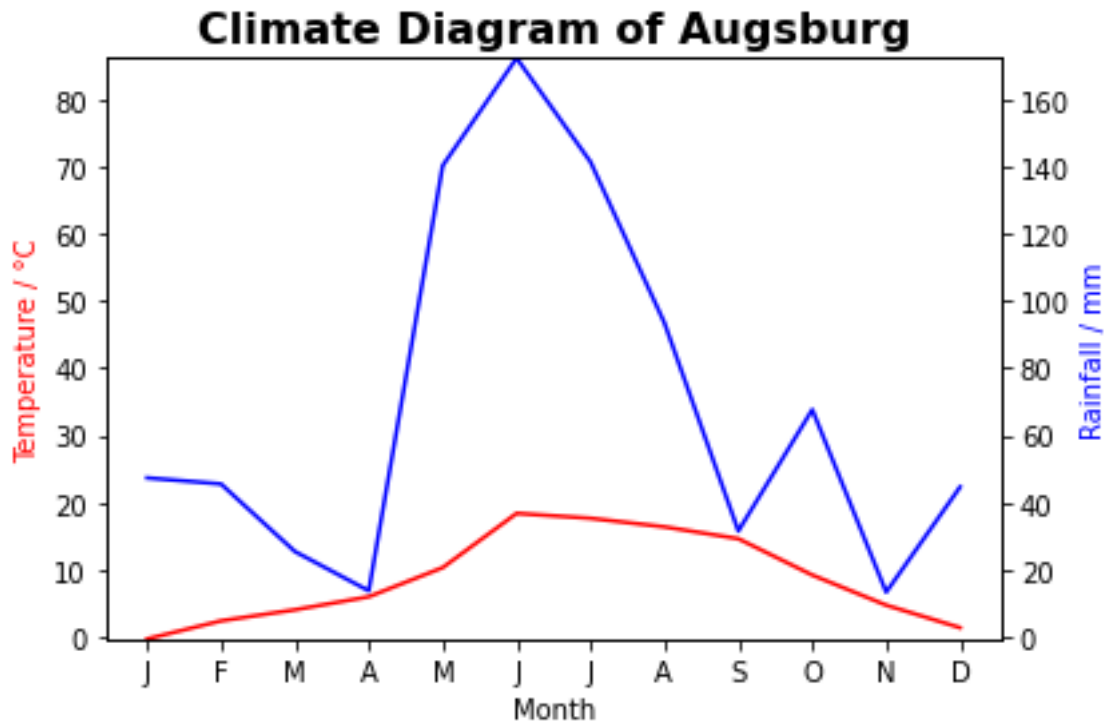# Exercise 06: Climate Diagram Generator

You are provided with three databases containing weather data from different locations in Bavaria. Each file contains exactly one year of measurement data but not starting at 1st of January but at 1st of another month. The raw data can be found on: https://www.dwd.de/DE/leistungen/klimadatendeutschland/klimadatendeutschland.html

Relevant columns:

- JJJJMMDD: date of measurement in format YYYYMMDD
- TM: mean temperature in 2 m height above ground
- SO: Sum of sunshine duration
- RR: Amount of rainfall

Tasks:

- Start from scratch. Import *numpy* and *matplotlib.pyplot*
- Create a global variable *LOC_NAME* for the location. E.g. LOC_NAME = 'Augsburg'
- Create a function *read_text()*:
  - This function reads the database for the location set in LOC_NAME
  - The function returns a tuple *data* containing the variables:
    - date: list of strings containing the date of measurement
    - T_avg: numpy array containing the average temperature for each day

- sun_time: numpy array containing the sun time of each day in hours
- rainfall: numpy array containing the amount rainfall of each day in mm
  - All variables should be ordered beginning with the oldest measurements
- Create a function *evaluate_sun_data(data)*:
  - This function analyses the sun time of the location and prints a text like this:

  ```
  In total there were 1772.1 hours of sun in Straubing, which on average were 4.86 hours per day.
  The sunniest day was on 2020/06/12 with 14.7 hours of sun.
  ```

- Create a function *calculate_month(data)*:
  - This function calculates the average temperature and the sum of rain for each month
  - Return two numpy arrays containing the 12 values of mean temperature and the values of accumulated rainfall. Make sure the values are ordered by months starting with January. Remember that not all databases start on the same date!
- Create a function *plot_climate_diagram(temp, rain)*:
  - This function generates a climate diagram with the same layout as the example diagram above:
    - Title: bold, size 16
    - Y-axis labels: Color red / blue
    - Y-axis values: The value for *Rainfall* has always to be twice the value of *Temperature* at the same height.
      Reason: https://de.wikipedia.org/wiki/Klimadiagramm#Walter/Lieth-Klimadiagramm_(hygrothermisch)
  - Save the climate diagram as 'Climate_Diagram_LOC_NAME.png' to your working directory
  - Call all previously created functions