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Homework 7

For each of the following problems I am asking for a small "C" program to be uploaded. I am NOT requiring a makefile or README.

1. Broken Code

In the Broken.c file there are two (at least) problems with how concurrency is implemented:

a) What is one problem?

The conditional if must change to while so that there is a continuous check.

b) What is the second problem?

The second problem is that we need condition variables.

c) How would you fix the code? Upload a corrected file (Unbroken.c) that has been corrected with comments describing your correction.

Lines 40, 45, 58, 70, 71, 75, 81 have comments

2. Double Linked List

In class (and the book) there is an example of a thread-safe linked list. The example is for a singly linked list.

Produce a new version of the example that uses a doubly linked list (Double.c). I've provided a starter Double.c file with the definitions of the list (minus any locks, control variables or semaphores required). The starter file also includes skeletons for the functions you will need to write as well as providing some sort of main function to test your list. Upload the completed Double.c file.

3. Multiple Wait.

It's frequently necessary to wait on more than a single event and be able to tell which event was the one that unlocked the thread. Using a control variable, construct a program that:

a) Starts up two threads

b) Each thread will signal the main task that it's done something.

c) The main program will wait for the signals. After each is received, it will print out which thread had signaled.

See Waiting.c in the ControlVariables.zip file from the March 3 Daily Slides module for an example of waiting for a single event. Upload your solution as MultipleWait.c. The code should compile but I do NOT expect a fully functioning example, it doesn't have to run, just compile. That said, I would recommend testing it anyway