EXPLORE WEATHER TRENDS

Project- 1

June 1, 2020

Udacity- Data Analyst Nonodegree

Elham Daha

Overview

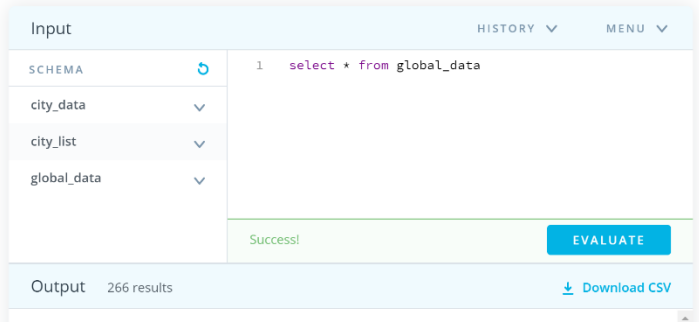
In this project, I will analyze local temperature and the global temperature data. The comparison is between the average temperature trends in Nashville, Tennessee in USA, where I live, with the overall global temperature trends.

Instruction

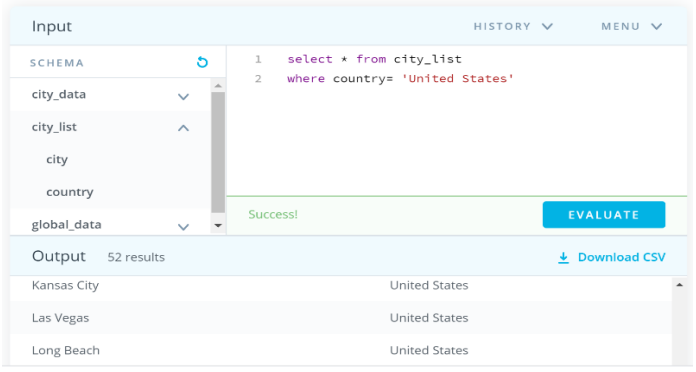
- **Extract the data:** I extracted data from the database using SQL and exported to CSV file.
- **Open up the CSV:** I used Excel Spreadsheet to open the CSV and calculate moving average of city vs global temperature.
- **Create a line chart:** I plot a line chart visualizing in excel to compare my city's temperature with the global temperature.
- **Make observations:** my conclusion about the similarities and differences between the world averages and my city's averages, as well as overall trends.

Extracting data from the database using SQL

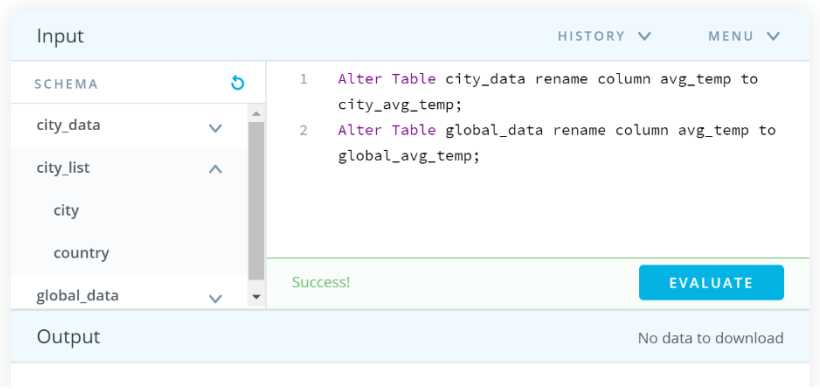
Step 1: to extract the global data- there are 266 results available to download to CSV



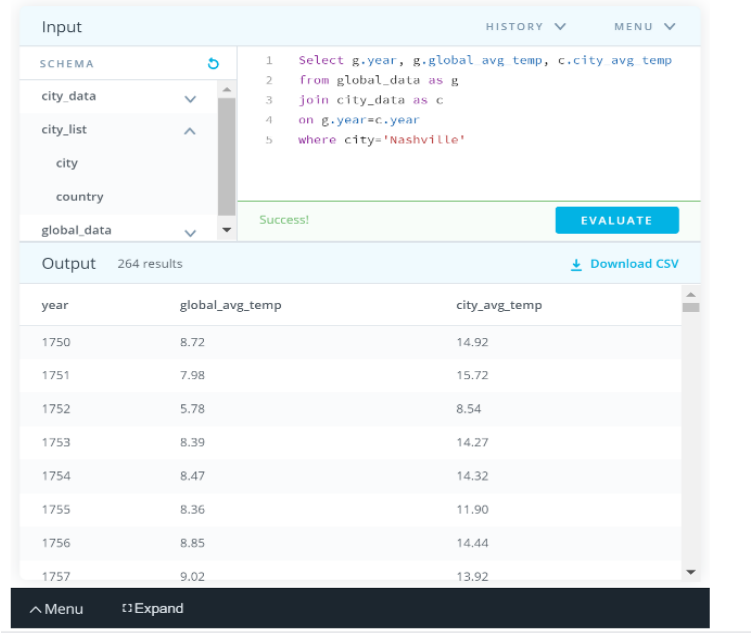
Step 2: to see the available cities for country USA



I live in Nashville and I will work on this city. There are 52 results for Nashville. As long as city_data and global_data has a column with a same name “avg_temp” which that one contains the global temperature and the other one presents the city temperature, I renamed the column “avg_temp” in “global_avg_temp” and “city_avg_temp” by using Alter Table in SQL.



Step 3: Joining two tables

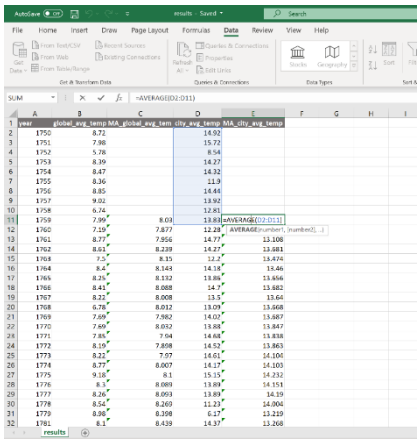


I got the required data with 264 results. In order to complete the extraction part, I downloaded the file as CSV format as “results.csv”.

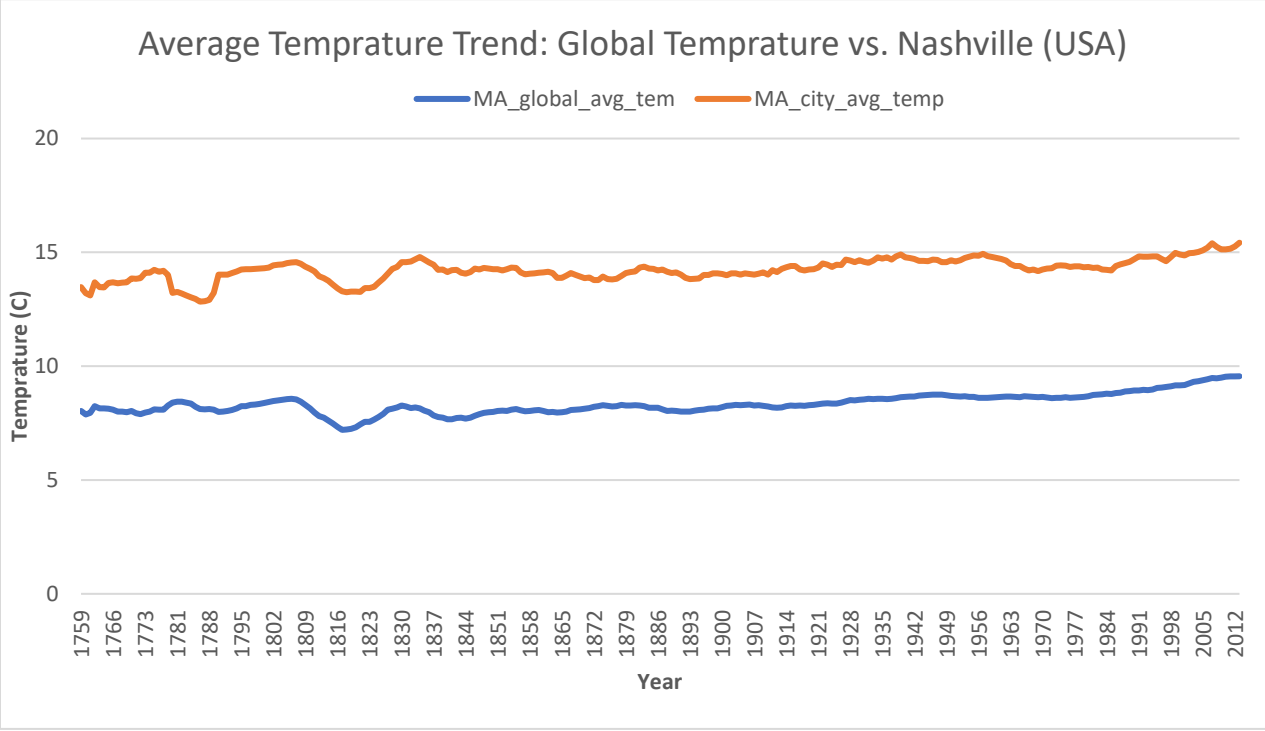
Moving Average & Trend Visualization

Step 1: CSV file opened in excel spreadsheet (or Google Sheets) and I deleted the missing year data (used if function to find the null columns). Only one row was deleted due to null value in city_avg_temp.

Step 2: Calculate the moving average for the first 10 years to smooth out the lines. (In my example, 10 years moving average line chart is smoother than 5 years)



Step 3: created a line chart for global average temperature and the City of Nashville average temperature to compare their trends. In order to visualize the trends, I considered to show a smooth trend rather than a fluctuated one. So, I worked with the 10-year moving average (tested two ranges). I tried to change column year type to date in order to format the unit and bound of "year" axis. But data only contains "yyyy" and I was not able to convert it to date in SQL. However, this problem can be solved in Tableau.



Observations

- Nashville's temperature is higher than the overall global temperature.
- In 18th century, the global temperature trend was steady, but Nashville temperature was increasing. Overall, there is a correlation between global and local temperature. (checked the correlation and it is 0.7)
- Overall trend is incremental. Even though it is not increasing rapidly but the city's and global temperature is increasing in the entire time frame which can be due to increase Global Warming, specifically in 20th century. In 18th and 19 centuries, the global temperature was on constant rise.
- In 1780s, Nashville's temperature fell significantly while the global temperature was almost steady. The beginning of 19th century, both global and local temperature had a significant decrease that did not last long and after few years increased to its peak. Still, today's temperature is higher than 19th century peak.
- According to the graph, average global temperature had only increased 1.5ºC throughout 260 years while Nashville average temperature had an increase of 2ºC. It means that Nashville is going to be hotter than the overall global temperature.

PS:

I googled to find a convert code in case if I can change the year type.

I checked GitHub of some students.