

## Exploring Weather Trends

### 1. Objective:

To analyze local and global temperature data and to compare the local and global temperature trends.

### 2. Procedure:

**Step 1 :** Extracting the local and global temperature data using SQL

Input

HISTORY ▾

MENU ▾

SCHEMA

city\_data ▾

city\_list ▾

global\_data ▴

year

avg\_temp ▾

1

2

3

4

5

6

SELECT city,avg\_temp,year

FROM city\_data

WHERE city LIKE 'Delhi' and Country LIKE 'India'

Success!

EVALUATE

Output

218 results

Download CSV

city	avg_temp	year
Delhi	25.03	1796
Delhi	26.71	1797
Delhi	24.29	1798

Extraction of City (Delhi) Temperature Data using SQL

Input

HISTORY ▾

MENU ▾

SCHEMA

city\_data ▾

city\_list ▾

global\_data ▲

year

avg\_temp ▾

1

2

3

4

5

6

SELECT avg\_temp, year

FROM global\_data

Success!

EVALUATE

Output

266 results

[Download CSV](#)

avg_temp	year
8.72	1750
7.98	1751
5.78	1752

Extraction of Global Temperature Data using SQL

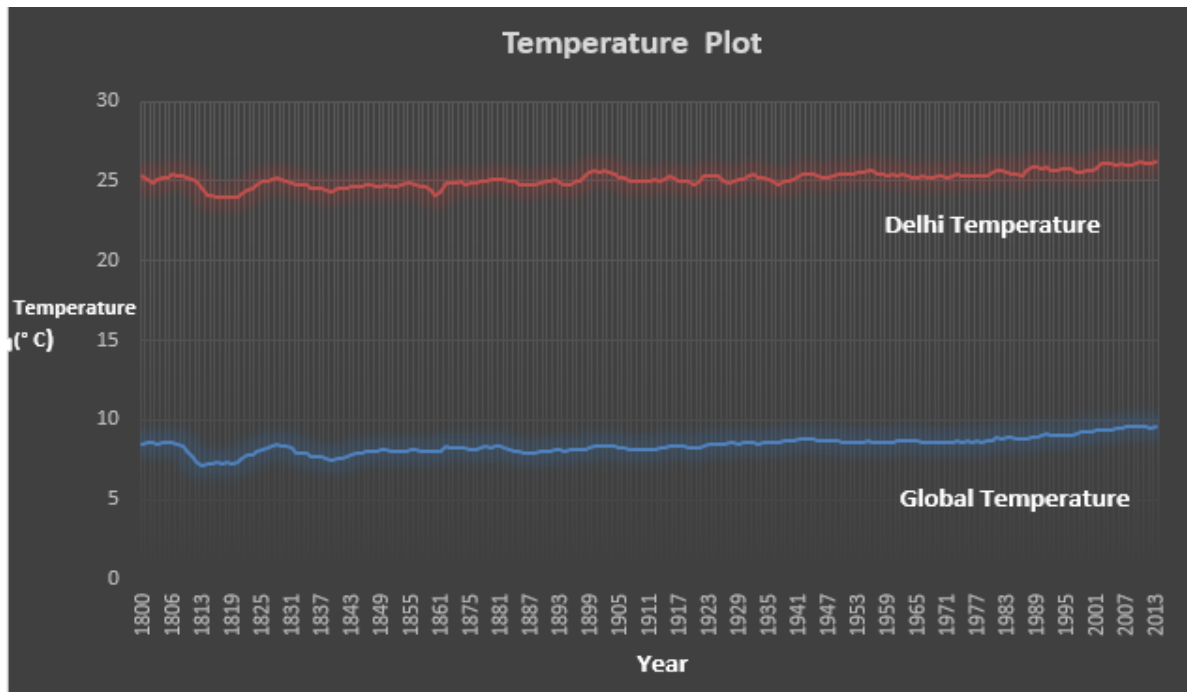
## Step 2: Calculation of Moving Averages

5 year moving averages (From 1800 to 2013) for both city level temperature data and global level temperature data is calculated **using Microsoft Excel**.

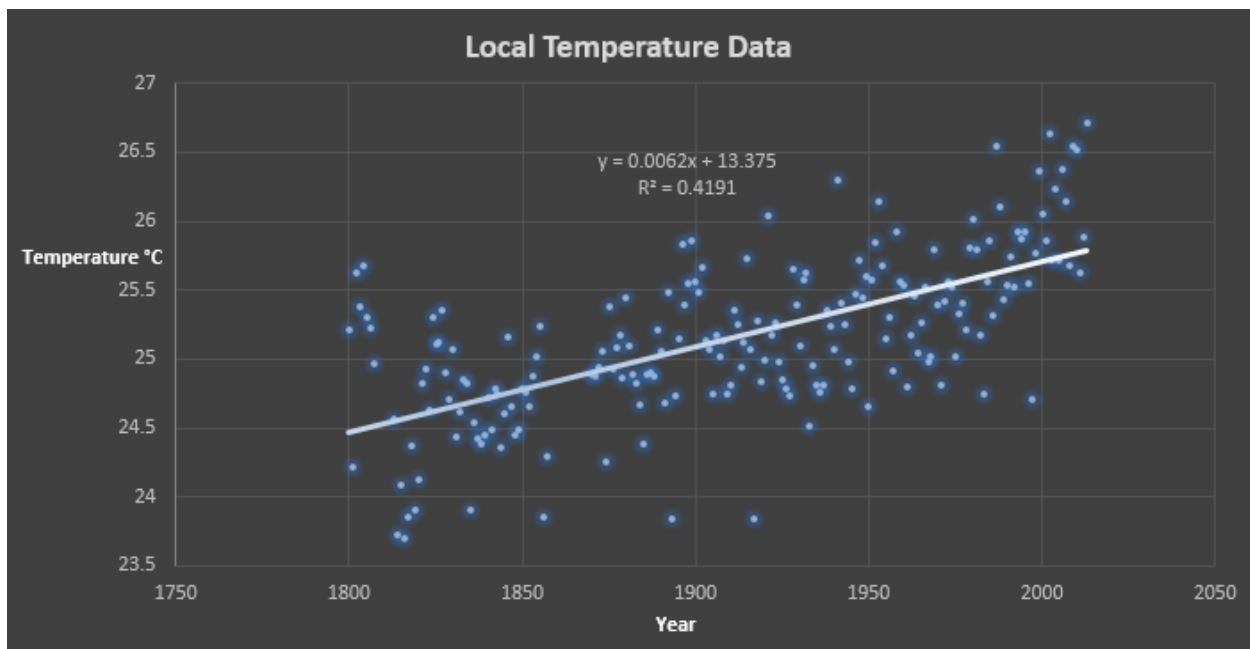
	A	B	C	D	E	F	G	H	I	J
1	city	avg_temp	year	5 Year Moving Average				avg_temp	year	5 Year Moving Average
6	Delhi	25.21	1800	25.304				8.48	1800	8.488
7	Delhi	24.22	1801	25.142				8.59	1801	8.552
8	Delhi	25.63	1802	24.926				8.58	1802	8.566
9	Delhi	25.38	1803	25.144				8.5	1803	8.532
10	Delhi	25.68	1804	25.224				8.84	1804	8.598
11	Delhi	25.3	1805	25.242				8.56	1805	8.614
12	Delhi	25.22	1806	25.442				8.43	1806	8.582
13	Delhi	24.97	1807	25.31				8.28	1807	8.522
14	Delhi		1808	25.2925				7.63	1808	8.348
15	Delhi		1809	25.16333333				7.08	1809	7.996
16	Delhi		1810	25.095				6.92	1810	7.668
17	Delhi		1811	24.97				6.86	1811	7.354
19	Delhi	24.56	1813	24.56				7.74	1813	7.13
20	Delhi	23.73	1814	24.145				7.59	1814	7.232
21	Delhi	24.09	1815	24.12666667				7.24	1815	7.296
22	Delhi	23.7	1816	24.02				6.94	1816	7.312
23	Delhi	23.86	1817	23.988				6.98	1817	7.298
24	Delhi	24.37	1818	23.95				7.83	1818	7.316
25	Delhi	23.9	1819	23.984				7.37	1819	7.272
26	Delhi	24.12	1820	23.99				7.62	1820	7.348
27	Delhi	24.83	1821	24.216				8.09	1821	7.578
28	Delhi	24.93	1822	24.43				8.19	1822	7.82

Calculation of 5 year moving averages for city level and global temperature data

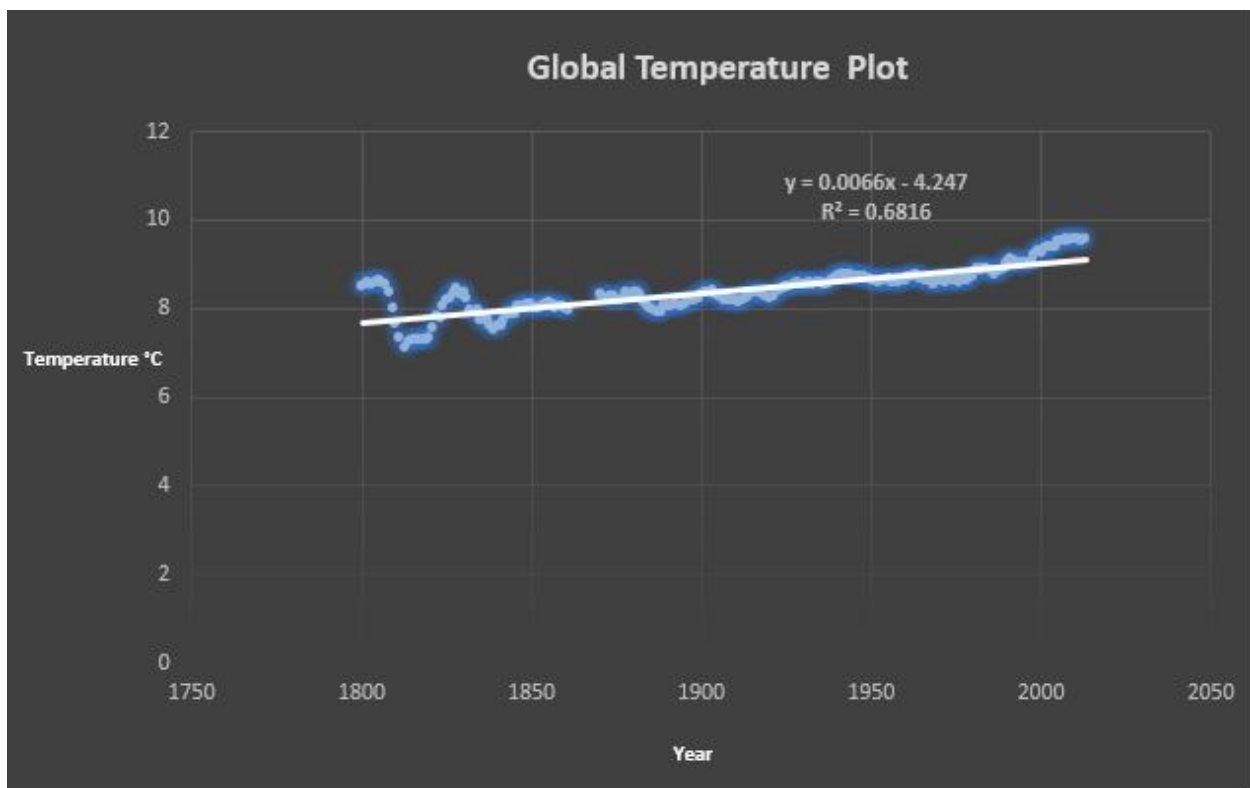
### Step 3 : Creation of Line Graph



A line graph comparing the local and global temperature trends from 1800 to 2013



Scatter Plot for City Temperatures (1800 – 2013)



Scatter Plot for Global Temperatures (1800 – 2013)

### 3. Data Analysis

Upon extracting the city level and global temperature data using SQL, a 5 year moving average is calculated to ensure that **oldest data points are dropped from the set and new data points come in to replace them**. Thus, the data set is constantly "moving" to account for new data as it becomes available. This ensures that only the **current information is being accounted for**.

<u>S.No.</u>	<u>Observation</u>	<u>Interpretation</u>
1.	Is my city hotter or cooler on average compared to the global average? Has the difference been consistent over time?	Delhi's temperature has always been more than the global temperature by more than 14°C, on an average, and the difference between the temperatures has been on the rise in the observed period.
2.	How do the changes in my city's temperatures over time compare to the changes in the global average?	While both Delhi's temperature and the global temperature has been on the rise in the given period, the global temperature's growth has been slightly higher than that of the city temperature growth during the observed period. (As can be observed from the slope of the lines in the scatter plots above).
3.	What does the overall trend look like? Is the world getting hotter or cooler? Has the trend been consistent over the last few hundred years?	The overall trend for the global temperatures (since the last 100 years) has been on the increase. The World is getting hotter as we progress with a temperature of 8.21°C in 1913 and increasing to 9.57°C in 2013.
4.	Correlation Coefficient	The correlation coefficient between the two temperatures curves turn out be 0.782255 which shows a moderate positive correlation between the two temperature distributions.

5.	Inference from Correlation Coefficient	A moderate positive correlation between the city and the global temperatures signifies that if the city temperature is on the rise, it is highly likely that the global temperature might also be on the increase.
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