



Title: Linux Lab Workbook

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1.0 Linux Lab Workbook

For each of the labs take the time to find out what each of the commands do. Use the man command to display what options the command takes, what its effects are, and what type of things to expect.

One of the key features of any UNIX type system is there is usually a number of different ways to achieve the same result. If your answer doesn't match mine but you get the right result then consider it correct!

1.1 Requirements

Before you start the exercises check the following sections to ensure you have the materials you need to run.

1.1.1 User ID

You will need to have a user id and password to logon to the specified Linux guest.

1.1.2 Telnet Client

To perform these lab exercises you will need access to a decent Telnet client. The default Windows client is pretty lousy, but it will work.

If you want one that I've found quite useful then go to

<http://www.chiark.greenend.org.uk/~sgtatham/putty/> and download the file to disk.

Running this program will enable you to simply fire off a telnet session or allow you to configure and save various settings. This client also has a Secure Shell (SSH) feature for making secure connections to hosts.

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2.0 Labs

2.1 Lab One

The objective of this exercise is to give you experience in using telnet to connect to the Linux host, login using the user id and password provided, and then to logout.

1. Fire up the telnet client specifying Lab system as the host
2. When prompted provide your user id and password
3. Logout or exit from the session

2.2 Lab Two

The objectives of this exercise are to

- Familiarize yourself with a couple of commonly used commands, and,
 - Let you explore the system a little.
1. Get help on the `ls` command
 2. Find out who else is on the system
 3. What is your current directory (present working directory)?
 4. Pipe the output of the `ls -l /` command to `ls.output` and see what you get

2.3 Lab Three

The objectives of these exercises are to find out how you can see what a system is running and what resources the system is using.

1. Use the `ps -ef | more` command to locate what daemons are running on the system
2. Use the `top` command to display the system activity

2.4 Lab Four

The objectives of these exercises are to:

- See how Linux can handle multiple file systems
 - Examine the `/proc` file system which Linux uses to provide information about its internal operation
3. Find out what devices are mounted and what file systems are in use
 4. Examine a couple of the `/proc` files using the `more` command (hint, use the `ls` command to see what files exist within the `/proc` system)

2.5 Lab Five

The objective of this exercise is to familiarize you with the hierarchy of files within a file system.

5. Use the `cd` command to go to the “root” of the file system
6. Use the `ls` command to display the files and directories
7. Use the `cd` command to go to your home directory

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8. Use the `pwd` command to display the name of the present working directory

2.6 Lab Six

The objective of this exercise is to get your hands dirty playing with files, directories and links.

9. Explore your filesystem:
 - Identify 1st level directories
 - Locate a symbolic link
 - Use the `umask` command to display current default
10. Create 3 files ('all', 'group', 'owner') & assign permissions:
 - all - r/w to owner, group, and others
 - group - r/w to owner and group, r/o to others
 - owner - r/w to owner, r/o to group, none to others
11. Create a directory 'test' under your home directory
12. Create a file 'real.file' within this directory
13. Create a symbolic link in your home directory to 'real.file' called 'symbolic.link'

2.7 Lab Seven

14. What shell are you using
15. Editing the command line:
 - Scrolling through past commands
 - Inserting/deleting characters on command line
 - Using editing key: CTRL-T
16. Try command completion:
 - Note what happens when you issue: `ls /etc/pro<TAB>`
17. Invoke the C shell (and then exit)

2.8 Lab Eight

The objectives of these exercises are to increase your competency and confidence in dealing with files and directories.

18. Use the `ls -a` command to display directories. Where did all those files come from?
When you use the SuSE YaST facility to add users, these files get put there as part of the creation process.
19. Use the `-R` option of `ls` to display down file tree
20. Use `cat` to display a file
21. Use `more` to display a file one page at a time
22. Erase the link 'symbolic.link', erase the 'test' directory and its contents, then erase the 'all', 'group', and 'owner' files.

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3.0 Lab Nine - vi Primer and Exercises

Some things you should know right away:

It is pronounced, “vee-eye”. That’s important because you don’t want people to think you are completely illiterate, and they will if you say “veye” or “vee”.

There are people who will differ with this, but here is the deal: those people who pronounce differently know that a great number of people say “vee-eye”, but a lot of the people who do pronounce it “vee-eye” do not realize that there are other ways. So be safe. Go with “vee-eye”.

By the way, if you have any modern version of SCO, what you probably want is the graphical editor that is (of course) available only within the graphical environment. Somebody shut that off a long time ago? Try “startx”. That editor does not begin to have the truly awesome power and beauty of `vi`, but there is no learning curve.

A caveat: it is hard to see leading or trailing spaces with the graphical Edit program, and there are places where spaces in the wrong spot can mysteriously break things. Be careful, and remember this.

Of course, you cannot use the graphical editor on a dumb terminal or over a dial-up connection. Nor can you use it if your graphical environment is kaplooeey, or never worked at all. So having at least a minimal knowledge of `vi` is helpful, if not absolutely necessary.

3.1 Getting Started

Honestly, there are only a few things you have to know to use `vi`. There are lots of things you should know, lots of things you could know that could make your life easier now and then, but there really are only a handful of things you need to know to get a job done. It may take you ten times longer than it would if you learned just a little bit more, but you will get it done, and that is better than getting nothing done at all.

So let us get started. First thing to do is type:

```
vi /ect/frammif/mkil
```

No, that is not a misprint: I really want you to type “`vi /ect/frammif/mkil`”. Trust me on this one; it is all in a good cause.

Okay, if you have done that, and your system is not the strangest Unix system in the whole world, you should see something that looks a lot like this:

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Without doing anything at all, I want you to look at your screen. Notice that the `"/ect/frammif/mkil"` is at the bottom of the screen and it says "[New file]". Memorize what this looks like, because every time you mistype the name of a file, this is what you will get.

Notice that, at least right now, `vi` doesn't care a bit that you don't (I'm pretty sure you don't) even have a directory `"/ect"`, or a sub-directory under that called `"frammif"`, never mind a file called `"mkil"`. Right now, `vi` just doesn't care. All it knows is that there is no such file right now, so it must therefore be a "New" file. Simple minded, yes. Notice the "~"s running down your screen? Those are called "tildes" if you prefer accuracy, or "squiggles" by some people. I do not care what you call them, I just want to remember that in `vi`, those "~"s mean "Nothing is there". That's "nothing" as in absolutely nuttin'. Not a bunch of spaces such as separate every word on this page, but nothing at all. Zip, nothing, empty.

That makes sense, here. If `/ect/frammif/mkil` is a new file, there should not be anything in it. Good so far? Okay, let us try something. Press `<ENTER>`.

Nothing happened, right? Try the arrow keys. Do not hit any letters or anything else, just the arrow keys. Anything happen? Can you move down into those squiggles? No? Why not?

Because `vi` will not let you move over what is not there. Other editors (like the graphical Edit program we talked about above), would just assume you want to add spaces or empty lines, and would let you move down. Not `vi`, though. `vi` is picky about those things, and you are stuck right where you are.

Well, there has to be a way to add text, right? Of course. There are two ways (actually a whole lot more, but we are only going to learn two here-keep it simple, remember?). The first way is to type a lower case `"i"`. If you can remember that `"i"` means insert, that will be good. Go ahead, type an `"i"`, but don't type anything else. What happened?

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Nothing, right? Actually, if someone else set up your editing environment, you might have seen “INSERT MODE” appear at the bottom of your screen, but probably not. So, that is the second thing you have learned about vi: if you type “i”, nothing happens. But wait: something did actually happen. Try typing something else now, anything at all. “The quick brown fox was not quick enough”. Wow. Look at that. It is working! Press <ENTER>. Type some more. Great fun, right?

Okay, now I'm going to break it. Sorry, but this is the only way you are going to learn. Press <ESC>. Go ahead, there is no point in typing more. Press <ESC>. Press it again. And again. Wait, then <ESC>-<ESC>-<ESC> really fast, pause for a second and then two more. Did your computer beep at you every time you pressed <ESC>? It might have (it depends on a few things like: does your speaker work?), which is vi's charming way of saying “Just what is your basic problem, dude? You already pressed it once; I did what I am supposed to, but NOOO, you have to press it again, and again and again...”

OK, now try the arrow keys. If they don't work, use the “-” key to move up, the <ENTER> to move down, Backspace to move left, and <SPACE-BAR> to move right. Try to remember those in case you are ever in a situation where your arrow keys do not work. If it is easier for you, you can also use “h”, “j”, “k” and “l” to move around. Try it.

Notice that you still cannot move into those tildes. Nothing has changed; you've added some text that you can move around in, but that is all.

Now let us add a line. Get yourself right on the very first line and then type “o”. The “o” stands for “open”. Neat, is it not? A whole line opened up underneath where you were and you can type whatever you want until you want to move around again. When you want that, press <ESC>, and then you can move again.

If you cheated and used the arrow keys while you were typing, you might have found out that they work, too. But do not count on that: you might not always have arrow keys that work, and some versions of vi don't let you use them when you are typing.

Next lesson: Press <ESC> if you haven't already, and put yourself (well, the cursor) anywhere on one of the lines you just typed. Type a lower case “d”. Nothing happens (you get a lot of “Nothing happens” with vi). Do it again. Whoops! Did you see that sucker disappear? No? Try it again, and pay closer attention. Type “d”, and then type it again. Instant line eradicator!

Of course, sometimes you are going to delete a line you did not mean to delete. Type “u” (“undo”). Magic?! Type it again. Wow. Again. And again. It's like stuck, isn't it?

Let's try something else. Get on the very first line and press “d” twice. Now move to the very last line and type a “p”. Wow, now you can move lines! But wait, there's more: type “p” again. And again. And once more. Now you can duplicate lines, too. “p” is for “put”. Sometimes you don't want to remove lines, just characters. vi can do that. Put your cursor on top of a character. Pick a mean looking one, a character that doesn't deserve to be in your file. You are now judge, jury, and executioner. Does this character deserve to die? You bet! Type an “x” and the little creep is gone. Changed your mind? Bring it back with “u”. Toy with it: “u” and it's gone, “u” and it's back. Gone, back, gone back. Only you can determine this letter's fate. There's another neat trick that can come in handy if you transpose characters while typing. Say you accidentally type “lteters”. Put your

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cursor on the first “t” and hit “x”. Then, without moving a muscle, hit “p”. You now have “letters”. Neat.

One more thing about “x” (actually about almost any command, but we'll use “x” to demonstrate). Put yourself at the beginning of a line and then type “i”, followed by “hello”. Hit `<ESC>`, then move back to the “h” of “hello”. Watch carefully now: type “5x”. “hello” disappears. Hit “u” and then try “3x”. Get the point? You could type “58x” and the next 58 characters would disappear. The reason I mention this is that sometime you will do it accidentally, and if I didn't give you this hint, you wouldn't have a clue. Forewarned and all that.

You've now learned how to move around, how to insert and delete characters and whole lines, and that's enough. There is no editing task that you cannot accomplish with just this. Yes, there are faster and better ways to do all kinds of things that you might have to do, but there is nothing you cannot do just knowing these few commands.

But you do have to learn how to write your changes and get out, and (important) how NOT to write your changes and get out.

Let's try writing this file. To do that, press `<ESC>` if you are in insert mode, and then type a “:”. The cursor moves to the bottom of your screen and your computer puts on a very patient expression. You probably won't want to try this, but you could sit there for 6 or 7 hours and vi would do ABSOLUTELY NOTHING. vi is very, very patient.

But you aren't, right? So type “w”, which means “write”. OK, cool, the file is written, and now we can.

What? What do you mean you got an error? What error? Let me see that stupid thing. What did you do now? You probably broke it for good this time, and people are going to be real mad at you because YOU PRESSED “w” WHEN YOU WEREN'T SUPPOSED TO!

Yeah, I'm kidding. You got “No such file or directory”, didn't you? It's OK, nothing bad happened. vi just can't write this file because of those crazy directory names we used. I stacked the deck to deliberately create this problem for you.

Great. So you've typed 10,000 words of deathless prose that's due on your boss's desk NOW, and you can't write it. Real amusing, right?

Naw. You can write it, you just can't write it to `/ect/frammif/mkil`. How about we write it to `myfile.safe` instead? To do that, simply hit “:” again so you are back at the bottom, and this time type “w myfile.safe”. You get back something like

```
myfile.safe 3 lines, 64 characters
```

Are you worried what would have happened if your boss had an important file named “`myfile.safe`”? Did you just overwrite that file with a bunch of stupid “brown fox” gibberish? Can you do ANYTHING right?

Stop sweating. It wouldn't have happened. Try it again. Type “:”, then “w myfile.safe”. See? It won't overwrite an existing file unless you type “w!”. You might also want to know that if vi says a file is read-only, but you should be able to write it anyway 'cause you are the superuser, the “w!” trick fixes that, too.

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3.2 Warning!

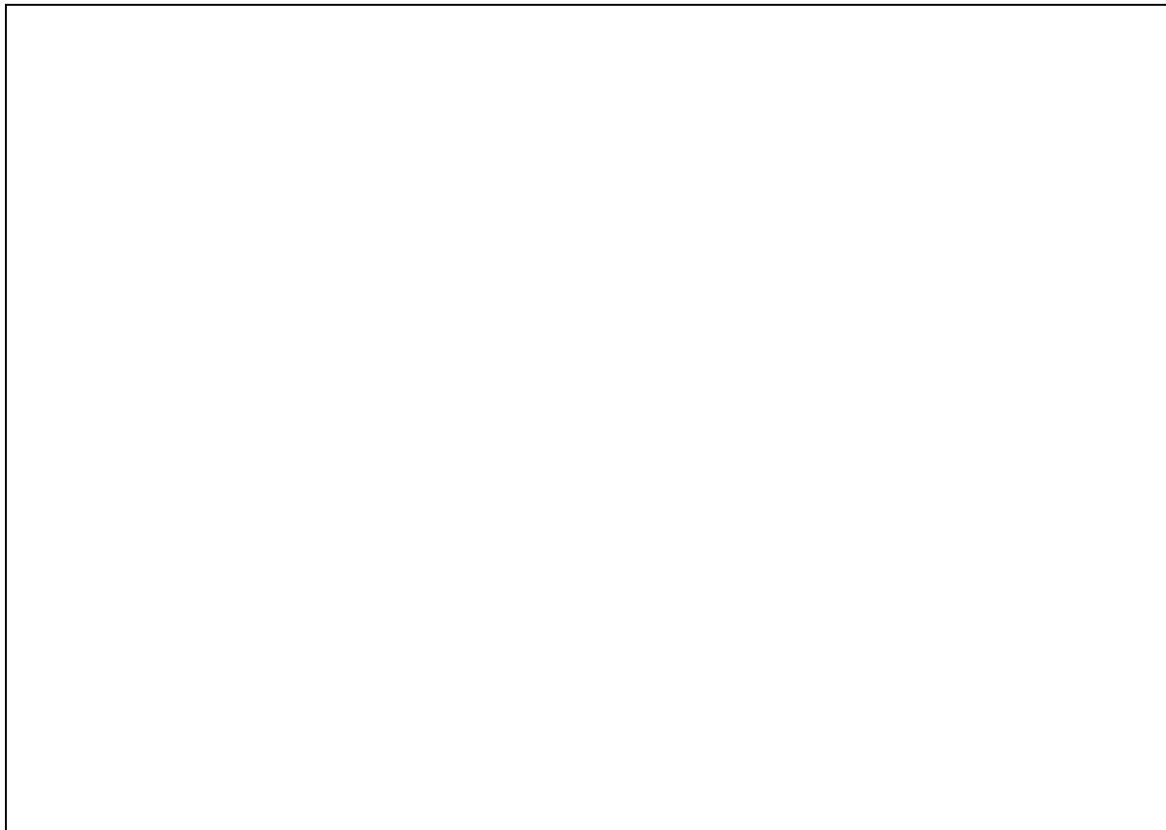
That won't save you from complete stupidity. If you had started this session by giving the name of a real file (like “vi /etc/inittab”), and then had deleted a bunch of lines and added a bunch of new ones, and then typed “:w” (with nothing else, no name, just the bare “w”), vi would have happily, efficiently, and mercilessly overwritten /etc/inittab with your changes. The theory here is that you saw what you were doing, so you must know what you were doing. So be it.

But let's say you messed up the file and you don't want to write it, you just want to quit. Let's try it: mess up this file a little more. Delete a line, add a line, it doesn't matter, just do something. Now do the “:” again, and type “q” (for “quit”).

Gotcha again. But notice that vi has given you a hint about what to do. It tells you that you need to type “:quit!” to get out. Actually, you just need “:q!”, but you can type it out if it makes you feel better.

That's it. You know the basics. I wish you'd learn more, 'cause it's worth it, but if this is all you can take, it is enough. Quick review and we're out of here:

i	insert
o	open
dd	delete line
x	remove characters
u	undo
p	put
:w	write file
:w!	write absolutely
:q	quit after saving (combine with “:wq”)
:q!	quit without saving



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3.3 vi Quick Reference

STARTING AND QUITTING VI	
vi	starts vi without a named file to save to.
vi filename.txt	start vi on an existing file (or supply name to save to if no file yet exists).
<Esc> key	puts you in edit mode if you weren't already there (the following commands only work in edit mode).
:q!	quit vi WITHOUT SAVING
:wq	write (save) to supplied file name and quit
<Esc>-ZZ	also saves and quits
:w newfile.txt	write to a new file and don't quit (still editing newfile.txt)
:wq newfile.txt	write to a new file and quit2) CURSOR MOVEMENTh <j vk ^l >
^ or 0	move cursor to start of line
\$	move cursor to the end of the line
<ctrl> G	indicates current line number of file where cursor currently is
<ctrl> F	moves cursor ahead one page
<ctrl> B	moves cursor back one page
<shift> H	moves cursor to top of screen
<shift> L	moves cursor to bottom of screen
lG	move to line 1
G	moves to last line
w	advances by a word (W doesn't stop at punctuation)
b	backs up by a word (B as well)
e	go to the end of a word
BASIC EDITING	
i	puts you in insert mode, press <Esc> to exit
I	^ then i
a	insert mode, but appending after cursor
A	\$ then a
o	insert mode, opening new line below where you are
O	insert mode, opening new line above where you are

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u	undo
x	deletes a single character; 5x deletes next 5 characters
J	deletes end-eof-line character (does a "Join" of current line with next line)
.	repeats last editing command
r	replaces current character with another
cw	changes remainder of current word to whatever you type; <esc> to end edit
/word	finds occurrence of 'word' in the file
n	finds next occurrence of 'word'
dd	deletes line
3dd	deletes 3 lines (from this line down)
23,50d	deletes lines 23-50, inclusive
3Y	"yank" three lines (place in unnamed buffer)
"a3Y	Yank three lines to a buffer called 'a'
p	puts deleted (or yanked lines) below this line
P	puts deleted (or yanked lines) above this line
"ap	places lines from buffer 'a'

COMMAND LINE EDITING

:%s/word/WORD	Replaces first occurrence of word with WORD on every line of the file
:1,\$s/word/WORD/g	From lines 1 to the end of the file change word to WORD (g means all occurrences on a line).
:1,23s/^word/WORD/	From lines 1 to 23 replace "word" at the beginning of any line with "WORD"
:1,23s/word\$/WORD/	From lines 1 to 23 replace "word" at the end of any line with "WORD"
:1,\$s/^...//	From lines 1 to the end of the file remove "..." beginning any of those lines.
:g/word/d	Does a "grep" to find lines with 'word', then deletes those lines
:1,\$s/\&/and/g	Replaces every occurrence of & (escaped) with "and"
:g/word/p	Does a "grep" to find lines with 'word', then prints those line to the screen

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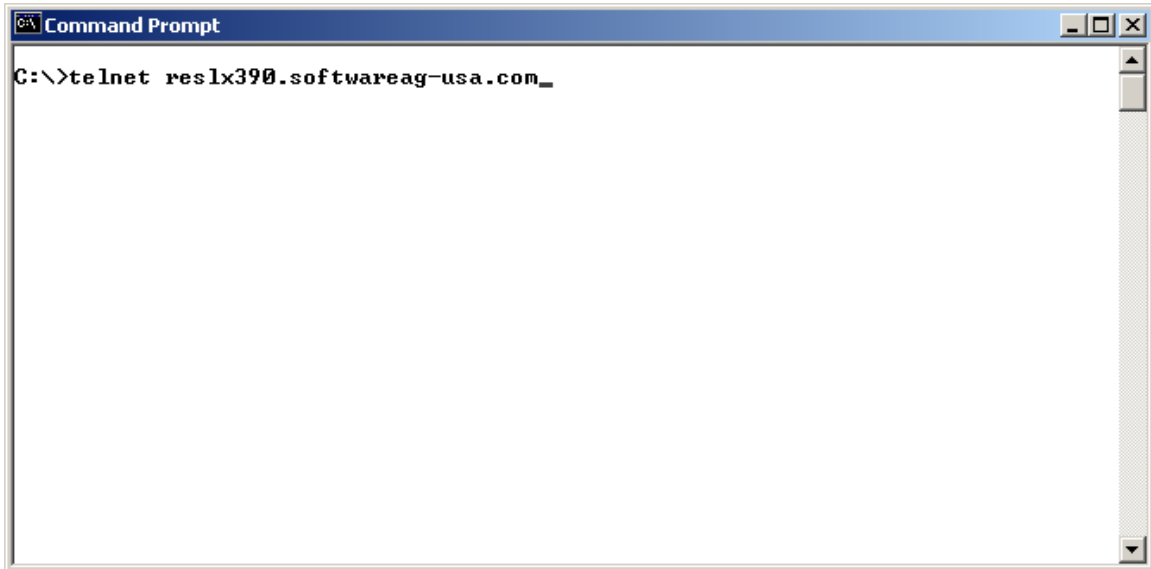
:3,15s/^/\#	Put a # at the beginning of lines 3 through 15
:%s/\$/;	Append a semicolon to the end of every line (note that "%" = "1,\$")
FILE OPERATIONS	
:r path\filename	read in the specified file starting on the next line
:w	save
:w filename	save as filename
:wq	save and quit
:q	quit if no modifications since last save
:q!	quit no matter what (without saving)
:e filename	edit another file without having to quit and restart vi

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4.0 Lab One Answers

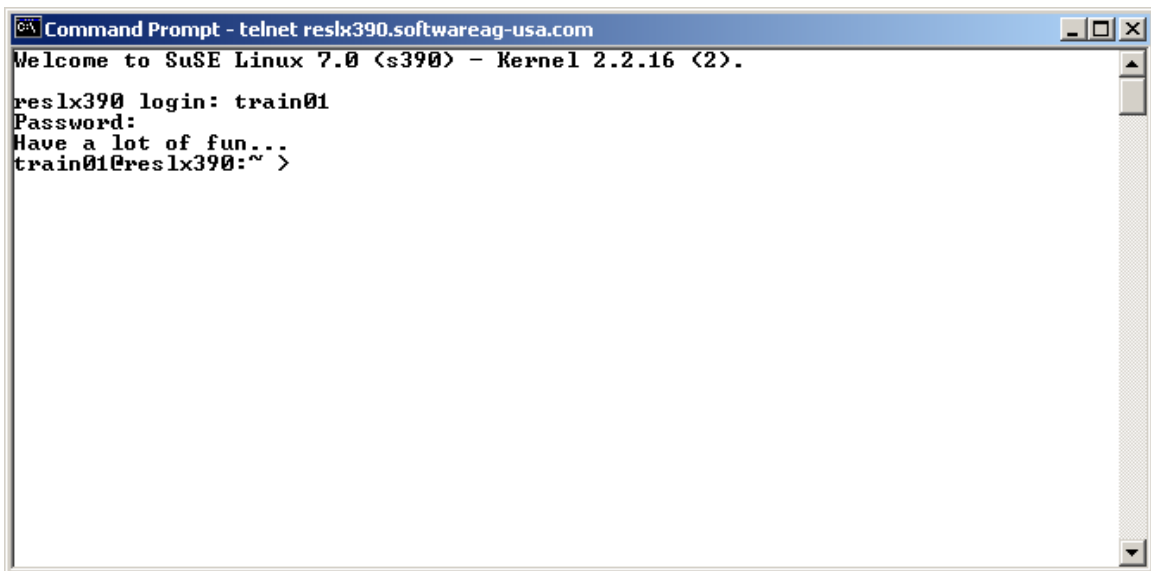
4.1 Using the Windows Client

23. Telnet to host



```
Command Prompt
C:\>telnet reslx390.softwareag-usa.com_
```

24. Provide user id and password when prompted



```
Command Prompt - telnet reslx390.softwareag-usa.com
Welcome to SuSE Linux 7.0 (s390) - Kernel 2.2.16 (2).
reslx390 login: train01
Password:
Have a lot of fun...
train01@reslx390:~ >
```

25. Logout or exit to terminate the session

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```

Command Prompt
Welcome to SuSE Linux 7.0 (s390) - Kernel 2.2.16 (2).
reslx390 login: train01
Password:
Have a lot of fun...
train01@reslx390:~ > logout

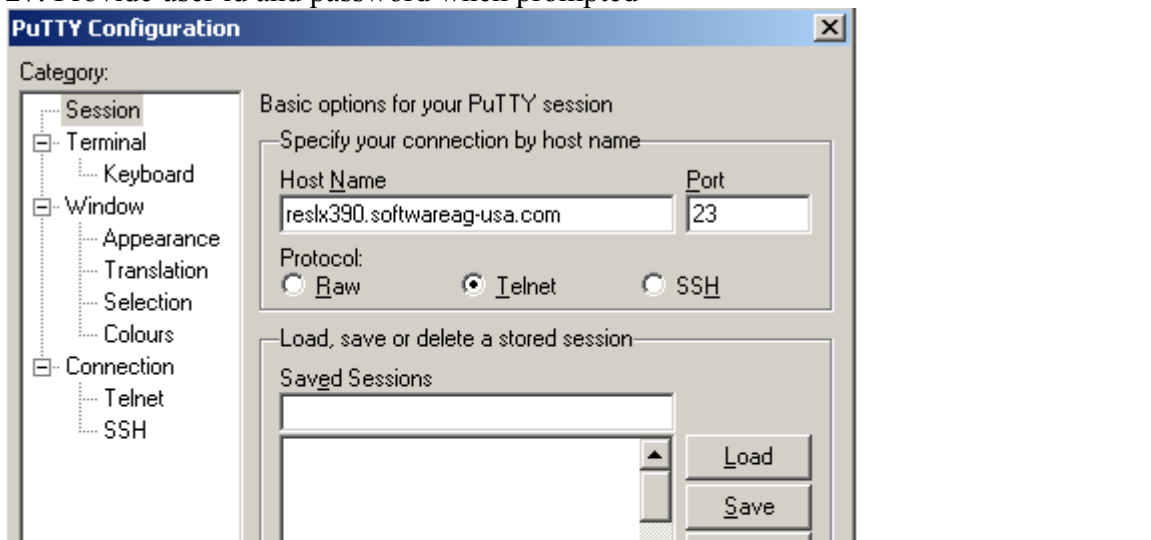
Connection to host lost.
C:\>_

```

4.2 Using Putty

26. Telnet to host

27. Provide user id and password when prompted



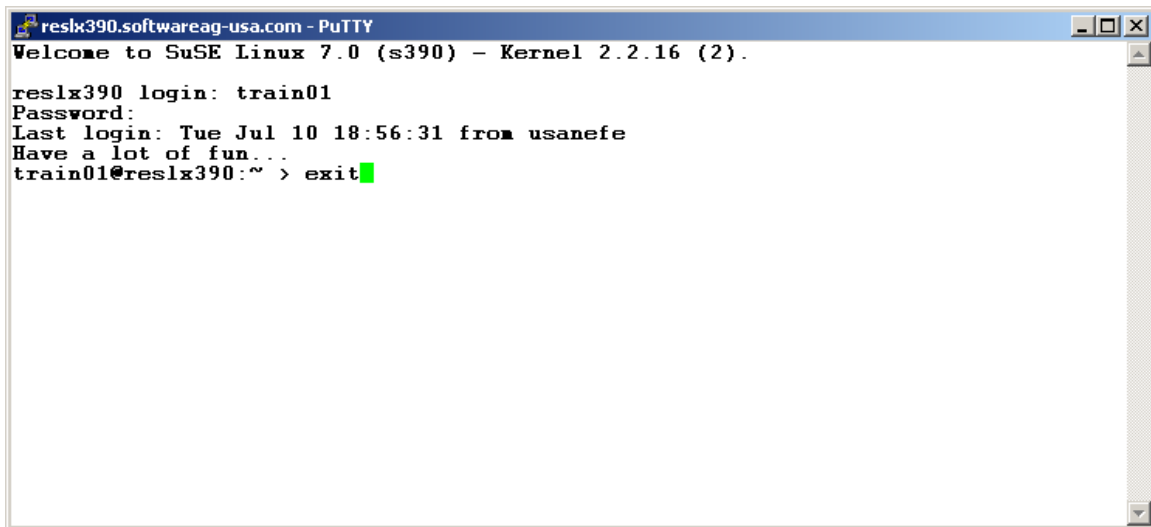
```

reslx390.softwareag-usa.com - PuTTY
Welcome to SuSE Linux 7.0 (s390) - Kernel 2.2.16 (2).
reslx390 login: train01
Password:
Last login: Tue Jul 10 18:56:31 from usanefe
Have a lot of fun...
train01@reslx390:~ > █

```

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28. Logout or exit to terminate session



```
reslx390.softwareag-usa.com - PuTTY
Welcome to SuSE Linux 7.0 (s390) - Kernel 2.2.16 (2).

reslx390 login: train01
Password:
Last login: Tue Jul 10 18:56:31 from usanefe
Have a lot of fun...
train01@reslx390:~ > exit
```


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5.0 Lab Two Answers

29. Get help on the `ls` command

```

Command Prompt - telnet reslx390.softwareag-usa.com
Welcome to SuSE Linux 7.0 (s390) - Kernel 2.2.16 (2).
reslx390 login: train01
Password:
Last login: Tue Jul 10 19:02:51 from usanefe
Have a lot of fun...
train01@reslx390:~ > man ls

Command Prompt - telnet reslx390.softwareag-usa.com

LS<1>                                FSF                                LS<1>

ls - list directory contents

[OPTION]... [FILE]...

List information about the FILES (the current directory by
default). Sort entries alphabetically if none of
nor
.
. do not hide entries starting with .
. do not list implied . and ..

Manual page ls<1> line 1

```

(Press q to exit from “man”)

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30. Find out who else is on the system

```

Command Prompt - telnet reslx390.softwareag-usa.com
train01@reslx390:~ > w
 7:24pm up 7 days, 22:23, 3 users, load average: 1.00, 1.00, 1.00
USER      TTY      FROM          LOGIN@   IDLE   JCPU   PCPU   WHAT
root      console  -             2Jul 1   7days  0.40s  0.25s  -bash
usaneffe pts/1    usaneffe     4:19pm  2:53m  0.69s  0.42s  -bash
train01   pts/2    usaneffe     7:20pm  1.00s  0.71s  0.23s  w
train01@reslx390:~ > _

```

31. What is your current directory

```

Command Prompt - telnet reslx390.softwareag-usa.com
train01@reslx390:~ > pwd
/home/train01
train01@reslx390:~ >

```

```

Command Prompt - telnet reslx390
train01@reslx390:~ > ls -l / >ls.output
train01@reslx390:~ > cat ls.output
total 88
drwxr-xr-x  2 root    root      4096 Nov 30  2000 bin
drwxr-xr-x  2 root    root      4096 Mar 27  00:48 boot
drwxr-xr-x  2 root    root      4096 Nov 29  2000 cdrom
drwxr-xr-x  6 root    root     12288 Jul  2  21:01 dev
drwxr-xr-x 24 root    root      4096 Jul 10  16:29 etc
drwxr-xr-x  2 root    root      4096 Nov 29  2000 floppy
drwxr-xr-x 29 root    root      4096 Jul 10  16:29 home
drwxr-xr-x  5 root    root      4096 Feb  8  17:07 lib
drwxr-xr-x  2 root    root     16384 Nov 29  2000 lost+found
drwxr-xr-x  4 root    root      4096 Jul  3  20:40 mnt
drwxr-xr-x 15 root    root      4096 Dec  5  2000 opt
dr-xr-xr-x 50 root    root        0 Jul  2  21:01 proc
drwx--x--x  4 root    root      4096 Jul  6  19:53 root
drwxr-xr-x  5 root    root      4096 Mar 27  00:31/sbin
drwxr-xr-x  6 root    root      4096 Mar 27  01:42 suse
drwxrwxrwt  5 root    root      4096 Jul 13  00:04 tmp
drwxr-xr-x 22 root    root      4096 Feb 22  14:45 usr
drwxr-xr-x 19 root    root      4096 Nov 30  2000 var
train01@reslx390:~ >

```

32. Pipe the output of the `ls -l /` command to `ls.output` and see what you get

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6.0 Lab Three Answers

33. Use `ps -ef` to locate daemons

```

Command Prompt - telnet reslx390.softwareag-usa.com
train01@reslx390:~ > ps -ef
UID          PID    PPID  C  STIME TTY          TIME CMD
root           1        0  0 Jul02 ?           00:00:09 init
root           2        1  0 Jul02 ?           00:00:00 [kmccheck]
root           3        1  0 Jul02 ?           00:00:00 [kflushd]
root           4        1  0 Jul02 ?           00:00:24 [kupdate]
root           5        1  0 Jul02 ?           00:00:00 [kpiod]
root           6        1  0 Jul02 ?           00:01:56 [kswapd]
bin          114        1  0 Jul02 ?           00:00:00 /sbin/portmap
root        128        1  0 Jul02 ?           00:00:03 /usr/sbin/syslogd
root        132        1  0 Jul02 ?           00:00:01 /usr/sbin/klogd -c 1
at          190        1  0 Jul02 ?           00:00:01 /usr/sbin/atd
root        194        1  0 Jul02 ?           00:00:25 /usr/sbin/httpd -f /etc/httpd/ht
root        198        1  0 Jul02 ?           00:00:01 /usr/sbin/inetd
lp          206        1  0 Jul02 ?           00:00:00 lpd Waiting
wwwrun     209       194  0 Jul02 ?           00:00:00 /usr/sbin/httpd -f /etc/httpd/ht
root        234        1  0 Jul02 ?           00:00:00 /usr/sbin/snmpd -f
root        241        1  0 Jul02 ?           00:00:14 /usr/sbin/cron
root        276        1  0 Jul02 ?           00:00:00 login -- root
root        318       276  0 Jul02 ?           00:00:00 -bash
root        328        1  0 Jul02 ?           00:00:00 db2wdog
db2as      329       328  0 Jul02 ?           00:00:05 db2sysc
root        330       329  0 Jul02 ?           00:00:00 db2gds
db2as      331       329  0 Jul02 ?           00:00:00 db2ipccm
db2as      332       330  0 Jul02 ?           00:00:05 Scheduler
db2as      333       329  0 Jul02 ?           00:00:00 db2tcpcm
db2as      334       329  0 Jul02 ?           00:00:00 db2tcpdm
usaneffe   769        1  99 Jul02 ?           20:49:26 setiathome -graphics
root       2842        1  0 Jul03 ?           00:00:07 /usr/sbin/rpc.mountd
root       2843        1  0 Jul03 ?           00:01:25 /usr/sbin/rpc.nfsd
root       20537       198  0 16:19 ?           00:00:01 in.telnetd: usaneffe
root       20538  20537  0 16:19 pts/1         00:00:00 login -- usaneffe
usaneffe   20539  20538  0 16:19 pts/1         00:00:00 -bash
root       20900        1  0 16:29 ?           00:00:00 /usr/sbin/nscd
root       20901  20900  0 16:29 ?           00:00:00 /usr/sbin/nscd
root       20902  20901  0 16:29 ?           00:00:00 /usr/sbin/nscd
root       20903  20901  0 16:29 ?           00:00:00 /usr/sbin/nscd
root       20904  20901  0 16:29 ?           00:00:00 /usr/sbin/nscd
root       20905  20901  0 16:29 ?           00:00:00 /usr/sbin/nscd
root       20906  20901  0 16:29 ?           00:00:00 /usr/sbin/nscd
root       21168       198  0 19:20 ?           00:00:00 in.telnetd: usaneffe
root       21169  21168  0 19:20 pts/2         00:00:00 login -- train01
train01    21170  21169  0 19:20 pts/2         00:00:00 -bash
root       21196       241  0 19:30 ?           00:00:00 [cron <defunct>]
train01    21220  21170  0 19:30 pts/2         00:00:00 ps -ef
train01@reslx390:~ >

```

Or to be tricky...

```

Command Prompt - telnet reslx390.softwareag-usa.com
train01@reslx390:~ > ps -ef | grep -E "http|inet"
root          194        1  0 Jul02 ?           00:00:25 /usr/sbin/httpd -f /etc/httpd/ht
tpd.conf     -D PERL  -D SUSEHELP
root          198        1  0 Jul02 ?           00:00:01 /usr/sbin/inetd
wwwrun     209       194  0 Jul02 ?           00:00:00 /usr/sbin/httpd -f /etc/httpd/ht
tpd.conf     -D PERL  -D SUSEHELP
train01     21225  21170  0 19:32 pts/2         00:00:00 grep -E http|inet
train01@reslx390:~ >

```

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```

Command Prompt - telnet reslx390.softwareag-usa.com
 8:44pm up 7 days, 23:43, 3 users, load average: 1.14, 1.05, 1.01
42 processes: 39 sleeping, 3 running, 0 zombie, 0 stopped
CPU states: 0.9% user, 51.4% system, 47.6% nice, 0.0% idle
Mem: 257032K av, 210116K used, 46916K free, 70208K shrd, 123996K buff
Swap: 387340K av, 1092K used, 386248K free, 18040K cached

  PID USER     PRI  NI  SIZE  RSS SHARE STAT  LIB %CPU %MEM  TIME COMMAND
  769 usanefe  16   1 14864 14M  816 R  N   0 95.8  5.7 11402m setiathome
21371 train01   7   0 1028 1028  856 R   0  4.0  0.3  0:00 top
   4 root     0   0   0    0    0  SW   0  0.1  0.0  0:24 kupdate
   1 root     0   0  208  208  172 S   0  0.0  0.0  0:09 init
   2 root     0   0   0    0    0  SW   0  0.0  0.0  0:00 kmcheck
   3 root     0   0   0    0    0  SW   0  0.0  0.0  0:00 kflushd
   5 root     0   0   0    0    0  SW   0  0.0  0.0  0:00 kpiod
   6 root     0   0   0    0    0  SW   0  0.0  0.0  1:56 kswapd
  114 bin      0   0   496  496  420 S   0  0.0  0.1  0:00 portmap
  128 root     0   0   584  584  492 S   0  0.0  0.2  0:03 syslogd
  132 root     0   0   740  740  428 S   0  0.0  0.2  0:01 klogd
  190 at      0   0   556  556  480 S   0  0.0  0.2  0:01 atd
  194 root     0   0  7444 7444 7284 S   0  0.0  2.8  0:25 httpd
  198 root     0   0   508  508  436 S   0  0.0  0.1  0:01 inetd
  206 lp      0   0   768  768  668 S   0  0.0  0.2  0:00 lpd
  209 wwwrun   0   0  7452 7452 7288 S   0  0.0  2.8  0:00 httpd
  234 root     0   0  1380 1380  924 S   0  0.0  0.5  0:00 snmpd
  241 root     0   0   644  644  548 S   0  0.0  0.2  0:14 cron

```

34. Use the top command to display system activity

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7.0 Lab Four Answers

35. Find out what devices are mounted and what file systems are in use

```

Command Prompt - telnet reslx390.softwareag-usa.com
train01@reslx390:~ > df
Filesystem            1k-blocks      Used Available Use% Mounted on
/dev/dasdb1            1984260      1335380    548084   71% /
/dev/dasdc1            2365528      1849912    395452   82% /home
/dev/dasdd1            2365528      1825176    420188   81% /suse
/home/usanefe/ThinkBlue64-7.1-disc1a.iso
662122      662122           0 100% /mnt/ThinkBlue64/CD1
/home/usanefe/ThinkBlue64-7.1-disc2.iso
259506      259506           0 100% /mnt/ThinkBlue64/CD2
train01@reslx390:~ > mount
/dev/dasdb1 on / type ext2 (rw)
proc on /proc type proc (rw)
/dev/dasdc1 on /home type ext2 (rw)
/dev/dasdd1 on /suse type ext2 (rw)
devpts on /dev/pts type devpts (rw,gid=5,mode=0620)
/home/usanefe/ThinkBlue64-7.1-disc1a.iso on /mnt/ThinkBlue64/CD1 type iso9660 (r
w,loop=/dev/loop0)
/home/usanefe/ThinkBlue64-7.1-disc2.iso on /mnt/ThinkBlue64/CD2 type iso9660 (r
w,loop=/dev/loop1)
train01@reslx390:~ >

```

```

Command Prompt - telnet reslx390.softwareag-usa.com
train01@reslx390:~ > ls /proc
1      20539 21168 318 6      fs          mdstat      slabinfo
114    206   21169 328 769    interrupts meminfo     stat
128    209   21170 329 bus      ioports    misc        swaps
132    20900 21237 330 cmdline kcore      modules     sys
190    20901 234   331 config.gz kcore_elf  mounts     tty
194    20902 241   332 cpuinfo  kmsg       net         uptime
198    20903 276   333 dasd     ksyms      partitions  version
2      20904 2842  334 devices loadavg    s390dbf
20537  20905 2843  4      dma       locks      scsi
20538  20906 3      5      filesystems lvm
train01@reslx390:~ > more /proc/cpuinfo
vendor_id      : IBM/S390
# processors   : 1
bogomips per cpu: 164.24
processor 0: version = FF, identification = 030950, machine = 7060
train01@reslx390:~ > more /proc/modules
nls_cp437      4112 2 (autoclean)
isofs          20260 2 (autoclean)
vfat           11156 0 (autoclean) (unused)
fat            35952 0 (autoclean) [vfat]
ctc            21200 1 (autoclean)
train01@reslx390:~ >

```

36. Examine a couple of /proc files using the more command

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8.0 Lab Five Answers

37. Explore the file system

- cd /
- ls
- cd ~



```
Command Prompt - telnet reslx390.softwareag-usa.com
train01@reslx390:~ > cd /
train01@reslx390:/ > ls
bin  cdrom  etc     home   lost+found  opt   root  suse  usr
boot dev   floppy lib    mnt       proc /sbin  tmp  var
train01@reslx390:/ > cd ~
train01@reslx390:~ > pwd
/home/train01
train01@reslx390:~ >
```

- pwd

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9.0 Lab Six Answers

38. Explore your file system

```

Command Prompt - telnet reslx390.softwareag-usa.com
train01@reslx390:~ > ls /
bin  cdrom  etc  home  lost+found  opt  root  suse  usr
boot  dev  floppy  lib  mnt  proc /sbin  tmp  var
train01@reslx390:~ > _

```

- Identify 1st level directories
- Locate a symbolic link
- Use the umask command to display the current default

```

Command Prompt - telnet reslx390.softwareag-usa.com
train01@reslx390:~ > umask
022
train01@reslx390:~ >

train01@reslx390:~ > ls -l /lib
total 10780
drwxr-xr-x  2 root    root          4096 Nov 29  2000 YaST
lrwxrwxrwx  1 root    root             12 Nov 29  2000 cpp -> /usr/bin/cpp
-rwxr-xr-x  1 root    root        367598 Nov  3  2000 ld-2.1.3.so
lrwxrwxrwx  1 root    root             11 Nov 29  2000 ld.so.1 -> ld-2.1.3.so
-rwxr-xr-x  1 root    root        21498 Nov  3  2000 libBrokenLocale.so.1

```

39. Create 3 files 'all', 'group', 'owner'

- all - give r/w permission to owner, group, and others
- group - give r/w permission to owner, group, and r/o to others

```

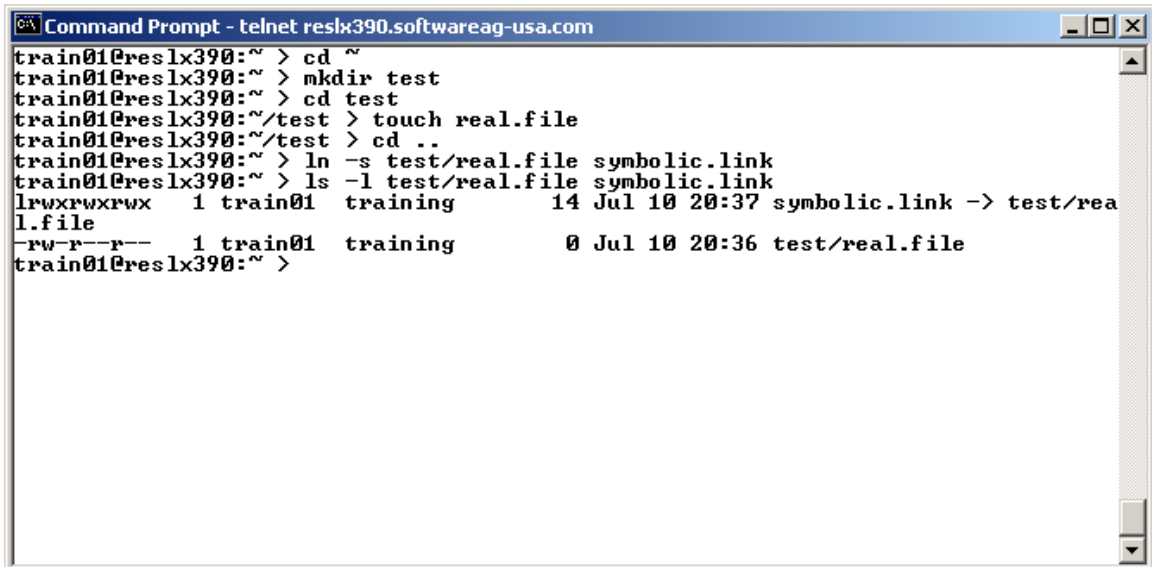
Command Prompt - telnet reslx390.softwareag-usa.com
train01@reslx390:~ > touch all group owner
train01@reslx390:~ > ls -l all group owner
-rw-rw-rw-  1 train01  training    0 Jul 10 20:01 all
-rw-rw-r--  1 train01  training    0 Jul 10 20:01 group
-rw-r--r--  1 train01  training    0 Jul 10 20:01 owner
train01@reslx390:~ > chmod 0666 all
train01@reslx390:~ > chmod 0664 group
train01@reslx390:~ > chmod 0640 owner
train01@reslx390:~ > ls -l all group owner
-rw-rw-rw-  1 train01  training    0 Jul 10 20:01 all
-rw-rw-r--  1 train01  training    0 Jul 10 20:01 group
-rw-r-----  1 train01  training    0 Jul 10 20:01 owner

```

- owner - give r/w permission to owner, r/o to group, and none to others

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40. Create a directory 'test' under your home directory
- Create a file 'real.file' in this directory
 - Create a symbolic link in your home directory to 'real.file' called 'symbolic.link'

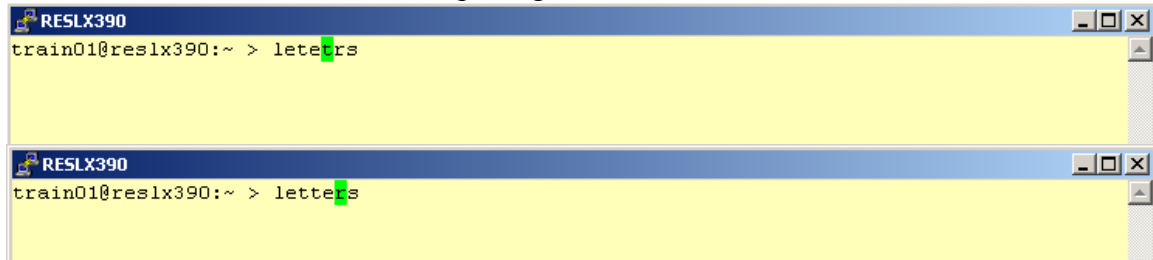


```
Command Prompt - telnet reslx390.softwareag-usa.com
train01@reslx390:~ > cd ~
train01@reslx390:~ > mkdir test
train01@reslx390:~ > cd test
train01@reslx390:~/test > touch real.file
train01@reslx390:~/test > cd ..
train01@reslx390:~ > ln -s test/real.file symbolic.link
train01@reslx390:~ > ls -l test/real.file symbolic.link
lrwxrwxrwx  1 train01  training    14 Jul 10 20:37 symbolic.link -> test/rea
l.file
-rw-r--r--  1 train01  training     0 Jul 10 20:36 test/real.file
train01@reslx390:~ >
```


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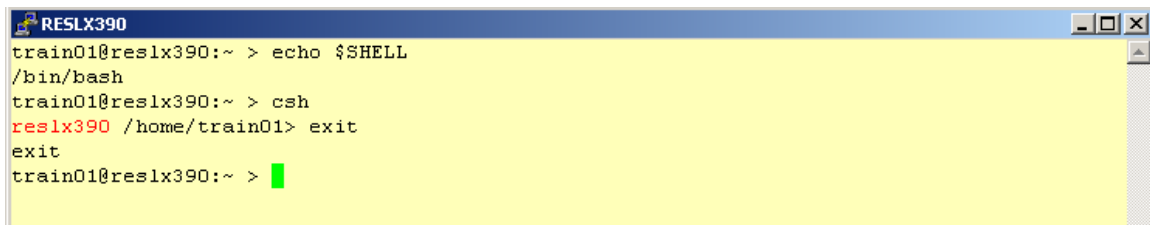
10.0 Lab Seven Answers

41. What shell are you using (see screen shot under “Invoke the C shell”)
42. Editing the command line:
 - Scrolling through past commands: Use the up arrow and down arrow cursor keys
 - Inserting/deleting characters on command line: Use the <CTRL-U>, , <INS> keys
 - Use the <CTRL-T> to correct spelling errors on the command line



```
RESLX390
train01@reslx390:~ > leterrs
RESLX390
train01@reslx390:~ > letters
```

43. Try command completion:
 - Note what happens when you issue: ls /etc/pro<TAB>
44. Invoke the C shell (and then exit)



```
RESLX390
train01@reslx390:~ > echo $SHELL
/bin/bash
train01@reslx390:~ > csh
reslx390 /home/train01> exit
exit
train01@reslx390:~ >
```

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11.0 Lab Eight

45. Use the `ls -a` command to display directories
46. Use the `-R` option of `ls` to display down file tree

```

RESLX390
train01@reslx390:~ > ls -a
.                .dayplan.priv  .jazz           .susephone      .xcoralrc       group
..               .dvipsrc       .kernrc         .tex             .xfm             owner
.Xdefaults       .emacs         .lyxrc          .uitrc.console  .xinitrc        symbolic.link
.Xmodmap         .exrc          .muttrc         .uitrc.vt100    .xserverrc.secure test
.Xresources      .gimprc        .nc_keys        .uitrc.vt102    .xsession
.bash_history    .grok          .profile        .uitrc.xterm    .xtalkrc
.bashrc          .history       .seyon          .urlview        .zsh
.dayplan         .hotjava       .stonxrc        .vimrc          all
train01@reslx390:~ > ls -aR
.:
.                .dayplan.priv  .jazz           .susephone      .xcoralrc       group
..               .dvipsrc       .kernrc         .tex             .xfm             owner
.Xdefaults       .emacs         .lyxrc          .uitrc.console  .xinitrc        symbolic.link
.Xmodmap         .exrc          .muttrc         .uitrc.vt100    .xserverrc.secure test
.Xresources      .gimprc        .nc_keys        .uitrc.vt102    .xsession
.bash_history    .grok          .profile        .uitrc.xterm    .xtalkrc
.bashrc          .history       .seyon          .urlview        .zsh
.dayplan         .hotjava       .stonxrc        .vimrc          all

./grok:
. .

./.hotjava:
. .. properties

./.seyon:
. .. phonelist protocols script.CIS script.PCBoard script.QWK script.unix startup

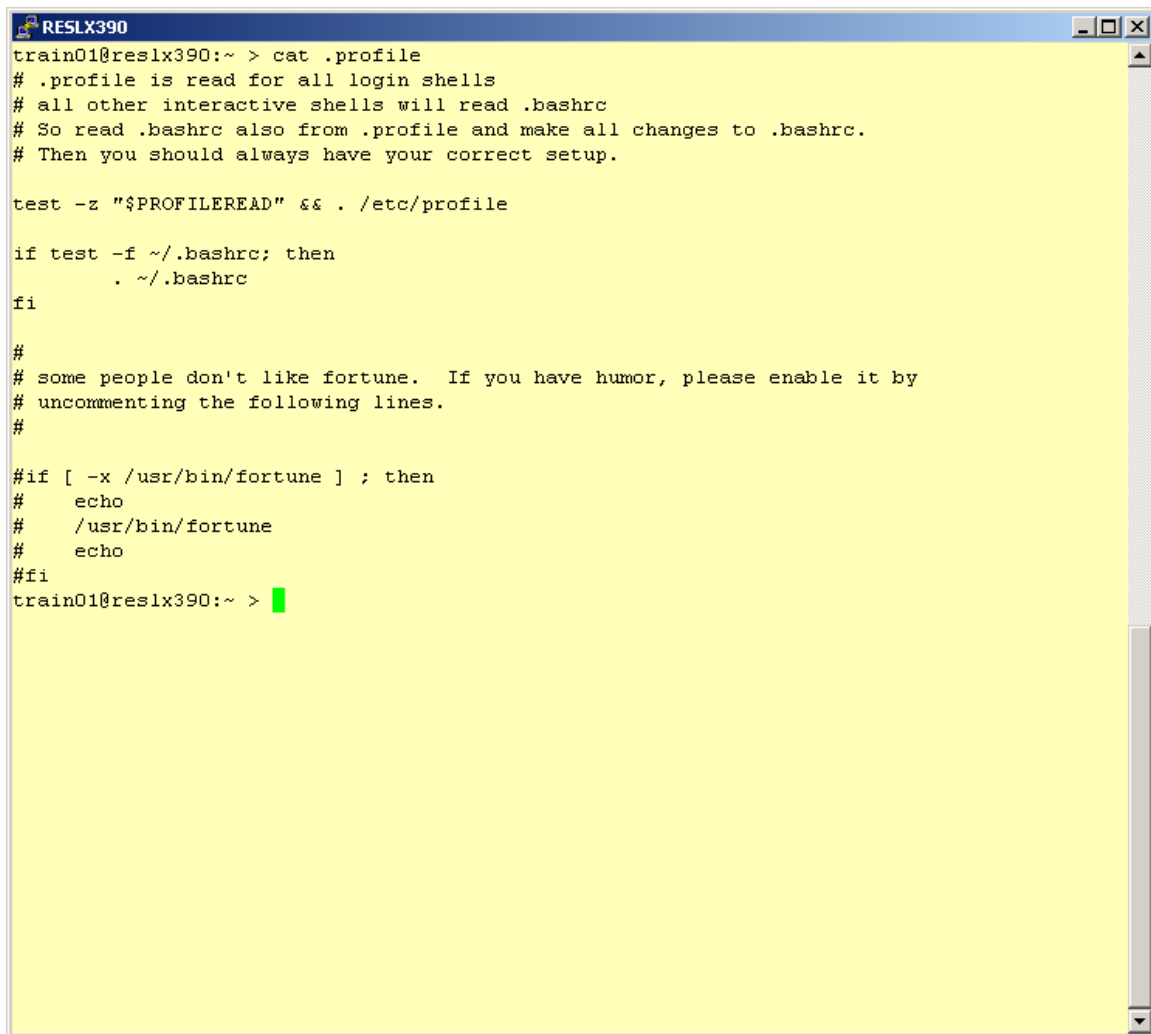
./xfm:
. .. Apps Graphics Hosts Toolbox magic xfmdev xfmrc

./test:
. .. real.file
train01@reslx390:~ >

```

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47. Use cat to display a file



```
RESLX390
train01@reslx390:~ > cat .profile
# .profile is read for all login shells
# all other interactive shells will read .bashrc
# So read .bashrc also from .profile and make all changes to .bashrc.
# Then you should always have your correct setup.

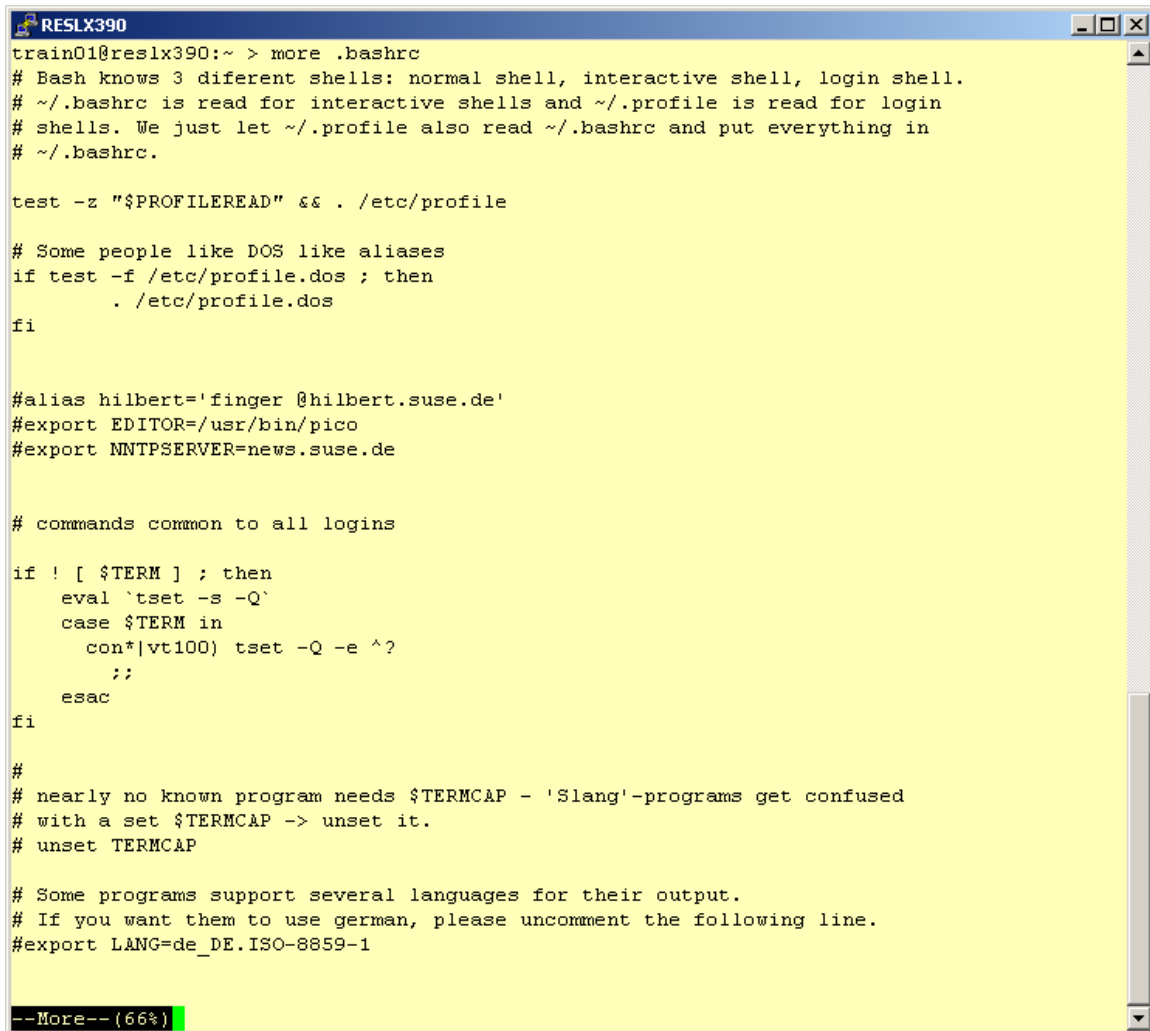
test -z "$PROFILEREAD" && . /etc/profile

if test -f ~/.bashrc; then
    . ~/.bashrc
fi

#
# some people don't like fortune.  If you have humor, please enable it by
# uncommenting the following lines.
#
#if [ -x /usr/bin/fortune ] ; then
#    echo
#    /usr/bin/fortune
#    echo
#fi
train01@reslx390:~ > █
```

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48. Use more to display a file one page at a time



```
RESLX390
train01@reslx390:~ > more .bashrc
# Bash knows 3 diferent shells: normal shell, interactive shell, login shell.
# ~/.bashrc is read for interactive shells and ~/.profile is read for login
# shells. We just let ~/.profile also read ~/.bashrc and put everything in
# ~/.bashrc.

test -z "$PROFILEREAD" && . /etc/profile

# Some people like DOS like aliases
if test -f /etc/profile.dos ; then
    . /etc/profile.dos
fi

#alias hilbert='finger @hilbert.suse.de'
#export EDITOR=/usr/bin/pico
#export NNTPSERVER=news.suse.de

# commands common to all logins

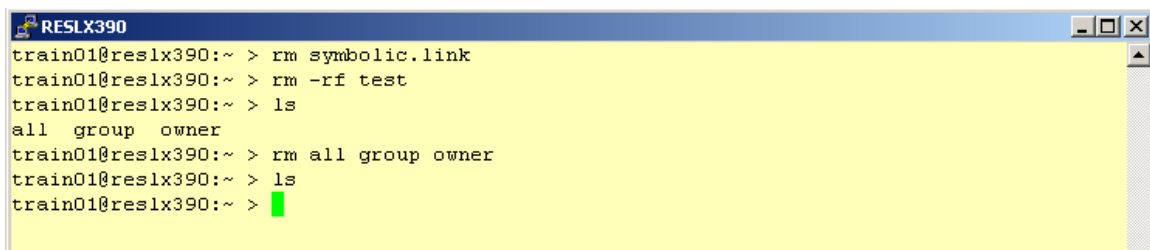
if ! [ $TERM ] ; then
    eval `tset -s -Q`
    case $TERM in
        con*|vt100) tset -Q -e ^?
        ;;
        esac
fi

#
# nearly no known program needs $TERMCAP - 'Slang'--programs get confused
# with a set $TERMCAP -> unset it.
# unset TERMCAP

# Some programs support several languages for their output.
# If you want them to use german, please uncomment the following line.
#export LANG=de_DE.ISO-8859-1

--More-- (66%)
```

49. Erase the link 'symbolic.link', erase the 'test' directory and its contents, then erase the 'all', 'group', and 'owner' files.



```
RESLX390
train01@reslx390:~ > rm symbolic.link
train01@reslx390:~ > rm -rf test
train01@reslx390:~ > ls
all group owner
train01@reslx390:~ > rm all group owner
train01@reslx390:~ > ls
train01@reslx390:~ >
```

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12.0 Appendix C. How to Speak 'Strine

(Courtesy of www.twi.ch & <http://australia-online.com/diction.html>.)

If you want to pass for a native of Australia try speaking slightly nasally, shortening any word of more than two syllables and then adding a vowel to the end of it, making anything you can into a diminutive (even the Hell's Angels can become mere bikies) and peppering your speech with as many expletives as possible.

12.1 Common Words

Arvo

Afternoon. “The Sarvo” means this afternoon, as in “Seeya the sarvo”. On Xmas morning a lot of people go to the beach to test out their new prezzies. But by the early arvo, they're at home stuffing themselves with Chrissie din-dins!

Avagoodweegend

Classic Aussie farewell comparable to American TGIF, basically means “Have a good weekend!”

Bend the Elbow

To have a drink - pretty well self-explanatory!

Bickie

Rhymes with “sticky”. Literally means a biscuit, but Aussie bickies are more like American cookies, and American biscuits are more like Australian scones (pronounced like the “Fonz”!)... go figure!

Bloody

Universal epithet: the great Australian adjective. Used to emphasize any point or story. Hence “bloody beauty”(bewdy!) or “bloody horrible” or even “absa-bloody-lutely”!

Bludger

Lazy bastard, definitely an insult in Oz. Originally thought to be someone who lives off the earnings of a call girl. In conversation, the verb 'to bludge' is most commonly used like the US 'to bum' a cigarette.

Bob's Yer Uncle

“Everything is OK” or “Everything's Sweet” or “Going according to plan”. Similar phrase includes: “She's apples!”... Bob may refer to Australia's long-serving Prime Minister , Sir Robert “Bob” Menzies.

Bon-Bons

Christmas Crackers. Special party favours which are essential on the Christmas table. Shaped like big lollies, their contents always include a corny joke or riddle, small plastic toy and a paper party hat (which must be worn by all who attend Chrissie dinner, even guests)

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Bonzer

Pronounced “bonza” - grouse, great, excellent.

Boxing Day

December 26th. Public holiday and traditional outdoor barbie day. Major Aussie sporting events kick off on this day including the 'Sydney to Hobart' and the 'Melbourne Test’.

Chew the Fat

To talk, engage in pleasant conversation, to have a chinwag.

Chook

Chicken. Often served barbecued at fancy turns (parties). If your hostess is befuddled and/or overcome by trying to do too many things at once, one might say she was “running around like a chook with its head cut-off!”

Chrissie

Christmas. By now you probably realize that Aussies like to shorten any words they can by adding an “o” or “ie” or “y”. No bloke named Christopher would be called Chrissie, probably 'Chrisso' or 'Toffa'.

Crack a Tinnie

Means to open up a can of beer major pastime during Aussie silly season.

Dial

Face. If some says to put a 'smile on your dial' it basically means to cheer up, she'll be right, mate.

Dunny

The toilet, W.C., or bathroom. If someone busting to know where the dunny is, tell 'em to “follow their nose to the thunderbox”.

Esky

Portable icebox or cooler - it's always a good idea to have one in the boot (trunk) of your car stocked with some cold ones (ice cold tubes) just in case the party's bar runs dry.

Fair Dinkum

Kosher, the real thing - as in “Fair Dinkum Aussie” (true blue Australian original). Often used by itself as a rhetorical question to express astonishment verging on disbelief ... “Fair Dinkum, mate?” (you' ve got to be kidding, haven't you?)

Full as a Goog

Completely filled with food (and drink). A 'Goog' is an egg (sometimes called a “googie egg”).

G'day

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Universal greeting, used anytime day or night, but never as a farewell. Pronounced “gud-eye”, usually followed by “mate” (mite) or a typically strung-together “howyagoinallright” (= how are you today, feeling pretty good?)

Good Onya

Omnipresent term of approval, sometimes ironic, offering various degrees of heartfelt congratulations depending on inflection. Indispensable during Aussie small talk - substitute “really, oh yeh, aha, etc.”

Good Tucker

Excellent food. After pigging out at Chrissie lunch, it's polite to tell your hosts how good the tucker was.

Grouse

Rhymes with “house” and means outstanding, tremendous. Can be applied universally to all things social ... “grouse birds (women), grouse band, in fact, grouse bloody gay and hearty (great party!)”

Happy as Larry

Fortunate, lucky. Who “Larry” is may forever be lost at the bottom of the Katherine Gorge.

Holls

Vacations or 'holidays'. Since most Aussies get at least 4 weeks 'holls' every year they usually take 2 or 3 of them at Chrissie which is our biggest family get together time (like US Thanksgiving).

Hooroo

Pronounced “who-roo”... means “see ya later”, make sure you don't say g'day when meaning goodbye - it's a dead giveaway you're not a true blue Aussie battler!

Laughing Gear

Mouth. Common phrase is “Wrap your laughing gear around this one” i.e. Have a drink!

Lolly

A sweet or candy. But to “Do Your Lolly” means to get agitated and angry, similar to “Spit the dummie”

Mate

Friend, associate, or anyone you can't remember the name of

Melbourne Test

Game of cricket played by Australia's national cricko team versus visiting country usually starting on Boxing day. The game lasts for up to 6 days, and is watched religiously on the TV (like a 5 day Superbowl)

Ocker

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Pronounced “ocka” - Typical uncultivated Australian, similar to American “redneck”.

Paralytic

Extremely drunk. Not good form too early on at a bash (party) especially if you end up having an “up & under” or “chunder” (puking or throwing-up while inebriated).

Plonk

Wine. Never used to describe the other main alcoholic beverage at an Australian social occasion - beer, i.e. the golden nectar, throat charmer, ice cold tube, etc.

Poets Day

Friday. Stands for P*ss off early, tomorrow’s Saturday.

Prezzie

A present or gift. If you've been a good little vegemite you'll probably get lots of bonza prezzies.

Pull your head In!

Use sparingly, since this equates a rather annoyed “shut up & mind your own business”. Only say this to the host if you know you're leaving (or off like a bride's nightie).

Raw Prawn

Not necessarily an uncooked shrimp! If someone says “Don't come the Raw Prawn with me, mate” it basically means “Don't try to fool me or rip me off” or “Rack off Noddy, you're being a tad offensive”.

Rels/Relos

Relatives, The family members you probably only see every Christmas!

Ripper

Pronounced “rippa” means beaut, tippy-tops, grouse - that bloke named “Jack” in the old Dart (England) was certainly not ripper!

Sheila

Archaic term now only found in Paul Hogan movies

Shout

To shout means to buy the next round (of drinks usually), so if someone says “It's your shout, mate” don't get vocal, just buy a couple of tinnies (cans of beer) and remain sociable, the next few drinks are someone else's responsibility!

Silly Season

Traditional summer holiday period, kicking off in December and running through to our national holiday Australia Day, January 26th (similar to the US July 4th).

Spit The Dummie

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A “dummie” is Australian for a child's pacifier. Your Hostess will not usually have cause to spit the dummie (completely lose her cool or go ballistic) if you and your mates can act like proper toffs (refined gentlemen) and enjoy the soiree!

Starters

This is the Australian for Hors D'oeuvres or “appetizers”. Aussies call their appetizers “entrees”. Also your first drink of the day, hence the ubiquitous question heard throughout the Silly Season: “What's for Starters?” Also commonly called a “Heart Starter”.

Strewth

This is pronounced “sta-ruth”. A general exclamation of disbelief or shock: i.e. “Strewth, would ya hava go at that, then?!” (My goodness, can you believe what we're seeing!?)

Sydney to Hobart

World famous Australian ocean Yacht race that commences on Boxing Day in Sydney Harbour boats from all around the world race down the East Coast across Bass Strait to our Apple Isle, “Tassie” (Tasmania).

The Go

Equivalent to the “rage” or current trendy thing. The latest trend in clothing or whatever is described as “all the go!”

Whinge

Rhymes with “hinge” as in door! Means to complain incessantly or to “belly ache” (= “whine”). Whingers are not fun to have around and definitely not likely to be asked back again to the next party. If you must whinge, keep it amongst your good mates!