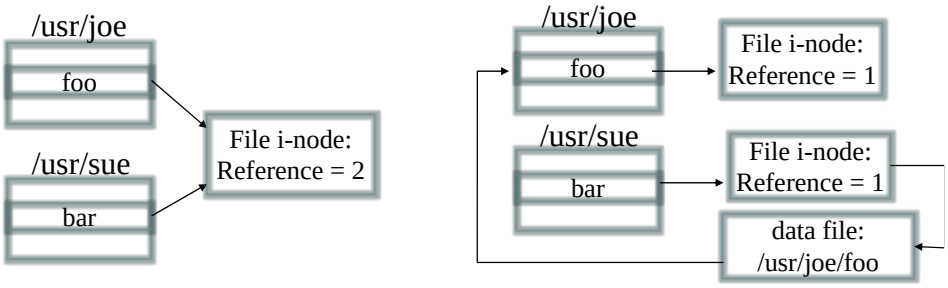
長庚大學110學年度第二學期 作業系統實務 第一次小考

系級: 姓名: 學號:

1. (a) (15%) How many i-nodes will be used if we create a file and create 2 hard links to the file? (b) (15%) How many i-nodes will be used if we create a file and create 4 soft links to the file? (c) (45%) We first create a file ABC, and then create a hard link HL to ABC, a soft link SL to ABC, and another soft link SL2 to HL. Now, we remove ABC (rm -rf ABC in Linux). Can we use the hard link HL? Can we use the soft link SL? Can we use the soft link SL2? The reasons have to be provided to support your answers.

   Hints: the pictures of a hard link and a soft link



Answer: (a) 1 i-node. Creating the file uses an i-node, and the 2 hard links share the i-node.
(b) 5 i-nodes. Creating the file uses an i-node, and the 4 symbolic links use another 4 i-nodes.
(c) HL: Yes, it just refers to the some i-node to use the original file.
SL: No, it refers to the path of ABC, and ABC is removed.
SL2: Yes, it refers to the path of HL, and HL still exists.

2. (30%) For file allocation methods, let's make some comparison between contiguous allocation and linked allocation. What is the disadvantage of contiguous allocation? What is the disadvantage of linked allocation?

Answer: There could be some external fragmentations if continue allocation is used.
For ransom access, the performance of linked allocation is bad.