CSE 201 - Advanced Programming
Lab 8

In this assignment, you will be using threads and observer pattern to do the following:

You have to create a system in which there are 7 threads, 3 producer threads and 4 consumer threads.

Data: There are 3 files given each containing 5 datasets separated by a newline. Each dataset has 100 values (100 days).

Producer Threads:

- Each producer thread generates weather data.
    - 1st producer generates temperature data (Range: -20 ºC to 50 ºC)
    - 2nd producer generates humidity data (Range: 10 to 100%)
    - 3rd producer generates rainfall data (Range: 0 to 600 mm)
- Calls the method of consumer and waits after generating the data.
- Each producer thread sleeps for a random time between 1-5 seconds after notifying the observer and then goes into conditional wait state. This wait will end when consumer notifies it.
- The producer then fetches the results from the consumer and displays results.

Consumer Threads:

- These threads remain in a conditional wait.
- Consumer threads also act as observers in the system.
- Every consumer thread performs a different function.
    - 1st calculates min temperature/humidity/rainfall
    - 2nd calculates max temperature/humidity/rainfall
    - 3rd calculates average temperature/humidity/rainfall
    - **4th predicts the value of temperature/humidity/rainfall for the 101st day. (Bonus)**
- As every thread will take random amount of time to do its task, every consumer thread should sleep for a random time between 0 to 2 seconds before going into conditional wait state (to be woken up by producer update)
- Each thread notifies the producer when it is done and then waits conditionally for the next data.

The output by the producers should be in the following sequence:

First temperature results, then humidity and in the last rainfall.

We also recommend that you print some message when a particular thread executes a function. This will also help you in debugging purposes.