DATA ANALYST NANODEGREE PROJECT 1: EXPLORE WEATHER TRENDS

GLOBAL AVERAGES VS. AVERAGES IN SACRAMENTO, CALIFORNIA, U.S.A

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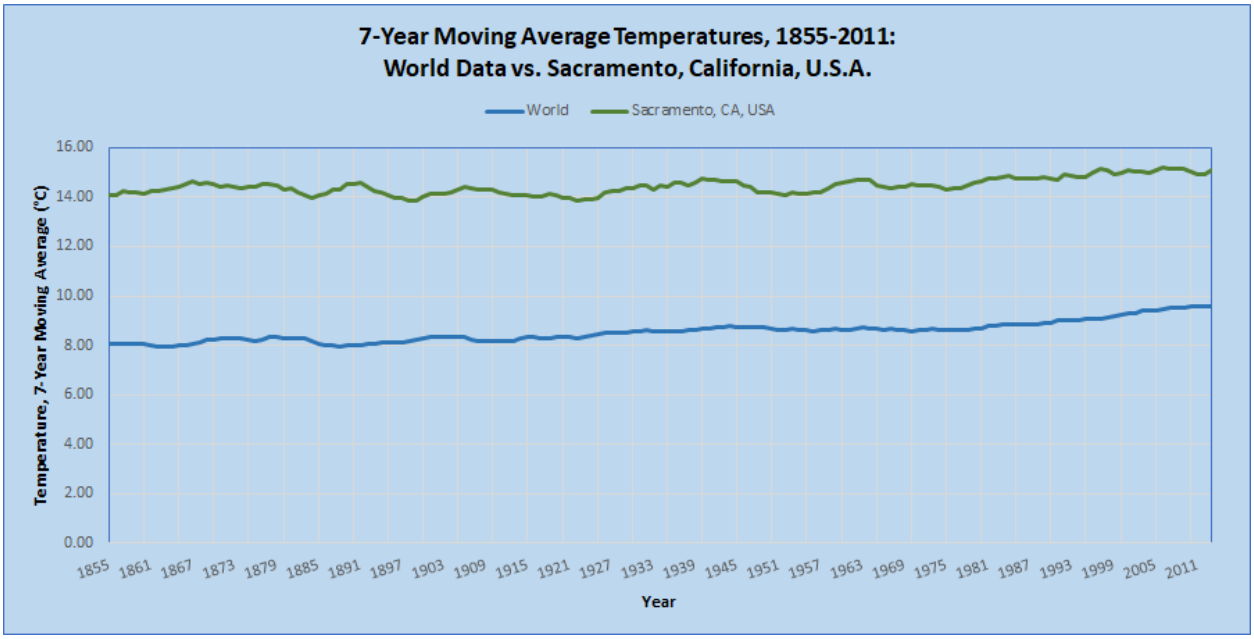
Procedure for Data Extraction and Analysis

1. **Data extraction via SQL & Excel**
   a. SQL query for extracting data for Sacramento, California, U.S.A.
      SELECT * FROM city_data
      WHERE city = 'Sacramento'
   b. Sacramento data began in 1848, thus the query used to extract data for world temperatures
      SELECT * FROM global_data
      WHERE year > '1848'
   c. Data from both queries were exported to two CSV files and saved as Excel workbooks
   d. The data for Sacramento was copied and pasted to the worksheet containing the global data
2. **The 7-year moving averages were calculated in the manner stated in the project lesson**
   a. New columns inserted after the average columns
   b. Starting with the row for 1855, the AVERAGE function is used for the first seven years' data for both global and local data
   c. The formulae were dragged down until the row for 2013

Line Chart Based on Extracted Data



Observations & Insights Based on the Visualization

1. The most noticeable observation is the sizeable difference between the 7-year moving averages of the global temperatures and those for Sacramento, the capital city of my home state (California) and approximately 40 miles from where I currently reside. The Sacramento temperatures from the mid-19th century until the present have been consistently higher than the world averages.

2. The differences between the world and Sacramento moving averages are quite consistent. The average difference between the moving averages is 5.90 degrees Centigrade; that being said, the standard deviation is only 0.258 degrees Centigrade, showing that the averages' differences were very closely clustered about the mean. Thus, the trends followed one another very closely.

3. Because of the close parallel between the moving averages, the overall increases in the one-hundred-sixty years of data are very close as well. The range (maximum less the minimum) is 1.66 degrees Centigrade for the world averages and 1.33 for Sacramento.

4. These observations are further confirmed by the correlation coefficient between the two sets of moving average: 0.78, which is positive and strong.

5. Sacramento was built in the heart of California's Central Valley, cut by the state's two largest rivers, the Sacramento and the San Joaquin. This valley is well-known for its relatively high-temperature climate (especially in the summer and early autumn) due in part to the surrounding mountain ranges---which prevent the cooling influences of the Pacific Ocean to affect the hot weather. This explains the consistent differences in average temperature which contrasted with global data.