

Final Study Guide

This is simply a guide of topics that I consider important for the midterm. I don't promise to ask you about them all, or about any of these in particular; but I may very well ask you about any of these, as well as anything we discussed in class, in discussion section, in the text, or that is in the reading.

1. *Anything from the midterm study guide*
2. Memory management
 - (a) Paging and page tables
 - (b) Segmentation and segment tables
 - (c) Optimizations: cache, hit ratio, effective memory access time
 - (d) Views of memory: program vs. operating system, address translation
 - (e) Protection
 - (f) Segmented paging (segment the page table)
 - (g) Paged segmentation (page the segments)
 - (h) Virtual memory: demand paging, page faults, pure demand paging
 - (i) Page replacement and victims and dirty bits: FIFO, OPT, LRU, stack algorithms
 - (j) Minimum number of pages per process
 - (k) Global vs. local allocation
 - (l) Working set: thrashing, principle of locality, working set principle and model
 - (m) Prepaging, I/O interlock, choosing page size, restructuring program
3. Device I/O
 - (a) Device drivers and transparency
 - (b) Structure of a device driver
 - (c) Character code independence, device independence, uniform treatment of devices
 - (d) Device drivers: lower, upper parts
 - (e) Disk scheduling algorithms: FCFS, pick-up, SSTF, SCAN, LOOK, N-Step SCAN, C-SCAN, C-LOOK
 - (f) File, system calls for I/O
 - (g) Blocking vs. non-blocking I/O
4. File Systems
 - (a) Virtual vs. physical; names; directory structures
 - (b) Access control: rights, ACLs, UNIX abbreviations
 - (c) Access via create, open, close, read, write, rewind, delete system calls or commands
 - (d) Access methods: sequential, direct mapped, structured
 - (e) Disk directory: free list implementations, allocation methods (contiguous, linked, indexed)
5. Computer Security
 - (a) Confidentiality, integrity, availability
 - (b) Policy vs. mechanism
 - (c) Saltzer's and Schroeder's Design Principles
 - (d) Access control: subjects, objects, access control matrix, ACLs, C-Lists, protection rings
 - (e) Classical ciphers

- (f) Public key ciphers
- (g) Cryptographic hashes
- (h) Networks, computers, and security