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 reslx390.softwareag-usa.com (10.64.41.130).

1.1.2 SSH Client

To perform these lab exercises you will need access to a decent SSH 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 SSH session or allow you to configure and save various settings.
2.0 Labs

2.1 Lab One

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

1. Fire up the SSH client specifying reslx390.softwareag-usa.com 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

1. Find out what devices are mounted and what file systems are in use
2. 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.

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

1. Explore your filesystem:
   - Identify 1st level directories
   - Locate a symbolic link
   - Use the `umask` command to display current default
7. 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
8. Create a directory ‘test’ under your home directory
9. Create a file ‘real.file’ within this directory
10. Create a symbolic link in your home directory to ‘real.file’ called ‘symbolic.link’

2.7 Lab Seven

1. What shell are you using
11. Editing the command line:
   - Scrolling through past commands
   - Inserting/deleting characters on command line
   - Using editing key: CTRL-T
12. Try command completion:
   - Note what happens when you issue: `ls /etc/pro<TAB>`
13. 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.
1. 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.
14. Use the `-R` option of `ls` to display down file tree
15. Use `cat` to display a file
16. Use `more` to display a file one page at a time
17. Erase the link 'symbolic.link', erase the 'test' directory and its contents, then
    erase the 'all', 'group', and 'owner' files.
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 kaplooey, 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:

\texttt{vi /ect/studentnn}

No, that is not a misprint: I really want you to type “\texttt{vi /ect/studentnn}”. 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:
Without doing anything at all, I want you to look at your screen. Notice that the “/ect/studentnn” 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 file called “studentnn”. 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/studentnn 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?

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 “letters”. Put your 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 “d”, 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 /etc/studentnn. 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.

### 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:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>insert</td>
</tr>
<tr>
<td>o</td>
<td>open</td>
</tr>
<tr>
<td>dd</td>
<td>delete line</td>
</tr>
<tr>
<td>x</td>
<td>remove characters</td>
</tr>
<tr>
<td>u</td>
<td>undo</td>
</tr>
<tr>
<td>p</td>
<td>put</td>
</tr>
</tbody>
</table>
### 3.3 vi Quick Reference

#### STARTING AND QUITING VI

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>vi</code></td>
<td>starts vi without a named file to save to.</td>
</tr>
<tr>
<td><code>vi filename.txt</code></td>
<td>start vi on an existing file (or supply name to save to if no file yet exits.</td>
</tr>
<tr>
<td><code>&lt;Esc&gt;</code> key</td>
<td>puts you in edit mode if you weren't already there (the following commands only work in edit mode).</td>
</tr>
<tr>
<td><code>:q!</code></td>
<td>quit vi WITHOUT SAVING</td>
</tr>
<tr>
<td><code>:wq</code></td>
<td>write (save) to supplied file name and quit</td>
</tr>
<tr>
<td><code>&lt;Esc&gt;-ZZ</code></td>
<td>also saves and quits</td>
</tr>
<tr>
<td><code>:w newfile.txt</code></td>
<td>write to a new file and don't quit (still editing newfile.txt)</td>
</tr>
<tr>
<td><code>:wq newfile.txt</code></td>
<td>write to a new file and quit2) CURSOR MOVEMENTTh <code>&lt;j vk ^l&gt;</code></td>
</tr>
<tr>
<td><code>^</code> or 0</td>
<td>move cursor to start of line</td>
</tr>
<tr>
<td><code>$</code></td>
<td>move cursor to the end of the line</td>
</tr>
<tr>
<td><code>&lt;ctrl&gt; G</code></td>
<td>indicates current line number of file where cursor currently is</td>
</tr>
<tr>
<td><code>&lt;ctrl&gt; F</code></td>
<td>moves cursor ahead one page</td>
</tr>
<tr>
<td><code>&lt;ctrl&gt; B</code></td>
<td>moves cursor back one page</td>
</tr>
<tr>
<td><code>&lt;shift&gt; H</code></td>
<td>moves cursor to top of screen</td>
</tr>
<tr>
<td><code>&lt;shift&gt; L</code></td>
<td>moves cursor to bottom of screen</td>
</tr>
<tr>
<td><code>1G</code></td>
<td>move to line 1</td>
</tr>
<tr>
<td><code>G</code></td>
<td>moves to last line</td>
</tr>
<tr>
<td><code>w</code></td>
<td>advances by a word (W doesn't stop at punctuation)</td>
</tr>
<tr>
<td><code>b</code></td>
<td>backs up by a word (B as well)</td>
</tr>
<tr>
<td><code>e</code></td>
<td>go to the end of a word</td>
</tr>
</tbody>
</table>

#### BASIC EDITING
<table>
<thead>
<tr>
<th>Key</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>i</td>
<td>puts you in insert mode, press &lt;Esc&gt; to exit</td>
</tr>
<tr>
<td>I</td>
<td>^ then i</td>
</tr>
<tr>
<td>a</td>
<td>insert mode, but appending after cursor</td>
</tr>
<tr>
<td>A</td>
<td>$ then a</td>
</tr>
<tr>
<td>o</td>
<td>insert mode, opening new line below where you are</td>
</tr>
<tr>
<td>O</td>
<td>insert mode, opening new line above where you are</td>
</tr>
<tr>
<td>u</td>
<td>undo</td>
</tr>
<tr>
<td>x</td>
<td>deletes a single character; 5x deletes next 5 characters</td>
</tr>
<tr>
<td>J</td>
<td>deletes end-eof-line character (does a &quot;Join&quot; of current line with next line)</td>
</tr>
<tr>
<td>.</td>
<td>repeats last editing command</td>
</tr>
<tr>
<td>r</td>
<td>replaces current character with another</td>
</tr>
<tr>
<td>cw</td>
<td>changes remainder of current word to whatever you type; &lt;esc&gt; to end edit</td>
</tr>
<tr>
<td>/word</td>
<td>finds occurrence of 'word' in the file</td>
</tr>
<tr>
<td>n</td>
<td>finds next occurrence of 'word'</td>
</tr>
<tr>
<td>dd</td>
<td>deletes line</td>
</tr>
<tr>
<td>3dd</td>
<td>deletes 3 lines (from this line down)</td>
</tr>
<tr>
<td>23,50d</td>
<td>deletes lines 23-50, inclusive</td>
</tr>
<tr>
<td>3Y</td>
<td>&quot;yank&quot; three lines (place in unnamed buffer)</td>
</tr>
<tr>
<td>&quot;a3Y</td>
<td>Yank three lines to a buffer called 'a'</td>
</tr>
<tr>
<td>P</td>
<td>puts deleted (or yanked lines) below this line</td>
</tr>
<tr>
<td>P</td>
<td>puts deleted (or yanked lines) above this line</td>
</tr>
<tr>
<td>&quot;ap</td>
<td>places lines from buffer 'a'</td>
</tr>
</tbody>
</table>

**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"
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>:l,23s/word$/WORD/</code></td>
<td>From lines 1 to 23 replace &quot;word&quot; at the end of any line with &quot;WORD&quot;</td>
</tr>
<tr>
<td><code>:l,$s/^...//</code></td>
<td>From lines 1 to the end of the file remove &quot;...&quot; beginning any of those lines.</td>
</tr>
<tr>
<td><code>:g/word/d</code></td>
<td>Does a &quot;grep&quot; to find lines with 'word', then deletes those lines</td>
</tr>
<tr>
<td><code>:l,$s/\&amp;/and/g</code></td>
<td>Replaces every occurrence of &amp; (escaped) with &quot;and&quot;</td>
</tr>
<tr>
<td><code>:g/word/p</code></td>
<td>Does a &quot;grep&quot; to find lines with 'word', then prints those line to the screen</td>
</tr>
<tr>
<td><code>:3,15s/^/\#</code></td>
<td>Put a # at the beginning of lines 3 through 15</td>
</tr>
<tr>
<td><code>:%s/$;/</code></td>
<td>Append a semicolon to the end of every line (note that &quot;%&quot; = &quot;1,$&quot;)</td>
</tr>
</tbody>
</table>

**FILE OPERATIONS**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>:r path\filename</code></td>
<td>read in the specified file starting on the next line</td>
</tr>
<tr>
<td><code>:w</code></td>
<td>save</td>
</tr>
<tr>
<td><code>:w filename</code></td>
<td>save as filename</td>
</tr>
<tr>
<td><code>:wq</code></td>
<td>save and quit</td>
</tr>
<tr>
<td><code>:q</code></td>
<td>quit if no modifications since last save</td>
</tr>
<tr>
<td><code>:q!</code></td>
<td>quit no matter what (without saving)</td>
</tr>
</tbody>
</table>
:e filename

edit another file without having to quit and restart vi

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We do appreciate being advised of any such use: Email: tony@aplawrence.co
4.0 Lab One Answers

4.1 Using the Windows Client

1. SSH to host

18. Provide user id and password when prompted

19. Logout or exit to terminate the session
4.2 Using Putty

1. SSH to host

![PuTTY Configuration](image-url)
20. Provide user id and password when prompted

```
Welcome to SuSE Linux 7.0 (s390) - Kernel 2.2.16 (2).

rcslx390 login: train01
Password:
Last login: Tue Jul 10 18:55:31 from usanefe
Have a lot of fun...
train01@rcslx390:~ > 
```

21. Logout or exit to terminate session

```
Welcome to SuSE Linux 7.0 (s390) - Kernel 2.2.16 (2).

rcslx390 login: train01
Password:
Last login: Tue Jul 10 18:55:31 from usanefe
Have a lot of fun...
train01@rcslx390:~ > exit
```
5.0 Lab Two Answers

1. Get help on the `ls` command

```
Welcome to SuSE Linux 7.0 (<s390>) - Kernel 2.2.16 <2>.
```

```
res1x390 login: train01
Password:
Last login: Tue Jul 10 19:02:51 from usanefc
Have a lot of fun...
train01@res1x390:~> man ls
```

```
ls(1) PSF 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 ..
```

(Press q to exit from “man”)

---

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22. Find out who else is on the system

```
train01@reslx390:~ > who
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 2Jul1   7days 0:48s 0.25s -bash
userabc pts/1   userabc  4:12pm 2:53m 0.69s 0.42s -bash
train01 pts/2   userabc  7:28pm 1.00s 0.71s 0.23s -bash
```

23. What is your current directory

```
train01@reslx390:~ > pwd
/home/train01
```

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

```
train01@reslx390:~ > ls -l | >ls.output
```

```
/home/train01
```

```
train01@reslx390:~ > cat ls.output
```
6.0 Lab Three Answers

1. Use `ps -ef` to locate daemons

```
uid  pid  ppid  c   s  time  tty
root  1     0  Ju02  ? 00:00:09  init
root  3     0  Ju02  ? 00:00:00  [kcheck]
root  4     1  Ju02  ? 00:00:00  [kflush]
root  4     1  Ju02  ? 00:00:24  [kudotd]
root  5     1  Ju02  ? 00:00:00  [kiod]
root  6     0  Ju02  ? 00:01:56  [kamd]
bin 114    1  Ju02  ? 00:00:00  /sbin/ptxmap
dev 128    1  Ju02  ? 00:00:00  /sbin/psaux
dev 132    1  Ju02  ? 00:00:00  /sbin/klogd
sel 133    1  Ju02  ? 00:00:01  /usr/sbin/atd
sel 142    1  Ju02  ? 00:00:01  /usr/sbin/adm
sel 194    1  Ju02  ? 00:00:25  /usr/sbin/hpmdm -f /etc/httpd/ht sel 198    1  Ju02  ? 00:00:01  /usr/sbin/inetd
lp 206    194  Ju02  ? 00:00:00  lpd Waiting
wwwrun 209 194  Ju02  ? 00:00:00  /usr/sbin/hpmdm -f /etc/httpd/ht root 220    1  Ju02  ? 00:00:00  /usr/sbin/kerbroot
root 234    1  Ju02  ? 00:00:00  /usr/sbin/nsm STORAGE
root 241    1  Ju02  ? 00:00:14  /usr/sbin/cron
root 276    1  Ju02  ? 00:00:00  login -- root
root 318  276  Ju02  ? 00:00:00  -bash
dm 328    1  Ju02  ? 00:00:00  dmwait
dm 329  328  Ju02  ? 00:00:05  dmwait
dm 330  329  Ju02  ? 00:00:00  dmwait
dm 331  329  Ju02  ? 00:00:00  dmwait
dm 332  330  Ju02  ? 00:00:05  Scheduler
dm 333  330  Ju02  ? 00:00:00  dmwait
dm 334  330  Ju02  ? 00:00:00  dmwait
usafe 769  199  Ju02  ? 20:41:26  setvshome -- graphics
root 2842  1  Ju03  ? 00:00:07  /usr/sbin/rpc.mountd
root 2843  1  Ju03  ? 00:00:35  /usr/sbin/rpc.nfsm
root 2853  198  16:19  pts/1  00:00:00  login -- usafe
root 2853  20539  16:19  pts/1  00:00:00  login
usafe 28539  20539  16:19  pts/1  00:00:00  -bash
root 20000  1  16:29  pts/1  00:00:00  /usr/sbin/med
root 20001  20000  16:29  pts/1  00:00:00  /usr/sbin/med
root 20002  20001  16:29  pts/1  00:00:00  /usr/sbin/med
root 20003  20001  16:29  pts/1  00:00:00  /usr/sbin/med
root 20004  20001  16:29  pts/1  00:00:00  /usr/sbin/med
root 20005  20001  16:29  pts/1  00:00:00  /usr/sbin/med
root 20006  20001  16:29  pts/1  00:00:00  /usr/sbin/med
root 20007  20001  16:29  pts/1  00:00:00  /usr/sbin/med
root 21168 198  19:20  pts/1  00:00:00  in.telnetd: usafe
root 21169  21168  19:20  pts/1  00:00:00  login -- trainer
trainer 21170  21169  19:20  pts/2  00:00:00  -bash
root 21170  21169  19:20  pts/2  00:00:00  [cron (default)]
trainer 21171  21170  19:30  pts/2  00:00:00  ps -ef
train01reslx398:~ >
```

Or to be tricky:

```
train01reslx398:~ > ps -el | grep -E "httpd/inet"
root 199    1  Ju02  ? 00:00:25  /usr/sbin/httpd -f /etc/httpd/ht
```

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25. Use the `top` command to display system activity
7.0 Lab Four Answers

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

```
train01@res1x390:~$ df
Filesystem 1k-blocks Used Available Use% Mounted on
/dev/sde1d 1985260 1335380 556880 71% /
/dev/sde1d 2365520 1848992 475528 82% /home
/home/vsanfe/ThinkBlue64-7.1-disc1.iso 662122 662122 0 100% /mnt/ThinkBlue64/CD1
/home/vsanfe/ThinkBlue64-7.1-disc2.iso 259506 259506 0 100% /mnt/ThinkBlue64/CD2
```

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

```
train01@res1x390:~$ ls /proc
users       wait            zram
fcs         mlock          zinc
fs          mutex          zz
interrupts  ncpuinfo       cpups
list        panic          cpuinfo
kernel      page_size      crts
kmem        pagetsel       cpuinfo
kmeminfo    perf            dmi
kmeminfo    proc           dmidevice
kmeminfo    proc_stats     dmidev
kmeminfo    proc_vfs        dmidev_css
kmeminfo    proc_virt       dmidev_dmi
kmeminfo    proc_virtfs     dmidev_physinfo
kmeminfo    proc_virtfs    20537 21168 16 0 0 0
kmeminfo    proc_virtfs    114 216 32 768 0 0 0 0
kmeminfo    proc_virtfs    114 216 32 768 0 0 0 0
kmeminfo    proc_virtfs    128 209 32 320 0 0 0 0
kmeminfo    proc_virtfs    128 209 32 320 0 0 0 0
kmeminfo    proc_virtfs    132 200 32 33 0 0 0 0
kmeminfo    proc_virtfs    132 200 32 33 0 0 0 0
kmeminfo    proc_virtfs    198 200 32 33 0 0 0 0
kmeminfo    proc_virtfs    198 200 32 33 0 0 0 0
kmeminfo    proc_virtfs    20537 21168 16 0 0 0 0
kmeminfo    proc_virtfs    20537 21168 16 0 0 0 0
kmeminfo    proc_virtfs    20537 21168 16 0 0 0 0
kmeminfo    proc_virtfs    20537 21168 16 0 0 0 0
kmeminfo    proc_virtfs    20537 21168 16 0 0 0 0
kmeminfo    proc_virtfs    20537 21168 16 0 0 0 0
```

```
train01@res1x390:~$ more /proc/cpupinfo
vendor_id : IBM/390
number cpu : 1
```

```
train01@res1x390:~$ ls /sys/fs/cgroup/cpu
1
```

```
train01@res1x390:~$ ls /sys/fs/cgroup/cpu/0
```

```
train01@res1x390:~$ ls /sys/fs/cgroup/cpusets
```
8.0 Lab Five Answers

1. Explore the file system
   - `cd /`
   - `ls`
   - `cd ~`
   - `pwd`
9.0 Lab Six Answers

1. Explore your file system
   - Identify 1st level directories

   ![Command Prompt]
   ```
   train01@reslx390:~ > ls
   bin  cdev  etc  home  inst+found opt  root  suse  usr
   boot  dev  floppy  lib  mnt  proc  sbin  tmp  var
   train01@reslx390:~ >
   ```

   - Locate a symbolic link

   ![Command Prompt]
   ```
   train01@reslx390:~ > ls -l /lib
   total 10780
   drwxr-xr-x  2 root  root  4096 Nov 29 2000 YaSI
   lrwxrwxrwx  1 root  root  12 Nov 29 2000 cpp -> /usr/bin/cpp
   lrwxrwxrwx  1 root  root  36798 Nov 3 2000 ld-2.1.3.so
   lrwxrwxrwx  1 root  root  11 Nov 29 2000 ld.so.1 -> ld-2.1.3.so
   lrwxr-xr-x  1 root  root  21498 Nov 3 2000 libBrokenLocale.so.1
   ```

   - Use the umask command to display the current default

   ![Command Prompt]
   ```
   train01@reslx390:~ > umask
   `'
   train01@reslx390:~ >
   ```

27. 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
   - owner - give r/w permission to owner, r/o to group, and none to others

   ![Command Prompt]
   ```
   train01@reslx390:~ > touch all group owner
   train01@reslx390:~ > ls -l all group owner
   -rw-r--r- 1 train01 training 0 Jul 10 20:01 all
   -rw-r--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 666 all
   train01@reslx390:~ > chmod 664 group
   train01@reslx390:~ > chmod 640 owner
   train01@reslx390:~ > ls -l all group owner
   -rw-rw-r- 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
   ```
28. 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’
10.0 Lab Seven Answers

1. What shell are you using (see screen shot under “Invoke the C shell”)

29. 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>, <DEL>, <INS> keys
   - Use the <CTRL-T> to correct spelling errors on the command line

30. Try command completion:
   - Note what happens when you issue: \ls /etc/pro<TAB>

31. Invoke the C shell (and then exit)
11.0 Lab Eight

1. Use the `ls -a` command to display directories

32. Use the `-R` option of `ls` to display down file tree
33. Use `cat` to display a file

```
train01@resix390:~ > 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 -z ~/.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
#else
train01@resix390:~ >
```
34. Use `more` to display a file one page at a time

```
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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)

**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
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

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**

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**

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**

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**

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!