UDACITY

Explore Weather Trends

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Data Analyst for Enterprise Nanodegree Program

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Project I – Explore Weather Trends

Overview:

In this project, I have analyzed local temperature of Charlotte, NC in accordance with the global temperature data and compared. I had been provided with a database on Udacity portal from where I have to extract, manipulate and visualize the data as in the following goals.

Goals:

1. Data Extraction from database and exported it as CSV.
2. Using Excel, Visualization charts are prepared based on the data.
3. Weather trends are observed from the Charts.

Tools Used:

1. SQL: To extract the data from the database.
2. EXCEL: For calculating moving average and plotting a line chart to visualize the weather trends.

Step 1 – Extraction of Data from provided Database

1. To see which cities are available for "United States" in the given dataset:
   Query: select * from city_list where country = 'United States';
2. Using JOIN, obtained Global Average Temperature and Charlotte average Temperature over the years:

   Query: select global_data.year,

           global_data.avg_temp as Global_Avg_Temp,

           city_data.avg_temp as Charlotte_Avg_temp

       from global_data

        join city_data

   on city_data.year = global_data.year

      where city = 'Charlotte';

Step 2 – Excel Calculations for Making Line Chart

1. Calculated Moving Average (MA) to observe the trends in temperature.
2. I used 9 years Moving Average to get the smooth line chart.
   Excel commands for Moving Averages:
   For 9 years Moving Average = {=Average(B2:B10)}

Line Chart:

Global Temperature vs Chartlotte Temperature (in Moving Average)
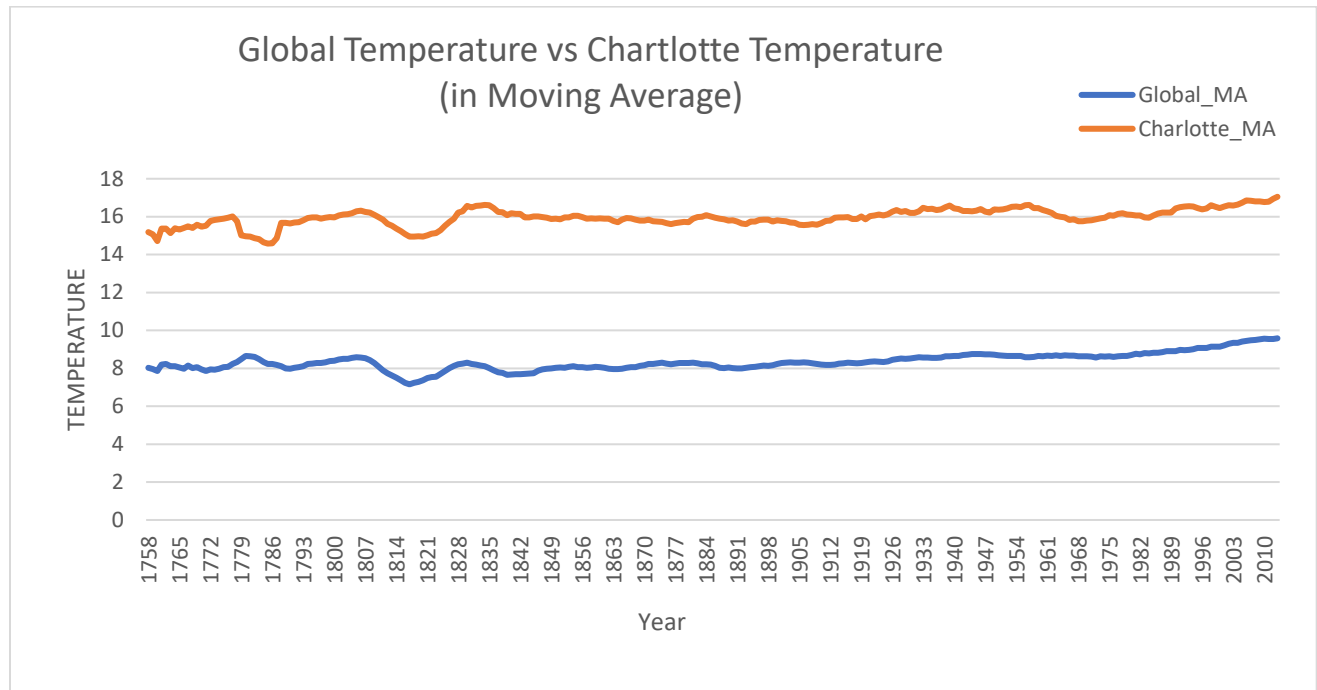
Observations:

- **Global** average temperature varies between 7.15 and 9.58 Degree Celsius and the **Charlotte** average temperature varies between 14.58 and 17.05 Degree Celsius.

- While comparing the Charlotte average temperature with Global average temperature, Charlotte city is slightly hotter than the Global Average Temperature.

- Change in temperature over the time:

YEAR	Change in Global Average Temperature	Change in Charlotte Average Temperature	Increasing/Decreasing Over Time
1803-1812	8.50-7.73	16.13 - 15.62	Decreasing
1920-1929	8.30-8.51	15.85-16.31	Increasing
1992-2010	8.94-9.58	16.54-17.04	Increasing

- Based on the Line Chart and the change in temperature table the difference between the Global average temperature and Bangalore average temperature is been **consistent over time**.

- During early years, both the Charlotte and Global average temperature seems to have similar kind of trends, also had ups and downs. Then approximately around from 1920's the moving average temperature starts to **Increase** at a steady rate.

- According to the graph the **World is Getting Hotter** because from 1804 to 2013 temperature is increases.

Conclusion:

Charlotte vs Global Average Temperature
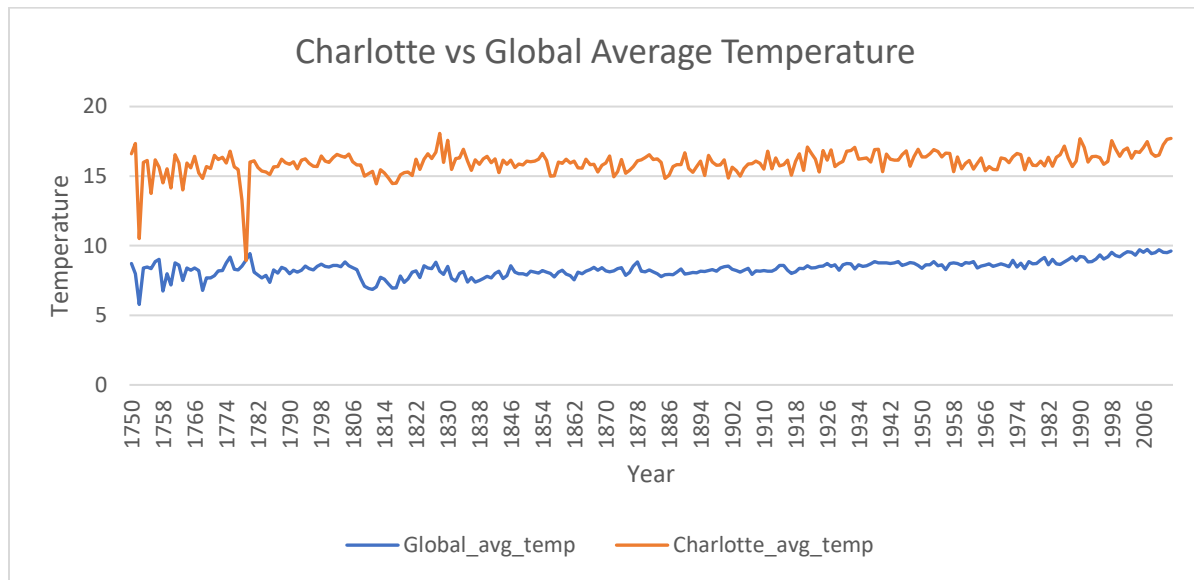
The above line chart clearly describes that the Global Temperature is rising which is directly proportional to increase in temperature of the city.

Key Considerations:

1. Unit of Temperature: Centigrade, on Y-axis
2. Years shown on X-axis
3. Different colors of lines for Charlotte and Global Average