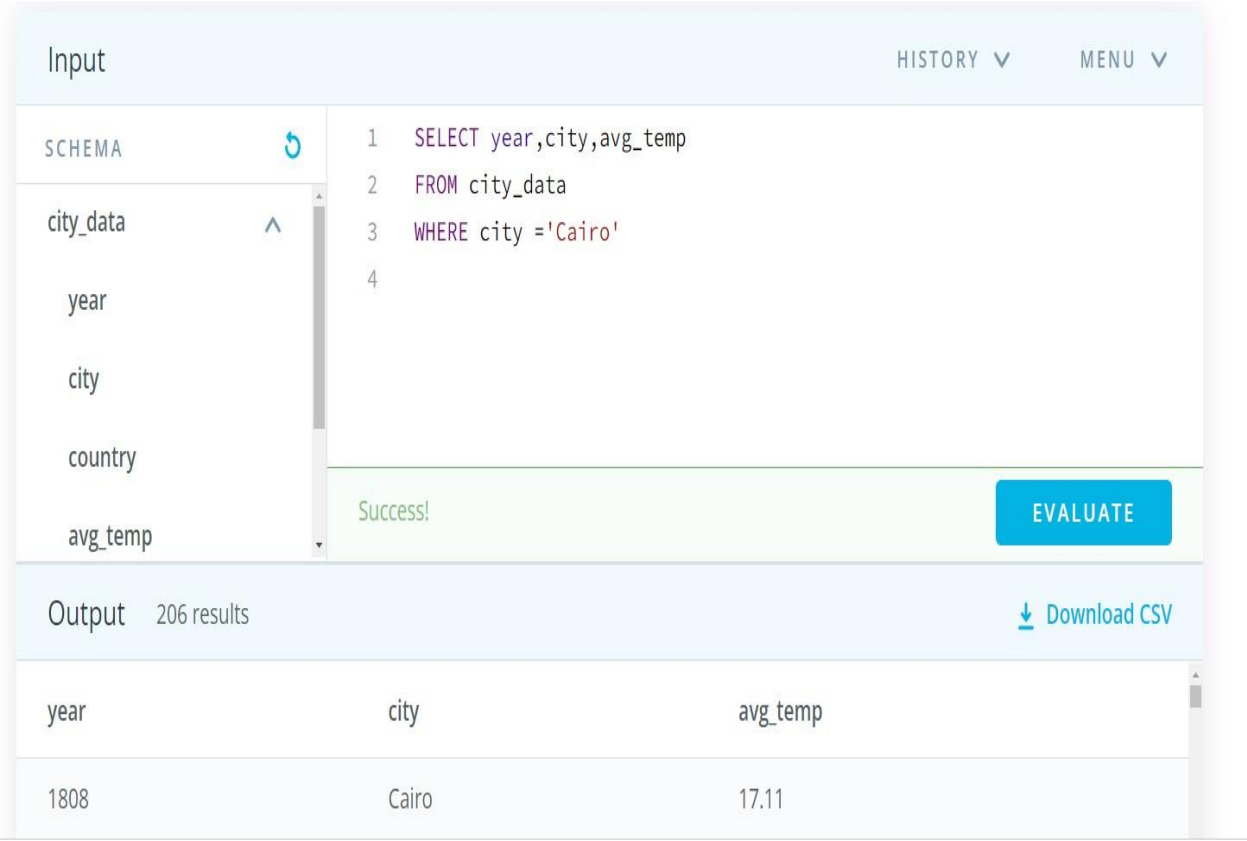
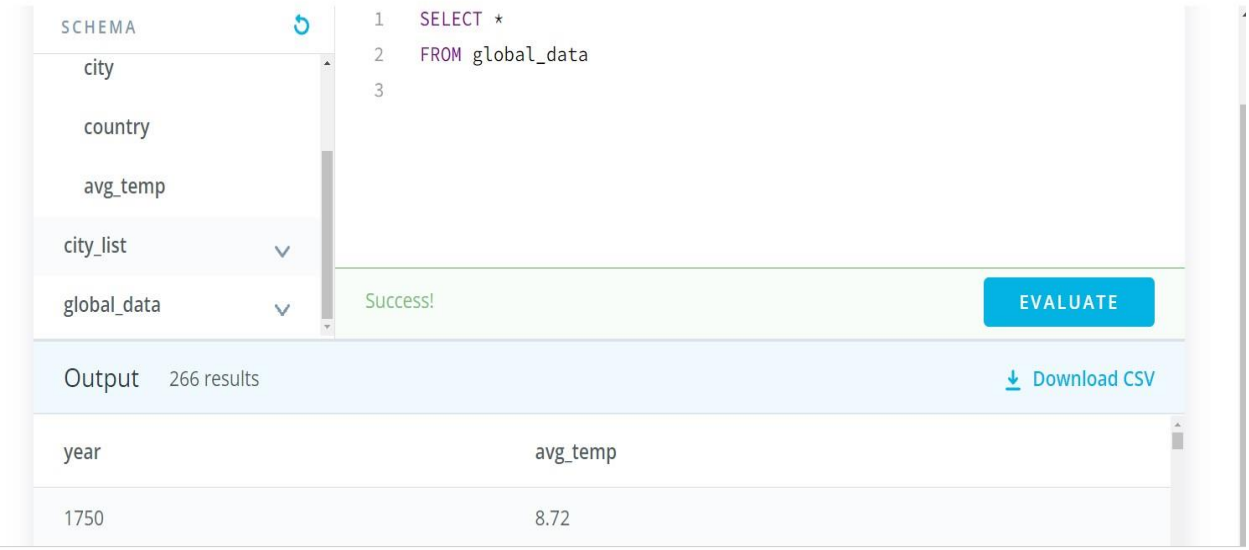
In the first project, I will analyze local and global temperature data to compare the temperature trends in my area with global temperature trends. I used SQL in the Udacity Classroom's SQL Workspace to extract data from the database. For city-level data, I selected Cairo City in Egypt. The screenshots below show the SQL queries that extract global



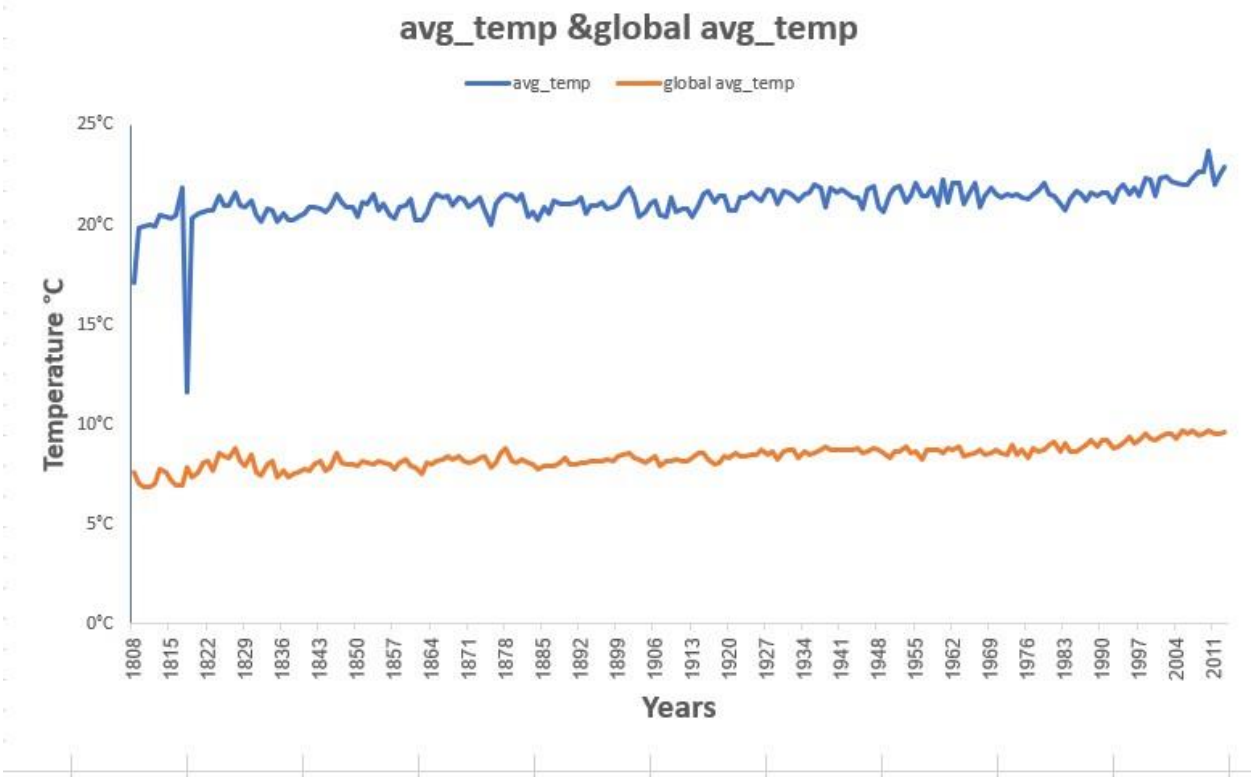


After downloading both datasets from the SQL Workspace in the Udacity Classroom, I used Excel, to open the CSV files, and use v lookup to arrange the data.

year	city	avg_temp	global avg_temp
1808	Cairo	17.11°C	7.63°C
1809	Cairo	19.87°C	7.08°C
1810	Cairo	19.93°C	6.92°C
1811	Cairo	20.00°C	6.86°C
1812	Cairo	19.93°C	7.05°C
1813	Cairo	20.51°C	7.74°C
1814	Cairo	20.43°C	7.59°C
1815	Cairo	20.30°C	7.24°C
1816	Cairo	20.51°C	6.94°C
1817	Cairo	21.88°C	6.98°C
1818	Cairo	11.60°C	7.83°C
1819	Cairo	20.31°C	7.37°C
1820	Cairo	20.58°C	7.62°C
1821	Cairo	20.63°C	8.09°C
1822	Cairo	20.72°C	8.19°C
1823	Cairo	20.71°C	7.72°C
1824	Cairo	21.44°C	8.55°C
1825	Cairo	21.00°C	8.39°C
1826	Cairo	20.94°C	8.36°C
1827	Cairo	21.63°C	8.81°C
1828	Cairo	20.99°C	8.17°C
1829	Cairo	20.91°C	7.94°C
1830	Cairo	21.25°C	8.52°C
1831	Cairo	20.52°C	7.64°C
1832	Cairo	20.20°C	7.45°C
1833	Cairo	20.81°C	8.01°C
1834	Cairo	20.69°C	8.15°C
1835	Cairo	20.17°C	7.39°C
1836	Cairo	20.59°C	7.70°C
1837	Cairo	20.27°C	7.38°C
1838	Cairo	20.21°C	7.51°C
1839	Cairo	20.43°C	7.63°C
1840	Cairo	20.56°C	7.80°C
1841	Cairo	20.91°C	7.69°C
1842	Cairo	20.92°C	8.02°C
1843	Cairo	20.83°C	8.17°C
1844	Cairo	20.66°C	7.65°C
1845	Cairo	20.90°C	7.85°C
1846	Cairo	21.57°C	8.55°C

The line chart below was created with Excel.

Moving averages are used to smooth out data to make it easier to observe long term trends and not get lost in daily fluctuations.

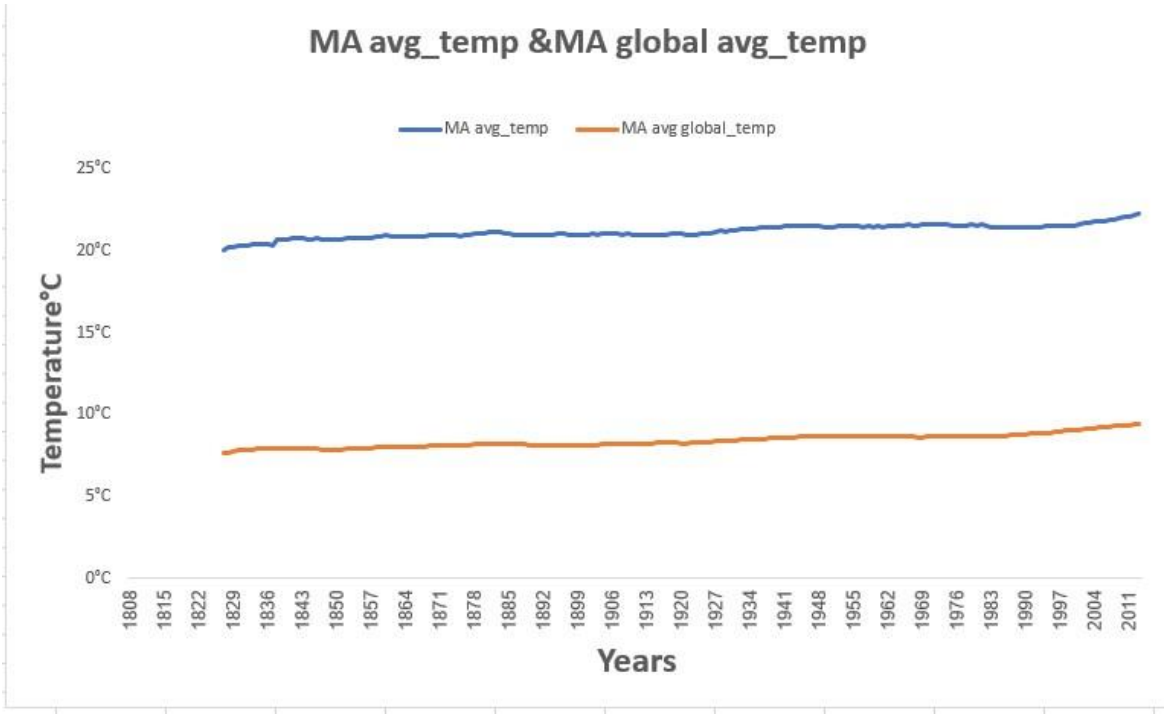


As we saw, we should use moving averages because moving averages are used to smooth out data to make it easier to observe long-term trends and not get lost in daily fluctuations

I use data analyses tape in Excel to calculate the moving average

MA avg_temp	MA avg global_temp
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
#N/A	#N/A
20.00°C	7.65°C
20.20°C	7.68°C
20.25°C	7.72°C
20.31°C	7.80°C
20.34°C	7.84°C
20.35°C	7.86°C
20.37°C	7.87°C
20.38°C	7.90°C
20.37°C	7.91°C
20.38°C	7.94°C
20.30°C	7.96°C
20.73°C	7.95°C
20.73°C	7.96°C
20.73°C	7.97°C
20.75°C	7.95°C
20.76°C	7.94°C
20.76°C	7.96°C
20.72°C	7.92°C
20.72°C	7.89°C
20.75°C	7.90°C

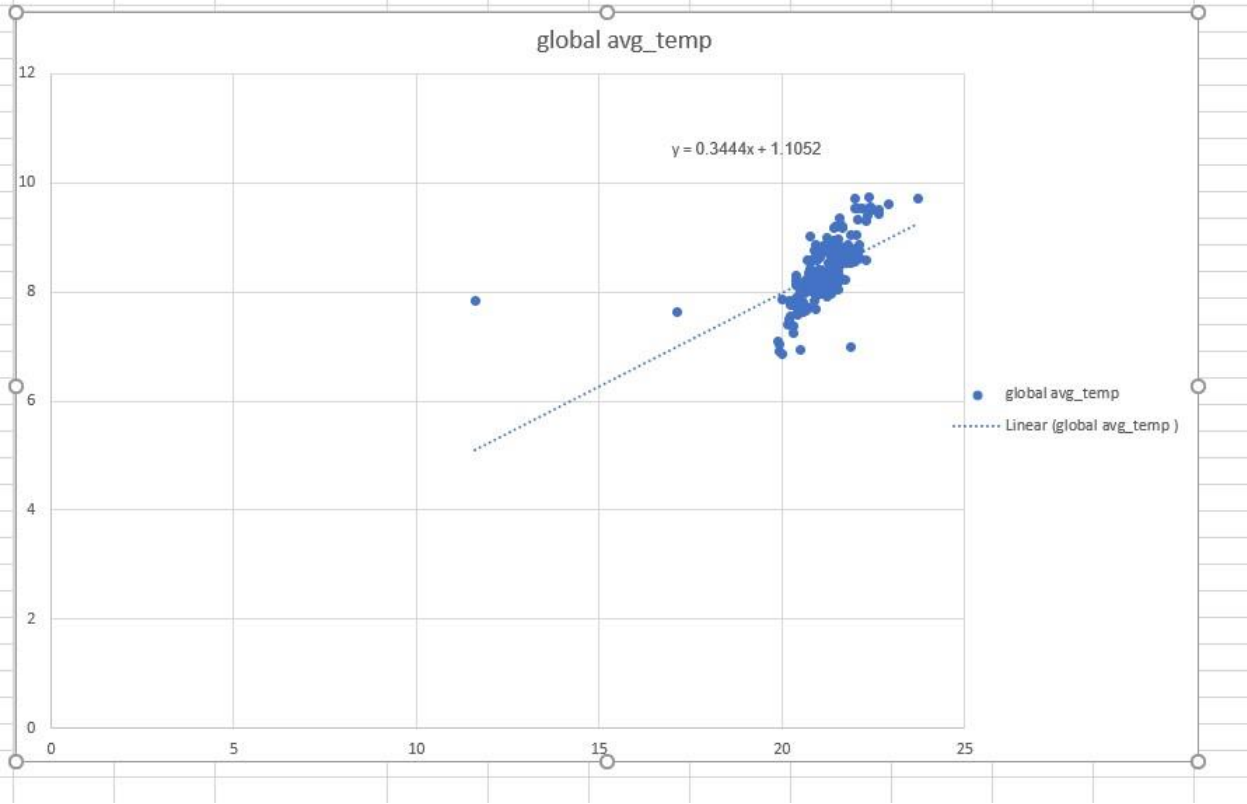
I can smooth out the daily volatility and observe the long-term trend. For calculating the moving averages, I used the data analysis tape in Excel, the line chart below shows the weather trends with the moving average.



<u>Conclusion</u>:

1. Over time, the temperature in Cairo has consistently exceeded the global average.
2. The city's temperature trends have followed a similar pattern to the global average, with both showing a consistent upward trend.
3. The increase in global and local temperatures over time indicates a hotter trend in the world.
4. According to the charts, this upward trend has persisted for about a century.

	avg_temp	*global avg_temp*
avg_temp	1	
global avg_	0.58267	1



The correlation = 0.58267

This means that is a positive correlation

Can you estimate the average temperature in your city based on the average global temperature? Yes