



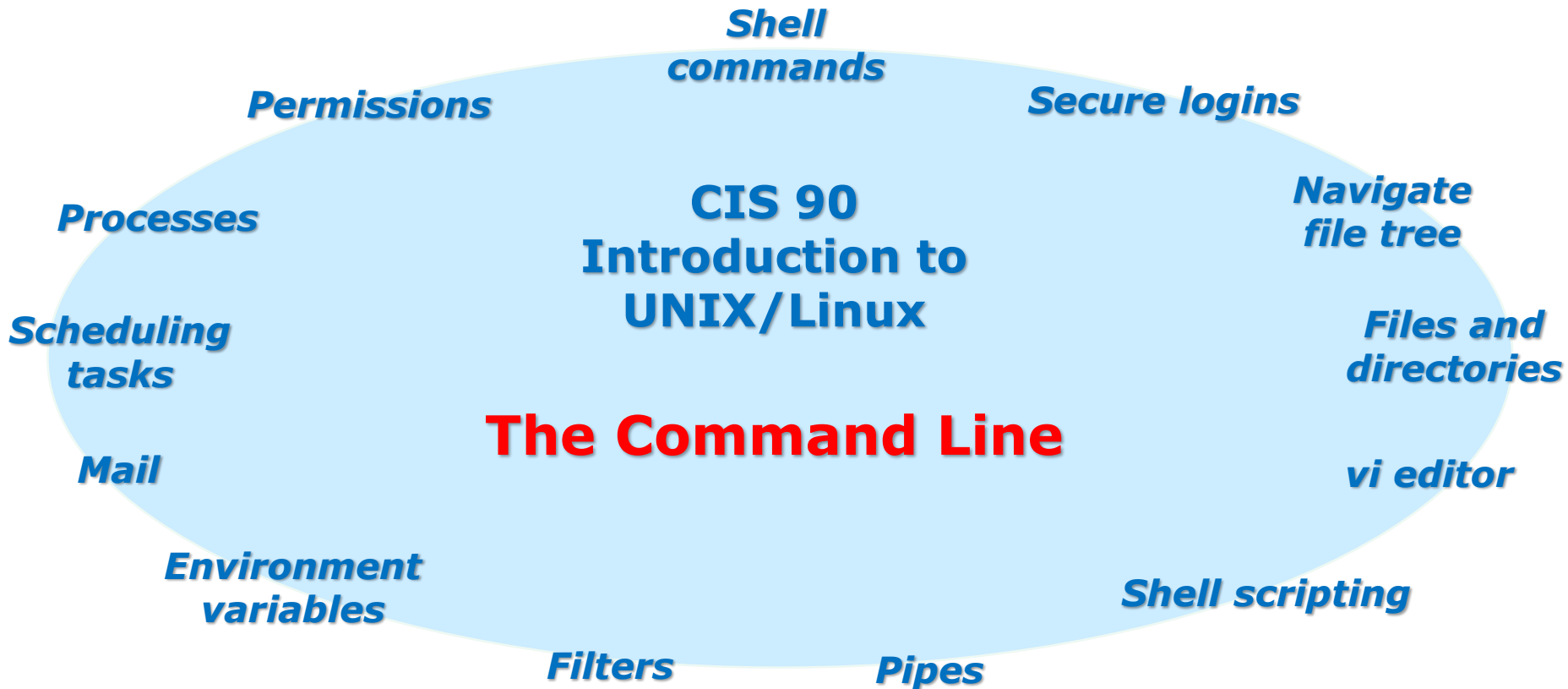
Rich's lesson module checklist

Last updated 09/16/2018

- ☐ Zoom recording named and published for previous lesson
- ☐ Slides and lab posted
- ☐ Print out agenda slide and annotate page numbers
- ☐ 1st minute quiz
- ☐ Flash cards
- ☐ Calendar page updated
- ☐ Lab 3 tested
- ☐ check3 updated (dates) and tested
- ☐ scripts/schedule-submit-locks
- ☐ Update Jesse's checkgrades script
- ☐ Census done - Microsoft and VMware web store accounts made
- ☐ Opus-II: cis90-students alias in /etc/aliases + newaliases command
- ☐ Welcome ready for mailing
- ☐ Lab 3 Unix events ready for mailing
- ☐ sun-hwa-iii ice cream and accounts made
- ☐ rhea setup
- ☐ irssi and eh-irc tested
- ☐ 9V backup battery for microphone
- ☐ Backup slides, CCC info, handouts on flash drive
- ☐ Key card to open door
- ☐ Fall 2018 - update dead.letter quiz question

☐ <https://zoom.us>

- ☐ Putty + slides + Chrome
- ☐ Enable/Disable attendee sharing
^ > Advanced Sharing Options > Only Host
- ☐ Enable/Disable attended annotations
Share > More > Disable Attendee Sharing



Student Learner Outcomes

1. Navigate and manage the UNIX/Linux file system by viewing, copying, moving, renaming, creating, and removing files and directories.
2. Use the UNIX features of file redirection and pipelines to control the flow of data to and from various commands.
3. With the aid of online manual pages, execute UNIX system commands from either a keyboard or a shell script using correct command syntax.

Introductions and Credits



Jim Griffin

- Created this Linux course
- Created Opus and the CIS VLab
- Jim's site: <https://web.archive.org/web/20140209023942/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. John's site: <http://teacherjohn.com/>
- Jaclyn Kostner for many webinar best practices: e.g. mug shot page.



Student checklist - Before class starts

The screenshot shows a web browser window with the address bar displaying `simms-teach.com/cis90calendar.php`. The page title is "Rich's Cabrillo College CIS Classes CIS 90 Calendar". On the left sidebar, there are links for "CIS 90", "CIS 90A", "CIS 90B", "CIS 90C", "CIS 90D", "CIS 90E", "CIS 90F", "CIS 90G", "CIS 90H", "CIS 90I", "CIS 90J", "CIS 90K", "CIS 90L", "CIS 90M", "CIS 90N", "CIS 90O", "CIS 90P", "CIS 90Q", "CIS 90R", "CIS 90S", "CIS 90T", "CIS 90U", "CIS 90V", "CIS 90W", "CIS 90X", "CIS 90Y", "CIS 90Z". The main content area shows the "CIS 90 (Fall 2014) Calendar" with a table of lessons. The "Calendar" link is highlighted in the top navigation bar. The "Presentation slides (download)" link is highlighted in the lesson details. The "Enter virtual classroom" link is highlighted in the lesson details.

Lesson	Date	Topics	Link
1	9/2	Class and Linux Overview - Understand how the course will work - High level overview of computers, operating systems and virtual machines - Overview of UNIX/Linux market and architecture - Using SSH for remote network access - Using terminals and the command line	Presentation slides (download) Enter virtual classroom
2	9/9	Supplemental PowerPoint: Logging into Opus (download)	Presentation slides (download) Enter virtual classroom
3	9/16	Assignment - Student Survey - Lab 1	Presentation slides (download) Enter virtual classroom
4	9/23	Lab 2	Presentation slides (download) Enter virtual classroom
5	9/30	Lab 3	Presentation slides (download) Enter virtual classroom
6	10/7	Lab 4	Presentation slides (download) Enter virtual classroom
7	10/14	Lab 5	Presentation slides (download) Enter virtual classroom
8	10/21	Lab 6	Presentation slides (download) Enter virtual classroom
9	10/28	Lab 7	Presentation slides (download) Enter virtual classroom
10	11/4	Lab 8	Presentation slides (download) Enter virtual classroom
11	11/11	Lab 9	Presentation slides (download) Enter virtual classroom
12	11/18	Lab 10	Presentation slides (download) Enter virtual classroom
13	11/25	Lab 11	Presentation slides (download) Enter virtual classroom
14	12/2	Lab 12	Presentation slides (download) Enter virtual classroom
15	12/9	Lab 13	Presentation slides (download) Enter virtual classroom
16	12/16	Lab 14	Presentation slides (download) Enter virtual classroom
17	12/23	Lab 15	Presentation slides (download) Enter virtual classroom
18	12/30	Lab 16	Presentation slides (download) Enter virtual classroom
19	1/6	Lab 17	Presentation slides (download) Enter virtual classroom
20	1/13	Lab 18	Presentation slides (download) Enter virtual classroom
21	1/20	Lab 19	Presentation slides (download) Enter virtual classroom
22	1/27	Lab 20	Presentation slides (download) Enter virtual classroom
23	2/3	Lab 21	Presentation slides (download) Enter virtual classroom
24	2/10	Lab 22	Presentation slides (download) Enter virtual classroom
25	2/17	Lab 23	Presentation slides (download) Enter virtual classroom
26	2/24	Lab 24	Presentation slides (download) Enter virtual classroom
27	3/2	Lab 25	Presentation slides (download) Enter virtual classroom
28	3/9	Lab 26	Presentation slides (download) Enter virtual classroom
29	3/16	Lab 27	Presentation slides (download) Enter virtual classroom
30	3/23	Lab 28	Presentation slides (download) Enter virtual classroom
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38	5/18	Lab 36	Presentation slides (download) Enter virtual classroom
39	5/25	Lab 37	Presentation slides (download) Enter virtual classroom
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41	6/8	Lab 39	Presentation slides (download) Enter virtual classroom
42	6/15	Lab 40	Presentation slides (download) Enter virtual classroom
43	6/22	Lab 41	Presentation slides (download) Enter virtual classroom
44	6/29	Lab 42	Presentation slides (download) Enter virtual classroom
45	7/6	Lab 43	Presentation slides (download) Enter virtual classroom
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60	10/19	Lab 58	Presentation slides (download) Enter virtual classroom
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161	9/24		



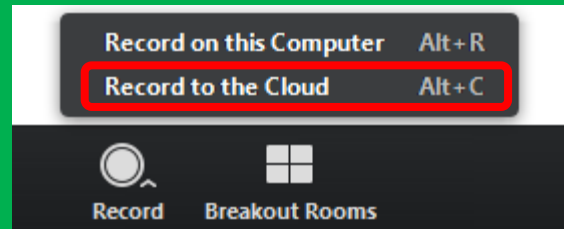
 ConferZoom

❑ *Downloaded PDF of Lesson Slides. I like Foxit Reader so I can take notes using annotations.*

- CIS 90 website
- Calendar page

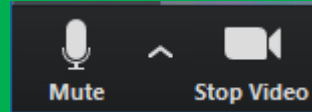
- ❑ One or more login sessions to Opus-II

Start



Start Recording

Audio Check



Start Recording

Audio & video Check



Instructor: **Rich Simms**
Dial-in: **408-638-0968 (toll)**
Meeting ID: **426 283 384**



Aaron



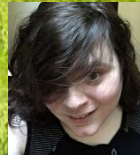
Mikey



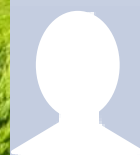
Jona



Conner



Tara Marie



Fredi



Carina



Isaac



Matthew



Victor



Danny



Erik



Molly



Branden



Dominic



Ryan L.



Alejandra



Blair



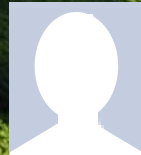
Zari



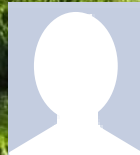
Ryan M.



Tony



Gabriel



Janelly

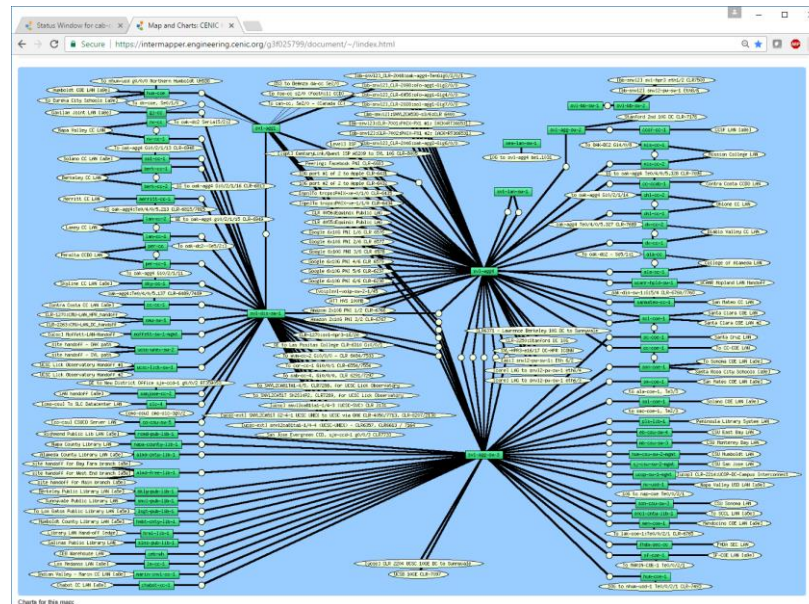


Austin



Joseph

Network Check



[https://intermapper.engineering.cenic.org/g3f025799/
document/~!/index.html](https://intermapper.engineering.cenic.org/g3f025799/document/~!/index.html)

First Minute Quiz

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

Use CCC Confer White Board

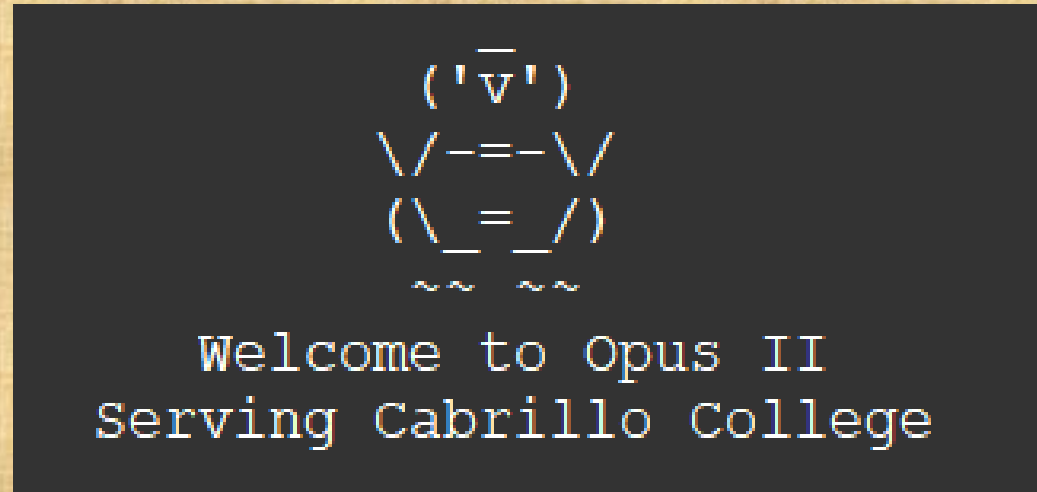
email answers to: risimms@cabrillo.edu

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

Electronic Communication

Objectives	Agenda
• Learn how to use the UNIX communication tools write and mail. • Overview on end-to-end email.	• Quiz • Questions • Subtle stuff • Mini review • Practice questions • Terminals • Housekeeping • Course expectations check • Write command • IRC • Mail basics • Managing mail • More on mail • End-to-end email • Other MUAs, MTAs, DA and AAs • Wrap up

Class Activity



If you haven't already,
log into Opus-II

Class Activity

3	2/19	Unit 3 Electronic Mail • Guest speaker: Denise Moore on OTC (On-The-Job) training programs • Learn how to use the LINC communication tools: write and /bin/mail • Overview on and to and mail Materials • Presentation slides (download) Supplemental • Howto #319: Accessing vlab (download) Assignment • Read/skim Lesson 3 slides	Lab 2
---	------	--	-----------------------

<https://simms-teach.com/cis90calendar.php>

If you haven't already,
download the lesson slides

Class Activity

	• Read/submit Lesson 3 status • Student Survey • Lab 1	
	ConferZoom • Enter virtual classroom • Class archives	
	Unit 1 Commands • Understand how the UNIX login operation	

<https://simms-teach.com/cis90calendar.php>

If you haven't already, join
ConferZoom classroom



Questions

Questions?

Lesson material?

Labs? Tests?

How this course works?

- Graded work in home directories
- Answers in /home/cis90/answers

Who questions much, shall learn much, and retain much.

- Francis Bacon

If you don't ask, you don't get.

- Mahatma Gandhi

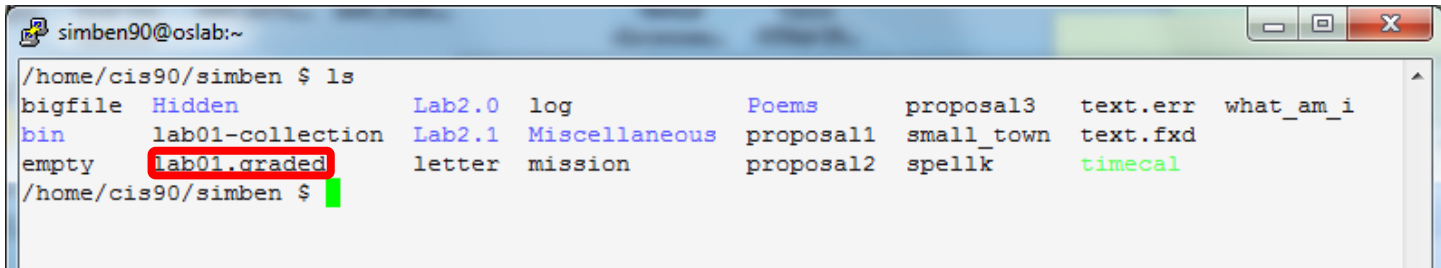
Chinese
Proverb

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.

Graded work is copied to your home directories

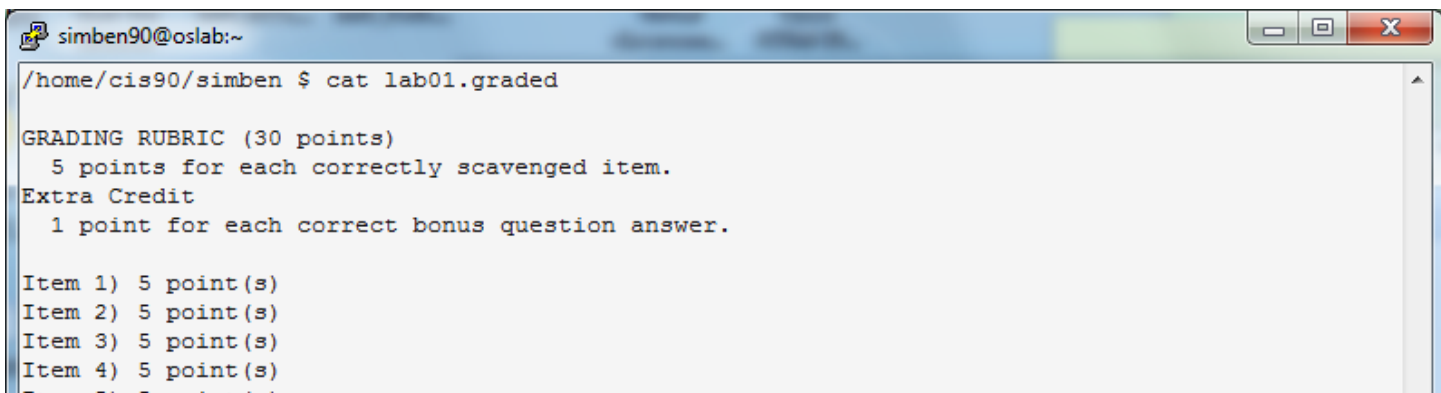
ls



```
simben90@oslab:~  
/home/cis90/simben $ ls  
bigfile  Hidden          Lab2.0  log          Poems      proposal3  text.err  what_am_i  
bin      lab01-collection Lab2.1  Miscellaneous proposal1  small_town text.fxd  
empty    lab01.graded     letter  mission      proposal2  spellk     timecal  
/home/cis90/simben $
```

*Log in to Opus-II and use the **ls** and **cat** commands to see your graded work*

cat lab01.graded

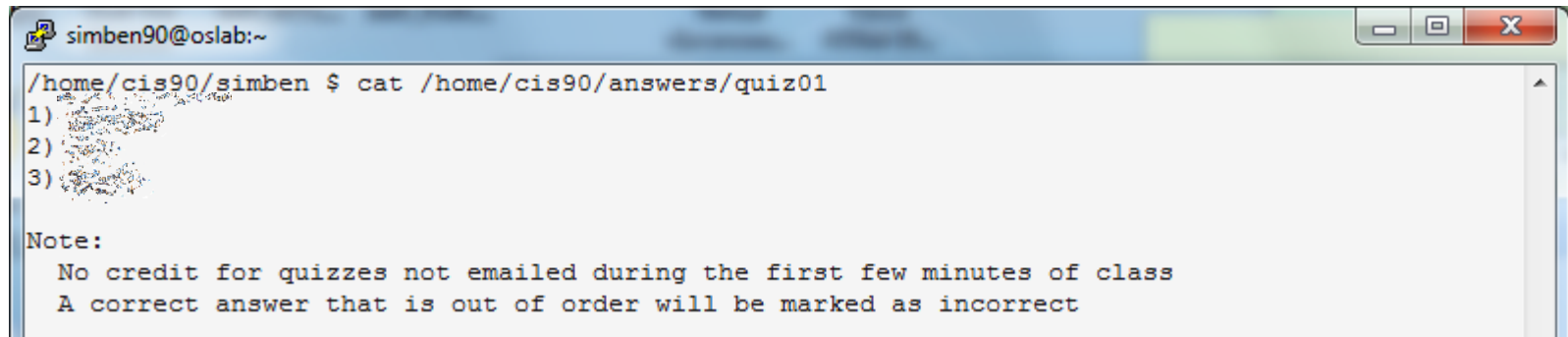


```
simben90@oslab:~  
/home/cis90/simben $ cat lab01.graded  
  
GRADING RUBRIC (30 points)  
  5 points for each correctly scavenged item.  
Extra Credit  
  1 point for each correct bonus question answer.  
  
Item 1) 5 point(s)  
Item 2) 5 point(s)  
Item 3) 5 point(s)  
Item 4) 5 point(s)  
Item 5) 5 point(s)
```

*Be sure to scroll back to the beginning of the **cat** output*

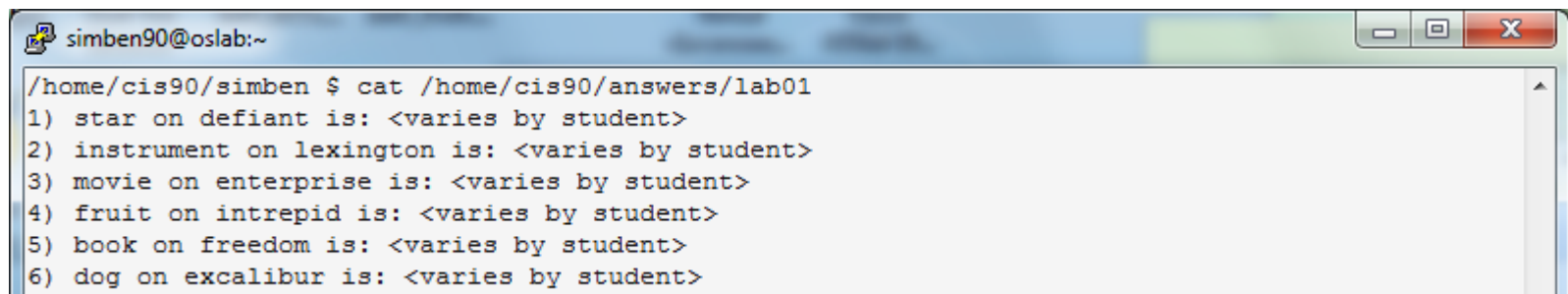
The answers/ directory on Opus-II

```
cat /home/cis90/answers/quiz01
```



```
simben90@oslab:~  
/home/cis90/simben $ cat /home/cis90/answers/quiz01  
1)  
2)  
3)  
  
Note:  
  No credit for quizzes not emailed during the first few minutes of class  
  A correct answer that is out of order will be marked as incorrect
```

```
cat /home/cis90/answers/lab01
```



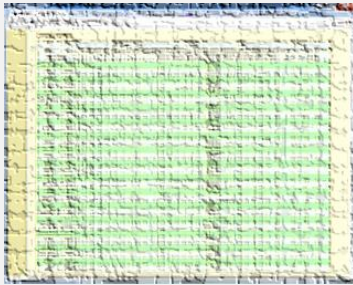
```
simben90@oslab:~  
/home/cis90/simben $ cat /home/cis90/answers/lab01  
1) star on defiant is: <varies by student>  
2) instrument on lexington is: <varies by student>  
3) movie on enterprise is: <varies by student>  
4) fruit on intrepid is: <varies by student>  
5) book on freedom is: <varies by student>  
6) dog on excalibur is: <varies by student>
```

The answers to quizzes, tests and labs will be posted to the /home/cis90/answers/ directory after the due date has passed.

Review your progress in the course

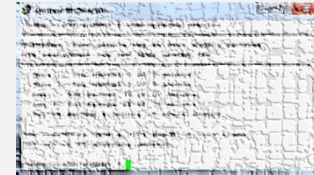
Check the website Grades page

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



Or check on Opus-II

checkgrades *codename*
(where *codename* is your LOR codename)



Written by Jesse Warren a past CIS 90 Alumnus

- Send me your survey to get your LOR codename.
- Graded labs and tests are in your home directories.

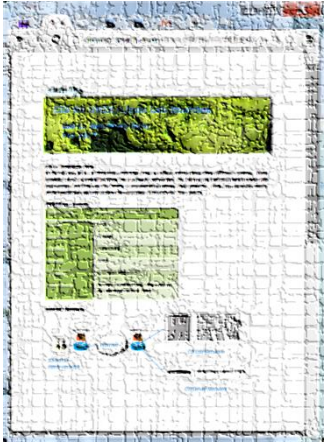
Percentage	Total Points	Letter Grade	Pass/No Pass
90% or higher	504 or higher	A	Pass
80% to 89.9%	448 to 503	B	Pass
70% to 79.9%	392 to 447	C	Pass
60% to 69.9%	336 to 391	D	No pass
0% to 59.9%	0 to 335	F	No pass

Points that could have been earned:

1 quiz: 3 points
1 labs: 30 points
Total: 33 points

At the end of the term I'll add up all your points and assign you a grade using this table

Lab Assignments -- Pearls of Wisdom



- Don't wait till the last minute to start.
- Plan for things to go wrong and give yourself time to ask questions and get answers.
- The *slower* you go the *sooner* you will be finished.
- A few minutes reading the forum can save you hour(s).
- Line up materials, references, equipment and software ahead of time.
- It's best if you fully understand each step as you do it. Use Google or refer back to lesson slides to understand the commands you are using.
- Keep a growing cheat sheet of commands and examples.
- Study groups are very productive and beneficial.
- Use the forum to collaborate, ask questions, get clarifications and share tips you learned while doing a lab.
- **Late work is not accepted** so submit what you have for partial credit.

Getting Help When Stuck on an Assignment

- Google the topic/error message.
- Search the Lesson Slides (they are PDFs) for a relevant example on how to do something.
- Check the forum. Someone else may have run into the same issue and found a way past it. If not start a new topic, explain what you are trying to do and what you have tried so far.
- Talk to a STEM center tutor/assistant.
- Come see me during my office or lab hours:

<https://www.cabrillo.edu/salsa/listing.php?staffId=1426>

I'm in the CTC (room 1403) every Tuesday from 3:30-5:00 pm.

- Make use of the Open Questions time at the start of every class.
- Make a cheat sheet of commands and examples so you never again get stuck on the same thing!

CIS Labs always involve some troubleshooting!

CTC - Building 1400 On lower campus



I will be in the CTC (room 1403) every Tuesday afternoon
from 3:30-5:00

Help Available in the CIS Lab

Instructors, lab assistants and equipment are available for CIS students to work on assignments.



Rich's Cabrillo College CIS Classes
Home Page

Home

Resources

Forums

CIS Lab

Canvas

CIS Lab & Datacenter
Aptos Campus

Home Resources NETLAB VLab Location

Announcements

The CIS Lab is in the **STEM Center** in building 800.
A great place to work on lab assignments and get help from student lab assistants and instructors on the schedule below.

STEM CIS/CS hours

Today Jan 28 - Feb 3, 2018

Week

Time	Sun 1/28	Mon 1/29	Tue 1/30	Wed 1/31	Thu 2/1	Fri 2/2	Sat 2/3
10am							
11am							
12pm							
1pm							
2pm		Jeffrey Bergamini CS Instructor 2:10p - 3p Carter Post CIS/CS	Jeffrey Bergamini CS Instructor 2:10p - 3p Carter Post CIS/CS	Jeffrey Bergamini CS Instructor 2:10p - 3p Carter Post CIS/CS	Jeffrey Bergamini CS Instructor 2:10p - 3p Carter Post CIS/CS		
3pm							
4pm							
5pm							
6pm							
7pm							

Events shown in time zone: Pacific Time

W3C XHTML 1.0 W3C CSS

To see schedule, click the CIS Lab link on the website and use the "Week" calendar view



The slippery slope



- 1) If you didn't submit Lab 1 ...
- 2) If you were here on time and didn't submit Quiz 1 or Quiz 2 ...
- 3) If you didn't send me the student survey assigned in Lesson 1 ...
- 4) If you haven't read the forum or made a post ...
- 5) If you haven't started last week's assignment that is due today ...
- 6) If you haven't logged into Opus-II or your Arya ...

*Please contact me by email, see me during
my office hours or when I'm in the CTC*

Email: risimms@cabrillo.edu

Passwords

If you haven't already

Change your default password on Opus-II

```
[simben90@opus-ii ~]$ passwd
Changing password for user simben90.
Changing password for simben90.
(current) UNIX password:
New password:
Retype new password:
passwd: all authentication tokens updated successfully.
[simben90@opus-ii ~]$
```

*Note: passwords
are never echoed
as you type them*

*This changes your password on Opus-II only
(NOT other VMs, the forum or Canvas)*

Subtle Stuff

Who else is logged in?

```
[rsimms@excalibur ~]$ who
simben90 :0                2015-09-16 08:36 (:0)
jadzia   pts/0            2015-09-16 08:41 (freedom.cis.cabrillo.edu)
rsimms   pts/1            2015-09-16 08:36 (opus.cis.cabrillo.edu)
worf     pts/3            2015-09-16 08:42 (2601:647:cb02:9eed:78d1:ef8f:7225:43e5)
simben90 pts/2            2015-09-16 08:38 (:0)
[rsimms@excalibur ~]$
```

```
[rsimms@excalibur ~]$ who -Hu
NAME      LINE      TIME      IDLE      PID COMMENT
simben90  :0        2015-09-16 08:36 ?         13924 (:0)
jadzia    pts/0     2015-09-16 08:41 00:01     15092 (freedom.cis.cabrillo.edu)
rsimms    pts/1     2015-09-16 08:36 .         14270 (opus.cis.cabrillo.edu)
worf      pts/3     2015-09-16 08:42 .         15181 (2601:647:cb02:9eed:78d1:ef8f:7225:43e5)
simben90  pts/2     2015-09-16 08:38 00:02     14876 (:0)
[rsimms@excalibur ~]$
```

```
[rsimms@excalibur ~]$ w
08:43:17 up 11 days, 10:10, 5 users, load average: 0.02, 0.14, 0.13
USER      TTY      LOGIN@  IDLE   JCPU   PCPU   WHAT
simben90  :0        08:36   ?xdm?  13:51  0.33s  gdm-session-worker [pam/gdm-password]
jadzia    pts/0     08:41   1:44   0.03s  0.03s  -bash
rsimms    pts/1     08:36   5.00s  0.04s  0.00s  w
worf      pts/3     08:42   5.00s  0.02s  0.00s  ping netlab.cis.cabrillo.edu
simben90  pts/2     08:38   2:53   0.35s  0.32s  top
[rsimms@excalibur ~]$
```



Putty to: **rsimms@opus-ii.cis.cabrillo.edu** vs **opus-ii.cis.cabrillo.edu**

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address)	Port
rsimms@opus-ii.cis.cabrillo.edu	2220

Connection type:

☐ Raw
 ☐ Telnet
 ☐ Rlogin
 ☒ SSH
 ☐ Serial

rsimms@oslab:~/cis90/labx1/graded

```
login as: rsimms
rsimms@opus-ii.cis.cabrillo.edu's password: █
```

If you specify the username in Putty you won't be prompted for it, just the password.

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address)	Port
opus-ii.cis.cabrillo.edu	2220

Connection type:

☐ Raw
 ☐ Telnet
 ☐ Rlogin
 ☒ SSH
 ☐ Serial

rsimms@oslab:~/cis90/labx1/graded

```
login as: █
```

If you specify only the hostname in Putty you get prompted for both username and password.

Tip: Use the Putty "Saved Sessions" for your Opus-II connection. Then you don't have to type in the username, hostname and port number each time you connect to Opus.



ssh arya-xx vs ssh cis90@arya-xx

(your Opus-II accounts are NOT on the Arya systems)

```

simben90@oslab:~
/home/cis90/simben $ ssh arya-35
simben90@arya-35's password:
Permission denied, please try again.
simben90@arya-35's password:
Permission denied, please try again.
simben90@arya-35's password:
Permission denied (publickey)
/home/cis90/simben $

cis90@Arya-35: ~
/home/cis90/simben $ ssh cis90@arya-35
cis90@arya-35's password:
Welcome to Ubuntu 14.04.1 LTS (GNU/Linux 3.13.0-35-generic x86_64)

* Documentation:  https://help.ubuntu.com/
  
```

*Benji is logged in as simben90 on Opus-II tries and fails to **ssh** into Arya-35 as simben90*

*Benji is logged in as simben90 on Opus-II tries and succeeds to uses **ssh** into Arya-35 as cis90*

If you don't specify the username the **ssh** command will use the username you are currently logged in as. This account may not exist on the remote system!

type and man caveats

Usually, to find the location of a command on your path, use the **type** command:

```
/home/cis90/simben $ type hostname  
hostname is /usr/bin/hostname
```

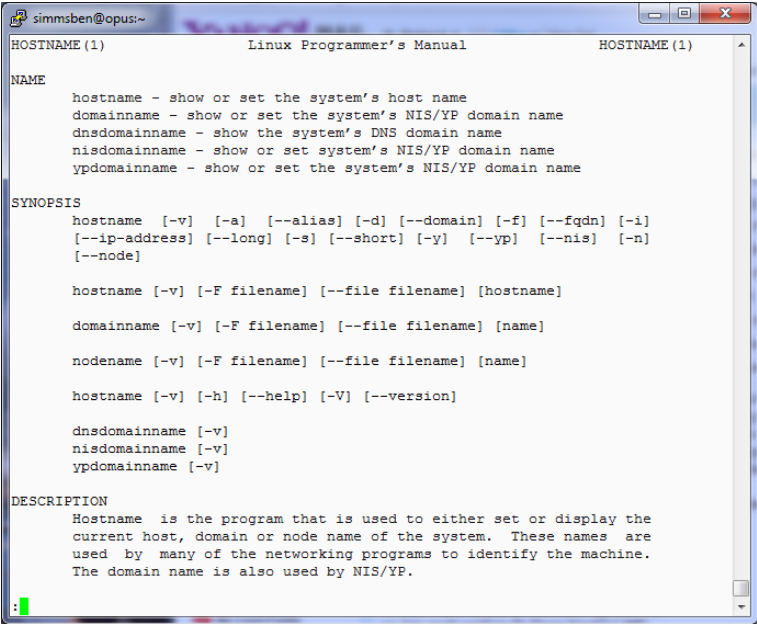
*The hostname program file is
in the /usr/bin directory*



type and man caveats

Usually, to find the manual page for a command, use the **man** command:

```
/home/cis90/simben $ man hostname
```



```
simmsben@opus:~
HOSTNAME(1)                                Linux Programmer's Manual            HOSTNAME(1)

NAME
hostname - show or set the system's host name
domainname - show or set the system's NIS/YP domain name
dnsdomainname - show the system's DNS domain name
nisdomainname - show or set system's NIS/YP domain name
ypdomainname - show or set the system's NIS/YP domain name

SYNOPSIS
hostname [-v] [-a] [--alias] [-d] [--domain] [-f] [--fqdn] [-i]
[--ip-address] [--long] [-s] [--short] [-y] [--yp] [--nis] [-n]
[--node]

hostname [-v] [-F filename] [--file filename] [hostname]
domainname [-v] [-F filename] [--file filename] [name]
nodename [-v] [-F filename] [--file filename] [name]
hostname [-v] [-h] [--help] [-V] [--version]

dnsdomainname [-v]
nisdomainname [-v]
ypdomainname [-v]

DESCRIPTION
Hostname is the program that is used to either set or display the
current host, domain or node name of the system. These names are
used by many of the networking programs to identify the machine.
The domain name is also used by NIS/YP.
```

Command Review

However,

Sometimes you may get something different than expected with the **type** and **man** commands

type and man caveats

```
/home/cis90/simmsben $ type ls  
ls is aliased to `ls --color=tty`
```

If the command is an alias (which we will learn about later) the type command by default doesn't show where the command resides on the path

```
/home/cis90/simmsben $ type -a ls  
ls is aliased to `ls --color=tty`  
ls is /usr/bin/ls
```

*To get around that use the **-a** option*

 *The ls program file resides in the /usr/bin directory*

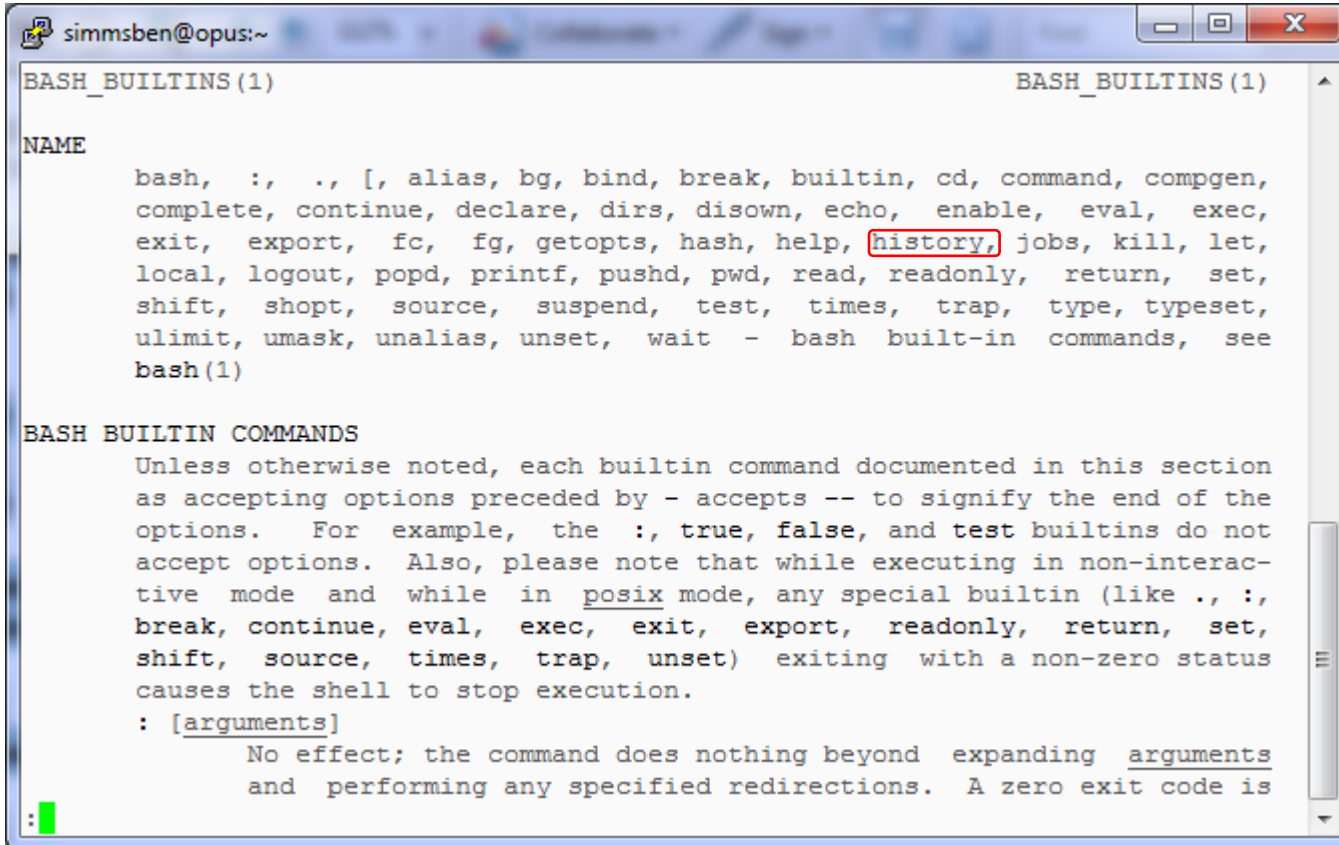
*The **ls** command is aliased, use the **-a** option on the **type** command to find where the command resides on the path*

type and man caveats

```
/home/cis90/simben $ type history
history is a shell builtin
```

*The **history** command is built into the shell and does not have its own program file*

```
/home/cis90/simben $ man history
```



```
simmsben@opus:~
BASH_BUILTINS(1)
NAME
    bash, :, ., [, alias, bg, bind, break, builtin, cd, command, compgen,
    complete, continue, declare, dirs, disown, echo, enable, eval, exec,
    exit, export, fc, fg, getopts, hash, help, history, jobs, kill, let,
    local, logout, popd, printf, pushd, pwd, read, readonly, return, set,
    shift, shopt, source, suspend, test, times, trap, type, typeset,
    ulimit, umask, unalias, unset, wait - bash built-in commands, see
    bash(1)
BASH BUILTIN COMMANDS
    Unless otherwise noted, each builtin command documented in this section
    as accepting options preceded by - accepts -- to signify the end of the
    options. For example, the :, true, false, and test builtins do not
    accept options. Also, please note that while executing in non-interac-
    tive mode and while in posix mode, any special builtin (like ., :,
    break, continue, eval, exec, exit, export, readonly, return, set,
    shift, source, times, trap, unset) exiting with a non-zero status
    causes the shell to stop execution.
    : [arguments]
        No effect; the command does nothing beyond expanding arguments
        and performing any specified redirections. A zero exit code is
```

*The **history** command does not have its own man page either!*

... but it is included in the man page for bash builtins

Either scroll down or use /history



Lesson 2

Recaps

(from Lesson 2)

Shell Slides

<https://simms-teach.com/docs/cis90/cis90-six-steps.pdf>

Life without a path

<https://simms-teach.com/docs/cis90/cis90-life-with-no-path.pdf>

Using VLab

<https://simms-teach.com/docs/cis90/cis90-Using-VLab.pdf>

Mini Review

Expectation Check

Commands you should understand and be comfortable using

Lesson/Lab 1		Lesson/Lab 2	
Commands	Files & Directories	Commands	Files & Directories
cal clear date exit history hostname id ps ssh uname tty who who am i	/etc/issue /etc/*-release	apropos banner bash bc cat cd echo env file finger info file ls passwd set type man whatis	/bin /usr/bin /sbin /usr/sbin /etc/passwd /etc/shadow

If you have any questions on these commands, post a question on the forum!

Class Activity

In what file are all the encrypted passwords kept?

Put your answer in the chat window

ssh command

Syntax:

ssh -p *port username@hostname*

Examples:

```
ssh -p 2220 simben90@son-of-opus.simms-teach.com
```

```
ssh -p 22 cis90@rhea.cis.cabrillo.edu
```

Syntax shortcuts:

- If the port is 22, then it does not need to be specified.
- If the username is the same on the remote system it can be left off.
- If domain suffixes are automatically added they can be left off.

For example Benji could use any of the commands below to log into daughter-of-opus from Opus-II:

```
ssh -p 22 simben90@daughter-of-opus.cis.cabrillo.edu
```

```
ssh simben90@daughter-of-opus.cis.cabrillo.edu
```

```
ssh daughter-of-opus.cis.cabrillo.edu
```

```
ssh daughter
```

The ssh command is used to log into a remote system

Class Activity

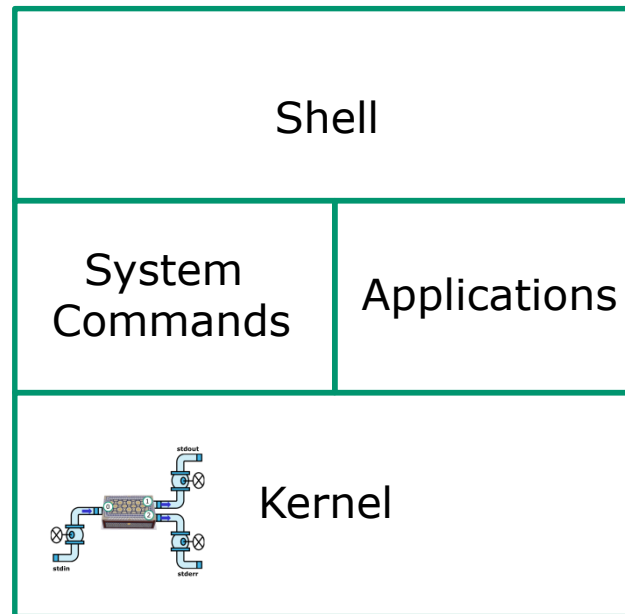
ssh to the Rhea system (port 22) and login as the cis90 user.

Which terminal device are you using on Rhea?

Put your answer in the chat window

Key components of the Linux/UNIX architecture

Users interact with the shell to run commands



Commands such as ls, cal, date, tty, id, who, etc.

Web servers, databases, word processors, etc.



The kernel manages processes, memory, file system, and the network stack and interacts with all the hardware components

Class Activity

If you haven't already, ssh to the Rhea system (port 22) and login as cis90.

What kernel is running on Rhea?

Put your answer in the chat window

Class Activity

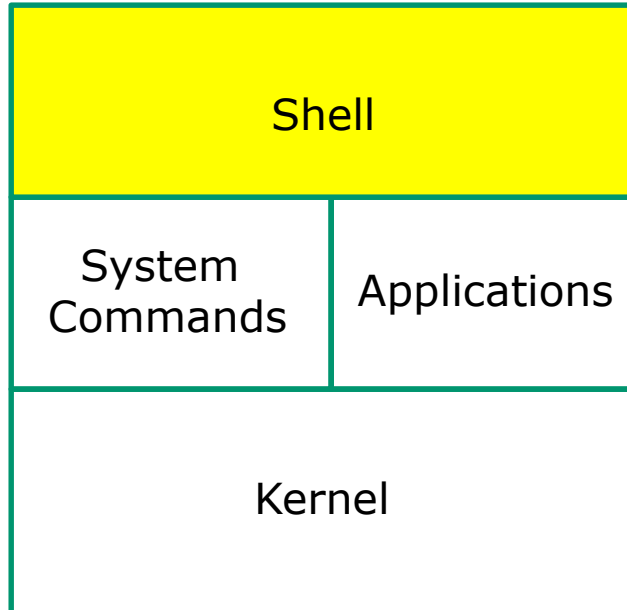
If you haven't already, ssh to the Rhea system (port 22) and login as cis90.

What shell is running on Rhea?

Put your answer in the chat window



Life of the Shell



- 1) Prompt
- 2) Parse
- 3) Search
- 4) Execute
- 5) Nap
- 6) Repeat



Class Activity

If you haven't already, ssh to the Rhea system (port 22) and login as cis90.

As the cis90 user on Rhea enter this command:

```
ls -lt /usr/games
```

How many directories on the path did the shell have to search to locate the command used above?

Put your answer in the chat window?

Class Activity

If you haven't already, ssh to the Rhea system (port 22) and login as cis90.

As the cis90 user on Rhea enter this command:

```
ls -z /bin
```

Which program, ls or the shell, output the error message?

Put your answer in the chat window?

Class Activity

If you haven't already, ssh to the Rhea system (port 22) and login as cis90.

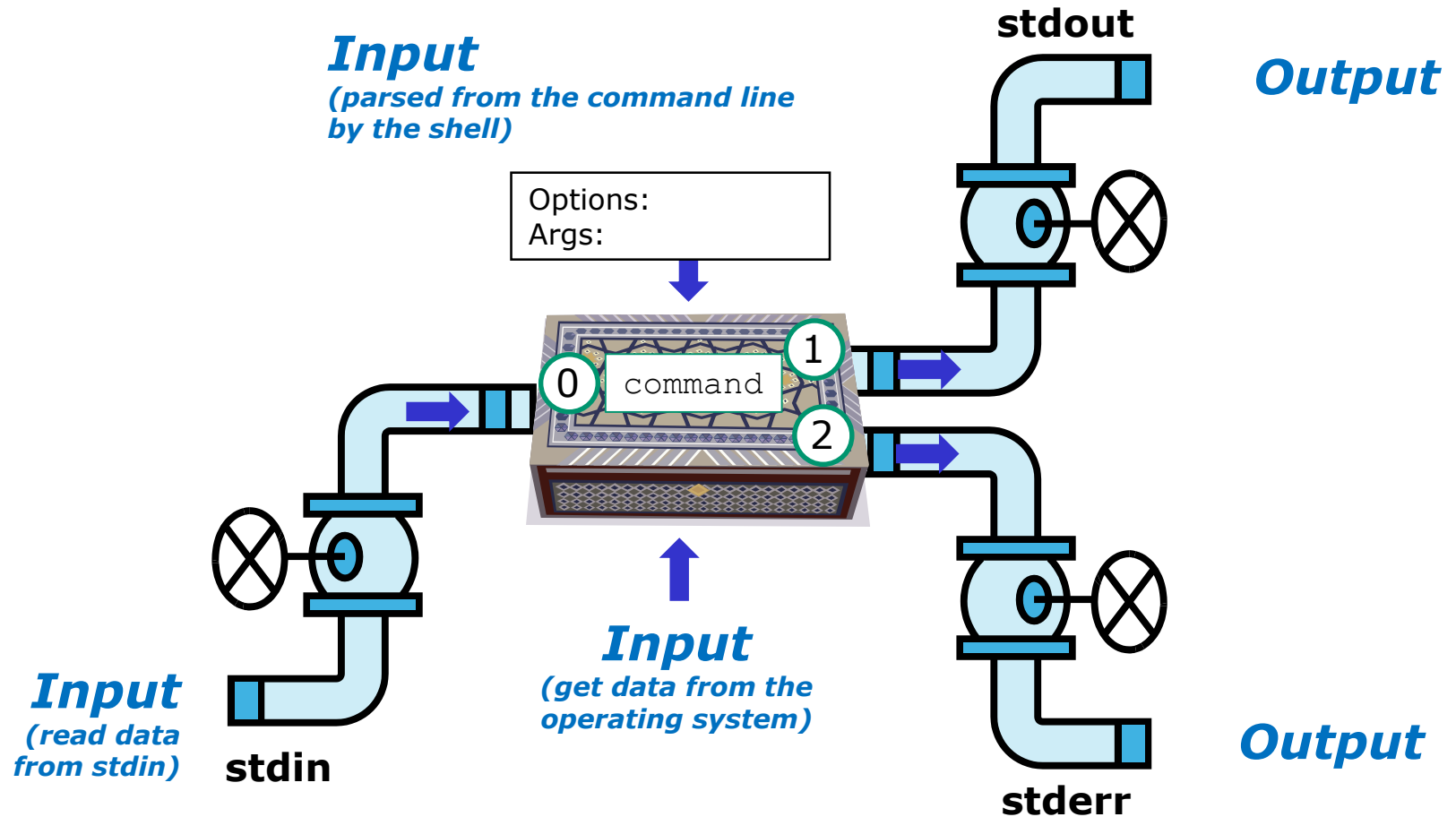
As the cis90 user on Rhea enter this command:

```
lls -z /bin
```

Which program, ls or the shell, output the error message?

Put your answer in the chat window?

Inputs and Outputs



The three file descriptors provided to every process are named **stdin**, **stdout** and **stderr**

Class Activity

As the cis90 user on Rhea enter this command:

```
banner Hola
```

Where does the **banner** command on Rhea get it's input from?

- a) The command line (passed in by the shell)
- b) The keyboard (read from stdin)
- c) The operating system

Put your answer in the chat window

Answer

In what file are all the encrypted passwords kept?

/etc/shadow

ssh to the Rhea system (port 22) and login as the cis90 user.

Which terminal device are you using on Rhea?

```
/dev/pts/0
```

57

If you haven't already, ssh to the Rhea system (port 22) and login as cis90.

What kernel is running on Rhea?

```
/home/cis90/simben $ ssh cis90@rhea
Password for cis90@rhea:
Last login: Tue Feb  9 15:32:36 2016 from opus.cis.cabrillo.edu
FreeBSD 10.0-RELEASE-p18 (GENERIC) #0: Wed Feb 25 01:08:00 UTC 2015
```

< snipped >

```
$ uname
```

FreeBSD

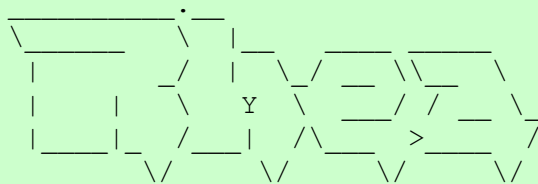
Free BSD kernel

Class Activity

If you haven't already, ssh to the Rhea system (port 22) and login as cis90.

What shell is running on Rhea?

```
/home/cis90/simben $ ssh cis90@rhea
Password for cis90@rhea:
Last login: Wed Feb  8 06:54:35 2017 from opus.cis.cabrillo.edu
FreeBSD 10.0-RELEASE-p18 (GENERIC) #0: Wed Feb 25 01:08:00 UTC 2015
```



```
< snipped >
$ echo $SHELL
/bin/sh
$ ps
  PID TT  STAT      TIME COMMAND
 4999  0   Ss    0:00.00 -sh (sh)
 5001  0   R+    0:00.00 ps
$
```

The sh (Bourne shell) is running on Rhea

Answer

If you haven't already, ssh to the Rhea system (port 22) and login as cis90.

As the cis90 user on Rhea enter this command:

```
ls -lt /usr/games
```

How many directories on the path did the shell have to search to locate the command used above?

```
$ type ls
ls is /bin/ls
$ echo $PATH
/sbin:/bin:/usr/sbin:/usr/bin:/usr/games:/usr/local/sbin:/usr/local/bin:/home/cis90/bin
```

The shell had to search two directories. The first was /sbin and the second was /bin.

Class Activity

If you haven't already, ssh to the Rhea system (port 22) and login as cis90.

As the cis90 user on Rhea enter this command:

```
ls -z /bin
```

Which program, ls or the shell, output the error message?

```
$ ls -z /bin
ls: illegal option -- z
usage: ls [-ABCFGHILPRSTUWZabcdefghiklmnopqrstuwxy1,] [-D format] [file ...]
$
```

- 1) Prompt
- 2) Parse
- 3) Search
- 4) Execute
- 5) Nap
- 6) Repeat

The ls command, during the execute step, output the error message.

Class Activity

If you haven't already, ssh to the Rhea system (port 22) and login as cis90.

As the cis90 user on Rhea enter this command:

```
lls -z /bin
```

Which program, ls or the shell, output the error message?

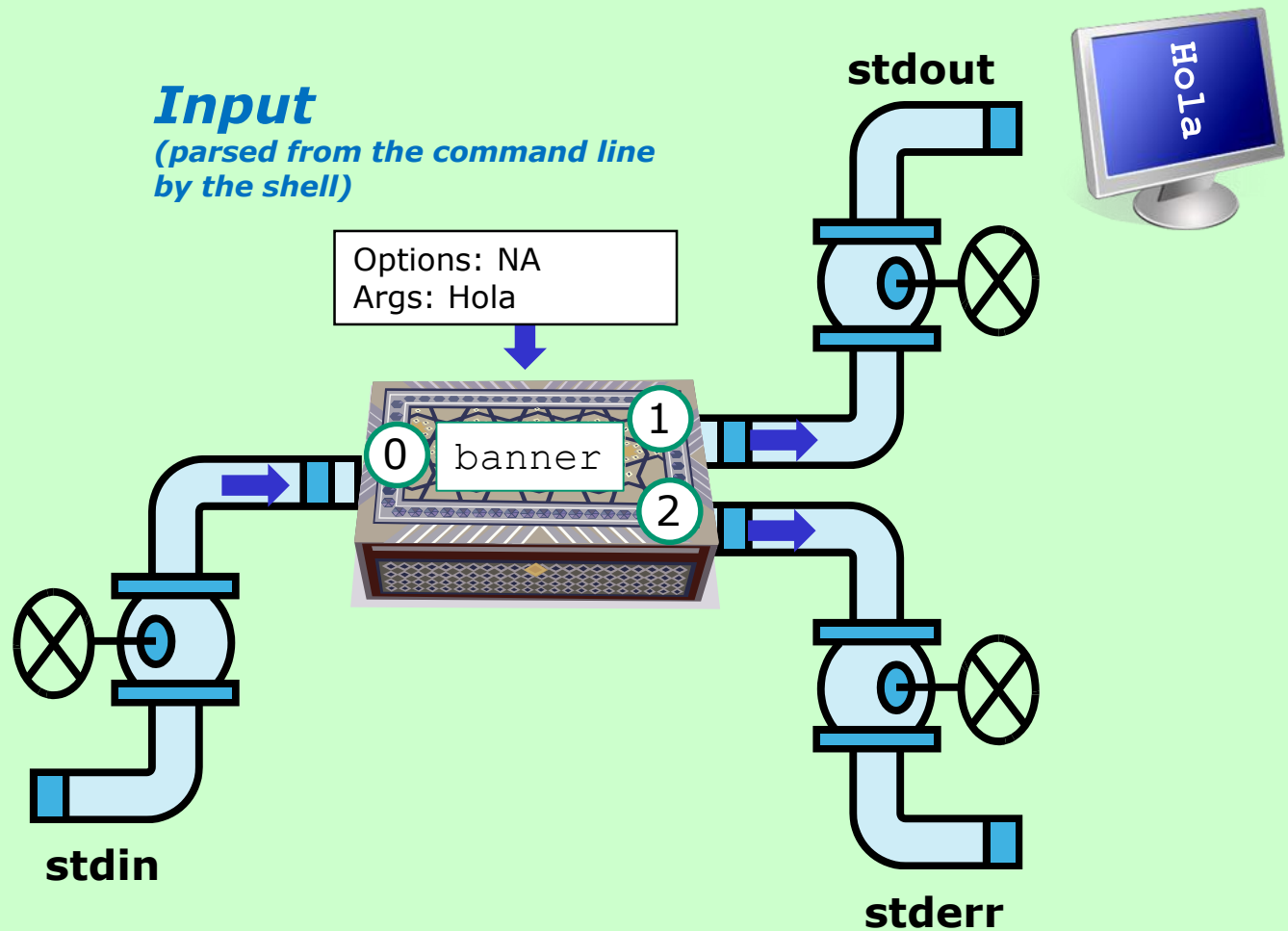
```
$ lls -z /bin
lls: not found
$
```

- 1) Prompt
- 2) Parse
- 3) Search
- 4) Execute
- 5) Nap
- 6) Repeat

The shell, during the search step, output the error message.

Answer

\$ **banner Hola**



The **banner** command is an example of a command that gets its input from the command line

Practice Questions sun-hwa-iii

My favorite ice cream shop



Source: http://attractions.uptake.com/blog/files/2008/10/dsc_0002.jpg

Practice Test Questions

Use **exit** to return back to Opus-II.

What command could be used on Opus-II to log into this remote system:

hostname: sun-hwa-iii.cis.cabrillo.edu

username: *same as your Opus-II username*

port: 22

Write your command in the chat window

Practice Test Questions

Log into sun-hwa-iii and run the **icecream** command.

Copy your ice cream flavor into the chat window.

Practice Test Questions

On Sun-Hwa-III, is the **icecream** command on your path?

Write your answer in the chat window

Practice Test Questions

On Sun-Hwa-III, what kind of a file is the **icecream** command?

Write your answer in the chat window

Practice Test Questions

On Sun-Hwa-III, how many directories does the shell have to search to locate the **icecream** command on your path?

Write your answer in the chat window

Practice Test Questions

Is **icecream** a standard UNIX command?

Write your answer in the chat window

Practice Test Questions

Is Sun-Hwa-iii a Linux or UNIX system?

Write your answer in the chat window

Practice Test Questions

What distro has been installed on Sun-Hwa-III?

Write your answer in the chat window

Answer

1) What command could be used on Opus-II to log into this remote system:

hostname: sun-hwa-iii.cis.cabrillo.edu

username: *same as your Opus-II username*

port: 22

Answer: ssh sun-hwa-iii

Answer

On Sun-Hwa-III, is the **icecream** command on your path? If so what directory is it in?

If the shell can find it when you run it then it is on your path!

```
[simben90@sun-hwa-iii ~]$ icecream
```

```
Welcome to Sun-Hwa-III Benji!  
You get 10-20 icecream today.  
Hope you like it. Have a great day!
```

*Use the **type** command to find the first directory on your path containing the command*

```
[simben90@sun-hwa-iii ~]$ type icecream  
icecream is /usr/local/bin/icecream  
[simben90@sun-hwa-iii ~]$
```

Answer: YES, the **icecream** command is in the `/usr/local/bin` directory

Answer

On Sun-Hwa-III, what kind of file is the **icecream** command?

*Use the **file** command to probe and
get extended file type information*

```
[simben90@sun-hwa-iii ~]$ file /usr/local/bin/icecream  
/usr/local/sbin/icecream: Bourne-Again shell script, ASCII text  
executable  
[simben90@sun-hwa-iii ~]$
```

Answer: BASH shell script

Answer

On Sun-Hwa-III, how many directories does the shell have to search to locate the **icecream** command on your path?

Echo the PATH environment variable to see the order of the directories on the path

```
simben90@Sun-Hwa-III:~$ type icecream  
icecream is hashed (/usr/local/bin/icecream)
```

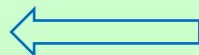
```
simben90@Sun-Hwa-III:~$ echo $PATH  
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games
```

Note the colon character : is used to delimit one directory from the next

Answer: Two

1) /usr/local/sbin

2) /usr/local/bin



Answer

On Sun-Hwa-III, is **icecream** a standard UNIX command?

*Use the **man** command to see if there is any documentation on **icecream***

```
[simben90@sun-hwa-iii ~]$ man icecream
```

```
No manual entry for icecream
```

```
See 'man 7 undocumented' for help when manual pages are not available.
```

Answer: NO

Answer

Is Sun-Hwa-iii a Linux or UNIX system?

*Use the **uname** command to show the name of the kernel*

```
[simben90@sun-hwa-iii ~]$ uname  
Linux
```

Answer: Linux

Answer

What distro has been installed on Sun-Hwa-iii?

*Use **cat /etc/issue** or **cat /etc/*-release**
to show the distro*

```
[simben90@sun-hwa-iii ~]$ cat /etc/issue
Ubuntu 14.04 LTS \n \l
[simben90@sun-hwa-iii ~]$
```

Answer: Ubuntu 14.04

Terminals

Hardware Terminals



Teletype (TTY)



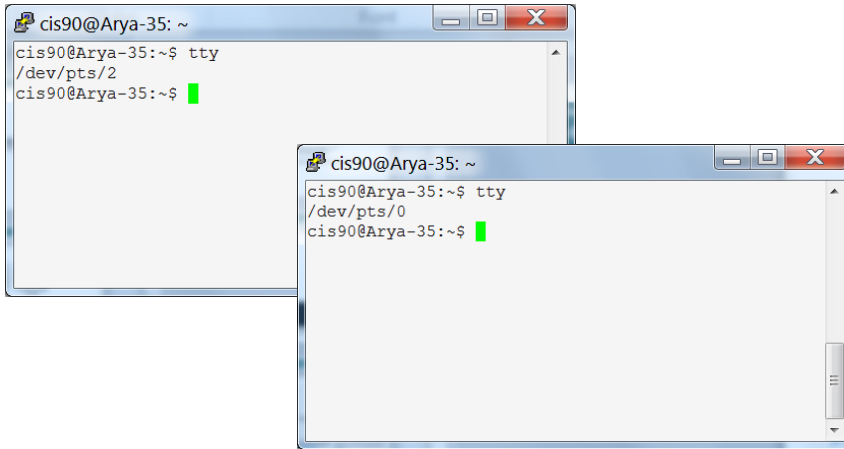
VT100



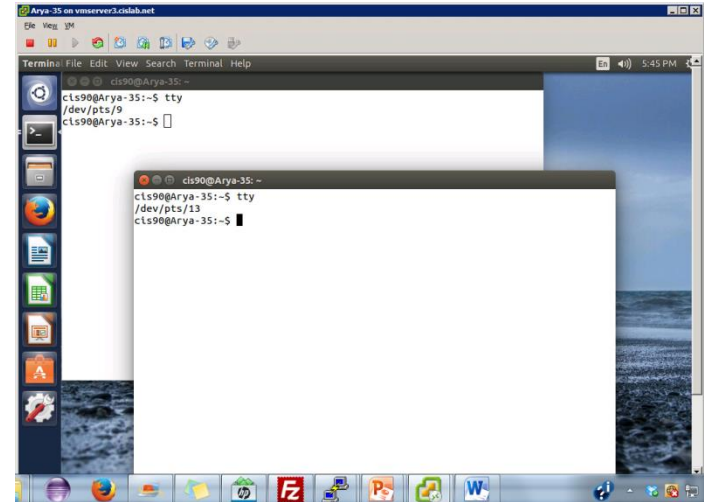
Terminals were used in the old days to interact with "minicomputers" and "mainframe" computers.

Today we use **terminal emulators** instead that are software programs.

Software Terminals



Terminal emulators like PuTTY (with scroll bars, colors, customizable backgrounds, fonts and sizes) for Windows



Graphical terminals (with scroll bars, colors, customizable backgrounds, fonts and sizes) built into Linux/Mac computers

Virtual terminals (use ctrl-alt-fn)

Bare bones, no scroll bars,
also called a console

```

Ubuntu 14.04.1 LTS Arya-35 tty2
Arya-35 login: cis90
Password:
Last login: Sat Sep  6 17:25:32 PDT 2014 on tty4
Welcome to Ubuntu 14.04.1 LTS (GNU/Linux 3.13.0-35-generic x86_64)

 * Documentation:  https://help.ubuntu.com/

41 packages can be updated.
0 updates are security updates.

Winter is coming

cis90@Arya-35:~$ tty
/dev/tty2
cis90@Arya-35:~$ _
    
```

```

Ubuntu 14.04.1 LTS Arya-35 tty4
Arya-35 login: cis90
Password:
Last login: Sat Sep  6 17:24:59 PDT 2014 on tty2
Welcome to Ubuntu 14.04.1 LTS (GNU/Linux 3.13.0-35-generic x86_64)

 * Documentation:  https://help.ubuntu.com/

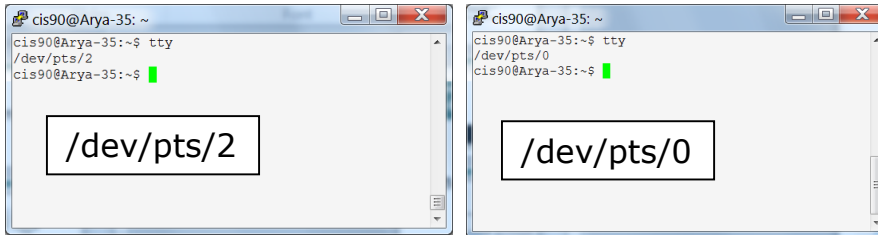
41 packages can be updated.
0 updates are security updates.

Winter is coming

cis90@Arya-35:~$ tty
/dev/tty4
cis90@Arya-35:~$
    
```

Various terminal devices on an Arya VM

Terminal emulators (e.g. Putty)



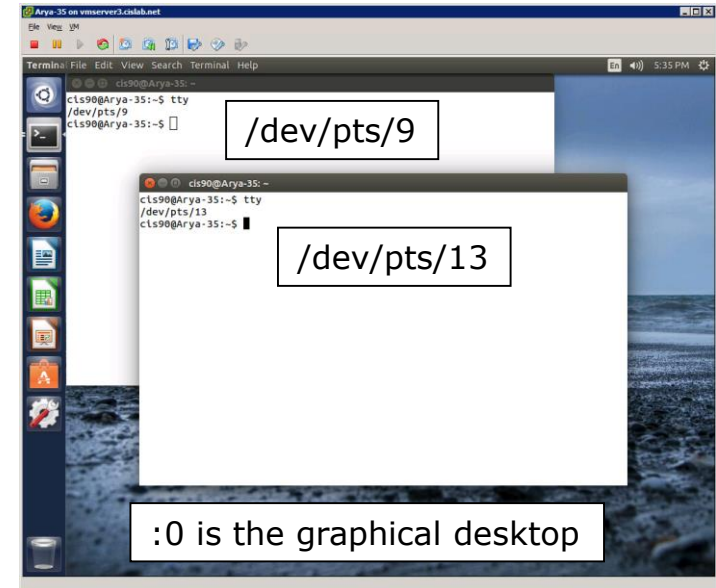
```
cis90@Arya-35:~$ who
cis90    tty4      2014-09-06 17:25
cis90    tty2      2014-09-06 17:25
cis90    pts/2      2014-09-06 17:20 (enterprise.cis.cabrillo.edu)
cis90    :0         2014-09-06 17:20 (:0)
cis90    pts/0      2014-09-06 17:21 (2601:9:6680:53b:4d09:e2b6:e7fc:d999)
cis90    pts/9      2014-09-06 17:22 (:0)
cis90    pts/13     2014-09-06 17:23 (:0)
```

pts=pseudo terminal,

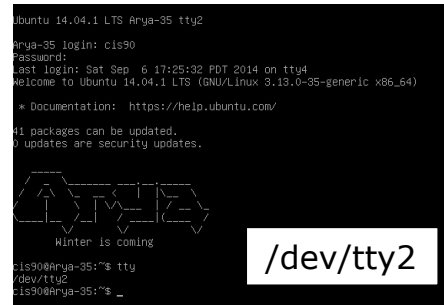
tty=teletype

:n=an X window display number

Graphical terminals on graphical desktop

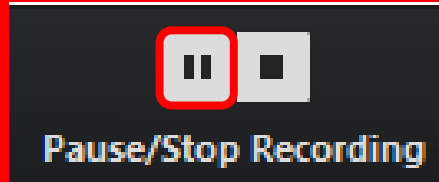


Virtual terminals



Housekeeping





Pause Recording

Audio Check

Roll Call

If you are watching the archived video please email me to let me know you were here.

risimms@cabrillo.edu



Resume/Stop Recording

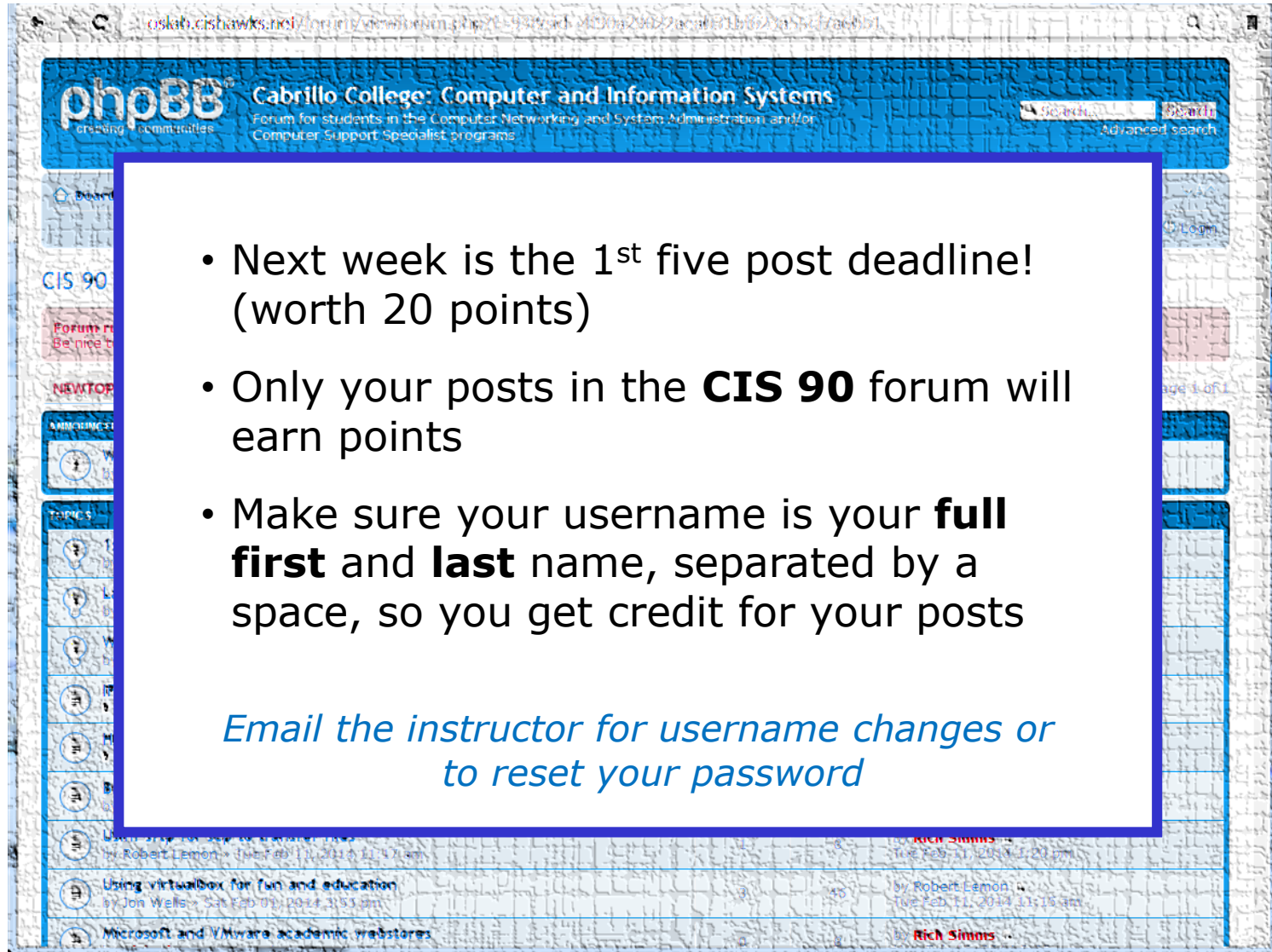
Resume Recording

Audio Check

Lab 2 due tonight

- Use **history -a** before every **submit**.
 - ❖ If you neglect to do this, the history snapshot you send me to grade will not have the latest commands you issued.
- Run **check2** to make sure you didn't miss anything.
- Submit as many times as you wish up to 11:59PM Opus-II time. You must submit your work to get credit.
- No credit for late work. Submit what you have for partial credit if you run out of time.
- You can optionally use the **verify** command to see what you submitted for grading.
 - ❖ To grade, I will check your submitted history to see if you used all the commands asked for in Lab 2 as well as your answers to the three questions.

Forum



oslab.cishawks.net/forum/viewforum.php?i=9&searchid=306290270ca0f11b327a56172ee051

phpBB
creating communities

Cabrillo College: Computer and Information Systems
Forum for students in the Computer Networking and System Administration and/or Computer Support Specialist programs

Search: **Search**
Advanced search

CIS 90

- Next week is the 1st five post deadline! (worth 20 points)
- Only your posts in the **CIS 90** forum will earn points
- Make sure your username is your **full first** and **last** name, separated by a space, so you get credit for your posts

Email the instructor for username changes or to reset your password

by Robert Lamon • Tue Feb 11, 2014 11:14 am

by Jon Wells • Sat Feb 09, 2014 3:53 am

by Robert Lamon • Tue Feb 11, 2014 11:16 am

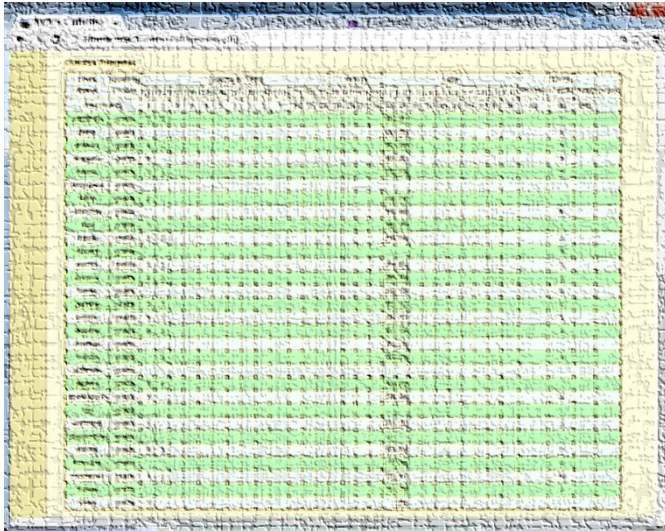
Microsoft and VMware academic webstores

Rich Simons

Where to find your grades

Send me your survey to get your LOR code name.

The CIS 90 website



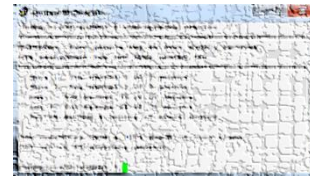
<http://simms-teach.com/cis90grades.php>

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

At the end of the term I'll add up all your points and assign you a grade using this table

On Opus-II

checkgrades *codename*
(where *codename* is your LOR codename)



Written by Jesse Warren a past CIS 90 Alumnus

Points that could have been earned to date:

1 quiz: 3 points
1 labs: 30 points
Total: 33 points

Extra Credit

SS
SS

se. Another 90 points is available from **extra credit** assignments. Students c
erall progress on the chart below. Contact the instructor by email with any que

				Forum				Labs										Final
Q	T1	T2	T3	F1	F2	F3	F4	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	Project
3	30	30	30	20	20	20	20	30	30	30	30	30	30	30	30	30	30	60
								30										
								30										

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

*Note the caps
on extra credit.*

Typos and HowTo's



Rich's Cabrillo College CIS Classes

CIS 90 Extra Credit

[Home](#)
[Resources](#)
[Forums](#)
[CIS Lab](#)
[CTC](#)

[Login](#)
[Flashcards](#)
[Admin](#)

[CIS 90](#)
[Previous Classes](#)

95 days till term
ends!

[Cabrillo College](#)
[Web Advisor](#)
[CCC Confer](#)
[Static IPs](#)
[Quick Ref](#)
[VM Repairs](#)
[GAH!](#)

CIS 90 Extra Credit

[Course Home](#) [Grades](#)

General Options

Any combination of the following can be done to earn extra credit up to the maximum amount shown on the Grades page:

- **Web site content review** - The first person to email the instructor pointing out an error or typo on this website will get one point of extra credit per content error found. This includes any errors found on the instructor's downloaded materials that have been covered in class. It does not include lesson PowerPoints or Labs that have not yet been covered in class but are pre-published on the website. (Up to 20 points total)
- **Develop new Howtos** - Investigate and develop a Howto on a new topic area you are interested in. At the Instructor's discretion and your permission, these Howtos will be published on this web site on the Resources page. Make a proposal first to the instructor on the topic area and to determine the amount of extra credit. Submittals must follow the format of the instructor's Howtos on the Resources web page and be web publishable. (Up to 20 points per Howto)
- **Optional activities in lab assignments** - Some of the lab assignments will have optional activities that can be worked for extra credit.
- **Lab assignments** - Some courses may have one or more extra credit labs. Check the Calendar web page. (Point amount varies)

Extra Credit

On the forum

Be sure to monitor the forum as I may post extra credit opportunities without any other notice!

On some labs

Extra credit (2 points)

For a small taste of what you would learn in CIS 191 let's add a new user to your Arya VM. Once added we will see how the new account is represented in `/etc/passwd` and `/etc/shadow`.

1. Log into your Arya VM as the cis90 user. Make sure it's your VM and not someone else's.
2. Install the latest updates:
`sudo apt-get update`
`sudo apt-get upgrade`
3. Add a new user account for yourself. You may make whatever username you wish. The example below shows how Benji would make the same username he uses on Opus:
`sudo useradd -G sudo -c "Benji Simms" -m -s /bin/bash simben90`

In lesson slides (search for extra credit)



On the website

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

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

<http://simms-teach.com/cis90extracredit.php>

- **Website content review** - The first person to email the instructor pointing out an error or typo on this website will get one point of extra credit for each unique error. The email must specify the specific document or web page, pinpoint the location of the error, and specify what the correction should be. Duplicate errors count as a single point. This does not apply to pre-published material that has been updated but not yet presented in class. (Up to 20 points total)

Extra Credit Howtos

Rich's Cabrillo College CIS Classes Resources

Home **Resources** Forums CIS Lab Canvas

Login
Flashcards
Admin

[CIS 90](#)
[Previous Terms](#)

103 days till term ends!

[Cabrillo College Web Advisor](#)

[VLab \(web\)](#)
[NETLAB+ VE](#)
[Annoying Issue List](#)

[CIS 90 VLab VM Assignments](#)

[RIP Dennis Ritchie](#)

General Links

Instructors - Ed - Gerlinde - Jeffrey - Jim - John - Michael - Marcelo - Rick - Steve - Sam at CCSF	Getting Linux/UNIX - Linux ISOs - Kernels - RPMs (rpmfind) - RPMs (pbone) Academic Software for CIS Students - Microsoft Webstore - VMware Webstore Virtualization - VirtualBox - VMware ESXi and vSphere client Standards - IEEE - IETF (RFCs) Academics - Cisco NetSpace	Palo Alto Networks - PAN commands Making Strong Passwords - Password Haystack - Ryan Riley - Strong passwords Grammar - Ultimate apostrophe flowchart Classical - Valentina Lisitsa - Beethoven, Moonlight, 3rd - Ji-Yong Kim - Beethoven, Moonlight, 3rd - Valentina Lisitsa - Chopin, Polonaise op 53 - Valentina Lisitsa - Rachmaninoff, Piano Concerto No. 2
---	---	---

Howtos

- HowtoForge
- DNS
- Ethernet (NIC drivers)
- NFS
- NIS
- PPP
- Putty SSH Keys

Student Howtos

- Replacing a MacBook Pro Hard Drive by Amr Sorour
- Logging into Opus from a Mac by Laura Sreckovic and updated by Ann Pike
- Monitor Script by Sean Callahan
- Logging into Opus from a Mac

Linux Commands

- Practical
- Command

Training and Tutorials

- Linux Basics

If you have a strong interest in a topic write a Howto on it to share what you've learned and earn some extra credit at the same time

Wifi Penetration
Wireless Communication and Computer/Network Forensics

**Understanding /bin/mail :
Lost Student versus /bin/mail**

Linux Howtos
Accessing VMWare remotely via Linksys Router
Fall 2008

Assumptions

- VMware server is installed and functioning on your home system.
- You have a home grade router that allows you to configure port forward
- You are able to determine the IP address of your home based system
- You are able to "hard code" and IP address on your VMWare host system
- You are able to determine the IP address of your Virtual Machine

How to Install Virtual Box
Marcos Padellaro

I. Introduction
This How To will show the installation of the Virtual Box program that can be set up in Windows XP to run a second Operating System in a single computer. Additionally, Linux Operating Systems will be installed to demonstrate the use of the Virtual Box.

II. What is VirtualBox?
Virtual Box is an Open Source software, is freely available, and performs as a Virtual Machine. It can be installed in the most popular operating systems such as Windows XP and Vista, Macintosh and Linux. Additionally, supporting a large number of guest operating systems such as Red Hat, Fedora, Ubuntu, OpenSUSE, OpenSUSE, Debian. You can even install Windows Vista or Windows XP Guest in a Linux Host without a dual boot environment... just one key will switch from Host OS to Guest OS. This is a big advantage since you can have two operating systems in the same screen at the same time without restarting your machine!

To get notifications of new forum posts

Subscribe to the forum to get email notifications of new posts

After logging in:

1. Go to the CIS 90 class forum.
2. At the bottom of the page, click the "Subscribe forum" link on the lower left. When subscribed you get email notifications when new posts are made.
3. To unsubscribe, click it again.

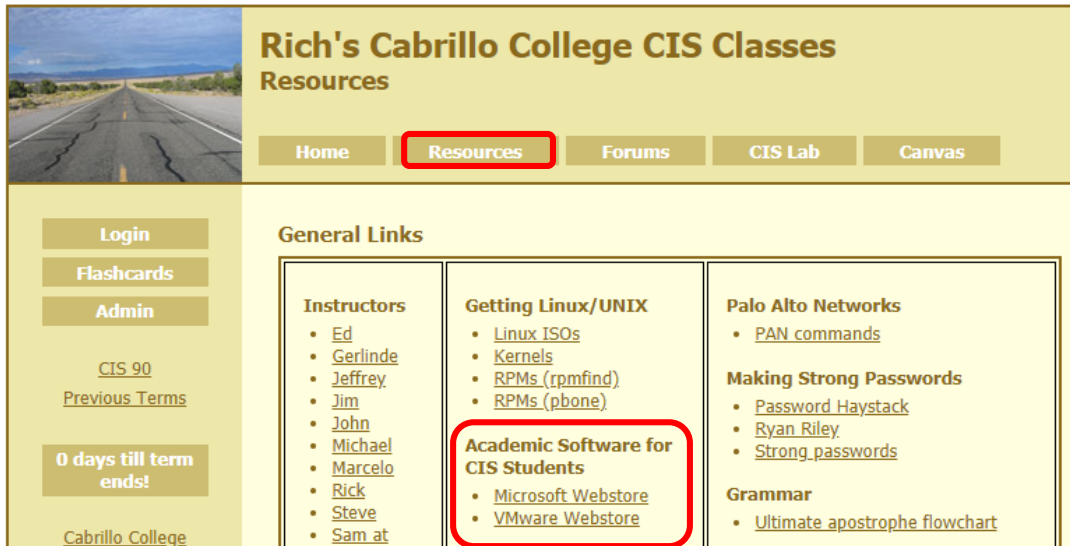
[Home](#) < [Board index](#) ☒ [Subscribe forum](#)

*Unsubscribed
looks like this.*

[Home](#) < [Board index](#) ☐ [Unsubscribe forum](#)

*Subscribed
looks like this.*

Software for eligible CIS students



The screenshot shows a web page titled "Rich's Cabrillo College CIS Classes Resources". The page has a navigation bar with links: Home, Resources (highlighted with a red box), Forums, CIS Lab, and Canvas. On the left side, there are buttons for Login, Flashcards, and Admin, along with links for CIS 90 and Previous Terms. A countdown timer shows "0 days till term ends!". The main content area is titled "General Links" and contains three columns of links. The second column, "Getting Linux/UNIX", includes a link to "Academic Software for CIS Students", which is highlighted with a red box. This link points to a page with links to the Microsoft Webstore and the VMware Webstore.

Rich's Cabrillo College CIS Classes Resources

Home Resources Forums CIS Lab Canvas

Login
Flashcards
Admin

CIS 90
Previous Terms

0 days till term ends!

Cabrillo College

General Links

Instructors	Getting Linux/UNIX	Palo Alto Networks
- Ed - Gerlinde - Jeffrey - Jim - John - Michael - Marcelo - Rick - Steve - Sam at	- Linux ISOs - Kernels - RPMS (rpmfind) - RPMS (pbone) Academic Software for CIS Students - Microsoft Webstore - VMware Webstore	PAN commands

Making Strong Passwords

- Password Haystack
- Ryan Riley
- Strong passwords

Grammar

- Ultimate apostrophe flowchart

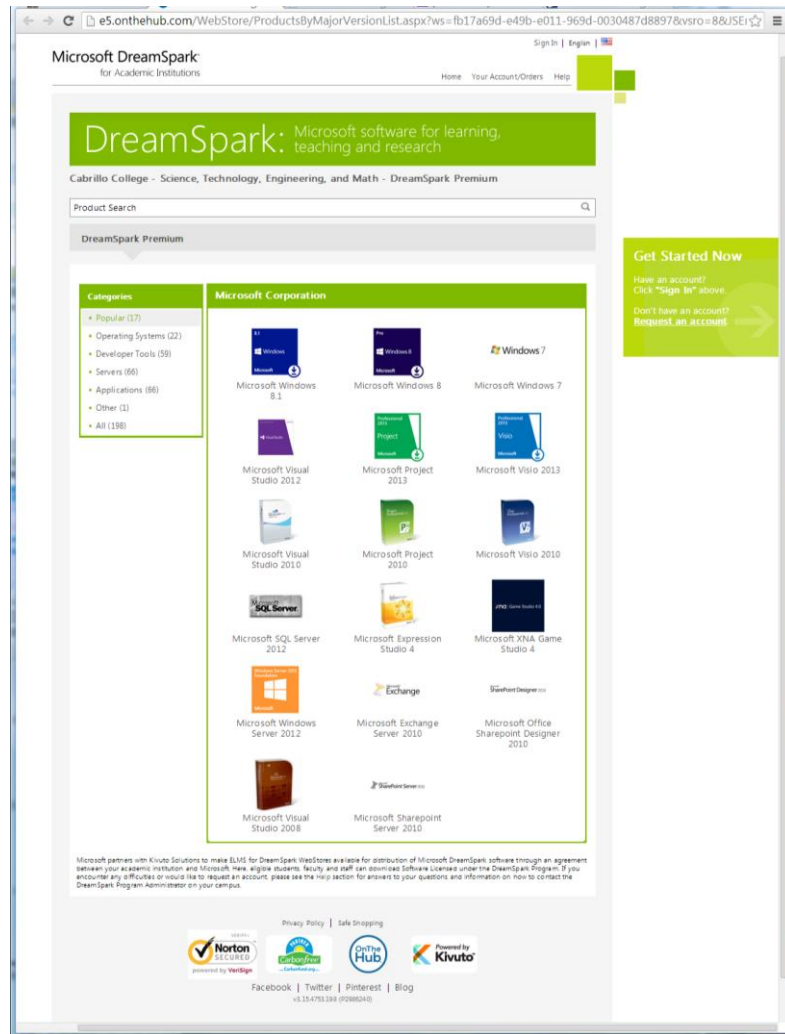


How to obtain Microsoft and VMware software for academic use



<https://simms-teach.com/resources.php>

Microsoft Academic Webstore



Microsoft software for students registered in a CIS or CS class at Cabrillo.

Available after registration is final (two weeks after first class).

For convenience, links to the Academic webstores are on the Resource page of the website:

<https://simms-teach.com/resources.php>

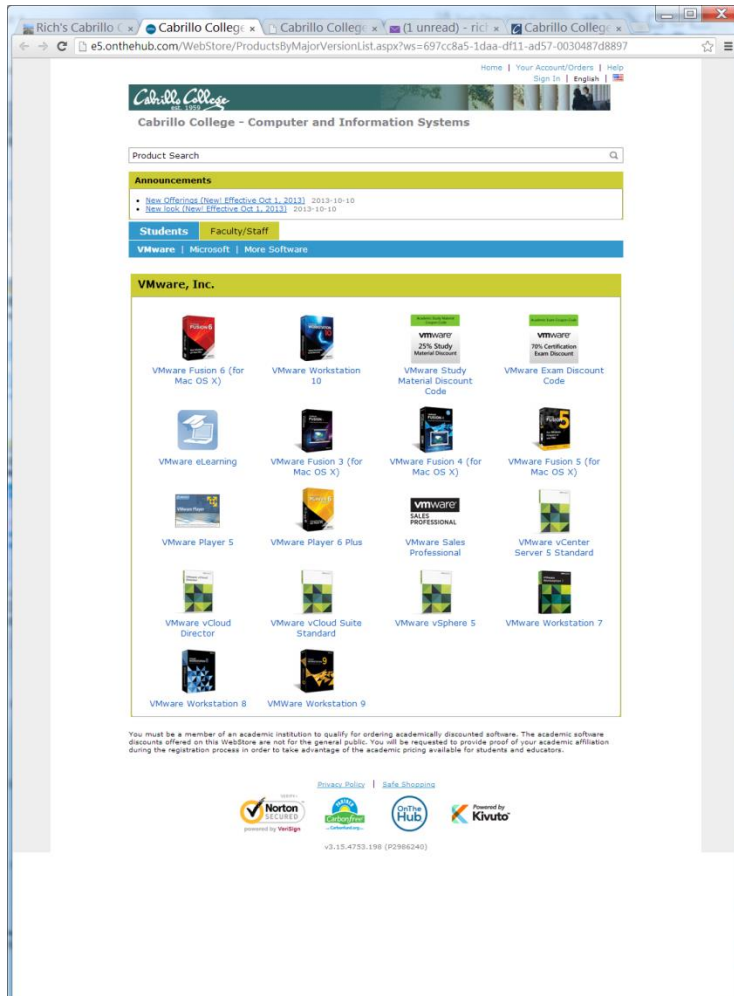
Academic Software for CIS Students

- [Microsoft Webstore](#)
- [VMware Webstore](#)

Licensed for educational use only.

Happy downloading!

VMware Academic Webstore



VMware software for students registered in a CIS or CS class at Cabrillo.

Available after registration is final (two weeks after first class).

For convenience, links to the Academic webstores are on the Resource page of the website:

<https://simms-teach.com/resources.php>

Academic Software for CIS Students

- [Microsoft Webstore](#)
- [VMware Webstore](#)

Licensed for educational use only.

Happy downloading!



Course Expectations Check

Expectation Check

Skills you should be comfortable performing

Navigating <http://simms-teach.com>

- Enter the Virtual Classroom
- Watch video recordings of previous lessons
- Download and search lessons PDFs
- Review your graded work and monitor your current grade status
- Find out when any assignment is due
- Find when any quiz and test will be held
- Find the answers for graded labs and quizzes
- Read and make forum posts
- Obtain Microsoft and VMware products at no cost for academic use
- Locate your personal Arya system

Navigating systems

- Log into Opus-II from home or school using SSH
- Log into Arya and other VMs from Opus-II using SSH
- Use Arya's graphical desktop via VLab
- Change Virtual (TTY) Terminals on your Arya

Using the shell

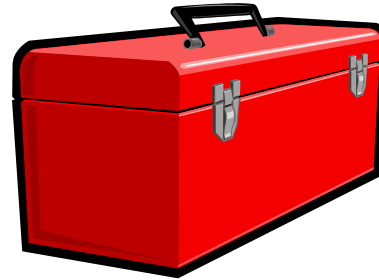
- Use any of the Lesson 1 and 2 commands
- Parse any shell command
- Get documentation on any command
- Identify the four key components of the UNIX/Linux architecture
- Identify the six steps the shell performs for every command
- Temporarily change your shell prompt
- Set and show values of shell variables like PATH, TERM and PS1

If you have any questions on these skills, post a question on the forum or come see me in the CTC!

Notes to Rich



If there is enough time do some of the practice questions in the Backup section



More commands for your toolbox



Lesson 3 commands for your toolbox

write

- "chat" with another user by writing to their terminal

mesg

- enable/disable writes to your terminal

irssi

- Chat using IRC protocol

mail

- send and read email

Write Command

write command

Output text to another user's terminal device

Syntax:

write *username [ttyname]*

- Use *ttyname* if there are multiple logins by the target username.
- The receiver sees:

Message from *yourname@yourhost* on *yourtty* at *hh:mm* ...

- Each line you enter is written to the other user's terminal.
- To end sending message type Ctrl-D (Hold down Ctrl and tap D key)
 - The receiver will see an EOF (end of file) at the end.
- If the receiver wants to reply then they must use the **write** command as well.
- Use **mesg n** (to block incoming messages).
- Use **mesg y** (to allow incoming messages).

Use the write command to chat with another user



```
simben90@oslab:~
/home/cis90/simben $ write milhom90
What's up?

Message from milhom90@oslab.cishawks.net on pts/1 at 09:30 ...
Not much ... want to run around and bark for awhile?
Sure, meet you in the park in 5 mins
Ok
EOF
/home/cis90/simben $ ^C
/home/cis90/simben $
```

```
milhom90@oslab:~
Message from simben90@oslab.cishawks.net on pts/0 at 09:30 ...
What's up?
write simben90
Not much ... want to run around and bark for awhile?
Sure, meet you in the park in 5 mins
Ok
/home/cis90/milhom $ EOF
/home/cis90/milhom $
```

write milhom90

What's up?

Sure, meet you in the park in 5 mins

<Ctrl-D>

write simben90

**Not much ... want to run around and
bark for awhile?**

OK

<Ctrl-D>

write command

send a message to another user

Where is the write command?

```
/home/cis90/simben $ type write  
write is /usr/bin/write
```

Answer: It's in the /usr/bin directory

What kind of file is the write command?

```
/home/cis90/simben $ file /usr/bin/write  
/usr/bin/write: setgid ELF 32-bit LSB shared object, Intel  
80386, version 1 (SYSV), dynamically linked (uses shared  
libs), for GNU/Linux 2.6.18, stripped
```

Answer: It's a binary executable

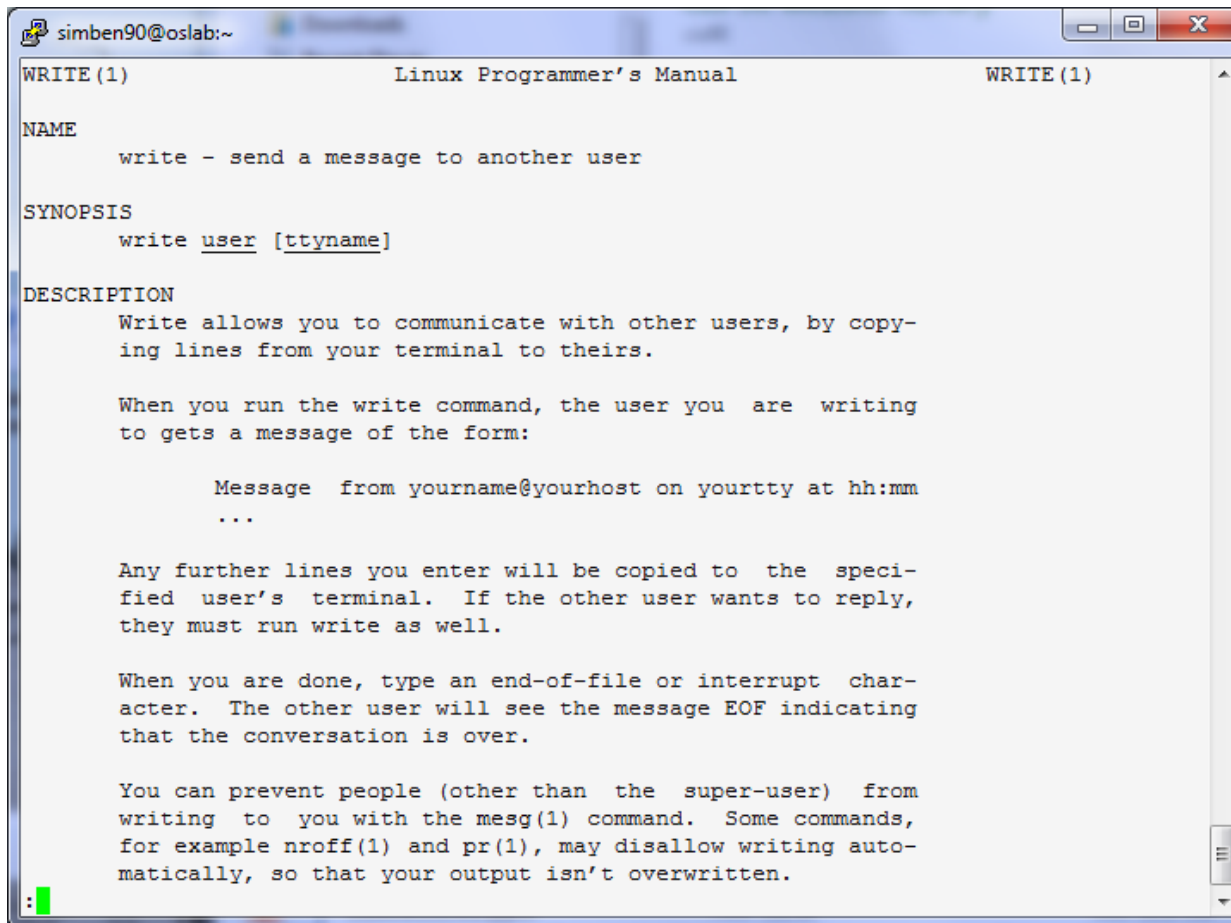
ELF = Executable and Linkable Format

LSB = Least Significant Bit type of bit order

write command

send a message to another user

```
/home/cis90/simben $ man write
```



The screenshot shows a terminal window titled 'simben90@oslab:~'. The terminal displays the output of the 'man write' command. The window has a title bar with standard Linux window controls (minimize, maximize, close). The content is formatted as a man page with sections: NAME, SYNOPSIS, and DESCRIPTION. The 'NAME' section states 'write - send a message to another user'. The 'SYNOPSIS' section shows 'write user [ttyname]'. The 'DESCRIPTION' section explains that 'write' allows communication with other users by copying lines from the terminal to theirs. It also shows the format of the message received: 'Message from yourname@yourhost on yourtty at hh:mm' followed by three dots. It further explains that any further lines entered will be copied to the specified user's terminal, and that the user can prevent people from writing to them using the 'mesg(1)' command. The terminal window has a green cursor at the bottom left.

```
WRITE (1)                                Linux Programmer's Manual                                WRITE (1)

NAME

    write - send a message to another user

SYNOPSIS

    write user [ttyname]

DESCRIPTION

    Write allows you to communicate with other users, by copy-
    ing lines from your terminal to theirs.

    When you run the write command, the user you are writing
    to gets a message of the form:

        Message from yourname@yourhost on yourtty at hh:mm
        ...

    Any further lines you enter will be copied to the speci-
    fied user's terminal. If the other user wants to reply,
    they must run write as well.

    When you are done, type an end-of-file or interrupt char-
    acter. The other user will see the message EOF indicating
    that the conversation is over.

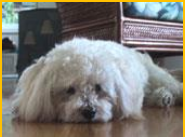
    You can prevent people (other than the super-user) from
    writing to you with the mesg(1) command. Some commands,
    for example nroff(1) and pr(1), may disallow writing auto-
    matically, so that your output isn't overwritten.
```

Use the **man** command to review how the write command works.

Supplemental write example

write command

simben90 writes to milhom90



*Benji, uses the **who** command to see the current users logged into Opus-II. He sees his friend Homer is logged in twice.*

```
/home/cis90/simben $ who
srelau98 pts/0      2012-09-11 06:36 (anice-34-27-241-136.wanadoo.fr)
simben90 pts/1      2012-09-11 06:47 (42-15-94-107.dsl.com)
alvdes98 pts/2      2012-09-11 07:49 (c-25-14-136-111.comcast.net)
milhom90 pts/3      2012-09-11 08:03 (42-15-94-107.dsl.com)
milhom90 pts/4      2012-09-11 08:09 (42-15-94-107.dsl.com)
```



*Homer, ever curious, uses the **tty** command to see what terminal device he is currently using*

```
/home/cis90/milhom $ tty
/dev/pts/4
/home/cis90/milhom $
```

write command

simben90 writes to milhom90



```
/home/cis90/simben $ write milhom90
```

1) Benji enters this

```
write: milhom90 is logged in more than once; writing to pts/4
```



```
/home/cis90/milhom $
```

```
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
```

2) Homer sees this appear on his terminal

write command

simben90 writes to milhom90



```
/home/cis90/simben $ write milhom90  
write: milhom90 is logged in more than once; writing to pts/4  
What do you think of the new CentOS distro?
```

1) Benji enters this



```
/home/cis90/milhom $  
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...  
What do you think of the new CentOS distro?
```

2) Homer sees this appear on his terminal

write command

simben90 writes to milhom90



```
/home/cis90/milhom $
```

```
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
```

```
What do you think of the new CentOS distro?
```

```
write simben90
```

1) Homer enters this



```
/home/cis90/simben $ write milhom90
```

```
write: milhom90 is logged in more than once; writing to pts/4
```

```
What do you think of the new CentOS distro?
```

```
Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...
```

2) and Benji sees this appear on his terminal

write command

simben90 writes to milhom90



```
/home/cis90/milhom $
```

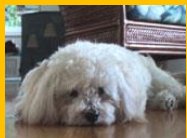
```
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
```

```
What do you think of the new CentOS distro?
```

```
write simben90
```

```
What's with the periods on the long listing permissions?
```

1) Homer enters this



```
/home/cis90/simben $ write milhom90
```

```
write: milhom90 is logged in more than once; writing to pts/4
```

```
What do you think of the new CentOS distro?
```

```
Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...
```

```
What's with the periods on the long listing permissions?
```

2) and Benji sees this appear on his terminal

write command

simben90 writes to milhom90



```
/home/cis90/simben $ write milhom90
write: milhom90 is logged in more than once; writing to pts/4
What do you think of the new CentOS distro?
```

```
Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...
What's with the periods on the long listing permissions?
```

```
I think it's SELinux
```

1) Benji enters this



```
/home/cis90/milhom $
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
What do you think of the new CentOS distro?
write simben90
What's with the periods on the long listing permissions?
I think it's SELinux
```

2) Homer sees this appear on his terminal

write command

simben90 writes to milhom90



```
/home/cis90/milhom $  
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...  
What do you think of the new CentOS distro?  
write simben90  
What's with the periods on the long listing permissions?  
I think it's SELinux  
Talk to you later, I'm going to bark a little and take a nap
```

1) Homer enters this



```
/home/cis90/simben $ write milhom90  
write: milhom90 is logged in more than once; writing to pts/4  
What do you think of the new CentOS distro?  
  
Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...  
What's with the periods on the long listing permissions?  
I think it's SELinux  
Talk to you later, I'm going to bark a little and take a nap
```

2) and Benji sees this appear on his terminal

write command

simben90 writes to milhom90



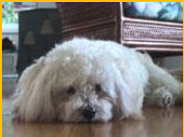
```
/home/cis90/milhom $  
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...  
What do you think of the new CentOS distro?  
write simben90  
What's with the periods on the long listing permissions?  
I think it's SELinux  
Talk to you later, I'm going to bark a little and take a nap  
Ctrl-D ← 1) Homer issues a Ctrl-D (holds down Ctrl  
/home/cis90/milhom $ key, then taps D key)
```



```
/home/cis90/simben $ write milhom90  
write: milhom90 is logged in more than once; writing to pts/4  
What do you think of the new CentOS distro?  
  
Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...  
What's with the periods on the long listing permissions?  
I think it's SELinux  
Talk to you later, I'm going to bark a little and take a nap  
EOF ← 2) and Benji sees this appear on his terminal
```

write command

simben90 writes to milhom90



```
/home/cis90/simben $ write milhom90
write: milhom90 is logged in more than once; writing to pts/4
What do you think of the new CentOS distro?
```

```
Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...
What's with the periods on the long listing permissions?
I think it's SELinux
Talk to you later, I'm going to bark a little and take a nap
EOF
```

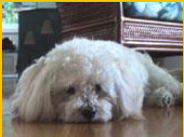
bye ← 1) *Benji enters this*



```
/home/cis90/milhom $
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
What do you think of the new CentOS distro?
write simben90
What's with the periods on the long listing permissions?
I think it's SELinux
Talk to you later, I'm going to bark a little and take a nap
/home/cis90/milhom $ bye ← 2) Homer sees this written to his terminal
```

write command

simben90 writes to milhom90



```
/home/cis90/simben $ write milhom90
write: milhom90 is logged in more than once; writing to pts/4
What do you think of the new CentOS distro?
```

```
Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...
What's with the periods on the long listing permissions?
I think it's SELinux
Talk to you later, I'm going to bark a little and take a nap
EOF
bye
Ctrl-D
```

1) Benji issues a Ctrl-D (holds down Ctrl key, then taps D key)

```
/home/cis90/simben $
```



```
/home/cis90/milhom $
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
What do you think of the new CentOS distro?
write simben90
What's with the periods on the long listing permissions?
I think it's SELinux
Talk to you later, I'm going to bark a little and take a nap
/home/cis90/milhom $ bye
EOF
```

2) and Homer sees this appear on his terminal

Class Activity

Students, login to Opus-II if you haven't already

- Use the write command to "chat" with your pair mate.
e.g. **write** *username*
- Ask your pair mate for their real first name and put that in the chat window.
- End the chat session with Ctrl-D

Note to Rich:

Run **pairs** alias (script in /home/rsimms/cis90/lab03/scripts directory)

mesg command

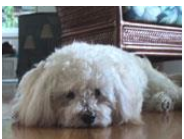
mesg y enables and **mesg n** disables writes to your terminal



```
/home/cis90/milhom $ mesg n
```



1) Homer disables writes to his terminal so he can take his nap



```
/home/cis90/simben $ write milhom90  
write: milhom90 has messages disabled
```

2) Benji discovers that Homer is no longer accepting messages

who command

The -T option shows who is writeable

The -T option shows users messages status

```
/home/cis90/simben $ who -T
srelau98 + pts/0          2012-09-11 06:36 (anice-34-27-241-136.wanadoo.fr)
simben90 + pts/1          2012-09-11 06:47 (42-15-94-107.dsl.com)
alvdes98 + pts/2          2012-09-11 07:49 (c-25-14-136-111.comcast.net)
milhom90 - pts/3          2012-09-11 08:03 (42-15-94-107.dsl.com)
milhom90 - pts/4          2012-09-11 08:09 (42-15-94-107.dsl.com)
```

+ indicate writes to this user are enabled and - indicates writes to this user are blocked

```
/home/cis90/simben $ ls -l /dev/pts*
total 0
crw--w----. 1 srelau98 tty 136, 0 Sep 11 08:15 0
crw--w----. 1 simben90 tty 136, 1 Sep 11 08:25 1
crw--w----. 1 alvdes98 tty 136, 2 Sep 11 08:25 2
crw-- --. 1 milhom90 tty 136, 3 Sep 11 08:19 3
crw-- --. 1 milhom90 tty 136, 4 Sep 11 08:19 4
c----- . 1 root root 5, 2 Jul 30 21:25 ptmx
```

We will learn about file wildcards and permissions later.

This is a just a preview showing that write permission is removed from /dev/pts/3 and /dev/pts/4 for the tty group.

IRC

irssi

Chat with multiple users via IRC server

Syntax:

irssi

/connect *hostname*

Connect to IRC server

/join *#channel*

Join channel

/part

Leave channel

/nick *your-nickname*

Set your display name

/names

See others in channel

message

Public chat message

/msg *nickname message*

Private chat message

 **1**

Main window

 **2**

Public chat window

 **3**

Private chat window

/disconnect

Disconnect from IRC server

/exit or /quit

Exit irssi

Follow me

Students, login to Opus-II if you haven't already

irssi

/connect eh-irc

/join #cis90

/nick Benji

Hello world

/names

/msg Benji Hey Benji

alt 1

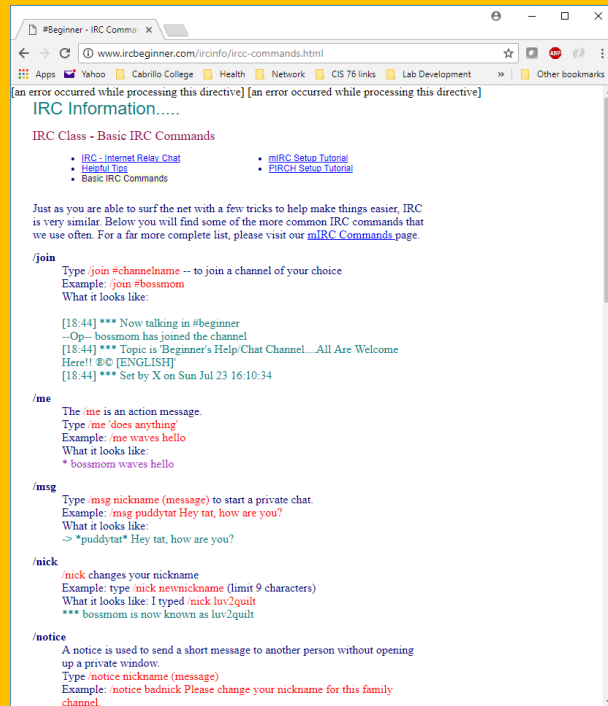
alt 2

alt 3

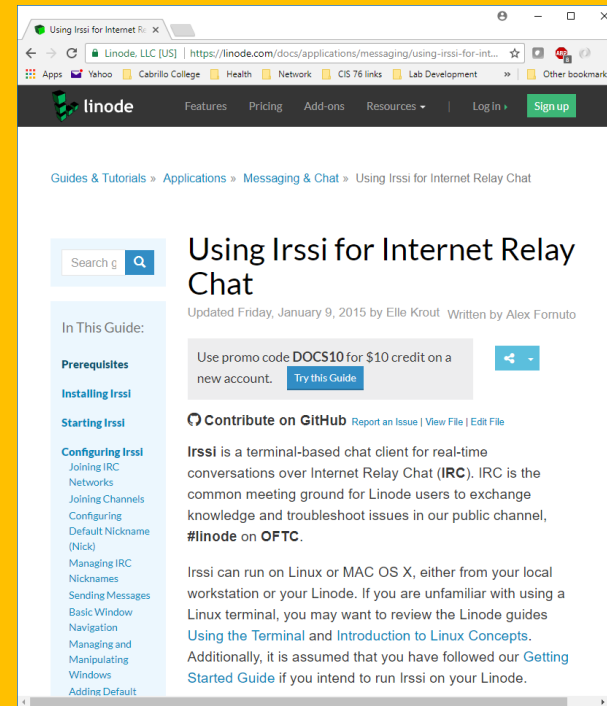
/exit or /quit

Use your own name here

irssi Supplemental Reading



<http://www.ircbeginner.com/ircinfo/ircc-commands.html>

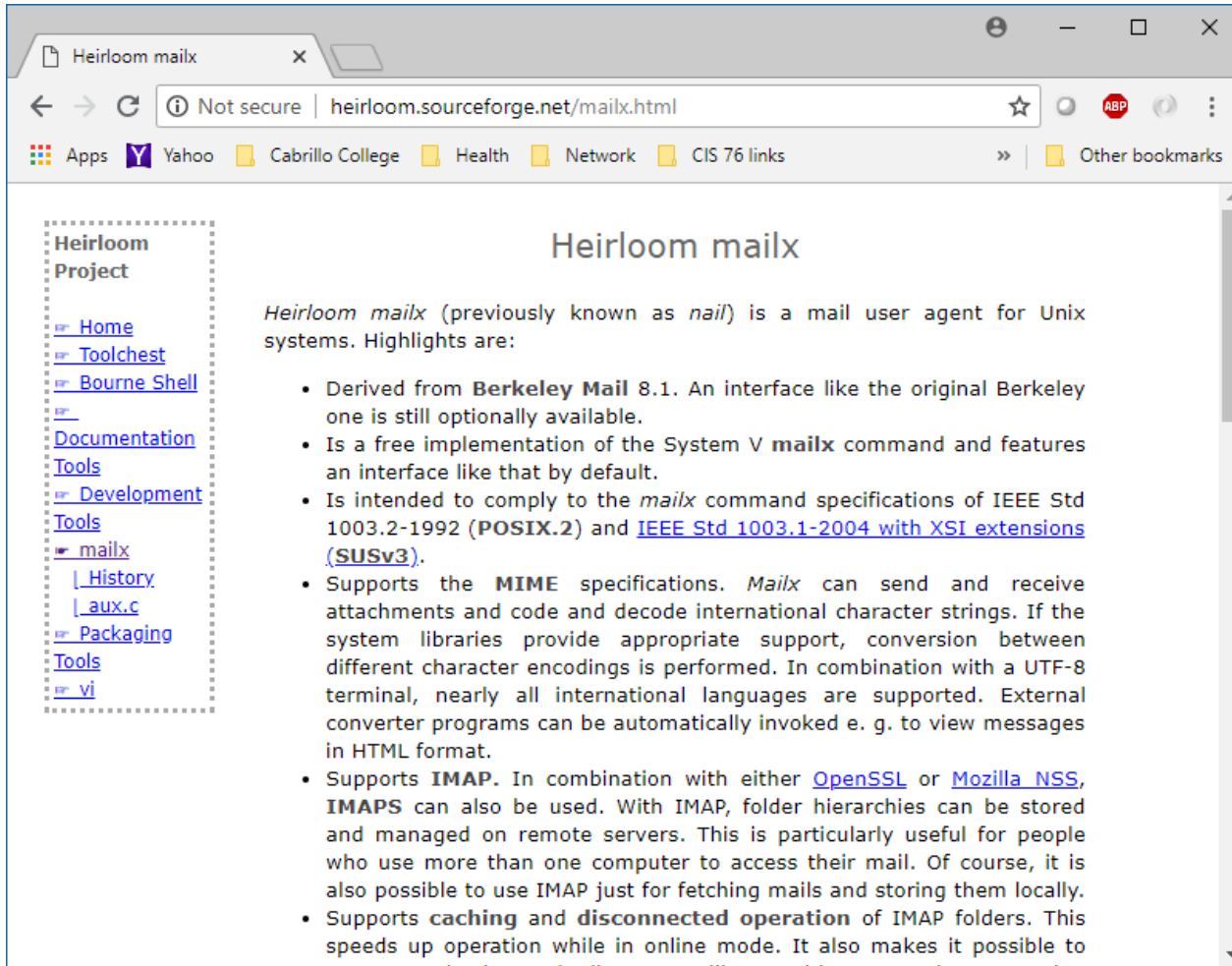


<https://linode.com/docs/applications/messaging/using-irssi-for-internet-relay-chat/>

Basic Mail

The mailx program

Heirloom mailx - email via the command line



The screenshot shows a web browser window with the title "Heirloom mailx". The address bar shows "http://heirloom.sourceforge.net/mailx.html". The page content includes a sidebar with links to Home, Toolchest, Bourne Shell, Documentation, Tools, Development, mailx, History, aux.c, Packaging, and vi. The main content area has the heading "Heirloom mailx" and a paragraph describing it as a mail user agent for Unix systems. Below this is a bulleted list of features.

Heirloom mailx

Heirloom mailx (previously known as *mail*) is a mail user agent for Unix systems. Highlights are:

- Derived from **Berkeley Mail 8.1**. An interface like the original Berkeley one is still optionally available.
- Is a free implementation of the System V **mailx** command and features an interface like that by default.
- Is intended to comply to the *mailx* command specifications of IEEE Std 1003.2-1992 (POSIX.2) and [IEEE Std 1003.1-2004 with XSI extensions \(SUSv3\)](#).
- Supports the **MIME** specifications. *Mailx* can send and receive attachments and code and decode international character strings. If the system libraries provide appropriate support, conversion between different character encodings is performed. In combination with a UTF-8 terminal, nearly all international languages are supported. External converter programs can be automatically invoked e. g. to view messages in HTML format.
- Supports **IMAP**. In combination with either [OpenSSL](#) or [Mozilla NSS](#), **IMAPS** can also be used. With IMAP, folder hierarchies can be stored and managed on remote servers. This is particularly useful for people who use more than one computer to access their mail. Of course, it is also possible to use IMAP just for fetching mails and storing them locally.
- Supports **caching** and **disconnected operation** of IMAP folders. This speeds up operation while in online mode. It also makes it possible to

We will be using the Heirloom Mailx program for a command-line version of email.

UNIX mail

The mail command is a program, named mailx

```
/home/cis90/simben $ type mail  
mail is hashed (/usr/bin/mail)
```

The mail program is on the path and in the /usr/bin directory.

```
/home/cis90/simben $ file /usr/bin/mail  
/usr/bin/mail: symbolic link to `mailx'
```

It is a "symbolic link" (we learn about these later) to the mailx program.

```
/home/cis90/simben $ type mailx  
mailx is /usr/bin/mailx
```

The mailx program file is also in the /usr/bin directory.

```
/home/cis90/simben $ file /usr/bin/mailx  
/usr/bin/mailx: ELF 64-bit LSB executable,  
x86-64, version 1 (SYSV), dynamically  
linked (uses shared libs), for GNU/Linux  
2.6.32,  
BuildID[sha1]=4899690244325ef32788582556f6c  
afad6ee9ea9, stripped
```

The mailx program is a binary executable.

Notes to Rich



[] - Verify new cis90-students alias has been created

```
grep cis90 /etc/aliases
```


UNIX mail

Sending messages

As an example, Benji sends an email to Homer (a user on Opus-II) and Rich (using his Yahoo email address)

Homer
(milhom90)



Rich
(richsimms@yahoo.com)



Benji
(simben90)

```
/home/cis90/simben $ mail milhom90 richsimms@yahoo.com
```

```
Subject: Where is the old bone
```

```
I can't find my old bone. Let me know if you see it.
```

```
Thanks,
```

```
Benji
```

```
.
```

```
EOT
```

```
/home/cis90/simben $
```

Use Ctrl-D or a single period to end the message (End Of Text)

Recipients can be Opus-II users (just specify their username) or regular email addresses.

UNIX Mail

Reading messages



Homer
(milhom90)

```
/home/cis90/milhom $
```

```
You have new mail in /var/spool/mail/milhom90
```

Homer notices he has received new mail and runs the mail command to see what has arrived

```
/home/cis90/milhom $ mail
```

```
Heirloom Mail version 12.4 7/29/08. Type ? for help.
```

```
"/var/spool/mail/milhom90": 1 message 1 new
```

```
>N 1 Benji Simms Tue Sep 11 12:59 22/830 "Where is the old bone"
```

```
& 1
```

He types 1 to read message 1

```
Message 1:
```

```
From simben90@oslab.cabrillo.edu Tue Sep 11 12:59:27 2012
```

```
Return-Path: <simben90@oslab.cabrillo.edu>
```

```
From: Benji Simms <simben90@oslab.cabrillo.edu>
```

```
Date: Tue, 11 Sep 2012 12:59:27 -0700
```

```
To: richsimms@yahoo.com, milhom90@oslab.cabrillo.edu
```

```
Subject: Where is the old bone
```

```
User-Agent: Heirloom mailx 12.4 7/29/08
```

```
Content-Type: text/plain; charset=us-ascii
```

```
Status: R
```

message headers

```
I can't find my old bone. Let me know if you see it.
```

```
Thanks,
```

```
Benji
```

message body

The N signifies a new message

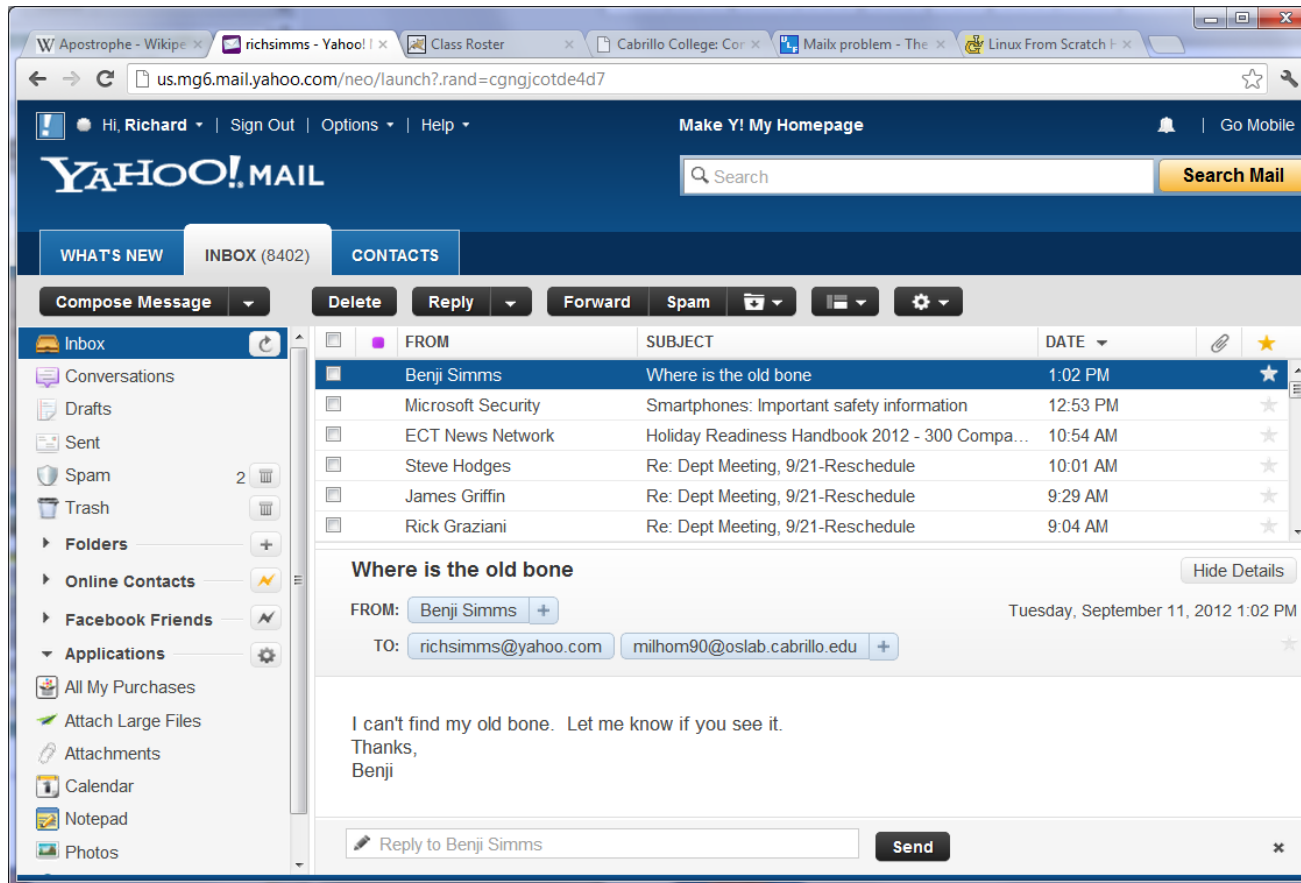
The & is the mail prompt

UNIX mail

Reading messages sent from UNIX mail



Rich
(richsimms@yahoo.com)



Rich reads the email from Benji using Yahoo mail (a mail user agent)

Sending Mail

UNIX mail

Sending messages using the mail command

mail *recipient1 recipient2 ... recipientN*

The mail command can be used to send an email to one or more recipients. Each argument designates a recipient specified by a username (in /etc/passwd), a normal email address, or an alias (in /etc/aliases).

Examples:

mail **rsimms** *username as argument*

mail **simben90 prites90 mcgmon90** *multiple usernames as arguments*

mail **risimms@cabrillo.edu feredu90** *regular email address and
username as arguments*

mail **\$LOGNAME** *your username, specified using a variable, as argument*

mail **cis90-students** *an alias (used as a distribution list)
for all CIS 90 students*

Sending an email from the command line

```
1) /home/cis90/simben $ mail simben90 rsimms  
2) Subject: Welcome  
3) This mail program is pretty crazy!  
4) .  
   /home/cis90/simben $
```

- 1) *Specify one or more recipients as arguments to the mail command.*
- 2) *When prompted, enter a subject for the message.*
- 3) *Then start typing (there is no prompt) the body of the message. Continue typing and entering each line till finished. Note you can't edit a line after you enter it!*
- 4) *Enter a . in column 1 to end the message and send it.*

Activity

- Login to Opus-II
- Send a message to Benji and me:

```
/home/cis90/simben $ mail simben90 rsimms
Subject: Welcome
This mail program is pretty crazy!
.
/home/cis90/simben $
```

Write "it works" or "having trouble" in the chat window.

Activity

- Send a message to yourself using the LOGNAME variable (which contains your username):

```
/home/cis90/simben $ mail $LOGNAME  
Subject: Velkominn  
This mail program is pretty crazy!  
.  
/home/cis90/simben $
```

Write "it works" or "having trouble" in the chat window.

Activity

- Send a message to yourself and your regular email address:

*Replace with your
Opus-II username*



```
/home/cis90/simben $ mail xxxxxx90 xxxxxx@xxxxxx.com  
Subject: Bienvenido  
This mail program is pretty crazy!  
.  
/home/cis90/simben $
```



*Replace with
your regular
email address*

Write "it works" or "having trouble" in the chat window.

Activity

- Send a message to the whole class using the cis90-students alias (a distribution list):

```
/home/cis90/simben $ mail cis90-students  
Subject: Tervetuloa  
This mail program is pretty crazy!  
.  
/home/cis90/simben $
```

Write "it works" or "having trouble" in the chat window.

Notes to Rich



[] - Send out Welcome letter

use **welcome** alias or

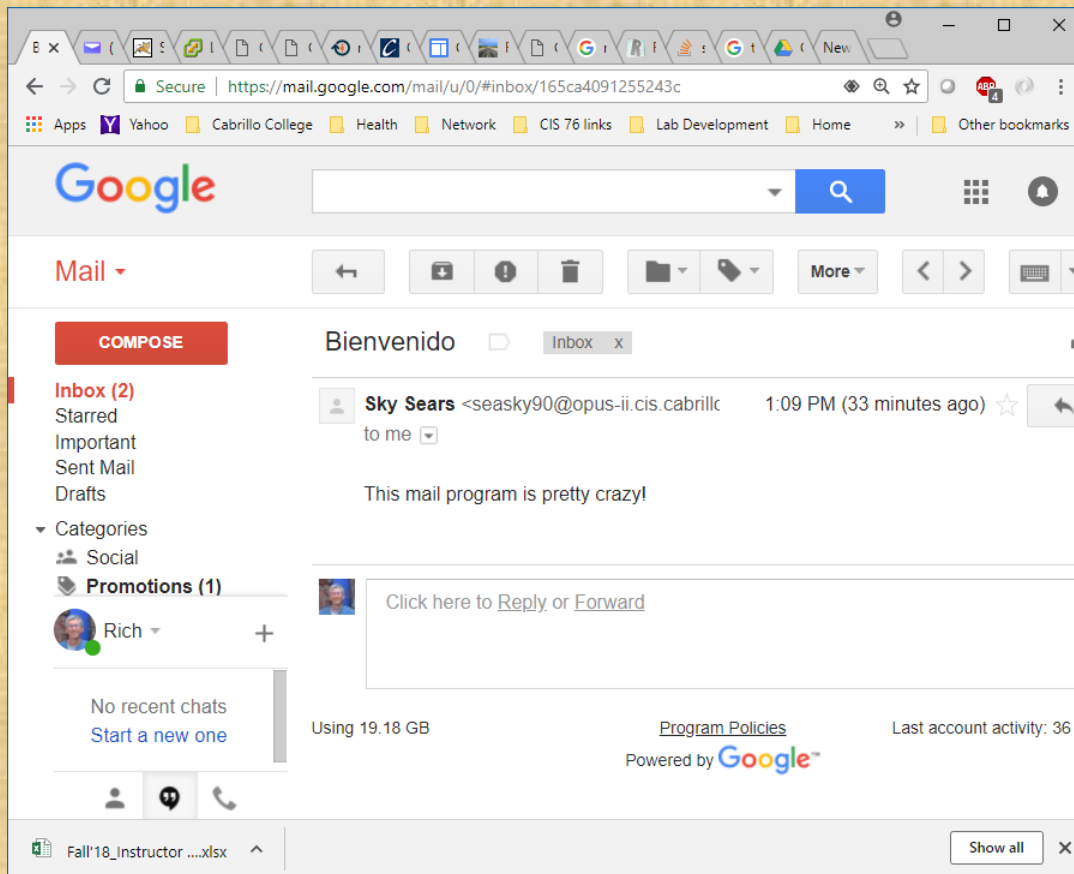
~rsimms/cis90/lab03/scripts/uhist/mail-welcome

Reading Mail

Activity



Rich
(richsimms@cabrillo.edu)



Check your regular mail and see if you got any messages from yourself.

Write "it works" or "having trouble" in the chat window.

UNIX mail

Reading messages

Syntax:

mail

To read mail, enter the mail command with no arguments. The mail command has its own mini-shell with its own set of mail oriented commands.

Activity

mail

```
/home/cis90/seasky $  
You have new mail in /var/spool/mail/seasky90  
/home/cis90/seasky $ mail  
Heirloom Mail version 12.5 7/5/10.  Type ? for help.  
"/var/spool/mail/seasky90": 4 messages 4 new  
>N 1 Sky Sears      Tue Sep 11 13:08  18/687  "Velkiminn"  
  N 2 Sky Sears      Tue Sep 11 13:09  19/711  "Bienvenido"  
  N 3 Sky Sears      Tue Sep 11 13:10  18/721  "Tervetuloa"  
  N 4 Rich Simms     Tue Sep 11 13:10  30/938  "Welcome"  
& █
```

You will get a notification "You have new mail ..." when new mail arrives.

To read your mail enter: **mail**

You will then see a list of messages in your "in-tray". Your "in-tray" is actually a regular file whose pathname is `/var/spool/mail/$LOGNAME`. The "N" indicates a new unread message.

Write "it works" or "having trouble" in the chat window.

Activity

2

```
& 2
Message 2:
From seasky90@opus-ii.cis.cabrillo.edu  Tue Sep 11 13:09:13 2018
Return-Path: <seasky90@opus-ii.cis.cabrillo.edu>
X-Original-To: seasky90
Delivered-To: seasky90@opus-ii.cis.cabrillo.edu
Date: Tue, 11 Sep 2018 13:09:13 -0700
To: risimms@cabrillo.edu, seasky90@opus-ii.cis.cabrillo.edu
Subject: Bienvenido
User-Agent: Heirloom mailx 12.5 7/5/10
Content-Type: text/plain; charset=us-ascii
From: seasky90@opus-ii.cis.cabrillo.edu (Sky Sears)
Status: R

This mail program is pretty crazy!
--More--
```

Enter 2 to arbitrarily read the second message.

If you see "--More--" then use the Space Bar to continue reading through the message.

Write "it works" or "having trouble" in the chat window.

Activity

[Space Bar]

```
Message 2:
From seasky90@opus-ii.cis.cabrillo.edu Tue Sep 11 13:09:13 2018
Return-Path: <seasky90@opus-ii.cis.cabrillo.edu>
X-Original-To: seasky90
Delivered-To: seasky90@opus-ii.cis.cabrillo.edu
Date: Tue, 11 Sep 2018 13:09:13 -0700
To: risimms@cabrillo.edu, seasky90@opus-ii.cis.cabrillo.edu
Subject: Bienvenido
User-Agent: Heirloom mailx 12.5 7/5/10
Content-Type: text/plain; charset=us-ascii
From: seasky90@opus-ii.cis.cabrillo.edu (Sky Sears)
Status: R
```

This mail program is pretty crazy!

& █

For long messages you may need to hit the Space Bar several times.

Write "it works" or "having trouble" in the chat window.

Activity

[Enter Key]

```
&
Message 3:
From seasky90@opus-ii.cis.cabrillo.edu  Tue Sep 11 13:10:05 2018
Return-Path: <seasky90@opus-ii.cis.cabrillo.edu>
X-Original-To: cis90-test-students
Delivered-To: cis90-test-students@opus-ii.cis.cabrillo.edu
Date: Tue, 11 Sep 2018 13:10:04 -0700
To: cis90-test-students@opus-ii.cis.cabrillo.edu
Subject: Tervetuloa
User-Agent: Heirloom mailx 12.5 7/5/10
Content-Type: text/plain; charset=us-ascii
From: seasky90@opus-ii.cis.cabrillo.edu (Sky Sears)
Status: R

This mail program is pretty crazy!
```

Hit the Enter Key to read the next unread message. If you see "--More--" then use the Space Bar to continue reading through the message.

Write "it works" or "having trouble" in the chat window.

Activity

[Enter Key]

```
&
Message 4:
From rsimms@opus-ii.cis.cabrillo.edu Tue Sep 11 13:10:37 2018
Return-Path: <rsimms@opus-ii.cis.cabrillo.edu>
X-Original-To: seasky90
Delivered-To: seasky90@opus-ii.cis.cabrillo.edu
Date: Tue, 11 Sep 2018 13:10:37 -0700
To: seasky90@opus-ii.cis.cabrillo.edu
Subject: Welcome
User-Agent: Heirloom mailx 12.5 7/5/10
Content-Type: text/plain; charset=us-ascii
From: rsimms@opus-ii.cis.cabrillo.edu (Rich Simms)
Status: R

Hello Sky,

Welcome to CIS 90!

Your account is on the Opus-II server which is running the
CentOS 7 distribution of Linux.

The external hostname for Opus-II is opus-ii.cis.cabrillo.edu which
will resolve to 207.62.187.230 outside of the campus.

Enjoy learning about Linux and UNIX.

- Rich
```

Hit the Enter key to read the next unread message. If you see "--More--" then use the Space Bar to continue reading through the message.

Write "it works" or "having trouble" in the chat window.

Activity

h

```
The external hostname for Opus-II is opus-ii.cis.cabrillo.edu which  
will resolve to 207.62.187.230 outside of the campus.
```

```
Enjoy learning about Linux and UNIX.
```

```
- Rich
```

```
&  
At EOF  
& h  
  N  1 Sky Sears      Tue Sep 11 13:08  18/687  "Velkiminn"  
    2 Sky Sears      Tue Sep 11 13:09  19/711  "Bienvenido"  
    3 Sky Sears      Tue Sep 11 13:10  18/721  "Tervetuloa"  
>  4 Rich Simms      Tue Sep 11 13:10  30/938  "Welcome"  
&
```

Enter **h** or **headers** to list the messages. The information listed comes from the mail headers associated with each message. "N" means new message, "A" means answered, U means unread, * means saved, and " " (blank) means the message has been read.

If you have more messages than can fit in the window use the **z** and **z-** commands to zoom (scroll) forward and back.

Write "it works" or "having trouble" in the chat window.

Activity

1

& 1

Message 1:

From seasky90@opus-ii.cis.cabrillo.edu Tue Sep 11 13:08:18 2018

Return-Path: <seasky90@opus-ii.cis.cabrillo.edu>

X-Original-To: seasky90

Delivered-To: seasky90@opus-ii.cis.cabrillo.edu

Date: Tue, 11 Sep 2018 13:08:18 -0700

To: seasky90@opus-ii.cis.cabrillo.edu

Subject: Velkiminn

User-Agent: Heirloom mailx 12.5 7/5/10

Content-Type: text/plain; charset=us-ascii

From: seasky90@opus-ii.cis.cabrillo.edu (Sky Sears)

Status: R

This mail program is pretty crazy!

& 

Enter 1 to read the first message. If you see "--More--" then use the Space Bar to continue reading through the message.

Write "it works" or "having trouble" in the chat window.

Activity

quit

```
& quit  
Held 4 messages in /var/spool/mail/seasky90  
You have mail in /var/spool/mail/seasky90  
/home/cis90/seasky $
```

Use **exit** or **quit** to leave mail. **quit** will exit and any deleted messages will be permanently removed. **exit** will exit without actually removing any deleted messages.

the **exit** command can be abbreviated as **x** and the **quit** command can be abbreviated as **q**.

Write "it works" or "having trouble" in the chat window.

Managing Mail

UNIX mail

Reading messages

potd (*10 or more times*)

```
/home/cis90/seasky $  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $ potd  
/home/cis90/seasky $
```

Enter the **potd** command a bunch of times to generate some messages to yourself. Be sure and use the up arrow instead of typing potd each time.

Write "it works" or "having trouble" in the chat window.

UNIX mail

mail

```
/home/cis90/seasky $ mail
Heirloom Mail version 12.5 7/5/10.  Type ? for help.
"/var/spool/mail/seasky90": 20 messages 16 new
 1 Sky Sears      Tue Sep 11 13:08  19/698  "Velkiminn"
 2 Sky Sears      Tue Sep 11 13:09  20/722  "Bienvenido"
 3 Sky Sears      Tue Sep 11 13:10  19/732  "Tervetuloa"
 4 Rich Simms     Tue Sep 11 13:10  31/949  "Welcome"
>N 5 Sky Sears     Tue Sep 11 14:09  31/1247 "sonnet35"
 N 6 Sky Sears     Tue Sep 11 14:09  26/872  "forget"
 N 7 Sky Sears     Tue Sep 11 14:09  45/1506 "mooncat"
 N 8 Sky Sears     Tue Sep 11 14:09  27/881  "ant"
 N 9 Sky Sears     Tue Sep 11 14:09  31/1270 "sonnet5"
 N10 Sky Sears     Tue Sep 11 14:09  27/881  "ant"
 N11 Sky Sears     Tue Sep 11 14:09  31/1252 "sonnet26"
 N12 Sky Sears     Tue Sep 11 14:09  35/1305 "twilight"
 N13 Sky Sears     Tue Sep 11 14:09  45/1508 "mooncat"
 N14 Sky Sears     Tue Sep 11 14:09  99/2088 "artichoke"
 N15 Sky Sears     Tue Sep 11 14:09  27/883  "ant"
 N16 Sky Sears     Tue Sep 11 14:09  70/2488 "dog"
 N17 Sky Sears     Tue Sep 11 14:09  31/1281 "sonnet2"
 N18 Sky Sears     Tue Sep 11 14:09  31/1238 "sonnet4"
 N19 Sky Sears     Tue Sep 11 14:09  29/882  "you"
&
```

Enter the **mail** command and you should see a bunch of new messages from yourself.

Write "it works" or "having trouble" in the chat window.

UNIX mail

s 1-3 trash

```

1 Sky Sears Tue Sep 11 13:08 19/698 "Velkiminn"
2 Sky Sears Tue Sep 11 13:09 20/722 "Bienvenido"
3 Sky Sears Tue Sep 11 13:10 19/732 "Tervetuloa"
4 Rich Simms Tue Sep 11 13:10 31/949 "Welcome"
> 5 Sky Sears Tue Sep 11 14:09 31/1247 "sonnet35"
N 6 Sky Sears Tue Sep 11 14:09 26/872 "forget"
N 7 Sky Sears Tue Sep 11 14:09 45/1506 "mooncat"
N 8 Sky Sears Tue Sep 11 14:09 27/881 "ant"
N 9 Sky Sears Tue Sep 11 14:09 31/1270 "sonnet5"
N 10 Sky Sears Tue Sep 11 14:09 27/881 "ant"
N 11 Sky Sears Tue Sep 11 14:09 31/1252 "sonnet26"
N 12 Sky Sears Tue Sep 11 14:09 35/1305 "twilight"
N 13 Sky Sears Tue Sep 11 14:09 45/1508 "mooncat"
N 14 Sky Sears Tue Sep 11 14:09 99/2088 "artichoke"
N 15 Sky Sears Tue Sep 11 14:09 27/883 "ant"
N 16 Sky Sears Tue Sep 11 14:09 70/2488 "dog"
N 17 Sky Sears Tue Sep 11 14:09 31/1281 "sonnet2"
N 18 Sky Sears Tue Sep 11 14:09 31/1238 "sonnet4"
N 19 Sky Sears Tue Sep 11 14:09 29/882 "you"
N 20 Sky Sears Tue Sep 11 14:09 31/1252 "sonnet26"
& s 1-3 trash
"trash" [New file] 61/2185
&

```

Using the **s** command, save the initial three welcome messages in a folder named trash.

Write "it works" or "having trouble" in the chat window.

UNIX mail

[Enter Key]

```
&
Message 20:
From seasky90@opus-ii.cis.cabrillo.edu  Tue Sep 11 14:09:14 2018
Return-Path: <seasky90@opus-ii.cis.cabrillo.edu>
X-Original-To: seasky90
Delivered-To: seasky90@opus-ii.cis.cabrillo.edu
Date: Tue, 11 Sep 2018 14:09:14 -0700
To: seasky90@opus-ii.cis.cabrillo.edu
Subject: sonnet26
User-Agent: Heirloom mailx 12.5 7/5/10
Content-Type: text/plain; charset=us-ascii
From: seasky90@opus-ii.cis.cabrillo.edu (Sky Sears)
Status: R
```

```
Lord of my love, to whom in vassalage
Thy merit hath my duty strongly knit,
To thee I send this written ambassage
To witness duty, not to show my wit;
Duty so great, which wit so poor as mine
May make seem bare, in wanting words to show it,
But that I hope some good conceit of thine
In thy soul's thought (all naked) will bestow it;
Till whatsoever star that guides my moving
Points on me graciously with fair aspect,
And puts apparel on my tottered loving,
To show me worthy of thy sweet respect:
    Then may I dare to boast how I do love thee,
    Till then, not show my head where thou mayst prove me.
```

Read all the new messages by repeatedly pressing the [Enter Key] and [Space Bar] as needed. When you get the end you will get "At EOF" (End of File).

Write "it works" or "having trouble" in the chat window.

UNIX mail

h

```
& h
* 1 Sky Sears      Tue Sep 11 13:08 19/698 "Velkiminn"
* 2 Sky Sears      Tue Sep 11 13:09 20/722 "Bienvenido"
* 3 Sky Sears      Tue Sep 11 13:10 19/732 "Tervetuloa"
  4 Rich Simms     Tue Sep 11 13:10 31/949 "Welcome"
  5 Sky Sears      Tue Sep 11 14:09 31/1247 "sonnet35"
  6 Sky Sears      Tue Sep 11 14:09 26/872 "forget"
  7 Sky Sears      Tue Sep 11 14:09 45/1506 "mooncat"
  8 Sky Sears      Tue Sep 11 14:09 27/881 "ant"
  9 Sky Sears      Tue Sep 11 14:09 31/1270 "sonnet5"
 10 Sky Sears      Tue Sep 11 14:09 27/881 "ant"
 11 Sky Sears      Tue Sep 11 14:09 31/1252 "sonnet26"
 12 Sky Sears      Tue Sep 11 14:09 35/1305 "twilight"
 13 Sky Sears      Tue Sep 11 14:09 45/1508 "mooncat"
 14 Sky Sears      Tue Sep 11 14:09 99/2088 "artichoke"
 15 Sky Sears      Tue Sep 11 14:09 27/883 "ant"
 16 Sky Sears      Tue Sep 11 14:09 70/2488 "dog"
 17 Sky Sears      Tue Sep 11 14:09 31/1281 "sonnet2"
 18 Sky Sears      Tue Sep 11 14:09 31/1238 "sonnet4"
 19 Sky Sears      Tue Sep 11 14:09 29/882 "you"
> 20 Sky Sears      Tue Sep 11 14:09 31/1252 "sonnet26"
& █
```

Use the **h** command to list messages in your "in-tray". It will display header information for each message. Note the "*" means the message has been saved to another folder, blanks mean the message has been read and ">" indicates the current message read.

Write "it works" or "having trouble" in the chat window.

UNIX mail

R 4

Thanks! - Sky

.

```
& R 4
To: rsimms@opus-ii.cis.cabrillo.edu
Subject: Re: Welcome

rsimms@opus-ii.cis.cabrillo.edu (Rich Simms) wrote:

> Hello Sky,
>
> Welcome to CIS 90!
>
> Your account is on the Opus-II server which is running the
> CentOS 7 distribution of Linux.
>
> The external hostname for Opus-II is opus-ii.cis.cabrillo.edu which
> will resolve to 207.62.187.230 outside of the campus.
>
> Enjoy learning about Linux and UNIX.
>
> - Rich

Thanks! - Sky
.
EOT
& █
```

Enter the **R 4** command to reply to the 4th message. Note that little **r** is used to reply-to-all and capital **R** is used to reply-to-sender only. Don't forget to end the message with a single **.** in column one.

Write "done" in the chat window when done.

UNIX mail

d 5-20

```
& h
* 1 Sky Sears      Tue Sep 11 13:08  19/698  "Velkiminn"
* 2 Sky Sears      Tue Sep 11 13:09  20/722  "Bienvenido"
* 3 Sky Sears      Tue Sep 11 13:10  19/732  "Tervetuloa"
>A 4 Rich Simms    Tue Sep 11 13:10  31/949  "Welcome"
    5 Sky Sears      Tue Sep 11 14:09  31/1247 "sonnet35"
    6 Sky Sears      Tue Sep 11 14:09  26/872  "forget"
    7 Sky Sears      Tue Sep 11 14:09  45/1506 "mooncat"
    8 Sky Sears      Tue Sep 11 14:09  27/881  "ant"
    9 Sky Sears      Tue Sep 11 14:09  31/1270 "sonnet5"
   10 Sky Sears      Tue Sep 11 14:09  27/881  "ant"
   11 Sky Sears      Tue Sep 11 14:09  31/1252 "sonnet26"
   12 Sky Sears      Tue Sep 11 14:09  35/1305 "twilight"
   13 Sky Sears      Tue Sep 11 14:09  45/1508 "mooncat"
   14 Sky Sears      Tue Sep 11 14:09  99/2088 "artichoke"
   15 Sky Sears      Tue Sep 11 14:09  27/883  "ant"
   16 Sky Sears      Tue Sep 11 14:09  70/2488 "dog"
   17 Sky Sears      Tue Sep 11 14:09  31/1281 "sonnet2"
   18 Sky Sears      Tue Sep 11 14:09  31/1238 "sonnet4"
   19 Sky Sears      Tue Sep 11 14:09  29/882  "you"
   20 Sky Sears      Tue Sep 11 14:09  31/1252 "sonnet26"
& d 5-20
& 
```

Delete the poem messages with the **d** command. If you delete the wrong message use the **u** command to undelete it.

Write "it works" or "having trouble" in the chat window.

UNIX mail

help

```
& help
mail commands
type <message list>      type messages
next                     goto and type next message
from <message list>      give head lines of messages
headers                  print out active message headers
delete <message list>    delete messages
undelete <message list>  undelete messages
save <message list> folder append messages to folder and mark as saved
copy <message list> folder append messages to folder without marking them
write <message list> file  append message texts to file, save attachments
preserve <message list>  keep incoming messages in mailbox even if saved
Reply <message list>     reply to message senders
reply <message list>     reply to message senders and all recipients
mail addresses           mail to specific recipients
file folder              change to another folder
quit                     quit and apply changes to folder
xit                      quit and discard changes made to folder
!                         shell escape
cd <directory>           chdir to directory or home if none given
list                     list names of all available commands
```

A <message list> consists of integers, ranges of same, or other criteria separated by spaces. If omitted, mail uses the last message typed.

&

Use the **help** command to see several common mail commands. To see all commands **quit** back the shell and use **man mail**.

Write "it works" or "having trouble" in the chat window.

UNIX mail

quit
ls

```
& q
Held 1 message in /var/spool/mail/seasky90
/home/cis90/seasky $ ls
bigfile  lab01-collection  letter      Poems      small_town  timecal
bin      lab01.graded       log         proposal1  spellk      trash
empty    Lab2.0             Miscellaneous proposal2   text.err    what_am_i
Hidden   Lab2.1             mission     proposal3  text.fxd
/home/cis90/seasky $
```

Use **quit** to finish. Use **ls** to see the new trash folder which is actually just a single file.

Write "it works" or "having trouble" in the chat window.

Mailbox Folders

UNIX mail

The mail folders are ascii text files

cat trash

```
seasky90@opus-ii:~$ cat trash
/home/cis90/seasky $ cat trash
From seasky90@opus-ii.cis.cabrillo.edu Tue Sep 11 13:08:18 2018
Return-Path: <seasky90@opus-ii.cis.cabrillo.edu>
X-Original-To: seasky90
Delivered-To: seasky90@opus-ii.cis.cabrillo.edu
Received: by opus-ii.cis.cabrillo.edu (Postfix, from userid 1252)
        id 3AF9B6B1F8; Tue, 11 Sep 2018 13:08:18 -0700 (PDT)
Date: Tue, 11 Sep 2018 13:08:18 -0700
To: seasky90@opus-ii.cis.cabrillo.edu
Subject: Velkiminn
User-Agent: Heirloom mailx 12.5 7/5/10
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
Message-Id: <20180911200818.3AF9B6B1F8@opus-ii.cis.cabrillo.edu>
From: seasky90@opus-ii.cis.cabrillo.edu (Sky Sears)
Status: RO

This mail program is pretty crazy!

From seasky90@opus-ii.cis.cabrillo.edu Tue Sep 11 13:09:13 2018
Return-Path: <seasky90@opus-ii.cis.cabrillo.edu>
X-Original-To: seasky90
Delivered-To: seasky90@opus-ii.cis.cabrillo.edu
Received: by opus-ii.cis.cabrillo.edu (Postfix, from userid 1252)
        id 90D576B1F8; Tue, 11 Sep 2018 13:09:13 -0700 (PDT)
Date: Tue, 11 Sep 2018 13:09:13 -0700
To: risimms@cabrillo.edu, seasky90@opus-ii.cis.cabrillo.edu
Subject: Bienvenido
User-Agent: Heirloom mailx 12.5 7/5/10
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
Message-Id: <20180911200913.90D576B1F8@opus-ii.cis.cabrillo.edu>
From: seasky90@opus-ii.cis.cabrillo.edu (Sky Sears)
Status: RO

This mail program is pretty crazy!

From seasky90@opus-ii.cis.cabrillo.edu Tue Sep 11 13:10:05 2018
Return-Path: <seasky90@opus-ii.cis.cabrillo.edu>
X-Original-To: cis90-test-students
Delivered-To: cis90-test-students@opus-ii.cis.cabrillo.edu
Received: by opus-ii.cis.cabrillo.edu (Postfix, from userid 1252)
        id 052FA6B1F8; Tue, 11 Sep 2018 13:10:05 -0700 (PDT)
Date: Tue, 11 Sep 2018 13:10:04 -0700
To: cis90-test-students@opus-ii.cis.cabrillo.edu
Subject: Tervetuloa
User-Agent: Heirloom mailx 12.5 7/5/10
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
Message-Id: <20180911201005.052FA6B1F8@opus-ii.cis.cabrillo.edu>
From: seasky90@opus-ii.cis.cabrillo.edu (Sky Sears)
Status: RO

This mail program is pretty crazy!

/home/cis90/seasky $
```

file trash

```
seasky90@opus-ii:~$ file trash
/home/cis90/seasky $ file trash
trash: ASCII text
/home/cis90/seasky $
```

mail -f trash

```
seasky90@opus-ii:~$ mail -f trash
Heirloom Mail version 12.5 7/5/10. Type ? for help.
"trash": 3 messages
> 1 Sky Sears Tue Sep 11 13:08 19/698 "Velkiminn"
  2 Sky Sears Tue Sep 11 13:09 20/722 "Bienvenido"
  3 Sky Sears Tue Sep 11 13:10 19/732 "Tervetuloa"
&
```

Mail folders are just regular files containing one or more messages (ASCII text) concatenated together.

You can cat them out or open them with the mail command.

Activity

```
mail -f trash  
quit
```

```
/home/cis90/seasky $ mail -f trash  
Heirloom Mail version 12.5 7/5/10.  Type ? for help.  
"trash": 3 messages  
>  1 Sky Sears      Tue Sep 11 13:08  19/698  "Velkiminn"  
  2 Sky Sears      Tue Sep 11 13:09  20/722  "Bienvenido"  
  3 Sky Sears      Tue Sep 11 13:10  19/732  "Tervetuloa"  
& quit  
/home/cis90/seasky $
```

Use the **-f** option on the **mail** command to open a mail folder file.

Write "it works" or "having trouble" in the chat window.

UNIX mail

```
mail
folder trash
q
```

```
/home/cis90/seasky $ mail
Heirloom Mail version 12.5 7/5/10. Type ? for help.
"/var/spool/mail/seasky90": 1 message
>A 1 Rich Simms Tue Sep 11 13:10 32/961 "Welcome"
& folder trash
Held 1 message in /var/spool/mail/seasky90
"trash": 3 messages
> 1 Sky Sears Tue Sep 11 13:08 19/698 "Velkiminn"
  2 Sky Sears Tue Sep 11 13:09 20/722 "Bienvenido"
  3 Sky Sears Tue Sep 11 13:10 19/732 "Tervetuloa"
& q
/home/cis90/seasky $
```

You can also open a different mail folder from inside mail using the **folder** command.

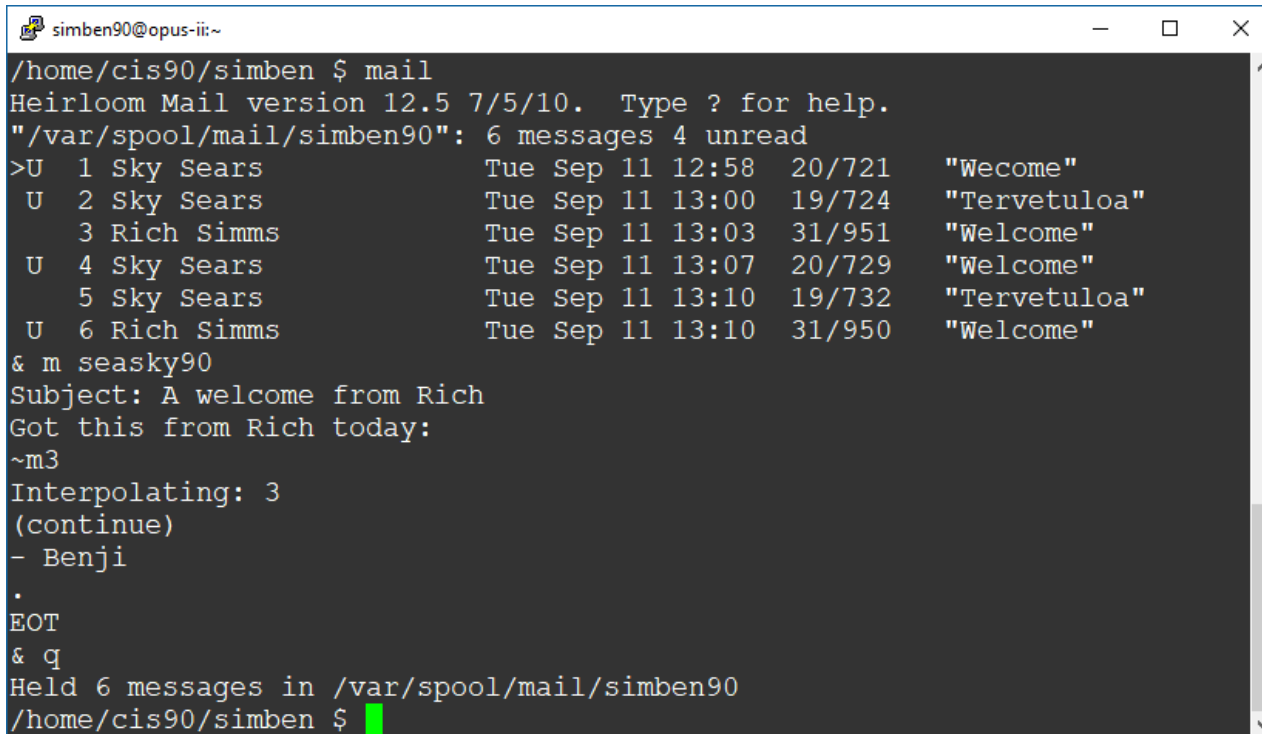
Write "it works" or "having trouble" in the chat window.

More on Mail

Forwarding Mail

Forwarding a message with ~m

```
mail
m seasky90
<some text>
~m3
<some more text>
.
```



```
simben90@opus-ii:~
/home/cis90/simben $ mail
Heirloom Mail version 12.5 7/5/10.  Type ? for help.
"/var/spool/mail/simben90": 6 messages 4 unread
>U  1 Sky Sears      Tue Sep 11 12:58  20/721  "Welcome"
   U  2 Sky Sears      Tue Sep 11 13:00  19/724  "Tervetuloa"
     3 Rich Simms      Tue Sep 11 13:03  31/951  "Welcome"
   U  4 Sky Sears      Tue Sep 11 13:07  20/729  "Welcome"
     5 Sky Sears      Tue Sep 11 13:10  19/732  "Tervetuloa"
   U  6 Rich Simms      Tue Sep 11 13:10  31/950  "Welcome"
& m seasky90
Subject: A welcome from Rich
Got this from Rich today:
~m3
Interpolating: 3
(continue)
- Benji
.
EOT
& q
Held 6 messages in /var/spool/mail/simben90
/home/cis90/simben $
```

*Benji forwards
message 3 from
Rich to Sky using
~m3 in the body of
his message*

Forwarding a message with ~m

```
seasky90@opus-ii-
/home/cis90/seasky $ mail
Heirloom Mail version 12.5 7/5/10. Type ? for help.
"/var/spool/mail/seasky90": 1 message 1 new
>N 1 Benji Simms      Wed Sep 12 09:39  45/1456  "A welcome from"
& 1
Message 1:
From: simben90@opus-ii.cis.cabrillo.edu Wed Sep 12 09:39:28 2018
Return-Path: <simben90@opus-ii.cis.cabrillo.edu>
X-Original-To: seasky90
Delivered-To: seasky90@opus-ii.cis.cabrillo.edu
Date: Wed, 12 Sep 2018 09:39:28 -0700
To: seasky90@opus-ii.cis.cabrillo.edu
Subject: A welcome from Rich
User-Agent: Heirloom mailx 12.5 7/5/10
Content-Type: text/plain; charset=us-ascii
From: simben90@opus-ii.cis.cabrillo.edu (Benji Simms)
Status: R

Got this from Rich today:
> From: rsimms@opus-ii.cis.cabrillo.edu Tue Sep 11 13:03:04 2018
> Return-Path: <rsimms@opus-ii.cis.cabrillo.edu>
> X-Original-To: simben90
> Delivered-To: simben90@opus-ii.cis.cabrillo.edu
> Date: Tue, 11 Sep 2018 13:03:03 -0700
> To: simben90@opus-ii.cis.cabrillo.edu
> Subject: Welcome
> User-Agent: Heirloom mailx 12.5 7/5/10
> Content-Type: text/plain; charset=us-ascii
> From: rsimms@opus-ii.cis.cabrillo.edu (Rich Simms)
> Status: RO
>
> Hello Benji,
>
> Welcome to CIS 90!
>
> Your account is on the Opus-II server which is running the
> CentOS 7 distribution of Linux.
>
> The external hostname for Opus-II is opus-ii.cis.cabrillo.edu which
> will resolve to 207.62.187.230 outside of the campus.
>
> Enjoy learning about Linux and UNIX.
>
> - Rich
>
- Benji
& █
```

mail
1

Sky reads the message from Benji. The message Benji forwarded from Rich has a ">" at the start of each line.

mail commands

Alternate ways to forward a message

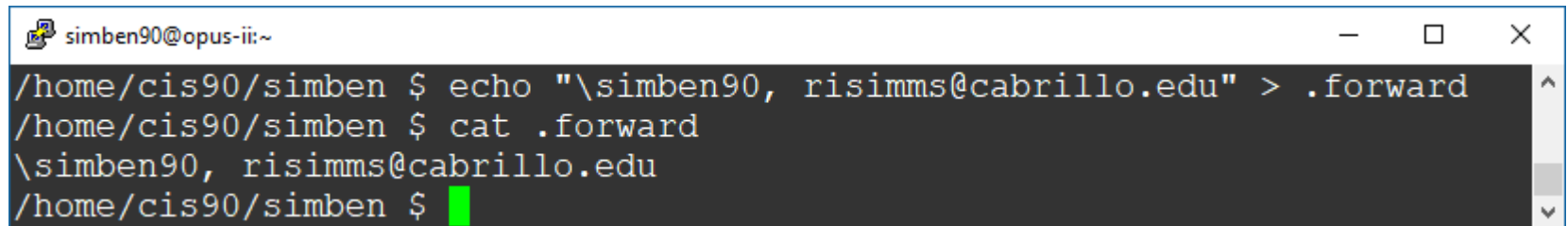
*There is an easier way to forward a message
with the latest version of mailx!*

*I wonder who will be the first person to find
out how its done and post the solution to the
forum?*



Automatically forwarding incoming messages

```
echo "\simben90, risimms@cabrillo.edu" > .forward  
cat .forward
```



```
simben90@opus-ii:~  
/home/cis90/simben $ echo "\simben90, risimms@cabrillo.edu" > .forward  
/home/cis90/simben $ cat .forward  
\simben90, risimms@cabrillo.edu  
/home/cis90/simben $
```

Creating a hidden *.forward* file so all email sent to simben90 on Opus-II will automatically get forwarded to risimms@cabrillo.edu and remain in Benji's in-tray.

You can have all your incoming email on Opus be forwarded to your regular email address. Very helpful for Lab 3!

Automatically forwarding incoming messages

mail simben90 *Homer sends message to Benji*

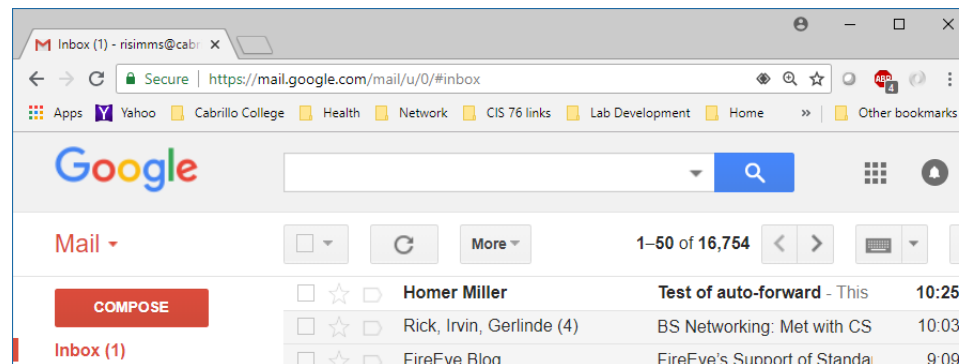
This should end up in Benji and Rich's in-trays!

```
milhom90@opus-ii:~
/home/cis90/milhom $ mail simben90
Subject: Test of auto-forward
This should end up in Benji and Rich's in-trays!
.
EOT
/home/cis90/milhom $
```

*Benji's
in-tray*

```
simben90@opus-ii:~
You have new mail in /var/spool/mail/simben90
/home/cis90/simben $ mail
Heirloom Mail version 12.5 7/5/10. Type ? for help.
"/var/spool/mail/simben90": 3 messages 1 new 3 unread
>N 3 Homer Miller      Wed Sep 12 10:25  18/715  "Test of auto-forward"
&
```

*Rich's
gmail
in-tray*



Undeleting a deleted message

u (undelete) mail command

```
simben90@opus-ii:~
/home/cis90/simben $ mail
Heirloom Mail version 12.5 7/5/10. Type ? for help.
"/var/spool/mail/simben90": 6 messages 4 unread
>U 1 Sky Sears      Tue Sep 11 12:58  20/721  "Welcome"
  U 2 Sky Sears      Tue Sep 11 13:00  19/724  "Tervetuloa"
    3 Rich Simms     Tue Sep 11 13:03  31/951  "Welcome"
  U 4 Sky Sears      Tue Sep 11 13:07  20/729  "Welcome"
    5 Sky Sears      Tue Sep 11 13:10  19/732  "Tervetuloa"
  U 6 Rich Simms     Tue Sep 11 13:10  31/950  "Welcome"
& d 2
& h
  U 1 Sky Sears      Tue Sep 11 12:58  20/721  "Welcome"
>    3 Rich Simms     Tue Sep 11 13:03  31/951  "Welcome"
  U 4 Sky Sears      Tue Sep 11 13:07  20/729  "Welcome"
    5 Sky Sears      Tue Sep 11 13:10  19/732  "Tervetuloa"
  U 6 Rich Simms     Tue Sep 11 13:10  31/950  "Welcome"
& u 2
& h
  U 1 Sky Sears      Tue Sep 11 12:58  20/721  "Welcome"
>    2 Sky Sears      Tue Sep 11 13:00  19/724  "Tervetuloa"
    3 Rich Simms     Tue Sep 11 13:03  31/951  "Welcome"
  U 4 Sky Sears      Tue Sep 11 13:07  20/729  "Welcome"
    5 Sky Sears      Tue Sep 11 13:10  19/732  "Tervetuloa"
  U 6 Rich Simms     Tue Sep 11 13:10  31/950  "Welcome"
&
```

mail
d 2
h
u 2
h

*Benji deletes
then undeletes
message 2*

(q)uit
vs
e(x)it

mail exit command

```
mail
d 2-5
h
exit
mail
```

```
simben90@opus-ii:~
/home/cis90/simben $ mail
Heirloom Mail version 12.5 7/5/10.  Type ? for help.
"/var/spool/mail/simben90": 6 messages 4 unread
>U 1 Sky Sears      Tue Sep 11 12:58  20/721  "Welcome"
  U 2 Sky Sears      Tue Sep 11 13:00  19/724  "Tervetuloa"
    3 Rich Simms     Tue Sep 11 13:03  31/951  "Welcome"
  U 4 Sky Sears      Tue Sep 11 13:07  20/729  "Welcome"
    5 Sky Sears      Tue Sep 11 13:10  19/732  "Tervetuloa"
  U 6 Rich Simms     Tue Sep 11 13:10  31/950  "Welcome"
& d 2-5
& h
  U 1 Sky Sears      Tue Sep 11 12:58  20/721  "Welcome"
>U 6 Rich Simms     Tue Sep 11 13:10  31/950  "Welcome"
& exit
/home/cis90/simben $ mail
Heirloom Mail version 12.5 7/5/10.  Type ? for help.
"/var/spool/mail/simben90": 6 messages 4 unread
>U 1 Sky Sears      Tue Sep 11 12:58  20/721  "Welcome"
  U 2 Sky Sears      Tue Sep 11 13:00  19/724  "Tervetuloa"
    3 Rich Simms     Tue Sep 11 13:03  31/951  "Welcome"
  U 4 Sky Sears      Tue Sep 11 13:07  20/729  "Welcome"
    5 Sky Sears      Tue Sep 11 13:10  19/732  "Tervetuloa"
  U 6 Rich Simms     Tue Sep 11 13:10  31/950  "Welcome"
& █
```

Benji deletes messages 2 through 5 and exits. The exit command does not save these changes and the messages are still there next time mail is run.

mail quit command

```
mail
d 2-5
h
quit
mail
```

```
simben90@opus-ii:~
/home/cis90/simben $ mail
Heirloom Mail version 12.5 7/5/10. Type ? for help.
"/var/spool/mail/simben90": 6 messages 4 unread
>U 1 Sky Sears      Tue Sep 11 12:58  20/721  "Wecome"
  U 2 Sky Sears      Tue Sep 11 13:00  19/724  "Tervetuloa"
    3 Rich Simms     Tue Sep 11 13:03  31/951  "Welcome"
  U 4 Sky Sears      Tue Sep 11 13:07  20/729  "Welcome"
    5 Sky Sears      Tue Sep 11 13:10  19/732  "Tervetuloa"
  U 6 Rich Simms     Tue Sep 11 13:10  31/950  "Welcome"
& d 2-5
& h
  U 1 Sky Sears      Tue Sep 11 12:58  20/721  "Wecome"
>U 6 Rich Simms     Tue Sep 11 13:10  31/950  "Welcome"
& quit
Held 2 messages in /var/spool/mail/simben90
/home/cis90/simben $ mail
Heirloom Mail version 12.5 7/5/10. Type ? for help.
"/var/spool/mail/simben90": 2 messages 2 unread
>U 1 Sky Sears      Tue Sep 11 12:58  20/721  "Wecome"
  U 2 Rich Simms     Tue Sep 11 13:10  31/950  "Welcome"
&
```

Benji deletes messages 2 through 5 and exits. The quit command makes these changes permanent.

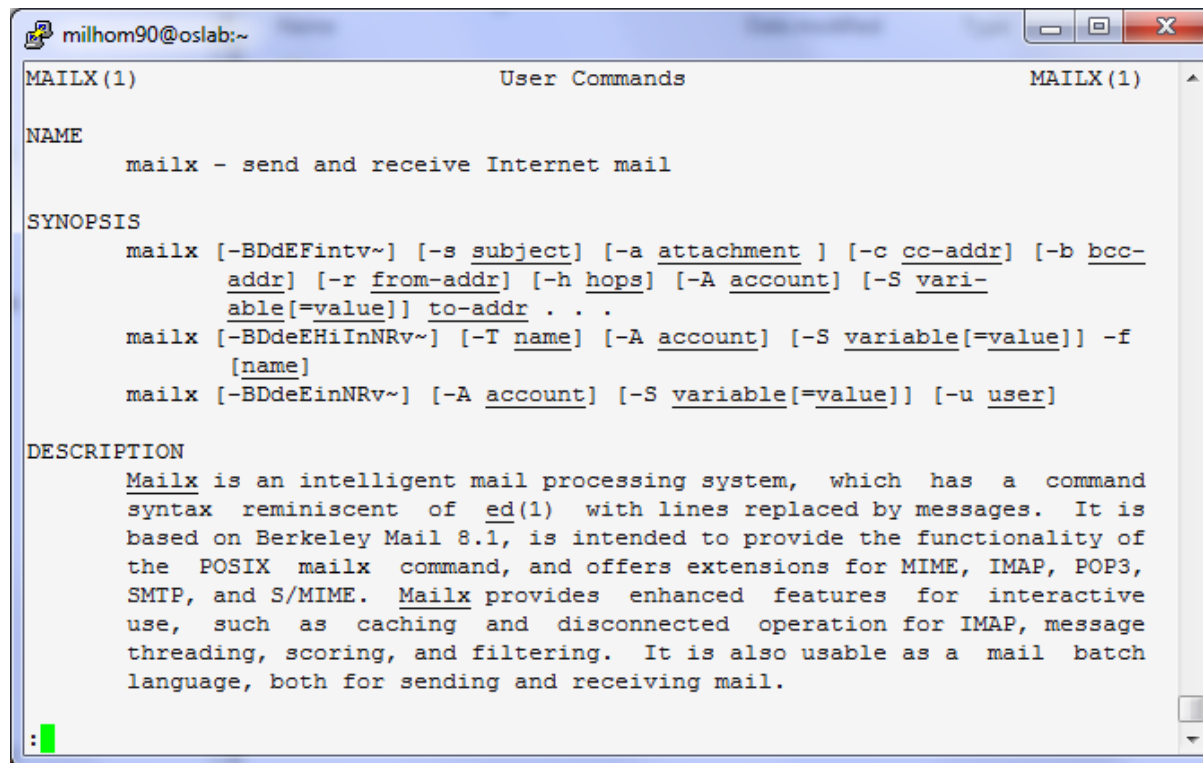
Running mail again and the deleted messages are gone.

Mail

Documentation

man page for mail

```
/home/cis90/milhom $ man mail
```



```

MAILX(1)                                User Commands                                MAILX(1)

NAME
    mailx - send and receive Internet mail

SYNOPSIS
    mailx [-BDdEFintv~] [-s subject] [-a attachment] [-c cc-addr] [-b bcc-
        addr] [-r from-addr] [-h hops] [-A account] [-S vari-
        able[=value]] to-addr . . .
    mailx [-BDdEHiInNRv~] [-T name] [-A account] [-S variable[=value]] -f
        [name]
    mailx [-BDdEinNRv~] [-A account] [-S variable[=value]] [-u user]

DESCRIPTION
    Mailx is an intelligent mail processing system, which has a command
    syntax reminiscent of ed(1) with lines replaced by messages. It is
    based on Berkeley Mail 8.1, is intended to provide the functionality of
    the POSIX mailx command, and offers extensions for MIME, IMAP, POP3,
    SMTP, and S/MIME. Mailx provides enhanced features for interactive
    use, such as caching and disconnected operation for IMAP, message
    threading, scoring, and filtering. It is also usable as a mail batch
    language, both for sending and receiving mail.
  
```

In the bash shell, use the man command for extensive documentation on mail

Mail ? or help commands

& ?

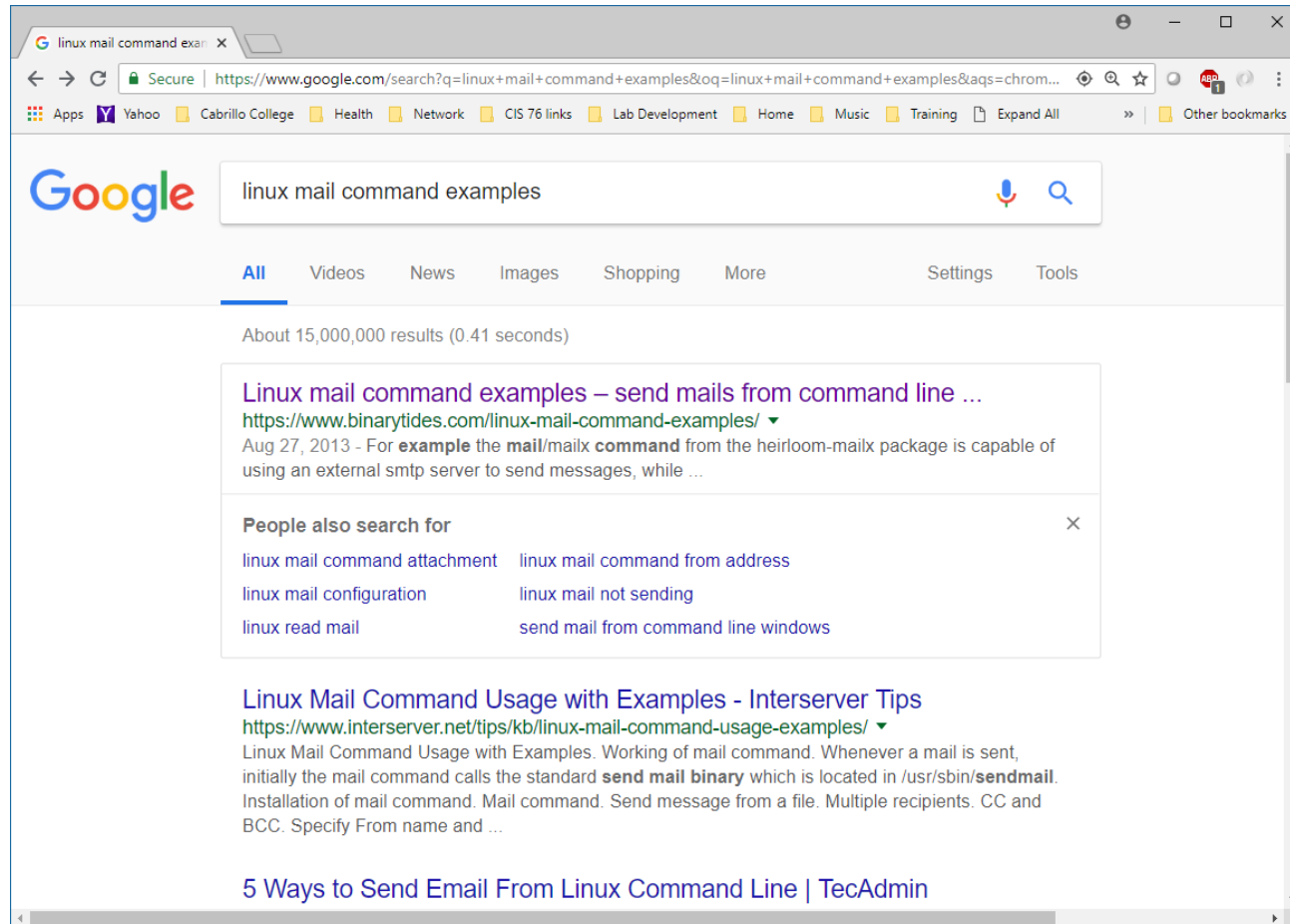
	mail commands
type <message list>	type messages
next	goto and type next message
from <message list>	give head lines of messages
headers	print out active message headers
delete <message list>	delete messages
undelete <message list>	undelete messages
save <message list> folder	append messages to folder and mark as saved
copy <message list> folder	append messages to folder without marking them
write <message list> file	append message texts to file, save attachments
preserve <message list>	keep incoming messages in mailbox even if saved
Reply <message list>	reply to message senders
reply <message list>	reply to message senders and all recipients
mail addresses	mail to specific recipients
file folder	change to another folder
quit	quit and apply changes to folder
xit	quit and discard changes made to folder
!	shell escape
cd <directory>	chdir to directory or home if none given
list	list names of all available commands

A <message list> consists of integers, ranges of same, or other criteria separated by spaces. If omitted, mail uses the last message typed.

&

Use the ? or help commands to see a short list of common mail commands

Google

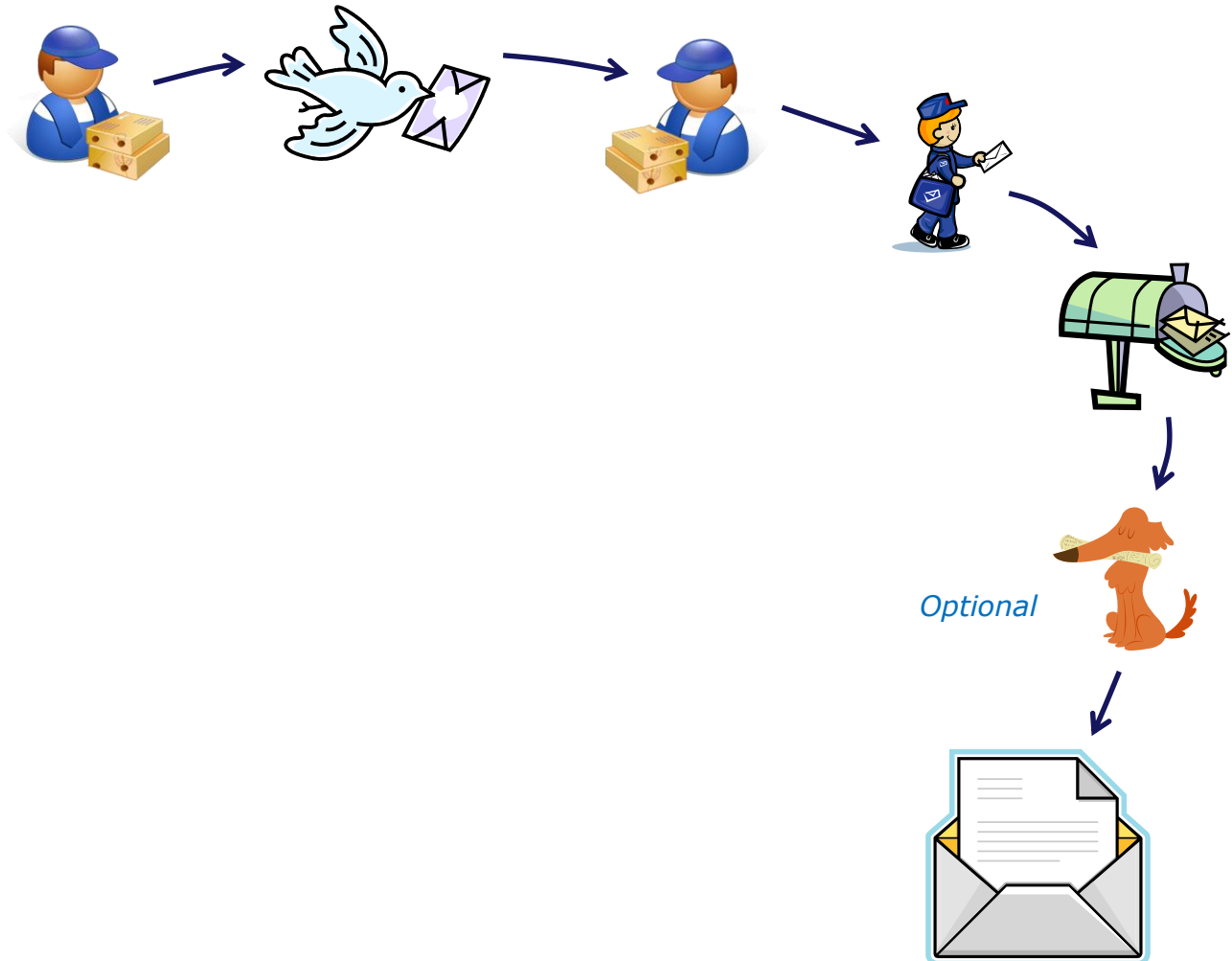


Google: linux mail command examples

end-to-end
email
(if time)



end-to-end email

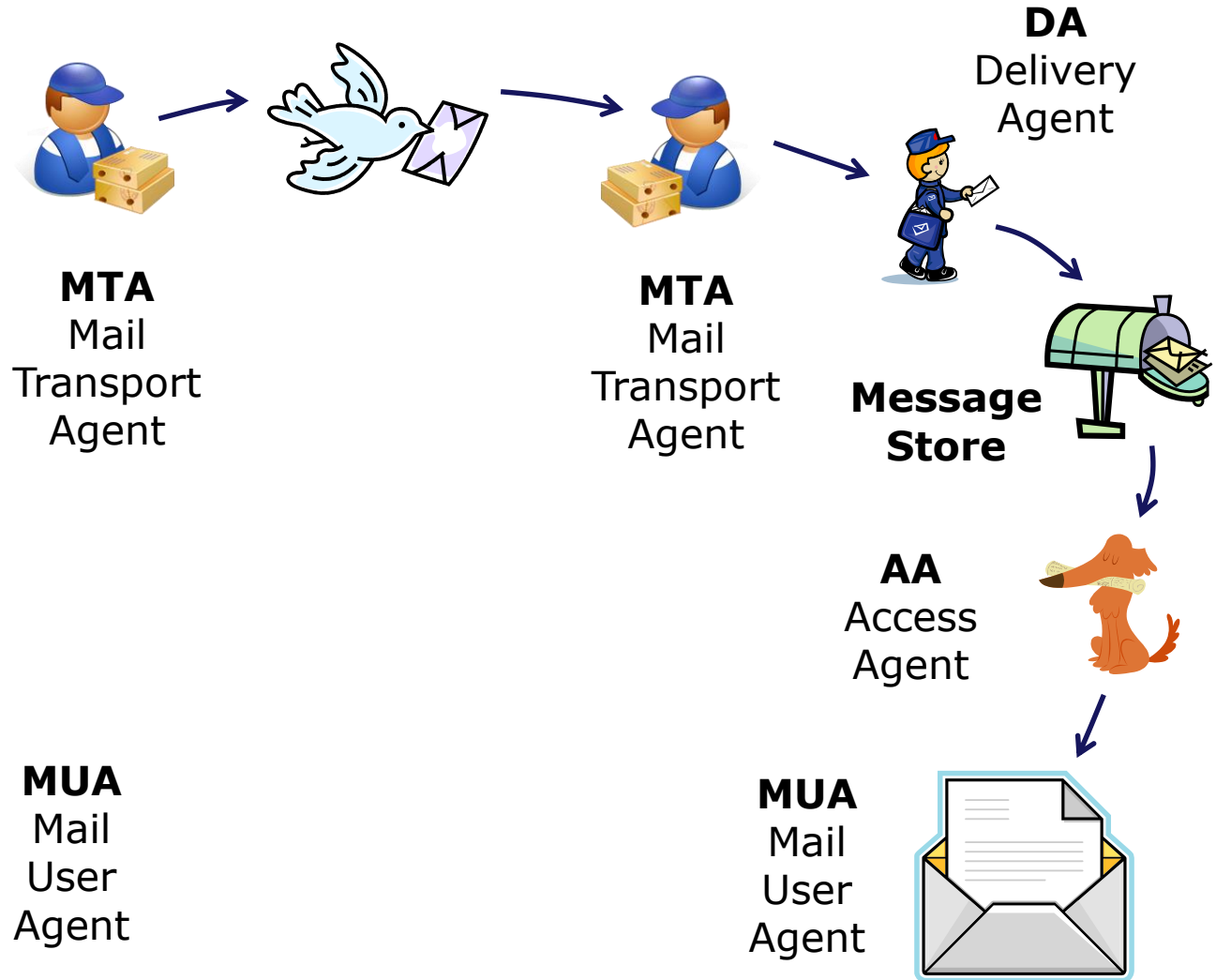


compose and send message

open and read message



end-to-end email

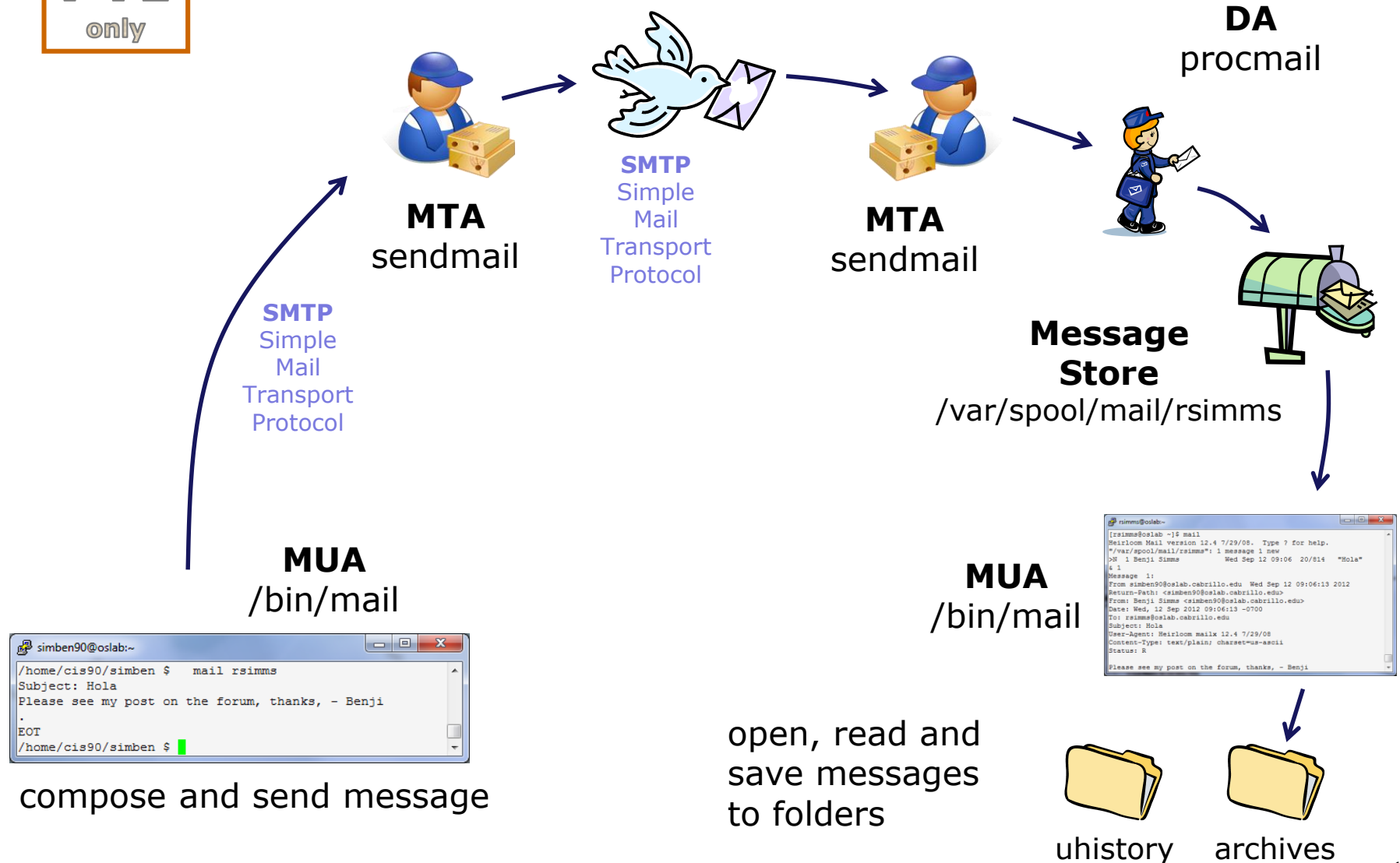


compose and send message

open and read message 189

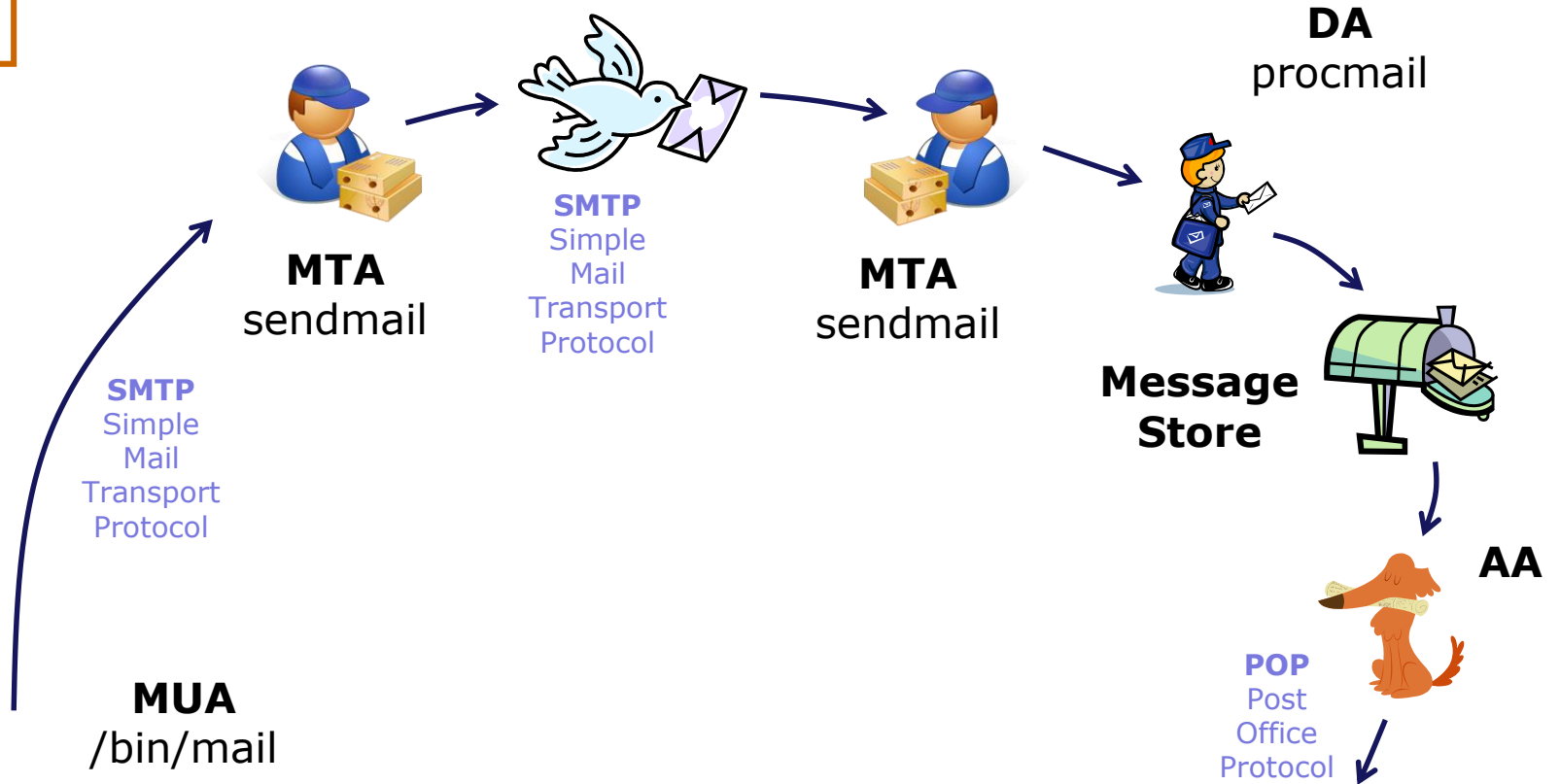
FYI
only

end-to-end email: example Implementation





end-to-end email: example Implementation



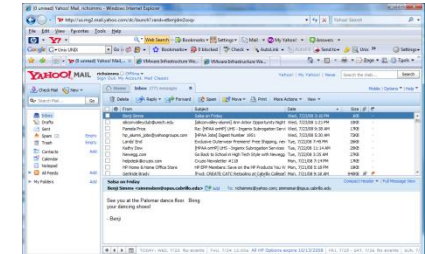
```

simmsben@opus:~
/home/cis90/simmsben $ mail simmsmar richsimms@yahoo.com
Subject: Salsa on Friday
See you at the Palomar dance floor. Bring
your dancing shoes!

- Benji
.
Cc:
/home/cis90/simmsben $
    
```

compose and send message

MUA
Yahoo Mail



open and read message 191

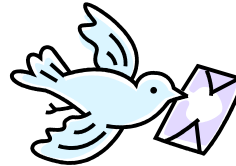
end-to-end email: configuring your MUA (Mail User Agent)



SMTP
Simple
Mail
Transport
Protocol



MTA
Mail
Transport
Agent



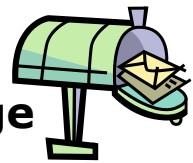
SMTP
Simple
Mail
Transport
Protocol



MTA
Mail
Transport
Agent



DA
Delivery
Agent



**Message
Store**



AA
Access
Agent

POP
Post
Office
Protocol

Example MUA: Windows Mail

This is why you get asked for the SMTP server and the POP3/IMAP server when you set up email on your PC.

Your MUA needs to know this to send and receive messages.

How does one MTA get the IP address of the other MTA?

```
[rsimms@oslab ~]$ dig +short mx gmail.com
10 alt1.gmail-smtp-in.1.google.com.
30 alt3.gmail-smtp-in.1.google.com.
20 alt2.gmail-smtp-in.1.google.com.
40 alt4.gmail-smtp-in.1.google.com.
5 gmail-smtp-in.1.google.com.
[rsimms@oslab ~]$
```

```
[rsimms@oslab ~]$ dig +short gmail-smtp-in.1.google.com.
74.125.25.26
[rsimms@oslab ~]$
```



```
[rsimms@oslab ~]$ dig +short mx hp.com
10 smtp.hp.com.
[rsimms@oslab ~]$ dig +short smtp.hp.com.
15.73.96.120
15.73.212.90
15.73.212.88
15.73.212.87
[rsimms@oslab ~]$
```

Other MUAs MTAs, DAs, AAs



end-to-end email

some of the many players



MTA



sendmail, Exim, Microsoft Exchange, Postfix

DA



/bin/mail, procmail, smrsh

AA



imapd, spop

MUA



gmail, /bin/mail, Outlook, Evolution, Yahoo Mail, hotmail

Assignment



Lab 3

Unix history
via command-line email

Notes to Rich



[] - Send out UNIX historical events for Lab 3

use **events** alias or

mail-lab03-events script in **~rsimms/cis90/lab03/scripts/uhist** directory



Lab 3 - Start early and check your Opus-II email every day!

You will receive a mail message from me with a Unix historical event for a particular year. Save this message to a mailbox called *uhistory*.

The objective of this lab is to use Unix mail to exchange and collect at least 15 individual events with your classmates. There are more students than events so some students will receive the same event.

Start by sending an email to your other classmates with your event and ask them to send you their events. Each time you get a Unix event that you haven't already saved, save it to your *uhistory* mailbox.

Rules:

- Do this lab on Opus-II using */bin/mail* (the mail command).
- When someone asks you for the date that you received, you must send it to them with the subject being just the year of the event, e.g. 1972. The email message must contain the complete line of event text for that year.
- Each email saved in *uhistory* must be for a single event/year.
- Each email saved in *uhistory* must have a subject that is just the year of the event.

If you receive an email that is missing the event or does not have the year as the subject, reply to the sender and ask them to resend a corrected version.

When you get all the Unix event messages saved in your *uhistory* mailbox you should have up to 22 messages, each with a different date for the Subject field. Delete any duplicate dates you may have.

Lab 3 (and all future labs) must be done on Opus-II

Tips for Lab 3

Start this lab early in the week and check your mail daily to collect all messages

- Use the **s** command in mail to save a message to your *uhistory* mailbox
- Use **mail -f uhistory** to review your collection
 - Use the **d** command in mail to delete duplicates
- Use the **check3** script to review progress
- You can **submit** your work as many times as you wish up to the deadline. Only the last submittal will be graded. Submit whatever you have completed for partial credit if you run out of time.

Post and read more tips on the forum

A full-page background image showing a sunset over a beach. The sky is filled with vibrant orange, pink, and purple clouds. The sun is low on the horizon, casting a warm glow. To the right, a dark, silhouetted cliff rises from the beach. The foreground shows the wet sand of the beach reflecting the colors of the sky, with some dark rocks scattered about.

Wrap up

New commands:

mail

<integer>
[Enter key]
p <message list>
d <message list>
s <message list> file
u <message list>
R <message list>
r <message list>
m <user list>
q
x
h
z or z-

mesg

write

irssi

- UNIX mail

print specific message specified by <integer>
print next message
print messages
delete messages
save (append) messages to file
undelete messages
reply to sender
reply to all
mail to specific users
quit saving changes
exit without saving changes
print message headers
scroll forward or backward through headers

- Enable or disable writes to your terminal
- Write message to another user
- IRC chat client

New Files and Directories:

/var/mail

/var/mail/*username*

mbox

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

Next Class

Assignment: Check Calendar Page on web site to see what is due next week.

**1st five forum posts
and Lab 3**

Quiz questions for next class:

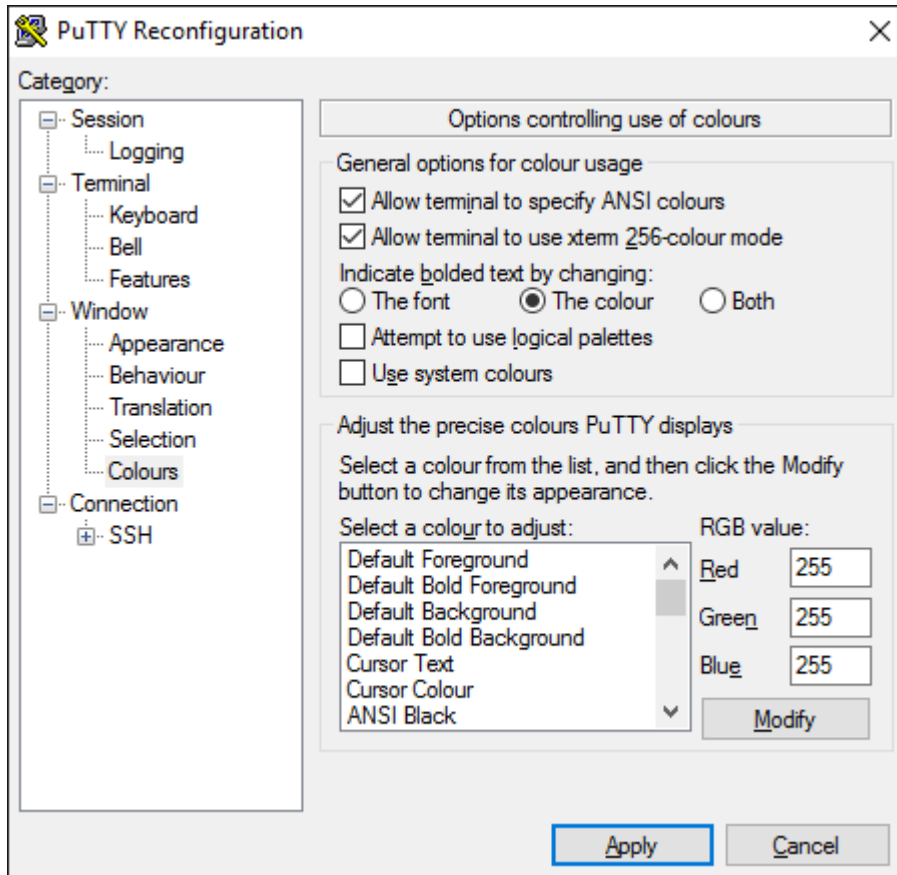
- What command can you use to output text to another user's terminal?
- Is a mailx folder implemented as a directory or a regular file?
- In mailx what command lists the messages in your "in tray"?

End Meeting

End Meeting

Backup

Rich's ConferZoom checklist - Putty Colors



Putty Colors

Default Foreground 255 255 255
 Default Bold Foreground 255 255 255
 Default Background 51 51 51
 Default Bold Background 255 2 85
 Cursor Text 0 0 0
 Cursor Color 0 255 0
 ANSI Black 77 77 77
 ANSI Black Bold 85 85 85
 ANSI Red 187 0 0
 ANSI Red Bold 255 85 85
 ANSI Green 152 251 152
 ANSI Green Bold 85 255 85
 ANSI Yellow 240 230 140
 ANSI Yellow Bold 255 255 85
 ANSI Blue 205 133 63
 ANSI Blue Bold 135 206 235
 ANSI Magenta 255 222 173
 ANSI Magenta Bold 255 85 255
 ANSI Cyan 255 160 160
 ANSI Cyan Bold 255 215 0
 ANSI White 245 222 179
 ANSI White Bold 255 255 255

<http://looselytyped.blogspot.com/2013/02/zenburn-pleasant-color-scheme-for-putty.html>



Practice Questions Lessons 1 & 2

Practice Test Questions

What is simben90's uid (user ID) on Opus-II?

Practice Test Questions

What is simben90's uid (user ID) on Opus-II?

Benji's uid is 1201

```
/home/cis90/simben $ id simben90  
uid=1201(simben90) gid=190(cis90) groups=190(cis90),100(users)  
/home/cis90/simben $
```

Practice Test Questions

What day of the week was Sept 11, 2001?

Practice Test Questions

What day of the week was Sept 11, 2001?

It was a Tuesday

```
/home/cis90/simben $ cal 9 2001
    September 2001
Su Mo Tu We Th Fr Sa
                1
 2  3  4  5  6  7  8
 9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30
/home/cis90/simben $
```

Practice Test Questions

Where (what directory) does the the **ps** command reside?

Practice Test Questions

Where (what directory) does the **ps** command reside?

```
/home/cis90/simben $ type ps  
ps is /usr/bin/ps
```

It's in the /usr//bin directory



Practice Test Questions

Parse the following command line. What is the command? How many options and how many arguments are there? What are the options and arguments?

```
ls -l /boot/grub/
```

Practice Test Questions

Parse the following command line. What is the command? How many options and how many arguments are there? What are the options and arguments?

```
ls -l /boot/grub/
```

Command: ls

One option: -l (for long listing)

One argument: /boot/grub

Practice Test Questions

Parse the following command line. What is the command? How many options and how many arguments are there? What are the options and arguments?

```
echo "1 2 3" four 5 six
```

Practice Test Questions

Parse the following command line. What is the command? How many options and how many arguments are there? What are the options and arguments?

```
echo "1 2 3" four 5 six
```

Command: echo

No options

4 arguments:

- *"1 2 3"*
- *four*
- *5*
- *six*

Practice Test Questions

Which program gave you this error message?

```
/home/cis90/simben $ uname-x  
-bash: uname-x: command not found  
/home/cis90/simben $
```

Practice Test Questions

Which program gave you this error message?

```
/home/cis90/simben $ uname-x  
-bash: uname-x: command not found  
/home/cis90/simben $
```

It was the bash program. bash is the shell being used and it could not find a command named uname-x on the path

Practice Test Questions

Which program gave you this error message?

```
/home/cis90/simben $ uname -x  
uname: invalid option -- 'x'  
Try `uname --help' for more information.  
/home/cis90/simben $
```

Practice Test Questions

Which program gave you this error message?

```
/home/cis90/simben $ uname -x  
uname: invalid option -- 'x'  
Try `uname --help' for more information.  
/home/cis90/simben $
```

It was the uname program. The uname program was loaded into memory and executed. It started to process the options it received from the shell and didn't like the -x option. It printed the error message and aborted.

Practice Test Questions

What terminal device are you using?

Practice Test Questions

What terminal device are you using?

Use the tty command to find out:

```
/home/cis90/simben $ tty  
/dev/pts/0  
/home/cis90/simben $
```

Practice Test Questions

What type of terminal are you using?

Practice Test Questions

What type of terminal are you using?

Use the **echo \$TERM** command to find out:

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

This user's terminal type is xterm

Practice Test Questions

What directories make up your path?

Practice Test Questions

What directories make up your path?

Use echo \$PATH to find out:

```
/home/cis90/simben $ echo $PATH
```

```
/usr/local/bin:/usr/bin:/usr/local/sbin:/usr/sbin:
```

```
/home/cis90/simben/../bin:/home/cis90/simben/bin:.
```

/usr/local/bin

/usr/bin

/usr/local/sbin

/usr/sbin

/home/cis90/simben/../bin

/home/cis90/simben/bin

.

*There are seven directories specified
on this user's path*

Practice Test Questions

Are the **yum**, **useradd**, and **yell** commands on your path?

Practice Test Questions

Are the **yum**, **useradd**, and **yell** commands on your path?

```
/home/cis90/simben $ type yum useradd yell
yum is /usr/bin/yum           Yes, on path
useradd is /usr/sbin/useradd  Yes, on path
-bash: type: yell: not found  No, not on path
```

Note: If you see "is hashed" that means bash has previously searched the path for this command. The location of the command has been saved in the hash table to speed up subsequent searches.

Practice Test Questions

What is the name of the environment variable that defines your shell prompt?

Practice Test Questions

What is the name of the environment variable that defines your shell prompt?

It's PS1

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

```
/home/cis90/simben $ echo "The PWD variable =" $PWD  
The PWD variable = /home/cis90/simben  
/home/cis90/simben $
```

Both PS1 and PS2 are environment variables

Practice Test Questions

How do you change the shell prompt to `"Enter next command: "` ?

Practice Test Questions

How do you change the shell prompt to "Enter next command: " ?

Set PS1 to new value using "=" sign

```
/home/cis90/simben $  
/home/cis90/simben $ PS1="Enter next command: "  
Enter next command:  
Enter next command: echo $PWD  
/home/cis90/simben  
Enter next command: echo $PS1  
Enter next command:  
Enter next command:
```

Practice Test Questions

How do you restore the original shell prompt so it displays the current directory followed by a \$ and a blank?

Practice Test Questions

How do you change the shell prompt to "Enter next command: "
then change it back again?

To restore the original prompt use:

```
Enter next command: PS1='$PWD $ '  
/home/cis90/simben $
```

More Review (variables)

Environment Variables

Use `$` for the "value" of a variable

Analogy: Each variable is a named location. The contents of any location is the "value" of that variable.

```
$ echo $LOGNAME
simmsben
```

```
$ echo HOME
HOME
```

```
$ echo $HOME
/home/cis90/simmsben
```

```
$ echo $SHELL
/bin/bash
```

```
$ echo $HOSTNAME
opus-ii.cabrillo.edu
```



Make your own shell variables

Imagine creating a new variable for use as the fan speed in your car



```
$ echo $FAN
```

Initially it's not defined so if echoed it has a null value

```
$ FAN=HI
$ echo $FAN
HI
$ echo "The fan is set to: " $FAN
The fan is set to: HI
$ FAN=LO
```

Create a variable named FAN and set the value to "HI"

```
$ echo "The fan is set to: " $FAN
The fan is set to: LO
```

Now set the FAN variable to "LO"

Activity

```
/home/cis90/simben $ weather=rain
/home/cis90/simben $ country=Spain
/home/cis90/simben $ location="the plain"
/home/cis90/simben $ echo The $weather in $country stays mainly in $location
The rain in Spain stays mainly in the plain
/home/cis90/simben $
```

When **echo** is loaded into memory and starts to run:

- 1) How many arguments does it receive from the bash shell?
- 2) Does **echo** see "\$weather" or "rain" as one of the arguments it receives?

Write your answers in the chat window