



## Rich's lesson module checklist

*Last modified: 3/6/2018*

- ☐ Zoom recording named and published for previous lesson
  - ☐ Slides and lab posted
  - ☐ WB converted from PowerPoint
  - ☐ Print out agenda slide and annotate page numbers
  - ☐ No 1<sup>st</sup> minute quiz today (test instead)
  - ☐ Flash cards
  - ☐ Calendar page updated
  - ☐ Lab 5
  - ☐ Put sonnet6 & bigfile in depot/
  - ☐ Real Test 1 configured on canvas (availability, accommodations, password)
  - ☐ Real Test 1 Q16, Q22 and Q30 updated
  - ☐ Real Test 1 Q29 scheduled
  - ☐ Real Test 1 systems access and shutdown scheduled
  - ☐ Practice Test 1 systems shutdown scheduled (OVH is on EDT) at T-30
  - ☐ 9V backup battery for microphone
  - ☐ Backup slides, CCC info, handouts on flash drive
  - ☐ Key card for classroom door
- ☐ <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: <http://cabrillo.edu/~jgriffin/>



Rich Simms

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

And thanks to:

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



## Student checklist - Before class starts

The screenshot shows the website [simms-teach.com/cis90calendar.php](http://simms-teach.com/cis90calendar.php). The page title is "Rich's Cabrillo College CIS Classes CIS 90 Calendar". On the left sidebar, the "CIS 90" link is highlighted. The main content area shows the "CIS 90 (Fall 2014) Calendar" with tabs for "Course Details", "Grades", and "Calendar". The "Calendar" tab is selected. A table lists lessons with columns for "Lesson", "Date", "Topics", and "Link". Lesson 1 is highlighted, showing topics like "Class and Linux Overview" and "Introduction". Below the table, there are links for "Presentation slides (download)", "Supplemental" materials, "Assignment" (including "Student Survey" and "Lab 1"), "CIS 90 Certificate", "Enter virtual classroom", "Quiz 1", and "Commands".

1. Browse to:  
**<http://simms-teach.com>**
2. Click the **CIS 90** link.
3. Click the **Calendar** link.
4. Locate today's lesson.
5. Find the **Presentation slides** for the lesson and **download** for easier viewing.
6. Click the **Enter virtual classroom** link to join ConferZoom.
7. Log into Opus-II with Putty or ssh command.





## Student checklist - Before class starts

☐ Google

☐ ConferZoom

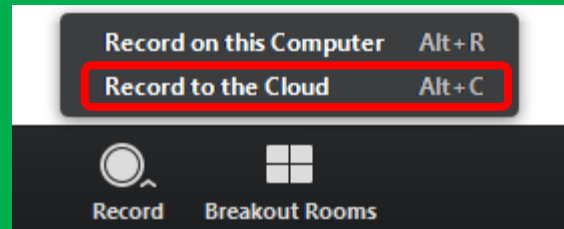
☐ Downloaded PDF of Lesson Slides. I like Foxit Reader so I can take notes using annotations.

The screenshot shows a Zoom meeting interface with several windows open. The main window displays a PDF document titled "Get into the car" with a background image of a white car. Other windows include the Google homepage, the Rich's Cabrillo College CIS 90 website, and a document titled "CIS 90 - Lesson 1" showing a stack of papers and the text "Each student gets their own Arya VM for the term". The Zoom toolbar at the bottom shows options like "Unmute", "Start Video", "Invite", "Participants", "Share Screen", "Chat", "Record", and "Leave Meeting".

☐ CIS 90 website Calendar page

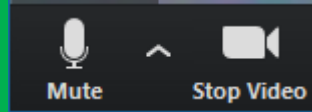
☐ One or more login sessions to Opus-II

# Start



# Start Recording

Audio Check



Start Recording

# Audio & video Check





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



Brandon



Shane



Dan



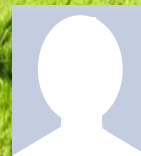
Kage



Nathan K.



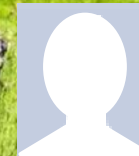
Jo Anne



Darren



Laine



Luis



Christian



Jetta



Cesar



Paul



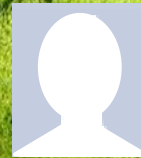
Hilary



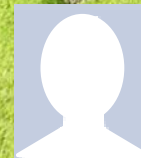
Fritz



Jake



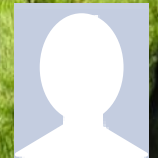
Richard



Nate P.



Ciarán



November



Henry



Elena



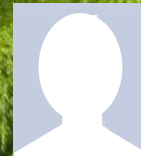
David



Claudius



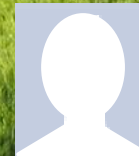
Edgar



Adam



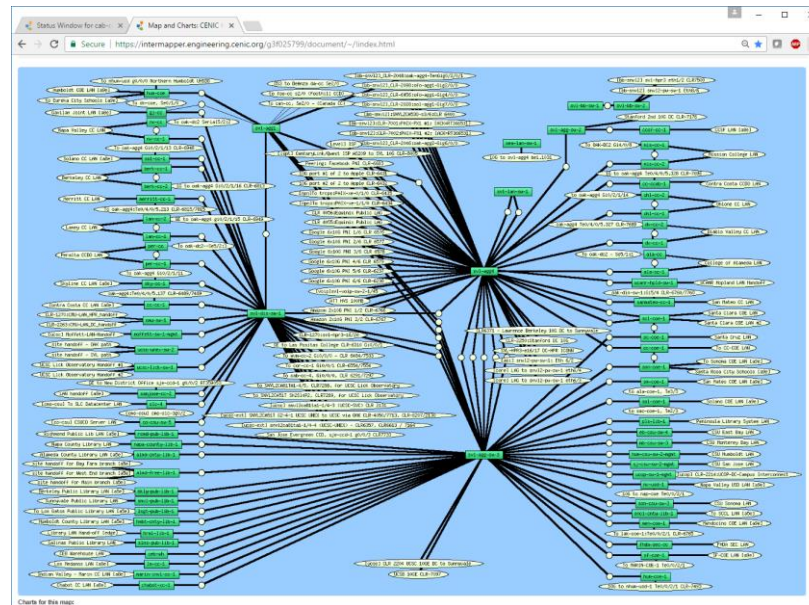
Nathanael T.



Clara



# Network Check



<https://intermapper.engineering.cenic.org/g3f025799/document/~!/index.html>

## First Minute Quiz

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

**No Quiz today ... test instead**

For credit email answers to:

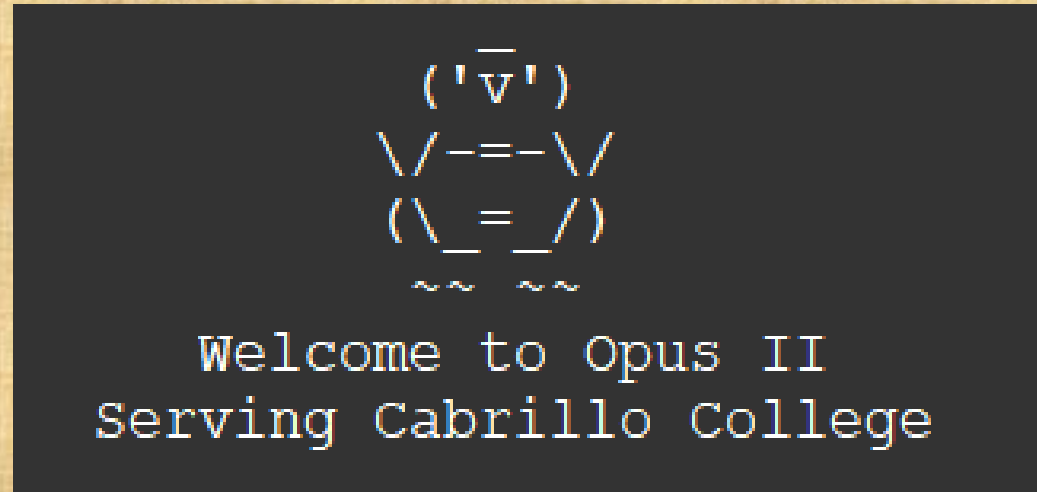
[risimms@cabrillo.edu](mailto:risimms@cabrillo.edu)

within the **first few minutes of class**

# Managing Files

Objectives	Agenda
<ul style="list-style-type: none"><li>• Be able to create, copy, move, remove and link files</li></ul>	<ul style="list-style-type: none"><li>• Questions</li><li>• Housekeeping</li><li>• Managing files</li><li>• Creating directories</li><li>• Creating regular files</li><li>• Listing files</li><li>• Copying files</li><li>• Moving Files</li><li>• Removing files</li><li>• Linking files</li><li>• Assignment</li><li>• Wrap up</li><li>• Test #1</li></ul>

## Class Activity



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

## Class Activity

3	2/19	<p><b>Unit 3</b></p> <p><b>Electronic Mail</b></p> <ul style="list-style-type: none"><li>• Guest speaker: Denise Moore on OTC (On-The-Job) training programs</li><li>• Learn how to use the LINC communication tools: write and /bin/mail</li><li>• Overview on and to and mail</li></ul> <p><b>Materials</b></p> <ul style="list-style-type: none"><li>• Presentation slides (<a href="#">download</a>)</li></ul> <p><b>Supplemental</b></p> <ul style="list-style-type: none"><li>• Howto #319: Accessing vlab (<a href="#">download</a>)</li></ul> <p><b>Assignment</b></p> <ul style="list-style-type: none"><li>• Read/skim Lesson 3 slides</li></ul>	<a href="#">Lab 3</a>
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<https://simms-teach.com/cis90calendar.php>

If you haven't already,  
download the lesson slides



## Class Activity

	<ul style="list-style-type: none"><li>• <u>Read/skim Lesson 1 slides</u></li><li>• <u>Student Survey</u></li><li>• <u>Lab 1</u></li></ul>	
	<div><b>ConferZoom</b><ul style="list-style-type: none"><li>• <u>Enter virtual classroom</u></li><li>• <u>Class archives</u></li></ul></div>	
	<u>Quiz 1</u> <b>Commands</b> <ul style="list-style-type: none"><li>• Understand how the UNIX login operation</li></ul>	

<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

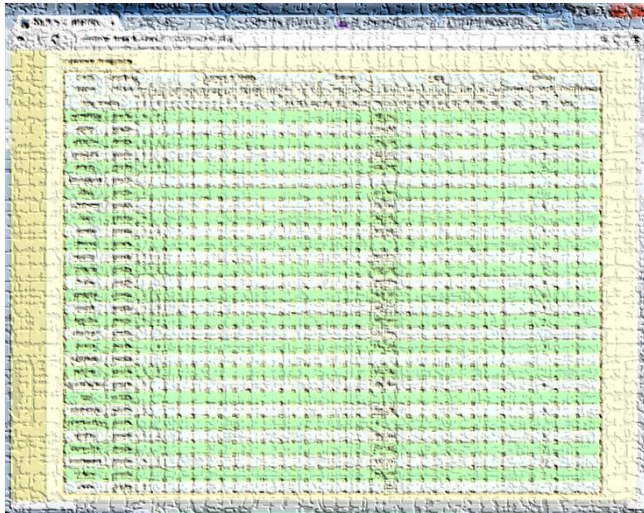
他問一個問題，五分鐘是個傻子，他不問一個問題仍然是一個傻瓜永遠。

*He who asks a question is a fool for five minutes; he who does not ask a question remains a fool forever.*

## Where to find your grades

*Send me your survey to get your LOR code name.*

### The CIS 90 website



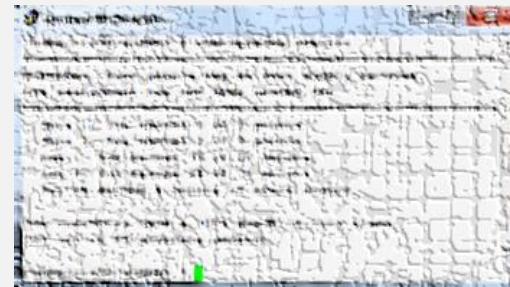
<http://simms-teach.com/cis90grades.php>

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:

4 quizzes: 12 points  
4 labs: 120 points  
1 forum quarter: 20 points  
**Total: 152 points**



## 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)

## Getting Help When Stuck on a Lab Assignment

- Google the topic/error message.
- Search the Lesson Slides (they are PDFs) for a relevant example on how to do something.
- Post a question on the forum. 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. **I will be in the CTC (room 1403) every Wednesday afternoon from 3-5:30.**
- 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!

*Expect to do a LOT of troubleshooting in this course!*



## Help Available in the CIS Lab

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



**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 Month Agenda

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

**Rich's Cabrillo College CIS Classes**  
Home Page

[Home](#)

[Resources](#)

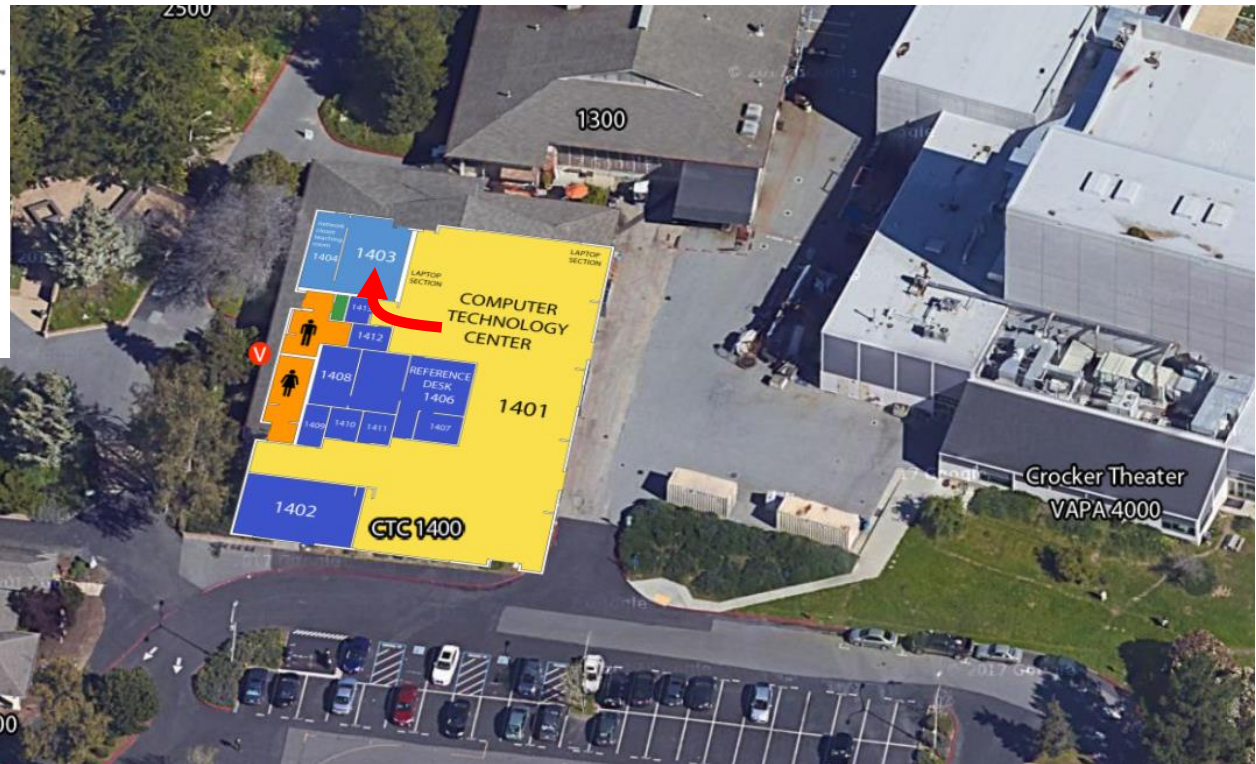
[Forums](#)

[CIS Lab](#)

[Canvas](#)

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

## CTC - Building 1400 On lower campus



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



# The slippery slope



- 1) If you didn't submit the last lab ...
- 2) If you were in class and didn't submit the last quiz ...
- 3) If you didn't send me the student survey assigned in Lesson 1 ...
- 4) If you haven't made a forum post in the last quarter of the course ...

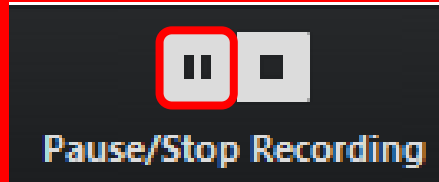
*Please contact me by email, see me during  
my office hours or when I'm in the CTC*

Email: [risimms@cabrillo.edu](mailto:risimms@cabrillo.edu)



# 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](mailto:risimms@cabrillo.edu)



# Overlap Students

Don't forget to update the Google  
Docs Log when watching the  
recording



Resume/Stop Recording

# Resume Recording

## Audio Check

No labs due today

Test 1 will become available at **11:00 AM** today

- Open book, open notes, open computer.
- You must work alone and not help or receive help from others.
- Online timed 60 minute test using Canvas
- Online "archive watching" students that work can take it later today but it must be completed by 11:59 PM.
- **Practice test systems shutdown 30 minutes before real test starts!**

Next week:

- Quiz 5
- Lab 5 is due

## Test 1 Instructions

**HONOR CODE:**

This test is open book, open notes, and open computer. HOWEVER, you must work alone. You may not discuss the test questions or answers with others during the test. You may not ask or receive assistance from anyone other than the instructor when doing this test. Likewise you may not give any assistance to anyone taking the test.

**INSTRUCTIONS:**

Every question on the test was designed to be answered using one of the systems below.

opus-ii.cis.cabrillo.edu (port 2220).

sun-hwa-vii.cis.cabrillo.edu (port 22)

son-of-opus.simms-teach.com (port 2220)

arya-xx (port 22) - Select xx for your own Arya.

Each question begins with *[system name]* so you know which system you should be logged into to answer the question.

All systems are accessible using ssh from opus-ii. For sun-hwa-vii and son-of-opus login using your original opus-ii credentials. For arya, use the generic cis90 account.

**IF YOU GET STUCK on a question you can ask or email the instructor for the answer and forfeit the point. The instructor will be available during class and be online between 8-10 PM in the evening for online or long distance students.**

Please KEEP YOUR ANSWERS TO A SINGLE LINE ONLY !!

This test must be completed in one sitting. The submittal will be made automatically when the time is up. If you submit early by accident you will not be able to re-enter and continue. If that happens don't panic! Just email the instructor any remaining answers before the time is up.

## Linux Computer Home Loans



<https://docs.google.com/a/cabrillo.edu/spreadsheets/d/1ljwkXZ7BYcCCo3UwqHz0EPm2I3OMSXYrfYv43C2MBc/edit?usp=sharing>

*If interested click the Google Docs link above and request access to the sign-up sheet. Based on the number of requests I'll determine how long they can be checked out for.*

## Perkins/VTEA Survey

The screenshot shows a forum post on the 'Cabrillo College: Computer and Information Systems' forum. The post is titled 'Carl D. Perkins Vocational and Technical Education Act' and was posted by Rich Simms on Tue Sep 22, 2015 at 1:45 pm. The post text explains that the Carl D. Perkins Vocational and Technical Education Act was originally authorized by Congress in 1966, reauthorized in 1990 and again in 2009. It provides federal funding for higher career technical education (CTE) in that the United States in order to help the economy. For Cabrillo College, it provides portions of this funding students to develop an Assessment through a survey. The survey already completed the grant funds the college will receive. The survey only needs to be completed once per year by each student. The survey can be completed online through advisor. Log on to WEBAUTOR at <https://webauto.cabrillo.edu>. Select 'ATTENDANCE' Click Menu (near blue bar) Under 'Attendance Profile' click on 'Student Update Form'. The drop down list under 'Select the earliest term for which you are registered' will click on the current term. Click on 'UPDATE'. Second, login to the 'Career Technical Information'. Answer questions by clicking on the circle to the left of your 'Yes' or 'No' answer. You can get details about a question by clicking on the question number. After answering all questions, click on 'UPDATE'. There is a 'GO BACK' link at the bottom of the page. The post also includes a signature for Rich Simms, who is a member since Tue Jun 16, 2015 and has 1797 posts.

*This is an important source of funding for Cabrillo College.*

*Send me an email stating you completed this Perkins/VTEA survey for **three points extra credit!***

<https://opus-ii.cis.cabrillo.edu/forum/viewtopic.php?f=6&t=349>

Career Technical Information	
Your answers to these questions will help qualify Cabrillo College for Perkins/VTEA grant funds.	
Are you currently receiving benefits from:	
<input type="radio"/> Yes	TANF/CALWORKS
<input type="radio"/> No	
<input type="radio"/> Yes	SSI (Supplemental Security Income)
<input type="radio"/> No	
<input type="radio"/> Yes	GA (General Assistance)
<input type="radio"/> No	
<input type="radio"/> Yes	Does your <u>income</u> qualify you for a fee waiver?
<input type="radio"/> No	
<input type="radio"/> Yes	Are you a single parent with custody of one or more minor children?
<input type="radio"/> No	
<input type="radio"/> Yes	Are you a <u>displaced homemaker</u> attending Cabrillo to develop job skills?
<input type="radio"/> No	
<input type="radio"/> Yes	Have you moved in the preceding 36 months to obtain, or to accompany parents or spouses to obtain, temporary or seasonal employment in agriculture, dairy, or fishing?
<input type="radio"/> No	



# Managing Files



## Lesson 6 commands for your toolbox:

<b>touch</b>	- make a file (or update the timestamp)
<b>mkdir</b>	- make a directory
<b>cp</b>	- copy a file
<b>mv</b>	- move or rename a file
<b>rmdir</b>	- remove a directory
<b>rm</b>	- remove a file
<b>ln</b>	- create a link
<b>tree</b>	- visual list a directory

Redirecting stdout:

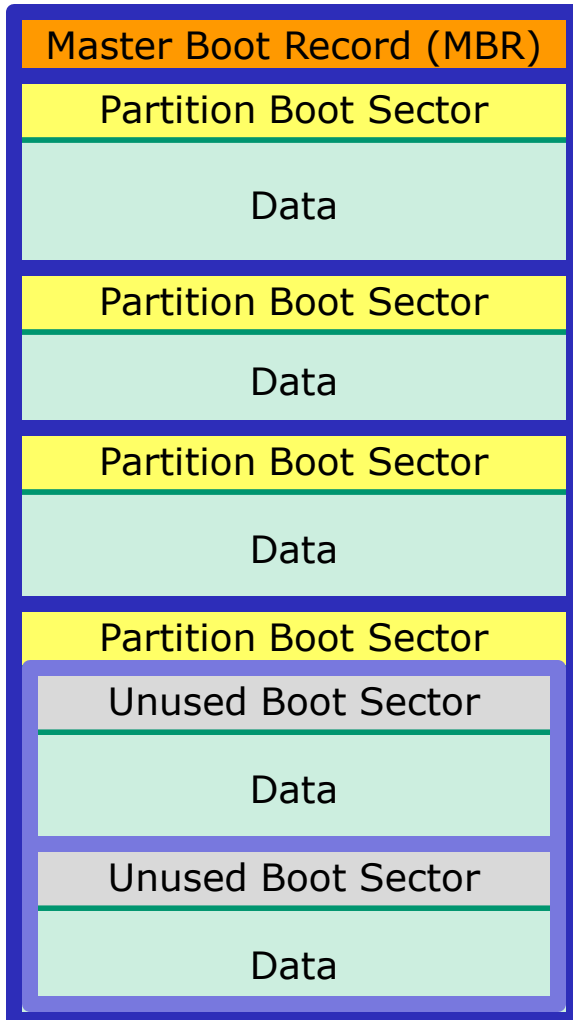
**> filename** - redirecting stdout to create/empty a file



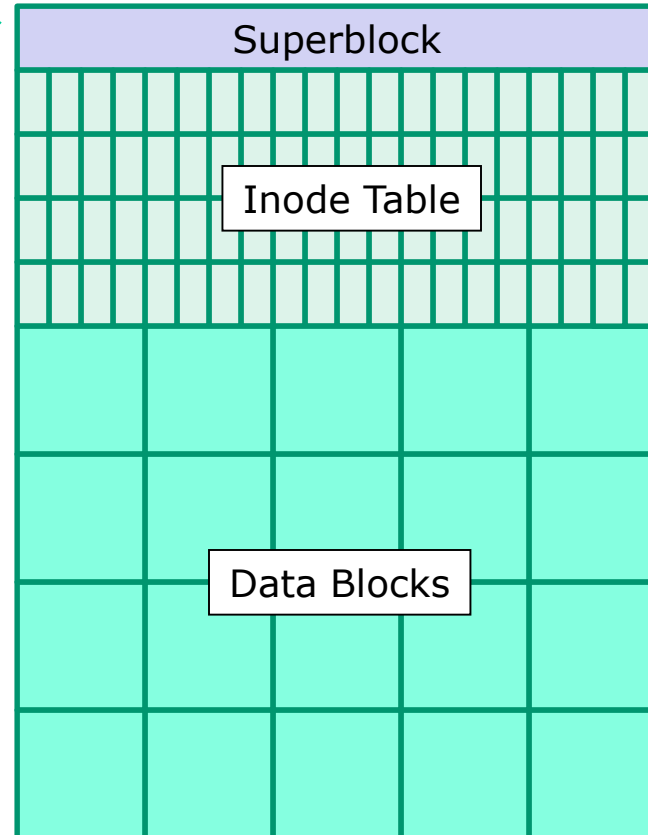
# File Systems

## Linux

*The hard drive is partitioned and the data areas can be formatted as a file system. Linux typically uses ext[234] and XFS file systems. Windows uses FAT32 and NTFS file systems.*



ext3 file system



# UNIX Files

## The three elements of a file

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

**filename**

+

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

*inode number* *inode information*

**inode**

+

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

**data**



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

bigfile 19470  
bin 9628  
letter 9662

Hello Mother! Hello Father!

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

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

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

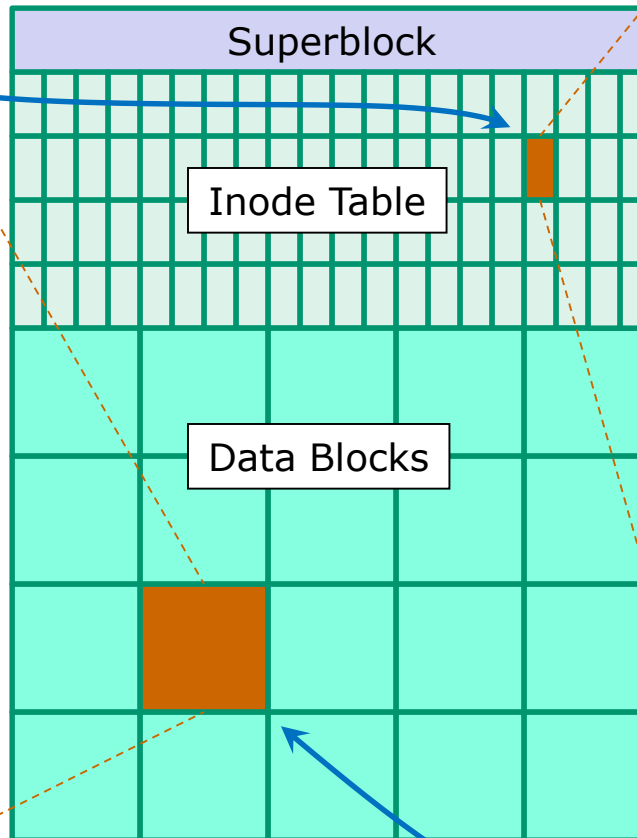
Take me home, oh Mother, Father, take me home! I hate Granada.  
Don't leave me out in the forest where I might get eaten by a bear! Take me home, I promise that I won't make noise, or mess the house with other boys, oh please don't make me stay -- I've been here one whole day.

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

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

Alan Sherman

ext2 file system



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

```
/home/cis90/simben $ ls -il letter
```

```
9662 -rw-r--r--. 1 simben90 cis90 1044 Jul 20 2001 letter
```

# Creating Directories

# Creating Directories

Command syntax:

**mkdir** *newdirectory*

- creates an empty directory(ies)
- options: -p (to create nested directories)

*Remember, everything in Unix is a file ... even directories!*

# Creating Directories

## The mkdir command

**mkdir** *newdirectory*

*Create a new directory named island*

```
/home/cis90/simben $ ls -l island  
ls: island: No such file or directory
```

```
/home/cis90/simben $ mkdir island  
/home/cis90/simben $ ls -ld island  
drwxrwxr-x 2 simben90 cis90 4096 Mar 18 06:43 island
```

*Note: Use the **d** option on the **ls** command to list information about the directory itself rather than directory contents*

*The basic file type is a directory*

*The file owner is a simben90*

*The file size is 4096 bytes*



# Creating Directories

## The mkdir command

*Create multiple directories at once*

```
/home/cis90/simben $ mkdir redhat debian slackware
```

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

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

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

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

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

```
/home/cis90/simben $ ls -ld redhat/ debian/ slackware/
```

```
drwxrwxr-x 2 simben90 cis90 4096 Mar 17 09:36 debian/
```

```
drwxrwxr-x 2 simben90 cis90 4096 Mar 17 09:36 redhat/
```

```
drwxrwxr-x 2 simben90 cis90 4096 Mar 17 09:36 slackware/
```

*Note: Use the **d** option on the **ls** command to list information about the directories themselves rather than their contents*

*Column 1 of the long listing shows the basic file type is a "d" for directory*

# Creating Directories

## The mkdir command

*Create nested directories (one directory inside another)*

```
/home/cis90/simben $ mkdir africa/ghana
```

```
mkdir: cannot create directory `africa/ghana': No such file  
or directory
```

```
/home/cis90/simben $ mkdir -p africa/ghana
```

```
/home/cis90/simben $ ls africa
```

```
ghana
```

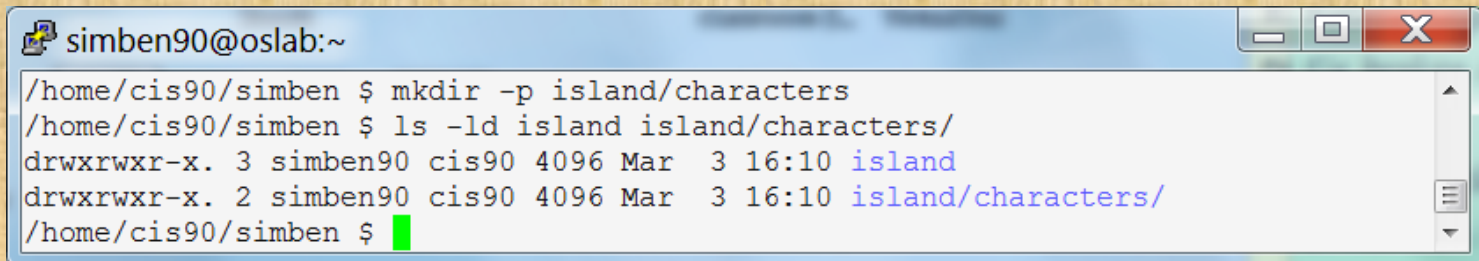
*Need to use the **p** option to create new parent directories as needed*

## Activity

In your home directory create a directory named *characters* inside a directory named *island* then list both new directories:

```
mkdir -p island/characters
```

```
ls -ld island island/characters/
```

A terminal window titled 'simben90@oslab:~' with standard window controls (minimize, maximize, close). The terminal shows the following commands and output:

```
/home/cis90/simben $ mkdir -p island/characters
/home/cis90/simben $ ls -ld island island/characters/
drwxrwxr-x. 3 simben90 cis90 4096 Mar  3 16:10 island
drwxrwxr-x. 2 simben90 cis90 4096 Mar  3 16:10 island/characters/
/home/cis90/simben $
```

# Creating Regular Files



# Creating Files

Command syntax:

## **touch** *newfile*

- creates an empty ordinary file(s), or if the file already exists, it updates the time stamp.

## **echo** "*string*" > *newfile*

- Creates or overwrites a text file

# Creating Files

## The touch command

### **touch** *newfile*

*Creates one or more empty regular files, or if the file already exists, it updates the time stamp.*

```
/home/cis90/simben $ ls -l sawyer  
ls: sawyer: No such file or directory
```

```
/home/cis90/simben $ touch sawyer  
/home/cis90/simben $ ls -l sawyer  
-rw-rw-r-- 1 simben90 cis90 0 Mar 18 06:34 sawyer
```

*The file type  
is a regular  
file*

*The file owner  
is simben90*

*The file size is 0  
bytes (an empty file)*

# Creating Files

## The touch command

*Multiple files can be created with one command*

```
/home/cis90/simben $ ls -l a b c
ls: a: No such file or directory
ls: b: No such file or directory
ls: c: No such file or directory
```

```
/home/cis90/simben $ touch a b c multiple arguments allowed
```

```
/home/cis90/simben $ ls -l a b c
```

```
-rw-rw-r-- 1 simben90 cis90 0 Mar 17 09:27 a
-rw-rw-r-- 1 simben90 cis90 0 Mar 17 09:27 b
-rw-rw-r-- 1 simben90 cis90 0 Mar 17 09:27 c
```

*Column 1 of the long listing shows the basic file type is a "-" for regular file*

# Creating Files


## The touch command

*The "last modified" timestamp is updated if the file already exists*

```
/home/cis90/simben $ ls -l sawyer  
-rw-rw-r-- 1 simben90 cis90 0 Mar 18 06:34 sawyer
```

*Wait a few minutes then touch  
the file to update the timestamp*

```
/home/cis90/simben $ touch sawyer  
/home/cis90/simben $ ls -l sawyer  
-rw-rw-r-- 1 simben90 cis90 0 Mar 18 06:40 sawyer
```





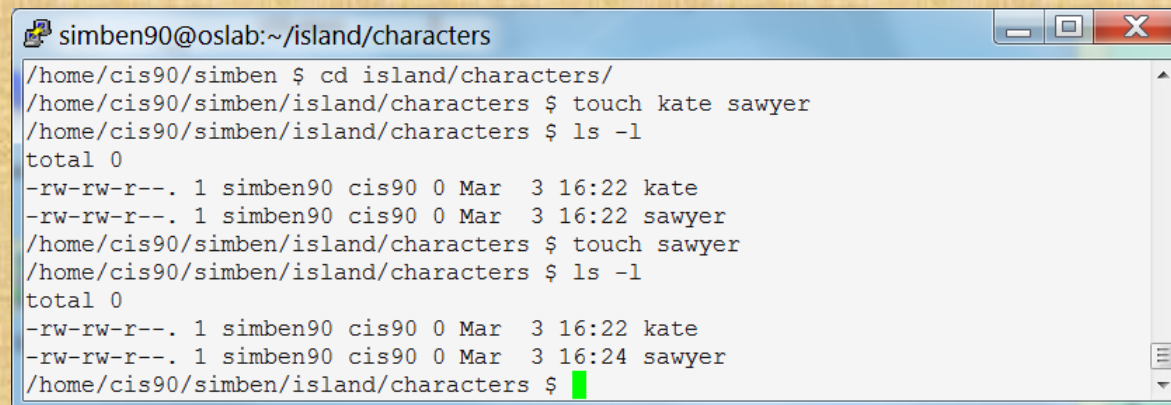
## Activity

In the directory named *characters* create 2 new files:

```
cd island/characters  
touch kate sawyer  
ls -l
```

*wait a minute or two*

```
touch sawyer  
ls -l
```



```
simben90@oslab:~/island/characters  
/home/cis90/simben $ cd island/characters/  
/home/cis90/simben/island/characters $ touch kate sawyer  
/home/cis90/simben/island/characters $ ls -l  
total 0  
-rw-rw-r--. 1 simben90 cis90 0 Mar  3 16:22 kate  
-rw-rw-r--. 1 simben90 cis90 0 Mar  3 16:22 sawyer  
/home/cis90/simben/island/characters $ touch sawyer  
/home/cis90/simben/island/characters $ ls -l  
total 0  
-rw-rw-r--. 1 simben90 cis90 0 Mar  3 16:22 kate  
-rw-rw-r--. 1 simben90 cis90 0 Mar  3 16:24 sawyer  
/home/cis90/simben/island/characters $
```

# Creating Files

## Redirection to stdout

**echo "string" > file** *Creates or overwrites a text file*

*Creating a file named accra and adding some text to it*

```
/home/cis90/simben $ cd africa
```

```
/home/cis90/simben/africa $ ls
```

```
ghana
```

```
/home/cis90/simben/africa $ cd ghana
```

```
/home/cis90/simben/africa/ghana $ echo "Population 1,658,937" > accra
```

```
/home/cis90/simben/africa/ghana $ cat accra
```

```
Population 1,658,937
```

*Output of the echo command is redirected from  
the screen to a file named accra*



# Creating Files

## Redirection to stdout

***Be careful!***



```
/home/cis90/simben/africa/ghana $ cat accra
Population 1,658,937
/home/cis90/simben/africa/ghana $ > accra
/home/cis90/simben/africa/ghana $ cat accra
/home/cis90/simben/africa/ghana $
```

*The redirection character > will create a new file if the filename does not exist.*

***However if the file exists already it will be emptied without warning!***

## Activity

- In the directory named *characters* create a new file:

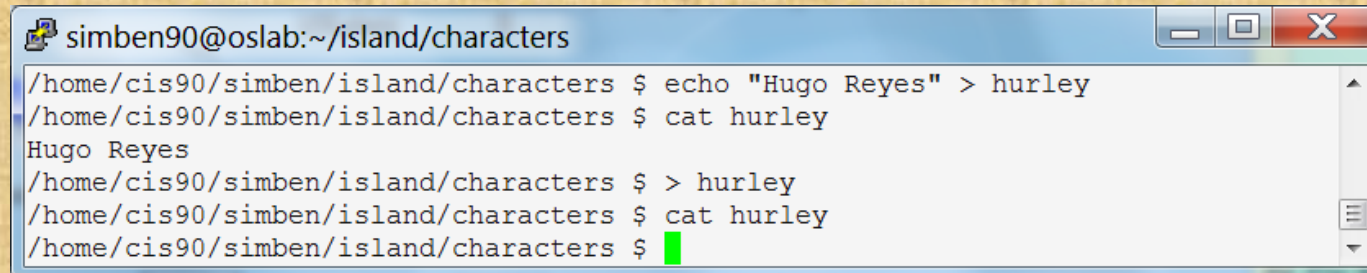
```
echo "Hugo Reyes" > hurley
```

- Print the new file with:

```
cat hurley
```

- Empty the file *hurley*

```
> hurley  
cat hurley
```



```
simben90@oslab:~/island/characters  
/home/cis90/simben/island/characters $ echo "Hugo Reyes" > hurley  
/home/cis90/simben/island/characters $ cat hurley  
Hugo Reyes  
/home/cis90/simben/island/characters $ > hurley  
/home/cis90/simben/island/characters $ cat hurley  
/home/cis90/simben/island/characters $
```

# Listing Files



# Listing Files & Directories

## *Short listing*

```
/home/cis90/simben $ ls island  
characters
```

## *Short recursive listing*

```
/home/cis90/simben $ ls -R island  
island:  
characters
```

```
island/characters:  
hurley kate sawyer
```

# Listing Files & Directories

## *Long listing*

```
/home/cis90/simben $ ls -l island  
total 4  
drwxrwxr-x. 2 simben90 cis90 4096 Mar  3 16:53 characters
```

## *Long recursive listing*

```
/home/cis90/simben $ ls -lR island  
island/:  
total 4  
drwxrwxr-x. 2 simben90 cis90 4096 Mar  3 16:53 characters
```

```
island/characters:  
total 0  
-rw-rw-r--. 1 simben90 cis90 0 Mar  3 16:53 hurley  
-rw-rw-r--. 1 simben90 cis90 0 Mar  3 16:22 kate  
-rw-rw-r--. 1 simben90 cis90 0 Mar  3 16:24 sawyer
```

# Listing Files & Directories

## *Making a directory tree diagram*

```
/home/cis90/simben $ tree island
island
|-- characters
    |-- hurley
    |-- kate
    |-- sawyer

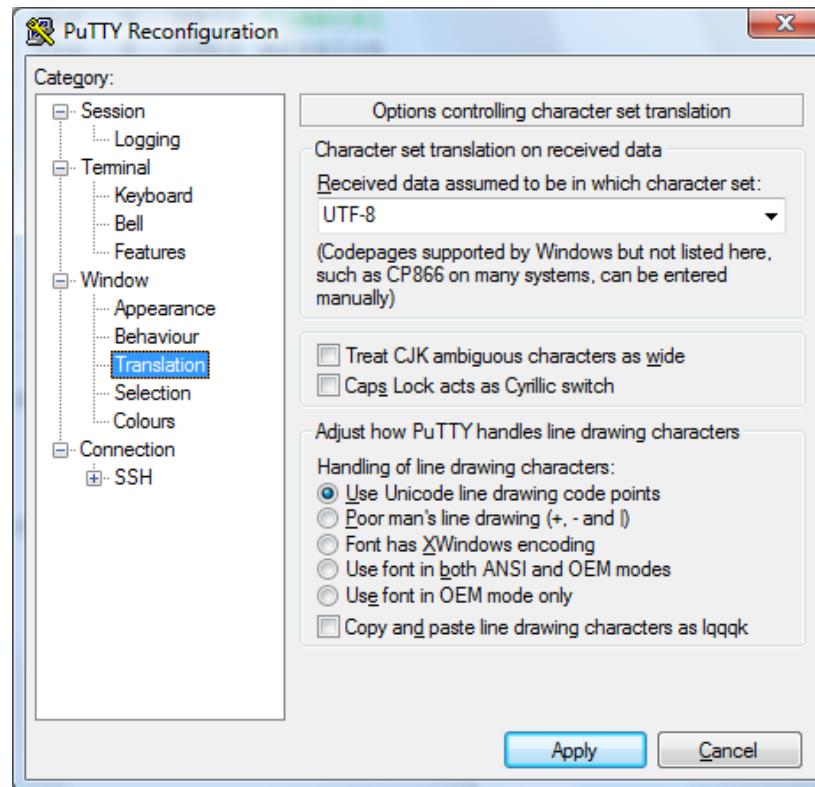
1 directory, 3 files
/home/cis90/simben $
```



*Putty must be configured to use the UTF-8 translation to show line drawing characters*

# Managing the UNIX/Linux File System

*Putty may need to be configured UTF-8 for tree command*



## Activity

- Return to your home directory with:

```
cd
```

- Do a long listing of the *island* directory with:

```
ls island
```

- Do a long recursive listing of the *island* directory with:

```
ls -lR island
```

- Make tree diagram of the *island* directory with:

```
tree island
```



# Copying Files

# Copying files

## The **cp** command



#Geneva

Command syntax:

**cp** *sourcefile targetfile*

**cp** *sourcefile targetdirectory/*

**cp** *sourcefile1 sourcefile2 targetdirectory/*

**cp** *sourcefile targetdirectory/targetfile*

**cp** *sourcefile sourcefile targetdirectory/*

*Where: sourcefile,  
targetfile, and  
targetdirectory are  
**absolute** or **relative**  
pathnames*

options: **-i -r**

**i** = warn before overwriting target files

**r** = recursive (copies all source sub-directories)

# Copying files

## Copy one file to another

**cp** *sourcefile targetfile*

```
/home/cis90/simben $ cd  
/home/cis90/simben $ cd island/characters/  
/home/cis90/simben/island/characters $ ls  
hurley kate sawyer  
/home/cis90/simben/island/characters $ echo "Hugo Reyes" > hurley
```

### *Make a copy of the hurley file*

```
/home/cis90/simben/island/characters $ cp hurley hurley.bak  
/home/cis90/simben/island/characters $ ls  
hurley hurley.bak kate sawyer
```

# Copying files

Copy multiple files to a directory

***cp sourcefile1 sourcefile2 targetdirectory/***

```
/home/cis90/simben/island/characters $ ls  
hurley hurley.bak kate sawyer
```

*Make a new directory called backup*

```
/home/cis90/simben/island/characters $ mkdir backup
```

*Copy three files of the four files to the new directory*

```
/home/cis90/simben/island/characters $ cp hurley kate sawyer backup/  
/home/cis90/simben/island/characters $ ls backup  
hurley kate sawyer
```

# Copying files

Copy multiple files to a directory

**cp** *sourcefile1 sourcefile2 targetdirectory*

*Copy all files to the new directory*

```
/home/cis90/simben/island/characters $ cp * backup/
```

```
cp: omitting directory `backup'
```

*While parsing the shell expands \*  
to hurley hurley.bak kate sawyer*

*Although \* matches backup,  
it is not included in the copy*

*List the four files in the new directory*

```
/home/cis90/simben/island/characters $ ls backup/
```

```
hurley hurley.bak kate sawyer
```

**Note: copying a file to an existing file will overwrite that file without warning!**

# Copy files

The **i** (interactive) option to warn about overwrites

```
/home/cis90/simben/island/characters $ ls h*
hurley  hurley.bak
/home/cis90/simben/island/characters $ cp -i hurley hurley.bak
cp: overwrite `hurley.bak'? yes
/home/cis90/simben/island/characters $
```

*The **i** option provides some interaction with the user before overwriting a file*



# Copying files

The **r** (recursive) option to copy an entire tree branch

```
/home/cis90/simben/island/characters $ cd ..
```

```
/home/cis90/simben/island $ ls
```

```
characters
```

*This directory does  
not exist yet*



```
/home/cis90/simben/island $ cp -r characters players
```

```
/home/cis90/simben/island $ ls -R players
```

```
players:
```

```
backup  hurley  hurley.bak  kate  sawyer
```

```
players/backup:
```

```
hurley  hurley.bak  kate  sawyer
```

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

*A recursive copy will copy everything in a directory (including all files and nested subdirectories) to another directory*

## Class Exercise

- Change to your *island* directory using an absolute path

```
cd /home/cis90/simben/island/characters/
```

*Use your own username*

- Make a backup copy of *kate*

```
cp kate kate2
```

- Copy *hurley* and overwrite *kate* using interactive mode

```
cp -i hurley kate    (Respond with yes to overwrite)  
cat kate
```

- Restore *kate* from the backup copy

```
cp kate2 kate  
cat kate
```

# Moving Files

# Moving Files

## The **mv** command

Command syntax:

**mv** *oldfilename newfilename*

**mv** *file targetdirectory*

**mv** *file targetdirectory/targetfile*

**mv** *file1 file2 targetdirectory/*

options: **-i**

**i** = warn before overwriting

Where: *file*,  
*targetfile*,  
*targetdirectory* are  
**absolute** or  
**relative**  
*pathnames*

# Moving Files

Renaming a file with the **mv** command

**mv** *oldfilename newfilename*

*This is how you rename files in UNIX/Linux!*

*oops ... typo!* →

```
/home/cis90/simben $ touch iPhone iPad ProLiant Pavilion Powerege
```

*typo fixed by renaming file*

```
/home/cis90/simben $ mv Powerege PowerEdge
```

```
/home/cis90/simben $ ls iP* P[ra]* Pow*
iPad  iPhone  Pavilion  PowerEdge  ProLiant
```

↑ *successfully renamed*

# Moving Files

## Moving a file into a directory

**mv** *file targetdirectory/*

/home/cis90/simben \$ **mkdir Apple HP Dell**     *Make some new directories*

/home/cis90/simben \$ **mv iPhone Apple/**     *Move one file at a time into one of*  
/home/cis90/simben \$ **mv iPad Apple/**     *the new directories*

/home/cis90/simben \$ **ls Apple**     *List the new directory the files were moved into*  
iPad   iPhone



# Moving Files

Moving multiple files into a directory

```
mv file1 file2 file3 targetdirectory/
```

```
/home/cis90/simben $ mv ProLiant Pavilion PowerEdge HP/
```

*Moving multiple files at once into a directory*

# Moving Files

## The **mv** command

*Listing the contents of multiple directories to verify file moves*

```
/home/cis90/simben $ ls Apple HP Dell
```

Apple:

iPad iPhone

Dell:

PowerEdge

HP:

Pavilion ProLiant

```
/home/cis90/simben $ tree Apple HP Dell
```

Apple

|-- iPad

`-- iPhone

HP

|-- Pavilion

`-- ProLiant

Dell

`-- PowerEdge

0 directories, 5 files

## Class Exercise

- Change to your *island* directory using an relative path

```
cd  
cd island/characters/
```

- Rename *kate* to *katherine*

```
mv kate katherine  
cat katherine
```

- Create a new file named *jin* and rename it to be hidden

```
touch jin  
mv jin .jin
```

(verify with `ls` and `ls -a`)

# Removing Files

# Removing Files

## The **rm** and **rmdir** commands

Removing files:

**rm** *file*

**rm** *file1 file2 ...*

*The ... (ellipses) mean you can specify more than one filename per command*

options: **-i -r -f**

**i** = prompt before remove

**r** = recursive (delete subdirectories)

**f** = force (never prompt)

**rmdir** *directory*

*Directories must be empty for this to work*

# Removing Files

The **rm** and **rmdir** commands

Remove a file:

```
/home/cis90/simben $ touch junk1 junk2 junk3 junk4  
/home/cis90/simben $ ls junk*  
junk1  junk2  junk3  junk4
```

*Create four test files*

```
/home/cis90/simben $ rm junk1  
/home/cis90/simben $ ls junk*  
junk2  junk3  junk4
```

*Remove one of them*

**Note: the file is removed without warning!**



# Removing Files

Using the `i` option to interactively remove multiple files

Remove one or more files interactively:

```
/home/cis90/simben $ rm -i junk*
```

```
rm: remove regular empty file `junk2'? y Remove just the junk2 file
```

```
rm: remove regular empty file `junk3'? n
```

```
rm: remove regular empty file `junk4'? n
```

```
/home/cis90/simben $ ls junk* Verify it was removed
```

```
junk3  junk4
```

# Removing Files

## The **rmdir** command

Use **rmdir** to remove a directory

```
/home/cis90/simben $ mkdir junkdir1 Make a test directory
/home/cis90/simben $ touch junkdir1/junk6 Put a test file in new directory

/home/cis90/simben $ rmdir junkdir1 Try to remove non-empty directory
rmdir: junkdir1: Directory not empty

/home/cis90/simben $ rm junkdir1/junk6 Remove file in directory
/home/cis90/simben $ rmdir junkdir1 Remove empty directory
/home/cis90/simben $
```

**Directories must be empty to be removed by rmdir**

## Class Exercise

- Change to your home directory

```
cd
```

- Create some test files

```
touch junk1 junk2 junk3 junk4  
ls junk*
```

- Remove one

```
rm junk1  
ls junk*
```

- Remove the others

```
rm junk[234]  
ls junk*
```

# linking files

# Linking files

## The **ln** command

Command syntax:

**ln** *file newlink*

options: -s

s = symbolic link (like Windows shortcut)

*With UNIX there are hard and soft (symbolic) links*

# Linking files

## Hard links

### Creating a "hard" link

#### In file newlink

```
/home/cis90/simben $ echo "Chocolate Licorice Taffy Jelly Beans" > sweets
/home/cis90/simben $ cat sweets
Chocolate Licorice Taffy Jelly Beans
```

```
/home/cis90/simben $ ln sweets dulces Create dulces hard link to sweets
/home/cis90/simben $ ls -il sweets dulces
100176 -rw-rw-r-- 2 simben90 cis90 37 Mar 14 09:29 dulces
100176 -rw-rw-r-- 2 simben90 cis90 37 Mar 14 09:29 sweets
```

*same inode* *number of hard linked files*

*Hard links allows **multiple** filenames for the **same** file.  
The link count on a long listing tells you how many  
names the file has.*



# Linking files

## Hard links

### Creating a "hard" link

#### In file newlink

```
/home/cis90/simben $ ln sweets candy
```

*Hard link candy to dulces*

```
/home/cis90/simben $ ls -il sweets dulces candy
```

```
100176 -rw-rw-r-- 3 simben90 cis90 37 Mar 14 09:29 candy
100176 -rw-rw-r-- 3 simben90 cis90 37 Mar 14 09:29 dulces
100176 -rw-rw-r-- 3 simben90 cis90 37 Mar 14 09:29 sweets
```

same inode

number of hard linked files

```
/home/cis90/simben $ ln sweets bonbons
```

*Hard link bonbons to sweets*

```
/home/cis90/simben $ ls -il sweets dulces candy bonbons
```

```
100176 -rw-rw-r-- 4 simben90 cis90 37 Mar 14 09:29 bonbons
100176 -rw-rw-r-- 4 simben90 cis90 37 Mar 14 09:29 candy
100176 -rw-rw-r-- 4 simben90 cis90 37 Mar 14 09:29 dulces
100176 -rw-rw-r-- 4 simben90 cis90 37 Mar 14 09:29 sweets
```

same inode

number of hard linked files

# Linking files

## Hard links

The . and .. directories are hard links!

```
/home/cis90/simben $ ls -ldi . /home/cis90/simben
```

```
98306 drwxr-xr-x 10 simben90 cis90 4096 Mar 14 09:41 .
98306 drwxr-xr-x 10 simben90 cis90 4096 Mar 14 09:41 /home/cis90/simben
```

*same inode*

*number of hard linked files  
(includes the . file and .. files in sub-directories)*

```
/home/cis90/simben $ ls -ldi .. /home/cis90/
```

```
2395394 drwxr-x--- 42 rsimms cis90 4096 Mar 6 08:17 ..
2395394 drwxr-x--- 42 rsimms cis90 4096 Mar 6 08:17 /home/cis90/
```

*same inode*

*number of hard linked files  
(includes the . file and .. files in sub-directories)*

Hard links allows **multiple** filenames for the **same** file.

Note the hidden . and .. files different filenames for the same directories

# Linking files

## Hard links

### Removing a "hard" link

**rm** *newlink*

```
/home/cis90/simben $ rm sweets
/home/cis90/simben $ ls -il sweets dulces candy bonbons
ls: sweets: No such file or directory
100176 -rw-rw-r-- 3 simben90 cis90 37 Mar 14 09:29 bonbons
100176 -rw-rw-r-- 3 simben90 cis90 37 Mar 14 09:29 candy
100176 -rw-rw-r-- 3 simben90 cis90 37 Mar 14 09:29 dulces
```

↑ *same inode*

↑ *number of hard linked files*

*Removing one of the hard linked files will not delete any of the other hard links, it will just decrement the number of hard links shown in a long listing*

# Linking Files

## Symbolic "Soft" Links

Creating a "soft" (symbolic) link

**ln -s** *file newlinkfile*

*The s option for a symbolic link*

```
/home/cis90/simben $ ln -s /etc/httpd/conf/httpd.conf apache
```

*Creating a symbolic link to the Apache configuration file*

```
/home/cis90/simben $ ls -li apache /etc/httpd/conf/httpd.conf
```

```
100172 lrwxrwxrwx 1 simben90 cis90 26 Mar 14 09:13 apache -> /etc/httpd/conf/httpd.conf
1280166 -rw-r--r-- 1 root root 33776 Feb 29 18:45 /etc/httpd/conf/httpd.conf
```

*l for symbolic link, - for regular file*

*Different inodes*

*Symbolic links are like Windows shortcuts. They are two separate files and it is possible to break the links when the target files get renamed.*

# Linking Files

## Symbolic "Soft" Links

```
/home/cis90/simben $ ls -li apache /etc/httpd/conf/httpd.conf
100172 lrwxrwxrwx 1 simben90 cis90    26 Mar 14 09:13 apache -> /etc/httpd/conf/httpd.conf
1280166 -rw-r--r-- 1 root      root    33776 Feb 29 18:45 /etc/httpd/conf/httpd.conf
```

```
/home/cis90/simben $ head -n 5 apache
#
# This is the main Apache server configuration file.  It contains the
# configuration directives that give the server its instructions.
# See <URL:http://httpd.apache.org/docs/2.2/> for detailed information.
# In particular, see
```

```
/home/cis90/simben $ head -n 5 /etc/httpd/conf/httpd.conf
#
# This is the main Apache server configuration file.  It contains the
# configuration directives that give the server its instructions.
# See <URL:http://httpd.apache.org/docs/2.2/> for detailed information.
# In particular, see
```

*From Benji's home directory, he can now refer to the Apache configuration file using either `apache` or `/etc/httpd/conf/httpd.conf`*

## Class Exercise

- Create a file named candy using:  
`> candy`
- Create a hard link to candy named sweets using:  
`ln candy sweets`
- Create a soft link to candy named dulces using:  
`ln -s candy dulces`
- List them using:  
`ls -li candy sweets dulces`



# Assignment







**Lab 5: Reorganize Your Home Directory**  
Topic: Reorganizing Your Home Directory

**Lab 5: Reorganize Your Home Directory**

The goal of this lab is to become proficient with system commands for copying, moving, renaming, creating and removing files within your home directory.

**Forum**

Discuss this: <http://opus.cabrillo.edu/forum/viewforum.php?f=46>

Check this forum for any lab feedback news about this lab. This forum is also the place to go if you get stuck, have a question or want to discuss something you have learned about this lab.

**Procedure**

Log on to this Open server as that you have a confirmed link shell at your disposal. Be sure you are in your home directory by using the `pwd` command. We are going to reorganize the files in that home directory. This will involve making new subdirectories and moving files around. The questions asked during this procedure are for your clarification only. You will be guided on exactly performing this procedure. At the end of this lab you will submit your new layout by executing the command:

**Submit**

**Part 1: Reorganize Your Home Directory**

1. Display a listing of the files in your home directory using the `ls -l` command.
2. Now the instructor will give directions using the `mkdir` command:
  - a. Create a new directory named `old` for keeping our old files using the `mkdir` command.
  - b. After the new directory's contents using the `ls -l` option of the `ls` command. Do you see the two hidden files that were created with this directory?
  - c. You can make more than one new directory at a time by supplying two arguments to the `mkdir` command. Make two new directories, one called `dir1` and the other called `dir2`.
  - d. Verify that they were made in your home directory.

## Lab 5

*In this lab you will reorganize your home directory*

*Be careful. For this lab, the slower you go the sooner you will be done!*

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:

cp

ln

mkdir

mv

rm

rmdir

touch

tree

copy files

link files

make directory

move or rename files

remove files

remove directory

make/modify a file

draw file tree branch

Redirection:

>

redirects stdout

## Next Class

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

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

**Lab 5 due**

Quiz questions for next class:

- What command is used to rename a file?
- If two files are hard linked do they have the same or different inode numbers?
- What option for the rm command provides confirmation when deleting files?

# Test 1

**HONOR CODE:**

This test is open book, open notes, and open computer. HOWEVER, you must work alone. You may not discuss the test questions or answers with others during the test. You may not ask or receive assistance from anyone other than the instructor when doing this test. Likewise you may not give any assistance to anyone taking the test.

**INSTRUCTIONS:**

Every question on the test was designed to be answered using one of the systems below.

- opus-ii.cis.cabrillo.edu (port 2220).
- sun-hwa-vii.cis.cabrillo.edu (port 22)
- son-of-opus.simms-teach.com (port 2220)
- arya-xx (port 22) - Select xx for your own Arya.

Each question begins with *[system name]* so you know which system you should be logged into to answer the question.

All systems are accessible using ssh from opus-ii. For sun-hwa-vii and son-of-opus login using your original opus-ii credentials. For arya, use the generic cis90 account.

**IF YOU GET STUCK on a question you can ask or email the instructor for the answer and forfeit the point. The instructor will be available during class and be online between 8-10 PM in the evening for online or long distance students.**

Please KEEP YOUR ANSWERS TO A SINGLE LINE ONLY !!

This test must be completed in one sitting. The submittal will be made automatically when the time is up. If you submit early by accident you will not be able to re-enter and continue. If that happens don't panic! Just email the instructor any remaining answers before the time is up.





## Notes to instructor

[ ] Canvas: Schedule end of **practice** test at [\[T-30\]](#)

[ ] Kick off and lock out users on **practice** test system

```
echo "/root/lock-cis90; cp /etc/nologin.bak /etc/nologin" | at \[T-30\]
```

[ ] Kick off and lock out users on **secondary practice** test system

```
echo "/root/lock-cis90" | at \[T-30\] (adjusted for timezone)
```

[ ] Canvas: **real** test availability from = [\[T-0\]](#), due & available until = [\[splashdown\]](#)

[ ] Canvas: **remove password on real test on Canvas** [\[before T-0\]](#)

[ ] Canvas: **publish real test and moderate any accommodations** [\[before T-0\]](#)

[ ] Send email on Opus-II to students

```
echo "/home/rsimms/cis90/test01/q29/mail-q29-T1 2 q" | at \[T-0\]
```

[ ] Allow logins on primary **real** test system

```
echo "/root/unlock-cis90; rm /etc/nologin" | at \[T-0\]
```

[ ] Allow logins on secondary **real** test system

```
echo "/root/unlock-cis90" | at \[T-0\]
```

[ ] Kick off and lock out users on **primary** and **secondary real** test systems

```
echo "/root/lock-cis90; cp /etc/nologin.bak /etc/nologin" | at \[splashdown\]
```

```
echo "/root/lock-cis90" | at \[splashdown\]
```





# Test 1

# Backup



# More Examples

# Practice Tasks

## For use on Opus-II

**Task 1:** Create a new directory named *birds* in your home directory. In that new directory create a sub-directory named *Antarctica*. Copy the *penguin* file from the */home/cis90/depot* directory to the new *Antarctica* directory. View the last line of the *penguin* file. Recursively remove the *birds* directory when finished.

```
/home/cis90/simben $ cd
/home/cis90/simben $ mkdir -p birds/Antarctica
/home/cis90/simben $ cp ../depot/penguin birds/Antarctica/
/home/cis90/simben $ tail -n1 birds/Antarctica/penguin
and envy your plumed pride.
/home/cis90/simben $ head -n1 birds/Antarctica/penguin
Magellanic Penguin
/home/cis90/simben $ rm -rf birds/
/home/cis90/simben $
```

*Performing Task 1 from the home directory using relative pathnames only.*

# Practice Tasks

## For use on Opus-II

**Task 1:** Create a new directory named *birds* in your home directory. In that new directory create a sub-directory named *Antarctica*. Copy the *penguin* file from the */home/cis90/depot* directory to the new *Antarctica* directory. View the last line of the *penguin* file. Recursively remove the *birds* directory when finished.

```
/home/cis90/simben $ cd
/home/cis90/simben $ mkdir birds
/home/cis90/simben $ cd birds
/home/cis90/simben/birds $ mkdir Antarctica
/home/cis90/simben/birds $ cd Antarctica
/home/cis90/simben/birds/Antarctica $ cp /home/cis90/depot/penguin .
/home/cis90/simben/birds/Antarctica $ tail -n1 penguin
and envy your plumed pride.
/home/cis90/simben/birds/Antarctica $ cd
/home/cis90/simben $ rm -rf /home/cis90/simben/birds/
/home/cis90/simben $
```

*Performing Task 1 by changing directories and using a mix of relative and absolute pathnames.*

# Practice Tasks

## For use on Opus-II

**Task 1:** Create a new directory named *birds* in your home directory. In that new directory create a sub-directory named *Antarctica*. Copy the *penguin* file from the */home/cis90/depot* directory to the new *Antarctica* directory. View the last line of the *penguin* file. Recursively remove the *birds* directory when finished.

```
/home/cis90/depot $ cd /home/cis90/depot/
/home/cis90/depot $ ls penguin
penguin
/home/cis90/depot $ mkdir -p ~/birds/Antarctica
/home/cis90/depot $ cp penguin ~/birds/Antarctica/
/home/cis90/depot $ tail -n1 ~/birds/Antarctica/penguin
and envy your plumed pride.
/home/cis90/depot $ rm -rf ~/birds
/home/cis90/depot $
```

*Performing Task 1 from the /home/cis90/depot directory and using the ~ for the home directory.*



# Practice Tasks

## For use on Opus-II

**Task 1:** Create a new directory named *birds* in your home directory. In that new directory create a sub-directory named *Antarctica*. Copy the penguin file from the `/home/cis90/depot` directory to the new *Antarctica* directory. View the last line of the *penguin* file. Recursively remove the *birds* directory when finished.

```
/home/cis90/depot $ cd /home/cis90/depot/
/home/cis90/depot $ ls penguin
penguin
/home/cis90/depot $ mkdir -p ../simben/birds/Antarctica
/home/cis90/depot $ cp penguin ../simben/birds/Antarctica/
/home/cis90/depot $ tail -n1 /home/cis90/simben/birds/Antarctica/penguin
and envy your plumed pride.
/home/cis90/depot $ rm -rf /home/cis90/simben/birds/
/home/cis90/depot $
```

*Performing Task 1 from the `/home/cis90/depot` directory and using relative and absolute pathnames.*