

Lesson Module Checklist

- Slides –
- Flash cards –
- Page numbers –
- 1st minute quiz –
- Web Calendar summary –
- Web book pages –
- Commands –
- Lab tested –

- Put sonnet6, bigfile in depot
- Real test 1 on standby –
- Forbidden web page updated –

- CCC Confer wall paper / quiz emailed –

- Pick up Polycom phone/extension mics –
- Check that headset is charged –
- Wireless lapel mic backup battery –
- Backup slides, CCC info, handouts on flash drive –



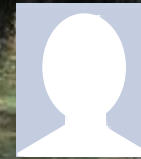
Dieskau



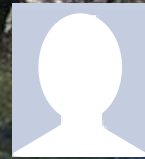
Jonathan



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



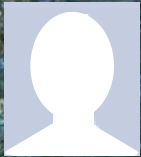
Ana



David



Obie



Dave



Cole



Corey



Nancy



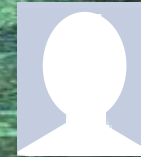
Ryan



Elia



Tasha



Darren



Scott



Devin



Everett



Juan



Raven



Rogan



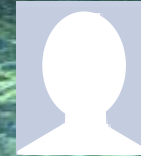
Mike



Mook



Melissa



Cameron



Jose



Jeff



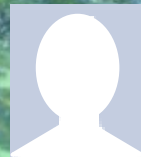
Matt



Kenneth



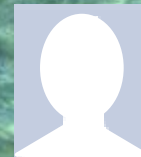
Ousmane



Ian



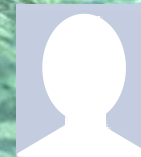
Solomon



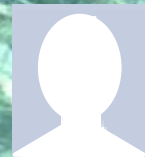
Henry



Matthew



Mason



Chan



- [] Has the phone bridge been added?
- [] Is recording on?
- [] Does the phone bridge have the mike?
- [] Share Slides, putty (rsimms x 3), Chrome, VLab
- [] Disable spelling on PowerPoint

Managing Files

Objectives	Agenda
• Be able to create, copy, move, remove and link files	• Questions • Test Prep • Housekeeping • Managing files • Wrap up • Test

Questions

Previous material and assignment

1. Questions on previous material or labs?
2. Questions on the practice test?

Lab 4

Post

Mortem

Lab 4 results

01 XXXXXX

02 XXXX

03 perfect

04 XXXX

05 XXXXX

06 X

07 XXX

08 XXXXX

09 XXXXXXXXXXXX

10 XX

11 XXXXXX

12 XXXX

13 XX

14 XX

15 XXXXXXXXXXXXXXXXXXXX

16 perfect

17 XXXXXXXXXXXXXXXXXXXX

18 perfect

19 XXX

20 X

21 XXXXXXXXXXXXXXXXXXXX

22 X

23 XXX

24 XXXX

25 XXXXXXXX

The most missed questions were 9, 15, 17, and 21

Lab 4 - Q9

9) Who is the owner of your home directory?

Correct answers: **your username, e.g. simben90, rodduk90, etc.**

Incorrect answers:

/home/cis90/simben *That's not a username (it's a home directory)*

simben *That is an incomplete user name*

rsimms *Not the owner*

cis90 *Not the owner*

Checking answer on Opus:

/home/cis90/simben \$ cd

*cd with no arguments takes you to
your home directory*

/home/cis90/simben \$ ls -ld

drwxr-xr-x 10 **simben90** cis90 4096 Mar 7 14:19 .

owner → *group*

/home/cis90/simben \$ ls -ld /home/cis90/simben/

drwxr-xr-x 10 **simben90** cis90 4096 Mar 7 14:19 /home/cis90/simben/

owner → *group*

Lab 4 - Q9

```
/home/cis90/simben $ ls -l /home/cis90
total 320
drwxr-xr-x 10 ahrmat90 cis90 4096 Mar 12 13:44 ahrmat
drwxr-xr-x  2 rsimms   cis90 4096 Mar  8 21:59 answers
drwxr-x---  3 rsimms   cis90 4096 Mar  7 06:34 bin
drwxr-xr-x  9 blerav90 cis90 4096 Mar  8 22:02 blerav
drwxr-xr-x  9 bodian90 cis90 4096 Mar  8 22:02 bodian
drwxr-xr-x 10 bunsol90 cis90 4096 Mar  7 15:39 bunsol
drwxr-xr-x  9 cheken90 cis90 4096 Feb 16 13:17 cheken
drwxr-xr-x  9 cofcol90 cis90 4096 Mar  8 22:02 cofcol
drwxr-xr-x 10 colabd90 cis90 4096 Mar  8 22:02 colabd
drwxr-xr-x 10 deltas90 cis90 4096 Mar  8 22:02 deltas
drwxr-xr-x  4 rsimms   cis90 4096 Feb 28 13:03 depot
drwxr-xr-x  9 doucor90 cis90 4096 Mar  8 22:02 doucor
drwxr-xr-x  9 flamat90 cis90 4096 Mar  8 22:02 flamat
drwxr-xr-x  9 gueous90 cis90 4096 Mar  8 22:02 gueous
drwxr-xr-x  9 guest90  cis90 4096 Feb 19 23:35 guest
< snipped >
```

owner
s

group
s

directorie
s

Lab 4 - Q15

15) Which files in your home directory should you not view with the cat or more commands?

Correct answer: **what_am_i**

Checking answer on Opus:

```
/home/cis90/simben $ file *
bigfile:          ISO-8859 English text, with overstriking
bin:              directory
dead.letter:      ASCII mail text
empty:            empty
Hidden:           directory
lab01.graded:     ASCII text
lab01-submitted:  ASCII text
lab02.graded:     ASCII English text
lab03.graded:     ASCII English text
Lab2.0:           directory
Lab2.1:           directory
letter:           ASCII English text
log:              ASCII text
```

Use the **file** command to classify files. Use * which bash will expand to all non-hidden files in the directory as arguments to the file command.

All these are text files or directories

Lab 4 - Q15

```
mbox:          ASCII mail text, with very long lines
Miscellaneous: directory
mission:       ASCII English text
Poems:         directory
proposal1:     ASCII English text
proposal2:     ASCII English text
proposal3:     ASCII English text
small_town:    ASCII English text
spellk:        ASCII English text
text.err:      ASCII text
text.fxd:      ASCII text
timecal:       shell archive or script for antique kernel text
uhistory:      ASCII mail text
what_am_i:     data
/home/cis90/simben $
```

*These are all text files ...
EXCEPT what_am_i which contains
binary data*

Even timecal is a text file (a script)

```
/home/cis90/roddyduk $ cat what_am_i
H/./>/..#.#.mailrc!.profile+HiddenLab3.1.1%Lab3.1.2f*PoemsReference8bigfile
$bi!mailfoldersa_very_long_filenameerrors/fruita/greeting,lettermys
tery^proposal1,proposal29timecal/home/cis90/roddyduk $
```

*Binary/data files contain unprintable characters that spew garbage on the screen. Text commands like **cat**, **head**, **more**, ..., etc. do not handle the unprintable characters gracefully. If your terminal gets messed up try the **reset** command.*

Lab 4 - Q17

17) What ls command-line allows you to see the permissions of your home directory while you are in your home directory?

Correct answer: **ls -ld** *(and many other solutions shown below)*

Checking answer on Opus:

Use the d option in conjunction with the l option to show information on the directory itself rather than its contents.

```
/home/cis90/simben $ ls -ld
drwxr-xr-x 10 simben90 cis90 4096 Mar 13 11:55 .
```

```
/home/cis90/simben $ ls -ld /home/cis90/simben/
drwxr-xr-x 10 simben90 cis90 4096 Mar 13 11:55 /home/cis90/simben/
```

```
/home/cis90/simben $ ls -ld $HOME
drwxr-xr-x 10 simben90 cis90 4096 Mar 13 11:55 /home/cis90/simben
```

```
/home/cis90/simben $ ls -ld ~
drwxr-xr-x 10 simben90 cis90 4096 Mar 13 11:55 /home/cis90/simben
```

permissions

Lab 4 - Q17

Or do a long listing of the parent directory and locate your home directory in the output

```
/home/cis90/simben $ ls -l /home/cis90
total 320
< snipped >
drwxr-xr-x 10 porjon90 cis90 4096 Mar  8 22:02 porjon
drwxr-xr-x  9 pummas90 cis90 4096 Feb 27 23:43 pummas
drwxr-xr-x  9 rafdav90 cis90 4096 Mar  8 22:02 rafdav
drwxr-xr-x  9 reedie90 cis90 4096 Mar  8 22:02 reedie
drwxr-xr-x  9 rodduk90 cis90 4096 Mar  1 10:15 rodduk
drwxr-xr-x 10 shidev90 cis90 4096 Mar  1 10:15 shidev
drwxr-xr-x 10 simben90 cis90 4096 Mar 13 11:55 simben
drwxr-xr-x  9 varana90 cis90 4096 Mar  8 22:02 varana
drwxr-xr-x 10 veleli90 cis90 4096 Mar  9 09:34 veleli
```

Lab 4 – Q21

21) What command will set your prompt to show your current working directory path and a \$?

Correct answer: `PS1=' $PWD $ '`

Incorrect answers:

`ps1='$PWD $'` (*variable names are case sensitive*)

`ps1="$PATH $"` (*the PATH would not make a good prompt*)

`PS1="$PWD $ "` (*bash will expand \$PWD and produce static prompt*)

`export PS1=$PWD" $ "` (*bash will expand \$PWD and produce static prompt*)

`echo $PWD "$"` (*bash will expand \$PWD and produce static prompt*)

Checking answer on Opus:

```
/home/cis90/simben $ PS1="Fix me: $"
```

static prompt

```
Fix me: $PS1='$PWD $ '
```

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

```
/ $ cd
```

```
/home/cis90/simben $ cd ~/Poems/
```

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

*dynamic prompt which
changes as you move
about file tree*



Housekeeping

1. Check the Grades page on the website to monitor your progress in the class

Current Progress																																	
Code Name	Grading Choice	Quizzes & Tests														Forum				Labs										Project	Extra Credit	Total	Grade
Max Points		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	T1	T2	T3	F1	F2	F3	F4	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10					
adaldrida	P/NP	3	1	3	2										20				24	26	30	27									16		
alatar	Grade	2	3	3	3										20				27	30	30	26									19		
amroth	Grade	3	3	3	3										20				29	23	30	26									20		
arador	Grade	3	3	3	3										20				19	30	24										20		
aragorn	Grade	3		3	3										20				28	15	28	26									18		
arwen	Grade	3	1	3	3										20				29	30	30	29									19		
carc	Grade	3	3	3	3										16				30	29	30	19									20		
celebrian	Grade	3		3	3										20					30	29										16		
cirdan	Grade	3	3	3	3										20				28	29	30	24									19		
denethor	Grade			2											20				14	22	28										7		
dori	Grade	3	2	3	2										16				28	27	30										8		
dwalin	Grade	3	1	1	1										20				28	25	28	22									20		
elrond	Grade	3	3	3											20				30	30	28	29									20		
eomer	Grade	2	2	1	2										20				21	25	30	23									8		
ewyn	Grade														20				26	28	30	15									18		
frodo	Grade	3	3	3	3										20				28	24	30	29									22		
galadriel	Grade	1	3	2	3										20				25	22	30	18									12		
haldir	Grade			3	0										20				30	28	28	20									18		
loredan	Grade	3	3												8				21	30											4		
khamul	Grade	3	2	3	2										20				29	22	30	22									15		
nazgul	Grade														4				8												2		
nessa	Grade			3	3										20				30	24	28	20									13		
orome	Grade			3	3										20				30	27	30	25									19		
pippin	Grade	3	3	3	2										20				30	20	30										12		
quickbeam	Grade	3	3	3	3										20				25	29	30	28									19		
samwise	Grade		2	3	3										4					22	16	24									10		
shadowfax	Grade		3	3	3										20				29	30	30	28									21		
strider	Grade	3	3	3	3										20				30	28	30	29									23		
theoden	Grade	1	0	3											0				27	22											3		
treebeard	Grade	3	3	3	3										16				28	25	30	29									18		
tulkas	Grade	3	2		0										0				30	22	28	18									3		
ulmo	Grade	3	3	3	3										20				28	25	30	30									14		
varda	Grade														0																		

2. /home/cis90ol/answers - check this directory on Opus for answers to completed labs.

Managing Files

New commands for your toolbox:

touch	<i>to make a file (or update the timestamp)</i>
mkdir	<i>to make a directory</i>
cp	<i>to copy a file</i>
mv	<i>to mv or rename a file</i>
rmdir	<i>to remove a directory</i>
rm	<i>to remove a file</i>
ln	<i>to create a link</i>

Redirecting stdout:

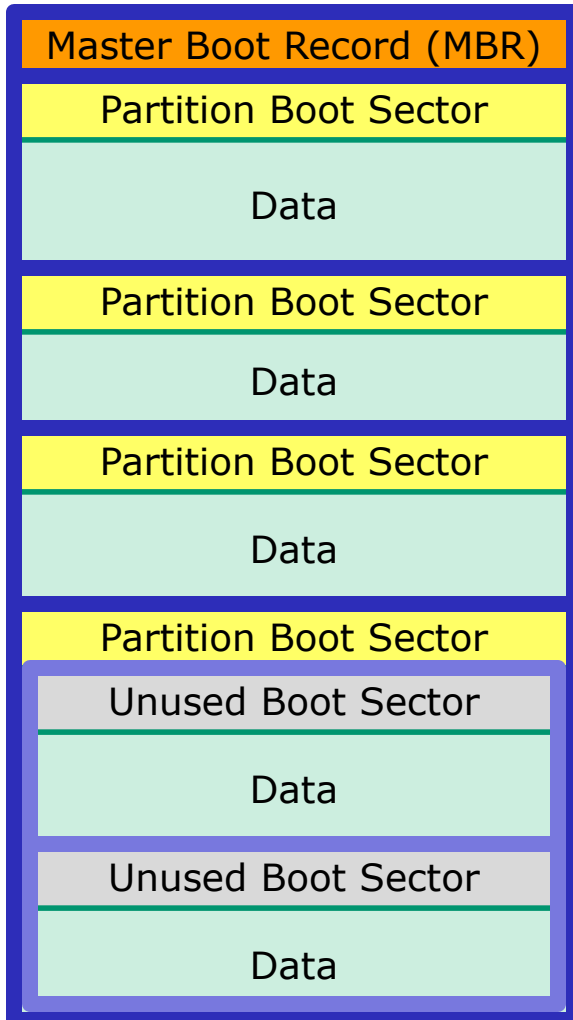
> *filename* *redirecting stdout to create/empty a file*



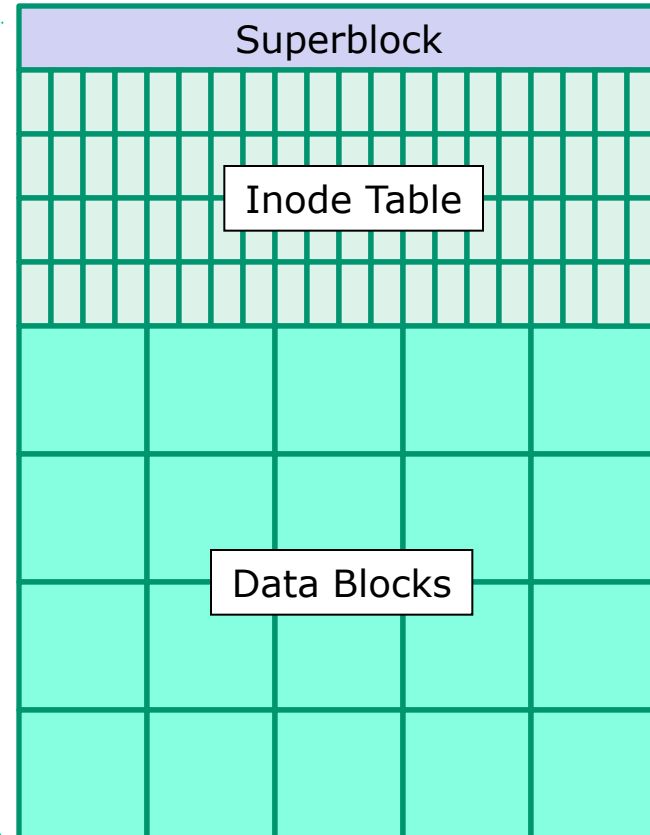
File Systems

Linux

The hard drive is partitioned and the data areas can be formatted as a file system. Linux typically uses ext2, ext3 and ext4 file systems. Windows uses FAT32 and NTFS file systems.



ext2 file system



UNIX Files

The three elements of a file

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

name

+

```
/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

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

bigfile 102559
bin 102560
letter 102594

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.

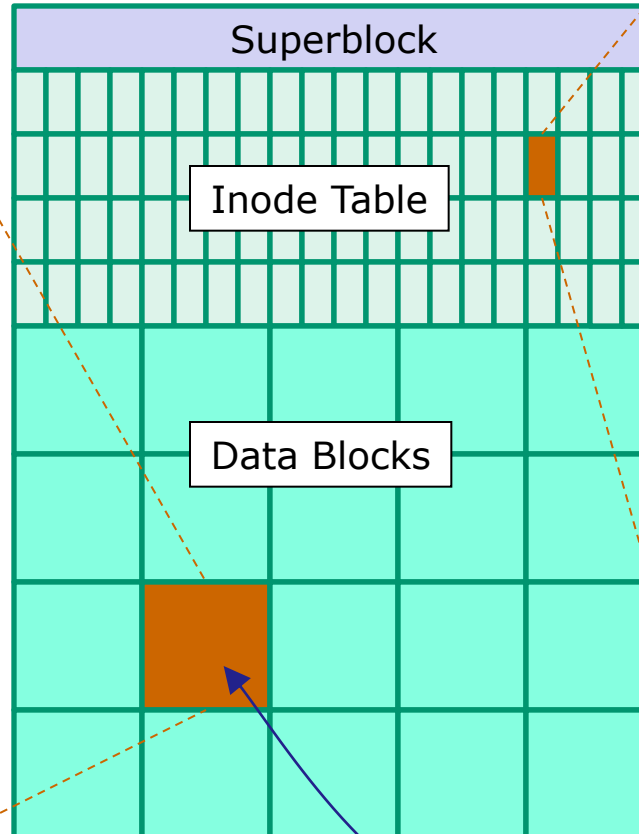
Take me home, oh Mother, Father, take me home! I hate Granada.
Don't leave me out in the forest where I might get eaten by a bear! Take me home, I promise that I won't make noise,
or mess the house with other boys, oh please don't make me stay -- I've been here one whole day.

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



102594	inode number
-	Type
rw-r--r--	Permissions
1	Number of links
simben90	User
cis90	Group
1044	Size
2001-07-20	Modification time
2012-02-15	Access Time
2012-02-04	Change time
Pointer(s) to data blocks	Pointer(s) to data blocks

inode number

Type

Permissions

Number of links

User

Group

Size

Modification time

Access Time

Change time

Pointer(s) to data blocks

```
/home/cis90ol/simmsben $ ls -il letter
102594 -rw-r--r-- 1 simben90 cis90 1044 Jul 20 2001 letter
```

Creating Files

Managing the UNIX/Linux File System

Creating Files

Commands:

touch

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

mkdir

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

echo "string" > filename

- Creates or overwrites a text file

Managing the UNIX/Linux File System

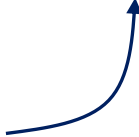
Creating Files

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

A new file, named sawyer is created in the current working directory

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

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

An empty file 

Managing the UNIX/Linux File System

Creating Files

Multiple files can be created with one command

```
/home/cis90ol/simmsben $ 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/cis90ol/simmsben $ touch a b c
```

```
/home/cis90ol/simmsben $ ls -l a b c
```

```
-rw-rw-r-- 1 simmsben cis90ol 0 Mar 17 09:27 a
```

```
-rw-rw-r-- 1 simmsben cis90ol 0 Mar 17 09:27 b
```

```
-rw-rw-r-- 1 simmsben cis90ol 0 Mar 17 09:27 c
```

Managing the UNIX/Linux File System

Creating Files

The last modified timestamp for sawyer is updated if the file already exists

```
/home/cis90/simmsben $ ls -l sawyer
```

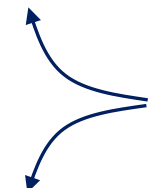
```
-rw-rw-r-- 1 simmsben cis90 0 Mar 18 06:34 sawyer
```

```
/home/cis90/simmsben $ touch sawyer
```

```
/home/cis90/simmsben $ ls -l sawyer
```

```
-rw-rw-r-- 1 simmsben cis90 0 Mar 18 06:40 sawyer
```

Last modified



Managing the UNIX/Linux File System

Creating Files

mkdir creates one or more new directories

Create a new directory named island

```
/home/cis90/simmsben $ ls -l island
```

```
ls: island: No such file or directory
```

```
/home/cis90/simmsben $ mkdir island
```

```
/home/cis90/simmsben $ ls -ld island
```

```
drwxrwxr-x 2 simmsben 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

file type is directory

Managing the UNIX/Linux File System

Creating Files

Create multiple directories at once

```
/home/cis90ol/simmsben $ mkdir redhat debian slackware  
/home/cis90ol/simmsben $ ls -ld redhat/ debian/ slackware/  
drwxrwxr-x 2 simmsben cis90ol 4096 Mar 17 09:36 debian/  
drwxrwxr-x 2 simmsben cis90ol 4096 Mar 17 09:36 redhat/  
drwxrwxr-x 2 simmsben cis90ol 4096 Mar 17 09:36 slackware/
```

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

Managing the UNIX/Linux File System

Creating Files

Create nested directories (one directory inside another)

```
/home/cis90/simmsben $ mkdir africa/ghana  
mkdir: cannot create directory `africa/ghana': No  
such file or directory
```

```
/home/cis90/simmsben $ mkdir -p africa/ghana  
/home/cis90/simmsben $ ls africa  
ghana
```

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

Managing the UNIX/Linux File System

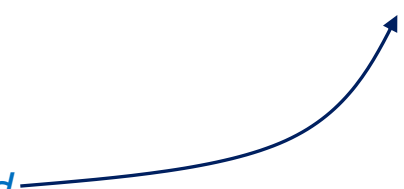
Creating Files

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

Creating a file named accra and adding some text to it

```
/home/cis90/simmsben $ cd africa  
/home/cis90/simmsben/africa $ ls  
ghana  
/home/cis90/simmsben/africa $ cd ghana  
/home/cis90/simmsben/africa/ghana $ echo Population 1,658,937 > accra  
/home/cis90/simmsben/africa/ghana $ cat accra  
Population 1,658,937
```

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



Managing the UNIX/Linux File System

Creating Files

Be careful!



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

*The redirection character > will create the file named if that file does not exist. **If the file does exist though it will be emptied!***

Class Exercise

- In your home directory create a directory named **characters** inside a directory name **island**.

mkdir -p island/characters

- In the directory named **characters** create three files:

cd island/characters

echo "Katherine Anne Austin" > kate

echo "James Ford" > sawyer

echo "Hugo Reyes" > hurley

- Print all files with **cat ***
- Empty the file **hurley**

> hurley

Listing Files

Managing the UNIX/Linux File System

Short listing

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

Short recursive listing

```
/home/cis90/simmsben $ ls -R island  
island:  
characters  
  
island/characters:  
hurley kate sawyer
```

Managing the UNIX/Linux File System

Long listing

```
/home/cis90/simmsben $ ls -l island  
total 8  
drwxrwxr-x 2 simmsben cis90 4096 Mar 18 07:25 characters
```

Long recursive listing

```
/home/cis90/simmsben $ ls -lR island  
island:  
total 8  
drwxrwxr-x 2 simmsben cis90 4096 Mar 18 07:25 characters
```

```
island/characters:  
total 24  
-rw-rw-r-- 1 simmsben cis90 11 Mar 18 07:25 hurley  
-rw-rw-r-- 1 simmsben cis90 22 Mar 18 07:25 kate  
-rw-rw-r-- 1 simmsben cis90 11 Mar 18 07:25 sawyer
```

Managing the UNIX/Linux File System

Making a directory tree diagram

```
/home/cis90/simmsben $ tree island
```

```
island
```

```
`-- characters  
    |-- hurley  
    |-- kate  
    `-- sawyer
```

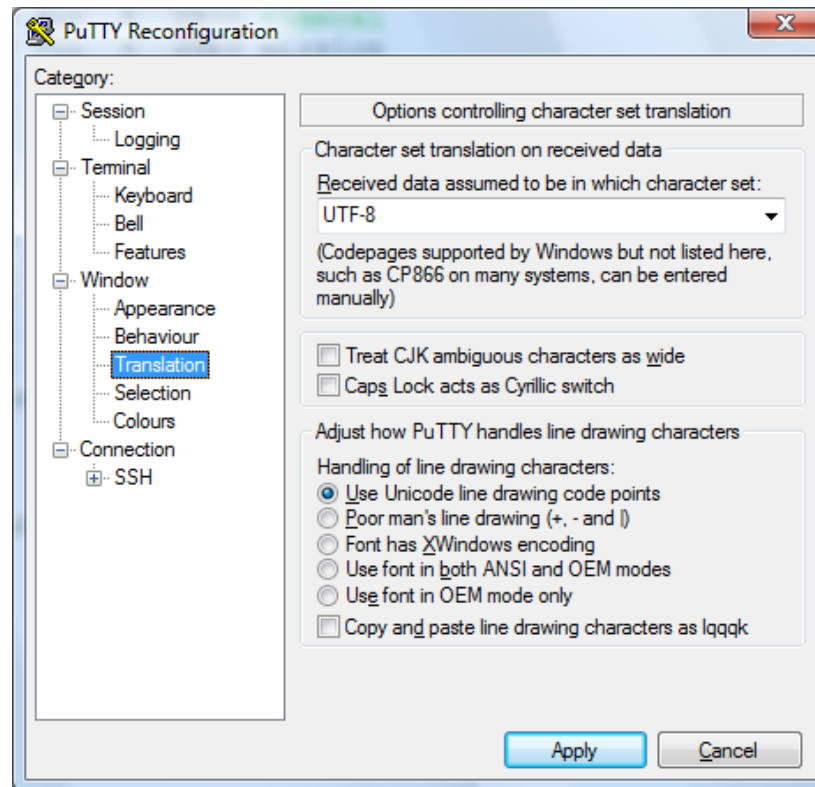
```
1 directory, 3 files
```

```
/home/cis90/simmsben $
```

Putty must be configured to use UTF-8 to show line drawing chacters

Managing the UNIX/Linux File System

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



Class Exercise

- 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 island with: **tree island**

Copy Files

Managing the UNIX/Linux File System

Copying

cp *<source file> <target file>*

cp *<source file> <target directory>*

cp *<source file> <source file> <target directory>*

options: **-i -r**

i = warns before overwriting

r = recursive (copies all sub folders)

Managing the UNIX/Linux File System

Copying a file

Commands:

Note: using a relative pathname

cp *<source file> <target file>*

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



Make a copy of the hurley file

```
/home/cis90/simmsben/island/characters $ cp hurley hurley.bak  
/home/cis90/simmsben/island/characters $ ls  
hurley hurley.bak kate sawyer  
/home/cis90/simmsben/island/characters $ cat hur*  
Hugo Reyes  
Hugo Reyes
```

Managing the UNIX/Linux File System

Copying multiple files to a directory

cp *<source file> <source file> <target directory>*

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

Make a new directory called backup

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

Copy three files to the new directory

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

List the three files in the new directory

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

Managing the UNIX/Linux File System

Copying multiple files to a directory

cp *<source file> <source file> <target directory>*

Copy all files to the new directory

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

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

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

List the four files in the new directory

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

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

```
/home/cis90/simmsben/island/characters $
```

Note: copying a file to an existing file will overwrite that file

Managing the UNIX/Linux File System

Copying

options: -i -r

i = warns before overwriting

r = recursive (copies all sub folders)

```
/home/cis90/simmsben/island/characters $ ls h*
```

```
hurley  hurley.bak
```

```
/home/cis90/simmsben/island/characters $ cp -i hurley hurley.bak
```

```
cp: overwrite `hurley.bak'? yes
```

```
/home/cis90/simmsben/island/characters $
```

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

Managing the UNIX/Linux File System

Copying

options: -i -r

i = warns before overwriting

r = recursive (copies all sub folders)

```
/home/cis90/simmsben/island/characters $ cd ..  
/home/cis90/simmsben/island $ ls  
characters
```

Do recursive copy of the characters directory to a new players directory

```
/home/cis90/simmsben/island $ cp -r characters players  
/home/cis90/simmsben/island $ ls -R players  
players:  
backup  hurley  hurley.bak  kate  sawyer  
  
players/backup:  
hurley  hurley.bak  kate  sawyer  
/home/cis90/simmsben/island $
```

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 to 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

Managing the UNIX/Linux File System

Moving

Commands:

mv *<source file> <target file>*

mv *<source file> <target directory>*

mv *<source file> <source file> <target directory>*

options: -i

i = warns before overwriting

Managing the UNIX/Linux File System

Renaming

Commands:

mv *<original name> <new name>*

This is how you rename files in UNIX/Linux!

Managing the UNIX/Linux File System

Moving Examples

```
/home/cis90/simben $ touch iPhone iPad ProLiant Pavilion Powerege  
/home/cis90/simben $ mv Powerege PowerEdge Renaming a file
```

```
/home/cis90/simben $ mkdir Apple HP Dell Make some sample directories
```

```
/home/cis90/simben $ mv iPhone Apple/ Moving files one at a  
/home/cis90/simben $ mv iPad Apple/ time into a directory
```

```
/home/cis90/simben $ mv ProLiant Pavilion HP/ Moving multiple files at  
 once into a directory
```

```
/home/cis90/simben $ mv PowerEdge Dell/ Moving one file into a  
 directory
```

Managing the UNIX/Linux File System

Verifying file moves

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

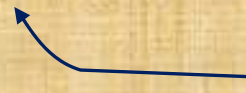
`-- PowerEdge

0 directories, 5 files

Class Exercise

- Change to your island directory using an absolute path

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

 *Use your own username*

- 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

Managing the UNIX/Linux File System

Removing

Commands:

rm *<filename>*...

The ... means you can specify more than one filename

options: -i -r -f

i = prompt before remove

r = recursive (delete subdirectories)

f = force (never prompt)

rmdir *<directory name>*

Directories must be empty for this to work

Managing the UNIX/Linux File System

Remove a file

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

Managing the UNIX/Linux File System

Remove one or more files interactively

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
```

Managing the UNIX/Linux File System

Removing Directories

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 junk 2 junk3 junk4
ls junk*

- Remove one

rm junk 1
ls junk*

- Remove the others

rm junk[234]
ls junk*

linking files

Managing the UNIX/Linux File System

Linking

Linking files

ln *<existing-name> <new-name>*
options: -s

s = symbolic link (like Windows shortcut)

With UNIX there are hard and soft (symbolic) links

Managing the UNIX/Linux File System

Hard Links

Creating a "hard" link

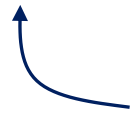
ln *<existing-name>* *<new-name>*

```
/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
/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.*

Managing the UNIX/Linux File System

Hard Links

Creating a "hard" link

In *<existing-name> <new-name>*

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

Managing the UNIX/Linux File System

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
(9 directories in /home/cis90/simben with a .. file)*

```
/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
(41 directories in /home/cis90 with a .. file)*

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

Note the hidden . and .. files are hard linked to their respective directories

Managing the UNIX/Linux File System

Hard Links

Creating a "hard" link

In *<existing-name> <new-name>*

```
/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

Managing the UNIX/Linux File System

Symbolic "Soft" Links

Creating a "soft" (symbolic) link

ln -s <existing-name> <new-name>

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.

Managing the UNIX/Linux File System

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: **In candy sweets**
- Create a soft link to candy named dulces using: **In -s candy dulces**
- List them using: **ls -li candy sweets dulces**

Wrap up (lesson)

New commands:

cp

ln

mkdir

mv

rm

rmdir

touch

copy files

link files

make directory

move or rename files

remove files

remove directory

make/modify a file

Redirection:

>

redirects stdout



CIS 90 Linux Lab Exercise

Lab 5: Managing Files Spring 2012

Lab 5: Managing Files

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

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

Check the forum for any late breaking news about this lab. The forum is also the place to go if you get stuck, have a question or want to share something you have learned about this lab.

Procedure

Log on to the Opus server so that you have a command line shell at your service. Be sure you are in your home directory to start this lab. We are going to reorganize the files in our 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 graded on correctly performing the procedure. At the end of the lab you will submit your new layout by entering the command:

submit

Part I - Making Directories

1. Display a listing of the files in your home directory using the **ls -F** command.
2. Now let's make some new directories using the **mkdir** command:
 - Make a new directory named **edits** for keeping our file edits using the following command:
mkdir edits
 - View the new directory's contents using the **-a** option of the **ls** command. Do you see the two hidden files that were created with the directory?
 - 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 **docs** the other called **etc**
 - Verify that they were made in your home directory.

*In this lab you will
reorganize your home
directory*

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

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

Test

- Open book, open notes, open computer ... **HOWEVER, you must work alone. You may not share answers. You may not receive or give assistance to others.**
- Download and save the test to your computer. Fill out the form, save it and email it as an attachment to **risimms@cabrillo.edu** using your regular (non-Opus) email. Please cc: yourself and verify you actually sent a non-blank, completed test to be graded.
- Everyone should submit their test (completed or not) by the end of class.
- If you need extra time, you can submit again by no later than 11:59PM. Only the last submittal will be graded.



Notes to instructor

- [] Send email on Opus to students
- [] Change file permissions on Test 1



Test 1

Backup

Lab 4 – Q1

2) Write down the absolute path of your home directory.

Correct answer: `/home/cis90/simben`

OK answer: `~`

Incorrect answers:

`$HOME` *That is the correct variable, but question asks for an absolute path*

`/home/cis90/xxxxxx $` *Close, that is the prompt and it fails ls test*

`home/cis90/xxxxxx` *Close, fails the ls test, absolute pathnames must start with /*

`/home/cis90/xxxxxx90/` *Close, fails the ls test, drop the "90"*

Using **ls** check on Opus:

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

Lab 4 - Q2

2) Relative to your home directory, what is the pathname of the tiger file in the Blake subdirectory?

Correct answer: **Poems/Blake/tiger**

OK answer: **./Poems/Blake/tiger**

Incorrect answers:

tiger

/Poems/Blake

../../cis90ol/cis90/Poems/Blake/tiger

cis90ol/simmsben/Poems/Blake/tiger

ls /Poems/Blake/tiger *(pathnames do not include commands)*

Fails the ls test

Using **ls** test on Opus:

```
/home/cis90/simben $ ls Poems/Blake/tiger
```

```
Poems/Blake/tiger
```

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

Lab 4 - Q5

5) Are any of your hidden files directories? If so, which ones?

Correct answers: `., .., .mozilla, .ssh`

Incorrect answers:

Poems/

Lab2.0/

Lab2.1

Hidden/

bin

Miscellaneous

.bash_history

.bash_profile

.emacs

.plan

Not hidden

(hidden files have names that start with .)

Not directoroes

Lab 4 - Q5

Files that are **directories** (1st column=d) AND **hidden** (filenames start with .)

```

/home/cis90/simben $ ls -ald .*
➡ drwxr-xr-x 10 simben90 cis90 4096 Mar  7 14:19 .
➡ drwxr-x--- 42 rsimms    cis90 4096 Mar  6 08:17 ..
-rw-----  1 simben90 cis90 16776 Mar  9 09:49 .bash_history
-rw-----  1 simben90 cis90    24 Jul 20  2001 .bash_logout
-rw-----  1 simben90 cis90   354 Sep 17  2003 .bash_profile
-rw-----  1 simben90 cis90   146 Jan 18  2004 .bashrc
-rw-r--r--  1 simben90 cis90   515 Feb  4 16:33 .emacs
-rw-----  1 simben90 cis90    65 Mar  9 07:45 .lessht
➡ drwxr-xr-x  4 simben90 cis90 4096 Feb  4 16:33 .mozilla ←
-rw-r--r--  1 simben90 cis90   40 Jul 20  2001 .plan
➡ drwx----- 2 simben90 cis90 4096 Feb  8 15:58 .ssh ←
-rw-----  1 simben90 cis90 1222 Feb 26 19:20 .viminfo
/home/cis90/simben $

```

Lab 4 - Q5

Files that are **directories** (1st column=d) AND **hidden** (filenames start with .)

```
/home/cis90/simben $ ls -aF
```

./	bin/	Lab2.0/	.plan	text.fxd
../	dead.letter	Lab2.1/	Poems/	timecal*
accounts@	.emacs	.lessht	proposal1	uhistory
allfiles17137	empty	letter	proposal2	.viminfo
.bash_history	Hidden/	log	proposal3	what_am_i
.bash_logout	lab01.graded	mbox	small_town	
.bash_profile	lab01-submitted	Miscellaneous/	spellk	
.bashrc	lab02.graded	mission	.ssh/	
bigfile	lab03.graded	.mozilla/	text.err	
/home/cis90/simben \$				

Lab 4 - Q10

10) What's the name of the largest text file in your home directory?

Correct answer: **varies by student**

```
/home/cis90/simben $ ls -ls
total 396
```

*Use the l (for long) and S (for size)
options to sort by size*

```
-rw----- 1 simben90 cis90 124804 Mar  4 20:09 mbox
-r----- 1 simben90 staff  27073 Mar  1 10:15 lab03.graded
-rw-rw-r-- 1 simben90 cis90  25390 Feb 29 22:18 uhistory
-rw-r--r-- 2 simben90 cis90  10576 Jul 20  2001 bigfile
```

< *snipped* >

```
/home/cis90/simben $ file mbox lab03.graded uhistory bigfile
```

```
mbox:          ASCII mail text, with very long lines
```

```
lab03.graded:  ASCII English text
```

Use the file command to identify text files

```
uhistory:      ASCII mail text
```

```
bigfile:       ISO-8859 English text, with overstriking
```

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

The biggest text file for simben90 is mbox at 124,804 bytes

Lab 4 - Q19

19) From your home directory what is the relative path to sonnet1?

Correct answer: **Poems/Shakespeare/sonnet1**

Incorrect answers:

/Poems/Shakespeare /sonnet1 *(multiple arguments, fails ls test)*

Poems/Shakespeare/ *(incomplete path, must include filename)*

/home/cis90/simben/Poems/Shakespeare/sonnet1 *(not a relative path)*

*cd with no arguments takes you to
your home directory*

```
/home/cis90/simben $ cd  
/home/cis90/simben $ ls Poems/Shakespeare/sonnet1  
Poems/Shakespeare/sonnet1
```

*Always check your pathname by using it as an
argument to the ls command*

Lab 4 - Q24/25

24) What file in the Miscellaneous directory is a symbolic link to another file?

25) What is the inode number of the file being linked to?

Correct answer: **varies by student**

The l code indicates this is a symbolic link

```
/home/cis90/simben $ ls -l Miscellaneous/
total 52
-rw-r--r-- 1 simben90 cis90 1382 Feb  1  2002 better_town
-rw-r--r-- 1 simben90 cis90  148 Jul  20  2001 file.dos
-rw-r--r-- 1 simben90 cis90   78 Oct  26  2004 fruit
-rw-r--r-- 2 simben90 cis90 10576 Jul  20  2001 manpage
lrwxrwxrwx 1 simben90 cis90   20 Feb  4 16:34 mystery -> ../bin/enlightenment
-rw-r--r-- 1 simben90 cis90   78 Apr 17  2004 salad
/home/cis90/simben $ ls -li bin/enlightenment
102568 bin/enlightenment
/home/cis90/simben $
```

The mystery file is a symbolic link to the enlightenment file in the user's bin directory

Lab 4 - Q24/25

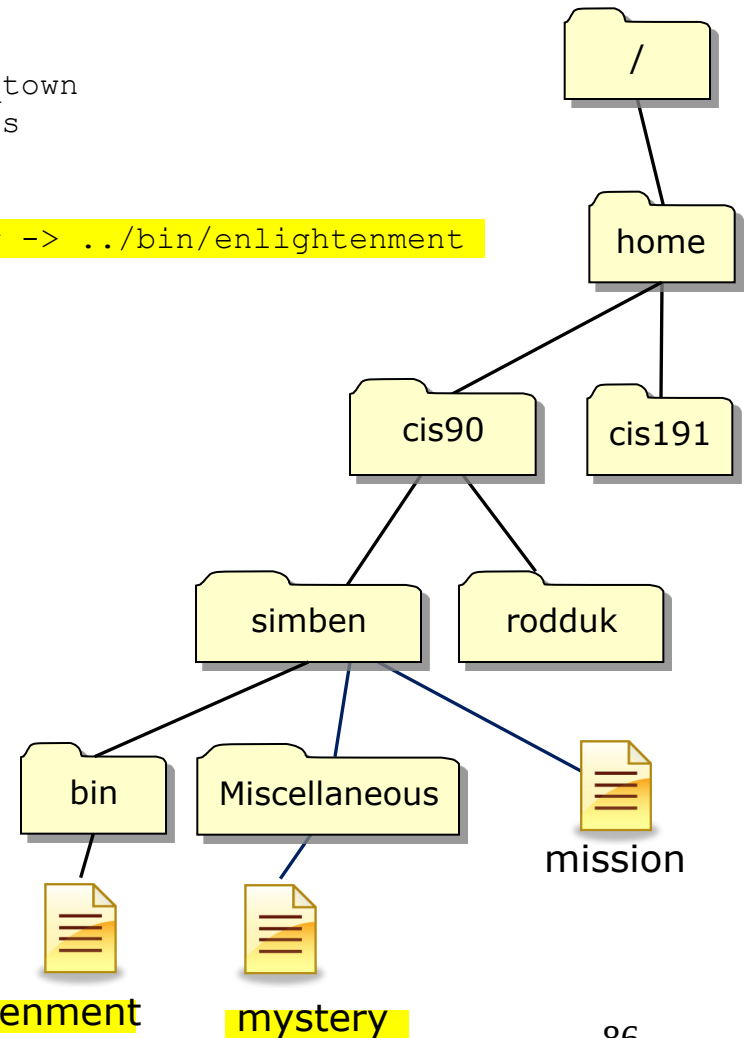
```
/home/cis90/simben $ ls -l Miscellaneous/
total 52
```

```
-rw-r--r-- 1 simben90 cis90 1382 Feb 1 2002 better_town
-rw-r--r-- 1 simben90 cis90 148 Jul 20 2001 file.dos
-rw-r--r-- 1 simben90 cis90 78 Oct 26 2004 fruit
-rw-r--r-- 2 simben90 cis90 10576 Jul 20 2001 manpage
lrwxrwxrwx 1 simben90 cis90 20 Feb 4 16:34 mystery -> ../bin/enlightenment
-rw-r--r-- 1 simben90 cis90 78 Apr 17 2004 salad
```

```
/home/cis90/simben $ ls -i bin/enlightenment
```

```
102568 bin/enlightenment
```

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



The mystery file is a symbolic link to the enlightenment file in the user's bin directory

Lab 4 - Extra Credit

Bonus) With what command can you list only the hidden files of your home directory?

```
/home/cis90ol/simmsben $ echo .*  
. .. .bash_history .bash_logout .bash_profile .bashrc .emacs .lessht .mozilla  
.plan .viminfo
```

```
/home/cis90ol/simmsben $ ls -d .*  
. .bash_history .bash_profile .emacs .mozilla .viminfo  
.. .bash_logout .bashrc .lessht .plan
```

```
/home/cis90ol/simmsben $ ls -a | grep '^\.'
```

```
.  
..  
.bash_history  
.bash_logout  
.bash_profile  
.bashrc  
.emacs  
.lessht  
.mozilla  
.plan  
.viminfo
```

This last command has several elements that we have not yet studied: piping, grep command and regular expressions.

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