

Project 1: Explore Weather Trends

Step 1: SQL quires and download CSV files

Extract city level temperature data

```
SELECT *  
FROM city_data  
WHERE city= 'London' AND country = 'United Kingdom'
```

Extract global temperature data

```
SELECT *  
FROM global_data
```

Step 2 : Checking the data

CSV filed opened in Excel. The two tables are combined into one table, the global temperature data started from year 1750 while London (UK) started from 1743 with missing data from years 1746 to 1749. Data before 1750 for London city has been discarded.

Step 3: calculate the 10 years moving average and plot the line chart

The moving average is calculated using blocks of 10 years. The average of temperatures from year 1750 to 1759 is calculated, then moving to have the average of temperatures from year 1751 to 1760 and so on.

year	local_avg_temp	local_moving_average	global_avg_temp	global_moving_average
1750	10.25		8.72	
1751	9.99		7.98	
1752	6.54		5.78	
1753	9.42		8.39	
1754	9.2		8.47	
1755	8.95		8.36	
1756	9.42		8.85	
1757	9.34		9.02	
1758	8.85		6.74	
1759	9.8	9.176	7.99	8.03
1760	9.26	9.077	7.19	7.877
1761	9.69	9.047	8.77	7.956
1762	8.99	9.292	8.61	8.239
1763	8.75	9.225	7.5	8.15

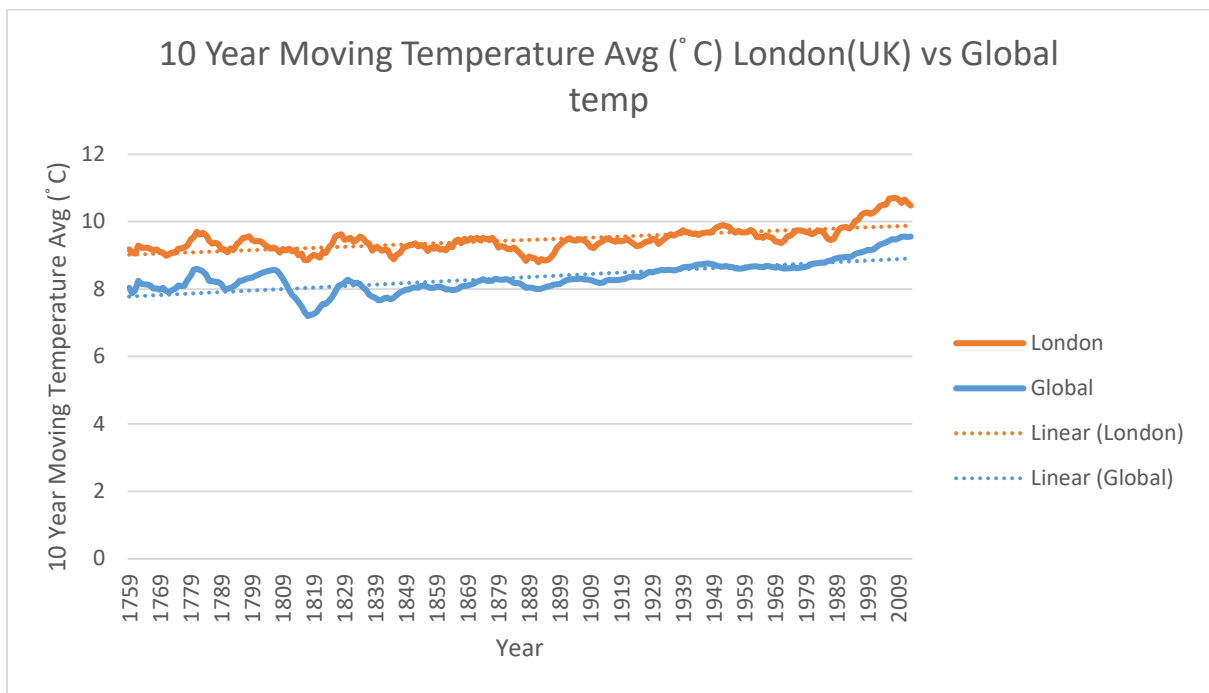


Figure 1: 10 Year Moving Average Temperature for London(UK) Vs Global

Step 4: Observations

1. London city is hotter with an average temperature of 9.45°C compared to the global temperature with an average temperature of 8.34°C . Both almost followed the same pattern overall the years.
2. The maximum difference in temperature between the two moving averages is 1.757°C and the minimum difference is 0.598°C . The average and the median of the difference are both 1.10°C . Overall the difference between the two temperatures decreased over time as shown in Figure-2.

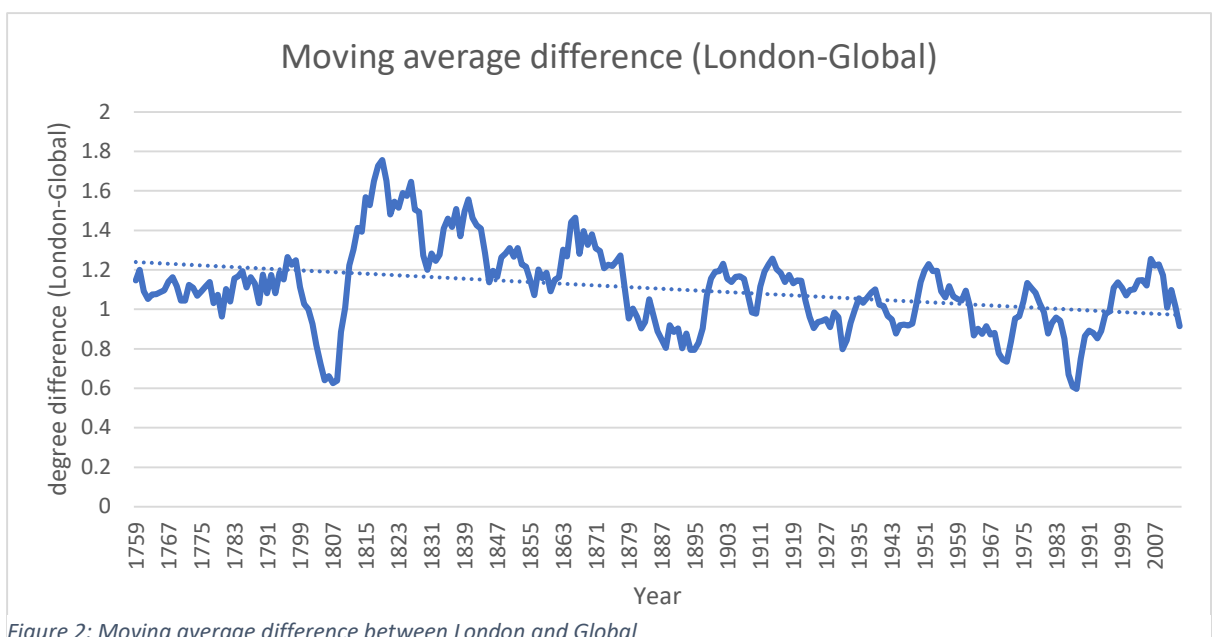


Figure 2: Moving average difference between London and Global

3. Global temperature and London temperature both increased over the years which consists with the global warming issue. The difference between the first temperature reading (1759) and last reading (2013) for London is 1.295°C , while for the global temperature the difference is 1.526°C .

	London	Global
Min ($^{\circ}\text{C}$)	8.80	7.20
Max ($^{\circ}\text{C}$)	10.70	9.56
Average ($^{\circ}\text{C}$)	9.45	8.34
Median ($^{\circ}\text{C}$)	9.42	8.27

4. The world is getting hotter and this has been consistent over the years except for the period between 1807 and 1829 where the global temperature dropped significantly while London temperature dropped slightly during the same period.