

### Administrivia

Slide 1

- Reminder (if one is needed!): Midterm Wednesday.
- Reminder: All written problems due now. Programming problems due at 5pm. Solutions to written problems available in class (and after). Solutions to programming problems will be online soon (later today / early tomorrow).
- Homework 1 written problems graded. More graded work coming soon, I hope. Grades for programming problems will be e-mailed.

### Topics to Review

Slide 2

- History — just a little about how things were added, bit by bit, to provide more functionality.
- Functions we want the system to provide — two views (top-down, bottom-up).
- High-level hardware review — features that make it easier for an operating system to defend itself.
- System calls — what they're for, a little about how they work.
- What a process is (program running on a virtual CPU); a little about implementation, including processes versus threads.
- Context switches.

### Topics to Review, Continued

Slide 3

- Interprocess communication — why needed, different mechanisms (shared variables, semaphores, monitors, message passing). Idea of program invariant, at the level presented in class.
- Classic IPC problems — mutual exclusion, bounded buffer, dining philosophers.
- Process scheduling — different algorithms, how to choose one.
- Deadlocks — what they are, maybe a little about what can be done about them.

### A Tiny Bit More About Synchronization

Slide 4

- Note distinction between *problems* and *mechanisms*.
- Problems include mutual exclusion, etc. — something that involves imposing constraints, potentially blocking processes.
- Mechanisms are ways to impose constraints:
  - Shared variables, with or without special hardware for locking.
  - Semaphores — only allowed operations are “up” and “down”.
  - Monitors — one-process-at-a-time procedures, condition variables.
  - Message passing — send/receive.

### Review, Continued

- (Look over sample solutions.)

Slide 5

### Minute Essay

- None — sign in.

Slide 6