FILE SYSTEMS & MASS STORAGE DEVICES

This assignment is due on December 1st at 11:00 PM. Post all your answers to the corresponding quiz in *eLearning*. Late assignments will not be accepted. See course syllabus for details on all course policies.

PROBLEM 1 – 4 POINTS

Consider a UNIX-like file system that manages a file's data block with an i-node. Assume that the i-node uses 10 directly indexed blocks and 4 single indirect and 2 doubly-indirect pointers to index all other data blocks in the file. Assume that each disk block is 512 bytes long and that a block address is 4 bytes long. What is the maximum file size of your file that the file system can create?

PROBLEM 2 – 4 POINTS

Assume a shortest seek time first (SSTF) scheduling method for accessing disk blocks on a hard drive. Assume that the head of your drive is located on track 55. The disk controller generates a request for the following tracks containing data blocks to read an entire file: 16, 28, 35, 105, 88. In what order are the tracks accessed? List, the track numbers in the order by which the disk accesses them. What is the average number of tracks that the disk controller has to traverse in order to visit all tracks and read the file content?

PROBLEM 3 – 2 POINTS

Assume a disk that has the capacity of storing 1 TB of data. If the file system uses a bit vector for free space management, what is the size of your bit vector if a disk block is 512 bytes long? Report results in MB.