

CSCI-GA.2250-001
Operating Systems
Homework Assignment#4

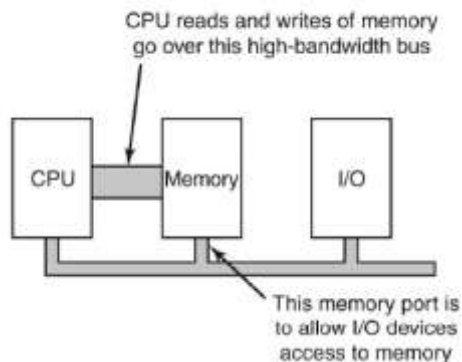
1. In slide 15, lecture 8, we have seen contiguous allocation of files. We saw that this implementation leads to fragmentation.

- a) Why does it lead to fragmentation?
- b) What type of fragmentation is this (internal or external)?
- c) Justify your answer in b above.

2. In slide 21, of lecture 8, we discussed the implementation of files using i-node. If we assume that a disk block is 1KB (an i-node requires one disk block), and an address of a disk block requires 4 bytes, and the i-node in the figure has 8 direct addresses and 1 extra pointer to another block of addresses.

- a) Given all that, what is the largest file size we can have?
- b) Does this mean that a file larger than the size you calculated in a will not be possible in that file system?
- c) Justify your answer in b.

3. We have discussed the following configuration in class (lecture 9).



Let's assume that the above configuration is used to implement memory-mapped I/O. The CPU tries with memory bus and if that fails it tries with I/O bus. Suppose that we decided to speed-up things a bit and make the CPU send the addresses on both buses at the same time. Is this a good or bad idea? Why?