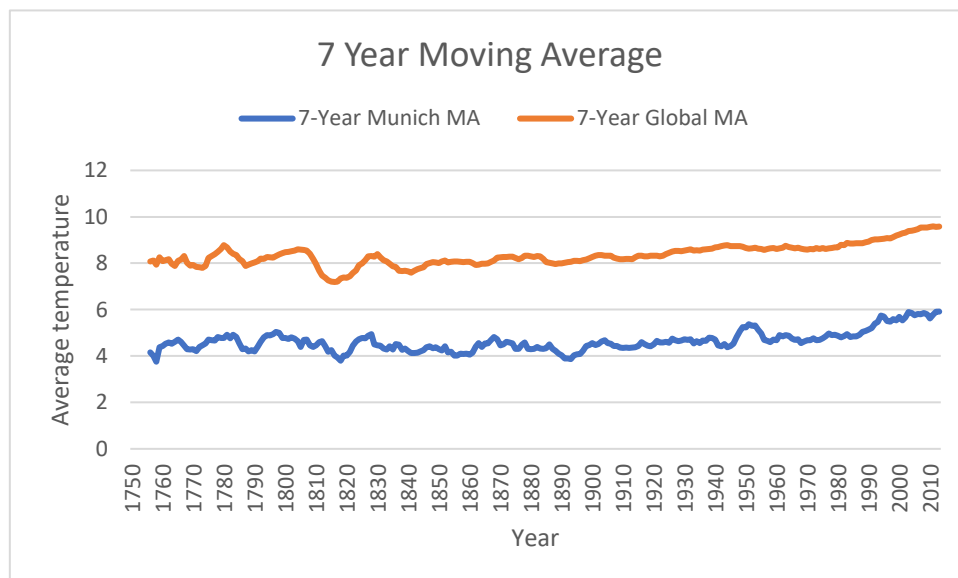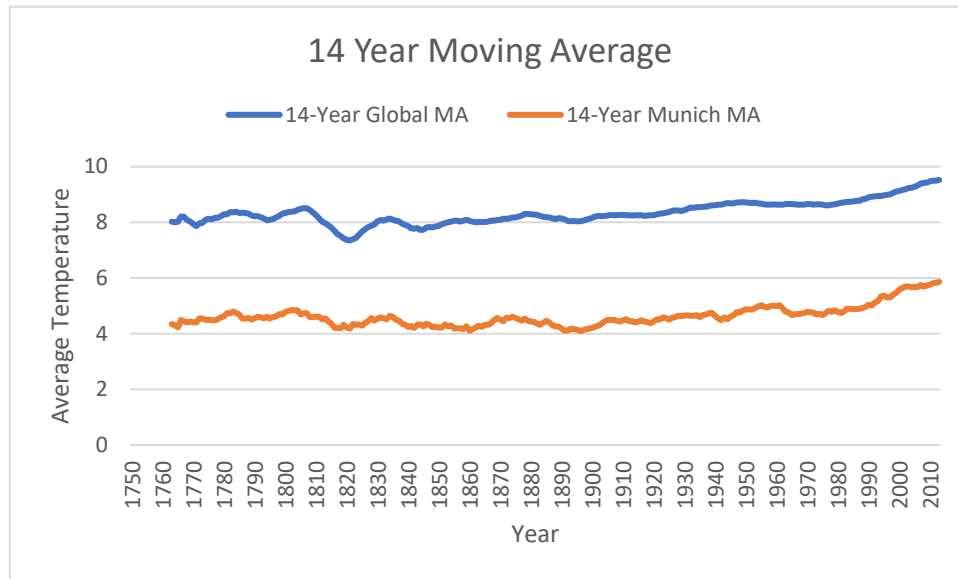**Project-1[1]**

Explore Weather Trends → In this project, I performed data extraction from a database, loading the data in MS Excel for creating line chart which are further used for analysis of the data and draw insightful information which would lead to understanding the data in depth.

1. **Data Extraction**: Extracted Data using SQL, where I join the cities table to global data table and filter a 'where' statement to extract the average temperature of Munich, Germany. Joining the global data and city data schemas on year. Extracting the data in one query for global and city. Downloading the CSV Data.

   ```
   SELECT global_data.year, global_data.avg_temp as global , city_data.avg_temp as munich - -same name of temperature so naming
   FROM city_data
   JOIN global_data ON global_data.year = city_data.year
   WHERE city_data.city = 'Munich'
   ```

2. **Accessing CSV**: Opening the CSV Data in MS Excel, using Data panel in Excel to read. Performing moving average of global and city data as mentioned in the tutorials using average function in Excel. Calculating 7- and 14-year moving average for both average temperatures.

   a. _Average(B2:B8)_ for 7-year MA and similarly for 14-year MA

3. **Creating Visualizations**: Creating a line chart for 7- and 14- year for city and global temperatures. Time frame **1750 to 2013**

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[1] Explore Weather Trends

14 Year Moving Average

14-Year Global MA ▬ 14-Year Munich MA

7 Year Moving Average

7-Year Munich MA ▬ 7-Year Global MA

2

[2] Explore Weather Trends

4. **Analyzing temperatures**: After the visualizations of the city and global average temperatures, to extract insightful information we need to deep-dive into the line-chart. As explained in tutorials, the yearly comparison does not yield many insights, if looking on long time frame window. So, moving average plays vital role in smoothening the curve of 7- and 14- year moving averages. As we can analyze from the line chart, as coming into 21st Century the global as well as city temperature is rising.

    a. **Similarities**
        i. Munich with time has got hotter along with the global average temperature.
        ii. The major rise and fall in the average temperature are mostly same. On closer look from year 1770-1840. As seen in *Figure 1,* we can find those similarities in 7-year MA but not in 14-year MA[3]
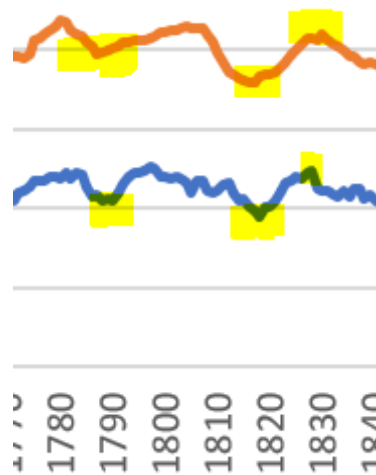

Figure 1: Highlighted parts shows rise and fall in average temperature between global and Munich.
PS: This is 7-year MA. Highligted Years→ 1789,1818,1828

    b. **Differences**
        i. During year circa. 1893, we can see the drop in temperature Munich w.r.t global.
        ii. In year 1953, there is step rise in temperature in Munich compared to Global. Assuming that after WW2, there has huge scale of Industrialization in Munich which leads to rise in temperature of the city.
        iii. From year 1986 to 1996, there is almost a linear rise in Munich's temperature and not such change is observed in global temperatures.
        iv. General difference over time remains mostly constant except certain time frames. For those exception, there would be a reason as to why there is change. But all in all, the city as well as world is getting warmer during course of 1770 to 2013 and would have risen even more when comparing the current temperature which leads to introduction of term '*global warming'.*

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[3] Explore Weather Trends