Global temperature trend (1900–2014)
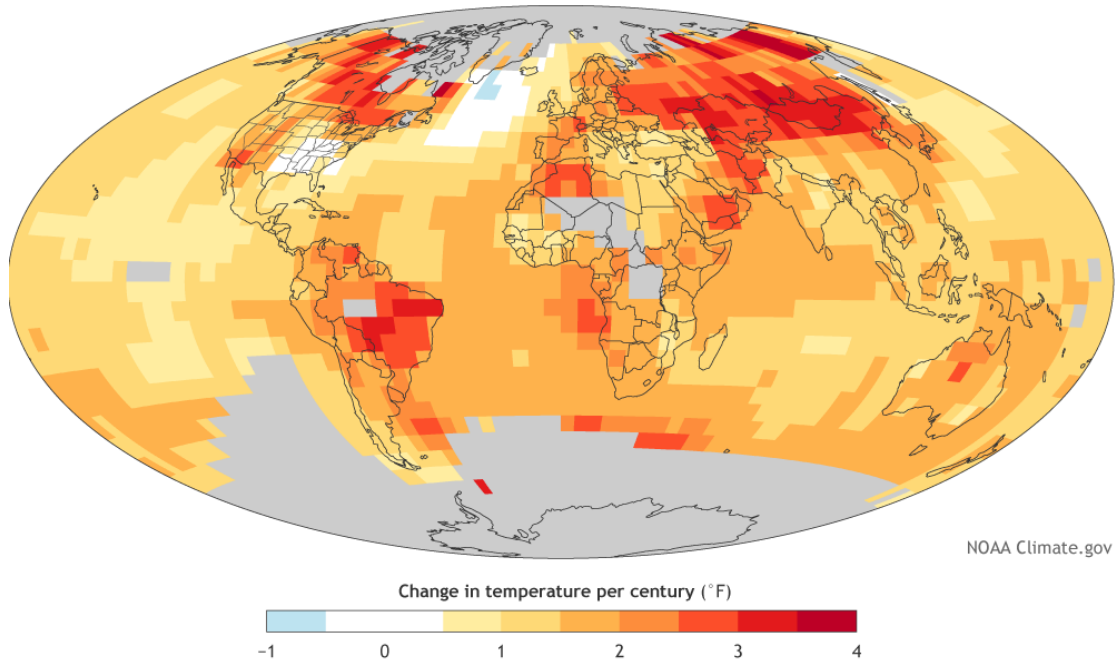
NOAA Climate.gov

Change in temperature per century (°F)

-1   0   1   2   3   4

Explore Weather Trends

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Project – 1

Data Analyst Nanodegree Program

Udacity

Aim

To analyze the change in temperature of London, UK against Global temperature change

Introduction

In this project, the change in temperature of London, UK was analyzed against the global temperature change from the year 1750 to 2013. The yearly average temperature data of London and yearly average global temperature were extracted from the database provided by Udacity.

Methodology

Tool Used

- SQL to extract the desired data from the database
- Microsoft Excel to analyze the data

Step 1: Extraction of data from the database
To extract the yearly average temperature of London, the following SQL command was used
SELECT*
From city_list
WHERE country = 'United Kingdom' AND city = 'London';
SELECT*
FROM city_data;

To extract the yearly average global temperature, the following SQL command was used
SELECT *
FROM global_data;

The data were downloaded as CSV file. The average yearly temperature data from the year 1750 – 2013 were given in °C.

Step 2: Calculation of moving average (MA) and analysis of data

10 years moving averages for London temperature and global temperature were calculated to obtain a smooth line chart. Moving averages were calculated using the AVERAGE() excel function shown in Table 1.

Table 1: Calculation of 10 years MA in excel

Year	City	Country	Temp_City	10 years MA
1750	London	United Kingdom	10.25	
1751	London	United Kingdom	9.99	
1752	London	United Kingdom	6.54	
1753	London	United Kingdom	9.42	
1754	London	United Kingdom	9.2	
1755	London	United Kingdom	8.95	
1756	London	United Kingdom	9.42	
1757	London	United Kingdom	9.34	
1758	London	United Kingdom	8.85	
1759	London	United Kingdom	9.8	=AVERAGE(D2:D11)

The AVERAGE() function was copied and pasted for the rest of the cells.

Result

10 years moving average temperature (°C) of London and that of the globe were plotted against the years (1750 – 2013) and is shown in Figure 1.
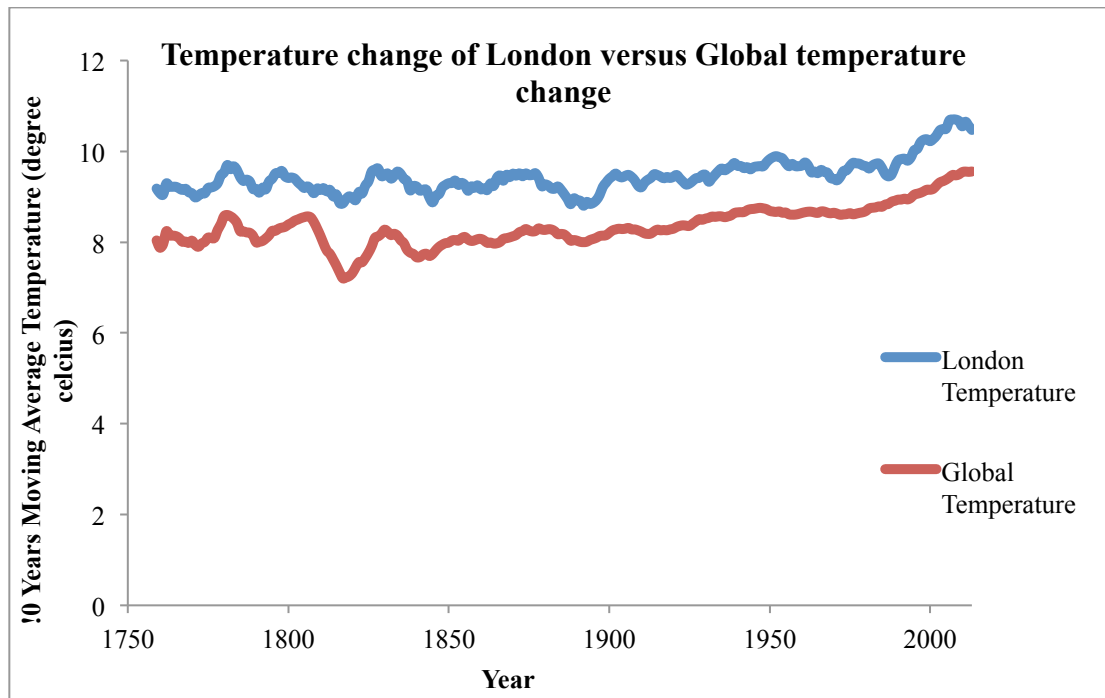
Fig.1: Temperature change of London versus global temperature change from 1750 – 2013.

Discussion

The following points were observed from the analysis:

1. The temperature change in London follows the same pattern as the global temperature change. Although the yearly average temperature of London was higher than that of the global temperature.

2. The yearly average temperature of London varies from 6.54°C – 11.19°C whereas the yearly average global temperature varies from 5.78°C – 9.73°C.

3. On an average, there was a 1.1°C temperature difference between London and global temperature.

4. The correlation coefficient was calculated using the Excel command CORREL(D2:D265,H2:H265), where D was the column for the yearly average temperature of London and H was the column for yearly average global temperature. The correlation coefficient was found out as 0.56, which shows that there was a moderate positive relationship between the temperature change in London and the global temperature change [1].

5. There was a steady increase in 10 years moving average temperature for both London and the globe from the year 1994 – 2013. So, it can be concluded that the world is getting hotter.

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Reference

Ratner, B. **"The correlation coefficient: Its values range between +1/−1, or do they",** Journal of Targeting, Measurement and Analysis for Marketing (2009), Vol 17(2), 139-142. https://link.springer.com/article/10.1057%2Fjt.2009.5.