Introduction to Computer Science II
Assignment 5

Due: 4:00 p.m. July 1, 2016

User Counter Simulator

Imagine a simulator that inclusively counts all the numbers between a given user range. In particular, the user would enter two integer values representing the lower/upper bound values, and accordingly the counter would start counting every one second from the lower bound value to the upper bound value by a fixed increment of one.
For example, if the user enters 3 and 10 as his or her range, the counter would output the values 3 4 5 6 7 8 9 10 (you may separate between the output values using a space or a new line). Remember there must be a delay of one second between each increment.

For this assignment, the user should have full control over the simulation through a GUI that asks the user for the min/max range values. The interface should also allow the user to "start", "pause", and "continue" the simulation whenever needed.
If the user enters a valid range, the simulation can be started and in that case the GUI should count and output as described earlier.
While the simulation is running, the user can "pause" the counter using appropriate button(s).
If the simulation is paused, the user can resume or continue the counting simulation by pressing the "continue" button.
Note that the user can only pause a simulation that has already started, and can only continue a simulation that has been paused.

Use multi-threading for the simulator, and create an interface using the Java API that updates the counter every second.

The submission must support the following features:

- Receive user inputs for defining the counter range
- Output the counter values when the simulation is running
- Allow the user to pause a running simulation
- Allow the user to continue a previously paused simulation
- The state diagram for the aforementioned simulation.

Bonus:

- Save the simulation output to a text file (5 points).
    - The text file may contain the range at the first line, and the actual counting at subsequent lines
- Allow the user to control the counter's increment value, e.g., count every two seconds (2 points)
- Allow the user to control the delay between each count (2 points)

New Skills Needed for this Assignment:

- Understanding of concurrent programming and use of threads
- Understanding and use of file I/O streams
- Use of state diagrams

Submit the following:

1. Your Java source code via electronic submission. Use the *Assignment 5* Dropbox Folder in D2L to submit electronically. Your TA will compile and run your program to test it. Your TA may also have you demonstrate your application in a tutorial session.
2. Your state diagram should be submitted electronically to the D2L drop box. The file should be in a commonly used file format such as PDF, TIFF, or JPEG.

Introduction to Computer Science II
Assignment 5 Grading

Student(s): _____

Functionality			
Counter Simulation			
Use of Threading and proper buffers	6	_____	
Display simulation output	3	_____	
Receive and handle user input	2	_____	
Allow simulation pausing	2.5	_____	
Allow simulation resuming	2.5	_____	
Miscellaneous			
GUI design quality	2	_____	
Code structure	4	_____	
(Documentation, formatting, handles invalid input, safe multi-threading)			
State Diagram	4	_____	
Total	**26**	**_____**	**_____%**
Bonus			
Save the simulation to file	5	_____	
Support dynamic counter increment	2	_____	
Support dynamic delay between counts	2	_____	
Assignment Grade	**35**	**_____**	**_____%**