Project 1

Title: *Explore Weather Trends*

Required Steps:

1. Prepare Data: SQL code is used to extract necessary data from the tables given. As I am from India and near to Delhi city, so I fetched data related to Delhi. Basically, I took data from 1870 to 2013. Following SQL code is used to extract data and downloaded that as CSV file-

--Extract Data

```
SELECT gd.year as Year, gd.avg_temp as Global_Temp,
cd.avg_temp as City_Temp FROM global_data as gd
INNER JOIN
(SELECT * FROM city_data WHERE year>1869 and
city='Delhi') as cd
ON gd.year=cd.year;
```

2. Moving Average: From the extracted data I calculated 10 year Moving Average(MA) for Global and Delhi Temperature one by one. I used Google Spreadsheet to calculate MA. Take the total temperature data of the world as Temperature and create another column 10 Year MA. First take first 10 data(i.e. A2 : A11) and take AVERAGE and that calculated value is MA for A11.

Then drag the formula till the cell B145 (as data is available till that cell) and calculated MA for every required cell. Same steps are followed to calculate 10 year Moving Average(MA) for Delhi city.

3. Line Chart: A Line Chart is drawn using Google Spreadsheet with 10 year Moving Average values for World and Delhi city. In this chart I used MA to cut down noise of data and make it smooth to visualize it for the long term.
Line Chart is given below.

10 Year Moving Average

Global Temperature in °C — Delhi Temperature in °C
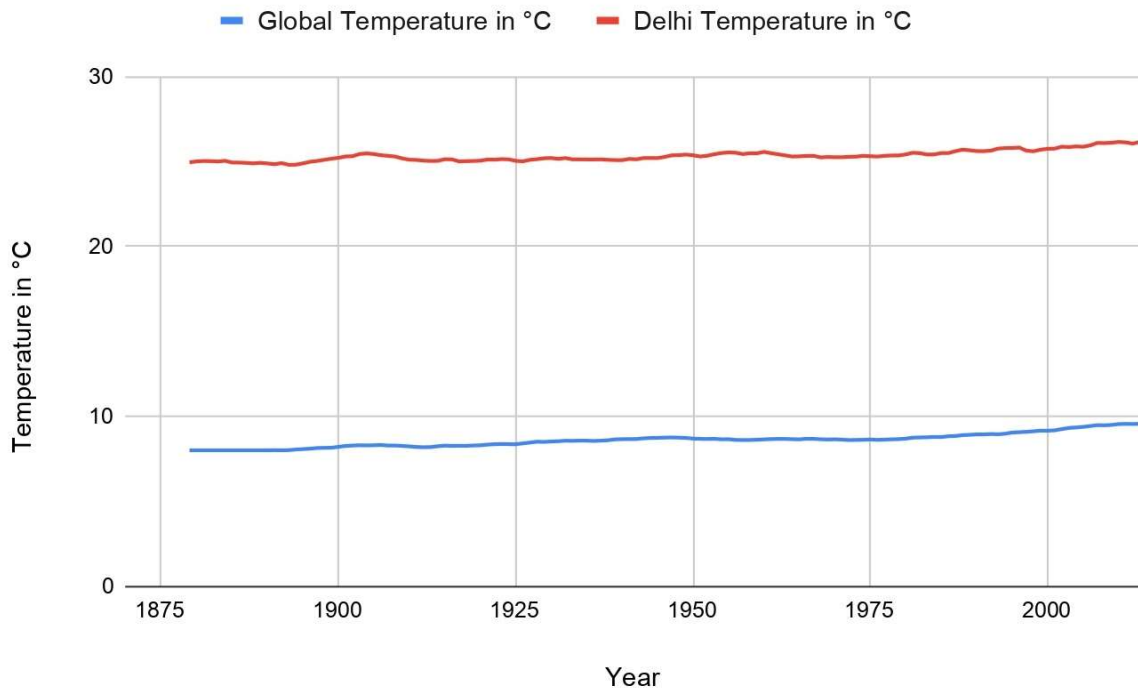
4. Correlation Coefficients: I found the correlation coefficient using Jupyter Notebook. The following shows the required python code and table of correlation coefficients -

```
import pandas as pd

weather_df = pd.read_csv('results.csv')
weather_df.corr()
```

	year	global_temp	city_temp
year	1.000000	0.857784	0.587321
global_temp	0.857784	1.000000	0.660049
city_temp	0.587321	0.660049	1.000000

Tools Used:

SQL, Python 3, Jupyter Notebook, Google Spreadsheet, Google Docs.

Observations:

- From the above chart we can see that the Temperature Trend is almost linear with Year for World and Delhi both. There is no drastic change in the Temperature Trend.
- Delhi is hotter than the World for all the time.
- World is cooler than Delhi city.
- For every Year, "Global Temperature in °C " increases by about 0.011.
- For every Year, "Delhi Temperature in °C " increases by about 0.019.
- In the Year 2013 Delhi had the highest temperature 26.71 °C and the World had 9.61 °C.
- We can conclude from the correlation coefficients that from year to year World and City becomes hotter. And if the city's temperature is increased then World's temperature will be increased.

Conclusions: Our aim was to analyse the temperature trends of the World and the City I live with the Year. And we can see that with the years the World and the city is becoming hotter. This also signifies the effect of "Global Warming".