

CS 420
HOMEWORK ASSIGNMENT H6

DUE DATE: Monday, November 19

1. The Macintosh Operating System records the name of the creating program with the file's attributes. What are the advantages and disadvantages of doing this?
2. If an application will only access file data in a sequential manner and the operating system were to know this in advance, how could this knowledge be exploited to improve performance?
3. Assume that a file system uses i-nodes to represent files. Disk blocks are 8-KB in size and a pointer to a disk block requires 4 bytes. This file system has 12 direct disk blocks, plus single, double, and triple indirect disk blocks. What is the maximum size of a file that can be stored in this file system?
4. A file system on an external hard disk has both logical and physical block sizes of 512 bytes. The directory information about each file is already in memory. Answer the following questions for each of three allocation strategies - contiguous, linked, and indexed:
 - a. How is the logical-to-physical address mapping accomplished in this system? (For the indexed allocation, assume that a file is always less than 512 blocks long.)
 - b. If the user is currently at logical block 10 (the last block accessed was block 10) and wants to access logical block 4, how many physical blocks must be read from the disk?
5. Assume that a disk drive has 5000 cylinders, numbered 0 to 4999. The drive is currently serving a request at cylinder 143, and the previous request was at cylinder 125. The queue of pending requests, in FIFO order, is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130. Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests, for each of the following disk-scheduling algorithms?
 - a. FCFS
 - b. SSTF
 - c. SCAN
 - d. LOOK
 - e. C-SCAN
 - f. C-LOOK

Either type your solutions or print legibly. Solutions that cannot be easily deciphered are incorrect!

General Instructions:

- Homework submissions should be prepared using computer document preparation applications such a word processor or similar editor. Handwritten solutions are only acceptable if they are neat and can be easily read by the grader – neatness, readability and grammar count!
- Homework submissions will be clearly marked with the student's name, date and assignment identification at the top of the first page.
- All homework is to be completed by each student individually and represent that student's original, unassisted work. Any material copied in any way from other sources must be clearly identified and attributed.
- The problem solutions printed on paper are submitted at the start of class on the due date.