

CSE 410 - Computer Systems

Homework 4

Assigned: Monday, December 3, 2001

Due: Monday, December 10, 2001
At the start of class

Your name: _____

1. Imagine that two students are working together on a project. Part of their work involves updating a single spreadsheet file. The file is located on a remote server that is accessible to both of them. Only one person can open the file in read/write mode at a time.
 - a. Late Sunday night both students are working on the project and decide that they will update the spreadsheet with their latest work. Student A opens the spreadsheet with read/write access. Student B then attempts to open the spreadsheet, also in read/write mode, but access is denied because the file is already open in read/write mode. Student B cannot continue working until A closes the spreadsheet.

Is this a deadlock situation?

- b. If yes, describe how each of the four necessary conditions for deadlock is true in this case. If no, describe one condition that is not true in this case.

4. Fragmentation in a memory system refers to the waste of memory space either because it cannot be allocated (external) or because it is allocated and won't be used (internal).
 - a. In a system using paged memory and a page size of 4096 bytes (4KB), what type of fragmentation will we see?
 - b. What is the maximum possible amount of wasted space due to fragmentation in a single page on this system?
5. Consider a different system using multiple-partition contiguous allocation to manage 128 MB of memory available to user processes.
 - a. What type of fragmentation will we see?
 - b. What is the maximum possible amount of wasted space due to fragmentation in a single partition on this system?
 - c. This system is running a 10MB user process and wants to load another 64MB process into user memory to run at the same time. Draw a diagram of a memory allocation in which it is not possible to load the second program due to fragmentation.

