

Process

1. I extracted the relevant data for global temperatures and local temperatures for New York (closest big city) by running SQL queries in the workspace provided. The SQL queries are listed below:

```
/* 1. Extract Global Temperatures data */
```

```
SELECT *
```

```
FROM GLOBAL_DATA
```

```
ORDER BY YEAR;
```

```
/* 2. Get the exact city name from the city list */
```

```
SELECT *
```

```
FROM CITY_LIST
```

```
WHERE COUNTRY = 'United States'
```

```
ORDER BY CITY;
```

```
/* 3. Extract temperatures for New York */
```

```
SELECT YEAR, AVG_TEMP
```

```
FROM CITY_DATA
```

```
WHERE COUNTRY = 'United States'
```

```
AND CITY = 'New York'
```

```
ORDER BY YEAR;
```

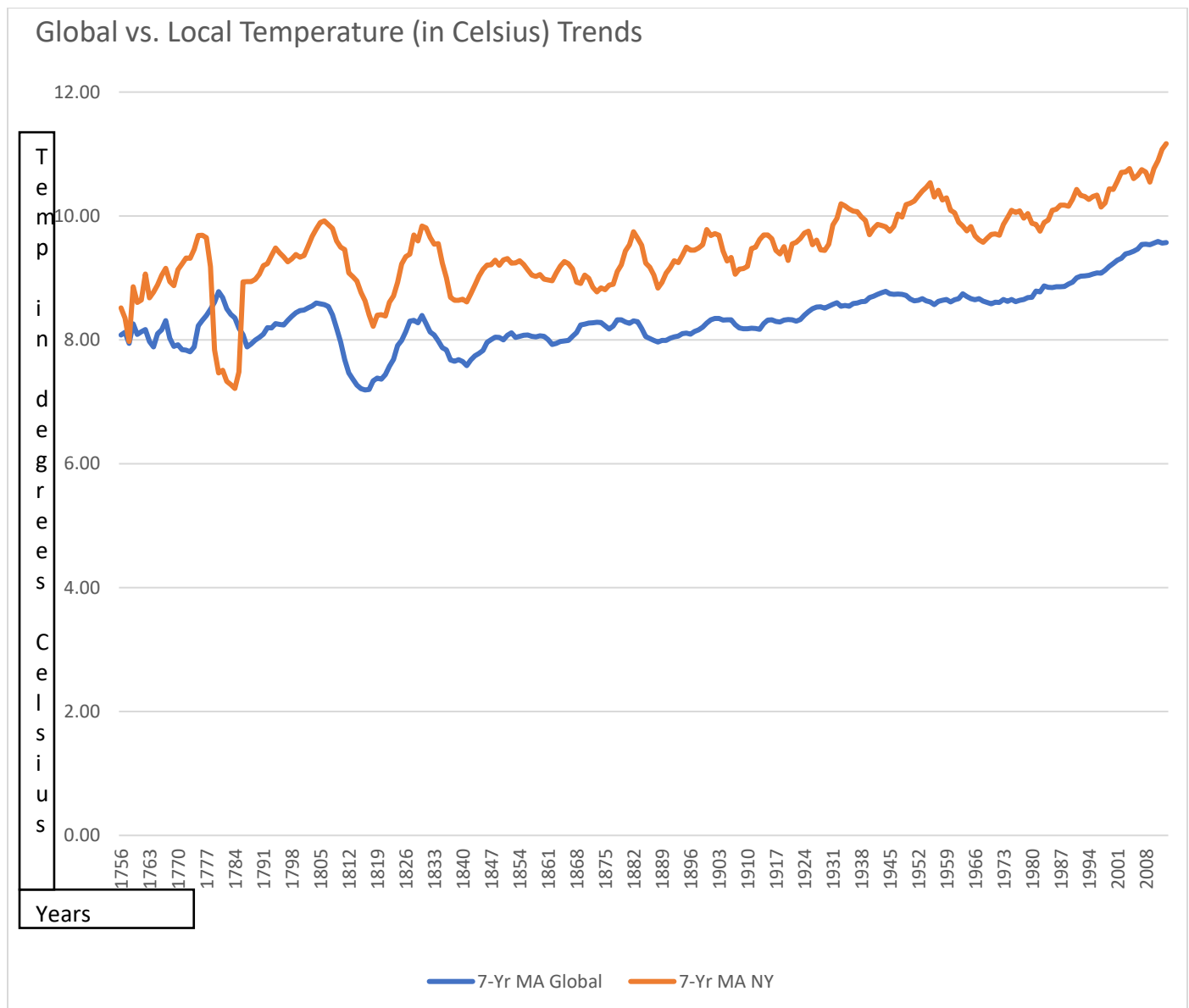
2. I exported the results of the first and third queries to CSV files
3. I put the global and local temperature data side by side in a separate sheet and removed the rows at the beginning and end of the list where temperature data was only available for one and not the other. In my case, I had temperature data for New York for the years 1743 through 1749 with no corresponding data for global temperatures. Similarly, I had global temperature data for the years 2014 through 2015 for which no corresponding data was available for New York.

I did this to get the data on an even keel for the periods that I wanted to chart.

4. Using this data, I calculated 7-year moving averages for both temperatures using the Excel AVERAGE function. This resulted in the moving averages being available from the year 1756 through 2013.
5. I then copied the years and the moving averages to a separate sheet so that it would be easier to plot them.

- Finally, I created a 2D Line Chart for this data using Excel Charting features. I chose a Line Chart because I thought that it would represent the temperature trends much better than any other type of chart, for example a Bar Chart. A Line Chart is continuous when compared to a Bar Chart which is discrete.

Line Chart for Temperature Data



Observations

- The chart above clearly shows that the temperatures have been rising steadily over the years both globally and locally.

2. While the local temperature was uniformly higher than the global temperature most of the time (see (4) below for exceptions), both trend lines show a similar movement.
3. The fluctuations in global temperatures show less variations when compared to the fluctuations in local temperatures but this seems reasonable considering that the global temperatures are averaged across the world and tend to smoothen out more.
4. Between the years 1779 and 1785, while the global temperatures showed an upward trend, the local temperatures for New York actually showed a considerable drop.

Initially, I thought that this was due to possibly incorrect data. However, some research online showed that these years recorded the harshest winters in the century beginning with 1779.

That is an interesting insight to explain the departure from the global trend.

5. Although not required, I created another line chart to compare global temperatures to local temperatures of Bangalore, India (chart not shown here).

I did this exercise to verify if the trends line were similar when I picked another location and found them to be so.