

Computer Science 801

Fall 2000

Homework 3

Due: Thursday, 12/7/2000

1. What is a daemon and how is it used by the operating system? Give an example of a common daemon.
2.
 - a. What is involved in a context switch?
 - b. What are threads and how can they improve the efficiency of context switching?
3. Identify these terms in relation to process scheduling:
 - a. critical section
 - b. mutual exclusion
 - c. deadlock
 - d. race condition
 - e. starvation
4. Given the following processes, show how process scheduling would be handled for the scheduling algorithms listed below:

Process	Time	Priority
P1	10	3
P2	6	5
P3	2	2
P4	4	1
P5	8	4

- a. FCFS (First-Come First-Served)
 - b. SJF (Shortest Job First)
 - c. Priority Scheduling
 - d. RR (Round Robin)
5. Consider a memory management system for which at a specific time, the following hole sizes appear in memory order: 10K, 4K, 20K, 18K, 7K, 9K, 12K, and 15K. What holes are allocated for the requests listed below for each of the memory management algorithms?

12K 10K 9K

- a. First Fit
- b. Best Fit
- c. Worst Fit

6. Define the following terms related to memory management:

- a. fragmentation (external)
- b. internal fragmentation
- c. thrashing
- d. virtual memory

7. Given a disk with 46 cylinders and the following queue of read requests, list the order the requests would be serviced with the following disk scheduling algorithms. Also compute the total number of cylinder movements by the read arm. In all cases, the arm is initially at cylinder 20.

10 22 20 2 40 6 38

- a. FCFS
- b. SSF (Shortest Seek First)
- c. elevator algorithm (initially moving upward)

8. How do the PC-based FAT (File Allocation Table) and Unix i-node structures each handle file management? What is one advantage that I-nodes have over the FAT?