# Homework 6

*Due: 17 Apr 2009*

## Problem 6.1

(Based on a problem from the book.) Some operating systems provide a system call `rename` to give a file a new name. Describe some differences between using this call to rename a file and just copying the file contents into a new file with the desired name, followed by deleting the old file. (There are at least two major ones.) Are there tradeoffs, or is one technique always better than the other? Does the answer change if the underlying filesystem is contiguous, linked list, FAT, or inode-based? Why or why not?

## Problem 6.2

A system with 512-byte blocks is implemented with a free space bitmap. The beginning of a free space bitmap looks like this after the disk partition is first formatted: 1000 0000 0000 0000 0000 (the first block is used by the root directory). The system always searches for free blocks starting at the lowest-numbered block, so after writing file $A$, which is 2,871 bytes, the bitmap looks like this: 1111 1110 0000 0000 0000. Show the bitmap after each of the following additional actions:

a. File $B$ is created and written, with 2,217 bytes.

b. File $A$ is extended to 3,123 bytes.

c. File $B$ is extended to 2,489 bytes.

d. File $A$ is deleted.

e. File $C$ is created and written, with 4,003 bytes.

f. File $B$ is deleted.

Also indicate which blocks are allocated to each file at each point. Document any assumptions you had to make about the system in solving this problem.