

Weather Trends

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1 Data extraction

The city on which this project will be conducted is the city of Paris, France.

We have to compare the global temperature trends and the temperature trends in Paris, so we will only study the interval of years when we have temperatures for both: from 1750 to 2013.

We first need to extract the global temperatures trends from the database using the following SQL request:

```
1  SELECT *
2  FROM global_data
3  WHERE year BETWEEN 1750 AND 2013
4  ORDER BY year;
```

Figure 1: SQL request for global temperatures trends

Then we extract the temperature trends in Paris from the database using the following SQL request:

```
1  SELECT year, avg_temp
2  FROM city_data
3  WHERE city = 'Paris' AND year BETWEEN 1750 AND 2013
4  ORDER BY year;
```

Figure 2: SQL request for temperatures trends in Paris

2 Data manipulation

In order to smooth out the lines and make trends more observable, a 10-years moving average is computed in Google Sheets, with the Average function.

If v_i is an average temperature of index i in the Google Sheets, and $ma_{i,n}$ the n moving average of v_i , then $ma_{i,n} = AVERAGE(ma_{i-(n-1)} : ma_i)$.

year	global_avg_temp	global_10y_ma	paris_avg_temp	paris_10y_ma
1750	8.72		11.18	
1751	7.98		11.15	
1752	5.78		6.97	
1753	8.39		10.40	
1754	8.47		10.15	
1755	8.36		9.84	
1756	8.85		10.20	
1757	9.02		10.02	
1758	6.74		9.62	
1759	7.99	8.03	10.66	10.02
1760	7.19	7.88	10.50	9.95
1761	8.77	7.96	10.55	9.89
1762	8.61	8.24	10.06	10.20
1763	7.50	8.15	9.83	10.14
1764	8.40	8.14	10.31	10.16
1765	8.25	8.13	10.15	10.19
1766	8.41	8.09	9.99	10.17
1767	8.22	8.01	10.01	10.17
1768	6.78	7.91	10.07	10.04

Figure 3: Moving averages in Google Sheets

3 Data visualization

From the moving averages above, we create a line chart that compares Paris's temperatures with the global temperatures.

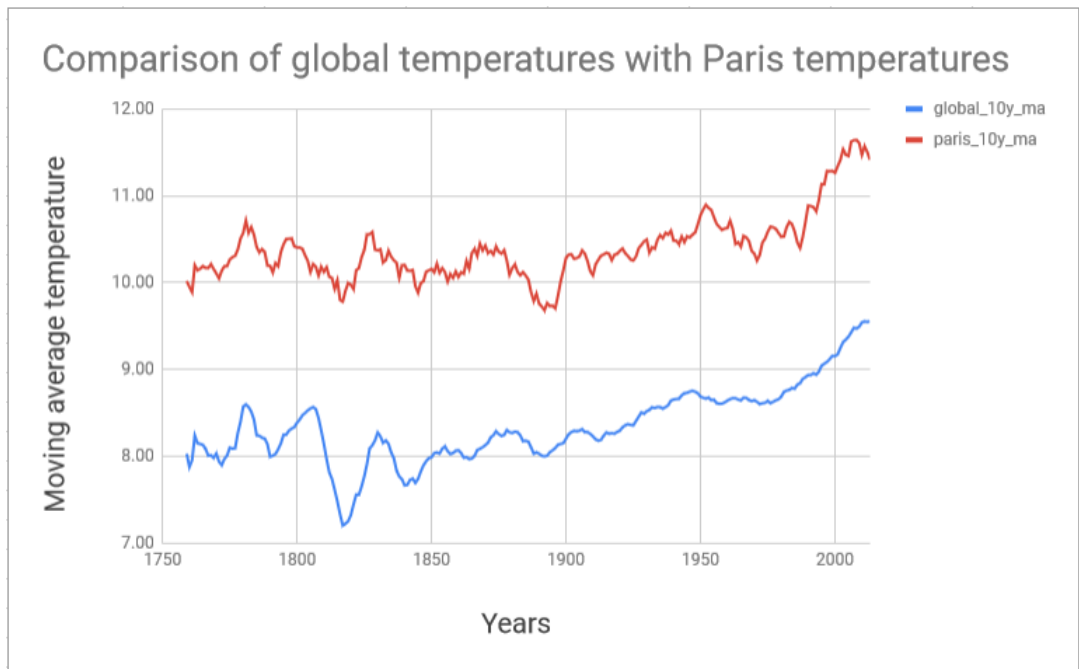


Figure 4: Line chart comparing Paris's temperatures with the global temperatures

4 Data interpretation

The city of Paris is hotter on average compared to the global average.

The difference in temperature between Paris and the global average has been consistent over time.

The overall trend looks like the world is slowly getting hotter.

Although there was a decrease in temperatures for both global and Paris's temperatures in the beginning of the first quarter of the 19th century, the decrease was much more significant for the global temperatures.