Exam #1

• Closed book
• Mix of short answer ~ 40%
• Longer ~ 60%
Exam #1 Topics

- Kernel and Processes
- Threads and Concurrency
- Synchronization
- Multi-object synchronization
- Scheduling
- Address Translation
- Virtual Memory
Exam #1

• What to study?
  – Your notes!
  – Skim book chapters: focus on sections we talked about in class – ignore topics we did not cover
  – Do not need to memorize minor code details

• How to study?
  – Look at homework questions in the book
  – Look at exercises in the book
Exam #1 Content

• Short question examples:
  – Contrast kernel threads with user threads – list pros of each.
  – Why is reader-writer synchronization unfair?
    • How could you make it fair?
  – What is the key insight behind the MCS protocol?
  – Contrast Hoare and Mesa semantics for CVs?
  – Why must there be a stub for process or thread create function?
  – Why must there be a stub for system calls?
Exam #1 Content

• Longer
  – Given a paging, segmentation, or multi-level AT, or some combination ...
    • sketch it out, how would you translate a VA to a PA, ...

  – Given this job arrival pattern: compare scheduling algorithms: measure one or more metrics

  – Use little law to do some simple queueing analysis

  – Explain the code fragment for the lock implementation(s) discussed in class

  – Run the Banker’s algorithm on a resource request trace
Exam #1 Content

• Longer
  – Analyze this code for safety, progress, **deadlock**

• Given a memory access pattern
  – Analyze behavior of various page replacement strategies
Good luck!