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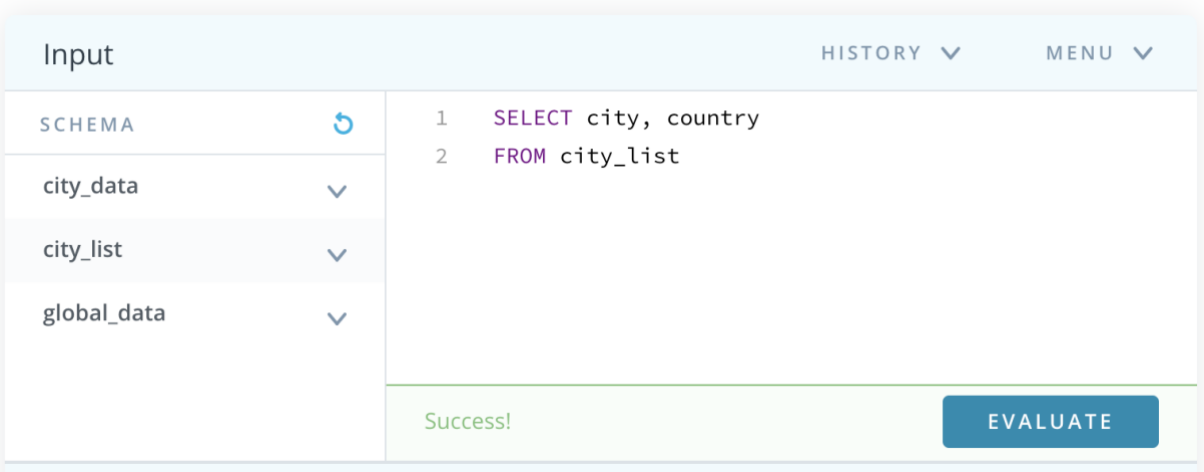
Project 1 Explore Weather Trends

Documentation on how I executed the project and the progress

Part 1. SQL Queries and extracting CSV file

To start off, the first thing I did was writing the queries required to find out what type of data I could use from the database as I wanted to find out if I could find Stockholm, Sweden in the dataset.

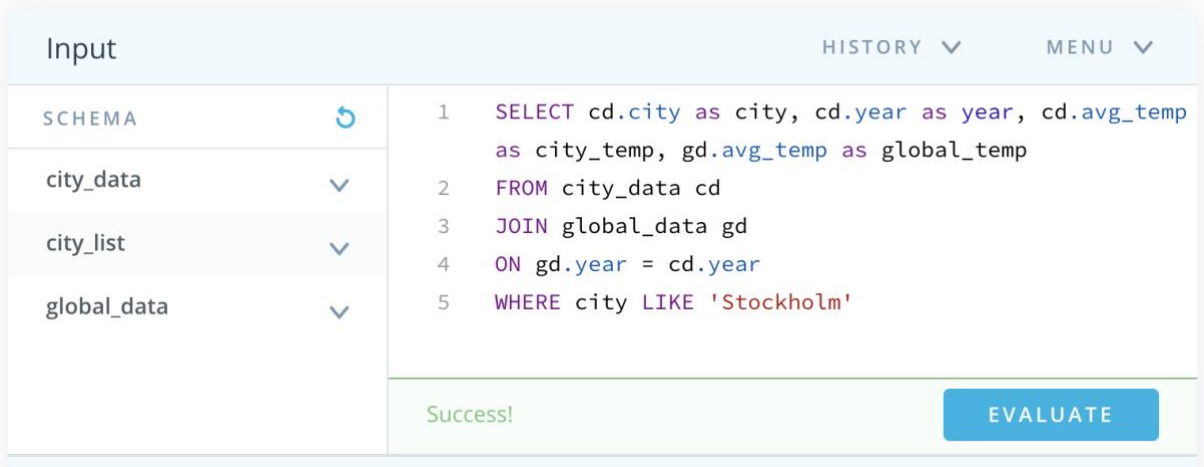
My input into the Udacity workspace using SQL was the following:



The result was one city recorded in the database, Stockholm.
For the next step I used the relevant information from the previous query and made a new one, where I wanted to extract the following data:

- City
- Year
- City Temperature
- Global Temperature

For which I wrote the following SQL code into the Udacity workspace:



Part 2. Working with excel CSV file to Line Chart

For the project, I decided to use excel as using the GUI is very simple to make line charts for this type of project.

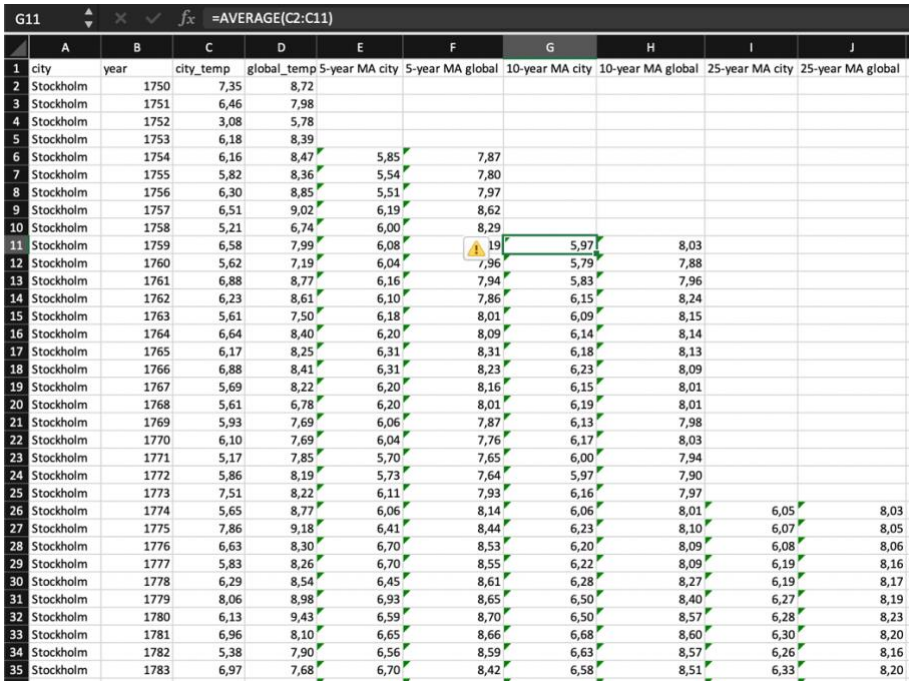
Working with the initial CSV file

After downloading the CSV with the extracted queries, the first thing that needed to be done was separating the comma-separated-variables into separate columns but using data > text to columns and inside the ‘convert text to columns wizard’ separateing the delimited data by columns, ending up with separate columns for ‘city’, ‘year’, ‘city_temp’, and ‘global_temp’.

Calculating Moving Averages and Creating a Line Chart

In the data, the year range is 1750 to 2013, and the average temperatures on the city level for Stockholm ranges from 3,08 degrees Celsius to 8,49 degrees, while on a global level, it ranges from 5,78 degrees to 9,73 degrees Celsius. With that in mind, I chose to use 10-year moving averages after experimenting how linear versus volatile the lines became dependent on an increase or a decrease of moving averages.

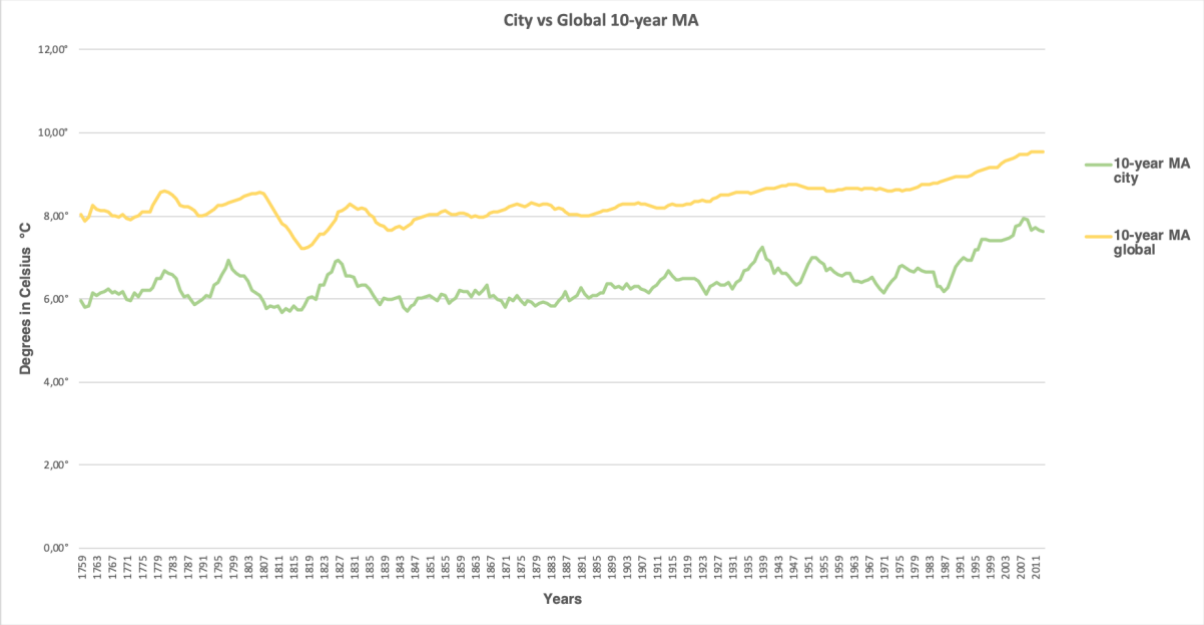
By calculating the average *(formula: ‘=average(C2:C11)’)* for the first ten years on a new column, but on the same row as the tenth year for the global- and city-temperature, and doing the same consequently for each row afterwards we got the ‘10 year moving average’ data for each year 1760-2013. I created a 10-year moving average for both the global- and city temperatures. (In did the same for the 5- 10- and 25- year moving averages, just to help me know which measure gave me a clear result.)



	A	B	C	D	E	F	G	H	I	J
1	city	year	city_temp	global_temp	5-year MA city	5-year MA global	10-year MA city	10-year MA global	25-year MA city	25-year MA global
2	Stockholm	1750	7,35	8,72						
3	Stockholm	1751	6,46	7,98						
4	Stockholm	1752	3,08	5,78						
5	Stockholm	1753	6,18	8,39						
6	Stockholm	1754	6,16	8,47	5,85	7,87				
7	Stockholm	1755	5,82	8,36	5,54	7,80				
8	Stockholm	1756	6,30	8,85	5,51	7,97				
9	Stockholm	1757	6,51	9,02	6,19	8,62				
10	Stockholm	1758	5,21	6,74	6,00	8,29				
11	Stockholm	1759	6,58	7,99	6,08	19	5,97	8,03		
12	Stockholm	1760	5,62	7,19	6,04	7,96	5,79	7,88		
13	Stockholm	1761	6,88	8,77	6,16	7,94	5,83	7,96		
14	Stockholm	1762	6,23	8,61	6,10	7,86	6,15	8,24		
15	Stockholm	1763	5,61	7,50	6,18	8,01	6,09	8,15		
16	Stockholm	1764	6,64	8,40	6,20	8,09	6,14	8,14		
17	Stockholm	1765	6,17	8,25	6,31	8,31	6,18	8,13		
18	Stockholm	1766	6,88	8,41	6,31	8,23	6,23	8,09		
19	Stockholm	1767	5,69	8,22	6,20	8,16	6,15	8,01		
20	Stockholm	1768	5,61	6,78	6,20	8,01	6,19	8,01		
21	Stockholm	1769	5,93	7,69	6,06	7,87	6,13	7,98		
22	Stockholm	1770	6,10	7,69	6,04	7,76	6,17	8,03		
23	Stockholm	1771	5,17	7,85	5,70	7,65	6,00	7,94		
24	Stockholm	1772	5,86	8,19	5,73	7,64	5,97	7,90		
25	Stockholm	1773	7,51	8,22	6,11	7,93	6,16	7,97		
26	Stockholm	1774	5,65	8,77	6,06	8,14	6,06	8,01	6,05	8,03
27	Stockholm	1775	7,86	9,18	6,41	8,44	6,23	8,10	6,07	8,05
28	Stockholm	1776	6,63	8,30	6,70	8,53	6,20	8,09	6,08	8,06
29	Stockholm	1777	5,83	8,26	6,70	8,55	6,22	8,09	6,19	8,16
30	Stockholm	1778	6,29	8,54	6,45	8,61	6,28	8,27	6,19	8,17
31	Stockholm	1779	8,06	8,98	6,93	8,65	6,50	8,40	6,27	8,19
32	Stockholm	1780	6,13	9,43	6,59	8,70	6,50	8,57	6,28	8,23
33	Stockholm	1781	6,96	8,10	6,65	8,66	6,68	8,60	6,30	8,20
34	Stockholm	1782	5,38	7,90	6,56	8,59	6,63	8,57	6,26	8,16
35	Stockholm	1783	6,97	7,68	6,70	8,42	6,58	8,51	6,33	8,20

With these finished columns and the appropriate data for the graph, the next step was creating line graphs. In excel, going to ‘insert > chart > line’. Then, I ended up

with a blank graph, where I needed to select my data. Inside ‘chart design > select data’, I needed to put in the data for the horizontal axis and then the two vertical axises and their names inside the ‘select data source’ window. After that I had my finished line chart which can be seen below:



Part 3. Observations and Conclusions regarding the line graph

- The first thing that comes to mind is that the global trend is a lot smoother and has less variability than the data from my local data in Stockholm.
- Also, the temperatures are in general, a lot cooler in Stockholm than the average global temperatures.
- Over time, it is very evident that both temperatures consistently increase slowly over time, however the local data has a slightly increased variability, despite the moving average calculation that mitigates spikes in the original data.
- However, notwithstanding my earlier point on variability, both trend lines are rather consistent, and it is clear that temperatures are rising over time.
- The overall trend shows that after a period of more variance 1760-1850 the temperatures have been slowly rising at an increasing rate both globally as well as locally in Stockholm, Sweden.