

Final Exam Review



CS 450 : Operating Systems
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Topics

- Concurrency essentials
- Semaphores & Synchronization
- Alternative concurrency models
- Deadlock



Concurrency Essentials

- Definitions:
 - threads of execution
 - concurrency vs. parallelism
 - race conditions, critical sections



Concurrency Essentials

- Motivation:
 - multitasking
 - separating blocking activities
 - improved resource utilization
 - performance gains



Concurrency Essentials

- Amdahl's law
- Gustafson's law
- Locks & Locking strategies
 - Pros/Cons



Semaphores & Synch

- Operations and Semantics
- Synchronization criteria
- Patterns: mutex, multiplex, barrier, turnstile, lightswitch, FIFO sem
- Classical problems: P/C, R/W, Phils



Alt. Conc. Models

- Concepts only!
- Actor model: premise, pros/cons
- STM: premise, pros/cons



Deadlock

- Necessary conditions
- Resource allocation graphs
- Prevention: claim edges / Banker's alg.
- Detection algorithm; resolution strategies

