Divya Naidu
Udacity's Project 1

EXPLORING

WEATHER TRENDS

Project Objective

The basic objective of this project is to extract and analyze the local and global temperatures data from the database provided and finally compare the global temperature data with my city's temperature data i.e. New York City temperature data to answer various similarities and differences in the trends over the years.

Data Extraction

The local and global temperature data is needs to be extracted from the temperatures database. I have used the SQL workspace which was provided for extracting these data from the data base. The temperatures database had three tables, **city_list, city_data and global_data**.

The city_list table was used to find New York City from the extensive list using the below SQL query.

```
select *
from city_list
where country like 'United States'
```

The **Global_data table** is used to get the global temperature data over the years.

```
select *
from global_data
```

The **city_data table** is used to get New York city's temperature data.

```
select year,
    avg_temp
from city_data
where city='New York' AND avg_temp IS NOT NULL
```

I have used Inner Join SQL query to get a final temperature_data with both New York city and Global temperature.

```
SELECT c.year, c.avg_temp, g.avg_temp as "avg_temp_global"
FROM city_data c
INNER JOIN global_data g on c.year = g.year
WHERE c.city = 'New York' AND c.avg_temp IS NOT NULL
```

All the extracted data was downloaded as .csv files for further analysis.

Data Analysis

The final temperature_data file was explored using Microsoft Excel.
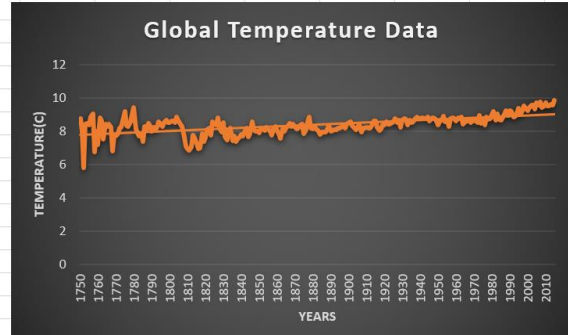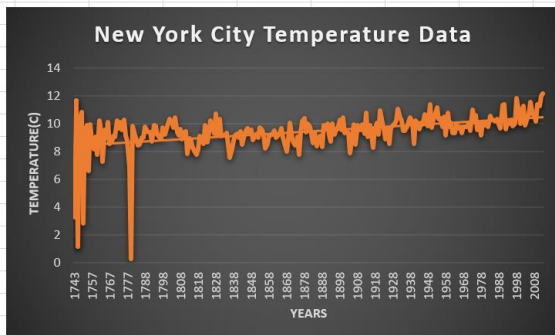
To visualize the data, I first applied moving average on both New York city and global temperature.

A moving average is simply a way to smooth out fluctuations to help distinguish between typical "noise" and the actual trend direction.

I have used 14 year moving average to smooth out the data and to make it easier to observe the trend. I have used the average function in excel to calculate the 14-MA data.

Below is the Line Chart that was made in Excel, for New York City and Global temperature data.
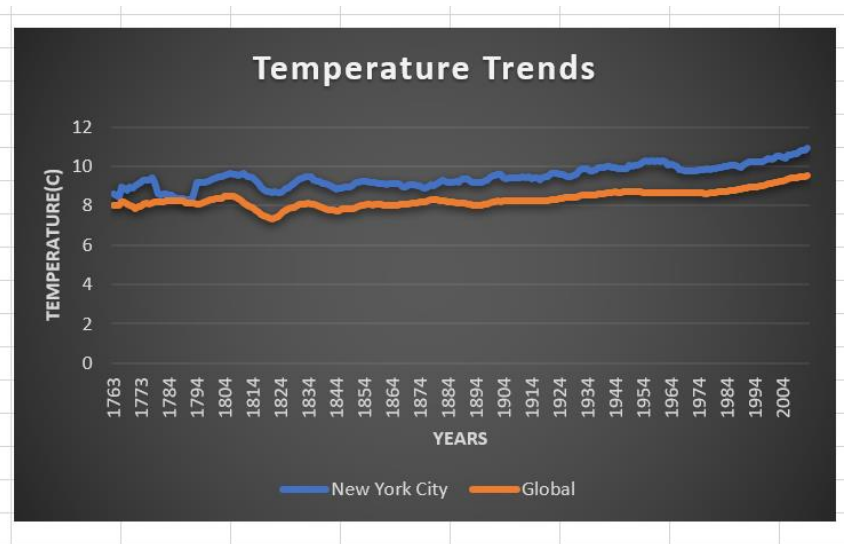
As seen the 14 year Moving average gave a smooth trend line, making the data more observable compared to the original data plot.

Observations

- From the visualization above, it can be clearly seen that the New York City temperature over the years on average have been **remarkably similar** to the global temperature.
- There has been a persistent difference of below 2 degree Celsius between them, still if compared to the global temperature the New York City temperature would be considered **hotter**.
- It is observed that the global temperatures have been growing over the years. The temperature has almost increased from **8.5 to 10** degree Celsius.
- Between the years **1784 to 1794** it can be seen in the graph that the average temperature of New York city was exactly similar to the global average temperature. Same goes for the years **1764** to almost **1770**.
- There has been a visual drop in temperatures for around **two decades** from **1804 to 1824** for both global and New York City temperature. Post that there has been a constant upsurge in the temperatures, thus we can conclude that the world is getting **hotter**.
- There has been ups and downs in the temperatures over the years but post **1894** it has been **steadily increasing**.
- From the above observations we can say that both the Global temperature and New York city temperature are **directly proportional** to each other.

Conclusion

"**Climate change**" has becomes a more and more frequently used terminology. One of many climate change indicators is the increase in temperature. Exploring the weather trends over the years using the temperatures data has provided a lot of insights on temperature change in my city, i.e. **New York**. So, finally with my observations I can conclude that the world is getting **Warmer** gradually and so is my city.