Test Problems

2.1 Suppose we have files F1 to F4 in sizes of 7178, 572, 499 and 1195 bytes. Our disks have fixed physical block size of 512 bytes for allocation. How many physical blocks would be needed to store these four files if we were to use a chained allocation strategy assuming that we need 5 bytes of information to determine the next block in the link? Which file results in the maximum internal fragmentation (measured as a percentage of the file size itself)?

2.2 We have a disc that has 8 tracks per platter with 10 writeable surfaces. The sectors store 512 byte blocks. There is a read/write head for every platter which can be switched in 1 ms. Track traversal is at the rate of 10 ms per track. Now reflect on the following.

a. Draw a small figure to show how a 7.5 KB file could be stored ideally.

b. What is the time of retrieval for the file in a. assuming that the head needs to be switched and the track needs to be traversed half-way?

c. What is the worst case response time for this disk?

2.3 Suppose UNIX disk block will hold 2048 disk addresses. What is the maximum-sized file using only the direct pointers? Single-indirection capability? Double-indirection capability? Triple-indirection capability?