

# COM S 352 Homework 9

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April 12, 2021

## Question 1

With links to the deleted file still existing there could be a dangling pointer. a solution to this would be to add a counter to the file which represents the number of references to a shared file, then when you add a new link increment, if you delete a link you decrement the counter, then the file can only be deleted when it has a count of 0.

## Question 2

The operating system should maintain just one table that contains references to the files that are currently being accessed by all users. If two users are creating entries, then the operating system will need separate entries for each user.

## Question 3

- **Contiguous:** This technique can result in internal and external fragmentation. A dynamic file size is also hard for this technique because it needs to find an open block of length N and is not expecting a file to gain size.
- **Linked:** Since this technique works like a linked list there is no external fragmentation. This technique is only really usable for sequential file access.
- **Indexed:** This technique has no issue with external fragmentation because it just points to certain clumps of memory from a central block of pointers. Only issue with this technique is that it does have to hold a lot of pointers which could take up a lot of space.

### Question 4

- **Contiguous:** 1 region
- **Linked without a FAT:** 4 blocks
- **Linked with a FAT:** 4 blocks
- **Indexed:** 4 blocks

### Question 5

- **a.** Since memory will be utilized effectively then we don't have to worry about a small amount of data taking up an entire region.
- **b.** We would just need to make sure that when memory is deallocated that the spaces are not left.

### Question 6

16kb = 16384 bytes

$\frac{16384}{8} = 2048$

16 blocks

$16 * 16 = 256$  direct

$256 + 2048 * 16 = 33024$  single

$33024 + 2048 * 2048 * 16 = 67141888$  double

$67141888 + 2048 * 2048 * 2048 * 16 = 137506095360$  triple

maximum size = 137 Gb