CSSE 332 -- Operating Systems

Introduction to Condition Variables

Name: ____

Question 1. Write down the API call that corresponds to each of the actions below.

(a) (5 points) Create a condition variable `c`:

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(b) (5 points) Given a condition variable `c` and a mutex `m`, wait on the condition variable:

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(c) (5 points) Given a condition variable `c`, signal **exactly one** waiting thread, if any.

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(d) (5 points) Given a condition variable `c`, signal **all** waiting threads, if any.

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Question 2. Consider a thread that calls `pthread_cond_wait(&c, &m);` where `c` and `m` are a condition variable and a mutex lock, respectively.

(a) (5 points) Describe the steps performed by the thread as it is ready to wait on the condition variable.

(b) (5 points) Assume now that another thread calls `pthread_cond_signal(&c)`. Describe the steps taken by the waiting thread when it gets signaled.

Question 3. (5 points) In the boxes below, write down a possible implementation of `pthread_join` using condition variables.

First, list your state of the world (or concurrency state). These will essentially be your global variables.

Parent (main) thread:

Child thread: