

# CSCI 132 Practical Unix Programming

## Homework 4

### Solution

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#### **PART 1**

Do exercises 2 and 3 of chapter 4; 1, 2, 3, and 5 of chapter 5; 1, 3, and 5 of chapter 6; and 1, 4, 6, and 7 of chapter 7.

Chapter 5:

ex1:

r-rw-r-: this is readable by everyone, but only members of the group can modify it.

rw-w-w-: this is writable by everyone, but only the owner can read it.

rwxr-xr-x: this is readable and writable and executable by the owner, but only readable and executable by everyone else.

r-r-rw-: this is readable by the owner and the group. But it is only writable by everyone else.

-w-w-w-: this is writable by everyone, but it is not readable.

r-x-x-x: this is readable and executable by the owner, but only executable by everyone else. It is not writable.

ex2: Translating the permissions above to binary:

r-rw-r-: 464

rw-w-w-: 622

rwxr-xr-x: 755

r-r-rw-: 446

-w-w-w-: 222

r-x-x-x: 511

ex3: translate the umask values (note: umask indicates what is masked)

007: rwxrwx—

111: rw-rw-rw-

272: r-x—r-x

077: rwx——

222: r-xr-xr-x

544: -w-wx-wx

: 777: ——

733: —r-r-

754: —w-wx

ex5:

The id command shows that user smith belongs to group users.

ls -lgF displays:

```
drw-r--r-- 2 root    users  ...  sh/
drwxr-xr-x 2 shakes  root   ...  shakes/
drw----- 2 meademd com435 ...  tmp/
drwxr-x--- 3 smith   users  ...  viewer/
drwx----- 3 jin     users  ...  Zot!/
```

The first directory cannot be modified because there is no permission w for the group or others. Although there is an r permission, but files in this directory cannot be listed because there is no x permission. Note that both r and x are needed for directories to be listed.

The second directory can be only listed but not modified. There is no w permission for the group or other users.

The third directory cannot be modified or listed.

The fourth directory is owned by user smith. Therefore, according to the first set of permission, can be modified and listed.

The fifth directory cannot be modified or listed due to the lack of permission in both the group and others.

Chapter 6:

ex:1

the difference is the following: cp creates another copy of the file, mv simply moves the file or renames it.

ex3:

If an operating system has a rename command, then if it must include either copy or move, it must be copy, because otherwise, one cannot make copies of a file. To move the file, we can then rename it, and copy it to another location.

ex 5:

rmdir is safer than `rm -r` because `rmdir` deletes the directory only if it is empty, but `rm -r` recursively deletes the directory and its content.

## PART 2

The Unix command `less` is a newer program that offers the same functionality as `more` but allows you to move back in a file. Use `man less` to learn about the `less` command and its options, and how to use it. Report your finding, especially on how to move back in a file.

## PART 3

(a) The following command could be simplified, why and how?

```
cat filename | more
```

We could simply do the following: `more filename`, because `cat` displays the file and pipes its output to `more`, so we can immediately provide the input to `more` by typing `more` followed by the file name.

(b) Use pipes and a combination of commands to output the number of files in the given directory.

```
ls -al | wc -l
```

This lists all the files in the directory in one column and pipes the output to `wc`, which counts the lines.

(c) Type the following `sed` command:

```
sed 's/\(.* \)*//'
```

Then repeatedly input a sentence and observe the output. What does this command do to your input? To stop it hit `Ctrl-C`.

This replaces the entire line by the last word.

(d) Try the command `cal`, what does it produce?

This displays the calendar for the current month.

(e) Using pipes and a combination of `cal`, `tail`, `head`, and `sed`, output the last day of the current month (it should be either 28, 29, 30, or 31). Change your `.cshrc` to alias this entire command and give it a nice name; for instance, call it `lastday`.

```
cal — tail -1 — sed 's/.**/'
```

This extracts the last line of the calendar output, then pipes it to the sed command, which extracts the last word, in this case, either 28, 29, 30, or 31. Which is what we want. To save this whole command in an alias, we can add the following to `.cshrc`

```
alias lastday = cal — tail -1 — sed 's/.**/'
```