Exploring Weather Trends - Project Instructions

Deepshika Muthusamy Poobalan

1. *Outline of steps:*

   a. **What tools did you use for each step? (Python, SQL, Excel, etc)**

      Excel was used for displaying the csv file.

      Python was used for loading data, calculating the 7-year and 10-year moving average, and visualizing the data.

   b. **SQL query used to extract the data?**

      SELECT g.year, g.avg_temp g_avg_temp, c.city, c.avg_temp

      FROM city_data AS c

      INNER JOIN global_data g on c.year = g.year

      WHERE c.country = 'Australia' AND c.city = 'Sydney';

   c. *How did you calculate the moving average?*

      Calculating 7-year moving average:

      def seven_year_rolling_average(df):

         df['g_seven_average_temp'] = df.iloc[:,1].rolling(window = 7).mean()

         df['c_seven_average_temp'] = df.iloc[:,3].rolling(window = 7).mean()

         return df

      Calculating 10-year moving average:
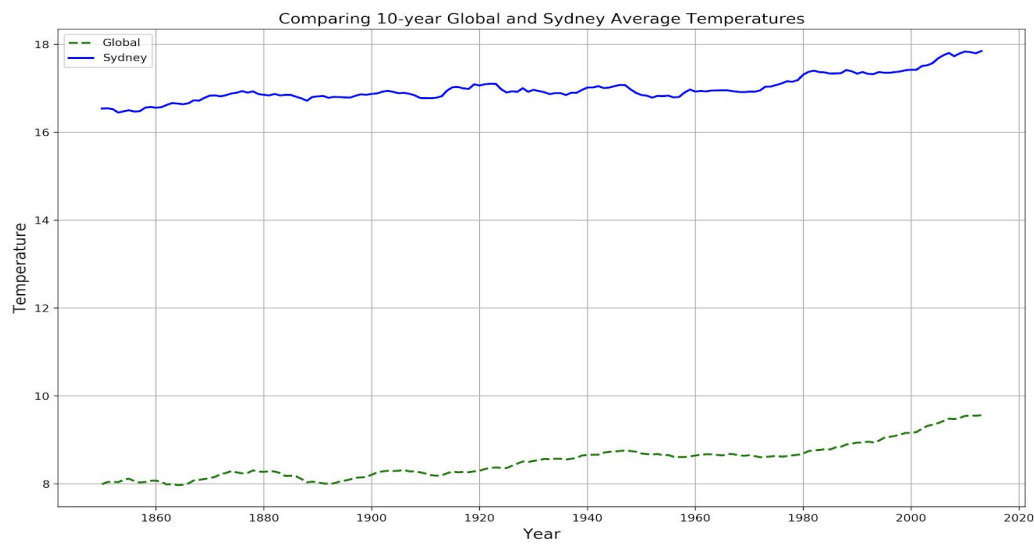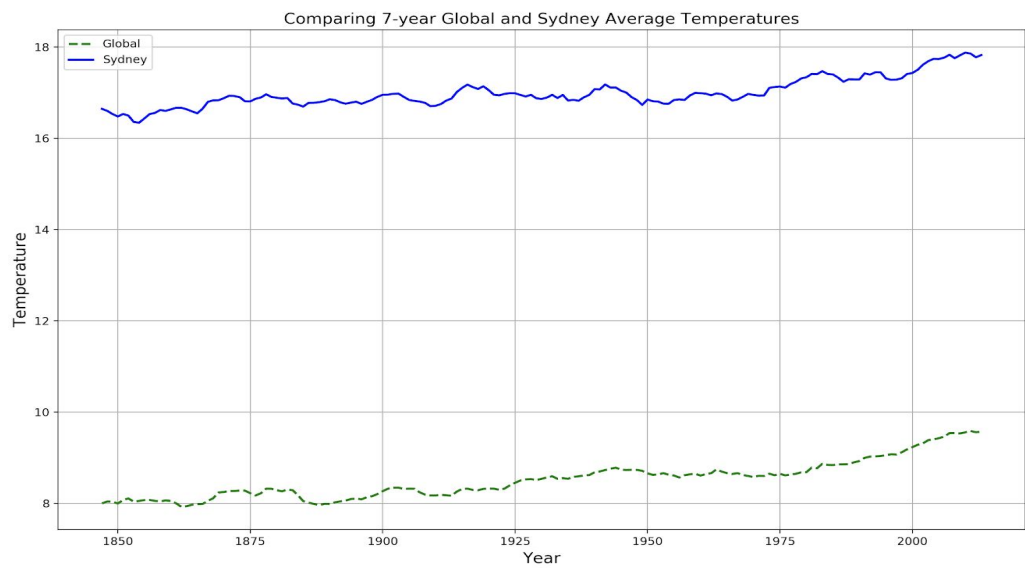
      def ten_year_rolling_average(df):

         df['g_ten_average_temp'] = df.iloc[:,1].rolling(window = 10).mean()

         df['c_ten_average_temp'] = df.iloc[:,3].rolling(window = 7=10).mean()

         return df

   d. *What were your key considerations when deciding how to visualize the trends?*

      The key considerations to visualize the trend was to make sure global and city temperatures were between the same time frame. Another consideration was to calculate a 7-year and 10-year average of

temperatures to compare the difference over a period of time in a group.

2. *Line chart with local and global temperature trends*

3. *At least four observations about the similarities and/or differences in the trends.*

   a. Is your city hotter or cooler on average compared to the global average? Has the difference been consistent over time?

   The city of Sydney is hotter compared to the 7-year and 10-year global average, by around 8 degrees. It has been consistent over time.

   b. How do the changes in your city's temperatures over time compare to the changes in the global average?

   Yes, the trend lines are aligned over time. However, after the year 1980, Sydney's average temperature there is a sudden rise and drop, but global temperature continues to rise.

   c. What does the overall trend look like?

   The overall trend shows that both the temperatures are trending upwards, indicating similarity in the rise between both the temperatures.

   d. Is the world getting hotter or cooler?

   The world is getting hotter over time.

   e. Has the trend been consistent over the last few hundred years?

   This trend has been consistently rising over the last few hundred years. This might because of industrialization across the world.