Project 1: Explore Weather Trends

***Summary/Conclusions/Observations*:**

I am using Excel to perform all the calculations and visualization. The biggest city that I live close to is Toronto.

SQL query:

- These are the SQL queries used to extract data,
  - city_list - This query pulled out data for all cities in Canada. Toronto is the closest to where I live.

```
SELECT *
FROM city_list
WHERE country LIKE '%Canada%';
```

  - city_data - This query pulled out all the data related to Toronto needed for analysis.

```
SELECT *
FROM city_data
WHERE country LIKE '%Canada%' AND city LIKE '%Toronto%';
```

  - global_data - This query pulled out all the global data related needed for analysis.

```
SELECT *
FROM global_data;
```

Preparing Data:

- Firstly, I observed that the number of years in city_data and global_data were different. City_data started from 1743 to 2013 with a few avg_temps missing between(1746-1949). Global_data starting from the year 1750 to 2015. So I deleted the first few rows in city_data and last two in global_data to even out the number of years observed between the two data sets.
- There are 264 rows of data when both city_data and global_data are combined.

Calculations:

- Moving Average - I calculated 7 year Moving average temp of city and global temps.
  I calculated by taking the average of the first 7 years in the spreadsheet and saving it in the 7th cell of a new column created name '7-year-city MA'. The rest of the cells in the column are computed with the same formula but starting from the 7th cell respectively.
  I similarly calculated '7-year-global MA' for calculating global Moving average.

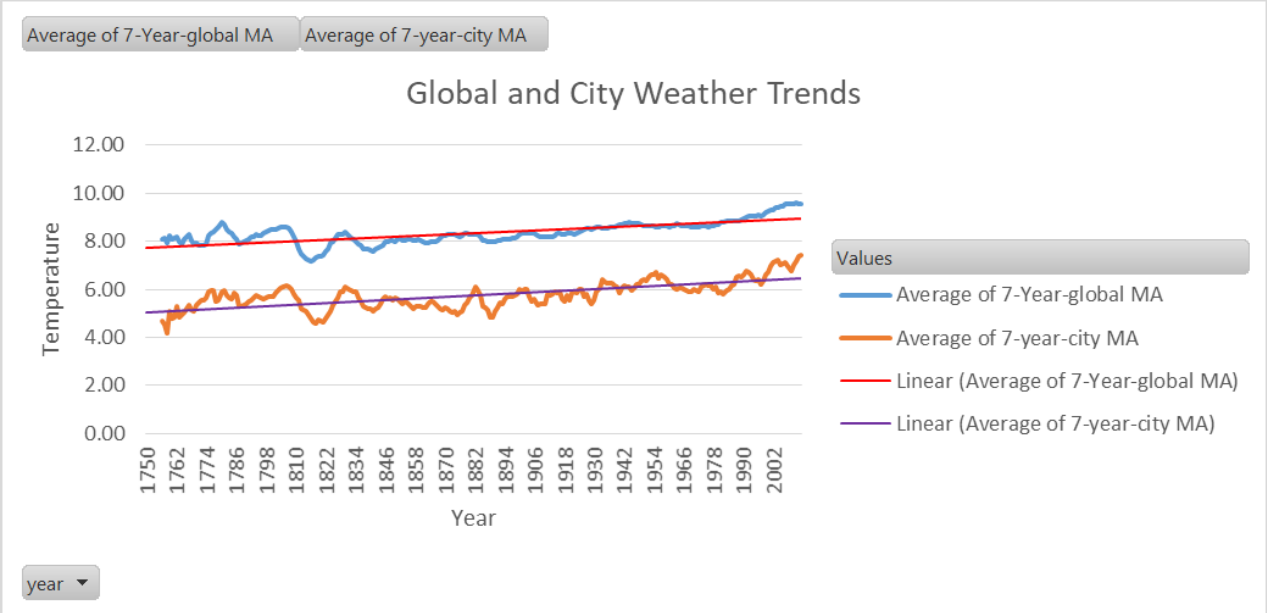
- Minimum, maximum and average temperatures of city and global are calculated.
- Difference between the city and global temperatures are calculated to observe if the difference has been reduced or increased since the past.

Considerations:

I wanted to observe the variations in the city and global temperatures individually and see how much of a difference there has been since the 1750's. I have also used a trend line so it is visually evident if there has been an increase in the trend.

Line Chart:

- The Line Chart shows the 7 year moving average of Toronto city and Global temperatures.
- Orange Line shows the 7 year moving average of Toronto and Linear Trend Line in Purple.
- Blue Line shows the 7 year moving average of Global and Linear Trend Line in Red.



Observations:

- Toronto is a cooler city as compared to global average temperatures.

- Orange Line shows the weather trend of Toronto over the years. As we can see the temperatures have fluctuated over the years but mostly seen increasing except for the small dip we see around the year 1820. The linear trend line (purple line) is also increasing which means that the trend shows a temperature rise over the past years.
- Blue Line shows the weather Trend of Global averages, as we see there has been an increase in average temperatures over the years and the trend line (Red) shows the same too.
- Now let's see how the City temperatures have varied in comparison with Global temps.
    - When we see the Line chart it's evident that the temperatures have increased in City and all around the Globe as well. The chart shows that there is a Correlation between the city temperature increase and Global Temperature increase.
    - The correlation is Positive which means when City temperatures increase then there is a rise in Global Temperature as well and vice versa. Say, when the City temperature dropped in 1820 the global temp dropped too as it is observed in the chart.

Conclusion:

It is evident that there has been a substantial increase in the average temperatures globally and locally over the years thus effecting and changing the Earth's climatic system (Global Warming).

Global warming has several harmful effects on the Earth's eco system thus affecting all living on Earth.