

長庚大學113學年度第二學期 作業系統實務 第一次小考

系級:

姓名:

學號:

1. (a) (20%) How many i-nodes will be used if we create a file and create 2 soft links and 3 hard links to the file? (b) (40%) We first create a file AAA, and then create a hard link HL to AAA, and another soft link SL to HL. Now, we remove HL (rm -rf HL in Linux). Can we access the file by AAA? Can we use the soft link SL to access the file? The reasons have to be provided to support your answers.

Answer: (a) 3 i-nodes. Creating the file uses an i-node, and the 2 soft links uses another 2 i-nodes. Hard links use the original i-node of the file.

(b) AAA: Yes, it just refers to the same i-node to use the original file.

SL: No, it refers to the path of HL, and HL is removed.

2. For free space management of file systems, please explain (a) (20%) the Bit Map approach and (b) (20%) the Linked List approach with the Counting method.

Answer: (a) There is an array in which each bit indicates the state (free or occupied) of a block.

(b) The first block of a sequence of free blocks will keep the number of the free blocks in the sequence and the pointer to the first block of the next sequence of free blocks.