

Outline for April 9, 2007

Question: Two MIT graduate students bought a number of used hard drives on E-Bay and analyzed them. They were able to recover lots of files, including files containing very personal information (such as medical records), and in some cases even restore the operating system of the computer to which the hard drive belonged. Some of these disks had simply been discarded, but others had files deleted, or were reformatted—and still the students could recover the files! As you will see, there is a simple way to prevent this. Why do you think the original owners of the disks did not use it? What might be done to encourage people and corporations who have sensitive data such as medical records to erase their disks securely before selling them?

1. Greetings and felicitations!
 - a. Prospectus due in class today, before you leave
 - b. Lab exercise 2 available on class web sites
2. How a computer knows what to do
 - a. Instructions
 - b. Move instructions
 - c. Arithmetic instructions (add, subtract)
 - d. Branching instructions
 - e. Other instructions
3. How the computer does it
 - a. Fetch instruction from location given by program counter
 - b. Increment program counter
 - c. Decode instruction into operation code (opcode), addresses, other information
 - d. Execute instruction, using addresses and other information as needed
 - e. Fetch next instruction and repeat
4. How a disk stores data
 - a. Boot block
 - b. Disk space: cylinders, tracks, sectors or blocks; sectors grouped into clusters; free list
 - c. Superblock or disk map
 - d. Inode table, FAT, or VFAT; file, directory attributes