Explore weather trends

1. An outline

1.1. Steps of analysis:

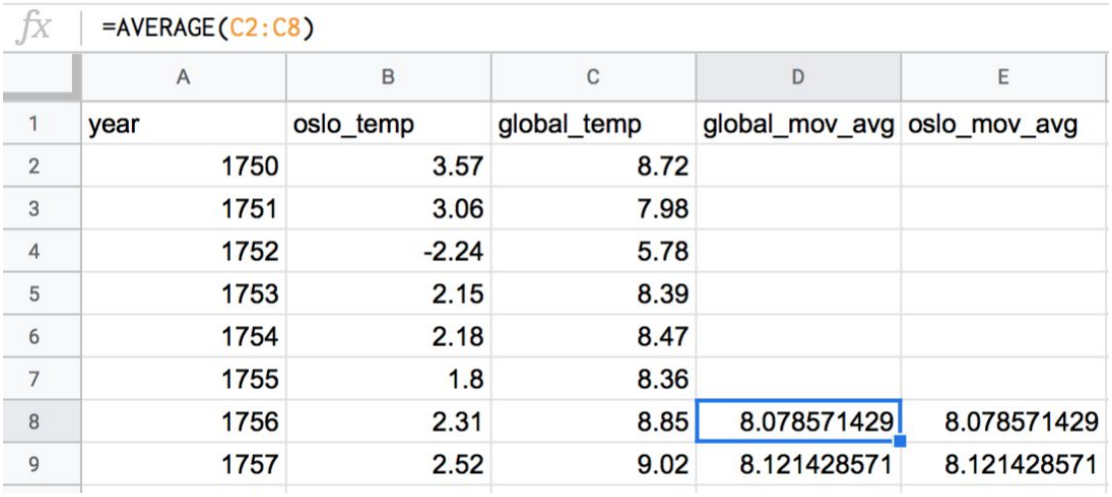
	Step	Tool
1	Extracting data from the database and export to CSV	SQL
2	Open up the CSV file	Google sheet
3	Computing the 7-years moving average	Google sheet
4	Creating a line chart that compares Oslo's temperatures with the global temperatures	RStudio

1.2. SQL query for data extracting:

```
SELECT city_data.year, city_data.city, city_data.avg_temp as Oslo_temp,
global_data.avg_temp as Global_temp
FROM city_data
RIGHT JOIN global_data
ON city_data.year = global_data.year
WHERE city_data.city='Oslo'
```

1.3. Computing moving average

1) Computing an arithmetic mean of initial 7 years.
2) Then a new subset of years was taken by moving forward the first one by 1 year, excluding the first year and including the next (8th year).
3) The calculation of the arithmetic mean is repeated for a new subset of 7 years.
4) The procedure was repeated until the moving average for the last subset of 7 years was computed.



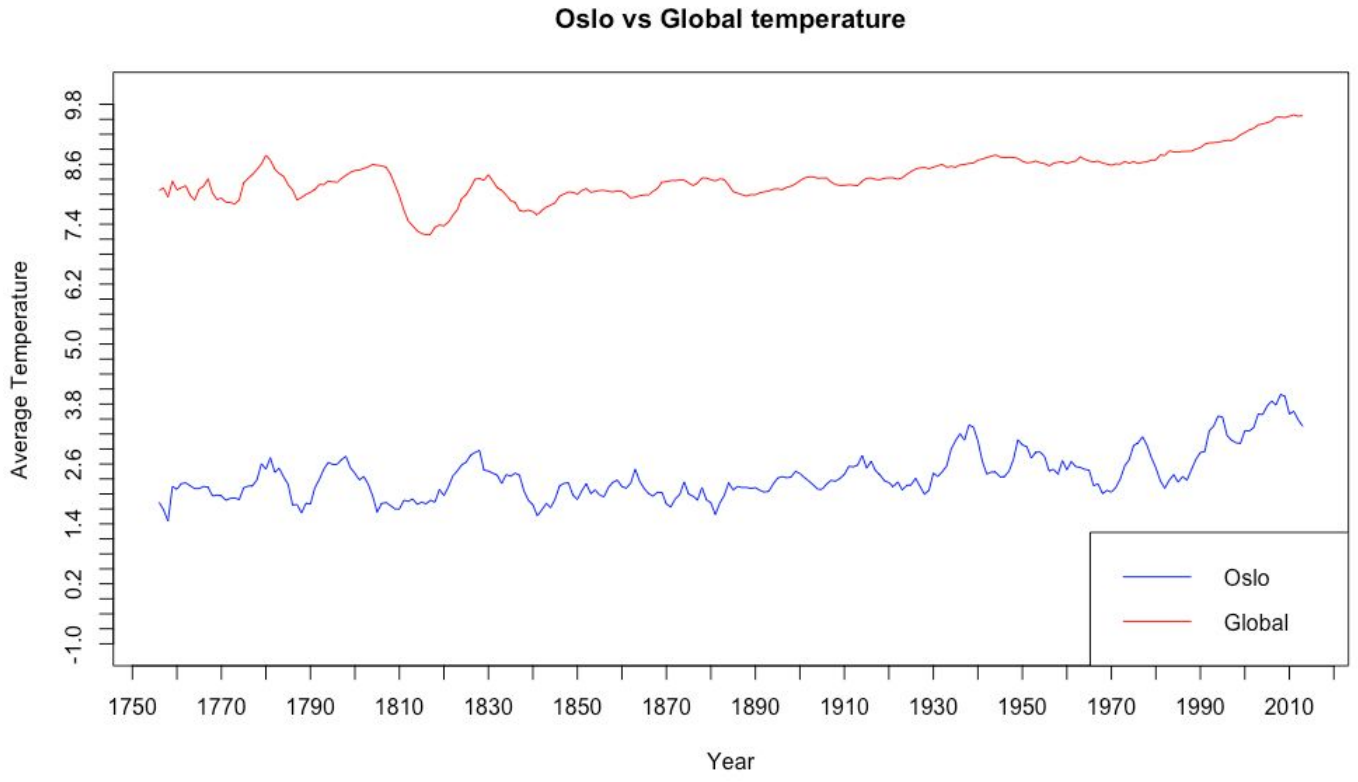
	A	B	C	D	E
1	year	oslo_temp	global_temp	global_mov_avg	oslo_mov_avg
2	1750	3.57	8.72		
3	1751	3.06	7.98		
4	1752	-2.24	5.78		
5	1753	2.15	8.39		
6	1754	2.18	8.47		
7	1755	1.8	8.36		
8	1756	2.31	8.85	8.078571429	8.078571429
9	1757	2.52	9.02	8.121428571	8.121428571

1.4. Key considerations used for plot visualisation:

1) A line chart was chosen to use to demonstrate the trend over the time period.
2) A moving average of temperatures was plotted instead of actual temperatures to smooth the data to observe long-term trends better.

2. A line chart

The line chart below compares the Oslo temperature to the global temperature (in degrees Celsius) in the period from 1756 to 2012.



3. Observations

- Oslo has been cooler by approximately 6 degrees C on average compared to the global temperature over the period.
- Overall, the global temperature has increased by approximately 1.5 degrees C over the last few hundred years, reaching the maximum average temperature of 9.6 degrees C in 2011.
- Both Oslo's and global temperature fluctuated from the year 1756 to 1850.
- From 1890, the global temperature increased rather steadily, while Oslo's temperature fluctuated by 1 degree C.
- The correlation coefficient 0.45, meaning there is a moderate positive correlation between Oslo's and global temperature. This means 20% of Oslo's temperature can be predicted by the global temperature.