CS 35L

LAB 8

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Outline

- Course Info
- OS
- File system
- Basic commands
- Lab Assignment

Course Info

What is this course about?

"Fundamentals of commonly used software tools and environments, particularly open-source tools to be used in upper division computer science courses."

NO TEXTBOOK :)

Course Organization

- Lab assignments and homeworks
- Monday session - Lab assignment
- Wednesday session - Homework
- 10 lab assignments and 10 homeworks

Homeworks

- Submit on CCLE
- Assignments are due by 23:55 on the specified date (i.e., five minutes before midnight at the end of the day).
- Assignments 2–9 and their schedule are tentative.
- Assignments are subject to change. Any changes will be informed to you

Assignment 10

- Read one of the stories referenced in recent issues of ACM TechNews
- Write a brief review of the story and submit on CCLE
- A suggested length is 400 to 1200 words per topic. Include tables, graphs, and images as appropriate.
- Mail me your topic and a tentative presentation date.
- Sign up will start in week 2
- 3 - 4 presentations in every lab session

Policy

- You are expected to do your homeworks by yourself.
- You can share ideas and discuss general principles with others in the class, but all the code and writings that you submit must be your own work; do not share them with others.
- Some assignments will be done on SEASnet GNU/Linux servers. In these cases, take care to not run commands like su and sudo that would make it appear to the system administrators that you might be trying to break into the system.
- Avoid arbitrary limits on the length or number of any data structure, including symbols, strings, and line length. It is OK to impose a non-arbitrary limit, e.g., because your computer runs out of memory or because of the limited range of the C ptrdiff_t type, but it is not OK to impose an arbitrary limit, e.g., a limit of at most 255 characters in a symbol.
- Please stick to coding styles used in the course material rather than inventing your own style. (Coding styles will be emailed)

Grading

Grades are weighted as follows:

- 50% homeworks (equally weighted)
- 50% final exam

PENALTY: “The lateness penalty for an assignment that is submitted between N and N+1 full days late (where N is nonnegative) is 2^N% of the assignment's value. For example, if an assignment is worth 100 points, the penalty is 1 point for being up to 1 day late, 2 points for being from 1 to 2 days late, 4 points for being from 2 to 3 days late, and so forth. Assignments are not accepted after the last day of instruction (this is typically the Friday before final exams), and are not accepted after the lateness penalty renders them irrelevant to the final grade.”

Finals

Finals: **Monday, June 12, 2017, 3:00 PM - 6:00 PM**

NO MAKEUP EXAMS

Students must follow the UCLA Student Conduct Code, which prohibits cheating, fabrication, multiple submissions, and facilitating academic dishonesty. A summary of the academic integrity material of the Student Conduct Code can be found in the Student Guide to Academic Integrity, and the Office of the Dean of Students has a workshop on academic integrity.

Theory

OS History

- Till 1960’s no operating system(OS)
- Every program needed
  - the full hardware specification to run correctly and perform standard tasks,
  - own drivers for peripheral devices
- Punched cards with programs and data. Later libraries with support code on punched cards
- Monitor programs or Run time libraries - started before the job, read in the customer job, control its execution, record its usage, reassign hardware resources after the job ended, and immediately go on to process the next job.
- OS - heavily dependent on machine hardware until System/360 which had same instruction and I/O architecture

Multiuser and MultiProcess OS

Multiple users are allowed access to the resources

Batch processing vs Time sharing system

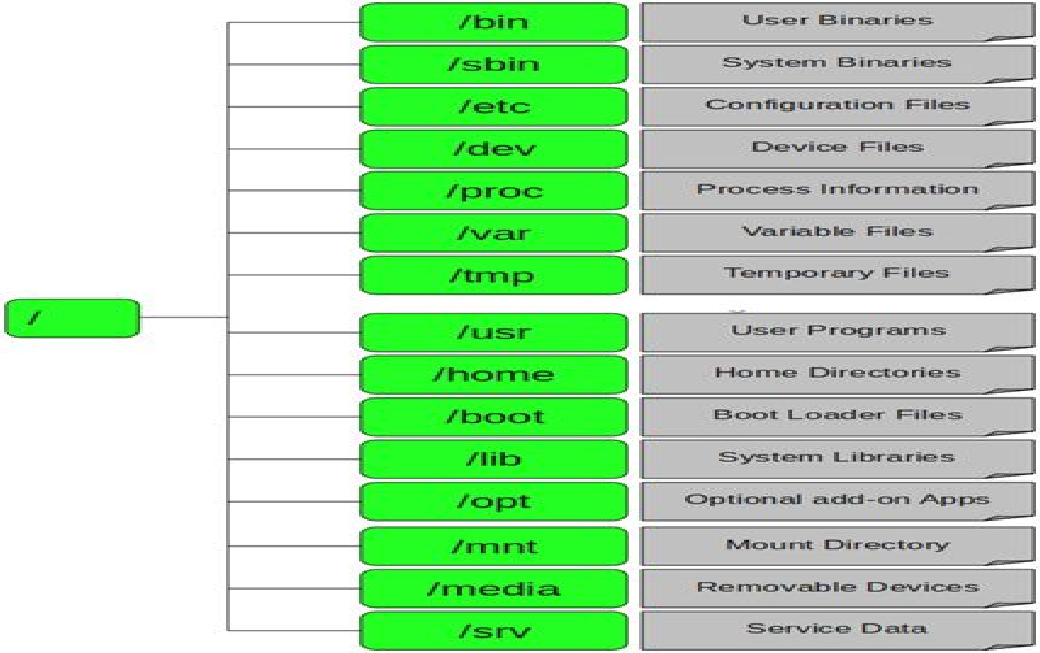
CLI vs GUI

CLI	**GUI**
Steep learning curve	Intuitive
Pure control (e.g., scripting)	Limited Control
Cumbersome multitasking	Easy multitasking
Speed: Hack away at keys	Limited by pointing
Convenient remote access	Bulky remote access

Files

- In Unix, everything is either a File or a Process
- Process - program that is being executed
- File - Collection of data
  - *Directories*: files that are lists of other files.
  - *Special files*: the mechanism used for input and output. Most special files are in /dev, we will discuss them later.
  - *Links*: a system to make a file or directory visible in multiple parts of the system's file tree.
  - *Sockets*: a special file type, similar to TCP/IP sockets, providing inter-process networking protected by the file system's access control.
  - *Named pipes*: act more or less like sockets and form a way for processes to communicate with each other, without using network socket semantics.

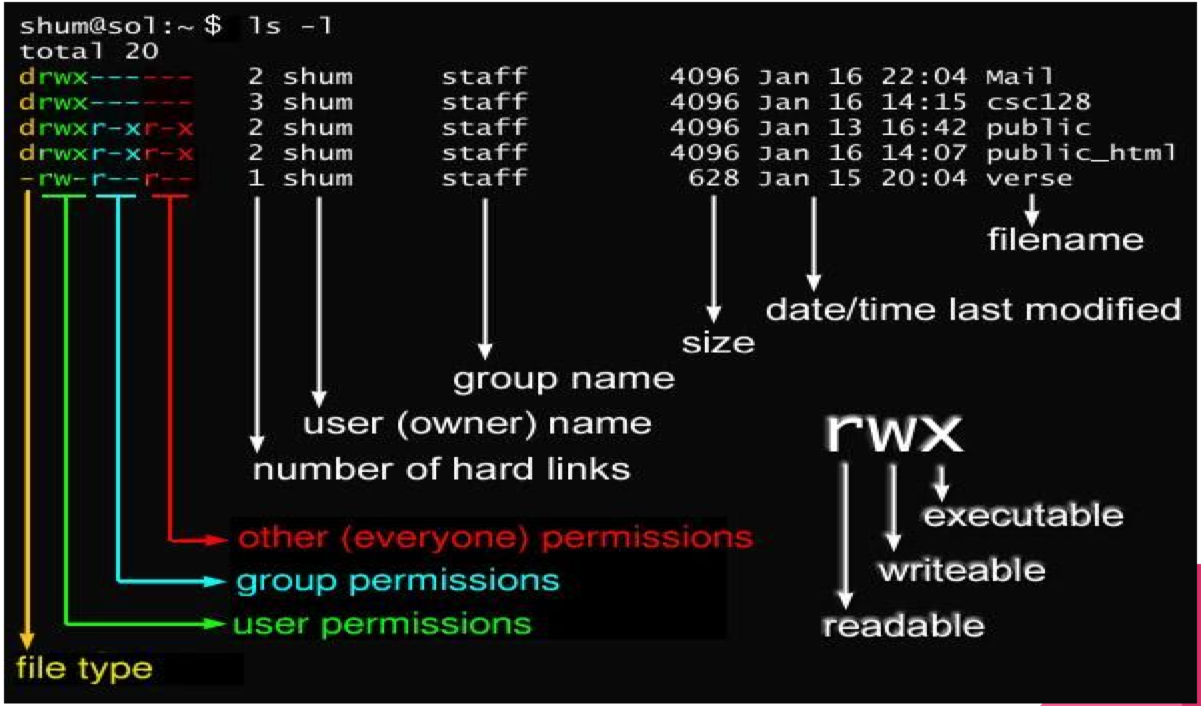
Linux File System



/

/bin	User Binaries
/sbin	System Binaries
/etc	Configuration Files
/dev	Device Files
/proc	Process Information
/var	Variable Files
/tmp	Temporary Files
/usr	User Programs
/home	Home Directories
/boot	Boot Loader Files
/lib	System Libraries
/opt	Optional add-on Apps
/mnt	Mount Directory
/media	Removable Devices
/srv	Service Data

Unix File Permissions



```
shum@sol:~ $  ls -l
total 20
drwx------    2 shum      staff         4096 Jan 16 22:04 Mail
drwx------    3 shum      staff         4096 Jan 16 14:15 csc128
drwxr-xr-x    2 shum      staff         4096 Jan 13 16:42 public
drwxr-xr-x    2 shum      staff         4096 Jan 16 14:07 public_html
-rw-r--r--    1 shum      staff          628 Jan 15 20:04 verse
```

Basics

Getting started

1) SEAS Server – best option, highly recommend

  - Lnxsrv.seas.ucla.edu (use lnxsrv06, lnxsrv07or lnxsrv09)
  - Make sure your PATH environment variable has /usr/local/cs/bin
  - export PATH=$PATH:/usr/local/cs/bin

2) On your computer

- Install or try Ubuntu
- Run with Windows (https://wiki.ubuntu.com/WubiGuide)
- Easy to remove Ubuntu from Windows via Control Panel, if you don't need Ubuntu.

Getting started

3) Virtual Machine

- VMWare
- Virtual Box

4) Live CDs on BH3760 Computers

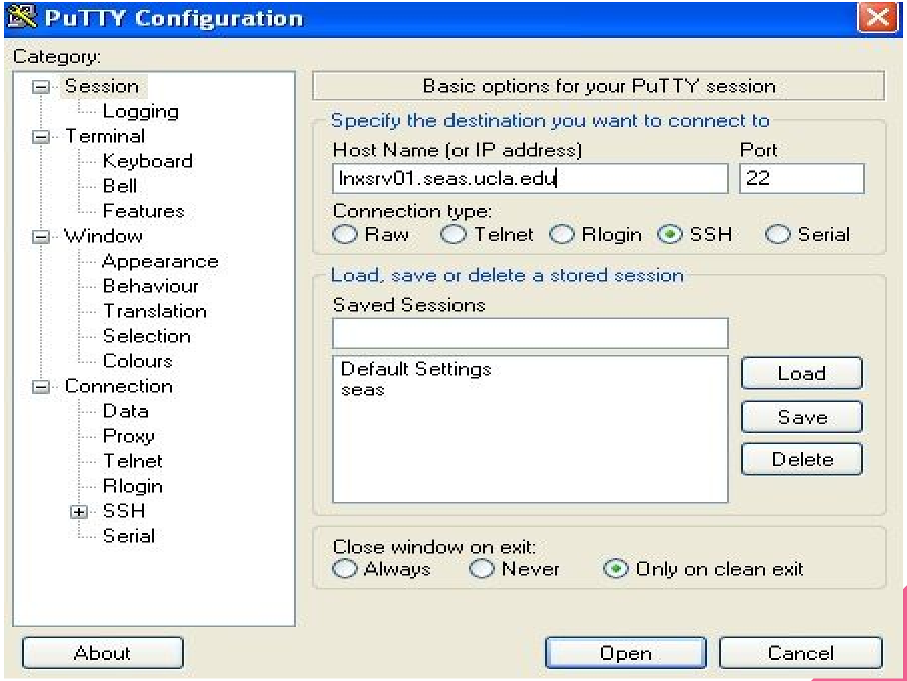
- Don’t install Ubuntu, try Ubuntu

Connecting to SEAS from Windows

- Use Putty

- Host name: lnxsrv.seas.ucla.edu
- User name and Password : your SEAS username and password

Connecting to SEAS from Windows



PuTTY Configuration

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address): lnxsrv01.seas.ucla.edu

Port: 22

Connection type:
○ Raw ○ Telnet ○ Rlogin ● SSH ○ Serial

Load, save or delete a stored session

Saved Sessions

Default Settings
seas

Close window on exit:
○ Always ○ Never ● Only on clean exit

Connecting to SEAS from OS X or Linux

```
ssh username@lnxsrv.seas.ucla.edu
```

Username = your SEAS username

Moving Around

pwd - print working directory

cd - change working directory

- ~ - home directory
- . - current directory
- / - root directory, or directory separator
- .. - parent directory

Commands

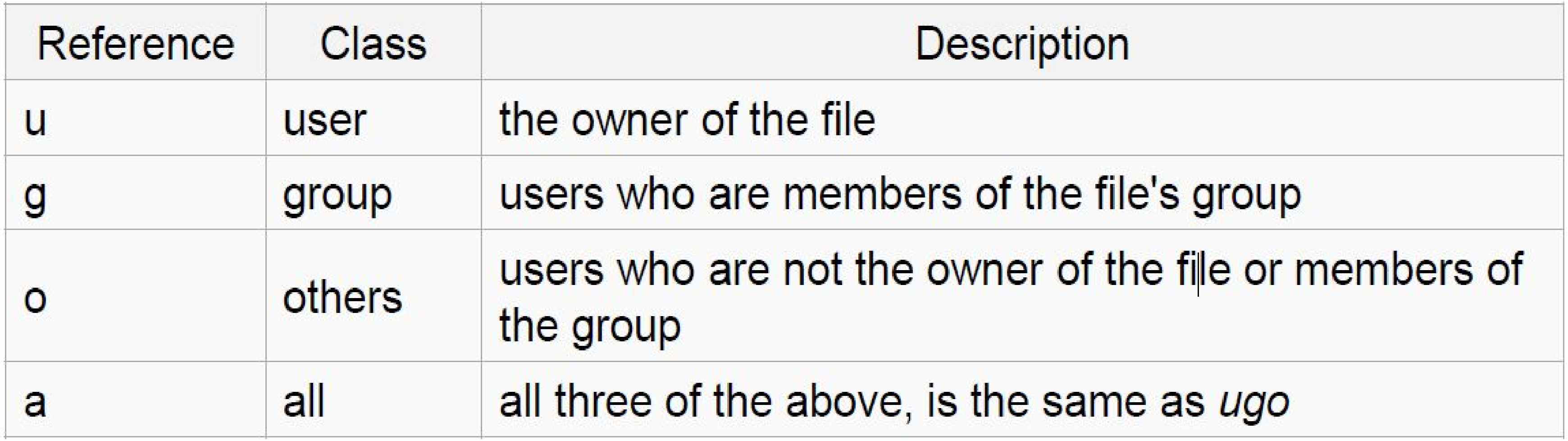
- mv: move a file (no undos!)
- cp: copy a file
- rm: remove a file
- mkdir: make a directory
- rmdir: remove a directory
- ls: list contents of a directory
    - -d: list only directories
    - -a: list all files including hidden ones
    - -l: show long listing including permission info
    - -s: show size of each file, in blocks

Changing file attributes

Chmod - change access permissions

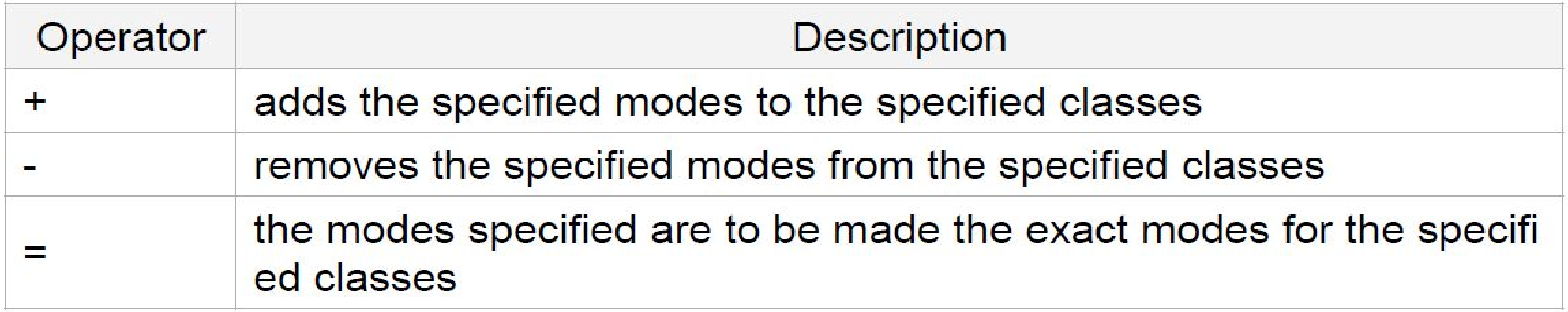
- read (r), write (w), executable (x), special execute (X), setuid/gid (s), sticky (t)
- User, group, others

Changing file attributes

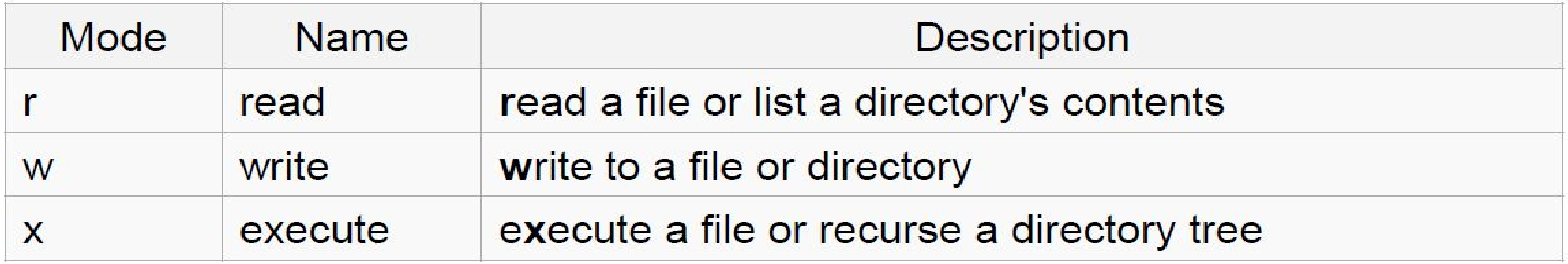


Reference	Class	Description
u	user	the owner of the file
g	group	users who are members of the file's group
o	others	users who are not the owner of the file or members of the group
a	all	all three of the above, is the same as *ugo*

Changing file attributes

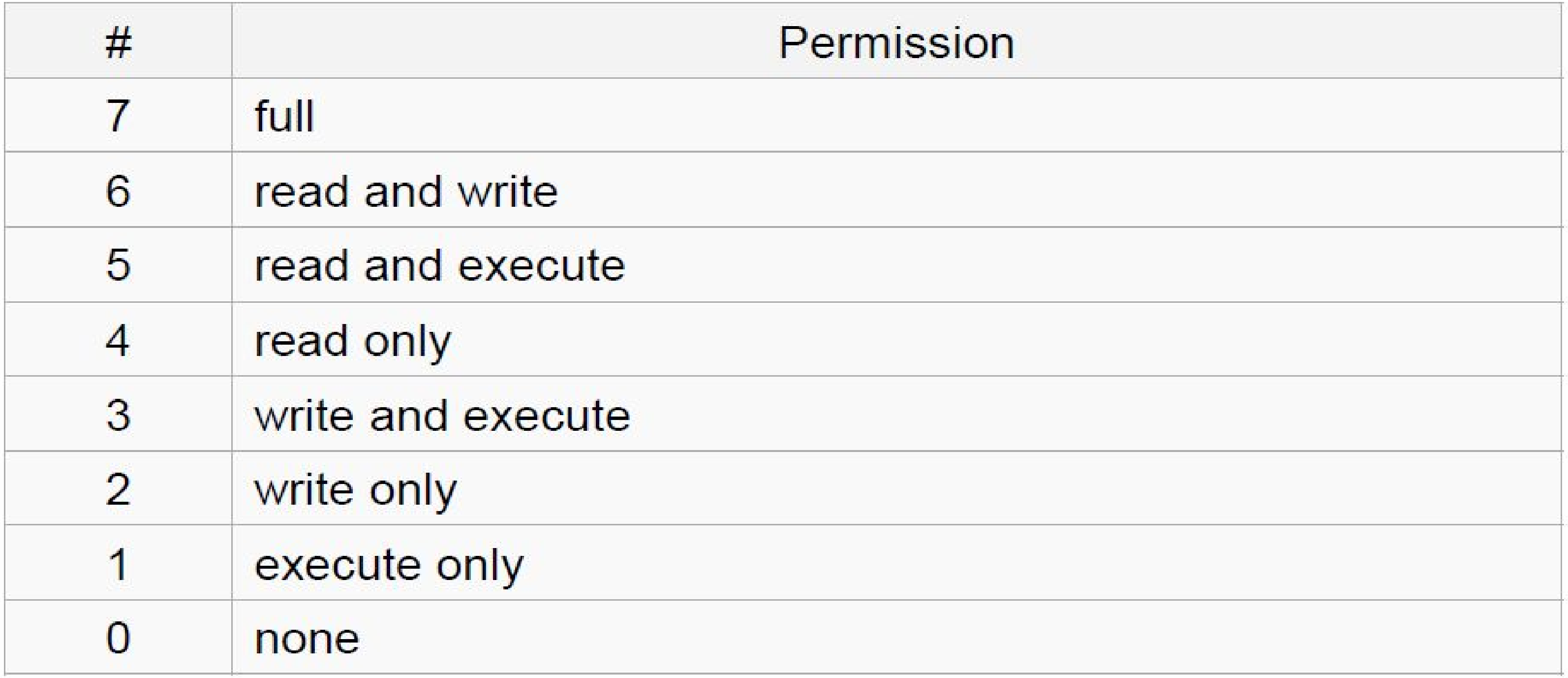


Operator	Description
+	adds the specified modes to the specified classes
-	removes the specified modes from the specified classes
=	the modes specified are to be made the exact modes for the specified classes



Mode	Name	Description
r	read	read a file or list a directory's contents
w	write	write to a file or directory
x	execute	execute a file or recurse a directory tree

Changing file attributes



#	Permission
7	full
6	read and write
5	read and execute
4	read only
3	write and execute
2	write only
1	execute only
0	none

Changing file attributes

Usage

– chmod ["references"]["operator"]["modes"] "file1" ...

Example:

- chmod ug+rw mydir
- chmod a-w myfile,
- chmod ug=rx mydir
- chmod 664 myfile

man

Man pages - user manual

Man command - Format and display man pages

For info about man: man man

Look these up

- cat
- Head, tail
- ls
- du
- ps
- kill
- diff
- cmp
- wc
- sort
- which

Lab Assignment

http://web.cs.ucla.edu/classes/spring17/cs35L/assign/assign1.html

Next class

- Links
- Emacs
- Homeworks