Final Review - 0

- 2:30am – 3:50am, 11/26/08
- Closed book
- Three or four problems

Final Review - 1

- Overview
  - What, why, concurrent vs sequential computation, models of concurrency (interleaving-based/true concurrency), semantics of correctness (safety & liveness), unique challenges in testing and debugging
- Shared variables
  - The CS problem, correctness requirements, Peterson's algorithm, Bakery algorithm, synchronization operation, SYN-sequence, RW-sequence, version-based tracing & replay

Final Review - 2

- Semaphore & Locks
  - Binary semaphore, counting semaphore, lock, semaphores in Java, common patterns in semaphore-based programming, semaphore-based solutions to classical synchronization problems, PV-sequence, Lock/Unlock-sequence, permission-based tracing & replay

Final Review - 3

- Monitor
  - Graphic representation, different signaling disciplines, monitor implementation, Java monitors, monitor-based solutions (dinning philosophers, bounded buffer, reader/writers), tracing/replay monitors (entry-based execution, simple and complete M-sequence)
- Message Passing
  - Link/port/mailbox, synchronous vs asynchronous, rendezvous, selective wait, happened-before relation, integer/vector timestamps

Final Review - 4

- Race Analysis
  - General & data race, the lockset algorithm, message race detection
- Reachability Testing
  - The RT process, the general execution model, timestamps for different constructs, race variants, the RT algorithm
- CCS
  - Observational equivalence
  - Agent, handshake, internal action
  - Transition rules
  - Inference diagram

Questions?