CSE 451
Section 5
Midterm review

Homework 2 / Queue

- Common HW2 problems:
  - Nothing is shared between parent and child unless it is made to be shared explicitly (through a shared memory segment
  - Changes in the child do not update the parent. The memory address space of the parent is copied. Copy-on-write fork is an optimization of fork but doesn't change the behavior
- Common queue problems:
  - Check your edge cases
  - Never touch something you freed

Math call / Hash Table

- The purpose of the math call was to set up a table of pointers. If you used a case/switch, you missed the point.
- If you leave compiler warnings, you lose points (even if it works).
- Linear probing requires a deleted or vacant flag on each index
- Memory leaks (especially in separate chaining)

The kernel

- You should know:
  - Kernel mode vs user mode
  - How these modes differ conceptually and from the CPU's point of view
  - How we go between the two
  - What must the kernel do when it starts and finishes
  - Conceptual difference between the different kinds of kernels

System Calls

- You should know:
  - What they are for
  - What they do
  - How they do it
  - What hardware is involved
  - What requires system calls

Virtual Machines

- You should:
  - What they do
  - Software VMM
    - Why it's tricky and how this is VMMs getting around this problem
  - Hardware VMM

Processes and Threads

- You should know:
  - Kernel processes, kernel threads, and user threads
  - How these differ from one another
  - Context switching
  - Fork, exec

Scheduling

- You should know:
  - Different scheduling algorithms and their trade-offs
  - Average turnaround time and average wait time
  - Starvation/fairness
  - Cooperative vs preemptive scheduling
  - Work conservation

Critical sections

- You should know:
  - What they are
  - Why they need protecting
  - The classic examples

Practice questions (high level stuff)

- What is “multiprogramming”? “Multiprocessing”?

Q

- What is the main idea and goal of a layered OS approach? What is the problem?
  - Microkernel? Exokernel?

Q

- Give some examples of metadata for files? Processes?

Cont.

- What is the principal advantage of user level threads? Disadvantages?

Q's

- What are the advantages of distributing a library versus distributing sources files?

Project related questions

- A process has a “zombie” state you may have noticed. Why does it exist?

Other questions

- Suppose a single CPU scheduler knows all jobs are either one or 60 seconds long. Describe and explain a minimal response time algorithm.