西南林業大學
SOUTHWEST FORESTRY UNIVERSITY

大数据与智能工程学院

《Linux 应用》课程实验报告

艾学习 (20251152xxx)

计算机科学与技术 2025 班

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目录

1 实习目的

熟练掌握 Linux 平台的使用，掌握基本命令及基本的 shell 编程，了解 Linux 平台上的常用软件开发环境及开发步骤。

2 实验要求

1. 在 Linux 平台完成所有实验
2. 在 Linux 平台完成实验报告
3. 努力尝试用英文撰写实验报告
4. 将实验作业及报告以 tgz 格式打包，并上传到指定教学网站
5. 迟交报告将被扣分

3 实验主要内容（含工具、方法等）

详见《实验指导书》。

- https://cs6.swfu.edu.cn/~wx672/lecture_notes/linux/bash/shell_basics.html
- https://cs6.swfu.edu.cn/~wx672/lecture_notes/linux/c/c_dev.html

3.1 Basic Commands and Concepts

3.1.1 Try the following commands

```
pwd; ls; cd; mkdir; cat; less; man; echo; help;
mv; cp; rm;
vi;
```

Answer:

```
# pwd - shows the present working directory.
pwd
# Output: /tmp

# ls - list files in current dir.
ls
# Output: lots of files and directories.

# cd - change directory
cd      # go home
cd /tmp # get into /tmp dir

```

```
# mkdir - create a new dir
mkdir /tmp/coursework # create a new dir coursework inside /tmp
mkdir -p /tmp/coursework/programming/{c,bash,python} # gets a set of dirs

# cat - concatenate files
cat > /tmp/tmp.txt # write into /tmp/tmp.txt
cat /tmp/tmp.txt   # show content of /tmp/tmp.txt
cat >> /tmp/tmp.txt # appned into it
cat /tmp/tmp.txt > /tmp/a.txt # copy tmp.txt to a.txt in /tmp

# less - view a file
less /tmp/a.txt # read a.txt

# man - read manual
man less # read the manual of less

# echo - write to stdout
echo 'hello, world!'
echo $PATH  # output the value of the variable PATH

# help - show help message of bash built-in commands
help echo

# mv - rename/move files
mv /tmp/a.txt /tmp/b.txt

# cp - copy
cp /tmp/b.txt /tmp/c.txt

# rm - remove files
rm /tmp/c.txt

# vi - a text editor
```

3.1.2 Try the following CLI shortcuts

- C-a, C-e, C-f, C-b, C-n, C-p, C-u, C-k, C-y, C-d, C-r, TAB

Answer:

- Ctrl-a: beginning of line
- Ctrl-e: end of line
- Ctrl-f: forward
- Ctrl-b: backward
- Ctrl-n: next
- Ctrl-p: previous
- Ctrl-r: reverse search
- Ctrl-u: cut to beginning
- Ctrl-k: kill (cut to end)
- Ctrl-y: yank (paste)
- Ctrl-d: delete a character

- TAB: magic key, completion

3.1.3 Output redirection (>, >>)

- To show the current time and date on the screen, you can do `date`. What if you do `date > file1`?
  Answer: Output to file1.
- To show a string on the screen, you can do `echo 'Hello, world'`. How to output to file1?
  Answer: `echo 'Hello, world!' >> file1`. This can append to file1.

3.1.4 Wildcard characters (*, ?)

Suppose you have `file1`, `file2`, `hello`, `hello.c` in `/tmp` dir, and two dirs `f` and `h` in `/tmp`. What do the following commands do?

`- mv f* f - mv h* h`

Answer:

- move `file1` and `file2` to `/tmp/f/`
- move `hello` and `hello.c` to `/tmp/h/`.

Suppose you have files fa fb fc faa fbb fcc faaa fbbb fccc in `/tmp/` dir. What's the output of `ls f?`, `ls f??`, `ls f???`?

Answer:

- `ls f?` shows `fa fb fc`
- `ls f??` shows `faa fbb fcc`
- `ls f???` shows `faaa fbbb fccc`

`?` means matching *any one character*.

3.1.5 Understanding `ls -l`

Answer:

```
-rw------- 1 sam sam    57 Apr 17  1998 weather.txt
drwxr-xr-x 6 sam sam   102 Oct  9  1999 web_page
-rw-rw-r-- 1 sam sam 27648 Feb 11 20:41 web_site.tar
-rw------- 1 sam sam   574 Dec 16  1998 xmas_file.txt


                                      File Name

                                 Modification Time

                            Size (in bytes)

                          Group

```

```
                              Owner

                            Number of hard links

                          File Permissions

                        File types
```

File types • “d” — directory • “-” — regular file • “l” — soft link • “c” — character device • “b” — block device • “s” — socket • “p” — named pipe (FIFO)

File modes

```
drwxr-xr-x 2 wx672 wx672 4096 Sep 26 17:59 f/
drwxr-xr-x 2 wx672 wx672 4096 Sep 26 20:49 f-test/
drwxr-xr-x 2 wx672 wx672 4096 Sep 26 18:00 h/



           Other's permission
          Group's permission
         Owner's permission
```

- “rwx” — readable, writable, executable
- “r-x” — readable, not writable, executable
- “r–” — readable, not writable, not executable
- “—” — not readable, not writable, not executable

3.1.6 File modes (`chmod`)

Comment on the following commands:

Answer:

```
chmod 777 f # everyone can rwx
chmod 700 f # owner can rwx, anyone else can do nothing
chmod 600 f # owner can rw-, anyone else can do nothing
chmod 000 f # nobody can do anything
chmod 755 f # owner can rwx, anyone else has r-x
chmod a+rwx f # same as 777
chmod a-rwx f # same as 000
chmod go-rwx f # group member and other users can do nothing
chmod u+x f # # add executable permission to owner
```

3.1.7 Shell variables

Show the values of these variables: PATH, PWD, HOME, USER.

Answer:

```
echo $PATH
echo $PWD
echo $HOME
echo $USER
```

What does `PATH="./:$PATH"` do?

Answer: Change the value of `PATH` by prepending it with `./`.

4 指导教师评语

Good!

成绩: B

指导教师（签名）:

2025 年 11 月 1 日