CS3210: Quiz 2 Overview

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Topics

- Ch. 3-6, Lab 3 and 4
  - System calls, interrupts, and exceptions
  - Multiprocessors and locking
  - Processes and switching
  - Sleep and wakeup
  - File Systems
  - Crash consistency

System Calls, Interrupts, and Exceptions (Chapter 3, Lab 3 and part of 4)

- Trap frames and trap frame manipulation
- Trap handlers
- Privilege Levels
- IDT
- IRQ and PIC and APIC

Multiprocessors and Locking (Chapters 4 and 5 and Lab 4)

- Locking and lock implementation
- Race conditions
- Interrupts and Locking
- Process table locking
- Swtch, sched, and schedule, context
- Process states: RUNNABLE, SLEEPING, etc.

Sleep and Wakeup

- Process coordination
- Lost wakeup problem
- Applications of sleep and wakeup (wait, exit, kill, pipe, ide)
- Semaphores

File systems (Chapter 6)

- Structure (boot, superblock, inodes, bitblock, data, logging)
- xv6 file system layers
  - file descriptors
  - pathnames
  - directory
  - inode
  - logging
  - buffer cache
  - disk
- inode allocation, deallocation, iget, iput, etc.
- inode content and possible improvements to xv6

Crash Consistency

- Logging procedure
- Crash recovery steps
- Logging approaches (potential solutions to xv6 drawbacks, see Real World discussion in Ch. 6)