Operating Systems
CMPSC 473
Exam 1 Review
February 17, 2009 - Lecture 10
Instructor: Trent Jaeger
• Exam Structure
  – (7) Short Answer (1-3 sentences)
    • 3-4 pts each
  – (3) Long Answer (3 paragraphs max)
    • 7-8 pts each
  – (5) Constructions (several related, small questions)
    • 8-12 pts each
• Exam Structure
  – (7) Short Answer (1-3 sentences)
    • How and what questions
      – How does X work? Why do X?
      – What is Y? Explain briefly.
  – (3) Long Answer (3 paragraphs max)
    • How and why questions
      – How and why does X work that way?
      – The ‘why’ may be implicit, but do not assume that I know that you know how these work
  – (3) Constructions (several related, small questions)
    • Specific questions about OS mechanisms/concepts
• **Scope**
  - About 1/3 to 1/2 is related to HWs
  - Test covers all topics that we discussed in class
    - But, not all the answers are specified in the slides
  - And related sections in book
    - We followed pretty closely in Chs. 3-5
  - Hopefully, your notes are good (or you have a good memory of what we discussed)
• **Scope**
  - Chapter 1-5
  - More emphasis on chapters 3-5, but build upon 1 and 2
Chapter 1

- Hardware concepts
  - CPU
    - Modes, Registers, …
  - Memory
    - Memory hierarchy
  - I/O devices
    - Interaction
- Communication mechanisms
  - Interrupts
  - Bus
• Chapter 2
  – OS structure
  – What is the OS?
    • Functions
  – OS API
    • System call processing
    • Process and file system calls
• Chapter 1 Questions
  – 1.7
  – 1.22
  – 1.24

• Chapter 2 Questions
  – 2.2
  – 2.13
  – 2.16
• Chapter 3
  – Process Structure (Address space)
    • Process creation (fork/exec)
    • Process loading (executables and libraries)
  – Process representation in kernel (structure)
    • Context switch
    • Hierarchy
  – Process states
  – Interprocess communication
    • Shared memory
    • Message passing
    • In detail -- studying actual systems will help understand the concepts
  – Remote procedure calls
• Chapter 4 -- Threads
  – Purpose of threads
  – Threading models
  – Thread context switch
  – Thread system issues
  – Threading system basics
    • Clone system call
    • Linux threads
    • Pthreads invocation, termination
• Chapter 3 Questions
  – 3.7
  – 3.9
  – 3.14
• Chapter 4 Questions
  – 4.2
  – 4.10
  – 4.11
• Chapter 5 -- Scheduling
  – Concepts
    • Bursts, preemption, quantum, aging, classes
  – I/O bound and CPU bound processes
  – Algorithms
    • FCFS, SJF, RR, priority
    • Exponential average
    • Multiqueue scheduling (combinations of above)
  – Study Linux/Solaris to better understand scheduling
• Chapter 5 Questions
  – 5.11
  – 5.12
  – 5.15
• Overall
  – Probably a bit long -- don’t dawdle over 3 pts
  – Fairly broad set of topics
  – Clear understanding of a lot of stuff is required
    • Fewer computations than later tests…