

UDACITY DATA ANALYST NANODEGREE

Project 1: Explore Weather Trends

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Overview:

This report aims to provide some analysis about weather trends focusing on temperature trends of Rio de Janeiro and Global city temperatures. For this purposes, the global and city level data were provided by Udacity and the data were exported using SQL to Microsoft Excel (spreadsheet manager) to make the analysis.

High level activities description:

1. Selecting city and country from the database "city_list".
2. Extracting the City level data from the database "city_data" and export to CSV file.
3. Extracting the global temperature from the database "global_data" and export to CSV file.
4. Apply moving average formula and plot it in a line chart.

Tools Used :

1. **SQL:** To extract the data from the database curated by Udacity.
2. **Excel:** To calculate Moving Averages of global and city temperatures and plot Line Chart.

STEP 1 : Extraction of data from the database

1. To check if Rio de Janeiro data is available in the database.

```
SELECT *  
FROM city_list WHERE Country='Brazil'  
AND City='Rio De Janeiro';
```

2. To select data from the City database

```
SELECT avg_temp,year,city,country
FROM city_data
WHERE city='Rio De Janeiro';
```

3. An observation made at this step is that there is a column called avg_temp which is same in both city_data and global_data. A change in the schema were made joining both the tables and changing their column names in both databases to CAT (City Average Temperature) and GAT (Global Average Temperature) in this step.

```
ALTER TABLE city_data
    RENAME COLUMN avg_temp to CAT;
ALTER TABLE global_data
    RENAME COLUMN avg_temp to GAT;
```

4. Then an inner join were applied in the two tables as avg_temp is same in both the tables.

```
SELECT city_data.CAT, global_data.GAT, global_data.year
FROM global_data
JOIN city_data
ON global_data.year = City_data.year
WHERE city='Rio De Janeiro' AND Country='Brazil';
```

5. The data provided by the Udacity environment were exported to CSV and loaded in Excel.

STEP 2 : Moving Averages and Analysis

To smooth the data and observe trends in the temperature a 10 year moving average were used. To apply the 10 year MA the command `=AVERAGE(Line2:Line11)` were used in both city and global data. The following plot is a result of the moving average

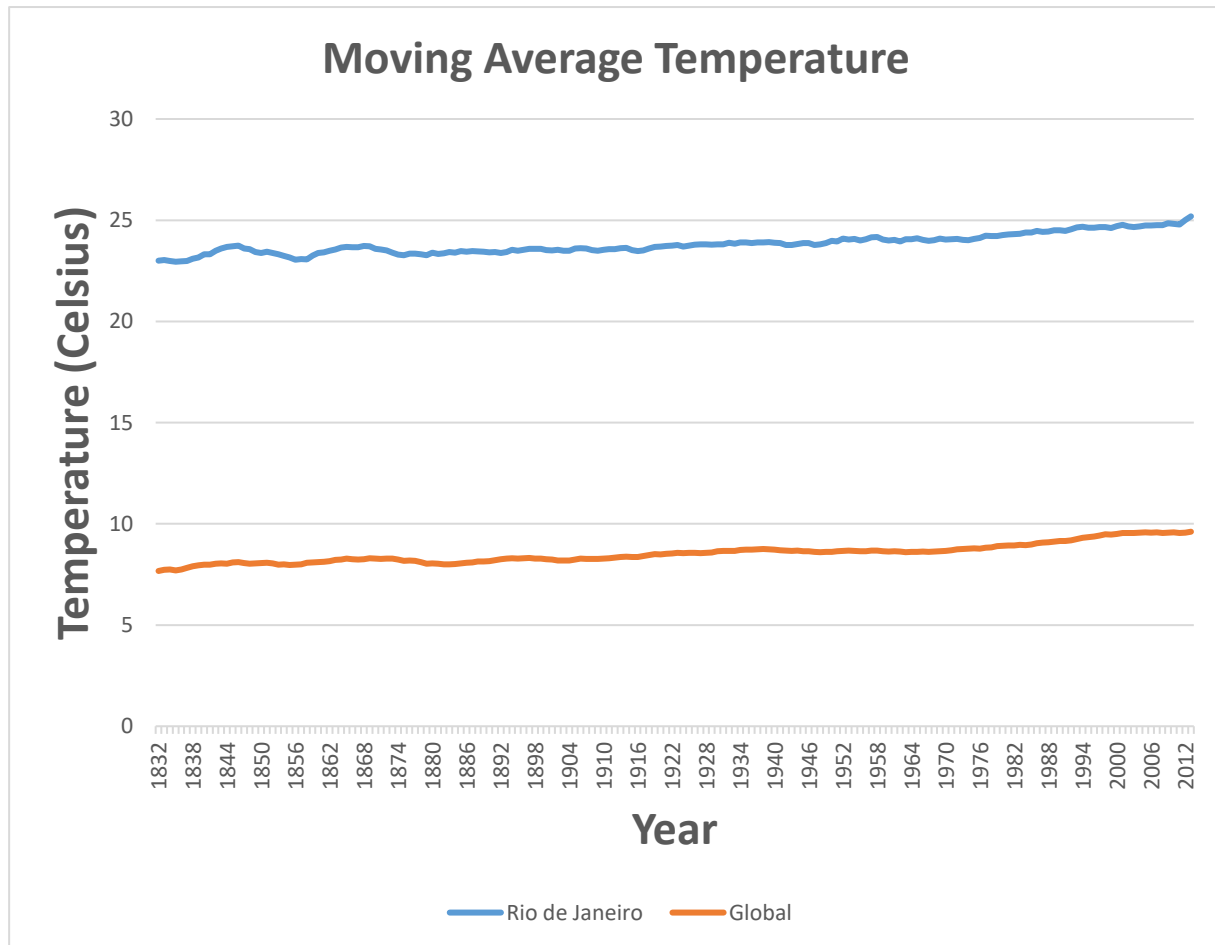


Figure 1: Moving average of Rio de Janeiro and Global temperature.

The following observations were made based on the Figure 1.

Insights :

1. Global Average Temperature for 10 years moving average varies between 8.5°C to 9.5°C. This implies that the global temperature is increasing over the years.
2. Rio de Janeiro city Average Temperature for 10 years moving average varies between 23°C to 25.19°C. This indeed implies that the temperature of Rio de Janeiro is increasing over the years.
3. The Rio de Janeiro average temperature varies more than the global temperature. This can be verified looking at the lines drawn in the Figure 1.
4. If comparison is made between Global and Rio de Janeiro average temperatures Rio de Janeiro is hotter than global average temperature. This is verified looking at the Figure 1 and knowing that Brazil is a tropical country.
5. Both average temperatures had ups and downs during the early years, later during 1996 to 2013 both the temperatures increased.

CONCLUSION:

The insights provided by the 10 year moving average in the Figure 1 shows us that both Rio de Janeiro and Global temperature is increasing over the last two decades.