# Explore Weather Trends

April 30, 2020
Udacity – Data Analyst Nanodegree

**Saikiran Bikumalla**
Project-1 (Explore weather trends)
Hyderabad, India

## Overview:

I have been provided with temperature data in the udacity workspace from where i have extracted the data related to my city temperature (Hyderabad) and global temperature using some SQL queries. I analysed the global temperatures and my city temperatures over the years by extracting, manipulating and visualizing the data.

## Goals:

1. Identifying and checking for my city in database using SQL queries.
2. Extracting the data from the Udacity Workspace.
3. Comparing the city data with global data.
4. Making a chart visualisation as a part of analysis.
5. Making observations based on visualised plots or charts.

## Tools Used:

- SQL : To extract data from database.
- LibreOffice Spreadsheets :
  1. To calculate the moving averages of the data.
  2. To plot a line chart for visualisation.

## STEP 1 : Extraction of the data from Udacity portal Database

1. Checking whether my city (Hyderabad) is available in the database.

   ```
   Select * from city_list where country='India' and city='Hyderabad';
   ```

2. To retrieve the city data from the data base for the city Hyderabad.

   ```
   Select * from city_data where city='Hyderabad';
   ```

3. There are two colums in two different tables with same name which are to be joined for comparison. Hence I have to modify the column names for avg_temp in both the tables.

   ```
   Alter table city_data rename column avg_temp to city_avg_temp;
   Alter table global_data rename column avg_temp to global_avg_temp;
   ```

4. Then I have joined two tables using inner join on the column year in both the tables.

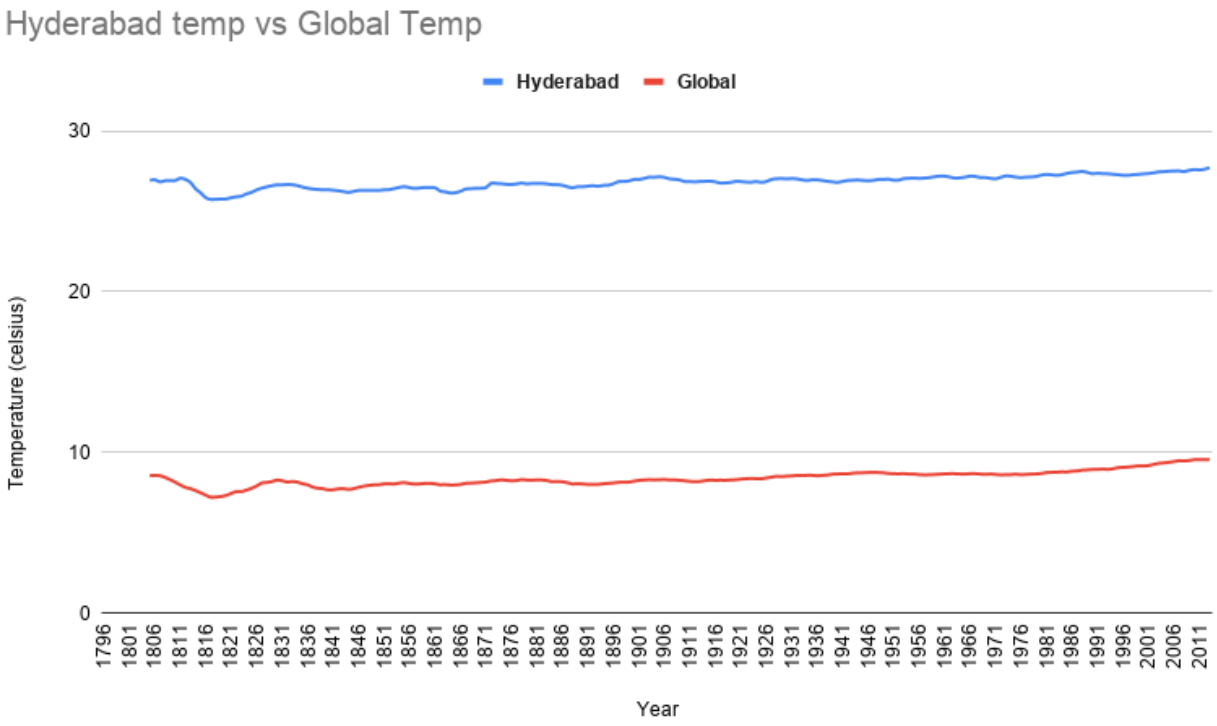
```
select city_data.city_avg_temp,global_data.global_avg_temp,global_data.year from
city_data join global_data on global_data.year=city_data.year where country='India' and
city='Hyderabad';
```

5. Then I have evaluated the query and downloaded the csv file which consisted global_avg_temp, city_avg_temp and year columns.

## Moving Averages :

1. To smooth the data and to observe the trends in the data.
2. I have done 10 year moving average to get a smooth line chart.
3. I used the aggregation function AVERAGE(A2:A11) to calculate the moving average for 10 years and then copied the formula by dragging it down.

I have plotted the average temperatures (moving averages) of hyderabad and global temp using a line chart. Here is the line chart of global avg temp and Hyderabad avg temp for 10 year MA.



## Observations :

1. Global Average temperature for 10 year MA varies between 7.2 °C to 9.5 °C.
2. Hyderabad Average temperature for 10 year MA varies between 25.7 °C to 27.7 °C.
3. From the plot it is clearly visible that Hyderabad is far too hotter when compared to global temperatues, being near to the Tropic of Cancer.
4. Trends in the changing temperatures.
    - Global Average and Hyderabad's Average temperature sees an decrease in the period of years 1806 and 1819.
    - Global Average and Hyderabad's Average temperatures steadily increase and are in direct proportion from 1820.
5. Final conclusion of project is that Hyderabad is hotter than global temperatures and temperature is increasing day by day due to climatic changes. And it is clear that the world is getting hotter when compared from 1800's to 2000's.