Questions for assignment 1?

Feedback / Office Hours

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  - Office Hours: Monday 4pm-6pm (or by appointment)
  - Feedback: https://forms.gle/6kcJ2aJtzAzFMhHQ7 (anonymous google form)

I/O Redirection

- stdin, stdout are input/output to terminal
  - What if we want to change?
- Echo writes to stdout
  - Let's use it to write to a file instead
  - Echo "text" >> file
- >> : redirect output to new file (and append)
- > : redirect output to new file (and overwrite)
- < : use file as input
  - Tr "a" "b" < file
- | : take output of one command and pass as input to another
  - Ls | grep cs
- 2>, 2>> : redirect stderr instead of stdout
- Demo

Wildcards + String Matching

- Similar to Regex
  - Regex can only be applied to a few commands like grep
  - Wildcards apply everywhere
- ?: single letter/number/character
- *: many letters/numbers/characters
- []: match any inside
  - [wr]est : matches west and rest
- https://tldp.org/LDP/GNU-Linux-Tools-Summary/html/x11655.htm
  - Summary of wildcards (and regex)
- Warning! Grep uses regex, not wildcards
  - grep .txt will match atxt (regex . is like wildcard ?)
- Demo

More on the file system in Linux

- Each file has metadata
  - Permissions, location on disk, size, modify date, etc
- Metadata stored on inodes. Data stored separately
  - Each file has a unique inode number
- Directories store names + inode numbers
- If you want to move a file from directory A to directory B,
  - Cut entry from A and paste in B
  - This is why the mv (move) command is also used for renaming files

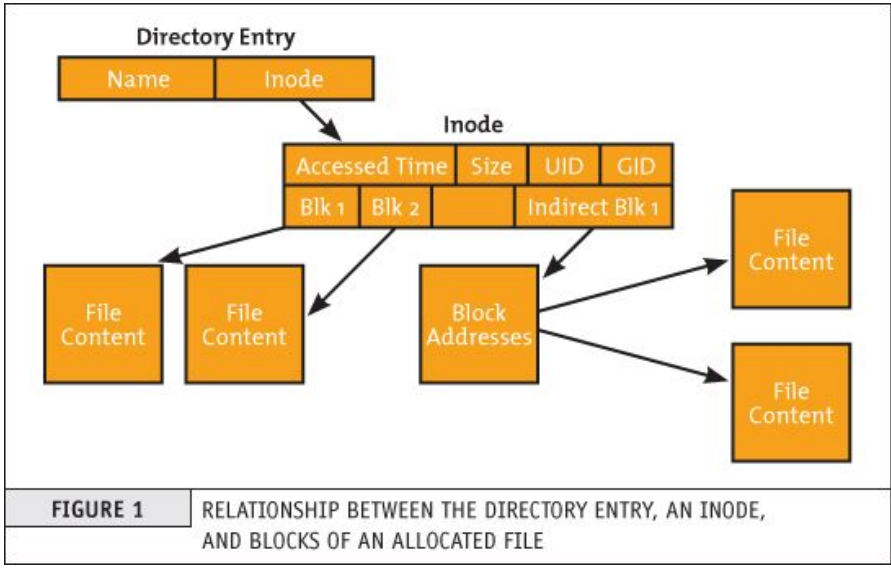

FIGURE 1 RELATIONSHIP BETWEEN THE DIRECTORY ENTRY, AN INODE, AND BLOCKS OF AN ALLOCATED FILE

Inodes

- Inodes have a link count
  - Number of hard links
  - Link count = 0 -> data deleted
- Hard links
  - One file, many names. Each name links to same inode
  - Ln sourcefile alias
  - Must be on same file system
- Symbolic Links
  - Point to file/path
  - Path may not exist!
  - Ln -s sourcefile symlink
  - Can link to any path/directory
- Ls -i -a -l
  - -l : first character (l, -, d) represents (link, regular file, directory)

Inodes - a little more

- Ls -i
- Stat <file>
- Symbolic links have different inodes!
  - What are the implications?
- Demo:
  - Echo “hey” > new_file.txt
  - Ln new_file.txt hardlink_file
  - Ln -s new_filt.txt softlink_file
  - Cat new_file.txt; cat hardlink_file; cat softlink_file
  - Rm new_file.txt
  - Cat hardlink_file
  - Rm hardlink_file
  - Cat softlink_file

Permissions

- User, group, other
- Read, write, execute (rwx)
- Add/change permissions?
  - Chmod [ugo][+-][wrx] file
  - E.g. chmod ug+w file
    - Give user and group write permission
  - What does “Chmod 731 file” do?
    - Encode rwx in binary, r = 100, w = 010, x = 001
    - 7 = 111 = rwx, 3 =011 = wx, 1 = 001 = x
- Ls -l shows permissions

Working on the server

- Scp [source] [dest]
  - Secure copy, can copy from your local computer to lnxsrv and vice versa
  - scp username@lnxsrv#.seas.ucla.edu:/file/path /local/path
- Other:
  - FileZlla
  - Remote Desktop
  - git (We will talk about this later in the quarter but it’s easy to learn)

Other useful stuff

- Grep
- Sed
  - This command can do a lot, but it might be difficult to learn
- Diff
- Cat/ls <file> >> <other_file>
- Head
- Tail
- Man
- Question: what will the following commands do? (use man or just experiment)
  - Cat a.txt | grep h | head -n 1
  - tr -s “a” < a.txt

Other

- Check the assignment 1 tips
  - Due monday!
- Quiz
- For lab:
  - Say which commands you used (e.g. cd, ls, etc)
- For hw:
  - Log which emacs shortcuts/commands you used (e.g. C-x C-c)
- Try to start early
  - Exercise 1.6 may be tricky
- **Read the submission instructions**
- **Piazza**
  - Can ask TA responsible for grading assignment directly