

**ECE329 HW #5**

Augment your UNIX shell with the following commands:

- *mv file1 file2*  
renames a file.
- *cp file1 file2*  
duplicates a file. If the first character of *file1* or *file2* is #, then the filename describes an actual file on the hard disk using either a relative or absolute path. Example: *cp #a.txt b.txt* copies an actual file named *a.txt* on the Windows hard disk to a file in the simulated file system named *b.txt*.
- *cat file*  
prints the contents of a file in the simulated file system.
- *duplot*  
plots the disk usage of the simulated file system. Prints a string of characters, one per sector, indicating which files are using which sectors. Display the usage of the entire simulated disk, with B indicating the boot block, S indicating the superblock, and I indicating the i-nodes. Files should be indicated by their zero-based index, using the file ordering displayed by the *ls* command. If a sector is used by more than one file, then display just the number associated with one of the files arbitrarily. If a sector is unused, then display a dash (-). Example:  
BSI2222----0000-1111-----

For simplicity, the data for each file can be stored contiguously. All the functionality from the previous assignments should still work, e.g., *touch*, *rm*, etc. Only *cp* needs to handle the special # preceding character.

For this assignment, you should continue to use the *SimulatedHardDisk* files provided by the instructor.

Separately, answer the following problems in Chapter 3 of the textbook (Tanenbaum, *Modern Operating Systems*, 3<sup>rd</sup> ed.): 4, 5, 6, 8, 18, 19 (erratum: memory size should be 256 MB), 22, 23, 24, 26, 28.