Lesson Module Status

- Slides - draft
- Flash cards – done
- properties – done
- page numbers - done
- 1st minute quiz – done
- Web Calendar summary – done
- Web book pages - none
- Commands – done
- Lab tested – done

- Materials uploaded – done
- CCC Confer wall paper / quiz - done
- Check that headset is charged – done
- Backup headset charged - done
- Backup slides, CCC info, handouts on flash drive - done

CIS 90 - Lesson 6

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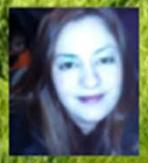
Marisol

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

[ ] Has the phone bridge been added?

[ ] Is recording on?

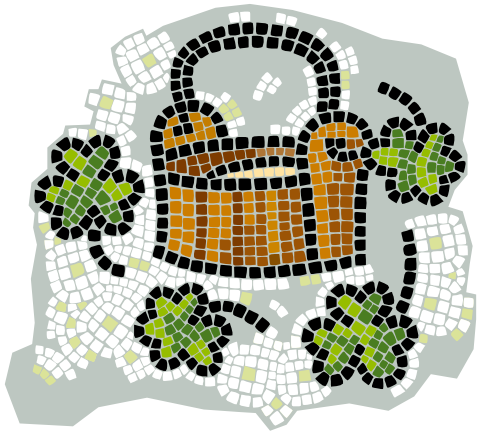
[ ] Does the phone bridge have the mike?

[ ] Share slides, putty (rsimms, simmsben, roddyduk), Chrome

[ ] 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 Review (Test Prep)

Lab 4 results

1 perfect
2 XXX
3 X
4 X
5 XXX
6 XX
7 X
8 X
9 XXXX
10 XXXXX
11 XX
12 XXX
13 perfect
14 perfect
15 XXXXXXXXX
16 X
17 XXXXXXXX
18 XX
19 XXX
20 X
21 XX
22 perfect
23 XX
24 X
25 XXXXX

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

```
/home/cis90ol/simmsben $ cd
/home/cis90ol/simmsben $ ls Poems/Blake/tiger
Poems/Blake/tiger
```

Lab 4 - Q5

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

Correct answers: ., .., .mozilla, .ssh, .gconf, or .gconfd

Incorrect answers:

Poems/
Lab2.0/
Lab2.1
Hidden/
bin
Miscellaneous

Not hidden
(hidden files have names that start with .)

.bash_history
.bash_profile
.emacs
.plan

Not directores

Lab 4 - Q5

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

```
/home/cis90/roddyduk $ ls -la
total 460
drwxr-xr-x  9 roddyduk cis90   4096 Sep 23 18:07 .
drwxr-x--- 59 rsimms   cis90   4096 Sep 26 15:11 ..
-rw-------  1 roddyduk cis90  10953 Oct  3 15:56 .bash_history
-rw-------  1 roddyduk cis90     24 Jul 20  2001 .bash_logout
-rw-------  1 roddyduk cis90    354 Sep 17  2003 .bash_profile
-rw-------  1 roddyduk cis90    146 Jan 18  2004 .bashrc
-rw-r--r--  2 roddyduk cis90  10576 Jul 20  2001 bigfile
drwxr-xr-x  2 roddyduk cis90   4096 Sep 11  2005 bin
-rw-------  1 roddyduk cis90   3723 Sep 20 06:08 dead.letter
-rw-r--r--  1 roddyduk cis90    515 Sep  6 14:08 .emacs
-rw-r--r--  1 roddyduk cis90      0 Jul 20  2001 empty
d---------  2 roddyduk cis90   4096 Feb  1  2002 Hidden
-r--------  1 roddyduk staff    143 Sep  9 14:38 lab01.graded
-r--------  1 roddyduk staff   1042 Sep 16 19:10 lab02.graded
-r--------  1 roddyduk staff  13834 Sep 23 18:07 lab03.graded
drwxr-xr-x  2 roddyduk cis90   4096 Feb 17  2001 Lab2.0
drwxr-xr-x  3 roddyduk cis90   4096 Feb 17  2001 Lab2.1
-rw-------  1 roddyduk cis90     35 Sep 26 14:14 .lesshst
-rw-r--r--  1 roddyduk cis90   1044 Jul 20  2001 letter
```

Lab 4 - Q5

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

```
-rw-r--r--  1 roddyduk cis90    156 Sep 18 07:41 log
-rw-------  1 roddyduk cis90 110556 Sep 22 05:33 mbox
drwxr-xr-x  2 roddyduk cis90   4096 Sep 11  2005 Miscellaneous
-rw-r--r--  1 roddyduk cis90    759 Jun  6  2002 mission
drwxr-xr-x  4 roddyduk cis90   4096 Sep  6 14:08 .mozilla
-rw-r--r--  1 roddyduk cis90     40 Jul 20  2001 .plan
drwxr-xr-x  5 roddyduk cis90   4096 Jan 18  2004 Poems
-rw-r--r--  1 roddyduk cis90   1074 Aug 26  2003 proposal1
-rw-r--r--  1 roddyduk cis90   2175 Jul 20  2001 proposal2
-rw-r--r--  1 roddyduk cis90   2054 Sep 14  2003 proposal3
-rw-r--r--  1 roddyduk cis90   1580 Nov 16  2004 small_town
-rw-r--r--  1 roddyduk cis90    485 Aug 26  2003 spellk
-rw-r--r--  1 roddyduk cis90    250 Jul 20  2001 text.err
-rw-r--r--  1 roddyduk cis90    231 Jul 20  2001 text.fxd
-rwxr-xr-x  1 roddyduk cis90    509 Jun  6  2002 timecal
-rw-rw-r--  1 roddyduk cis90  33697 Sep 21 22:54 uhistory
-rw-------  1 roddyduk cis90    682 Sep 18 08:16 .viminfo
-rw-r--r--  1 roddyduk cis90    352 Jul 20  2001 what_am_i
/home/cis90/roddyduk $
```

Lab 4 - Q9

9) Who is the owner of your home directory?

Correct answers: your username, e.g. simmsben, roddyduk, etc.

Incorrect answers:

- /home
- 500
- cis90ol
- rsimms

cd with no arguments takes you to your home directory

```
/home/cis90/roddyduk $ cd
/home/cis90/roddyduk $ ls -ld
drwxr-xr-x 9 roddyduk cis90ol 4096 Sep 23 18:07 .
```

owner *group*

```
/home/cis90/roddyduk $ ls -ld /home/cis90ol/roddyduk/
drwxr-xr-x 9 roddyduk cis90ol 4096 Sep 23 18:07 /home/cis90ol/roddyduk/
```

owner *group*

Lab 4 - Q9

```
/home/cis90ol/simmsben $ ls -l /home/cis90ol
total 248
drwxr-x---  2 rsimms   cis90ol 4096 Mar 11 14:16 answers
drwxr-x---  2 rsimms   cis90ol 4096 Feb 23 08:18 bin
drwxr-xr-x 10 carvaema cis90ol 4096 Mar 11 14:18 carvaema
drwxr-xr-x  9 cheeken  cis90ol 4096 Sep 11  2005 cheeken
drwxr-xr-x  9 christan cis90ol 4096 Mar 11 14:18 christan
drwxr-xr-x 10 cis90    cis90ol 4096 Feb 17 10:27 cis90
drwxr-xr-x 10 clarkric cis90ol 4096 Mar 11 14:18 clarkric
drwxr-x---  4 rsimms   cis90ol 4096 Feb 28 21:09 depot
drwxr-xr-x  9 dienequi cis90ol 4096 Mar 11 14:18 dienequi
drwxr-xr-x  9 elmenchr cis90ol 4096 Mar 11 15:08 elmenchr
drwxr-xr-x 10 herodbob cis90ol 4096 Mar 11 14:18 herodbob
drwxr-xr-x  9 hextcra  cis90ol 4096 Mar 11 14:18 hextcra
drwxr-xr-x  9 hillejef cis90ol 4096 Mar 11 14:18 hillejef
drwxr-xr-x  9 hwangyuc cis90ol 4096 Mar 11 14:18 hwangyuc
drwxr-xr-x  9 keezeter cis90ol 4096 Mar 15 08:00 keezeter
< snipped >
```

owners *groups* *directories*

Lab 4 - Q10

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

Correct answer: varies by student

Use the l (for long) and S (for size) options on the ls command

```
/home/cis90/roddyduk $ ls -lS
total 364
-rw------- 1 roddyduk cis90 110556 Sep 22 05:33 mbox
-rw-rw-r-- 1 roddyduk cis90  33697 Sep 21 22:54 uhistory
-r-------- 1 roddyduk staff  13834 Sep 23 18:07 lab03.graded
-rw-r--r-- 2 roddyduk cis90  10576 Jul 20  2001 bigfile
drwxr-xr-x 2 roddyduk cis90   4096 Sep 11  2005 bin
d--------- 2 roddyduk cis90   4096 Feb  1  2002 Hidden
drwxr-xr-x 2 roddyduk cis90   4096 Feb 17  2001 Lab2.0
drwxr-xr-x 3 roddyduk cis90   4096 Feb 17  2001 Lab2.1
< snipped >
```

The biggest text file for roddyduk is mbox at 110,556 bytes

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

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

All these are text files or directories

Lab 4 - Q15

```
mbox:           ASCII mail text, with very long lines, with escape
sequences
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/roddyduk $ cat what_am_i
H/.>/..▒#.mailrc▒!.profile▒+HiddenLab3.1.1▒%Lab3.1.2f*Poems▒▒▒Referen
ce8bigfile$▒bi!mailfolders▒▒▒a_very_long_fi▒)lename▒▒▒errors▒/fruita▒g
reeting,▒letter▒▒▒mystery^proposal1▒,proposal2▒9timecal/home/cis90/ro
ddyduk $
```

These are all text files except for what_am_i which contains binary data

*Binary/data files contain unprintable characters that spew garbage on the screen. 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 *or* ls –ld /home/cis90/$LOGNAME (varies)

Use the d option so the ls command will show information for the directory itself rather than the contents of the directory

```
/home/cis90ol/simmsben $ ls -ld
drwxr-xr-x 10 simmsben cis90ol 4096 Mar 14 14:05 .

/home/cis90ol/simmsben $ ls -ld /home/cis90ol/simmsben
drwxr-xr-x 10 simmsben cis90ol 4096 Mar 14 14:05 /home/cis90ol/simmsben

/home/cis90ol/simmsben $ ls -ld $HOME
drwxr-xr-x 10 simmsben cis90ol 4096 Mar 14 14:05 /home/cis90ol/simmsben

/home/cis90ol/simmsben $ ls -ld /home/cis90ol/$LOGNAME
drwxr-xr-x 10 simmsben cis90ol 4096 Mar 14 14:05 /home/cis90ol/simmsben
```

permissions

Lab 4 - Q17

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

```
/home/cis90ol/simmsben $ ls -l ..
total 248
drwxr-x---  2 rsimms   cis90ol 4096 Mar 11 14:16 answers
drwxr-x---  2 rsimms   cis90ol 4096 Feb 23 08:18 bin
drwxr-xr-x  9 paytomar cis90ol 4096 Mar 11 14:18 paytomar
drwxr-xr-x  9 roddyduk cis90ol 4096 Mar  3 15:17 roddyduk
drwxr-xr-x 10 simmsben cis90ol 4096 Mar 14 14:05 simmsben
drwxr-xr-x 10 stumbdav cis90ol 4096 Mar  3 13:41 stumbdav
drwxr-xr-x  9 sylvijos cis90ol 4096 Mar 11 14:18 sylvijos
drwxr-xr-x  9 vieyrleo cis90ol 4096 Feb 23 20:22 vieyrleo
drwxr-xr-x  9 vistigab cis90ol 4096 Mar 11 14:18 vistigab
drwxr-xr-x 10 warrejes cis90ol 4096 Mar 11 14:18 warrejes
drwxr-xr-x  9 willitaj cis90ol 4096 Mar 11 14:18 willitaj
drwxr-xr-x  9 wilsodan cis90ol 4096 Mar 11 14:18 wilsodan
drwxr-xr-x  9 wingejas cis90ol 4096 Mar 11 14:18 wingejas
/home/cis90ol/simmsben $
```

Lab 4 - Q10

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

Correct answer: varies by student

```
/home/cis90ol/simmsben $ ls -lS
total 356
-rw------- 1 simmsben cis90ol 99246 Mar  8 10:32 mbox
-rw-rw-r-- 1 simmsben cis90ol 20170 Mar  3 13:43 uhistory
-rw-r--r-- 2 simmsben cis90ol 10576 Jul 20  2001 bigfile
< snipped >
/home/cis90ol/simmsben $ file mbox uhistory bigfile
mbox:     data
uhistory: ASCII mail text
bigfile:  ISO-8859 English text, with overstriking
/home/cis90ol/simmsben $
```

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

Use the file command to identify text files

The biggest file for simmsben is mbox at 99,246 bytes

The biggest text file for simmsben is uhistory at 20,170 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 *(not a relative path)*
Poems/Shakespeare/ *(incomplete path, must include filename)*

cd with no arguments takes you to your home directory

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

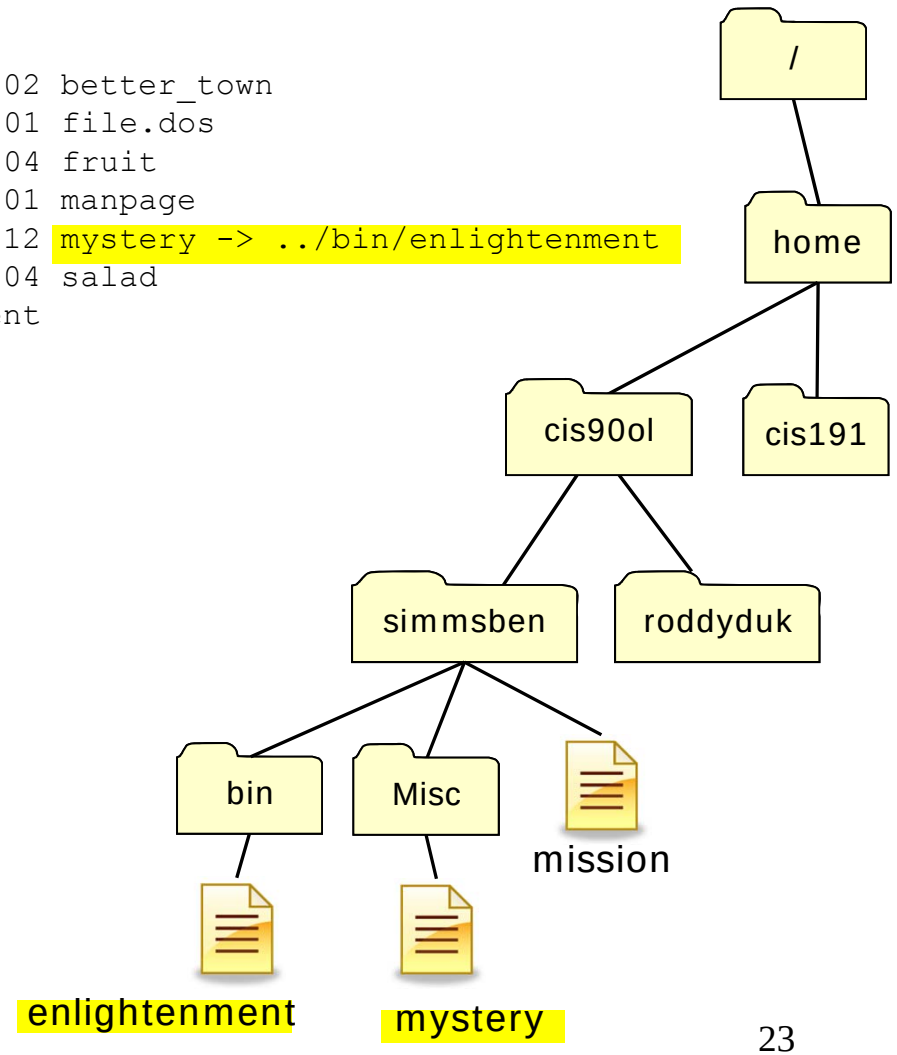
The l code indicates this is a symbolic link

```
/home/cis90ol/simmsben $ ls -l Miscellaneous/
total 52
-rw-r--r-- 1 simmsben cis90ol  1382 Feb  1  2002 better_town
-rw-r--r-- 1 simmsben cis90ol   148 Jul 20  2001 file.dos
-rw-r--r-- 1 simmsben cis90ol    78 Oct 26  2004 fruit
-rw-r--r-- 2 simmsben cis90ol 10576 Jul 20  2001 manpage
lrwxrwxrwx 1 simmsben cis90ol    20 Feb 17 10:12 mystery -> ../bin/enlightenment
-rw-r--r-- 1 simmsben cis90ol    78 Apr 17  2004 salad
/home/cis90ol/simmsben $ ls -i bin/enlightenment
2330049 bin/enlightenment
/home/cis90ol/simmsben $
```

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

Lab 4 - Q24/25

```
/home/cis90ol/simmsben $ ls -l Miscellaneous/
total 52
-rw-r--r-- 1 simmsben cis90ol  1382 Feb  1  2002 better_town
-rw-r--r-- 1 simmsben cis90ol   148 Jul 20  2001 file.dos
-rw-r--r-- 1 simmsben cis90ol    78 Oct 26  2004 fruit
-rw-r--r-- 2 simmsben cis90ol 10576 Jul 20  2001 manpage
lrwxrwxrwx 1 simmsben cis90ol    20 Feb 17 10:12 mystery -> ../bin/enlightenment
-rw-r--r-- 1 simmsben cis90ol    78 Apr 17  2004 salad
/home/cis90ol/simmsben $ ls -i bin/enlightenment
2330049 bin/enlightenment
/home/cis90ol/simmsben $
```



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 .lesshst .mozilla
.plan .viminfo

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

/home/cis90ol/simmsben $ ls -a | grep '^\.'
.
..
.bash_history
.bash_logout
.bash_profile
.bashrc
.emacs
.lesshst
.mozilla
.plan
.viminfo
/home/cis90ol/simmsben $
```

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

Practice Test

Practice Test 1 – Q7

Q7) What is the actual absolute pathname to the /etc/passwd file?

Correct answer: **/etc/passwd**

Use the ls test to verify your pathnames

```
/home/cis90ol/simmsben $ ls /etc/passwd
/etc/passwd
```

Note, ***etc/passwd*** *is an incorrect answer!*

```
/home/cis90ol/simmsben $ ls etc/passwd
ls: etc/passwd: No such file or directory
```

Practice Test 1 - Q8

Q8) Is the directory named . in your path?

Correct answer: **yes**

*Use **echo $PATH** to see your path which contains directories separated by :'s*

```
/home/cis90/simmsben $ echo $PATH
/usr/kerberos/bin:/usr/local/bin:/bin:/usr/bin:/home/cis90/simmsben/../bin:/ho
me/cis90/simmsben/bin:.
/home/cis90/simmsben $
```

The directories, and the order they are searched are:

1. /usr/kerberos/bin
2. /usr/local/bin
3. /bin
4. /usr/bin
5. /home/cis90/simmsben/../bin
6. /home/cis90/simmsben/bin
7. .

See forum post for additional information on the . directory

Practice Test 1 - QX3

QX3) What is the relative path from your home directory to the less command?

Correct answer: **../../../usr/bin/less**

*First, use the **type** command to find where the **less** command resides*

```
/home/cis90/simmsben $ type less
less is /usr/bin/less
/home/cis90/simmsben $
```

*The **type** command shows it resides in the /usr/bin directory*

Practice Test 1 - QX3

Next, construct and verify the pathname using the ls command and tab key

```
/home/cis90ol/simmsben $ cd Start in home directory
/home/cis90ol/simmsben $ ls Use ls to view what's in the directory
bigfile      Hidden        letter         Poems       stage1    what_am_i
bin          lab01.graded  log            proposal1   stage2
countargs    lab02.graded  mbox           proposal2   text.err
dead.letter  lab04.graded  Miscellaneous  proposal3   text.fxd
empty        Lab2.0        mission        small_town  timecal
experiment   Lab2.1        myfile         spellk      uhistory
/home/cis90ol/simmsben $ ls .. Use up arrow to load previous command and add next directory
answers   christan  dienequi  hillejef  lighttom  montageo  stumbdav  warrejes
bin       cis90     elmenchr  hwangyuc  lynbeeri  paytomar  sylvijos  willitaj
carvaema  clarkric  herodbob  keezeter  mcnamdan  roddyduk  vieyrleo  wilsodan
cheeken   depot     hextcra   lewisgre  millehom  simmsben  vistigab  wingejas
/home/cis90ol/simmsben $ ls ../.. Use up arrow to load previous command and add next directory
backup  cis172  cis192  cis90    gerlinde  guest191  mikki   ryan
cis130  cis191  cis193  cis90ol  guest     jimg      rsimms  turnin
/home/cis90ol/simmsben $ ls ../../..Use up arrow to load previous command and add next directory
bin   dev  home  lost+found  misc  net  proc  sbin     srv  tftpboot  u    var
boot  etc  lib   media       mnt   opt  root  selinux  sys  tmp       usr
/home/cis90ol/simmsben $ ls ../../../usr/bin/less Use tab completes to finish pathname
../../../usr/bin/less
```

Practice Test 1 - Q13

Q13) Starting in /u and descending down subfolders, what are the names of the two files in the last and deepest folder?

Correct answer: **dorothy toto**

```
/home/cis90/simmsben $ cd /u
/u $ ls
krb  money  named.conf  notes  ntab  ntp  r  update
/u $ ls -F
krb  money  named.conf  notes  ntab  ntp  r/  update
/u $ ls -l
total 60
-rw-r--r-- 1 root root 2281 Dec  9  2009 krb
-rw-r--r-- 1 root root  400 Dec  9  2009 money
-rw-r--r-- 1 root root 1051 Dec  9  2009 named.conf
-rw-r--r-- 1 root root    0 Dec  9  2009 notes
-rw-r--r-- 1 root root  242 Dec  9  2009 ntab
-rw-r--r-- 1 root root 2794 Dec  9  2009 ntp
drwxr-xr-x 3 root root 4096 Dec  9  2009 r
-rw-r--r-- 1 root root  149 Dec  9  2009 update
/u $ cd r
/u/r $ ls
far
```

Use the cd command to start in /u

To descend, we must find directories to descend into.

There is a directory named r so lets begin the descent!

*Start the descent down with the **cd** command*

Practice Test 1 - Q13

```
/u/r $ cd far
/u/r/far $ ls
away
/u/r/far $ cd away
/u/r/far/away $ ls
in
/u/r/far/away $ cd in
/u/r/far/away/in $ ls
the
/u/r/far/away/in $ cd the
/u/r/far/away/in/the $ ls
land
/u/r/far/away/in/the $ cd land
/u/r/far/away/in/the/land $ ls
of
/u/r/far/away/in/the/land $ cd of
/u/r/far/away/in/the/land/of $ ls
oz
/u/r/far/away/in/the/land/of $ cd oz
/u/r/far/away/in/the/land/of/oz $ ls
dorothy  toto
```

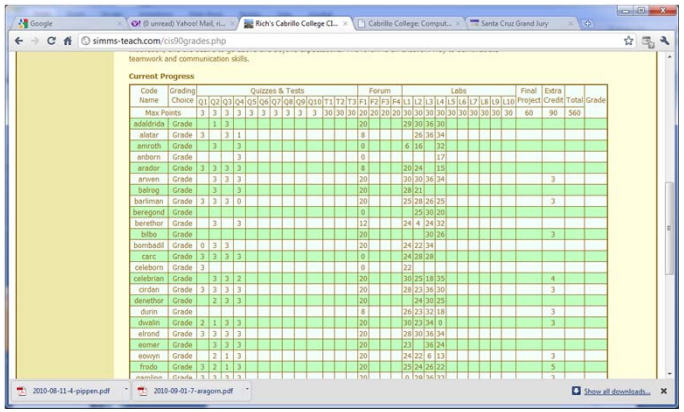
*Use the **cd** and **ls** commands to work your way down the file tree till you get to the bottom*

*Or use **ls –R /u** to do it in a single command*

Here are the two files in the deepest and last folder and the answer to Q13!

Housekeeping

1. Grades page
   - Do you know your code name? email me if you don't.
   - Grading option - students who are not turning in any assignments should contact me!



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

```
/home/cis90ol/simmsben $ ls /home/cis90ol/answers
lab01  lab02  lab03  lab04
```

Managing Files

Managing the UNIX/Linux File System

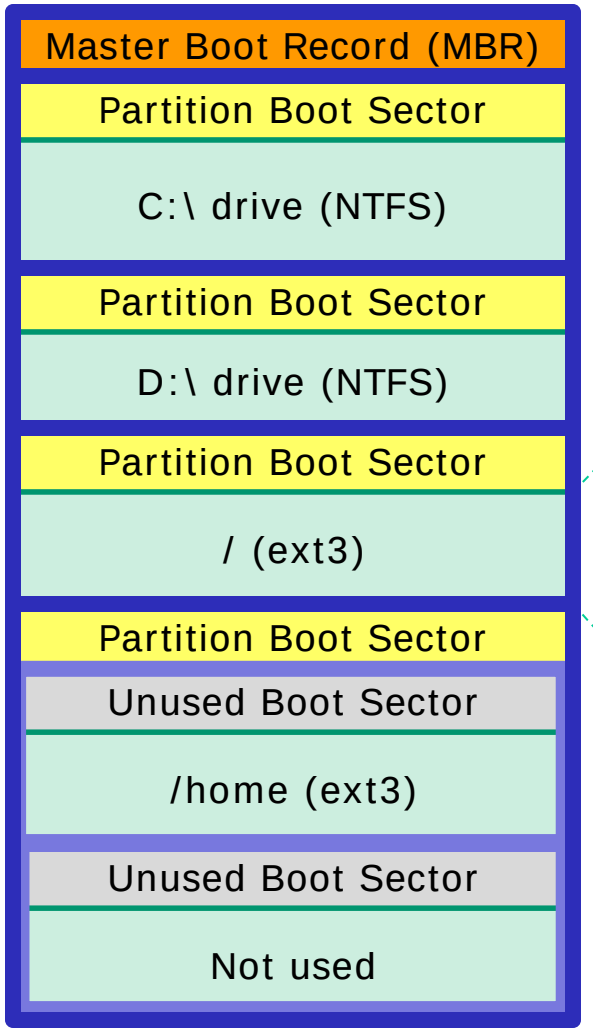
Objectives:

- Name the three elements of a Unix file, and where each is stored.
- Learn how to use these commands to manage the files in your home directory:

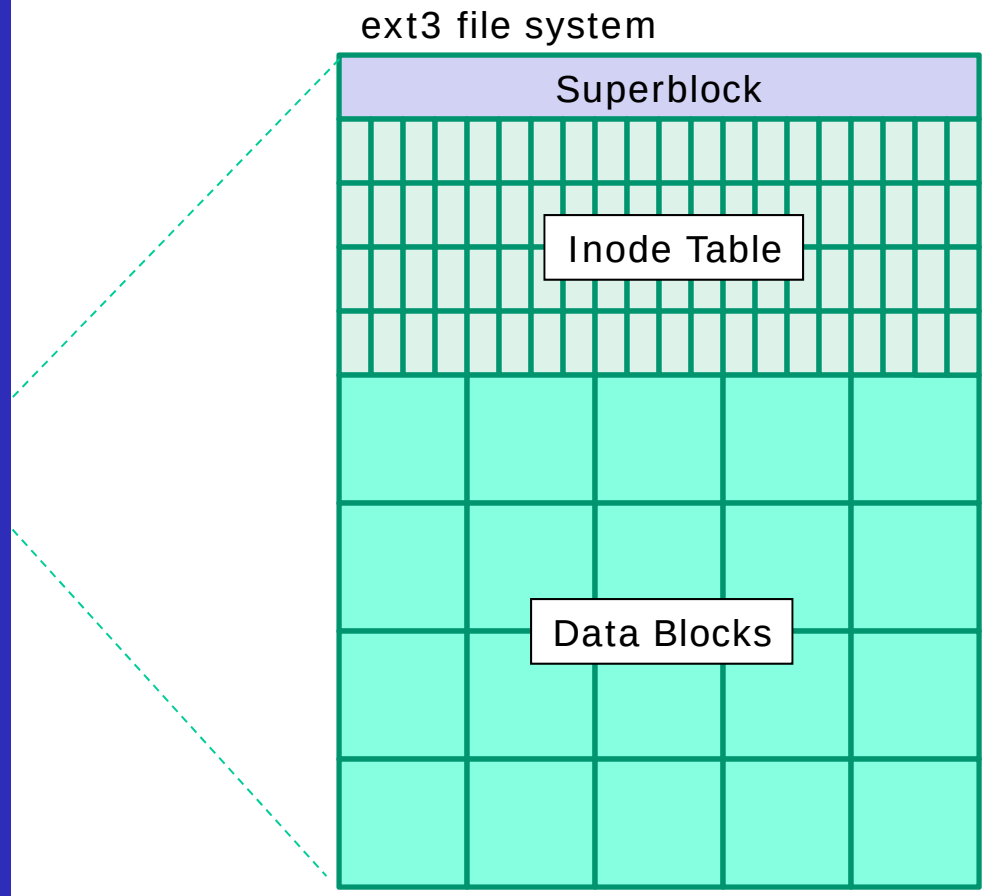
mkdir
cp
mv
rmdir
rm
ln

File Systems

Linux



An example dual-boot hard disk partition scheme



UNIX Files
The three elements of a file

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

```
/home/cis90/simmsben/Poems $ ls -l twister
-rw-r--r-- 1 simmsben cis90 151 Jul 20  2001 twister
```

```
/home/cis90/simmsben/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?"
```

name

+

inode

+

data

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

bigfile 2332249
bin 2330041
letter 2330075

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.

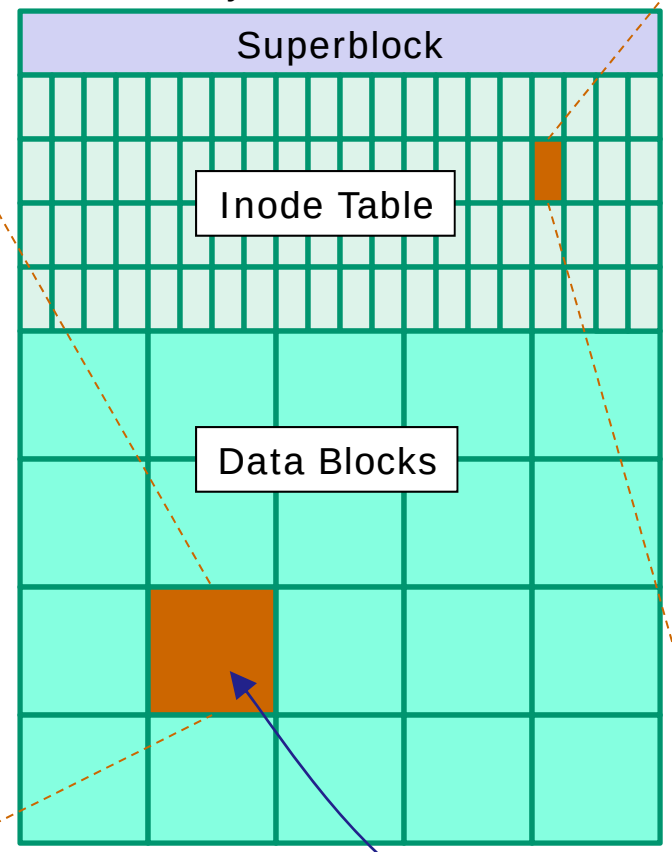
Now I don't want this to scare you, but my bunk mate has
malaria. You remember Jeffrey Hardy? Their about to organize a searching party.

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



2330075	inode number
-	Type
rw-r—r--	Permissions
1	Number of links
simmsben	User
cis90ol	Group
1044	Size
2001-07-20	Modification time
2011-02-24	Access Time
2011-02-17	Change time
Pointer(s) to data blocks	Pointer(s) to data blocks

```
/home/cis90ol/simmsben $ ls -il letter
2330075 -rw-r--r-- 1 simmsben cis90ol 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" > newfile

- 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
/home/cis90/simmsben $
```

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
/home/cis90/simmsben $
```

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/
/home/cis90ol/simmsben $
```

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: **sawyer**, **kate** and **hurley**

- Add some text of the new files:

  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
/home/cis90/simmsben $
```

Managing the UNIX/Linux File System

Making a directory tree diagram

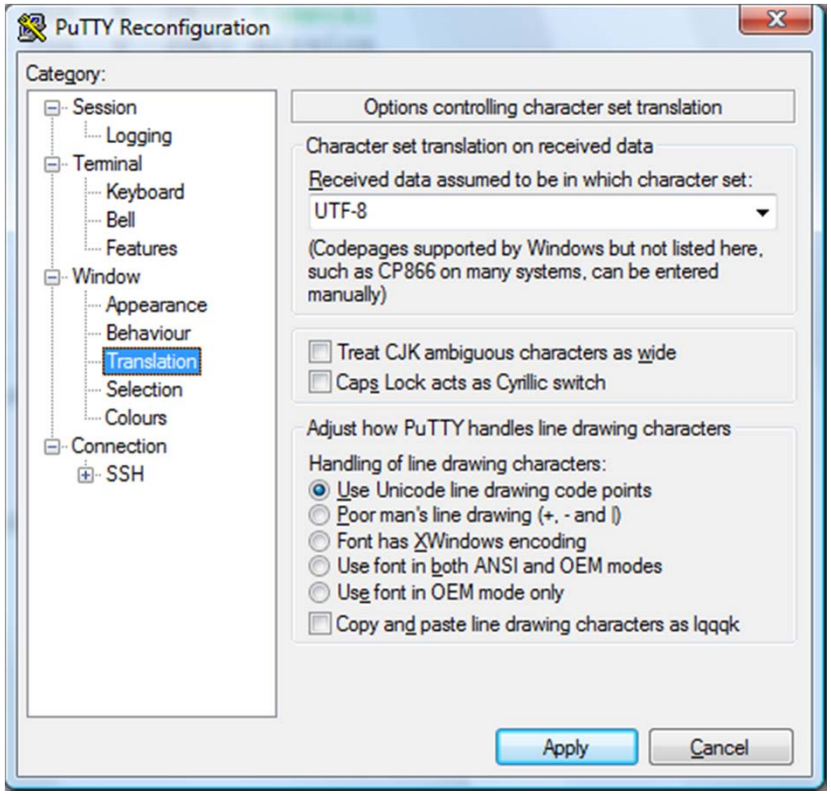
```
/home/cis90/simmsben $ tree island
island
`-- characters
    |-- hurley
    |-- kate
    `-- sawyer

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

Putty must be configured to use UTF-8

Managing the UNIX/Linux File System

Putty must be configured to use UTF-8



Class Exercise

- Return to your home directory with **cd**
- Do a short listing of the island directory with **ls island**
- Do a short recursive listing of the island directory **ls –R island**
- Do a long listing of the island directory with **ls –l island**
- Do a long recursive listing of the island directory with **ls –lR island**
- Do a long recursive listing of your home directory with **ls –lR**
- 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

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

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

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/cis90ol/simmsben/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

move

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!

Class Exercise

- Change to your island directory using an absolute path

  cd /home/cis90ol/simmsben/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**)

Remove Files

Managing the UNIX/Linux File System

Removing

Commands:

The … means you can specify more than one filename

rm <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

Removing

rm <filename>...

options: `-i -r -f`

- `i` = prompt before remove
- `r` = recursive (delete subdirectories)
- `f` = force (never prompt)

```
/home/cis90/simmsben/island/characters $ ls
backup  hurley  hurley.bak  kate2  katherine  sawyer
/home/cis90/simmsben/island/characters $ rm h* k*
/home/cis90/simmsben/island/characters $ ls
backup  sawyer
```

Remove all files except for sawyer (using filename expansion characters)

Managing the UNIX/Linux File System

Removing

Commands:

rm <filename>...

options: `-i -r -f`

`i` = prompt before remove

`r` = recursive (delete subdirectories)

`f` = force (never prompt)

```
/home/cis90/simmsben/island/characters $ ls
backup  sawyer
/home/cis90/simmsben/island/characters $ rm -i sawyer
rm: remove regular file `sawyer'? yes
/home/cis90/simmsben/island/characters $ ls
backup
```

Remove sawyer file interactively

Managing the UNIX/Linux File System

Removing

Commands:

rm <filename>...

options: `-i -r -f`

`i` = prompt before remove

`r` = recursive (delete subdirectories)

`f` = force (never prompt)

```
/home/cis90/simmsben/island/characters $ ls
backup
/home/cis90/simmsben/island/characters $ mv backup/* .
/home/cis90/simmsben/island/characters $ ls
backup  hurley  hurley.bak  kate  sawyer
/home/cis90/simmsben/island/characters $ rmdir backup
/home/cis90/simmsben/island/characters $ ls
hurley  hurley.bak  kate  sawyer
```

Move the files in the backup directory to the current directory and then remove the backup directory

Class Exercise

- Change to your island directory using an absolute path

  cd /home/cis90ol/simmsben/island/characters/

  Use your own username

- Remove all files except sawyer

  ls
  rm h* k* (use **ls** to verify)

- Remove sawyer interactively with **rm -i sawyer** and use **ls** to verify

- Move the files in backup/ to the current directory

  mv backup/* .

- Remove the backup directory with **rmdir backup/**

links

Managing the UNIX/Linux File System

Linking

Linking files

ln <existing-name> <new-name>

options: `-s`

`s` = symbolic link (like Windows shortcut)

Managing the UNIX/Linux File System

Linking

Creating a "hard" link

ln <existing-name> <new-name>

```
/home/cis90/simmsben/island/characters $ ln kate katy
/home/cis90/simmsben/island/characters $ ls -li k*
105406 -rw-rw-r-- 2 simmsben cis90 22 Mar 18 07:59 kate
105406 -rw-rw-r-- 2 simmsben cis90 22 Mar 18 07:59 katy
```

same inode

number of hard linked files

*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

Linking

Creating a "soft" (symbolic) link

ln –s <existing-name> <new-name>

The s option for a symbolic link

```
/home/cis90/simmsben/island/characters $ ln -s hurley hugo
/home/cis90/simmsben/island/characters $ ls -li hu*
105401 lrwxrwxrwx 1 simmsben cis90  6 Mar 18 09:09 hugo -> hurley
105405 -rw-rw-r-- 1 simmsben cis90 11 Mar 18 07:59 hurley
```

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.

Class Exercise

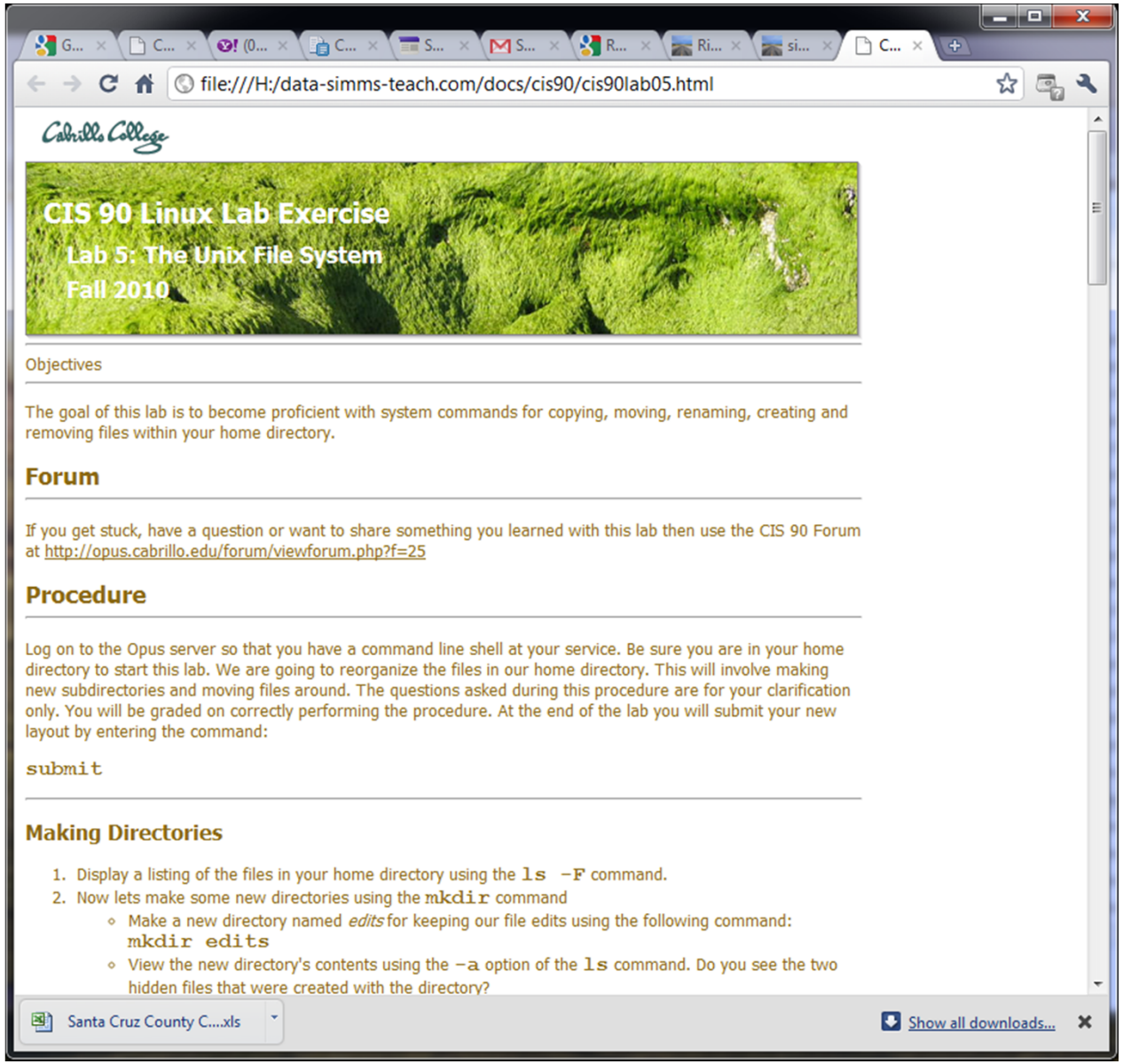
- Hard link kate and katy with **ln kate katy**
- Use **cat ka*** and **ls –l ka*** to show these files
- Create symbolic link hugo to hurley

  ln -s hurley hugo
- Use **cat hu*** and **ls –l hu*** to show these files
- Break the link with **mv hurley hurley2**
- Show broken link with **cat hugo**
- Fix link with **mv hurley2 hurley**

Wrap up

New commands:

cp	copy files
ln	link files
mkdir	make directory
mv	move or rename files
rm	remove files
rmdir	remove directory
touch	make/modify a file



In this lab you will reorganize your home directory

This lab is not one to start at the last minute!

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

- 30 points, plus some extra credit
- 5 flashcard questions
  - Take directly from the flashcards on the web site
- 10 operational questions
  - You can verify your answers using Opus
- Open book, open notes, open computer
- Should take about 15-60 minutes, however if you need extra time, you can turn it in no later than midnight

Test 1

Backup

Lab 4 - Q9

9) Who is the owner of your home directory?

Correct answers: your username, e.g. simmsben, roddyduk, etc.

Incorrect answers:

- rsimms
- Cis 90
- mikki
- cis90

cd with no arguments takes you to your home directory

```
/home/cis90/roddyduk $ cd
/home/cis90/roddyduk $ ls -ld
drwxr-xr-x 9 roddyduk cis90 4096 Sep 23 18:07 .
```

owner *group*

```
/home/cis90/roddyduk $ ls -ld /home/cis90/roddyduk/
drwxr-xr-x 9 roddyduk cis90 4096 Sep 23 18:07 /home/cis90/roddyduk/
```

owner *group*

Lab 4 - Q9

```
/home/cis90/simmsben $ ls -l /home/cis90
total 456
drwxr-xr-x  2 rsimms   staff 4096 Sep 30 14:08 answers
drwxr-xr-x  9 antiden  cis90 4096 Sep 30 15:24 antiden
drwxr-xr-x  9 beltredt cis90 4096 Sep 30 15:24 beltredt
drwxr-x---  2 rsimms   cis90 4096 Sep 18 13:01 bin
drwxr-xr-x  9 birmijam cis90 4096 Sep 30 15:24 birmijam
drwxr-xr-x  9 blacksea cis90 4096 Sep 15 16:02 blacksea
drwxr-xr-x 10 botoschr cis90 4096 Sep 30 15:24 botoschr
drwxr-xr-x  9 brownbri cis90 4096 Sep 11  2005 brownbri
drwxr-xr-x  9 brownliz cis90 4096 Sep 30 15:24 brownliz
drwxr-xr-x  9 cardefra cis90 4096 Sep 30 15:24 cardefra
drwxr-xr-x  9 castrsal cis90 4096 Sep 11  2005 castrsal
drwxr-xr-x  9 dahlicas cis90 4096 Sep 30 22:05 dahlicas
drwxr-xr-x  9 dakkaabd cis90 4096 Sep 23 18:07 dakkaabd
drwxr-xr-x  9 daviesar cis90 4096 Sep 30 15:24 daviesar
drwxr-xr-x 10 dawadast cis90 4096 Oct  4 18:23 dawadast
< snipped >
```

owners *groups* *directories*

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 *or* ls -l .. *or* ls /home/cis90/$LOGNAME

```
/home/cis90/roddyduk $ ls -ld
drwxr-xr-x 9 roddyduk cis90 4096 Sep 23 18:07 .

/home/cis90/roddyduk $ ls -ld /home/cis90/roddyduk/
drwxr-xr-x 9 roddyduk cis90 4096 Sep 23 18:07 /home/cis90/roddyduk/
/home/cis90/roddyduk $

/home/cis90/roddyduk $ ls -ld /home/cis90/$LOGNAME
drwxr-xr-x 9 roddyduk cis90 4096 Sep 23 18:07 /home/cis90/roddyduk
```

permissions

Lab 4 - Q17

Another way to do it is to do a long listing of the parent directory which will include your home directory

```
/home/cis90/roddyduk $ ls -l ..
total 456
drwxr-xr-x  2 rsimms   staff 4096 Sep 30 14:08 answers
drwxr-xr-x  9 antiden  cis90 4096 Sep 30 15:24 antiden
< snipped >
drwxr-xr-x  9 rochajua cis90 4096 Sep 29 14:06 rochajua
drwxr-xr-x  9 roddyduk cis90 4096 Sep 23 18:07 roddyduk
drwxr-xr-x 14 salinjac cis90 4096 Oct  4 12:04 salinjac
drwxr-xr-x 12 simmsben cis90 4096 Oct  3 15:24 simmsben
drwxr-xr-x  9 srecklau cis90 4096 Sep 30 15:24 srecklau
drwxr-xr-x 10 valadand cis90 4096 Sep 30 15:24 valadand
drwxr-xr-x  9 velasliv cis90 4096 Sep 30 15:24 velasliv
drwxr-xr-x  9 wattsluk cis90 4096 Sep 30 15:24 wattsluk
drwxr-xr-x  9 woodjan  cis90 4096 Sep 23 18:07 woodjan
drwxr-xr-x  9 zilissau cis90 4096 Sep 30 15:24 zilissau
/home/cis90/roddyduk $
```

Lab 4 - Q10

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

Correct answer: varies by student

Use the l (for long) and S (for size) options on the ls command

```
/home/cis90/roddyduk $ ls -lS
total 364
-rw------- 1 roddyduk cis90 110556 Sep 22 05:33 mbox
-rw-rw-r-- 1 roddyduk cis90  33697 Sep 21 22:54 uhistory
-r-------- 1 roddyduk staff  13834 Sep 23 18:07 lab03.graded
-rw-r--r-- 2 roddyduk cis90  10576 Jul 20  2001 bigfile
drwxr-xr-x 2 roddyduk cis90   4096 Sep 11  2005 bin
d--------- 2 roddyduk cis90   4096 Feb  1  2002 Hidden
drwxr-xr-x 2 roddyduk cis90   4096 Feb 17  2001 Lab2.0
drwxr-xr-x 3 roddyduk cis90   4096 Feb 17  2001 Lab2.1
< snipped >
```

The biggest text file for roddyduk is mbox at 110,556 bytes

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

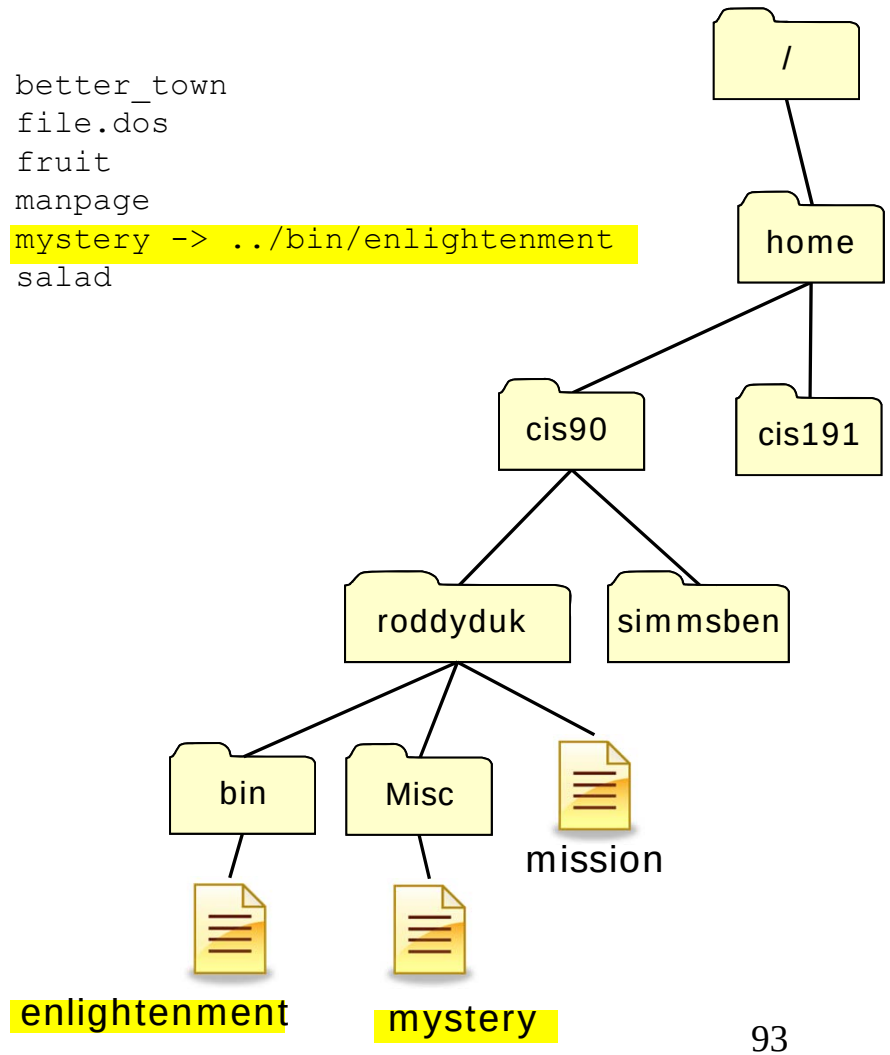
The l code indicates this is a symbolic link

```
/home/cis90/roddyduk $ ls -l Miscellaneous/
total 52
-rw-r--r-- 1 roddyduk cis90  1382 Feb  1  2002 better_town
-rw-r--r-- 1 roddyduk cis90   148 Jul 20  2001 file.dos
-rw-r--r-- 1 roddyduk cis90    78 Oct 26  2004 fruit
-rw-r--r-- 2 roddyduk cis90 10576 Jul 20  2001 manpage
lrwxrwxrwx 1 roddyduk cis90    20 Sep  9 06:03 mystery -> ../bin/enlightenment
-rw-r--r-- 1 roddyduk cis90    78 Apr 17  2004 salad
/home/cis90/roddyduk $ ls -i bin/enlightenment
2425572 bin/enlightenment
/home/cis90/roddyduk $
```

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

Lab 4 - Q24/25

```
/home/cis90/roddyduk $ ls -l Miscellaneous/
total 52
-rw-r--r-- 1 roddyduk cis90  1382 Feb  1  2002 better_town
-rw-r--r-- 1 roddyduk cis90   148 Jul 20  2001 file.dos
-rw-r--r-- 1 roddyduk cis90    78 Oct 26  2004 fruit
-rw-r--r-- 2 roddyduk cis90 10576 Jul 20  2001 manpage
lrwxrwxrwx 1 roddyduk cis90    20 Sep  9 06:03 mystery -> ../bin/enlightenment
-rw-r--r-- 1 roddyduk cis90    78 Apr 17  2004 salad
/home/cis90/roddyduk $ ls -i bin/enlightenment
2425572 bin/enlightenment
/home/cis90/roddyduk $
```



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

Lab 4 - Extra Credit

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

```
/home/cis90/simmsben $ echo .*
. .. .bash_history .bash_logout .bash_profile .bashrc .emacs .gconf .gconfd
.lesshst .mozilla .plan .ssh .viminfo
/home/cis90/simmsben $ ls -d .*
.   .bash_history  .bash_profile  .emacs  .gconfd   .mozilla  .ssh
..  .bash_logout   .bashrc        .gconf  .lesshst  .plan     .viminfo
/home/cis90/simmsben $ ls -a | grep '^\.'
.
..
.bash_history
.bash_logout
.bash_profile
.bashrc
.emacs
.gconf
.gconfd
.lesshst
.mozilla
.plan
.ssh
.viminfo
/home/cis90/simmsben $
```

Practice Test 1 - QX3

```
/usr/bin $ cd
/home/cis90/simmsben $ ls
bigfile      Hidden        letter         mylist     small_town  uhistory
bin          lab01.graded  log            Poems      spellk      what_am_i
class        lab03.graded  mbox           proposal1  text.err
dead.letter  Lab2.0        Miscellaneous  proposal2  text.fxd
empty        Lab2.1        mission        proposal3  timecal
/home/cis90/simmsben $ ls ../
answers   brownliz  depot     guest     martiant  parrijen  roddyduk  zilissau
antiden   cardefra  derriale  hamiljas  menafer   pennitan  salinjac
beltredt  castrsal  dingechr  henrydal  messison  perezrud  simmsben
bin       dahlicas  enriqste  hernaaar  millehom  pirkllau  srecklau
birmijam  dakkaabd  fouric    hrdinste  mottste   pitzemik  valadand
blacksea  daviesar  galbrnat  husemat   ojedavic  plastadr  velasliv
botoschr  dawadast  garciton  joossam   orozcmig  redmanic  wattsluk
brownbri  delfimik  garibjam  komicser  palmilar  rochajua  woodjan
/home/cis90/simmsben $ ls ../../
backup  cis191  cis193  gerlinde  jimg   noah    ryan
cis172  cis192  cis90   guest     mikki  rsimms  turnin
/home/cis90/simmsben $ ls ../../../
bin   dev  home  lost+found  misc  net  proc  sbin     srv  tftpboot  u    var
boot  etc  lib   media       mnt   opt  root  selinux  sys  tmp       usr
/home/cis90/simmsben $
```

Start in home directory

Use ls to view what's in the directory

Use up arrow to load previous command and add next directory

Use up arrow to load previous command and add next directory

Use up arrow to load previous command and add next directory

Climbing up the tree and building the relative path step-by-step

Practice Test 1 - QX3

```
/home/cis90/simmsben $ ls ../../../usr
bin  games    kerberos  libexec  sbin   src  X11R6
etc  include  lib       local    share  tmp
/home/cis90/simmsben $ ls ../../../usr/bin
[                                        nslookup
411toppm                                 nspr-config
a2p                                      nss-config
a2ps                                     nsupdate
< skipped >
lddlibc4                                 tree
leaftoppm                                troff
less                                     tset
lessecho                                 tsort
lesskey                                  ttmkfdir
< skipped >
notify-send                              znew
nroff                                    zsoelim
nsgmls
/home/cis90/simmsben $ ls ../../../usr/bin/less
../../../usr/bin/less
```

Use up arrow to load previous command and add next directory

Use up arrow to load previous command and add next directory

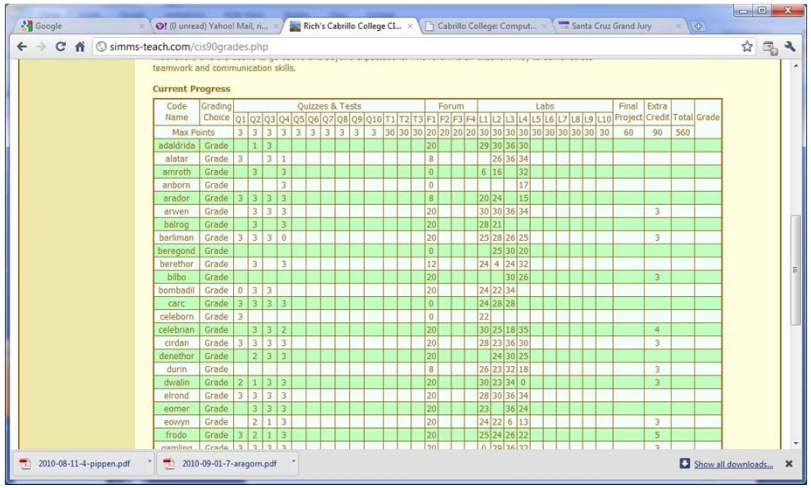
Use up arrow to load previous command and add file name

This is the relative path to the less command and the answer to QX3!

Descending down the file tree to the less command file

1. Grades page
   - Do you know your code name? email me if you don't.
   - Grading option - students who are not turning in any assignments should contact me!

2. /home/cis90/answers - check this directory on Opus for answers to completed labs.




```
/home/cis90/simmsben $ ls -l /home/cis90/answers/
total 64
-rw-r--r-- 1 rsimms cis90   173 Sep  9 14:43 lab01
-rw-r--r-- 1 rsimms cis90  1096 Sep 16 17:03 lab02
-rw-r--r-- 1 rsimms cis90 33699 Sep 30 14:08 lab03
-rw-r--r-- 1 rsimms cis90   506 Sep 30 14:06 lab04
/home/cis90/simmsben $
```

bigfile 102574
bin 102575
letter 102609

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.

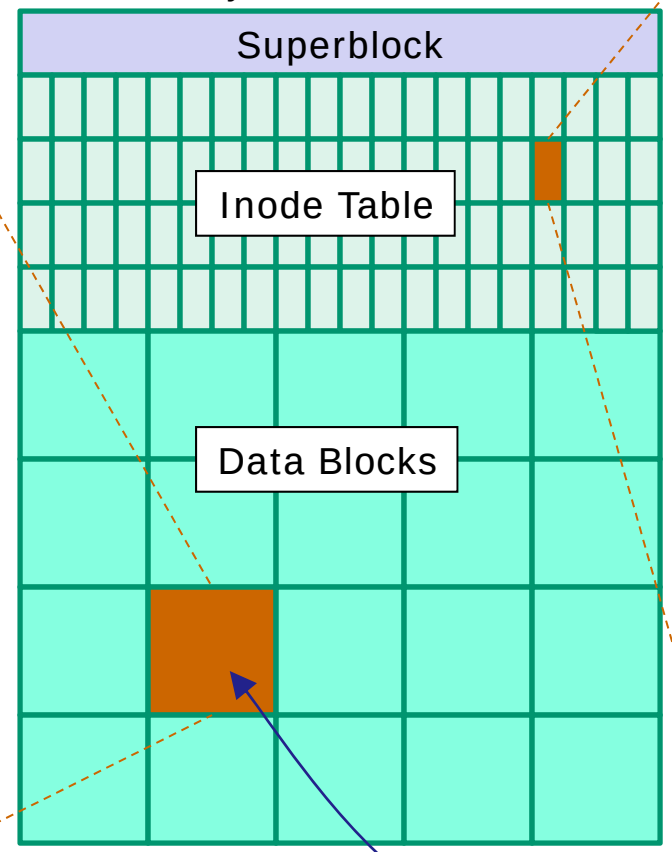
Now I don't want this to scare you, but my bunk mate has
malaria. You remember Jeffrey Hardy? Their about to organize a searching party.

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



102609	inode number
-	Type
rw-r—r--	Permissions
1	Number of links
simmsben	User
cis90	Group
1044	Size
2001-07-20	Modification time
2008-08-08	Access Time
2008-06-20	Change time
Pointer(s) to data blocks	Pointer(s) to data blocks

```
[simmsben@opus ~]$ls -il letter
102609 -rw-r--r-- 1 simmsben cis90 1044 Jul 20  2001 letter
```