Exploring Weather Trends

Climate change is a relevant and important nowadays because it affects every single living creature on Earth. A direct consequence is related to the steady temperature rise we have been experiencing over the past hundred years. The objective of this report is to compare weather trends between Chile's capital, Santiago and the global data gathered from the past hundred and fifty-eight years.

Section 1: Data extraction

The data used to analyze the trends was retrieved from Udacity's workspace considering 3 databases and variables:

- city_data: year, city, country, avg_temp.
- city_list: city, country.
- global_data: year, avg_temp

First off, I downloaded the city list with the following command:

SELECT *

FROM city_list;

After downloading the CSV file, I used Microsoft Excel to open the file and transformed it to independent cells. There, I checked that the city I currently live in (Santiago) was on the table in order to use it for further analysis.

Then, I downloaded the specific temperature data for Chile using the following command:

SELECT *

FROM city_data

WHERE country = 'Chile';

Once again, I used MS Excel to transform the data. There, I noted that the table contained two cities of Chile. Since my analysis is related only to Santiago, I deleted the rows from the southern city of Los Ángeles. I also realized that the output of the temperature average from CSV file was transformed into an integer in Excel. I processed the data with Excel formulas (CONCATENATE, IF, LEN, RIGHT, LEFT) to get the original float values.

Lastly, I downloaded the global data using the following command:

SELECT *

FROM global_data;

Once downloaded and open in MS Excel, I had to repeat the procedure to transform figures from integers to floats in order to be able to work with the data.

Section 2: Moving averages

In order to analyze the weather trend, I used moving averages to smoothen the data and identify a tendency in both local (Santiago) and global datasets.

As it is more natural to talk about decades when we describe year data, I created two variables to analyze; a 5-year moving average and a 10-year (decade) moving average).

In addition, and in order to compare both sets (and trends) in a proper way, I only considered temperature data from year 1855 to 2013 (even though global data goes from 1754 to 2015). Hence, both 5-year ad 10-year moving averages go from 1864 to 2013.

The line charts are presented in the following page

5-year Moving Average Temperature for Santiago, Chile vs Global

10-year Moving Average Temperature for Santiago, Chile vs Global
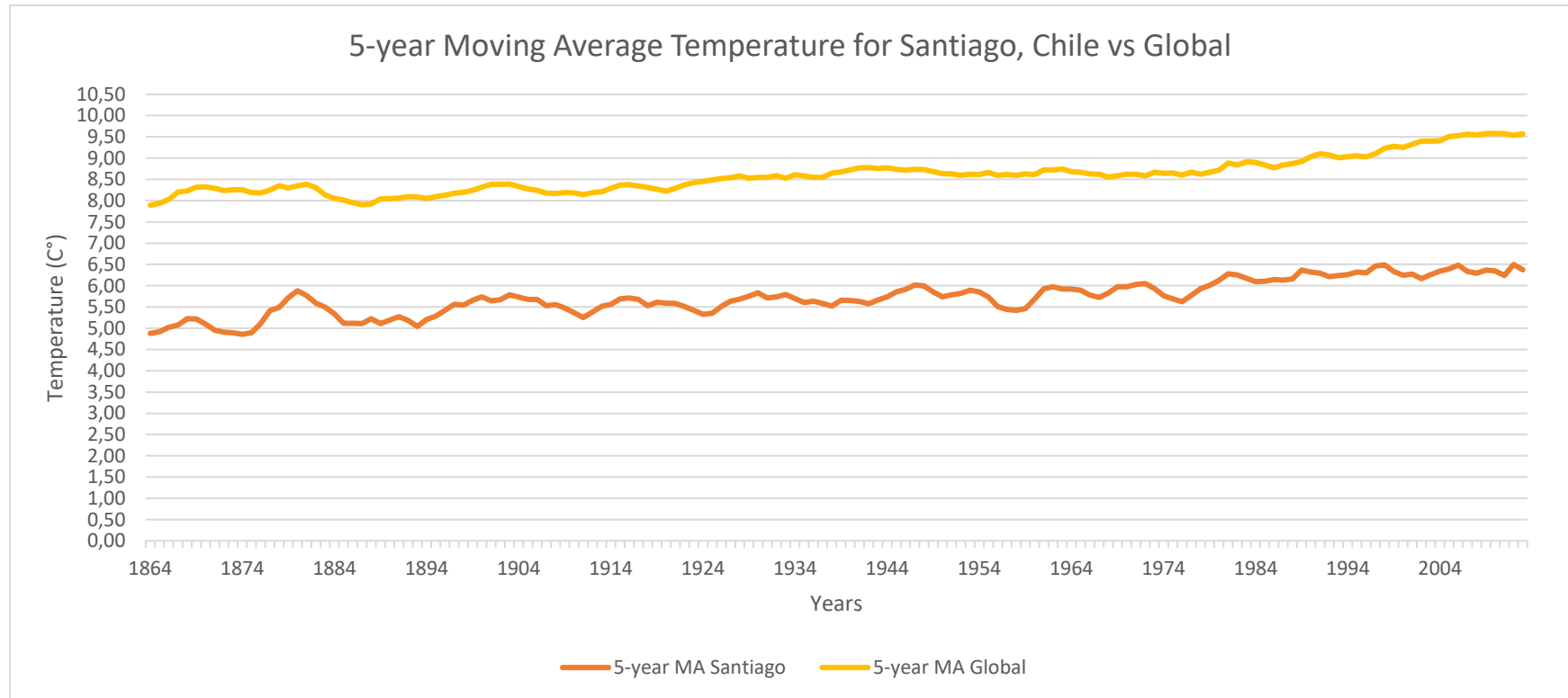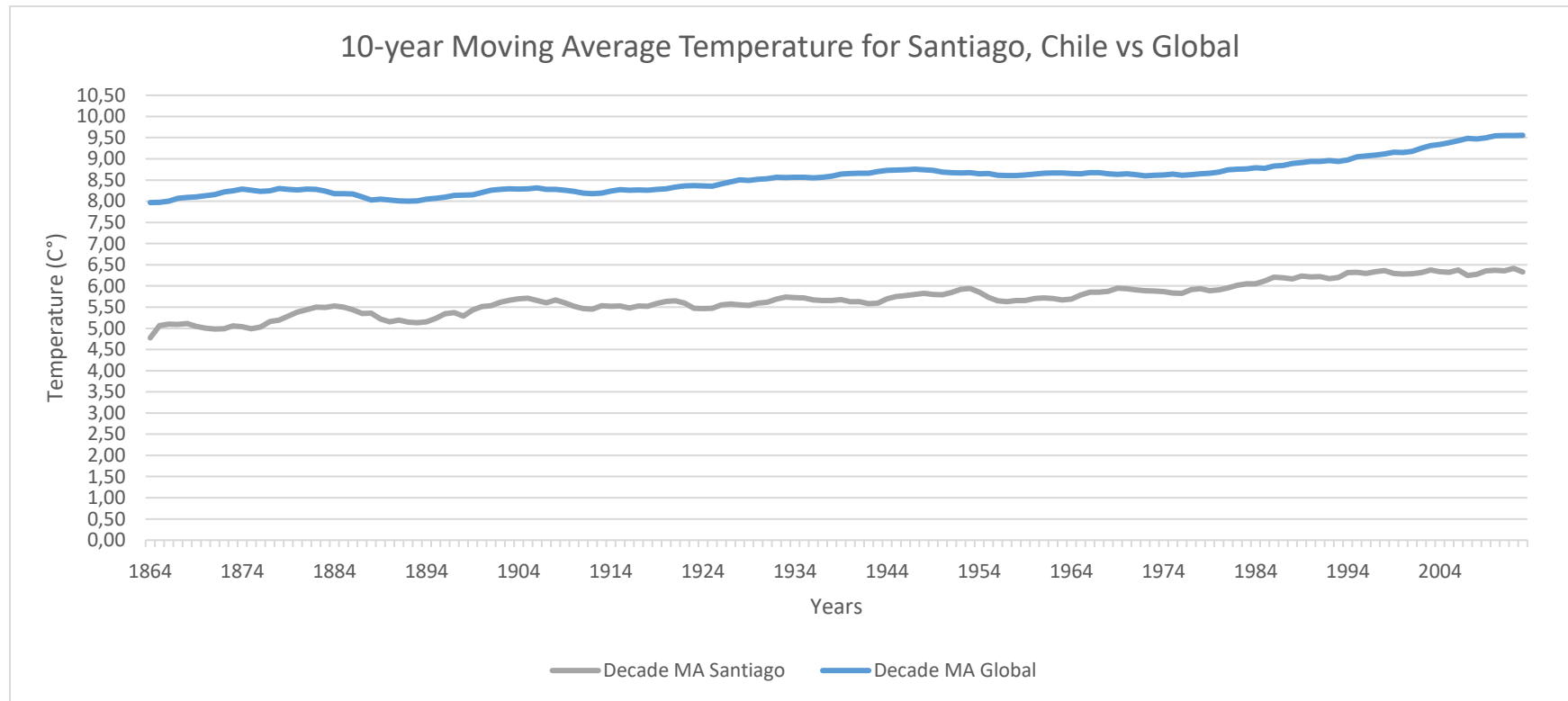
Section 3: Data analysis

After analyzing the data, I was able to make the following observations:

- Both Santiago de Chile and global temperature have been experiencing a temperature rise over the past 150 years.

- Comparatively, Santiago has consistently remained cooler than the global temperature in at least 2.47°C (5-year moving average, year 1880) and 2.59° C (10-year moving average, year 1905).

- From a decade-moving-average standpoint, global temperature has risen faster than Santiago's since 2004.

- Considering the first measurement in 1885 and the last taken in 2013, temperature has risen 3.37° C in Santiago, Chile in a 158-year period.