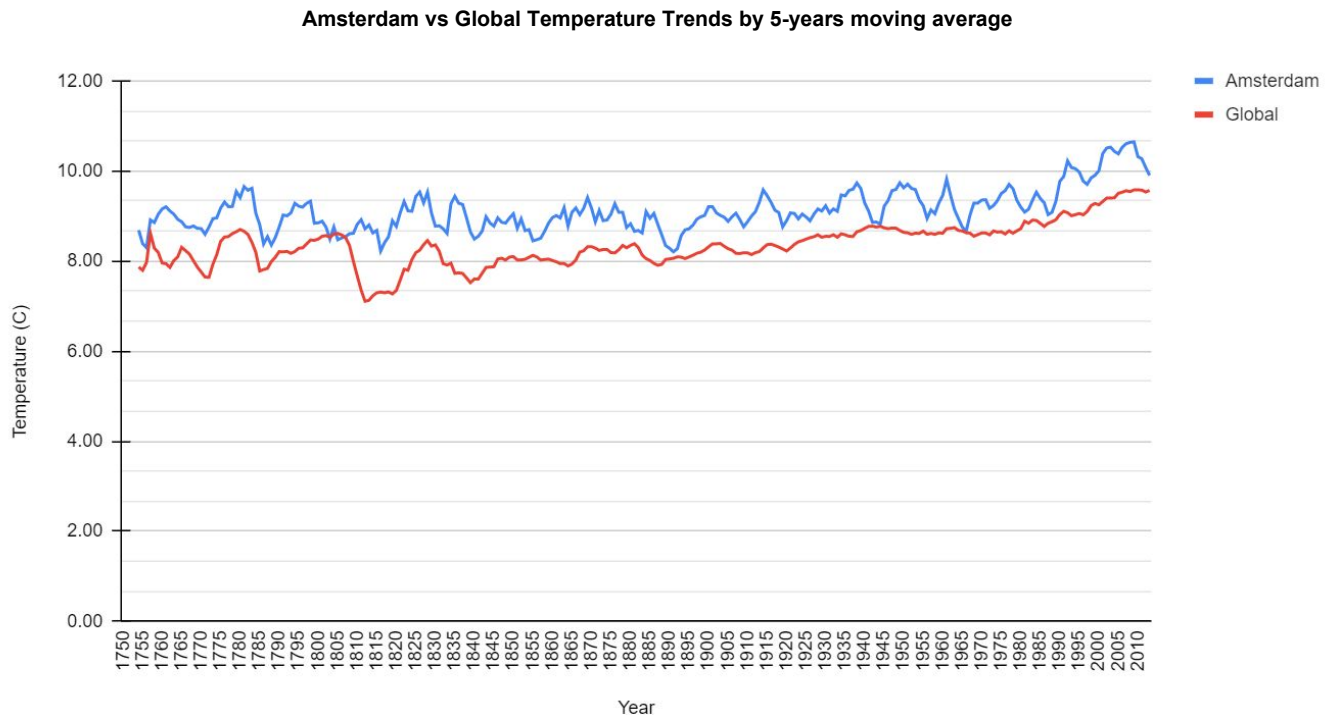
2b) In the second part, I worked with the global temperature. I used the same approach as the local temperature in Amsterdam.

1	year	avg_temp	5-year MA	10-year MA	15-year MA
2	1750	8.72			
3	1751	7.98			
4	1752	5.78			
5	1753	8.39			
6	1754	8.47	7.87		
7	1755	8.36	7.80		
8	1756	8.85	7.97		
9	1757	9.02	8.62		
10	1758	6.74	8.29		
11	1759	7.99	8.19	8.03	
12	1760	7.19	7.96	7.88	
13	1761	8.77	7.94	7.96	
14	1762	8.61	7.86	8.24	
15	1763	7.50	8.01	8.15	
16	1764	8.40	8.09	8.14	8.05
17	1765	8.25	8.31	8.13	8.02
18	1766	8.41	8.23	8.09	8.05
19	1767	8.22	8.16	8.01	8.21

254	2002	9.57	9.40	9.25	9.19
255	2003	9.53	9.40	9.32	9.21
256	2004	9.32	9.41	9.34	9.24
257	2005	9.70	9.51	9.38	9.27
258	2006	9.53	9.53	9.43	9.29
259	2007	9.73	9.56	9.48	9.35
260	2008	9.43	9.54	9.47	9.39
261	2009	9.51	9.58	9.49	9.42
262	2010	9.70	9.58	9.54	9.45
263	2011	9.52	9.58	9.55	9.48
264	2012	9.51	9.53	9.55	9.50
265	2013	9.61	9.57	9.56	9.50

3. Create a line chart.

When I plotted the moving average using 5, 10 and 15-years MA and faced with overlapping lines each other. As it turns out, better when we use only one MA. As an example, a line chart has shown below



The moving average of 5-years(blue line) shows a clear and more smother upward trend of local temperature within the last 100 years. Although ups and downs the global temperature(red line) is rising as well. We can see that the rate of both temperatures local and global increased by 2 degrees from 1750 years to now. It is caused by increased concentrations of greenhouse gases in the atmosphere, mainly from human activities such as burning fossil fuels, deforestation and farming.

Summary

- 1. Is your city hotter and cooler on average compared to the global average? Has the difference been consistent over time?**

The Netherlands literally means "lower countries" in reference to its low elevation and flat topography, with only about 50% of its land exceeding 1 metre above sea level, and nearly 17% falling below sea level. The surface of The Netherlands is flat and the North Sea is located in the northwest. All these factors influence the weather in The Netherlands. So, a graph shows us a tendency of increasing both scenarios of temperatures locally and globally. It means, the rate of temperature is going up further, even incoming years.

- 2. How do the changes in your city's temperatures over time compare to the changes in the global average?**

Comparing two lines in the chart we can see that the temperature is rising in both cases. The temperature locally and globally increased by 2 degrees from 1750 years to now.

- 3. What does the overall trend look like? Is the world getting hotter or cooler? Has the trend been consistent over the last few hundred years?**

As we can see from our chart, the overall trend is upward. The world is getting hotter and hotter.

Around 200 years ago we had a peak (red line) where the temperature went down, but the global average temperature and local (Amsterdam) are consistently rising over the last few hundred years.