Programming Homework Assignment #4

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Programming Homework #4

- Programming problems:
  - Chap.11: 11.13*
  - Chap.12: 12.16*
- Note: Each student must complete all programming problems on your own
- Due: two weeks (Jun. 12, 2023)

Programming Problems for Chap.11

- 11.13*: This exercise examines the relationship between files and inodes on a UNIX or Linux system. You can complete this exercise on the Linux virtual machine that is provided with this text.
- (1) In the source code available with this text, open file1.txt and examine its contents. Next, obtain the inode number of this file with the command:
  ls –li file1.txt
  Create a hard link between file1.txt and file2.txt:
  ln file1.txt file2.txt
  What are the inode values of file1.txt and file2.txt? Are they the same or different? Do the two files have the same or different contents?

- (2) Next, edit file2.txt and change its contents. Examine the contents of file1.txt. Are the contents of file1.txt and file2.txt the same or different? Next, remove file1.txt. Does file2.txt still exist as well? Check what system call is used for removing file2.txt by the following command: *strace rm file2.txt*.
- (3) Create a soft link to file3.txt by the following command: *ln –s file3.txt file4.txt*
  Are the inode numbers of file3.txt and file4.txt the same, or is each unique?
  Next, edit the contents of file4.txt. Have the contents of file3.txt been altered as well? Last, delete file3.txt. Explain what happens when you attempt to edit file4.txt.

Programming Problem for Chap.12

- 12.16*: Write a program that implements the following disk-scheduling algorithms:
  (a) FCFS
  (b) SSTF
  (c) SCAN
  (d) C-SCAN
  Your program will be passed the initial position of the disk head (as a parameter on the command line) and report the total amount of head movement required by each algorithm.

Any Questions or Comments?