

CS 4/53201, Operating Systems, Spring 2006

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Take Home Assignment#1*

All problem and page numbers refer to your text book (6th Edition, OS Concepts, Silberschartz).

1. Explain the steps a Computer System must take to process an interrupt. How interrupt improves the performance of computer?
2. When are caches useful? What problems do they solve? What problems do they cause? Why we want to make caches large?
3. Which hardware aids can be used to improve CPU and Memory protection? Explain their operations.
4. (Problem 3.10) What is the purpose of system programs?
5. (Problem 3.12) What is the main advantage of the microkernel approach to system design?
6. Describe the actions taken by a kernel to context switch (a) among threads, (b) among processes.
7. (Problem 4.1) MS-DOS provided no means of concurrent processing. Discuss three major complications that concurrent processing adds to an operating system.
8. (Problem 4.7) Consider the interprocess-communication scheme where mailboxes are used.
 - a. Suppose a process **P** wants to wait for two messages, one from mailbox **A** and one from mailbox **B**. What sequence of **send** and **receive** should it execute?
 - b. What sequence of **send** and **receive** should **P** execute if **P** wants to wait for one message from mailbox **A** or from mailbox **B** (or from both)?
 - c. A **receive** operation makes a process wait until the mailbox is nonempty. Devise a scheme that allows a process to wait until a mailbox is empty, or explain why such a scheme cannot exist.
9. (Problem 5.3) What are two differences between user-level threads and kernel-level threads? Under what circumstances is one type better than the other?
10. (Problem 5.6) What resources are used when a thread is created? How do they differ from those used when a process is created?