Lesson Module Checklist

- Slides
- WB

- Flash cards
- Page numbers
- 1st minute quiz
- Web Calendar summary
- Web book pages
- Commands

- Practice test 1
- Sun-Hwa updated
- Updated /etc/cis90-passwd

- 9V backup battery for microphone
- Backup slides, CCC info, handouts on flash drive

Introductions and Credits

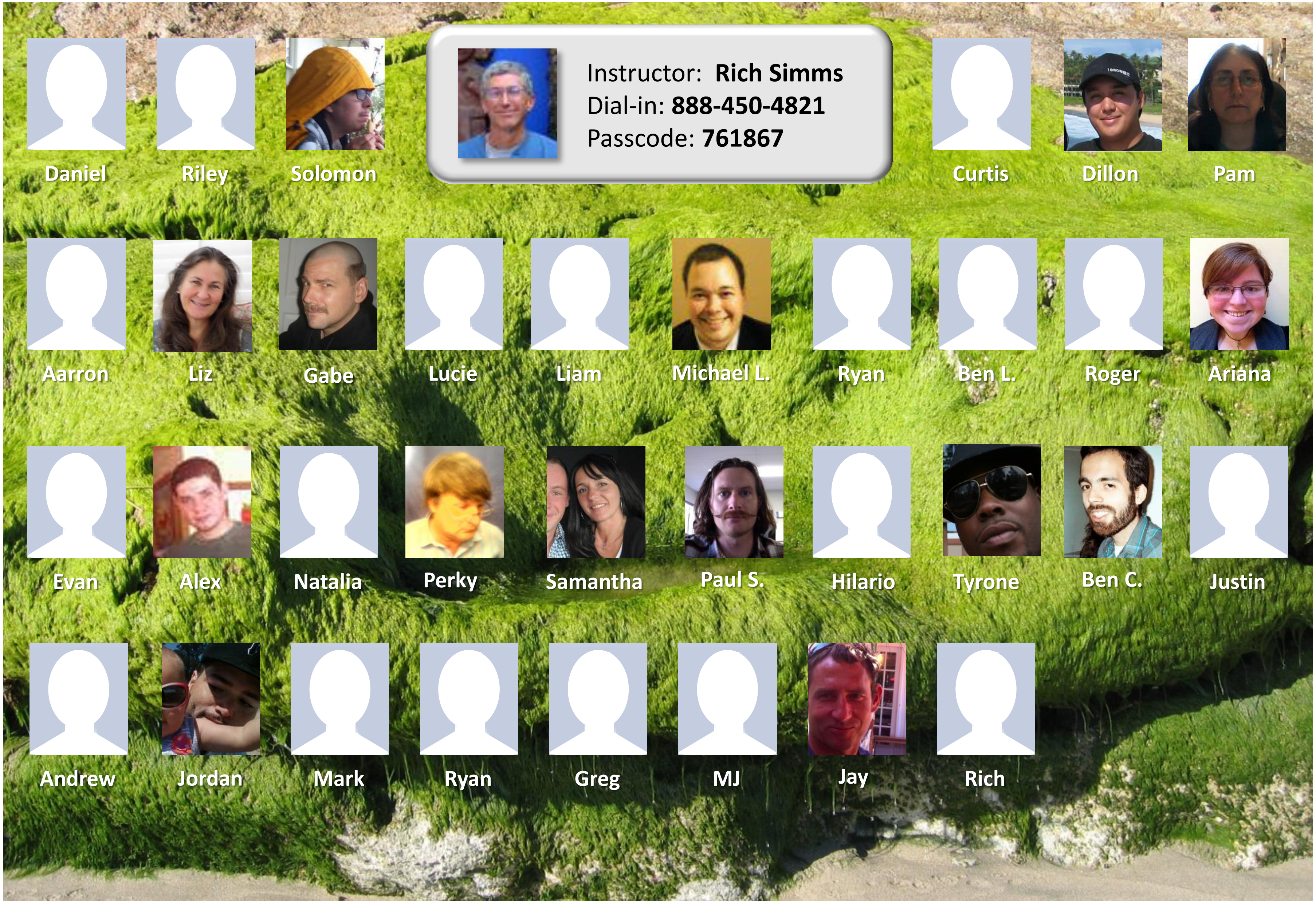
Jim Griffin
- Created this Linux course
- Created Opus and the CIS VLab
- Jim’s site: http://cabrillo.edu/~jgriffin/

Rich Simms
- HP Alumnus
- Started teaching this course in 2008 when Jim went on sabbatical
- Rich’s site: http://simms-teach.com

And thanks to:
- John Govsky for many teaching best practices: e.g. the First Minute quizzes, the online forum, and the point grading system (http://teacherjohn.com/)

Cabrillo College est. 1959

CIS 90 - Lesson 5



Instructor: **Rich Simms**
Dial-in: **888-450-4821**
Passcode: **761867**

Email me (risimms@cabrillo.edu) a relatively current photo of your face for 3 points extra credit

Quiz

Please answer these questions **in the order** shown:

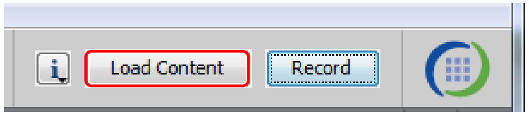
See electronic white board

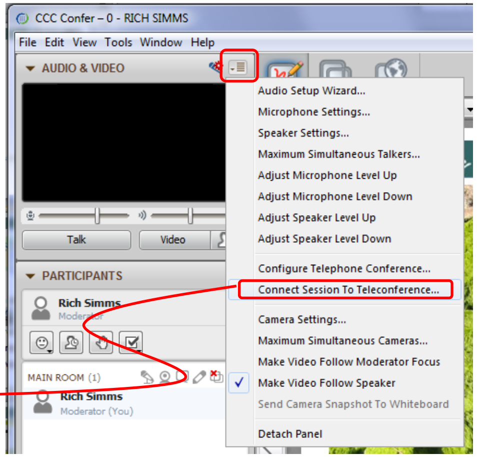
email answers to: `risimms@cabrillo.edu`

(answers must be emailed within the first few minutes of class for credit)

CCC Confer

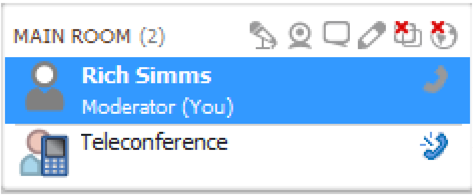
[ ] Preload White Board with *cis*lesson??*-WB*



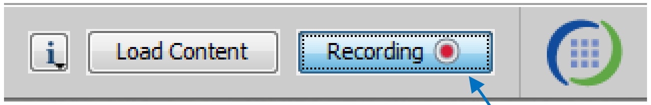

CCC Confer – 0 - RICH SIMMS
File Edit View Tools Window Help
AUDIO & VIDEO
Audio Setup Wizard...
Microphone Settings...
Speaker Settings...
Maximum Simultaneous Talkers...
Adjust Microphone Level Up
Adjust Microphone Level Down
Adjust Speaker Level Up
Adjust Speaker Level Down
Configure Telephone Conference...
Connect Session To Teleconference...
Camera Settings...
Maximum Simultaneous Cameras...
Make Video Follow Moderator Focus
Make Video Follow Speaker
Send Camera Snapshot To Whiteboard
Detach Panel
Talk
Video
PARTICIPANTS
Rich Simms
Moderator
MAIN ROOM (1)
Rich Simms
Moderator (You)

[ ] Connect session to Teleconference

Session now connected to teleconference

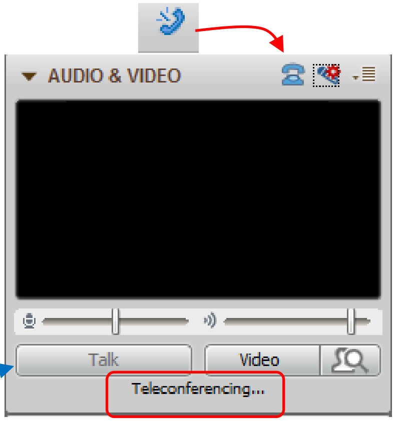


[ ] Is recording on?



Red dot means recording

[ ] Use teleconferencing, not mic

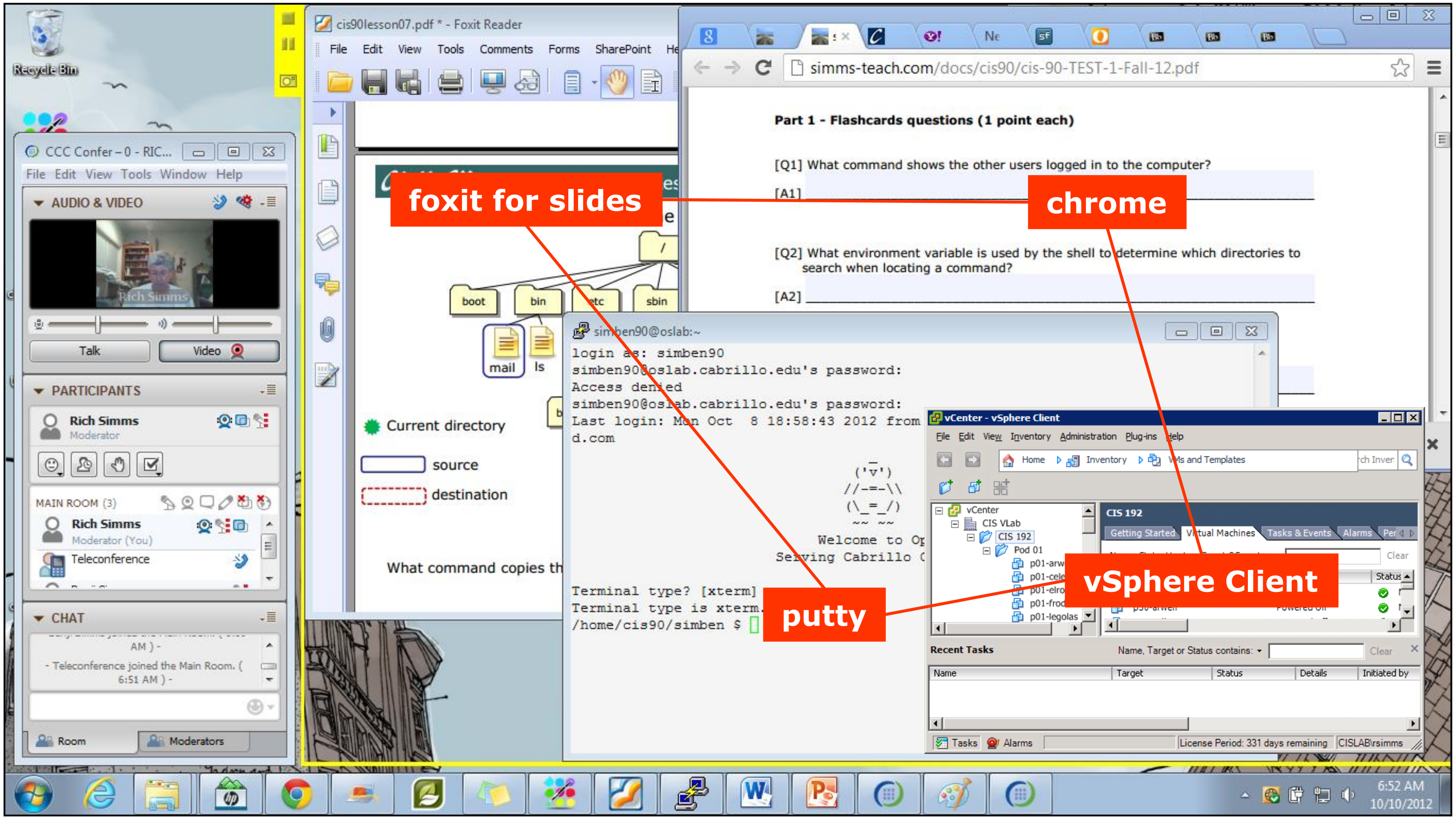


Should be greyed out

CCC Confer

[ ] **Video (webcam) optional**

[ ] **layout and share apps**



foxit for slides

chrome

putty

vSphere Client

simms-teach.com/docs/cis90/cis-90-TEST-1-Fall-12.pdf

Part 1 - Flashcards questions (1 point each)

[Q1] What command shows the other users logged in to the computer?

[A1] ______________________________

[Q2] What environment variable is used by the shell to determine which directories to search when locating a command?

[A2] ______________________________

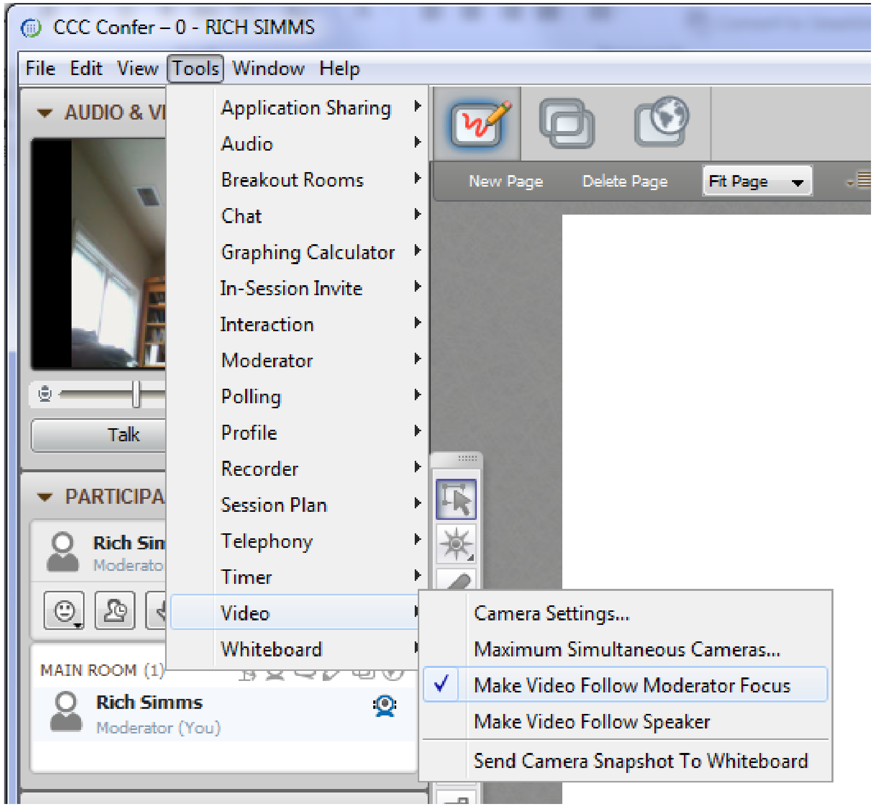
```
login as: simben90
simben90@oslab.cabrillo.edu's password:
Access denied
simben90@oslab.cabrillo.edu's password:
Last login: Mon Oct  8 18:58:43 2012 from
d.com

                                   ('v')
                                  //-=-\\
                                  (\_=_/)
                                   ~~ ~~
                               Welcome to Op
                           Serving Cabrillo C

Terminal type? [xterm]
Terminal type is xterm.
/home/cis90/simben $
```

CCC Confer

[ ] Video (webcam) optional

[ ] Follow moderator

[ ] Double-click on postages stamps

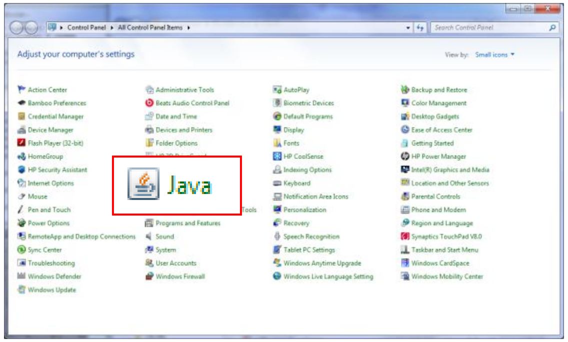


✓ Make Video Follow Moderator Focus

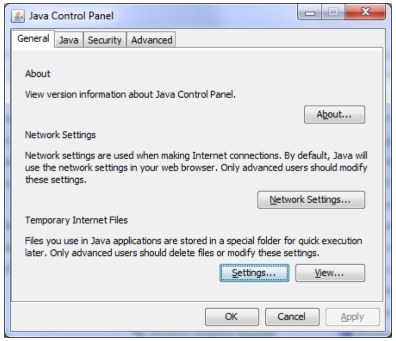
Universal Fix for CCC Confer:

1) Shrink (500 MB) and delete Java cache
2) Uninstall and reinstall latest Java runtime

Control Panel (small icons)



General Tab > Settings...



About

View version information about Java Control Panel.

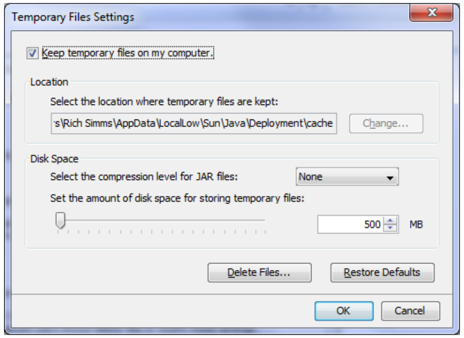
Network Settings

Network settings are used when making Internet connections. By default, Java will use the network settings in your web browser. Only advanced users should modify these settings.

Temporary Internet Files

Files you use in Java applications are stored in a special folder for quick execution later. Only advanced users should delete files or modify these settings.

500MB cache size



☑ Keep temporary files on my computer.

Location

Select the location where temporary files are kept:

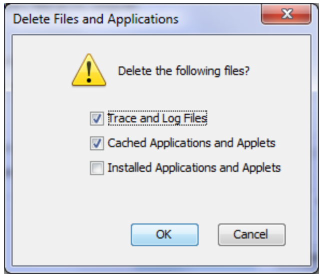
s\Rich Simms\AppData\LocalLow\Sun\Java\Deployment\cache

Disk Space

Select the compression level for JAR files: None

Set the amount of disk space for storing temporary files: 500 MB

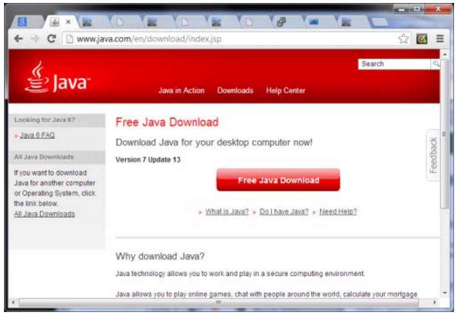
Delete these



Delete the following files?

☑ Trace and Log Files
☑ Cached Applications and Applets
□ Installed Applications and Applets

Google Java download



www.java.com/en/download/index.jsp

If you want to download Java for another computer or Operating System, click the link below.
All Java Downloads

Free Java Download

Download Java for your desktop computer now!

Version 7 Update 13

Why download Java?

Java technology allows you to work and play in a secure computing environment.

Java allows you to play online games, chat with people around the world, calculate your mortgage

Review

Objectives	Agenda
• Review Lessons 1-4 • Practice skills • Learn about filename expansion characters	• Quiz • Questions • Trouble on the island • Everything is a file • More filename expansion characters • Lots of review • Test tips • Wrap up

Questions

Questions

Lesson material?

Labs?

How this course works?

Are you enlightened yet?

```
/home/cis90/cruben $ _
```

Chinese Proverb	他問一個問題，五分鐘是個傻子，他不問一個問題仍然是一個傻瓜永遠。 *He who asks a question is a fool for five minutes; he who does not ask a question remains a fool forever.*

Trouble on the island today

Reminder to instructor:
On Sun-Hwa, run trouble-L5 as root

Can you cat a file?

Warm-up Activity

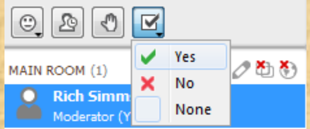
From Opus, login to Sun-Hwa as follows:

```
ssh cislab\\$LOGNAME@sun-hwa
```

Sun uses the VLab Active Directory for authentication. To tell the shell to ignore the required Windows \ it must be escaped. Use your original Opus password!

After logging in, try to cat out the contents of this file: /etc/mensaje

```
If successful:
  then
     copy the contents of /etc/mensaje to the chat window
     exit Sun-Hwa
     click green "yes" check on CCC Confer
     Help your neighbor
  else
     Start TROUBLESHOOTING!
```



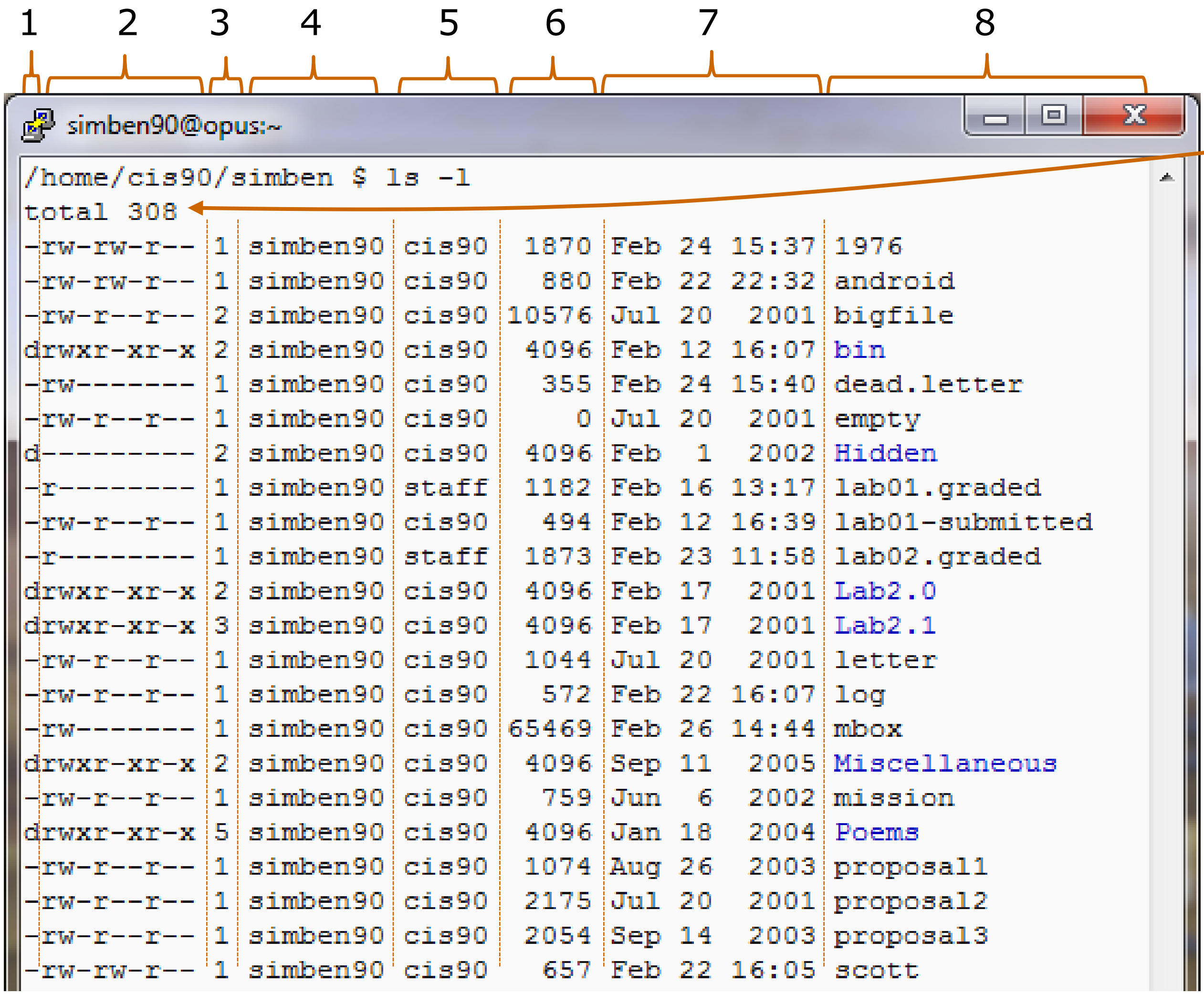
Hint: Lesson 2

More on the ls command

review

ls command

Use the -l option for a “long listing”



```
/home/cis90/simben $ ls -l
total 308
-rw-rw-r-- 1 simben90 cis90  1870 Feb 24 15:37 1976
-rw-rw-r-- 1 simben90 cis90   880 Feb 22 22:32 android
-rw-r--r-- 2 simben90 cis90 10576 Jul 20  2001 bigfile
drwxr-xr-x 2 simben90 cis90  4096 Feb 12 16:07 bin
-rw------- 1 simben90 cis90   355 Feb 24 15:40 dead.letter
-rw-r--r-- 1 simben90 cis90     0 Jul 20  2001 empty
d--------- 2 simben90 cis90  4096 Feb  1  2002 Hidden
-r-------- 1 simben90 staff  1182 Feb 16 13:17 lab01.graded
-rw-r--r-- 1 simben90 cis90   494 Feb 12 16:39 lab01-submitted
-r-------- 1 simben90 staff  1873 Feb 23 11:58 lab02.graded
drwxr-xr-x 2 simben90 cis90  4096 Feb 17  2001 Lab2.0
drwxr-xr-x 3 simben90 cis90  4096 Feb 17  2001 Lab2.1
-rw-r--r-- 1 simben90 cis90  1044 Jul 20  2001 letter
-rw-r--r-- 1 simben90 cis90   572 Feb 22 16:07 log
-rw------- 1 simben90 cis90 65469 Feb 26 14:44 mbox
drwxr-xr-x 2 simben90 cis90  4096 Sep 11  2005 Miscellaneous
-rw-r--r-- 1 simben90 cis90   759 Jun  6  2002 mission
drwxr-xr-x 5 simben90 cis90  4096 Jan 18  2004 Poems
-rw-r--r-- 1 simben90 cis90  1074 Aug 26  2003 proposal1
-rw-r--r-- 1 simben90 cis90  2175 Jul 20  2001 proposal2
-rw-r--r-- 1 simben90 cis90  2054 Sep 14  2003 proposal3
-rw-rw-r-- 1 simben90 cis90   657 Feb 22 16:05 scott
```

total size of all files in blocks

On Opus,
1 block = 1024 bytes

1. file type
   - – = regular
   - d = directory
   - l = symbolic link
2. permissions
3. number of hard links
4. owner
5. group
6. size (in bytes)
7. last modified
8. filename

ls command

Using files vs directories as arguments

*Case 1: **No arguments** specified, all files in the current directory will be listed*

```
/home/cis90/simben $ ls
bigfile  Lab2.0         mission    proposal3  text.fxd
bin      Lab2.1         Poems      small_town timecal
empty    letter         proposal1  spellk     what_am_i
Hidden   Miscellaneous  proposal2  text.err
```

*Case 2: With a **filename** specified as an argument, just that file will be listed*

```
/home/cis90/simben $ ls bigfile
bigfile
```

*Case 3: With a **directory** specified as an argument, the contents of the directory will be listed*

```
/home/cis90/simben $ ls Poems/
ant  Blake  nursery  Shakespeare  twister  Yeats
```

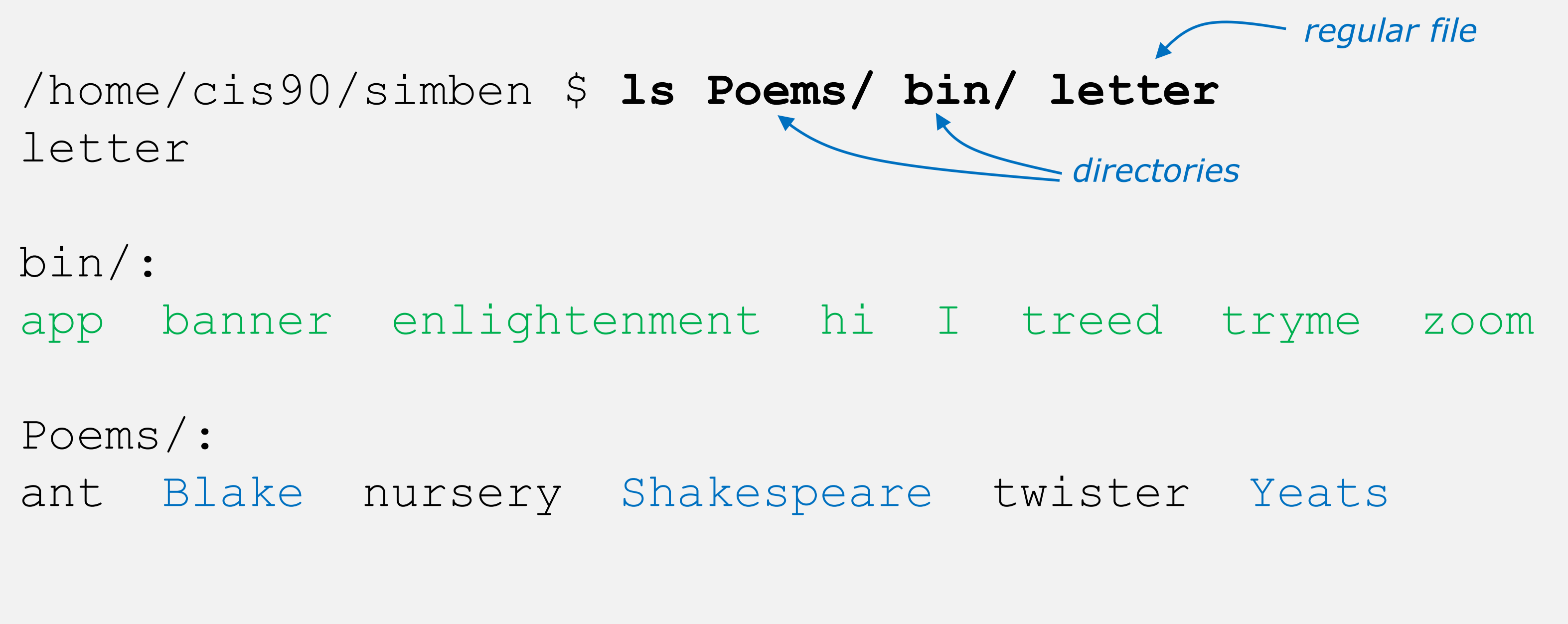
ls command

specifying multiple directories

*The **ls** command can take multiple arguments*

When a file is specified, just the filename is listed

When a directory is specified, the contents of the directory are listed



```
/home/cis90/simben $ ls Poems/ bin/ letter
letter

bin/:
app   banner   enlightenment   hi   I   treed   tryme   zoom

Poems/:
ant   Blake   nursery   Shakespeare   twister   Yeats
```

ls command example

*The * is expanded by the shell and replaced with the names of all files and directories in the current directory*

```
/home/cis90/simmsben $ ls *
bigfile  letter   proposal1  proposal3   spellk    text.fxd  what_am_i
empty    mission  proposal2  small_town  text.err  timecal

bin:
app  banner  enlightenment  hi  I  treed  tryme  zoom
ls: Hidden: Permission denied

Lab2.0:
386    A_long_name    file.9        README     this_years_annual_report
afile  annual report  junk.old.bak  sTrAnGeNeSs

Lab2.1:
1.1  filename  junk  letter  more  old  Proposal3  Proposal.old  xyz

Miscellaneous:
better_town  file.dos  fruit  manpage  mystery  salad

Poems:
ant  Blake  nursery  Shakespeare  twister  Yeats
```

Files listed first

Then the contents of each directory are listed

Do you see the error message? … permission issue (more in future lessons)
Do you see the symbolic link? … in light blue (more in future lessons)

ls command

How to override showing directory contents

The contents of the directory are shown

```
/home/cis90/simben $ ls bin
app  banner  enlightenment  hi  I  treed  tryme  zoom
```

The directory itself is shown with the -d option

```
/home/cis90/simben $ ls -d bin
bin
```

*Use the **d** option to list the directory itself. Without the **d** the directory contents are listed instead.*

ls command

How to override showing directory contents

The directory contents are shown

```
/home/cis90/simben $ ls -i bin
9634 app  9635 banner  9636 enlightenment  9630 hi  9632 I
9631 treed  9633 tryme  9629 zoom
```

The directory itself is shown with the -d option

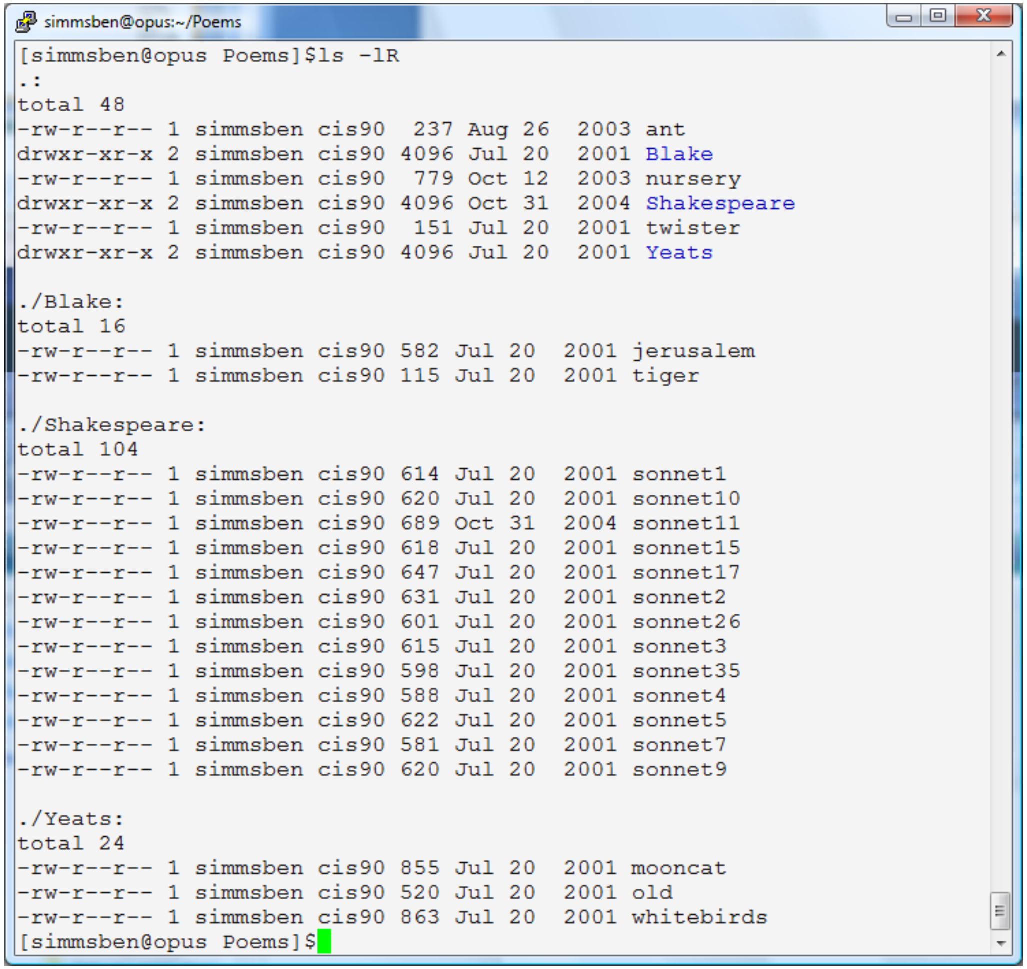
```
/home/cis90/simben $ ls -id bin
9628 bin
```

*Use the **d** option to list the directory itself.*

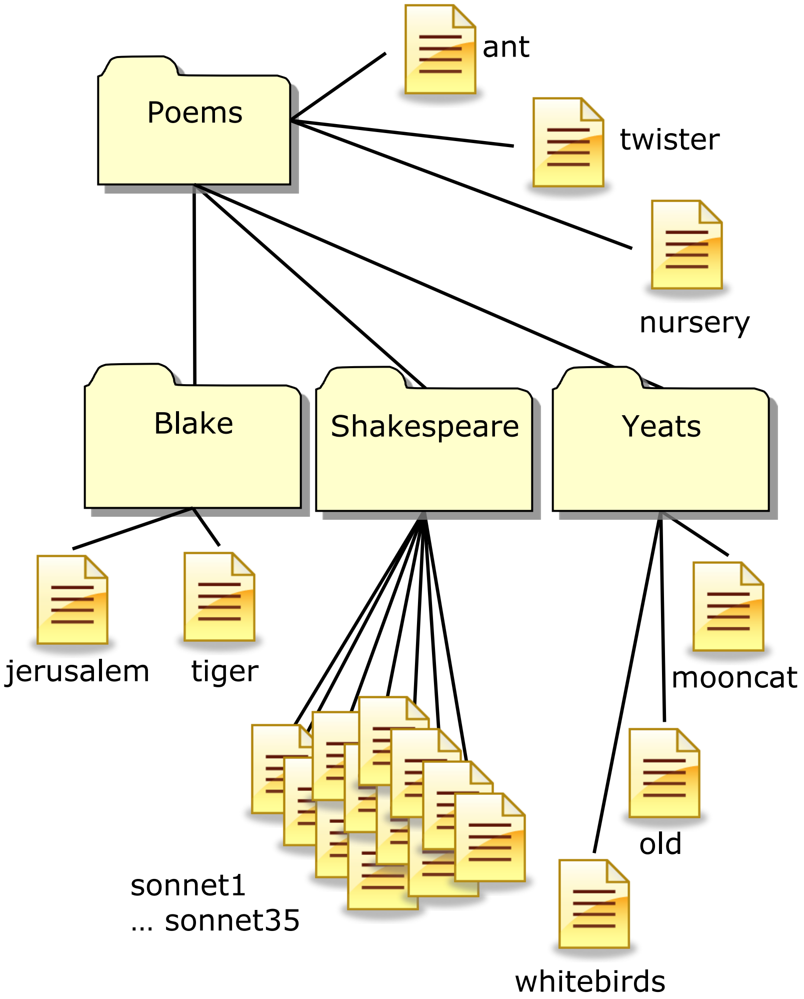
ls command

Recursively list subdirectories (-R)

`ls -lR`



```
[simmsben@opus Poems]$ls -lR
.:
total 48
-rw-r--r-- 1 simmsben cis90  237 Aug 26  2003 ant
drwxr-xr-x 2 simmsben cis90 4096 Jul 20  2001 Blake
-rw-r--r-- 1 simmsben cis90  779 Oct 12  2003 nursery
drwxr-xr-x 2 simmsben cis90 4096 Oct 31  2004 Shakespeare
-rw-r--r-- 1 simmsben cis90  151 Jul 20  2001 twister
drwxr-xr-x 2 simmsben cis90 4096 Jul 20  2001 Yeats

./Blake:
total 16
-rw-r--r-- 1 simmsben cis90 582 Jul 20  2001 jerusalem
-rw-r--r-- 1 simmsben cis90 115 Jul 20  2001 tiger

./Shakespeare:
total 104
-rw-r--r-- 1 simmsben cis90 614 Jul 20  2001 sonnet1
-rw-r--r-- 1 simmsben cis90 620 Jul 20  2001 sonnet10
-rw-r--r-- 1 simmsben cis90 689 Oct 31  2004 sonnet11
-rw-r--r-- 1 simmsben cis90 618 Jul 20  2001 sonnet15
-rw-r--r-- 1 simmsben cis90 647 Jul 20  2001 sonnet17
-rw-r--r-- 1 simmsben cis90 631 Jul 20  2001 sonnet2
-rw-r--r-- 1 simmsben cis90 601 Jul 20  2001 sonnet26
-rw-r--r-- 1 simmsben cis90 615 Jul 20  2001 sonnet3
-rw-r--r-- 1 simmsben cis90 598 Jul 20  2001 sonnet35
-rw-r--r-- 1 simmsben cis90 588 Jul 20  2001 sonnet4
-rw-r--r-- 1 simmsben cis90 622 Jul 20  2001 sonnet5
-rw-r--r-- 1 simmsben cis90 581 Jul 20  2001 sonnet7
-rw-r--r-- 1 simmsben cis90 620 Jul 20  2001 sonnet9

./Yeats:
total 24
-rw-r--r-- 1 simmsben cis90 855 Jul 20  2001 mooncat
-rw-r--r-- 1 simmsben cis90 520 Jul 20  2001 old
-rw-r--r-- 1 simmsben cis90 863 Jul 20  2001 whitebirds
[simmsben@opus Poems]$
```



Class Exercise

- Go to your home directory, type: **cd**
- Do a long listing of every file in your home directory and sub-directories and include inode numbers

```
ls -l Miscellaneous/

ls -ld Miscellaneous/

ls -ilR
```

Everything is a file (new)

Everything is a file in UNIX
(even a terminal)

- A terminal
- A file
- A hard drive
- A hard drive partition
- A CD
- A partition on a USB flash drive
- Kernel run-time information

Implemented as files in UNIX

Everything is a file in UNIX
(even a terminal)

A terminal	*e.g. /dev/pts/2*
A file	*e.g. /home/cis90/simben/letter*
A directory	*e.g /home/cis90/*
A hard drive	*e.g. /dev/sda*
A hard drive partition	*e.g. /dev/sda1*
A CD	*e.g. /dev/cdrom*
A partition on a USB flash drive	*e.g. /dev/sdb2*
Kernel run-time information	*e.g. /proc/sys/kernel/hostname*

Everything is a file
(even a terminal)

```
/home/cis90/simmsben $ tty
/dev/pts/1
```

*Use the **tty** command to identify the specific terminal device being used*

Note this device is identified using a pathname

```
/home/cis90/simmsben $ echo $TERM
xterm
```

Use the TERM variable to identify the specific type of terminal being used

Everything is a file
(even a terminal)

```
/home/cis90/simmsben $ tty
/dev/pts/1
```

Show which terminal you are using

```
/home/cis90/simmsben $ echo $TERM
xterm
```

Show what kind of terminal you are using

```
/home/cis90/simmsben $ who
simmsben pts/1        2010-09-29 07:38 (dsl-49-64-10-90.dhcp.cruzio.com)
srecklau pts/2        2010-09-29 06:06 (62.143.60.194)
rsimms   pts/4        2010-09-29 06:47 (dsl-49-64-10-90.dhcp.cruzio.com)
```

Use who to see who is logged in

```
/home/cis90/simmsben $ ls -l /dev/pts/*
crw--w---- 1 simmsben tty 136, 1 Sep 29 07:45 [redacted]
crw--w---- 1 srecklau tty 136, 2 Sep 29 07:44
crw--w---- 1 rsimms   tty 136, 4 Sep 29 06:48
```

Do a long listing to see all the terminal devices in use

Notice the owner is someone who has logged in

Notice the file type is "c" which is a character device file

Basic File Types and Commands

Long listing code (ls –l)	Type	How to make one
d	directory	mkdir
-	regular • Programs • Text • Data (binary)	touch
l	symbolic link	ln -s
c	character device files	mknod
b	block device files	mknod

Note: Other files types includes sockets (s) and named pipes (p)

Everything is a file in UNIX
(even a terminal)

Nice things about files

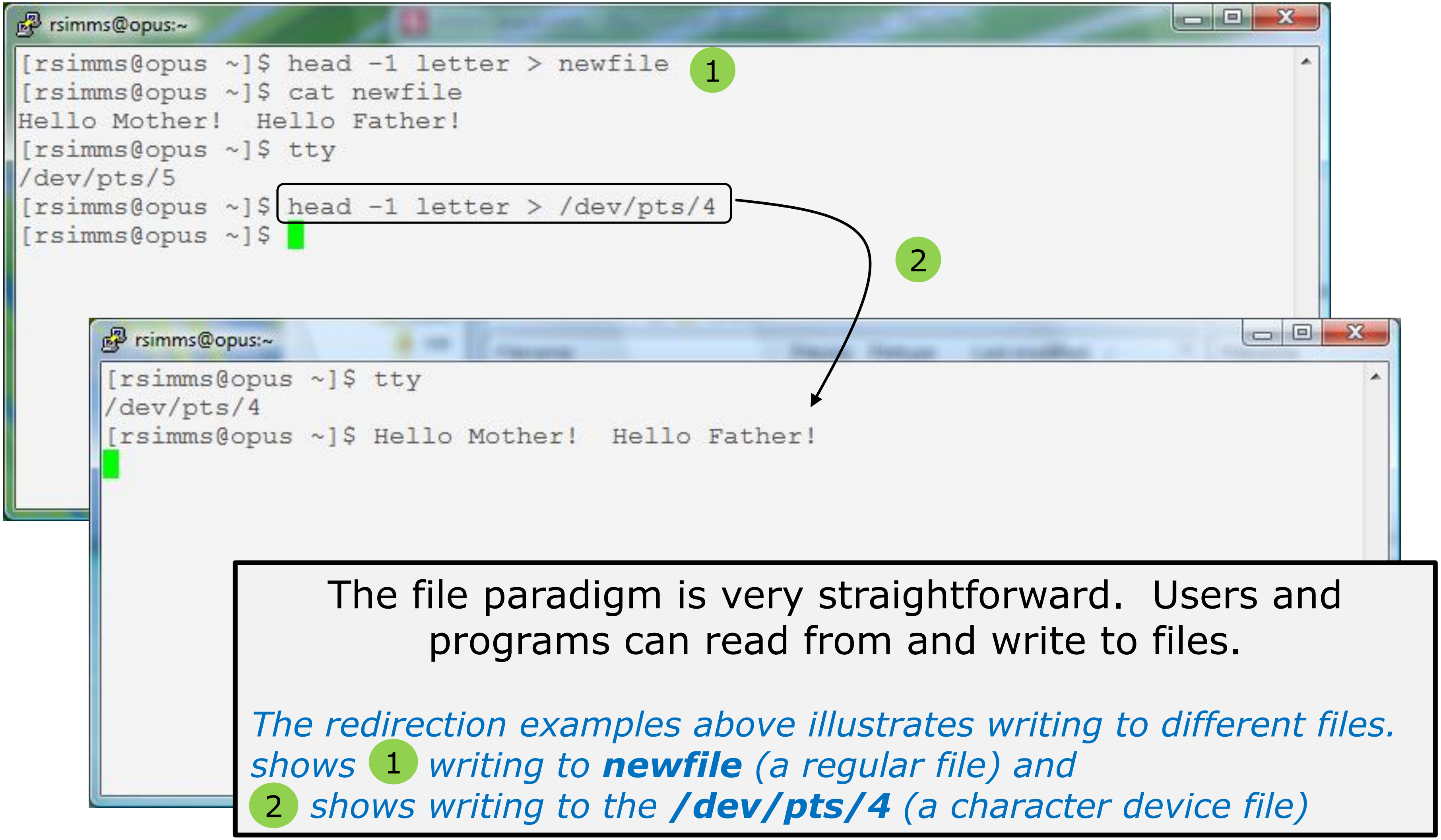
- you can write to them

```
[rsimms@opus ~]$ echo "Rich was here" > myfile
```

- and read from them

```
[rsimms@opus ~]$ cat myfile
Rich was here
```

Everything is a file in UNIX)



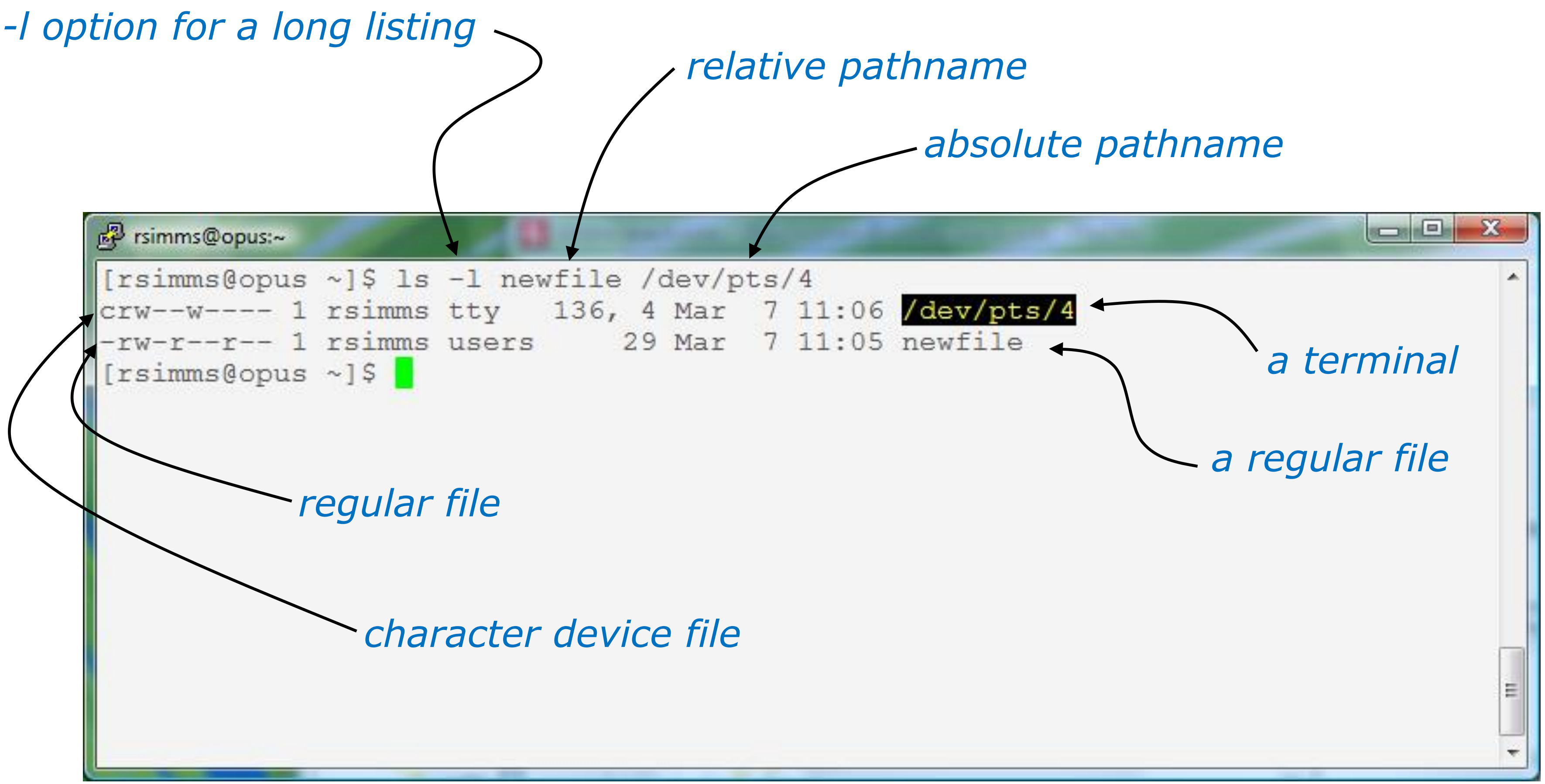
```
[rsimms@opus ~]$ head -1 letter > newfile
[rsimms@opus ~]$ cat newfile
Hello Mother!  Hello Father!
[rsimms@opus ~]$ tty
/dev/pts/5
[rsimms@opus ~]$ head -1 letter > /dev/pts/4
[rsimms@opus ~]$
```

```
[rsimms@opus ~]$ tty
/dev/pts/4
[rsimms@opus ~]$ Hello Mother!  Hello Father!
```

The file paradigm is very straightforward. Users and programs can read from and write to files.

*The redirection examples above illustrates writing to different files. shows 1 writing to **newfile** (a regular file) and 2 shows writing to the **/dev/pts/4** (a character device file)*

Everything is a file
(even a terminal)



```
[rsimms@opus ~]$ ls -l newfile /dev/pts/4
crw--w---- 1 rsimms tty   136, 4 Mar  7 11:06 /dev/pts/4
-rw-r--r-- 1 rsimms users     29 Mar  7 11:05 newfile
[rsimms@opus ~]$
```

Class Exercise

Part I

- Login into Opus using Putty
- Use **echo "I can do it" > myfile**
- Print your new file with **cat myfile**

Part II

- Open a second session on Opus
- You should have two terminals now
- Use **tty** to identify your terminals
- In one terminal use **echo "I can do it" > /dev/pts/***xx* where *xx* is your other terminal

Housekeeping

Lab 4

Lab 4 due 11:59PM, email it to me at:
rsimms@oslab.cabrillo.edu

- Text only, one answer per line, no attachments please. Include yourself on the distribution list to have a verifiable record of your submittal.
- Be sure and read the forum before turning in Lab 4 (or any lab for that matter).
- Remember, you can re-submit labs as many times as you wish up till the deadline. The most recent submittal gets graded.
- Q15 – correct answers will identify the names(s) of the specific file(s) that should not be viewed that way.
- When asked for a command, e.g. Q3, Q4, Q7, Q17, Q18, Q21 etc., correct answers must actually work on Opus without errors.
- When asked for an inode number, e.g. Q8, don’t answer with a command!

- Test #1 is next week
- Practice test available now

Test next week

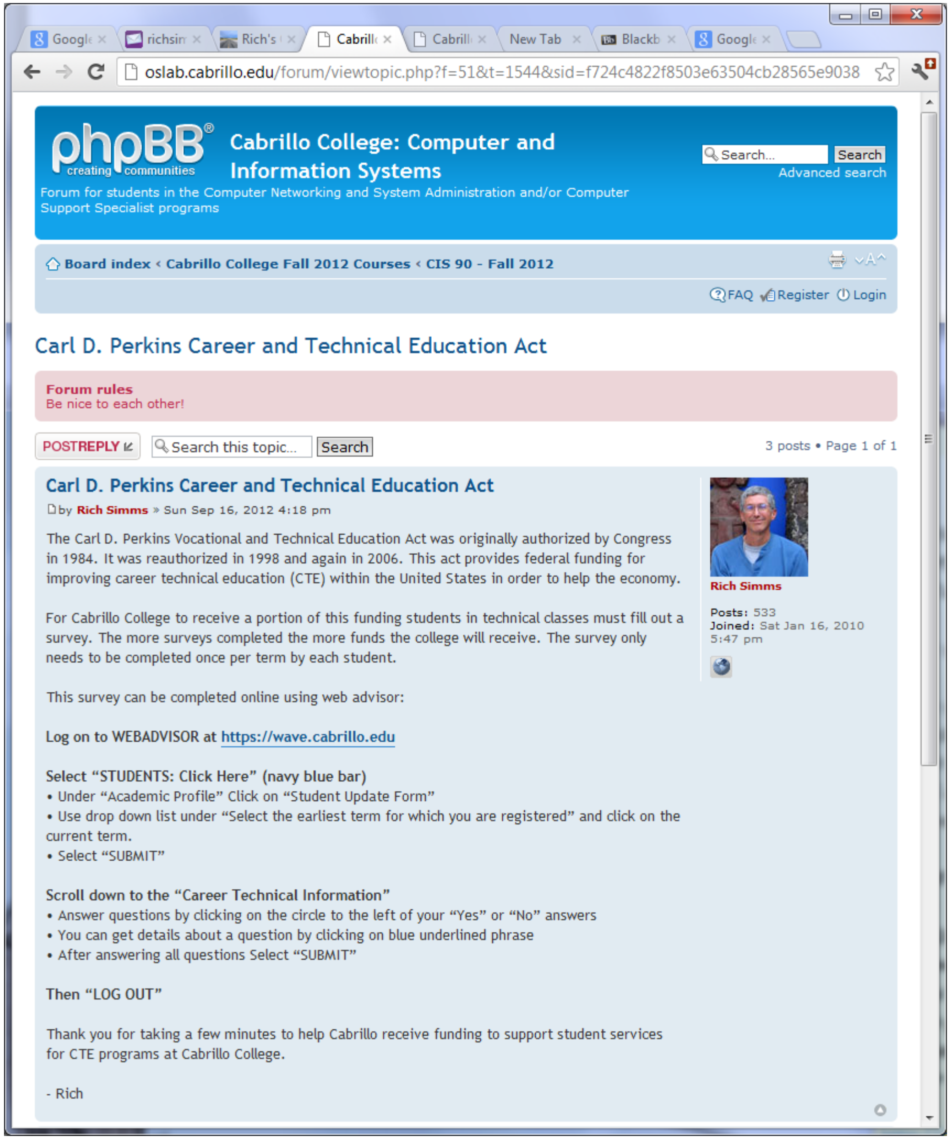
30 points, plus some extra credit:

- 5 flashcard questions (taken from website)
- 25 operational questions (verify your answers on Opus & Sun-Hwa)

- Open book, open notes, open computer
- To be taken during the last half of class
- Should take about 60-90 minutes, however if you need extra time, you can turn it in no later than 11:59PM.

- PDF form format. Download form first, fill it out, save it, then email it as an attachment to the instructor and cc: yourself (please do not send me a blank test!)

http://oslab.cabrillo.edu/forum/viewtopic.php?f=51&t=1544



Cabrillo College: Computer and Information Systems

Forum for students in the Computer Networking and System Administration and/or Computer Support Specialist programs

Board index ‹ Cabrillo College Fall 2012 Courses ‹ CIS 90 - Fall 2012

Carl D. Perkins Career and Technical Education Act

Forum rules
Be nice to each other!

3 posts • Page 1 of 1

Carl D. Perkins Career and Technical Education Act

by **Rich Simms** » Sun Sep 16, 2012 4:18 pm

Rich Simms
Posts: 533
Joined: Sat Jan 16, 2010 5:47 pm

The Carl D. Perkins Vocational and Technical Education Act was originally authorized by Congress in 1984. It was reauthorized in 1998 and again in 2006. This act provides federal funding for improving career technical education (CTE) within the United States in order to help the economy.

For Cabrillo College to receive a portion of this funding students in technical classes must fill out a survey. The more surveys completed the more funds the college will receive. The survey only needs to be completed once per term by each student.

This survey can be completed online using web advisor:

Log on to WEBADVISOR at https://wave.cabrillo.edu

Select “STUDENTS: Click Here” (navy blue bar)
• Under “Academic Profile” Click on “Student Update Form”
• Use drop down list under “Select the earliest term for which you are registered” and click on the current term.
• Select “SUBMIT”

Scroll down to the “Career Technical Information”
• Answer questions by clicking on the circle to the left of your “Yes” or “No” answers
• You can get details about a question by clicking on blue underlined phrase
• After answering all questions Select “SUBMIT”

Then “LOG OUT”

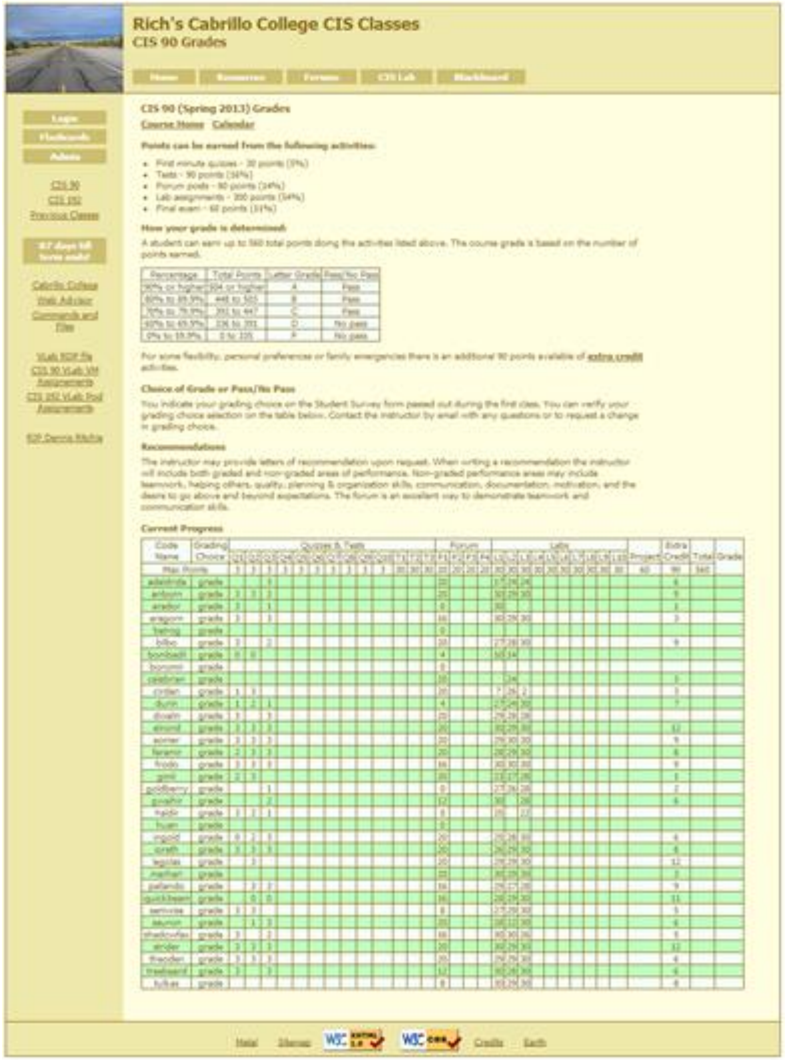
Thank you for taking a few minutes to help Cabrillo receive funding to support student services for CTE programs at Cabrillo College.

- Rich

This is an important source of funding for Cabrillo College.

Send me an email that you completed this survey for ***3 points extra credit!***

http://simms-teach.com/cis90grades.php



Rich's Cabrillo College CIS Classes
CIS 90 Grades

Home | Resources | Forums | CIS Lab | Blackboard

Login
Flashcards
Admin

CIS 90
CIS 192
Previous Classes

[illegible]

Cabrillo College
Web Advisor
Commands and Files

VLab RDP file
CIS 90 VLab VM Assignments
CIS 192 VLab Pod Assignments

RIP Dennis Ritchie

CIS 90 (Spring 2013) Grades

Course Home Calendar

Points can be earned from the following activities:

- First minute quizzes - 30 points (5%)
- Tests - 90 points (16%)
- Forum posts - 80 points (14%)
- Lab assignments - 300 points (54%)
- Final exam - 60 points (11%)

How your grade is determined:

A student can earn up to 560 total points doing the activities listed above. The course grade is based on the number of points earned.

Percentage	Total Points	Letter Grade	Pass/No Pass
90% or higher	504 or higher	A	Pass
80% to 89.9%	448 to 503	B	Pass
70% to 79.9%	392 to 447	C	Pass
60% to 69.9%	336 to 391	D	No pass
0% to 59.9%	0 to 335	F	No pass

For some flexibility, personal preferences or family emergencies there is an additional 90 points available of extra credit activities.

Choice of Grade or Pass/No Pass

You indicate your grading choice on the Student Survey form passed out during the first class. You can verify your grading choice selection on the table below. Contact the instructor by email with any questions or to request a change in grading choice.

Recommendations

The instructor may provide letters of recommendation upon request. When writing a recommendation the instructor will include both graded and non-graded areas of performance. Non-graded performance areas may include teamwork, helping others, quality, planning & organization skills, communication, documentation, motivation, and the desire to go above and beyond expectations. The forum is an excellent way to demonstrate teamwork and communication skills.

Current Progress

Mail Sitemap Credits Earth

GRADES

Be sure and check your progress on the Grades page as the course continues on.

Send me a student survey if you haven't already to get your LOR secret code name.

Jesse’s checkgrades python script

http://oslab.cabrillo.edu/forum/viewtopic.php?f=31&t=773&p=2966

```
/home/cis90/simben $ checkgrades celebrian

Remember, your points may be zero simply because the
assignment has not been graded yet.

Quiz 1: You earned 3 points out of a possible 3.
Quiz 2: You earned 3 points out of a possible 3.
Quiz 3: You earned 3 points out of a possible 3.


Forum Post 1: You earned 20 points out of a possible 20.

Lab 1: You earned 28 points out of a possible 30.
Lab 2: You earned 30 points out of a possible 30.
Lab 3: You earned 30 points out of a possible 30.


You've earned 6 points of extra credit.

You currently have a 103% grade in this class. (123 out of
119 possible points.)
```

Substitute with your own grading code name

Jesse is a CIS 90 Alumnus. He wrote this python script when taking the course. It mines data from the website to check how many of the available points have been earned so far.

Help with labs

Like some help with labs?

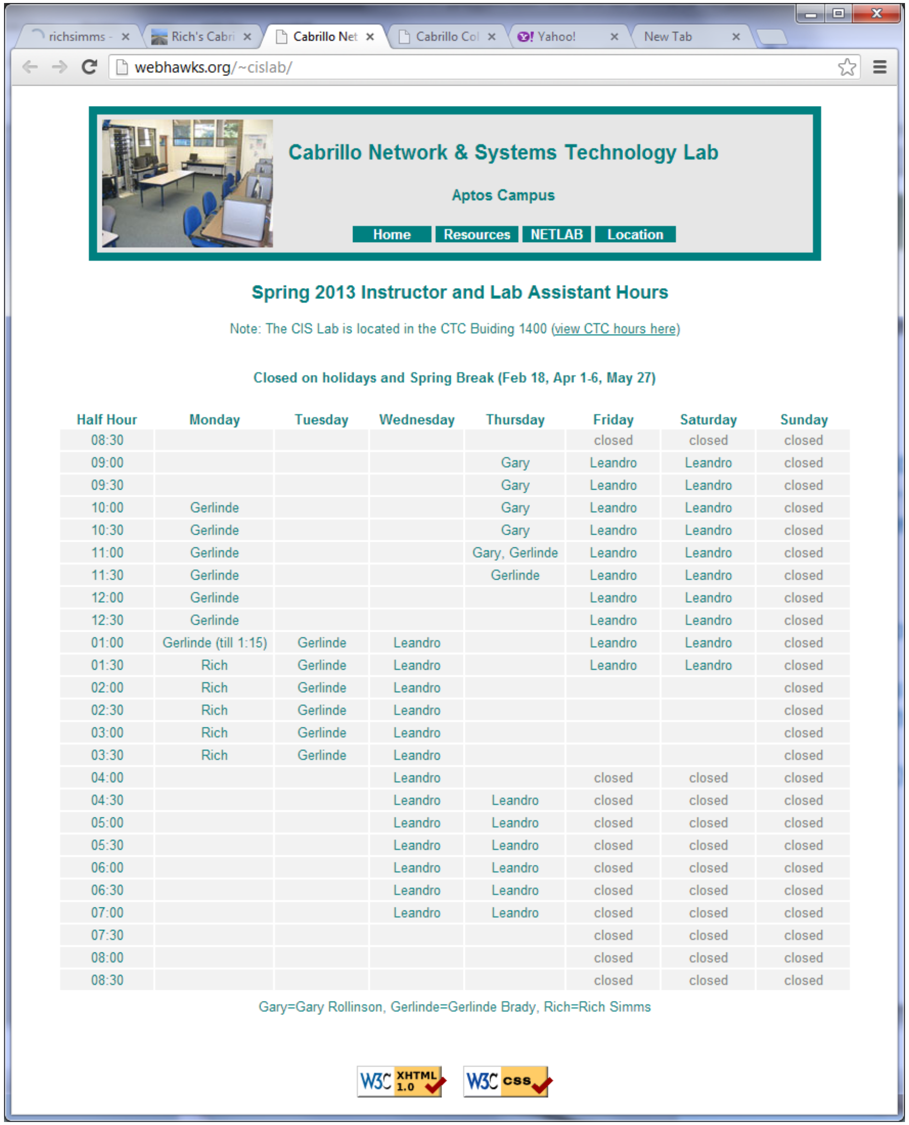
I'm in the CIS Lab Monday afternoons

- See schedule at http://webhawks.org/~cislab/

or see me during office hours

or contact me to arrange another time online

CIS 90 - Lesson 5



Cabrillo Network & Systems Technology Lab

Aptos Campus

Spring 2013 Instructor and Lab Assistant Hours

Note: The CIS Lab is located in the CTC Buiding 1400 (view CTC hours here)

Closed on holidays and Spring Break (Feb 18, Apr 1-6, May 27)

Half Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
08:30					closed	closed	closed
09:00				Gary	Leandro	Leandro	closed
09:30				Gary	Leandro	Leandro	closed
10:00	Gerlinde			Gary	Leandro	Leandro	closed
10:30	Gerlinde			Gary	Leandro	Leandro	closed
11:00	Gerlinde			Gary, Gerlinde	Leandro	Leandro	closed
11:30	Gerlinde			Gerlinde	Leandro	Leandro	closed
12:00	Gerlinde				Leandro	Leandro	closed
12:30	Gerlinde				Leandro	Leandro	closed
01:00	Gerlinde (till 1:15)	Gerlinde	Leandro		Leandro	Leandro	closed
01:30	Rich	Gerlinde	Leandro		Leandro	Leandro	closed
02:00	Rich	Gerlinde	Leandro				closed
02:30	Rich	Gerlinde	Leandro				closed
03:00	Rich	Gerlinde	Leandro				closed
03:30	Rich	Gerlinde	Leandro				closed
04:00			Leandro		closed	closed	closed
04:30			Leandro	Leandro	closed	closed	closed
05:00			Leandro	Leandro	closed	closed	closed
05:30			Leandro	Leandro	closed	closed	closed
06:00			Leandro	Leandro	closed	closed	closed
06:30			Leandro	Leandro	closed	closed	closed
07:00			Leandro	Leandro	closed	closed	closed
07:30					closed	closed	closed
08:00					closed	closed	closed
08:30					closed	closed	closed

Gary=Gary Rollinson, Gerlinde=Gerlinde Brady, Rich=Rich Simms

W3C XHTML 1.0 W3C CSS

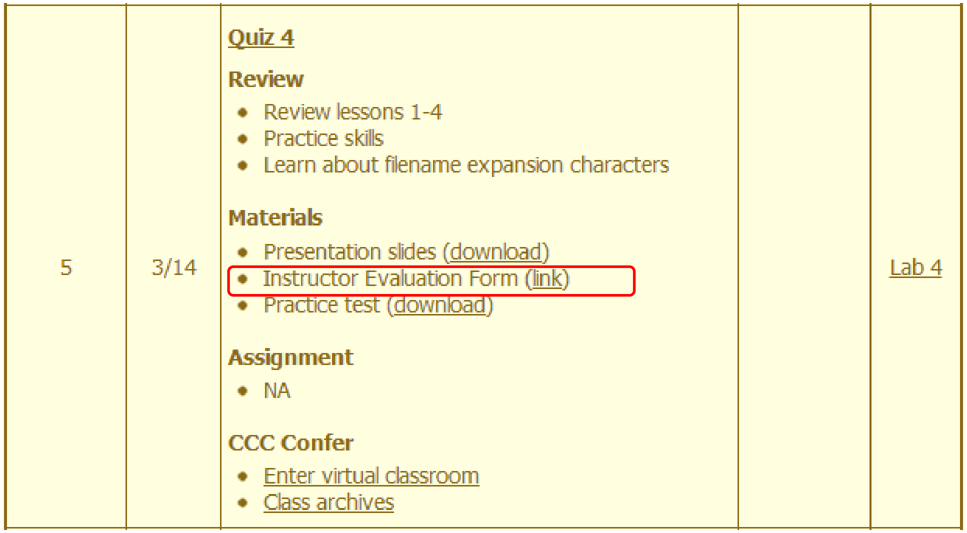
http://webhawks.org/~cislab/

Take advantage of the CIS Lab to get 1-on-1 help on labs and course material.

I'm there Monday afternoons

Leandro is a CIS 90 alumnus!

Evaluate Your Instructor Tonight



5	3/14	Quiz 4 **Review** - Review lessons 1-4 - Practice skills - Learn about filename expansion characters **Materials** - Presentation slides (download) - Instructor Evaluation Form (link) - Practice test (download) **Assignment** - NA **CCC Confer** - Enter virtual classroom - Class archives		Lab 4

Please fill out the survey form using link on the website

or type this link into your browser

https://www.surveymonkey.com/s/RichSimms-CIS-90-78467

File Name Expansion (new)

Filename Expansion Metacharacters

More metacharacters for making file name wildcards

***** matches all non-hidden filenames in the current directory when used alone matches zero or more characters when used as a prefix, infix or postfix.

? matches any single character in any of your current directory's filenames.

[] matches any single character contained within the brackets.

The * Filename Expansion Metacharacter

Use ls to show non-hidden filenames in the current directory

```
/home/cis90/simmsben $ ls
bigfile  empty   Lab2.1         mission     proposal2   spellk    timecal
bin      Hidden  letter         Poems       proposal3   text.err  what_am_i
delete   Lab2.0  Miscellaneous  proposal1   small_town  text.fxd
```

*The shell will replace * with the non-hidden filenames in the current directory*

```
/home/cis90/simmsben $ echo *
bigfile bin delete empty Hidden Lab2.0 Lab2.1 letter Miscellaneous mission
Poems proposal1 proposal2 proposal3 small_town spellk text.err text.fxd
timecal what_am_i
```

*The **echo** command above never sees the *, instead it gets all the matched filenames as arguments .*

The * Filename Expansion Metacharacter

*Note the * metacharacter by itself does not match any hidden files in your current working directory*

```
/home/cis90/simmsben $ echo *
bigfile bin delete empty Hidden Lab2.0 Lab2.1 letter Miscellaneous mission
Poems proposal1 proposal2 proposal3 small_town spellk text.err text.fxd
timecal what_am_i
```

```
/home/cis90/simmsben $ ls -a
.              .bashrc  empty    letter         Poems       spellk
.zshrc
..             bigfile  Hidden   Miscellaneous  proposal1   text.err
.bash_history  bin      Lab2.0   mission        proposal2   text.fxd
.bash_logout   delete   Lab2.1   .mozilla       proposal3   timecal
.bash_profile  .emacs   .lesshst .plan          small_town  what_am_i
```

Shell Parse Step

When the shell parses the following head command:

```
head *
```

*It expands the * with the names of all non-hidden files in the current directory to become:*

```
head bigfile bin delete empty Hidden Lab2.0 Lab2.1 letter
Miscellaneous mission Poems proposal1 proposal2 proposal3
small_town spellk text.err text.fxd timecal what_am_i
```

(all on one line)

Filename expansion happens during the shell parsing step, before the command is even located or executed.

1) Prompt
2) Parse
3) Search for program (along the path)
4) Execute program
5) Nap (wait till process is done)
6) Repeat

The * Filename Expansion Metacharacter

Note, DOS uses *.* to match all files.

BUT, this is NOT true in UNIX

```
/home/cis90/simmsben $ echo *.*
Lab2.0 Lab2.1 text.err text.fxd
```

*Instead, *.* is expanded to match all files in the current directory containing a "."*

The * Filename Expansion Metacharacter

Your turn now

What command would classify all files in the parent directory that start with m?

The * Filename Expansion Metacharacter

Answer

What command would classify all files in the parent directory that start with m?

```
/home/cis90/simben $ file ../m*
../marand: directory
../marrog: directory
../mazari: directory
../mckeva: directory
../melale: directory
../mennat: directory
../milhom: directory
/home/cis90/simben $
```

The ? Filename Expansion Metacharacter

A ? matches exactly one character which could be anything

What command would list all three letter filenames in /bin

The ? Filename Expansion Metacharacter

What command would list all three letter filenames in /bin

Answer

```
/home/cis90/simben $ ls /bin/???
/bin/awk  /bin/csh  /bin/env  /bin/raw  /bin/rpm  /bin/sed
/bin/cat  /bin/cut  /bin/pwd  /bin/red  /bin/rvi  /bin/tar
```

The [] Filename Expansion Metacharacter

NEW *A [] will match any character between the brackets*

From your home directory, what command would print the first line of all Shakespeare sonnets ending in a 2 or 5?

The [] Filename Expansion Metacharacter

From your home directory, what command would print the first line of all Shakespeare sonnets ending in a 2 or 5?

Answer

```
/home/cis90/simben $ head -n 1 Poems/Shakespeare/*[25]
==> Poems/Shakespeare/sonnet15 <==
When I consider every thing that grows

==> Poems/Shakespeare/sonnet2 <==
When forty winters shall besiege thy brow,

==> Poems/Shakespeare/sonnet35 <==
Whoever hath her wish, thou hast thy Will,

==> Poems/Shakespeare/sonnet5 <==
Those hours that with gentle work did frame
/home/cis90/simben $
```

Filename Expansion Metacharacters
* ? []

What commands are there in /usr/bin that start with a “n” or “m”, are 5 letters long and end with a “p”?

Hint: Use a combination of filename expansion metacharacters

Filename Expansion Metacharacters
* ? []

What commands are there in /usr/bin that start with a “n” or “m”, are 5 letters long and end with a “p”?

Answer

```
/home/cis90/simben $ echo /usr/bin/[nm]???p
/usr/bin/nohup
```

Filename Expansion Metacharacters
* ? []

For the command:

```
file /usr/share/man/*/[ap]??.8.gz
```

What arguments are actually getting passed to the **file** command to process?

Filename Expansion Metacharacters
* ? []

For the command:

`file /usr/share/man/*/[ap]??.8.gz`

What arguments are actually getting passed to the **file** command to process?

```
/home/cis90/simben $ echo /usr/share/man/*/[ap]??.8.gz
/usr/share/man/man8/arp.8.gz /usr/share/man/man8/atd.8.gz
/usr/share/man/man8/pam.8.gz /usr/share/man/man8/pvs.8.gz
/home/cis90/simben $
```

Tip: Use echo to expand complicated filenames containing multiple filename expansion characters

Command Review

*Use the **man** command or google for the details*

New commands:

cal	- show calendars
clear	- clear the terminal screen
exit	- terminate your shell and log off
history	- show previous commands
hostname	- show the name of the computer being accessed
id	- show user and group id information
ps	- show processes (loaded programs) being run
ssh	- secure login to a remote system
uname	- show OS name
tty	- show terminal information
who	- show who else is logged on
who am i	- Identifies which login session you are using
Ctrl-Alt-F1 to Ctrl-Alt-F7	- Change between terminals and X windows (graphics)

New Files and Directories:

VMware:

Ctrl-Alt	- to move mouse cursor out of VM

*Use the **man** command or google for the details*

New commands:

apropos	- search for string in whatis database
bc	- binary calculator
cat	- print file(s)
cd	- change directory
echo	- print text
env	- show shell environment variables
info	- online documentation with hot links
file	- show file information
ls	- show directory contents
passwd	- change password
set	- show (or set) shell variables
type	- show command location in path
man	- manual page for a command
whatis	- command summary

New Files and Directories:

/etc/passwd	- user accounts
/etc/shadow	- encrypted passwords
/bin	- directory of commands
/sbin	- directory of superuser commands
/usr/bin	- directory of commands, tools and utilities
/usr/sbin	- directory of superuser commands, tools and utilities

New commands:

mail	- UNIX mail
?	print these commands
p <message list>	print messages
n	goto and print next message
e <message list>	edit messages
d <message list>	delete messages
s <message list> file	save (append) messages to file
u <message list>	undelete messages
R <message list>	reply to sender(s)
r <message list>	reply to all
m <user list>	mail to specific users
q	quit, saving read messages to local mbox file
x	quit, mark all mail as unread and undeleted.
h	print out active message headers
mesg	- Enable or disable writes to your terminal
write	- Write message to another user

New Files and Directories:

/var/mail	- Message store for mail
/var/mail/*username*	- Incoming mailbox for *username*
mbox	- File in users home directory where read messages are archived to

*Use the **man** command or google for the details*

*Use the **man** command or google for the details*

Commands:

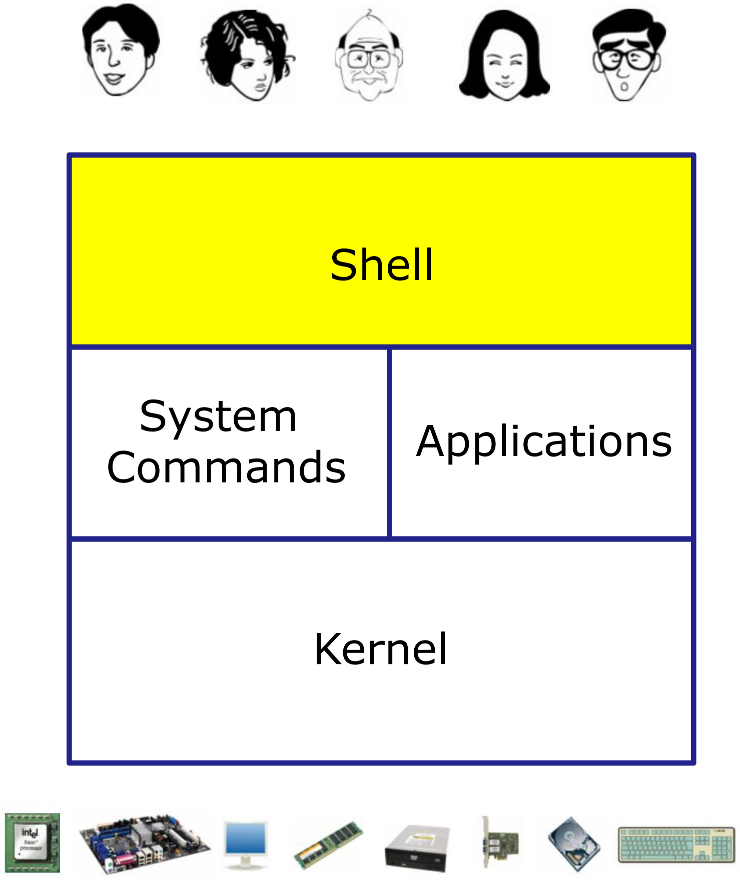
cat	Print a file on the screen
cd	Change directory
file	Classify a file
head	View first several lines of a file
less	Scroll up and down long files
ls	List files
more	Scroll down long files
pwd	Print working directory
reset	Use to reset terminal window
tail	View last several lines of a file
wc	Count the words, lines or characters in a file
xxd	View (hex dump) binary/data files

New Files and Directories:

/	Root of the file tree
/home	Opus home directories
/home/cis90	CIS 90 class home directories
/home/cis90/*username*	The home directory for CIS 90 student *username*

Command line Prompt Parse (review)

Life of the Shell



1) **Prompt** for a command
2) **Parse** (interpret metacharacters, expand file names and dissect command line into options and arguments)
3) **Search** for program (along the path)
4) **Execute** program by loading into memory (becomes a process), hookup input and outputs, and pass along command line options and arguments.
5) **Nap** (wait till process is done)
6) **Repeat**

Command Syntax

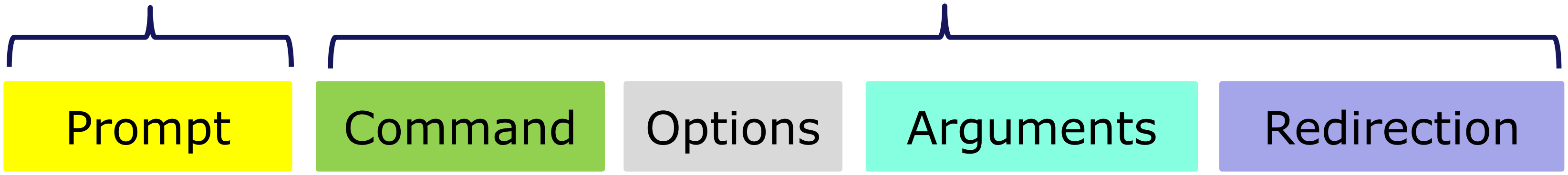
Command	Options	Arguments	Redirection

Command – is the name of an executable program file.
Options – various options which control how the program will operate.
Arguments – the objects the command is directed to work upon.
Redirection – The default input stream (stdin) is from the console keyboard, the default output (stdout) and error (stderr) streams go to the console screen. Redirection can modify these streams to other files or devices.

Command Syntax

Shell prints this to prompt user to enter a command

Shell parses this command line



***Options** modify the behavior of the command*

Examples

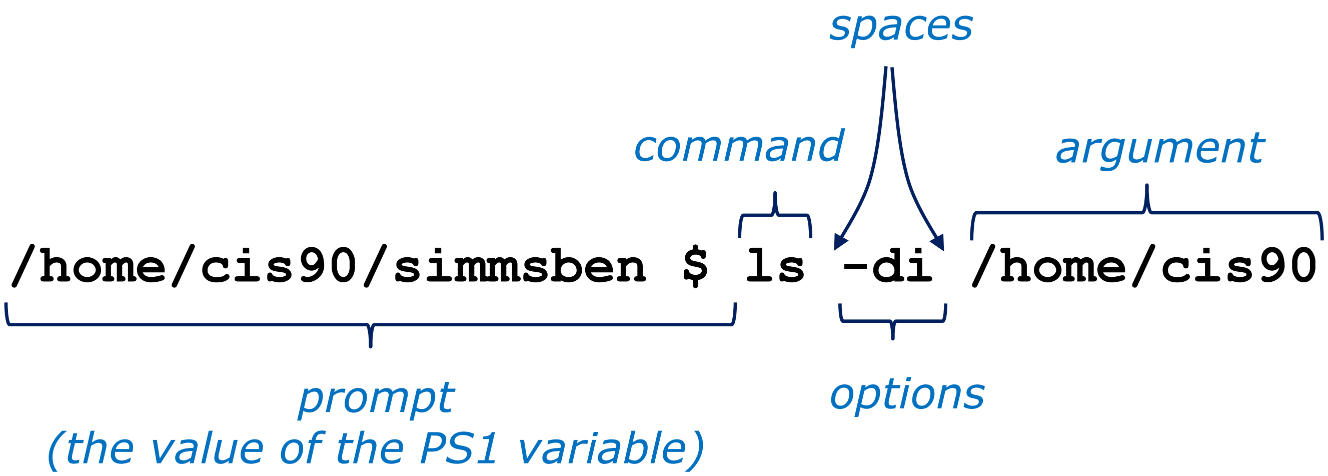
```
/home/cis90/simmsben $
/home/cis90/simmsben $ ls
/home/cis90/simmsben $ ls -l
/home/cis90/simmsben $ ls -lt
/home/cis90/simmsben $ ls -lt Poems/
/home/cis90/simmsben $ ls -lt Poems/ bin/
/home/cis90/simmsben $ ls -lt Poems/ bin/ > mylist
```

***Arguments** are what the command works upon*

***Redirection** is covered later in the course*

***Spaces (blanks)** are used to separate the command, options and arguments.*

Command Line Syntax Review



spaces

command

argument

```
/home/cis90/simmsben $ ls -di /home/cis90
```

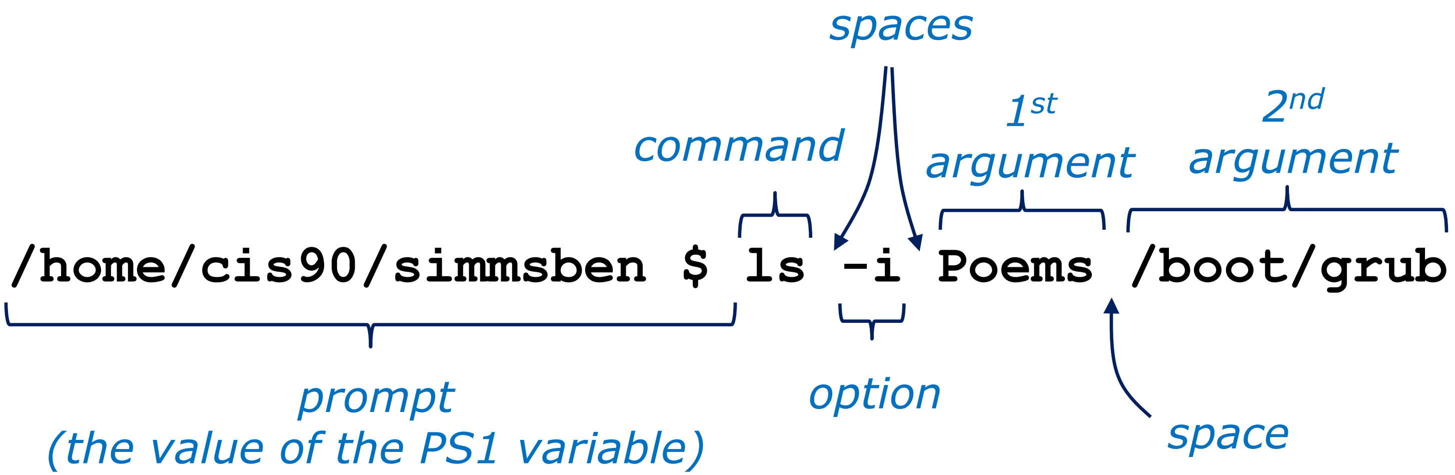
prompt
(the value of the PS1 variable)

options

Parsing the command line above yields:

One command: **ls**
Two options: **d** and **i**
One argument: **/home/cis90** (an absolute pathname to a directory)

Command Line Syntax Review



spaces

command

1st argument

2nd argument

```
/home/cis90/simmsben $ ls -i Poems /boot/grub
```

prompt
(the value of the PS1 variable)

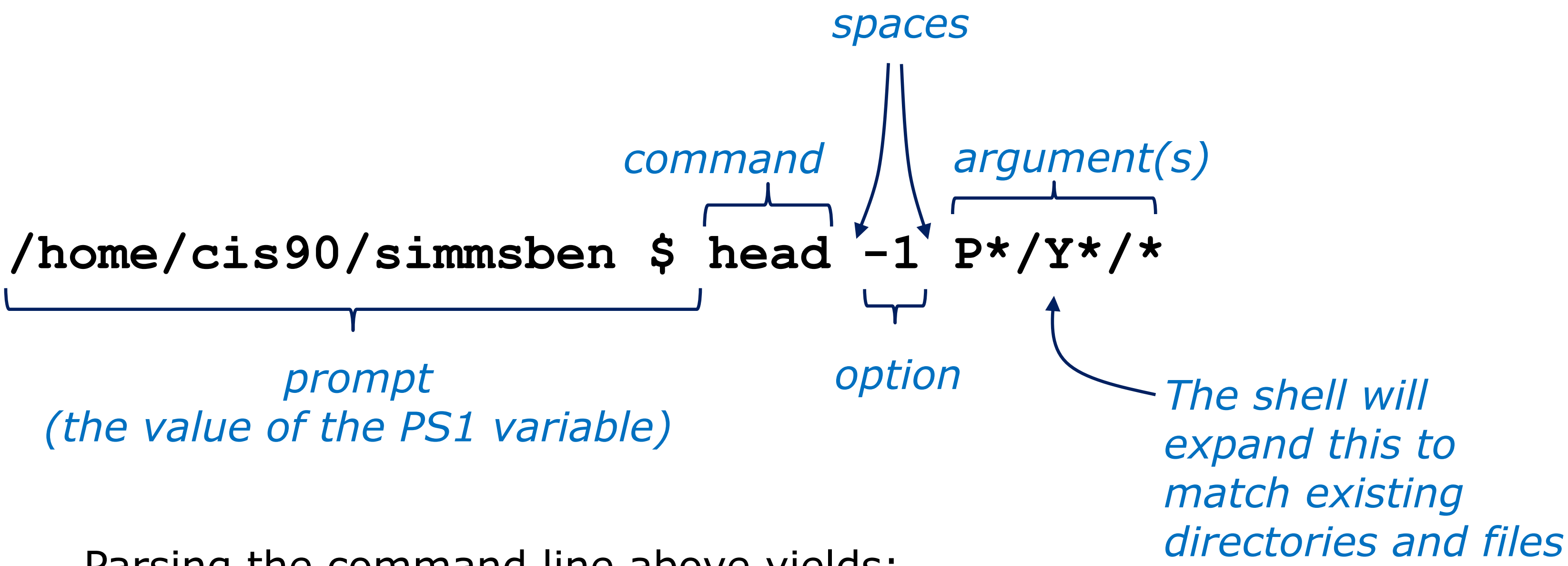
option

space

Parsing the command line above yields:

One command: **ls**
One options: **i**
Two arguments:
Poems (a relative pathname to a directory)
/boot/group (an absolute pathname to a directory)

Command Line Syntax Review



spaces

command

argument(s)

```
/home/cis90/simmsben $ head -1 P*/Y*/*
```

prompt
(the value of the PS1 variable)

option

The shell will expand this to match existing directories and files

Parsing the command line above yields:

One command: **head**
One option: **1**
Three arguments:
Poems/Yeats/mooncat (a relative pathname to a file)
Poems/Yeats/old (a relative pathname to a file)
Poems/Yeats/whitebirds (a relative pathname to a file)

Your turn now!

```
/home/cis90ol/simmsben $ ls -ls /usr/bin/ls*
```

1) What portion of the line above is the shell prompt?

2) Parse the command the user typed and identify:

The name of the program/script to run:

options:

arguments:

Your turn now!

```
/home/cis90ol/simmsben $ ls -ls /usr/bin/ls*
```

1) What portion of the line above is the shell prompt?

```
/home/cis90ol/simmsben $
```

2) Parse the command the user typed and identify:

The name of the program/script to run: **`ls`**

options: There are 2 options: **`l`** and **`s`** (long and size in blocks)

arguments: there are 10 arguments:

```
/usr/bin/ls
/usr/bin/lsattr
/usr/bin/lsblk
/usr/bin/lscpu
/usr/bin/lsdvb
/usr/bin/lsinitrd
/usr/bin/lspgpot
/usr/bin/lss3
/usr/bin/lsusb
/usr/bin/lsusb.py
```

Meta Characters (review)

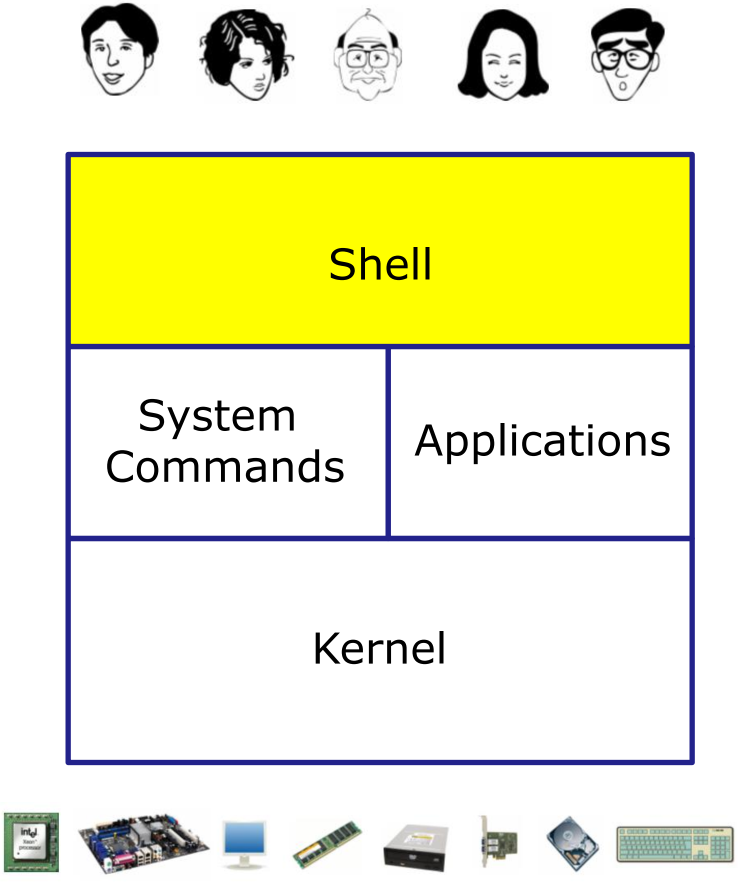
Metacharacters

Have special interpretation by the shell

Char	Description
\	Treat the following metacharacter as a plain character. Also called "escaping" the next character.
$	The following text is a shell (environment) variable and the value should be used.
<cr>	Carriage return marks the end of the command
;	Separates multiple commands on one line
'	used to enclose a string that the shell will not do further interpretation
"	Used to enclose a string that the shell will do further interpretation.
>	Redirects stdout *(more in Lesson 8)*
2>	Redirects stderr *(more in Lesson 8)*
*	Matches all non-hidden file names when used alone or zero or more characters when used as prefix, infix or postfix
?	Matches any single character of a file name
[]	Matches any single character contained within the brackets
#	Not an official metacharacter, but any text following the # is ignored by the shell

Life of the Shell

*The shell processes metacharacters during the **Parse** step*



Shell

System Commands

Applications

Kernel

1) **Prompt** for a command
2) **Parse** (interpret metacharacters, expand file names and dissect command line into options and arguments)
3) **Search** for program (along the path)
4) **Execute** program by loading into memory (becomes a process), hookup input and outputs, and pass along command line options and arguments.
5) **Nap** (wait till process is done)
6) **Repeat**

Metacharacters
#

# has the ability to make everything that follows the # be ignored by the shell. Good for adding comments in scripts

```
/home/cis90/simmsben $ #OK lets escape the carriage return in next example
/home/cis90/simmsben $
```

Note there is no error message because everything after the # is ignored

Metacharacters
$

$ metacharacter has the ability to "show the value of"

```
/home/cis90/simmsben $ EYES=brown
/home/cis90/simmsben $ echo EYES
EYES
/home/cis90/simmsben $ echo $EYES
brown

/home/cis90/simmsben $ echo $LOGNAME
simmsben
/home/cis90/simmsben $
```

echo the string EYES

echo the value of the variable EYES

echo the value of the predefined environment variable LOGNAME

Metacharacters
" and '

Weak "double" quotes allow the shell to process $ metacharacters inside the quoted string

```
/home/cis90/simmsben $ echo "I am in $PWD"
I am in /home/cis90/simmsben


/home/cis90/simmsben $ echo 'I am in $PWD'
I am in $PWD
/home/cis90/simmsben $
```

Strong "single" quotes block the shell from processing $ metacharacters inside the quoted string

Metacharacters
;

```
/home/cis90/simmsben $ #Lets put two commands on one line
/home/cis90/simmsben $ echo "This is my terminal device:"; tty
This is my terminal device:
/dev/pts/2
/home/cis90/simmsben $
```

the ; metachacter lets you combine several commands on one line

Metacharacters
\

```
/home/cis90/simmsben $ #OK lets escape the carriage return in next example
/home/cis90/simmsben $ echo Lets start line 1 here \
> and finish it here
Lets start line 1 here and finish it here
/home/cis90/simmsben $
```

The \ is used to escape the next character typed. Use an escape to disable the special abilities of a metacharacter.

Escaping a carriage return (the Enter key) tells the shell to keeping inputting more characters from the next line for the current command being entered.

Metacharacters
\

Escaping the # means it is no longer treated as comment

```
/home/cis90/simmsben $ \#OK lets put a comment here
-bash: #OK: command not found
/home/cis90/simmsben $
/home/cis90/simmsben $
/home/cis90/simmsben $ echo $PS1
$PWD $
/home/cis90/simmsben $ echo \$PS1
$PS1
/home/cis90/simmsben $
```

and you get an error when the shell processes your comment

Escaping the $ means $ is no longer treated "the value of"

Environment Variables

(review)

Shell (Environment) Variables

common environment variables

Shell Variable	Description
HOME	Users home directory (starts here after logging in and returns with a cd command (with no arguments)
LOGNAME	User's username for logging in with.
PATH	List of directories, separated by :'s, for the Shell to search for commands (which are program files) .
PS1	The prompt string.
PWD	Current working directory
SHELL	Name of the Shell program being used.
TERM	Type of terminal device , e.g. dumb, vt100, xterm, ansi, etc.

Shell (Environment) Variables

Show variable values

```
/home/cis90/simben $ echo $HOME
/home/cis90/simben

/home/cis90/simben $ echo $LOGNAME
simben90

/home/cis90/simben $ echo $PS1
$PWD $

/home/cis90/simben $ echo $PWD
/home/cis90/simben

/home/cis90/simben $ echo $SHELL
/bin/bash

/home/cis90/simben $ echo $TERM
xterm
```

Use echo to show the values of variables

Shell (Environment) Variables
PATH

```
/home/cis90/simben $ echo $PATH
/usr/lib/qt-
3.3/bin:/usr/local/bin:/bin:/usr/bin:/usr/local/sbin:/usr/sbi
n:/sbin:/home/cis90/simben/../bin:/home/cis90/simben/bin:.
```

These are the directories in Benji's PATH in the order they will be searched:

1st: /usr/lib/qt-3.3/bin
2nd: /usr/local/bin
3rd: /bin
4th: /usr/bin
5th: /usr/local/sbin
6th: /usr/sbin
7th: /sbin
8th: /home/cis90/simben/../bin
9th: /home/cis90/simben/bin
10th: .

The PATH variable is used by the shell to locate commands

Shell (Environment) Variables

Set variable values

Use an "=" with no spaces to set values of variables

```
/home/cis90/simben $  # Change the prompt variable
/home/cis90/simben $  PS1='[\u@\h \W]\$ '
[simben90@opus ~]$ echo $PS1
[\u@\h \W]\$
[simben90@opus ~]$


[simben90@opus ~]$ # Change it back again
[simben90@opus ~]$ PS1='$PWD $ '
/home/cis90/simben $ echo $PS1
$PWD $
/home/cis90/simben $
```

Shell Variables

Set variable values

If the variable has never been use before then it is created

```
/home/cis90/simben $ myfavoritedog="Benji Simms"
/home/cis90/simben $ echo $myfavoritedog
Benji Simms
```

Shell (Environment) Variables

env command – show all environment variables

```
/home/cis90/simmsben/Poems $ env
HOSTNAME=opus.cabrillo.edu
SHELL=/bin/bash
TERM=xterm
HISTSIZE=1000
USER=simmsben
LS_COLORS=no=00:fi=00:di=00;34:ln=00;36:pi=40;33:so=00;35:bd=40;33;01:cd=40;33;01:or=01;05;37;41:mi
=01;05;37;41:ex=00;32:*.cmd=00;32:*.exe=00;32:*.com=00;32:*.btm=00;32:*.bat=00;32:*.sh=00;32:*.csh=
00;32:*.tar=00;31:*.tgz=00;31:*.arj=00;31:*.taz=00;31:*.lzh=00;31:*.zip=00;31:*.z=00;31:*.Z=00;31:*
.gz=00;31:*.bz2=00;31:*.bz=00;31:*.tz=00;31:*.rpm=00;31:*.cpio=00;31:*.jpg=00;35:*.gif=00;35:*.bmp=
00;35:*.xbm=00;35:*.xpm=00;35:*.png=00;35:*.tif=00;35:
USERNAME=
MAIL=/var/spool/mail/simmsben
PATH=/usr/kerberos/bin:/usr/local/bin:/bin:/usr/bin:/home/cis90/simmsben/../bin:/home/cis90/simmsbe
n/bin:.
INPUTRC=/etc/inputrc
PWD=/home/cis90/simmsben/Poems
LANG=en_US.UTF-8
SSH_ASKPASS=/usr/libexec/openssh/gnome-ssh-askpass
SHLVL=1
HOME=/home/cis90/simmsben
BASH_ENV=/home/cis90/simmsben/.bashrc
LOGNAME=simmsben
CVS_RSH=ssh
LESSOPEN=|/usr/bin/lesspipe.sh %s
G_BROKEN_FILENAMES=1
_=/bin/env
OLDPWD=/home/cis90/simmsben
/home/cis90/simmsben/Poems $
```

*Use the **env** command to show all environment variables (a subset of the shell variables)*

Shell Variables

set command – show all shell variables

```
/home/cis90/simmsben/Poems $ set
BASH=/bin/bash
BASH_ARGC=()
BASH_ARGV=()
BASH_ENV=/home/cis90/simmsben/.bashrc
BASH_LINENO=()
BASH_SOURCE=()
BASH_VERSINFO=([0]="3" [1]="2" [2]="25" [3]="1"
[4]="release" [5]="i686-redhat-linux-gnu")
BASH_VERSION='3.2.25(1)-release'
COLORS=/etc/DIR_COLORS.xterm
COLUMNS=80
CVS_RSH=ssh
DIRSTACK=()
EUID=1160
GROUPS=()
G_BROKEN_FILENAMES=1
HISTFILE=/home/cis90/simmsben/.bash_history
HISTFILESIZE=1000
HISTSIZE=1000
HOME=/home/cis90/simmsben
HOSTNAME=opus.cabrillo.edu
HOSTTYPE=i686
IFS=$' \t\n'
IGNOREEOF=10
INPUTRC=/etc/inputrc
LANG=en_US.UTF-8
LESSOPEN='|/usr/bin/lesspipe.sh %s'
LINES=24
LOGNAME=simmsben
LS_COLORS='no=00:fi=00:di=00;34:ln=00;36:pi=40;33:so=00;35
:bd=40;33;01:cd=40;33;01:or=01;05;37;41:mi=01;05;37;41:ex=
00;32:*.cmd=00;32:*.exe=00;32:*.com=00;32:*.btm=00;32:*.ba
t=00;32:*.sh=00;32:*.csh=00;32:*.tar=00;31:*.tgz=00;31:*.a
rj=00;31:*.taz=00;31:*.lzh=00;31:*.zip=00;31:*.z=00;31:*.Z
=00;31:*.gz=00;31:*.bz2=00;31:*.bz=00;31:*.tz=00;31:*.rpm=
00;31:*.cpio=00;31:*.jpg=00;35:*.gif=00;35:*.bmp=00;35:*.x
bm=00;35:*.xpm=00;35:*.png=00;35:*.tif=00;35:'
MACHTYPE=i686-redhat-linux-gnu
MAIL=/var/spool/mail/simmsben
MAILCHECK=60
OLDPWD=/home/cis90/simmsben
OPTERR=1
OPTIND=1
OSTYPE=linux-gnu
PATH=/usr/kerberos/bin:/usr/local/bin:/bin:/usr/bin:/home/
cis90/simmsben/../bin:/home/cis90/simmsben/bin:.
PIPESTATUS=([0]="0")
PPID=26514
PROMPT_COMMAND='echo -ne
"\033]0;${USER}@${HOSTNAME%%.*}:${PWD/#$HOME/~}"; echo -ne
"\007"'
PS1='$PWD $'
PS2='> '
PS4='+ '
PWD=/home/cis90/simmsben/Poems
SHELL=/bin/bash
SHELLOPTS=braceexpand:emacs:hashall:histexpand:ignoreeof:i
nteractive-comments:monitor
SHLVL=1
SSH_ASKPASS=/usr/libexec/openssh/gnome-ssh-askpass
TERM=xterm
UID=1160
USER=simmsben
USERNAME=
_=env
consoletype=pty
```

*Use the **set** command to show all shell variables (which includes the environment variables)*

Class Exercise

- Change your prompt with:
  PS1='$LOGNAME, command please: '

- Change your prompt with:
  PS1='[\u@\h \W]\$ '

- Change your prompt with:
  PS1="$PWD $ "
  Now change directories using **cd**, what happenned?

- Restore original prompt with:
  PS1='$PWD $ '

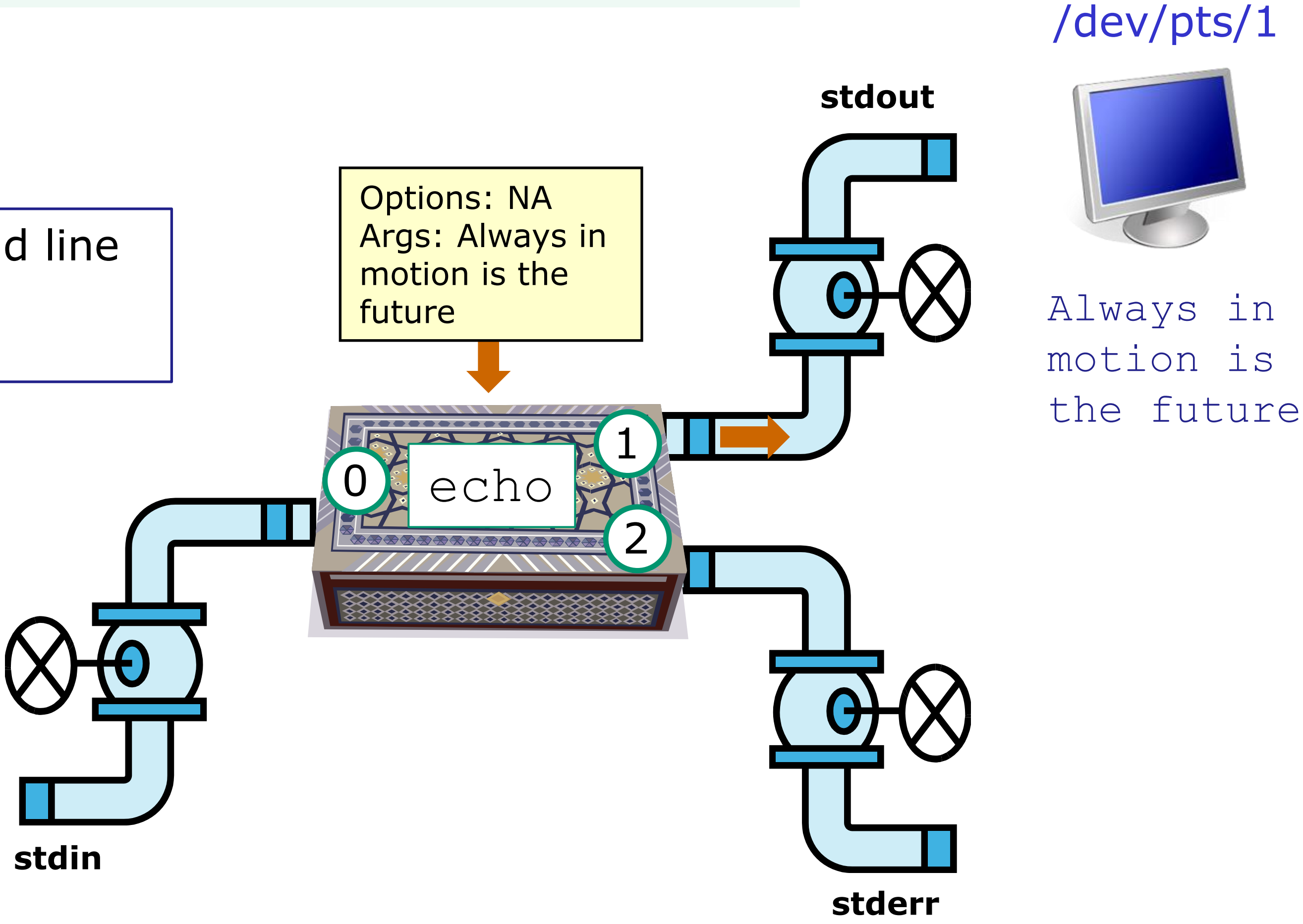
Program to Process (continuing)

Example program to process: echo command

```
[rsimms@opus ~]$ echo Always in motion is the future
Always in motion is the future
[rsimms@opus ~]$
```

Inputs: Command line

Outputs: stdout

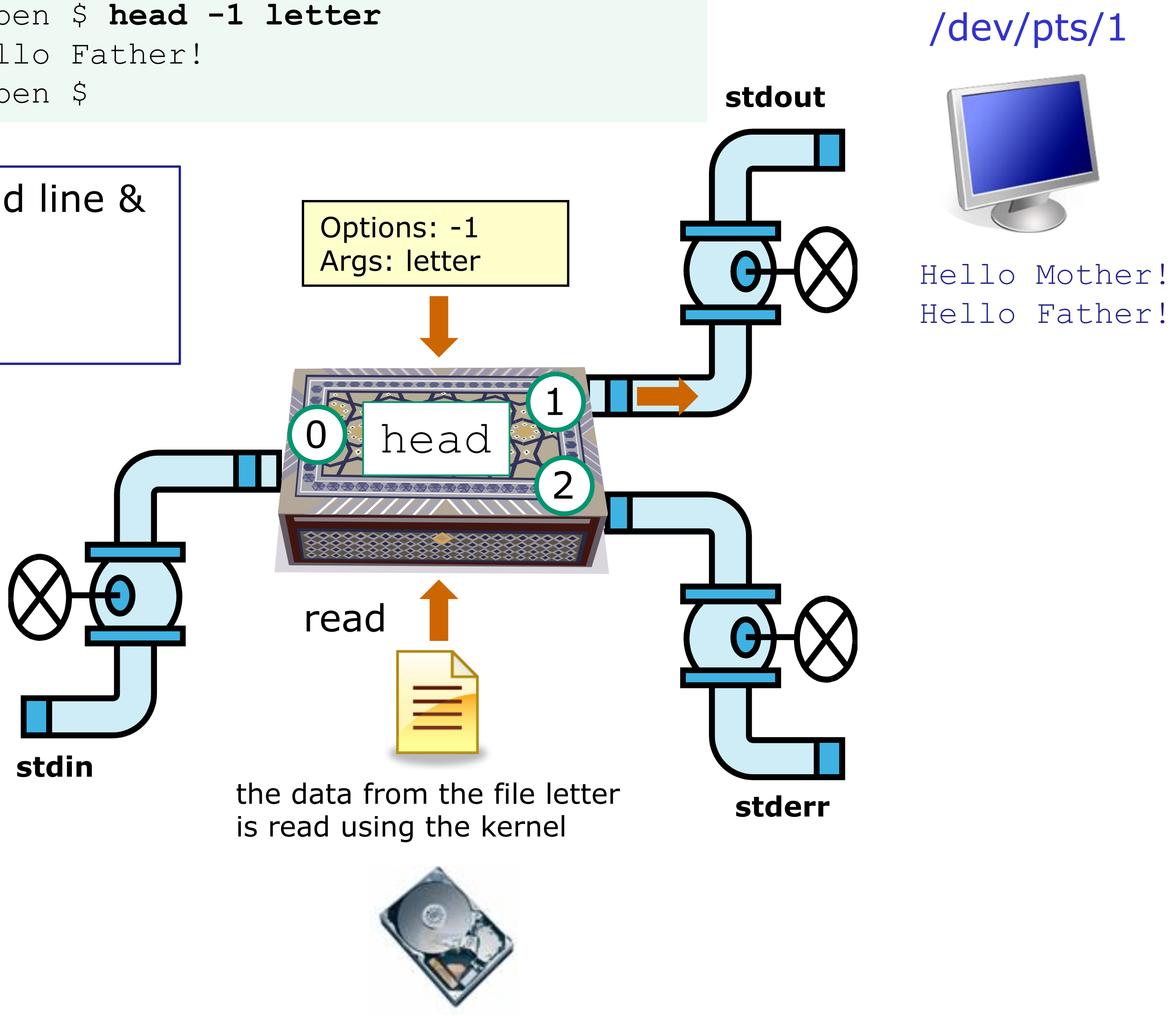

/dev/pts/1
stdout
Options: NA
Args: Always in motion is the future
Always in motion is the future
1
0
echo
2
stdin
stderr

Example program to process: head command

```
/home/cis90/simmsben $ head -1 letter
Hello Mother!  Hello Father!
/home/cis90/simmsben $
```

Inputs: Command line & Operating System

Outputs: stdout



```
Hello Mother!
Hello Father!
```

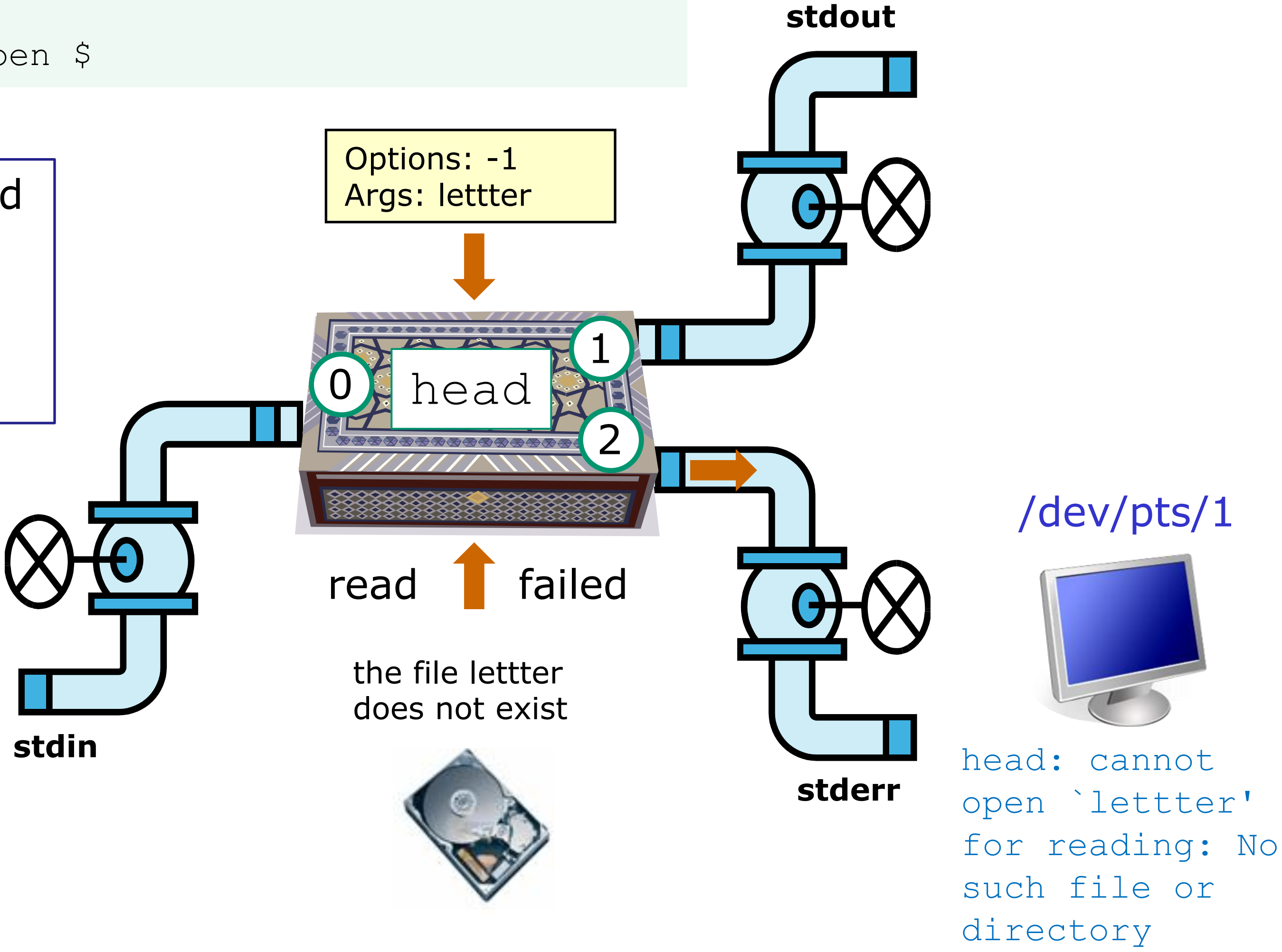
the data from the file letter is read using the kernel

Example program to process: head command

```
/home/cis90/simmsben $ head -1 lettter
head: cannot open `lettter' for reading: No such
file or directory
/home/cis90/simmsben $
```

Inputs: Command line & Operating System

Outputs: stderr



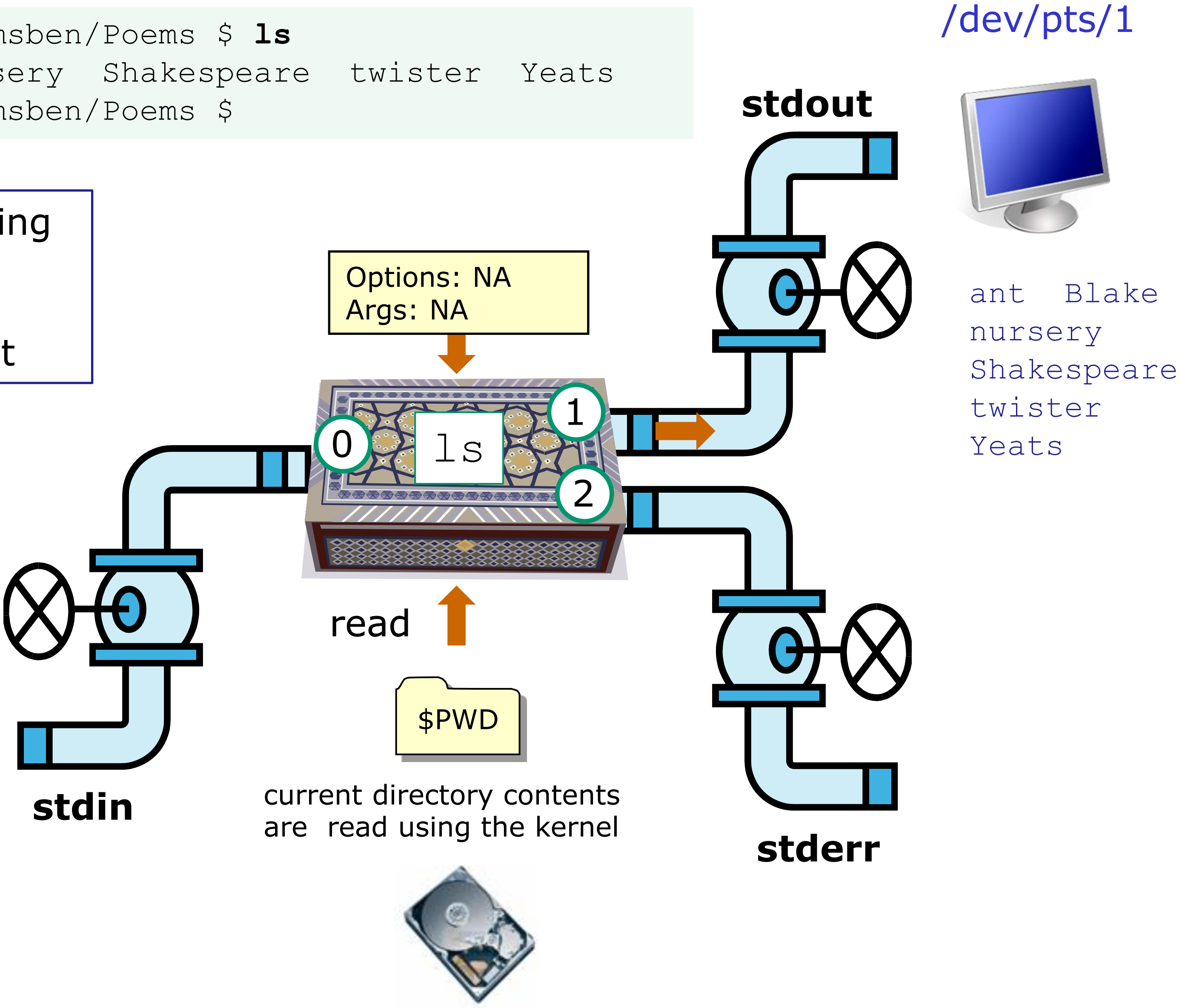
```
head: cannot
open `lettter'
for reading: No
such file or
directory
```

Example program to process: ls command

```
/home/cis90/simmsben/Poems $ ls
ant  Blake  nursery  Shakespeare  twister  Yeats
/home/cis90/simmsben/Poems $
```

Inputs: Operating System

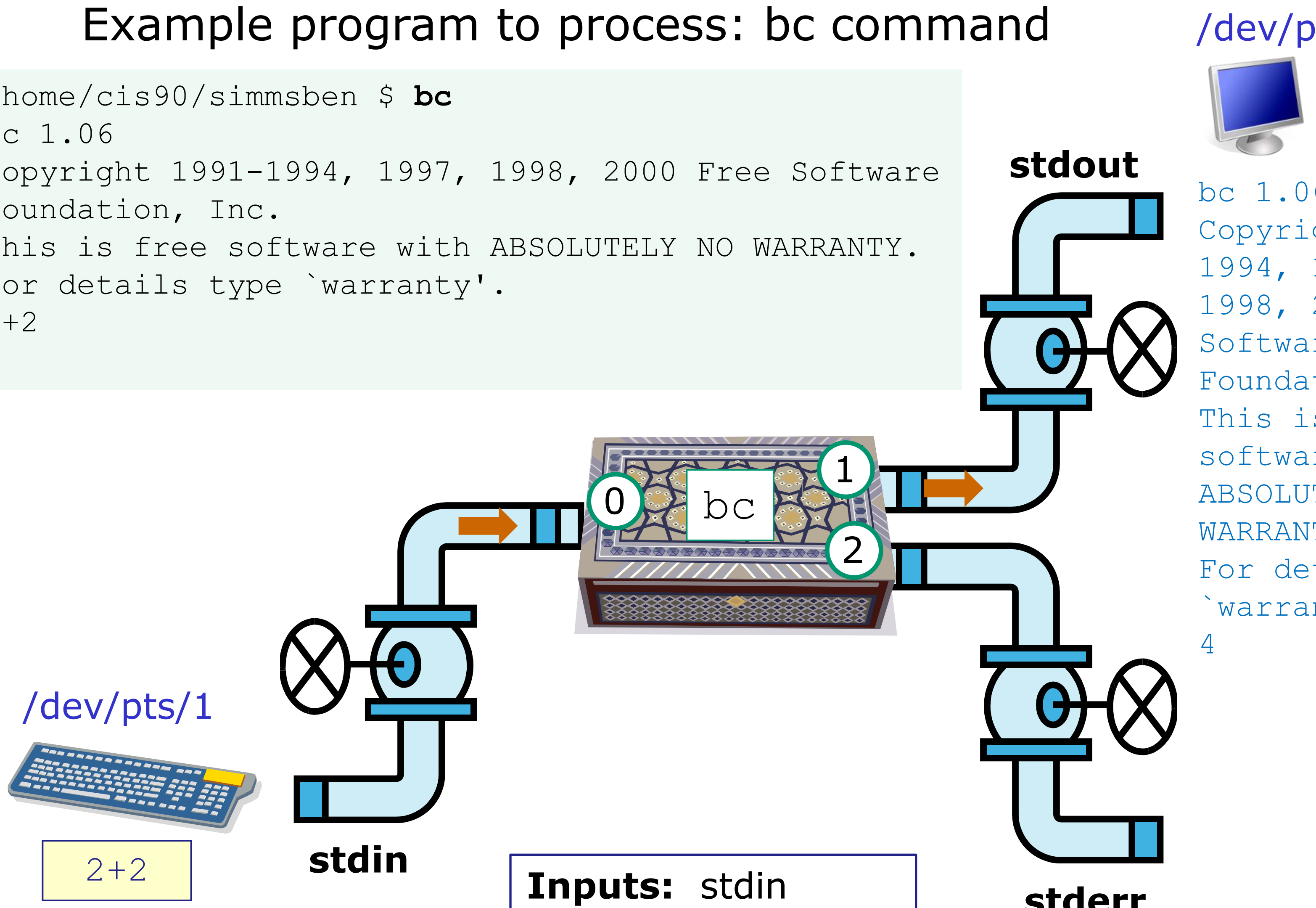
Outputs: stdout



current directory contents are read using the kernel

Example program to process: bc command

```
/home/cis90/simmsben $ bc
bc 1.06
Copyright 1991-1994, 1997, 1998, 2000 Free Software
Foundation, Inc.
This is free software with ABSOLUTELY NO WARRANTY.
For details type `warranty'.
2+2
4
```



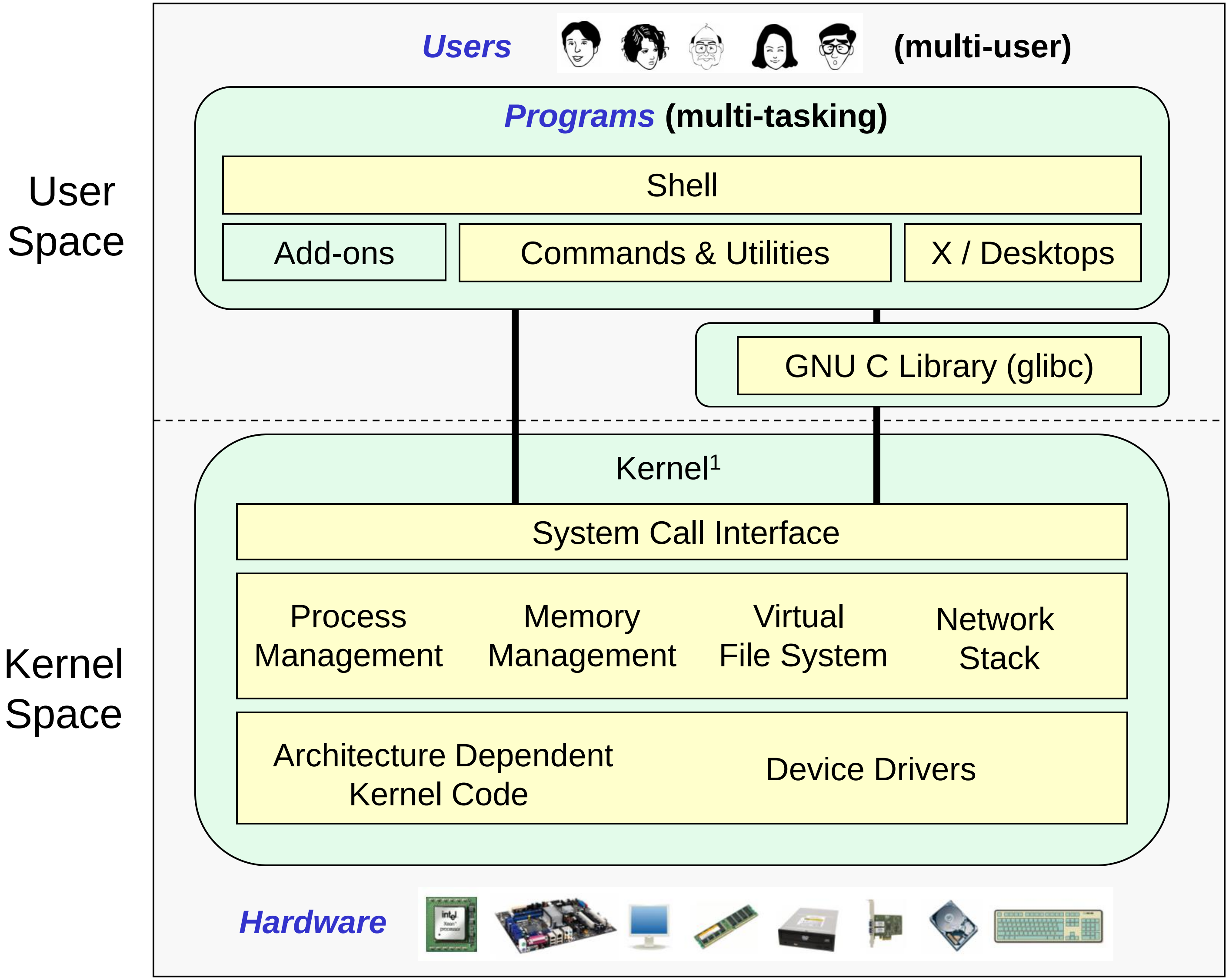
```
bc 1.06
Copyright 1991-
1994, 1997,
1998, 2000 Free
Software
Foundation, Inc.
This is free
software with
ABSOLUTELY NO
WARRANTY.
For details type
`warranty'.
4
```

Inputs: stdin

Outputs: stdout

Architecture (review)

GNU/Linux Operating System Architecture



User Space

Kernel Space

Users (multi-user)

Programs (multi-tasking)

Shell

Add-ons

Commands & Utilities

X / Desktops

GNU C Library (glibc)

Kernel[1]

System Call Interface

Process Management

Memory Management

Virtual File System

Network Stack

Architecture Dependent Kernel Code

Device Drivers

Hardware

Richard Stallman started the GNU project in 1983 to create a free UNIX-like OS. He Founded the Free Software Foundation in 1985. In 1989 he wrote the first version of the GNU General Public License

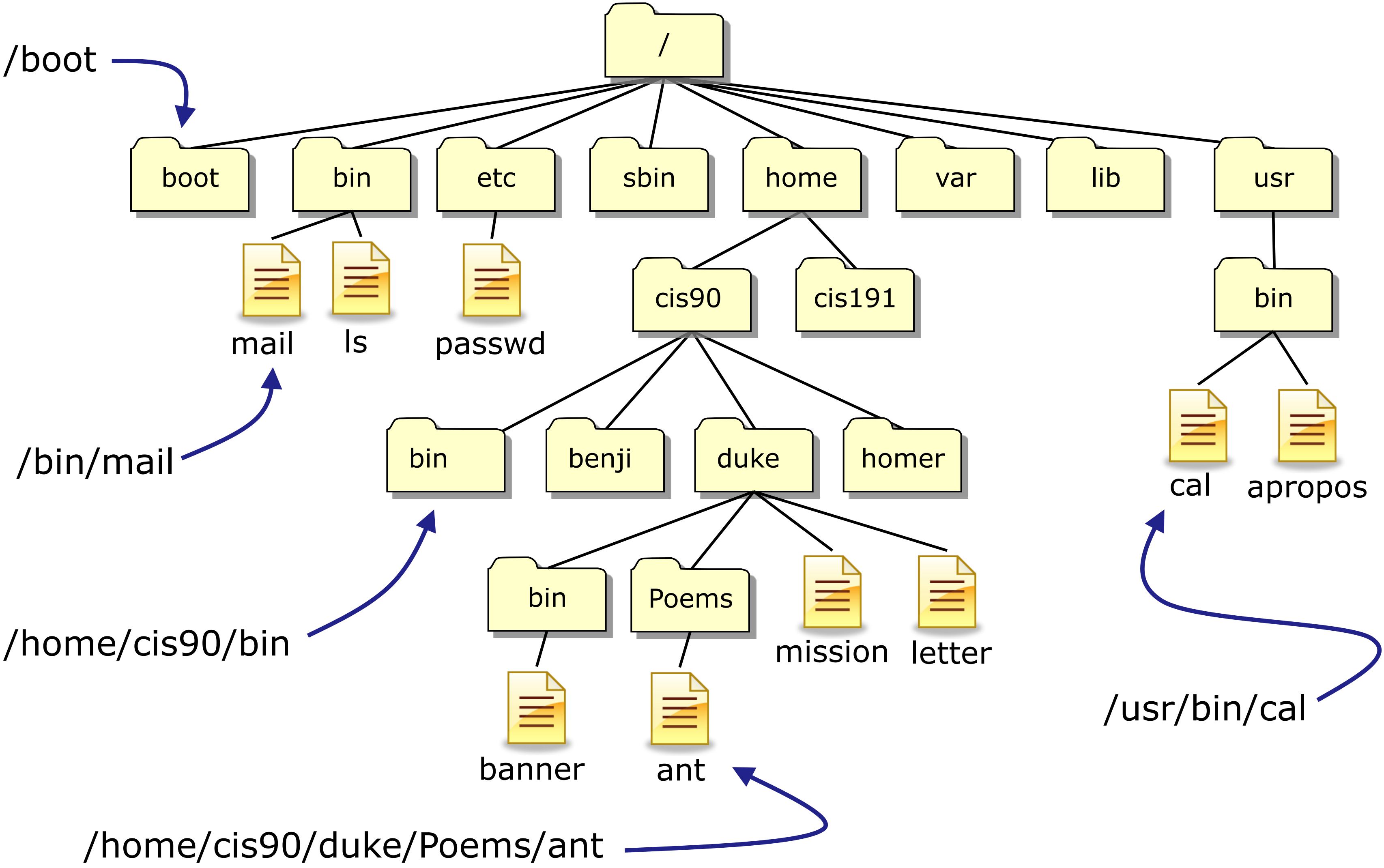
Linus Torvalds, as a student, initially conceived and assembled the Linux kernel in 1991. The kernel was later re-licensed under the GNU General Public License in 1992.

[1] See "Anatomy of the Linux kernel" by M. Tim Jones at http://www-128.ibm.com/developerworks/linux/library/l-linux-kernel/

File System (review)

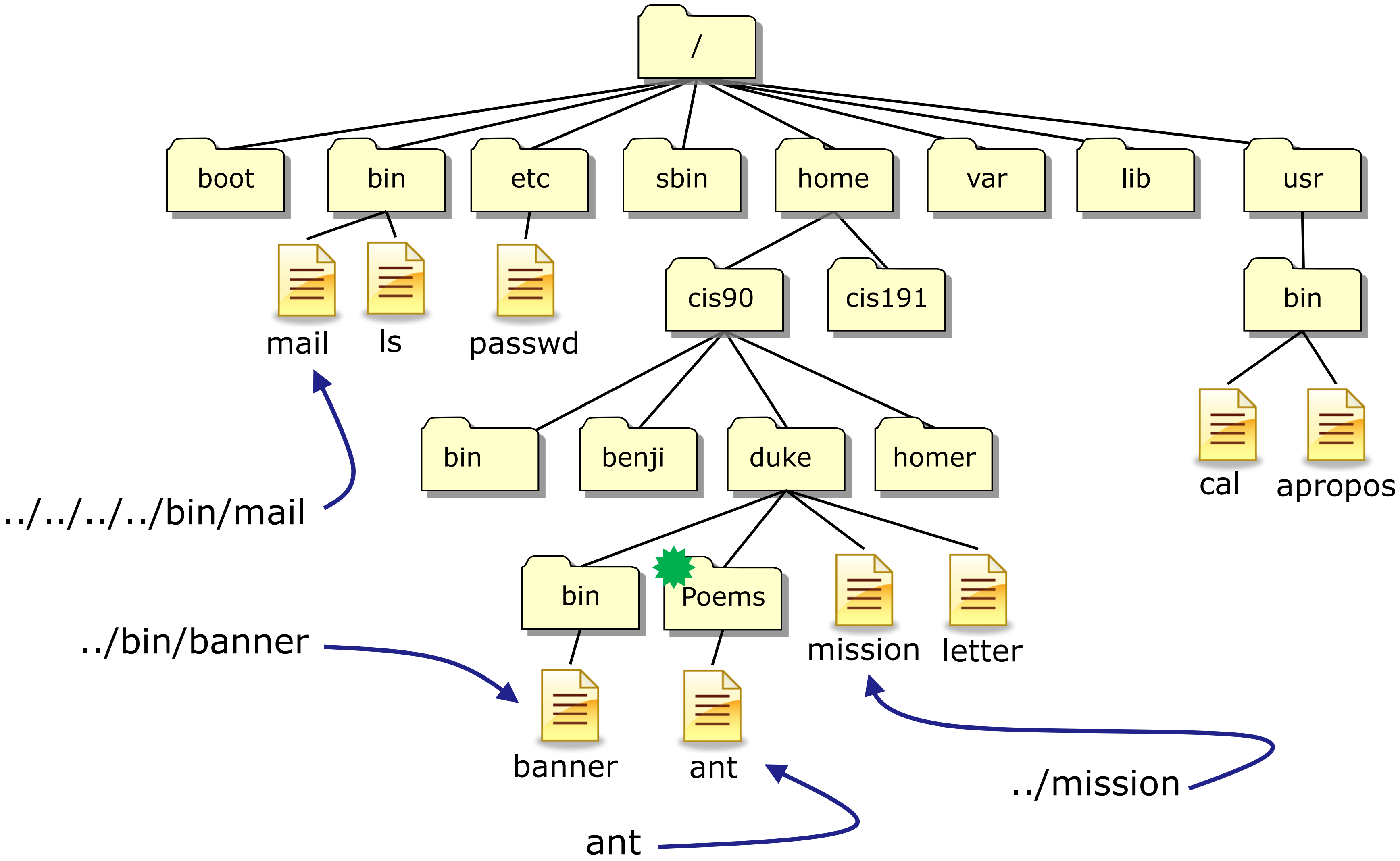
Absolute Pathnames

Fully specified names starting with /



Relative Pathnames

Names that start relative to the current working directory (✹)

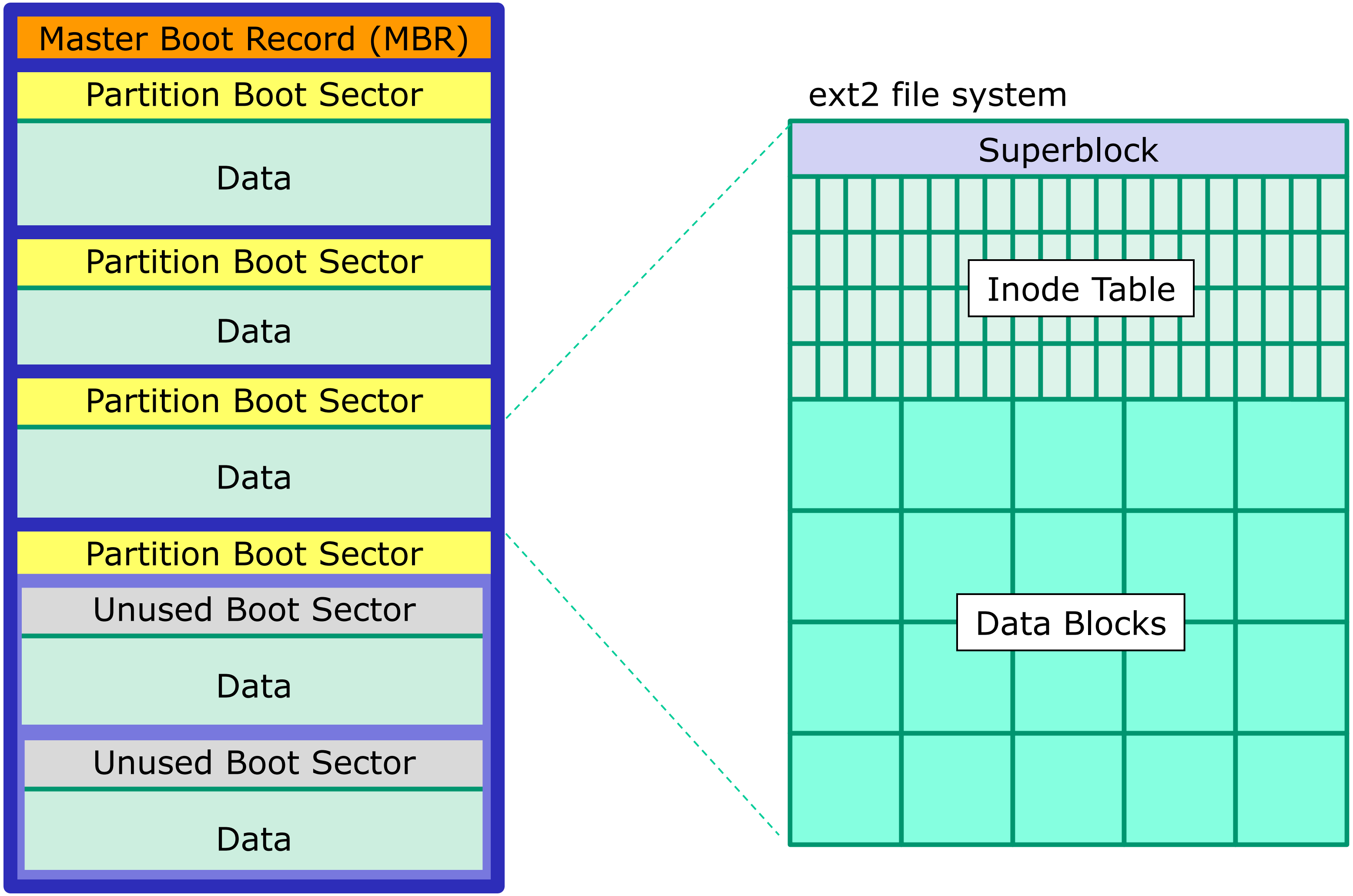


Top Level Directories

Directory	Contents
/bin	binary files forming the commands and shells used by the system administrator and users
/boot	files used during the initial boot-up process including the kernel
/dev	device files for connected hardware
/etc	system configuration files
/home	individual directories owned by each user
/lib	shared libraries needed to boot the system and run the commands in the root filesystem (i.e. commands in /bin and /sbin)
/lost+found	recovered files that were corrupted by power failures or system crashes
/mnt	mount points for floppies, cds, or other file systems
/opt	add-on software packages and/or commercial applications
/proc	kernel level process information
/root	home directory for the root user
/sbin	system administration commands reserved for the superuser (root)
/tmp	temporary files that are deleted when the system is rebooted or started
/usr	program files and related files for use by all users
/var	log files, print spool files, and mail queues

File Systems

Linux



The three elements of a UNIX file

```
/home/cis90/simben/Poems $ ls
ant  Blake  nursery  Shakespeare  twister  Yeats

/home/cis90/simben/Poems $ ls -li twister
102625 -rw-r--r-- 1 simben90 cis90 151 Jul 20  2001 twister

/home/cis90/simben/Poems $ cat twister
A tutor who tooted the flute,
tried to tutor two tooters to toot.
Said the two to the tutor,
"is it harder to toot?  Or to
tutor two tooters to toot?"
```

filename

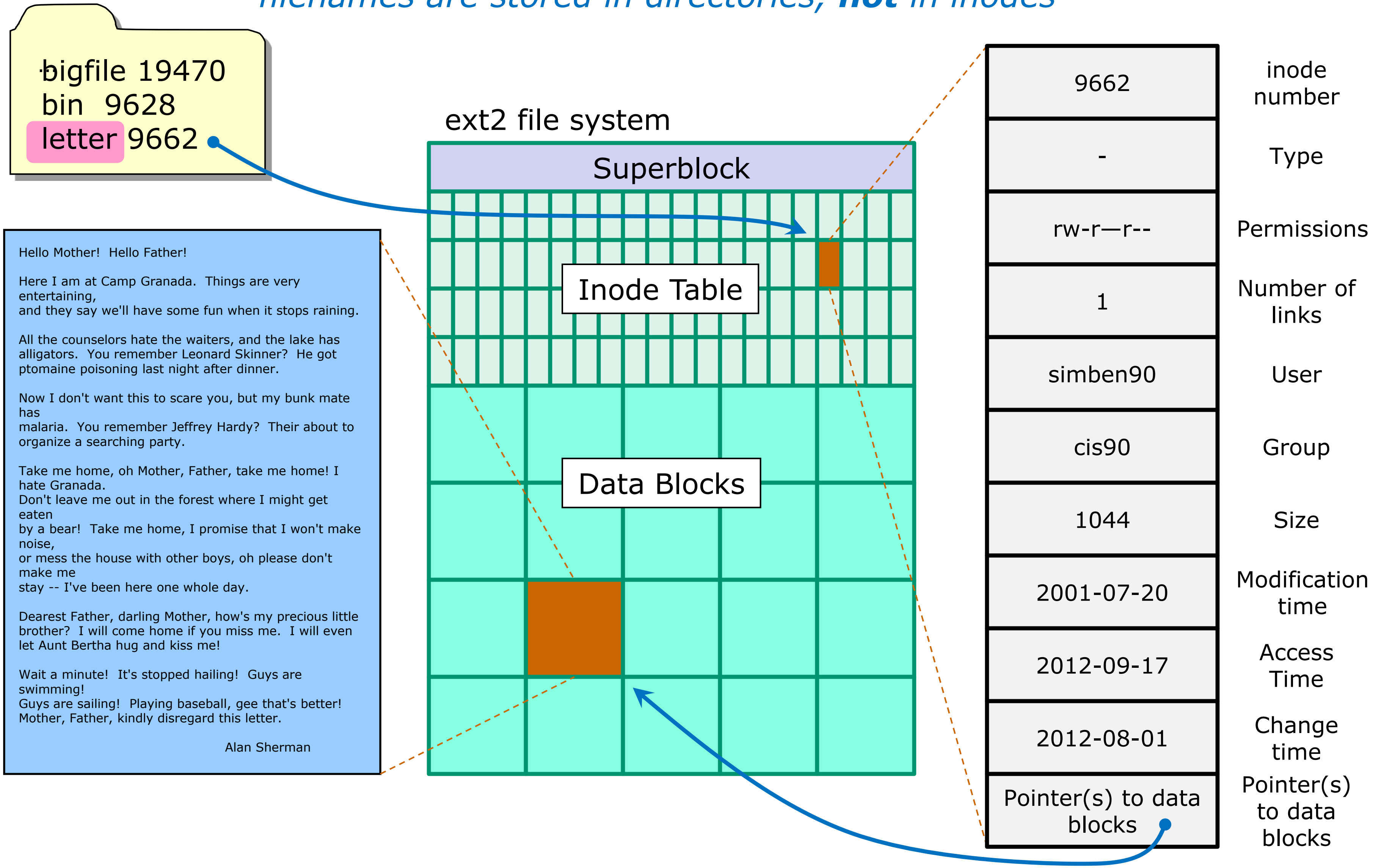
+

inode

+

data

*filenames are stored in directories, **not** in inodes*



Hello Mother! Hello Father!

Here I am at Camp Granada. Things are very
entertaining,
and they say we'll have some fun when it stops raining.

All the counselors hate the waiters, and the lake has
alligators. You remember Leonard Skinner? He got
ptomaine poisoning last night after dinner.

Now I don't want this to scare you, but my bunk mate
has
malaria. You remember Jeffrey Hardy? Their about to
organize a searching party.

Take me home, oh Mother, Father, take me home! I
hate Granada.
Don't leave me out in the forest where I might get
eaten
by a bear! Take me home, I promise that I won't make
noise,
or mess the house with other boys, oh please don't
make me
stay -- I've been here one whole day.

Dearest Father, darling Mother, how's my precious little
brother? I will come home if you miss me. I will even
let Aunt Bertha hug and kiss me!

Wait a minute! It's stopped hailing! Guys are
swimming!
Guys are sailing! Playing baseball, gee that's better!
Mother, Father, kindly disregard this letter.

Alan Sherman

9662	inode number
-	Type
rw-r—r--	Permissions
1	Number of links
simben90	User
cis90	Group
1044	Size
2001-07-20	Modification time
2012-09-17	Access Time
2012-08-01	Change time
Pointer(s) to data blocks	Pointer(s) to data blocks

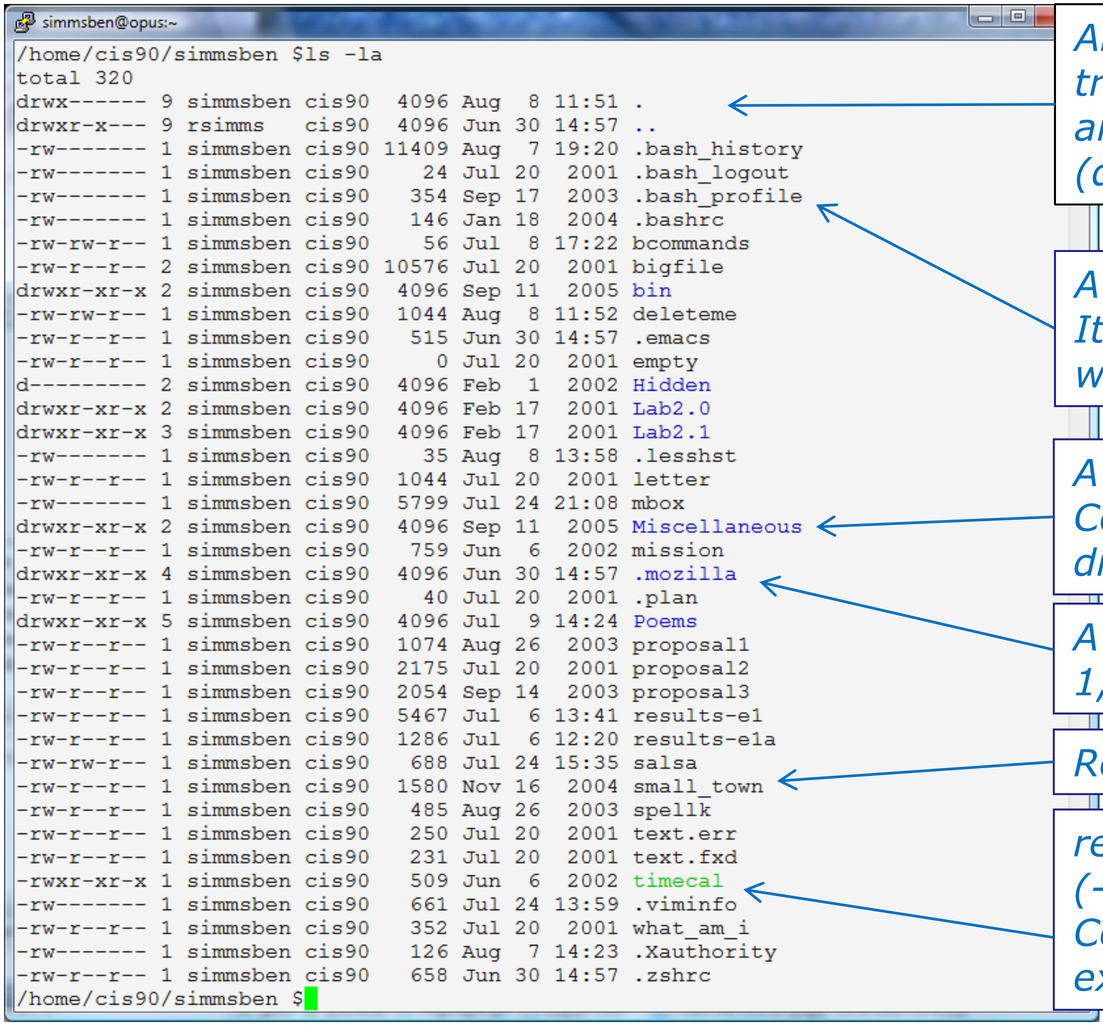
```
/home/cis90/simmsben $ ls -il letter
9662 -rw-r--r--. 1 simben90 cis90 1044 Jul 20  2001 letter
```

Basic File Types and Commands

Long listing code (ls –l)	Type		How to make one
d	directory		mkdir
-	regular • Programs • Text • Data (binary)	*Use the **file** command to further classify files*	touch
l	symbolic link		ln -s
c	character device files		mknod
b	block device files		mknod

Note: Other files types includes sockets (s) and named pipes (p)

Interpreting a long listing file types



```
/home/cis90/simmsben $ls -la
total 320
drwx------ 9 simmsben cis90  4096 Aug  8 11:51 .
drwxr-x--- 9 rsimms   cis90  4096 Jun 30 14:57 ..
-rw------- 1 simmsben cis90 11409 Aug  7 19:20 .bash_history
-rw------- 1 simmsben cis90    24 Jul 20  2001 .bash_logout
-rw------- 1 simmsben cis90   354 Sep 17  2003 .bash_profile
-rw------- 1 simmsben cis90   146 Jan 18  2004 .bashrc
-rw-rw-r-- 1 simmsben cis90    56 Jul  8 17:22 bcommands
-rw-r--r-- 2 simmsben cis90 10576 Jul 20  2001 bigfile
drwxr-xr-x 2 simmsben cis90  4096 Sep 11  2005 bin
-rw-rw-r-- 1 simmsben cis90  1044 Aug  8 11:52 deleteme
-rw-r--r-- 1 simmsben cis90   515 Jun 30 14:57 .emacs
-rw-r--r-- 1 simmsben cis90     0 Jul 20  2001 empty
d--------- 2 simmsben cis90  4096 Feb  1  2002 Hidden
drwxr-xr-x 2 simmsben cis90  4096 Feb 17  2001 Lab2.0
drwxr-xr-x 3 simmsben cis90  4096 Feb 17  2001 Lab2.1
-rw------- 1 simmsben cis90    35 Aug  8 13:58 .lesshst
-rw-r--r-- 1 simmsben cis90  1044 Jul 20  2001 letter
-rw------- 1 simmsben cis90  5799 Jul 24 21:08 mbox
drwxr-xr-x 2 simmsben cis90  4096 Sep 11  2005 Miscellaneous
-rw-r--r-- 1 simmsben cis90   759 Jun  6  2002 mission
drwxr-xr-x 4 simmsben cis90  4096 Jun 30 14:57 .mozilla
-rw-r--r-- 1 simmsben cis90    40 Jul 20  2001 .plan
drwxr-xr-x 5 simmsben cis90  4096 Jul  9 14:24 Poems
-rw-r--r-- 1 simmsben cis90  1074 Aug 26  2003 proposal1
-rw-r--r-- 1 simmsben cis90  2175 Jul 20  2001 proposal2
-rw-r--r-- 1 simmsben cis90  2054 Sep 14  2003 proposal3
-rw-r--r-- 1 simmsben cis90  5467 Jul  6 13:41 results-e1
-rw-r--r-- 1 simmsben cis90  1286 Jul  6 12:20 results-e1a
-rw-rw-r-- 1 simmsben cis90   688 Jul 24 15:35 salsa
-rw-r--r-- 1 simmsben cis90  1580 Nov 16  2004 small_town
-rw-r--r-- 1 simmsben cis90   485 Aug 26  2003 spellk
-rw-r--r-- 1 simmsben cis90   250 Jul 20  2001 text.err
-rw-r--r-- 1 simmsben cis90   231 Jul 20  2001 text.fxd
-rwxr-xr-x 1 simmsben cis90   509 Jun  6  2002 timecal
-rw------- 1 simmsben cis90   661 Jul 24 13:59 .viminfo
-rw-r--r-- 1 simmsben cis90   352 Jul 20  2001 what_am_i
-rw------- 1 simmsben cis90   126 Aug  7 14:23 .Xauthority
-rw-r--r-- 1 simmsben cis90   658 Jun 30 14:57 .zshrc
/home/cis90/simmsben $
```

All directories in the UNIX file tree contain these two hidden . and .. directories (d in column 1)

A regular file (- in column 1) Its hidden because it starts with a .

A directory (d in column 1) Color is blue because it's a directory

A hidden directory (d in column 1, name starts with .

Regular file (- in column 1)

regular file (- in column 1) Color is green because with execute bits are set

*Use the **file** command to get additional information about a file*

Symbolic links

A symbolic link file (l in column 1)

```
/home/cis90/simben $ ls -l accounts /etc/passwd
lrwxrwxrwx 1 simben90 cis90   11 Mar  7 08:52 accounts -> /etc/passwd
-rw-r--r-- 1 root     root  7183 Mar  6 08:17 /etc/passwd
/home/cis90/simben $
```

```
/home/cis90/simben $ head -5 /etc/passwd
root:x:0:0:root:/root:/bin/bash
bin:x:1:1:bin:/bin:/sbin/nologin
daemon:x:2:2:daemon:/sbin:/sbin/nologin
adm:x:3:4:adm:/var/adm:/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin

/home/cis90/simben $ head -5 accounts
root:x:0:0:root:/root:/bin/bash
bin:x:1:1:bin:/bin:/sbin/nologin
daemon:x:2:2:daemon:/sbin:/sbin/nologin
adm:x:3:4:adm:/var/adm:/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
```

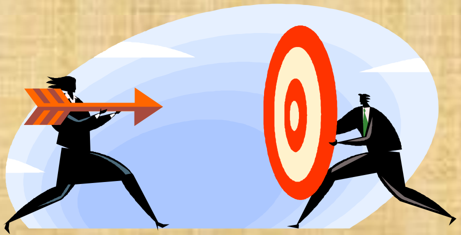
The accounts file in Benji’s directory is a symbolic link to the /etc/passwd file.

These “shortcuts” can be used for convenience

```
/home/cis90/simben $ ls -i accounts /etc/passwd
  99983 accounts   1280173 /etc/passwd
/home/cis90/simben $
```

Note they have different inodes

Relative/Absolute Pathname Target Practice



```
/home/cis90/bin/randomFile

# From …
# What is absolute/relative pathname to …
```

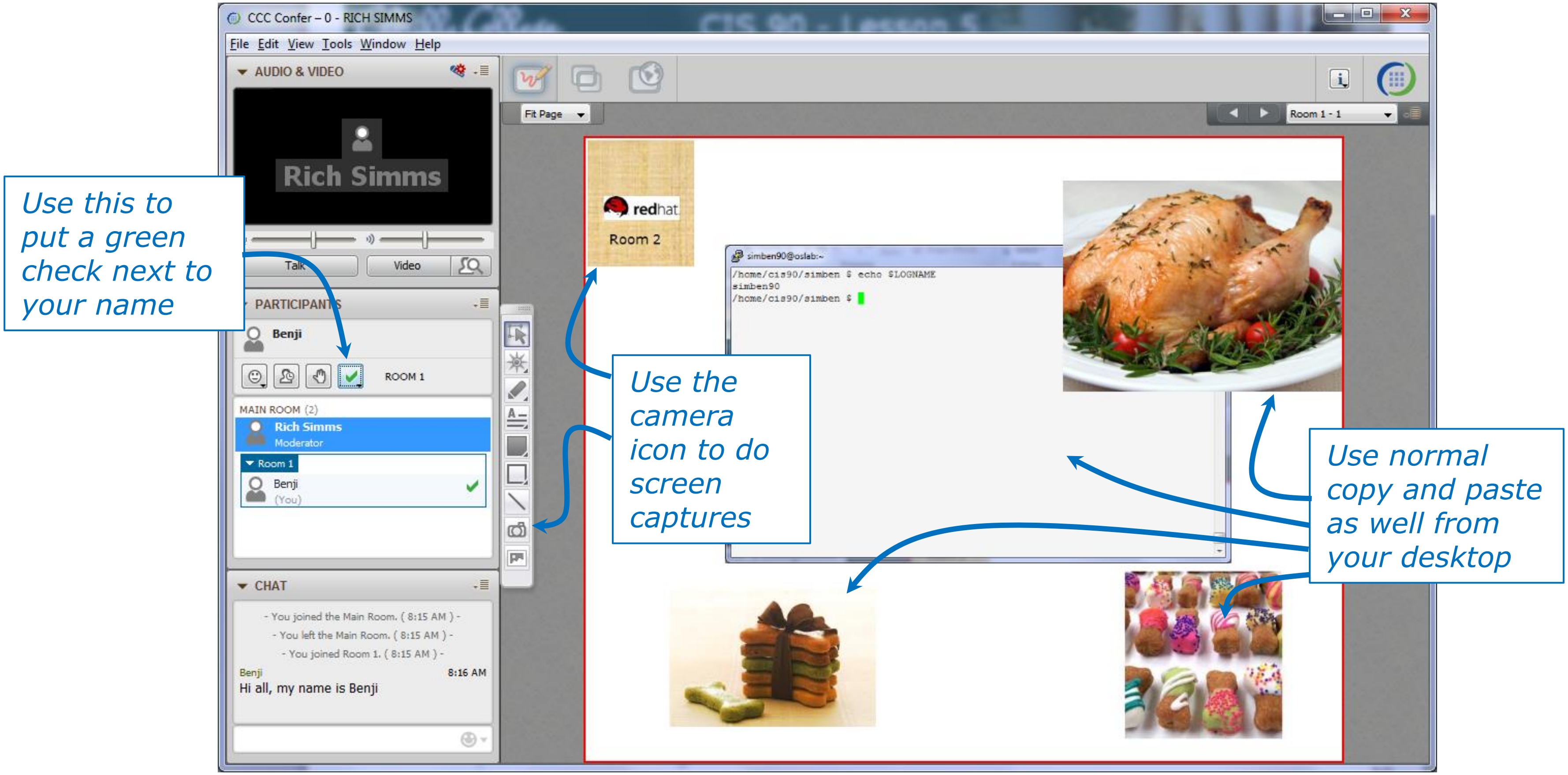
Type your answers in the chat window

CCC Confer

CCC Confer Breakout Rooms Test

debian	redhat	suse	CentOS	ubuntu	lm
Room 1	Room 2	Room 3	Room 4	Room 5	Room 6

Everyone needs to be on CCC Confer today, please use your Opus username.



```
/home/cis90/simben $ echo $LOGNAME
simben90
/home/cis90/simben $
```

- You joined the Main Room. (8:15 AM) -
- You left the Main Room. (8:15 AM) -
- You joined Room 1. (8:15 AM) -

Benji 8:16 AM
Hi all, my name is Benji

Use this to put a green check next to your name

Use the camera icon to do screen captures

Use normal copy and paste as well from your desktop

I'll be sending you into virtual breakout rooms today so you can work together on various activities

CCC Confer Activity

debian	redhat	suse	CentOS	ubuntu	lm
Room 1	Room 2	Room 3	Room 4	Room 5	Room 6

1. Download the presentation slides for Lesson 5 from the Calendar page of the web site.

2. Locate this slide.

3. Put a green check next to your name when you have done steps 1-2.

When I see the green checks I'll distribute you the different rooms

1. In your breakout room, see if you can do the following:
   - Introduce yourselves using room chat window.
   - Use whiteboard camera icon to copy your Linux logo above. Note you can resize the screen rectangle that is copied.
   - Each student use the **echo $LOGNAME** command in a Putty/MAC terminal and then paste a copy of their ssh session on the whiteboard.
   - Decorate your room with anything else so you will recognize it when you return.
   - Return to the main room when finished (drag your name from the breakout room back to the main room)

Flashcards

Lessons L1-L5 random

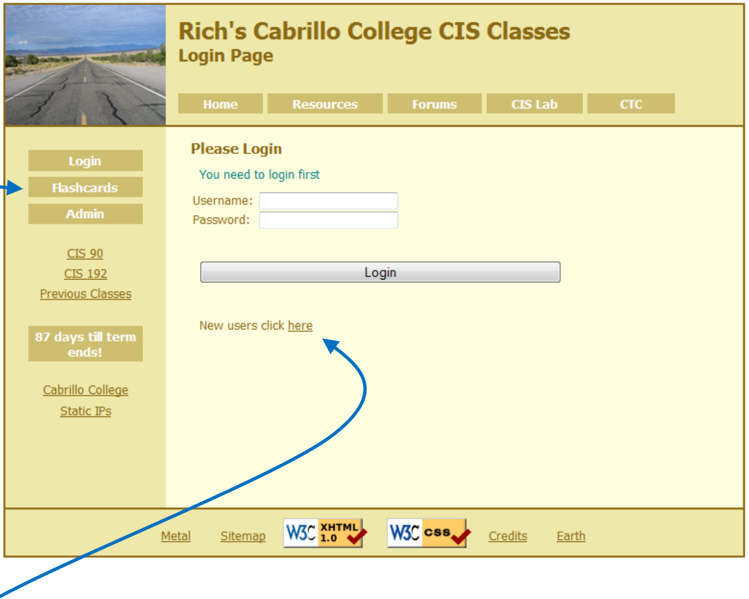
Flashcards
Deck size " "
L1=18
L2=22
L3=5
L4=26
L5=4
Total=75

Rules

- Chat window belongs to team that is up (no one else can use)
- "Final Answer" must be from someone on team that hasn't answered yet
- All team members can help each other and suggest answers

Flash Cards

Click on Flashcards in left panel



Rich's Cabrillo College CIS Classes
Login Page

Please Login

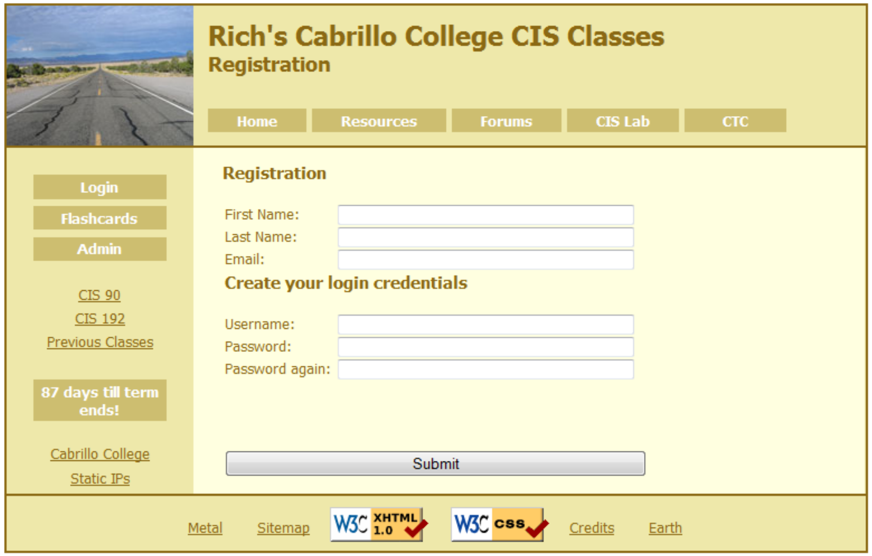
You need to login first

Username:
Password:

New users click here

87 days till term ends!

Register if this is the first time using Flashcards



Rich's Cabrillo College CIS Classes
Registration

Registration

First Name:
Last Name:
Email:

Create your login credentials

Username:
Password:
Password again:

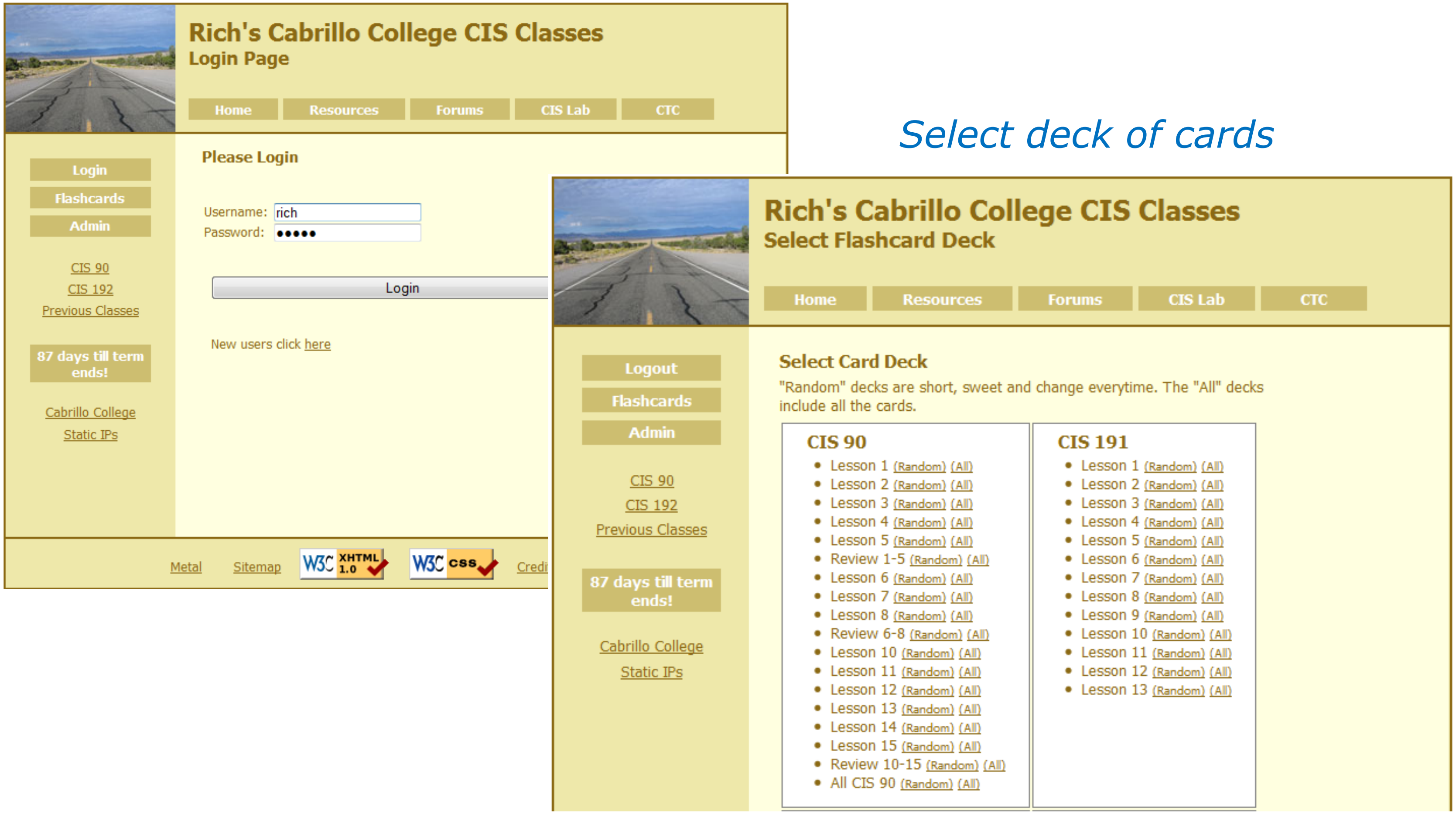
87 days till term ends!

Register and choose a username and password of your choice

Logging in and using Flashcards

Login with your username and password

Select deck of cards



Rich's Cabrillo College CIS Classes
Login Page

Please Login

Username: rich
Password: ●●●●●

New users click here

Rich's Cabrillo College CIS Classes
Select Flashcard Deck

Select Card Deck

"Random" decks are short, sweet and change everytime. The "All" decks include all the cards.

CIS 90

- Lesson 1 (Random) (All)
- Lesson 2 (Random) (All)
- Lesson 3 (Random) (All)
- Lesson 4 (Random) (All)
- Lesson 5 (Random) (All)
- Review 1-5 (Random) (All)
- Lesson 6 (Random) (All)
- Lesson 7 (Random) (All)
- Lesson 8 (Random) (All)
- Review 6-8 (Random) (All)
- Lesson 10 (Random) (All)
- Lesson 11 (Random) (All)
- Lesson 12 (Random) (All)
- Lesson 13 (Random) (All)
- Lesson 14 (Random) (All)
- Lesson 15 (Random) (All)
- Review 10-15 (Random) (All)
- All CIS 90 (Random) (All)

CIS 191

- Lesson 1 (Random) (All)
- Lesson 2 (Random) (All)
- Lesson 3 (Random) (All)
- Lesson 4 (Random) (All)
- Lesson 5 (Random) (All)
- Lesson 6 (Random) (All)
- Lesson 7 (Random) (All)
- Lesson 8 (Random) (All)
- Lesson 9 (Random) (All)
- Lesson 10 (Random) (All)
- Lesson 11 (Random) (All)
- Lesson 12 (Random) (All)
- Lesson 13 (Random) (All)

Class Exercise

Flashcards

- Browse to simms-teach.com
- Register with a username and password of your choice
- Verify you can login and use the flash cards.

Test Prep

run ./trouble-p1 on sun-hwa as root

Reminder to instructor:

On Sun-Hwa, run trouble-P1 as root for practice test
on Opus, /home/rsimms/cis90/test01/q14/mail-q14-practice

Reminder to students:

Be sure to logout of Sun-Hwa after doing last exercise before logging in again to work on practice test

First Test

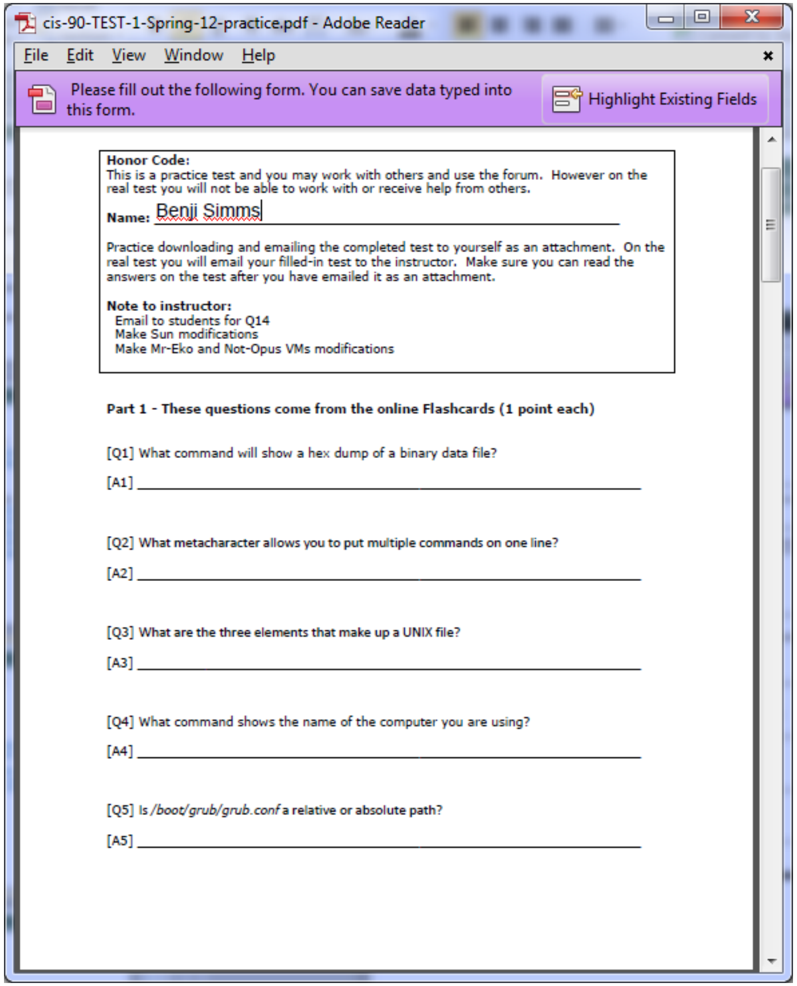
1. Example flash card question:
   What is the program called that prompts you for a command, then locates that command and executes it?

2. Example operational question:
   From your home directory change to the Poems/Yeats/ directory. What one-liner (one ore more commands followed by Enter) would clear the screen and print the last line of all three Yeats poems without having to type the names of each individual poem file name?

How to prepare for the test:

- Review slides for Lessons 1-5 (download and make sure you know how to electronically search PDFs)
- DO THE PRACTICE TEST
- Compare your practice test answers used with others and discuss on the forum
- DO THE PRACTICE TEST
- Note the steps you take to answer each question so you can use them again on the real test
- DO THE PRACTICE TEST
- Go through the Lesson 1-5 flashcards till you feel comfortable with the material
- DO THE PRACTICE TEST
- Practice, practice, practice ... repeating Labs 1-4 never hurts!

Practice Test


cis-90-TEST-1-Spring-12-practice.pdf - Adobe Reader
File Edit View Window Help
Highlight Existing Fields

Please fill out the following form. You can save data typed into this form.

Honor Code:
This is a practice test and you may work with others and use the forum. However on the real test you will not be able to work with or receive help from others.

Name: Benji Simms

Practice downloading and emailing the completed test to yourself as an attachment. On the real test you will email your filled-in test to the instructor. Make sure you can read the answers on the test after you have emailed it as an attachment.

Note to instructor:
Email to students for Q14
Make Sun modifications
Make Mr-Eko and Not-Opus VMs modifications

Part 1 - These questions come from the online Flashcards (1 point each)

[Q1] What command will show a hex dump of a binary data file?

[A1] ____________________

[Q2] What metacharacter allows you to put multiple commands on one line?

[A2] ____________________

[Q3] What are the three elements that make up a UNIX file?

[A3] ____________________

[Q4] What command shows the name of the computer you are using?

[A4] ____________________

[Q5] Is */boot/grub/grub.conf* a relative or absolute path?

[A5] ____________________

A practice test is available on the web site Calendar page.

Download it, open with Adobe Reader, fill in with your answers, and save it.

Make sure you can email it as an attachment to yourself to verify your answers were saved.

You may need to download the latest version of Adobe Reader if you have problems filling it out.

What command … ?

Tips on how to answer questions on lab assignments and tests

What command will do "blah, blah, blah" questions:

Examples:

- What **ls** command allows you to see the permissions of your home directory while you are in your home directory?
- What command will give you a prompt showing your current working directory path and a $?
- What command allows you to see hidden files in your current directory?

Tip: Always use Opus (or the appropriate VM) to test your answers for these kinds of questions. ***I will!*** *If your command doesn't work it won't be the right answer!*

Practice Question

What **ls** command allows you to see the permissions of your home directory while you are in your home directory?

Practice Question

What **ls** command allows you to see the permissions of your home directory while you are in your home directory?

```
/home/cis90/simben $ ls -l
total 392
-rw-r--r-- 2 simben90 cis90  10576 Jul 20  2001 bigfile
drwxr-xr-x 2 simben90 cis90   4096 Feb 12 16:07 bin
-rw------- 1 simben90 cis90    606 Feb 29 22:17 dead.letter
-rw-r--r-- 1 simben90 cis90      0 Jul 20  2001 empty
d--------- 2 simben90 cis90   4096 Feb  1  2002 Hidden
< snipped >
-rw-r--r-- 1 simben90 cis90    250 Jul 20  2001 text.err
-rw-r--r-- 1 simben90 cis90    231 Jul 20  2001 text.fxd
-rwxr-xr-x 1 simben90 cis90    509 Jun  6  2002 timecal
-rw-rw-r-- 1 simben90 cis90  25390 Feb 29 22:18 uhistory

-rw-r--r-- 1 simben90 cis90    352 Mar  5 08:24 what_am_i
/home/cis90/simben $
```

Nope, that didn't work. *We got permissions of all the files in the directory but we didn't get the permissions of the directory itself!*

Practice Question

What **ls** command allows you to see the permissions of your home directory while you are in your home directory?

```
/home/cis90/simben $ ls -dl /home/cis90/simben
drwxr-xr-x 10 simben90 cis90 4096 Mar  1 10:15

/home/cis90/simben $ ls -dl ~
drwxr-xr-x 10 simben90 cis90 4096 Mar  1 10:15

/home/cis90/simben $ ls -dl .
drwxr-xr-x 10 simben90 cis90 4096 Mar  1 10:15 .

/home/cis90/simben $ ls -dl $HOME
drwxr-xr-x 10 simben90 cis90 4096 Mar  1 10:15

/home/cis90/simben $ ls -dl
drwxr-xr-x 10 simben90 cis90 4096 Mar  1 10:15 .
```

Yep, that worked! *The -d option instructs the ls command not to descend into the directory. Any of the commands above would be correct.*

Practice Question

What command will give you a prompt showing your current working directory path and a $?

Practice Question

What command will give you a prompt showing your current working directory path and a $?

```
/home/cis90/simben $ PS1=blah
blah
blahPS1="/home/cis90/simben $ "
/home/cis90/simben $
/home/cis90/simben $ cd ..
/home/cis90/simben $ cd
/home/cis90/simben $
/home/cis90/simben $ echo $PS1
/home/cis90/simben $
```

***Nope, that didn’t work**. The prompt doesn’t change after changing to another directory*

Practice Question

What command will give you a prompt showing your current working directory path and a $?

```
/home/cis90/simben $ PS1=blah
blah
blahPS1="PWD $ "
PWD $
PWD $ echo $PS1
PWD $
```

Nope, that didn't work either*. A $ in front of the variable name is required to use its value.*

Practice Question

What command will give you a prompt showing your current working directory path and a $?

```
PWD $ PS1=blah
blah
blahPS1="$PWD $ "
/home/cis90/simben $ cd ..
/home/cis90/simben $ cd
/home/cis90/simben $
/home/cis90/simben $ echo $PS1
/home/cis90/simben $
```

Better, but still didn’t work*. The prompt is still not changing after cd’ing to another directory.*

We need to block bash from expanding the $PWD variable when it’s being set.

Practice Question

What command will give you a prompt showing your current working directory path and a $?

```
/home/cis90/simben $ PS1=blah
blah
blahPS1='$PWD $ '
/home/cis90/simben $ cd ..
/home/cis90 $ cd
/home/cis90/simben $
/home/cis90/simben $ echo $PS1
$PWD $
```

Touchdown! That worked!

The single quotes prevent bash from expanding $PWD when setting the PS1 variable.

It is not expanded till the prompt is actually generated for the next command.

Practice Question

What command allows you to see hidden files in your current directory?

Practice Question

What command allows you to see hidden files in your current directory?

```
/home/cis90/simben $ ls
bigfile       lab01.graded     Lab2.1         mission     small_town  uhistory
bin           lab01-submitted  letter         Poems       spellk      what_am_i
dead.letter   lab02.graded     log            proposal1   text.err
empty         lab03.graded     mbox           proposal2   text.fxd
Hidden        Lab2.0           Miscellaneous  proposal3   timecal
```

Nope, that didn't work! *Hidden files start with a "." and note of these start with a "." (period)*

Practice Question

What command allows you to see hidden files in your current directory?

```
/home/cis90/simben $ ls -a
.              dead.letter      Lab2.0         .mozilla    .ssh
..             .emacs           Lab2.1         .plan       text.err
.bash_history  empty            .lesshst       Poems       text.fxd
.bash_logout   Hidden           letter         proposal1   timecal
.bash_profile  lab01.graded     log            proposal2   uhistory
.bashrc        lab01-submitted  mbox           proposal3   .viminfo
bigfile        lab02.graded     Miscellaneous  small_town  what_am_i
bin            lab03.graded     mission        spellk
```

Bingo, that worked! *Hidden files and directories start with a "." (period)*

How many arguments or “parse this command” questions

Tips on how to answer questions on lab assignments and tests

How many arguments or “parse this command” questions

Example: The shell performs file name expansion during the Parse step. When a user types the command: **file /v*/l??/*o*.[14]** on Opus, how many arguments get passed to the **file** command? What specifically are those arguments?

Tip: Use the echo command to preview how the shell will expand arguments containing metacharacters.

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Practice Question

The shell performs file name expansion during the Parse step. When a user types the command: **file /v*/l??/*o*.[14]** on Opus, how many arguments get passed to the **file** command? What specifically are those arguments?

```
/home/cis90ol/simmsben $ echo /v*/l??/*o*.[14]
/var/log/boot.log.1 /var/log/boot.log.4 /var/log/cron.1 /var/log/cron.4
  /var/log/maillog.1 /var/log/maillog.4 /var/log/spooler.1
  /var/log/spooler.4 /var/log/yum.log.1
```

Answer: The shell will expand ***/v*/l??/*o*.[14]*** *into the 9 arguments shown above*

Practice Question

Parse the following command on Opus:

```
wc -wl /home/cis90/d*t/*w*
```

what is the second argument passed to the **wc** command?

Practice Question

Parse the following command on Opus:

```
wc -wl /home/cis90/d*t/*w*
```

what is the second argument passed to the **wc** command?

command: **wc**
options: **w** and **l**
arguments:

```
[rsimms@oslab ~]$ echo /home/cis90/d*t/*w*
/home/cis90/depot/network /home/cis90/depot/newfile /home/cis90/depot/randomwords
```

3 arguments, the second argument is

Answer: /home/cis90/depot/newfile

Practice Question

Parse the following command on Opus:

```
wc -wl /home/cis90/d*t/*w*
```

Regarding the options passed to the wc command, how many and what are they?

Practice Question

Parse the following command on Opus:

```
wc -wl /home/cis90/d*t/*w*
```

Regarding the options passed to the wc command, how many and what are they?

command: `wc`
options: `w` and `l`
arguments:

```
/home/cis90/depot/network
/home/cis90/depot/newfile
/home/cis90/depot/randomwords
```

Answer: there are two options, w and l

Absolute/relative pathname questions:

Tips on how to answer questions on lab assignments and tests

Absolute/relative pathname questions:

Examples:

- What is the relative pathname from your home directory to the **date** command?
- What is the absolute path to the sonnet1 file in your Shakespeare directory?

*Tip: Use the **ls** command with tab completion to verify your absolute or relative pathnames*

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Tip: Use the ls command with tab completion to verify your absolute or relative pathnames

Practice

What is the relative pathname from your home directory to the **date** command?

Practice

What is the relative pathname from your home directory to the **date** command?

First, use the type command to find where the date command is

```
/home/cis90/simmsben $ type date
date is /bin/date

/home/cis90/simben $ ls ../
ahrmat/         colabd/         huljef/         olscam/         rodduk/
answers/        deltas/         jimmel/         pacnan/         shidev/
.bash_profile   depot/          lowmic/         phacha/         simben/
bin/            doucor/         macrya/         plajos/         varana/
blerav/         flamat/         maxsco/         plajua/         veleli/
bodian/         gueous/         mcidar/         porjon/
bunsol/         guest/          milhen/         pummas/
cheken/         helrog/         milhom/         rafdav/
cofcol/         hovdav/         milmic/         reedie/
/home/cis90/simben $ ls ../../
backup/       cis191/       cis90/        guest/        rick/         turnin/
cis164/       cis192/       cis98/        jimg/         rsimms/       .Xauthority
cis172/       cis193/       gerlinde/     mikki/        ryan/
/home/cis90/simben $ ls ../../../
.autofsck    etc/         media/       opt/         selinux/     tmp/
bin/         home/        misc/        proc/        srv/         u/
boot/        lib/         mnt/         root/        sys/         usr/
dev/         lost+found/  net/         sbin/        tftpboot/    var/
/home/cis90/simben $ ls ../../../bin/date
../../../bin/date
/home/cis90/simben $
```

Tap tab key twice to see what is in that directory

No errors so this relative pathname is GOOD!

Answer: ../../../bin/date

Example

What is the absolute path to the sonnet1 file in your Shakespeare directory?

Practice

What is the absolute path to the sonnet1 file in your Shakespeare directory?

```
/home/cis90/simben $ ls /
.autofsck   etc/        media/      opt/        selinux/    tmp/
bin/        home/       misc/       proc/       srv/        u/
< snipped >
/home/cis90/simben $ ls /home/
backup/      cis191/      cis90/       guest/       rick/        turnin/
< snipped >
/home/cis90/simben $ ls /home/cis90/
ahrmat/        colabd/        huljef/        olscam/        rodduk/
answers/       deltas/        jimmel/        pacnan/        shidev/
.bash_profile  depot/         lowmic/        phacha/        simben/
< snipped >
cofcol/        hovdav/        milmic/        reedie/
/home/cis90/simben $ ls /home/cis90/simben/
.bash_history    lab01.graded     Miscellaneous/   .ssh/
< snipped >
.bashrc          lab03.graded     .plan            timecal
bigfile          Lab2.0/          Poems/           uhistory
< smipped >
Hidden/          mbox             spellk
/home/cis90/simben $ ls /home/cis90/simben/Poems/
ant          Blake/       nursery      Shakespeare/ twister      Yeats/
/home/cis90/simben $ ls /home/cis90/simben/Poems/Shakespeare/sonnet
sonnet1   sonnet11  sonnet17  sonnet26  sonnet35  sonnet5   sonnet9
sonnet10  sonnet15  sonnet2   sonnet3   sonnet4   sonnet7
/home/cis90/simben $ ls /home/cis90/simben/Poems/Shakespeare/sonnet1
/home/cis90/simben/Poems/Shakespeare/sonnet1
```

Tap tab key twice to see what is in that directory

No errors so this absolute pathname is GOOD!

Wrap up

New commands:

NA	NA

New metacharacters:

?	Matches any single character
[]	Matches any character in the brackets

New Files and Directories:

NA	NA

Next Class

Assignment: Check Calendar Page on web site to see what is coming up.

No Quiz

No Lab due

Test !

Backup