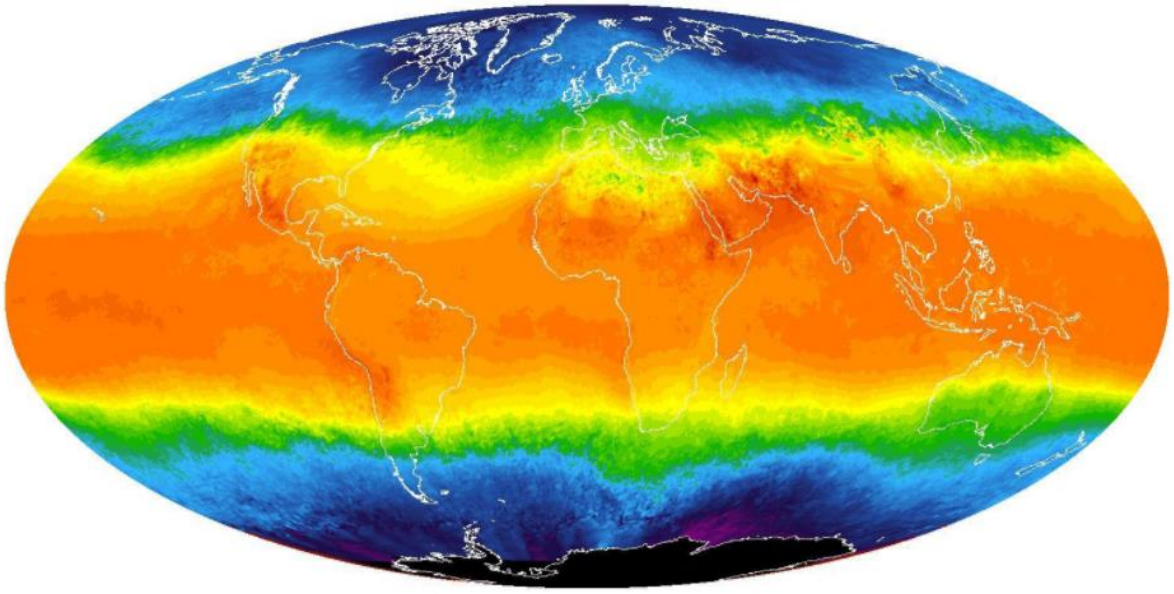
EXPLOREING WEATHER TRENDS



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Introduction

Analyse local and global temperature trends and compare the temperature trends where you live to overall global temperature trends. As I am from Pune, India who is currently living in Paris. These are the two cities I choose to analyse their weather trends w.r.t. global weather trends.

Tools Used

The tools used for the project were Excel and SQL.

Extraction of data for Analysis

To analyse the weather trends of Paris and Pune w.r.t global weather trends particular data needed to be extracted from the temperature database. Below are the SQL queries that I used to extract the data.

```
SELECT year, avg_temp

FROM city_data

WHERE city IN ('Paris') AND year BETWEEN '1813' AND '2013';   // extract Paris weather detail//
```

```
SELECT year, avg_temp

FROM city_data

WHERE city IN ('Pune') AND year BETWEEN '1813' AND '2013'; // extract Pune weather detail
```

```
SELECT *

FROM city_list

WHERE city IN ('Paris','Pune');   // Check if Pune and Paris are in Temperature database
```

```
SELECT *

FROM global_data

WHERE year BETWEEN '1813' AND '2013'; // Extract global data two analyse trend over two centuries//
```

With the help of the above queries the relevant data was extracted and converted into CSV.

Calculation of Moving average

In order to create line chart and analyse the temperature of selected cities with global temperature. It was important to calculate moving average. The moving average was calculated as follows:

	A	B	C	D	E
1	year	city	country	avg_temp	
2	1813	Paris	France	9.77	
3	1814	Paris	France	9.22	
4	1815	Paris	France	10.06	
5	1816	Paris	France	8.89	
6	1817	Paris	France	10.06	
7	1818	Paris	France	10.76	
8	1819	Paris	France	10.79	
9	1820	Paris	France	9.68	
10	1821	Paris	France	10.67	
11	1822	Paris	France	11.54	10.144
12	1823	Paris	France	10	10.167
13	1824	Paris	France	10.48	10.293
14	1825	Paris	France	10.87	10.374
15	1826	Paris	France	10.7	10.555

Figure 1 Moving average calculation

As you can see from the image above first the average of first ten years was calculated in cell E11 with the help of average formulae in excel. Once the average was calculated with the help of excels drag and drop option the rest of the moving average was calculated. The same process was repeated to calculate the moving average temperature of Pune city.

Observation and line chart on comparison between Pune city and global temperature

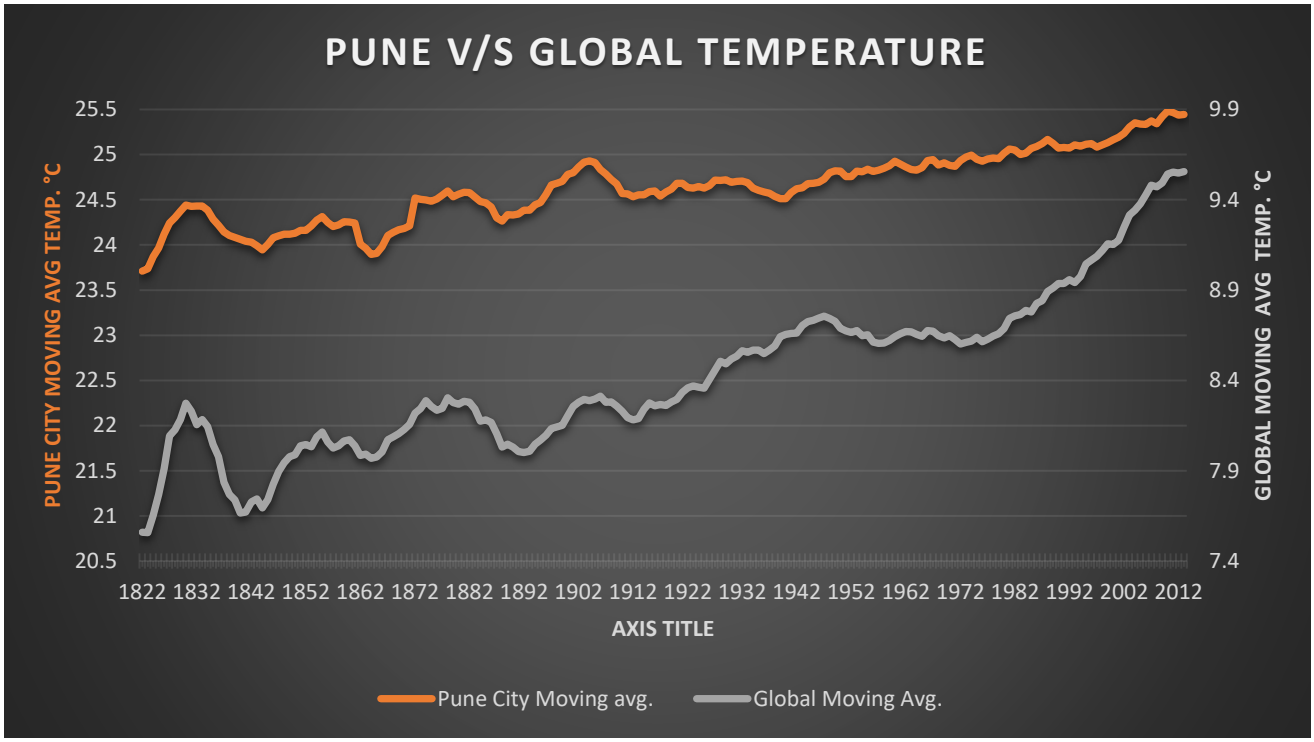

Figure 2 Comparison between Pune city and global temperature

1. Correlation coefficient :

Correlation coefficient formulas are used to find how strong a relationship is between data. The formulas return a value between -1 and 1, where:

- 1 indicates a strong positive relationship.
- -1 indicates a strong negative relationship.
- A result of zero indicates no relationship at all.

The correlation coefficient between Pune city and global temperature is **0.928097**. As it is a positive correlation this means that if the global temperature on an average is rising so is Pune cities temperature.

2. Considering the global average temperature, the temperature in Pune city is much hot and warmer. The difference in the temperature is consistent over time.
3. As you can see from the graph the trend is consistent in last two centuries. Both the lines are slightly inclined in upwards direction as the time goes on. This means that the world is getting hotter as the time progresses
4. If we observe the global moving average temperature after the late 19th century, there is a considerable upwards inclination of the line compared to before that. This suggest that due to urbanisation and industrialisation all over the globe in the recent time, there is too much carbon omission that is very harmful for the environment especially ozone layer, thus giving rise to global warming.

Observation and comparison between Paris city and global temperature

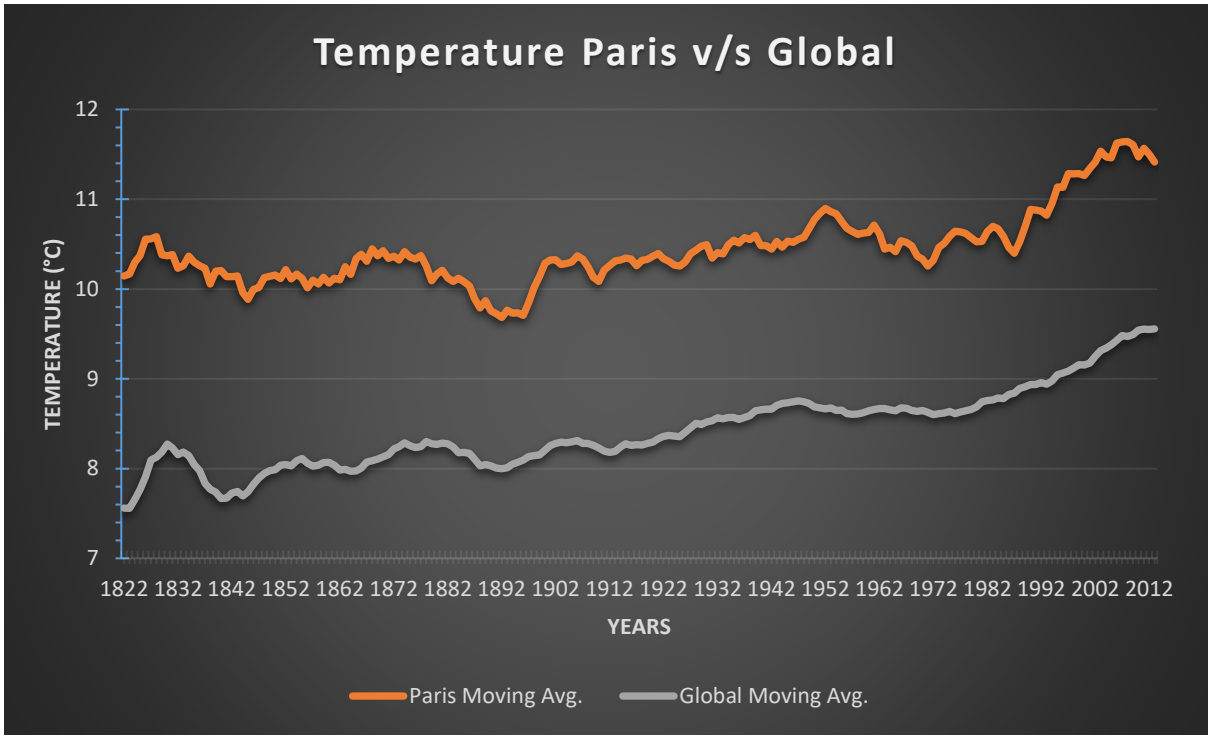

Figure 3 Comparison between Paris city and global temperature

1. In comparison with global average temperature, the temperature in Paris is very much similar. As the average temperature ranges from 9 – 12 we can say that temperature in Paris is cool, although it is still slightly above the global average.
2. The correlation coefficient is 0.878195, which means that if global temperature rises so doe's temperature in Paris.