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Outline

Step 1: Data Extraction

To extract the data I needed to complete the project, I used SQL.

To find the city closest to me, I queried:

```
SELECT *
FROM city_list
```

This provided a list of all the cities in the database. After scanning the list, I found Atlanta to be the city closest to me.

To pull data regarding Atlanta's temperature every year, I queried:

```
SELECT year, city, avg_temp
FROM city_data
WHERE city = 'Atlanta'
ORDER BY year, city
```

To pull data regarding the global temperature each year, I queried:

```
SELECT year, avg_temp
FROM global_data
ORDER BY year
```

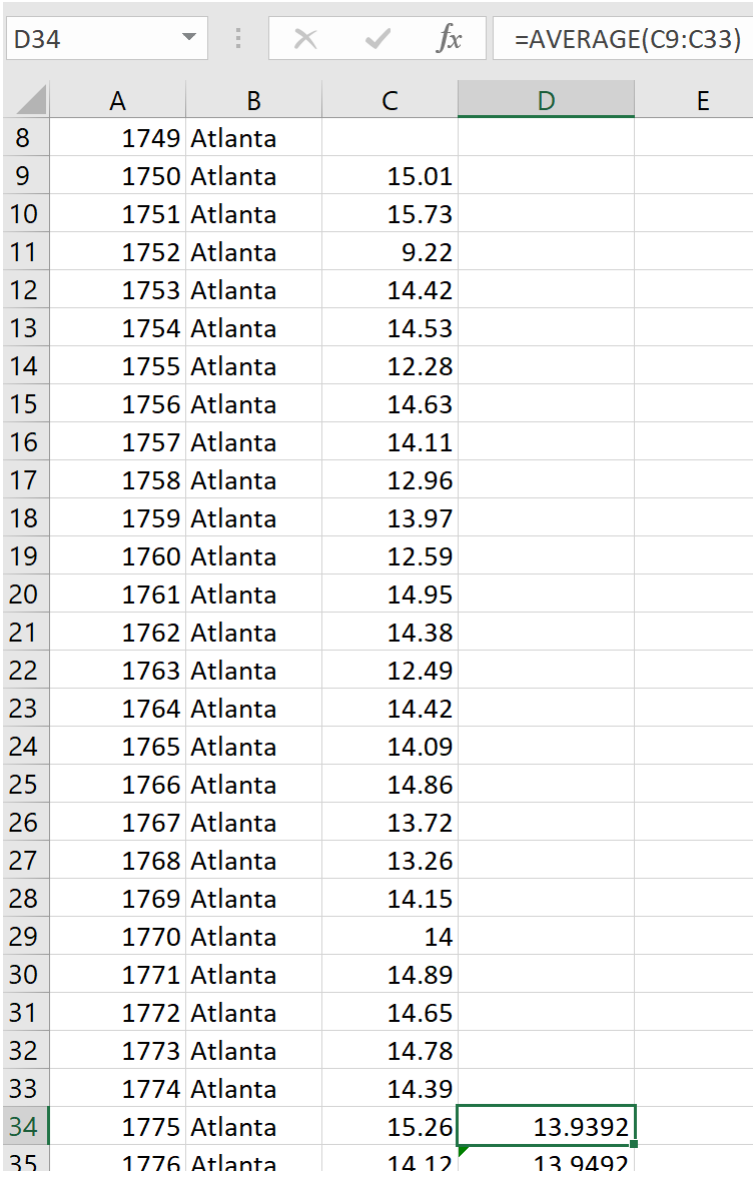
Following these steps, I then downloaded each piece of data into an Excel Workbook.

Step 2: Calculate the Moving Average

After extracting the necessary data from the database, my next objective was to calculate the moving averages for both Atlanta and global temperatures. Using the moving average is advantageous in order to have more readable data for further interpretation.

While Atlanta had data dating back to the year 1743, the global data started at the year 1750, so I used 1750 as my starting year for the data. In order to improve data visibility and minimize volatile fluctuations of data, I used a 25-year moving average for each year.

In order to calculate Atlanta's 25-year moving average, I used Excel's average formula. Starting at the year 1775 (the first usable year for a 25-year moving average), I typed in =average[(previous 25 years' temperature data)]. This is how it appeared:



	A	B	C	D	E
8	1749	Atlanta			
9	1750	Atlanta	15.01		
10	1751	Atlanta	15.73		
11	1752	Atlanta	9.22		
12	1753	Atlanta	14.42		
13	1754	Atlanta	14.53		
14	1755	Atlanta	12.28		
15	1756	Atlanta	14.63		
16	1757	Atlanta	14.11		
17	1758	Atlanta	12.96		
18	1759	Atlanta	13.97		
19	1760	Atlanta	12.59		
20	1761	Atlanta	14.95		
21	1762	Atlanta	14.38		
22	1763	Atlanta	12.49		
23	1764	Atlanta	14.42		
24	1765	Atlanta	14.09		
25	1766	Atlanta	14.86		
26	1767	Atlanta	13.72		
27	1768	Atlanta	13.26		
28	1769	Atlanta	14.15		
29	1770	Atlanta	14		
30	1771	Atlanta	14.89		
31	1772	Atlanta	14.65		
32	1773	Atlanta	14.78		
33	1774	Atlanta	14.39		
34	1775	Atlanta	15.26	13.9392	
35	1776	Atlanta	14.12	13.9492	

After calculating the 25-year moving average starting with the year 1775, I simply dragged down the column until the last year of the data. This allowed me to calculate the 25-year moving average of every year from 1775 to 2013 (the end of the data).

I did the same with the global data.

Next, I performed a paste special of the moving averages (both Atlanta and global), and inserted them into a separate sheet with the year that the averages corresponded with.

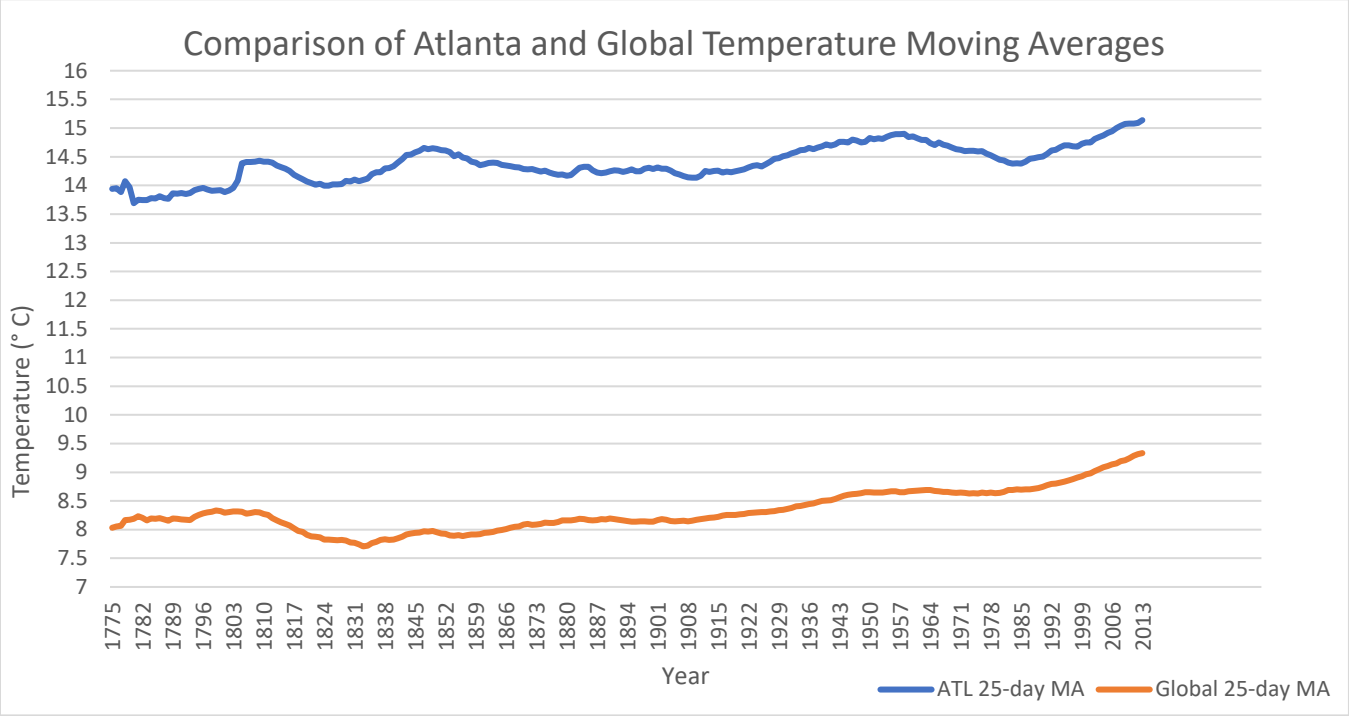
A	B	C
Year	ATL 25-day MA	Global 25-day MA
1775	13.9392	8.0336
1776	13.9492	8.052
1777	13.8848	8.0648
1778	14.0748	8.164
1779	13.968	8.17
1780	13.6904	8.1904
1781	13.74916667	8.2332
1782	13.74541667	8.2032
1783	13.74375	8.1584
1784	13.77958333	8.196
1785	13.77208333	8.1908
1786	13.81333333	8.1976
1787	13.77916667	8.1772
1788	13.77	8.154
1789	13.86	8.192
1790	13.85916667	8.1892
1791	13.86791667	8.1784
1792	13.85333333	8.1712
1793	13.86541667	8.166
1794	13.91916667	8.224
1795	13.94041667	8.2576
1796	13.95708333	8.284
1797	13.92791667	8.3008

Note: this is a sample of the whole data.

Step 3: Create a clear data visualization

To visualize the data and compare the moving averages, I tapped into Excel's chart function. I highlighted all 3 columns and then clicked "Insert" and selected the "Line Chart" option.

This was the result:



This line chart gives a clear visual comparison of Atlanta and global 25-day moving averages with regards to temperature.

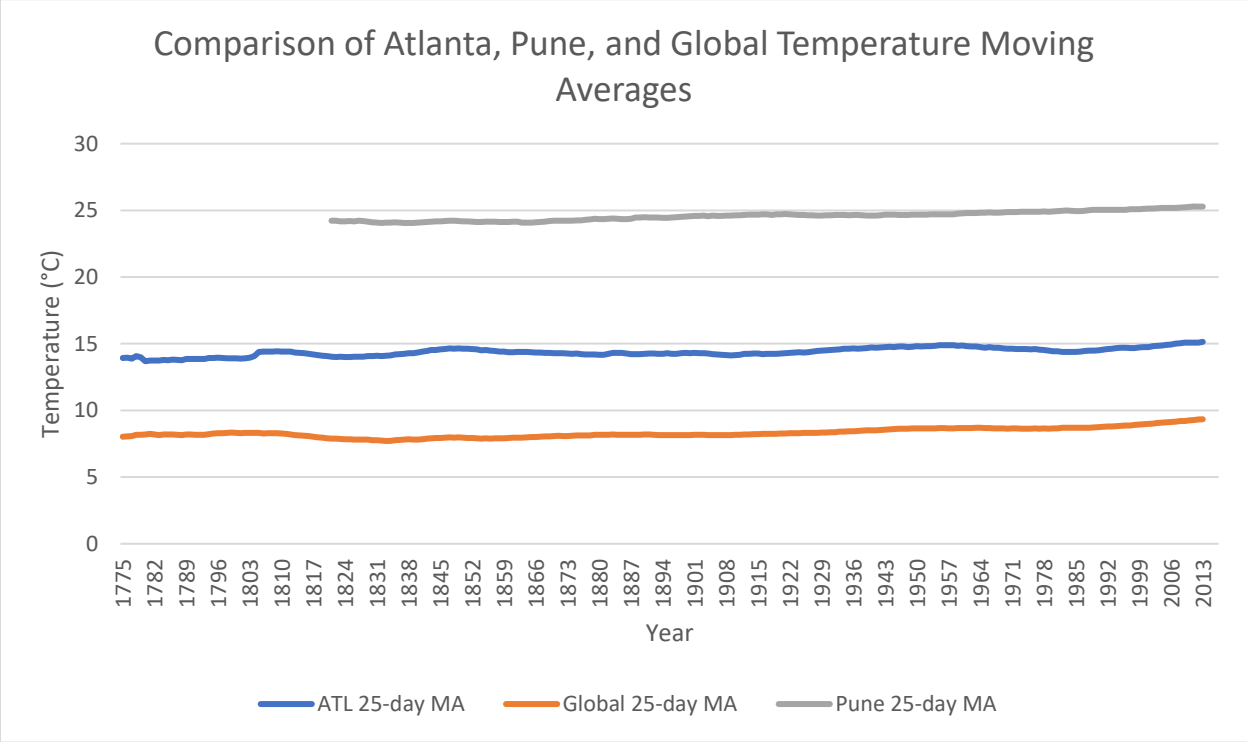
Step 4: Interpret the data

Some notable observations after re-organizing and visually representing the data:

- From 1775 to 2013, Atlanta's temperature is reasonably higher than the overall global temperature. Atlanta's temperatures hover around 14 to 15° C, while the global temperatures tend to stay between 8 and 9.5° C.
- There appear to be more fluctuations in Atlanta's temperature as compared to global temperature over time, as evidenced by the peaks and valleys in Atlanta's line. This is likely due to the fact that Atlanta covers a much smaller area and so is more vulnerable to significant changes than the entire world.
- The world (and Atlanta) appears to be gradually getting warmer over time. This does gives some credence to the theory of global warming and the threats that it may bring. However, it has taken well over 200 years for the global temperature to rise by 1° C, so the pace is glacial.
- There appears to be a positive correlation between the temperature and time, which suggests that there are several factors involved in warming the global temperature, such as population, technology, and resource usage, which would only increase over time.

Bonus: Comparison between Atlanta, Pune (India), and Global Temperatures

Using the same methods above, I decided to add a third line for Pune, India. The chart is as follows:



Note: Pune's data started in 1821.

Based on the findings from the data and chart, one can conclude that Pune has had significantly higher temperatures over time than both Atlanta and the world overall. This is likely attributed to large population growth over a confined area.