

# CPS310/ECE353 Practice Final Exam Questions

Name:

NetID:

1. (**Extra credits:** 1 point) Have you finished the course evaluation?
  - Yes
  - No
2. (4 points) What's the difference between a process and a thread?
  - A process is sequence of programmed instructions that can be managed independently, but a thread is not.
  - A process has an address space but a thread does not.
  - A process is a component of a thread.
  - Kernel scheduler schedules processes instead of threads.

3. (4 points)

|   |  |
|---|--|
| Thread A                                    | Thread B                                       |
| <code>thread_lock(1); printf("a");</code>   | <code>thread_lock(1); printf("1");</code>      |
| <code>thread_wait(1,1); printf("b");</code> | <code>thread_signal(1, 2); printf("2");</code> |
| <code>thread_wait(1,2); printf("c");</code> | <code>thread_signal(1, 1); printf("3");</code> |
| <code>thread_unlock(1);</code>              | <code>thread_unlock(1);</code>                 |

Assuming no instruction reordering, which of the following is NOT a possible output?

- a123b
  - 123a
  - abc1
4. (2 points) A set of lawyers go to a dining place. Lawyers sit at a round table. There is a single chopstick between neighboring lawyers. You know that not all lawyers are left-handed. Also, you know that not all lawyers are right-handed. A lawyer eats food by first picking up the chopstick on the dominant hand and then picking up the chopstick on the other hand. Can these lawyers be deadlocked?
    - Yes.
    - No.
  5. (2 points) Preemptive shortest job first is the optimal scheduling algorithm in terms of average job completion times.
    - True.
    - False.
  6. (4 points) What's a translation lookaside buffer (TLB)?
    - A cache (which does not store the entire table) to translate virtual address to physical address.
    - A lookup table to translate virtual address to physical address. If virtual address is not in the table, raise an exception.
    - A cache (which does not store the entire table) to store the virtual address of content in L1 cache.
    - A lookup table to store the virtual address of content in L1 cache. If the virtual address is not in the table, look up L2 cache.
  7. (2 points) Assuming FIFO cache eviction, having a larger cache always improve cache hit rate.
    - True.
    - False.

8. (4 points) Which of the followings is NOT an approach to achieve crash safety in file systems.
- Logging.
  - Immediately storing file system state into non-volatile memory before server crash.
  - Copy-on-write layout.
  - Carefully breaking down complex operations to make sure file system state can be recovered when server crashes at every step.