

Data Analyst Project 1

Exploring Weather Trends

Ankit Naik

14 December 2017

Abstract

This project compares weather trends between average global temperature and particular city which is chosen as Bangalore, India. Database has been taken from the project section of Term 1 of Nano-Degree program of Data Analyst by Udacity.

Several observations has been made according to the data provided and has been mentioned in the document.

1 Introduction

Database provides three tables named -

- *city_list* - which provides list of cities with temperature available in database
- *city_data* - which provides average temperature over the years in the city
- *global_data* - which provides global average temperature over the years

Following steps has been taken to create observations related to data provided -

Step 1 *Queried* for city Bangalore in *city_list* table

Step 2 *Chosen* Bangalore as city and queried both tables *city_data* and *global_data* for values

Step 3 *Exported* CSV for plotting line charts

Step 4 *Calculated* moving average to remove spikes

Step 5 *Observed* data based on several parameter

Following section provides methodology used for observed information.

2 Methodology

2.1 Finding city in *city_list*

The following SQL query has been used for finding city Bangalore in *city_list* table

```
SELECT *  
  FROM city_list  
WHERE city = 'Bangalore'
```

2.2 Retrieving city details from city_data and global_data

To retrieve average temperature details of Bangalore an INNER JOIN query has been used, since some of the year in global_data and city_data were not common.

INNER JOIN based on year will retrieve common rows between these two table. The query that has been used is :

```
SELECT city_data.year, city_data.city, city_data.avg_temp AS city_avg_temp ,
       global_data.avg_temp AS global_temp_avg
FROM city_data
INNER JOIN global_data
ON city_data.year = global_data.year
WHERE city = 'Bangalore'
```

2.3 Exporting CSV and Calculating Moving Average

The result obtained with above query has been exported as **CSV** and imported in **Google Sheets**.

7 years has been taken for calculating Moving Average and formula has been copy pasted for remaining rows.

2.4 Plotting Line Chart

To plot line charts top 6 rows has been removed since moving average of 7 years has been taken.

Following line chart is plotted using Google Sheets between Moving average Temperature of Bangalore (Axis Y) and Moving Average Temperature of Globe (Axis Y) over the Years (Axis X).

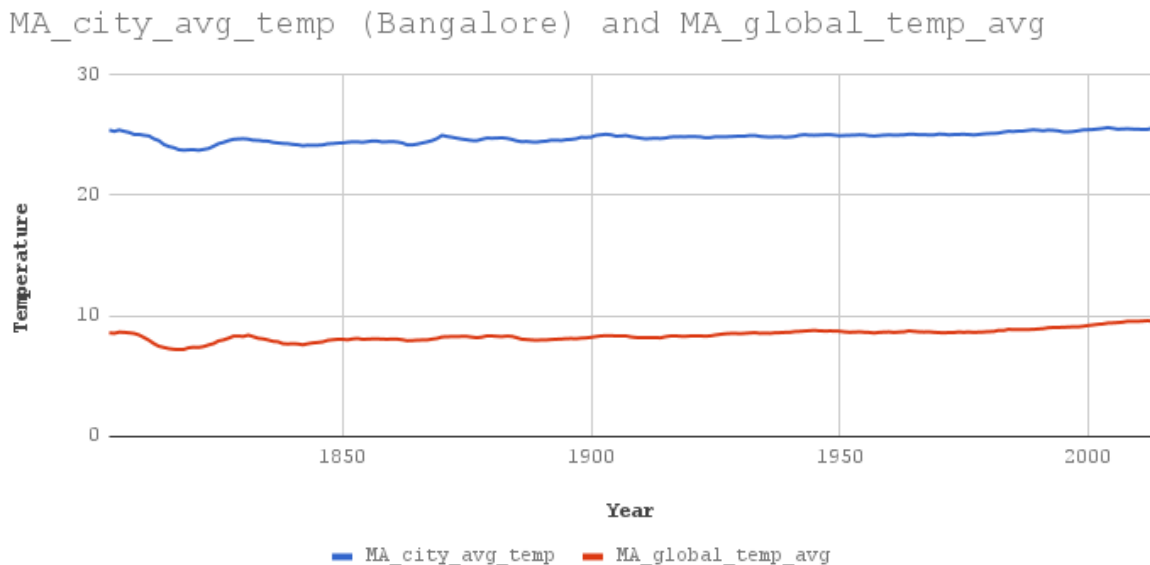


Figure 1: Line Chart for Moving Average Temperature of Globe and Bangalore

In above figure red line represents temperature of Globe and blue line represents temperature of Bangalore.

3 Observations

Following subsection describes observations that has been made according to the analysis made observing the line chart prepared.

3.1 Observation 1: Average temperature in Bangalore v/s Globe

Bangalore is **hotter** when compared to global average temperature. As temperature recorded in 2013, Bangalore recorded 26.61°C and Global average was 9.61°C

3.2 Observation 2: Difference in temperature over the years

When adding a new column having value as a difference of global average temperature and Bangalore's average temperature it has been observed that the difference is **not constant** and varies allot between range 15.72-17.21.

3.3 Observation 3: Relationship with Global temperature and City Temperature

From the line chart we can easily observe that global temperature and city temperature are **correlated**. Whenever global temperature drops or rises there is an effect in city temperature.

3.4 Observation 4: Changes in global temperature trends over the years

There has been several changes in trends over the years, from 1804-1817 there has been a consistent drop in temperature then it started to rise again.

From 1829-1842 there is again drop in temperature after 1842 temperature again rose and somewhat remain small constant change over the years.

From 1979-2013 there has been subsequently larger increase in temperature compared to trends in previous years.

3.5 Observation 5: Percent temperature change for Globe and Bangalore

Moving Average has been taken for considering percentage change -

Type	Year	Temperature	Deviation(%)
Globe	1802	8.58	0
Globe	2013	9.57	11.54
Bangalore	1802	25.44	0
Bangalore	2013	25.75	1.21

According to the table we can see that the temperature difference between 1802 and 2013 is not much for Bangalore comparing to Global average.

3.6 Observation 6: Overall Trend

Overall trend suggest that temperature is rising significantly over last 100 years compared to previous years. As a result overall climate is **hotter**.

4 Conclusion

Using SQL and Excel sheet several observations has been made for weather trends. Overall trend suggests that world is getting hotter and climate in Bangalore has an impact but less comparing to changes in global temperature.