Project 1: Exploring Weather Trends

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Contents

1. Task

Extracting temperature data using SQL and visualizing the data to understand the relationship between local temperature and global temperature.

2. Data preparation

Below steps are used to extract and prepare the data:

1. Extracting data by SQL
   I used SQL code to extract the data and download the file in CSV format.
   SQL code:

   ```
   SELECT *
   FROM Name_of_File
   ```

   Note: * means that all columns of data are shown in the display.
2. Downloading the data
   After the first step, I downloaded the files in CSV format.
3. Calculating the moving average by Excel
   I used excel to visualize the data. The yearly average of temperature is not smooth. To avoid a zig-zag trend, I used the moving average of 20 years. For example the average temperature of Kansas City (from 1758 to 1777) and is 9.82 ℃ and the average global temperature (from 1750 to 1769) is 8 ℃.
4. Key considerations to visualize the data
   The most important thing is that the units should be the same for both datasets. The data should give enough information in the first look. If the data is crowded and zig zag a lot, it will be hard to follow it. To avoid such problems, I used the moving average for 2 years.
   Besides, the graph should have proper legend, title, x and y label and the lines should be distinguishable by color and symbols.

3. Line chart

The Kansas City and global temperature trends are compared in the Figure 1.

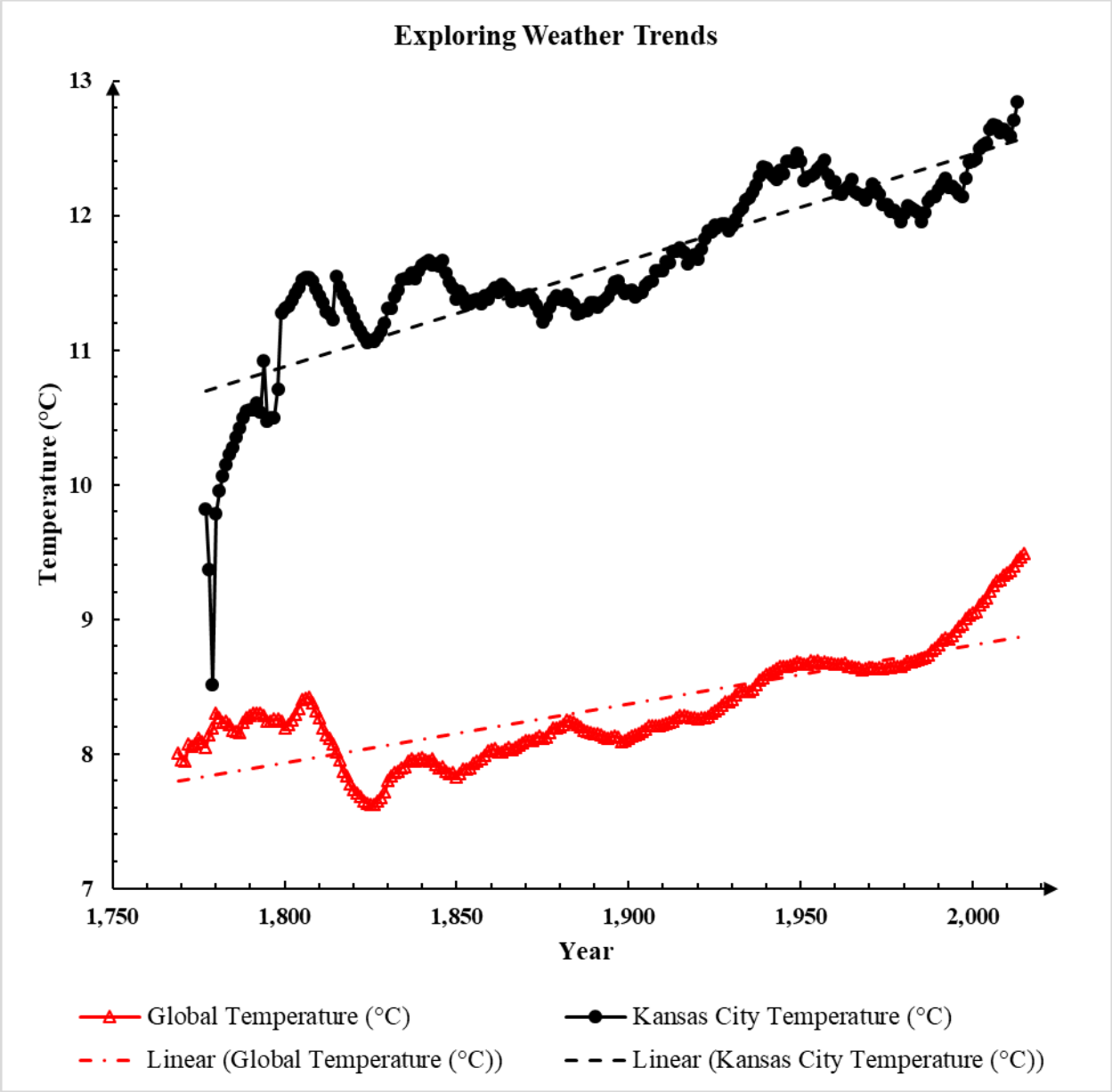

Figure 1. Global temperature and Kansas City temperature trend from 19750 to 2010. Note that the data point of each temperature is the average temperature of 20 years.

4. Observations

The figure 1 shoes that:

1. The overall average temperature in Kansas City is ~3−4°C higher than average global temperature.
2. In general the overall temperatures increased gradually in both trends, from ~10°C to 13°C in Kansas City and from ~8°C to 9°C in global scale.
3. Both trends experienced a “sharp decrease” and “sharp increase” respectively in early 1800 and 1957.

4. The fluctuation of average temperature in Kansas City is more than the overall global temperature.
5. In early 1770, the temperature in Kansas City is unusually too low! Maybe the data are not recorded well or maybe the City experienced a very cold winter.