# Basic Linux Commands (Part 2)

## Due date

- End of Week 4 lab class

## Evaluation

- 3% of final grade.

## Submission

Hand in or email (in email subject line: CST8102-15W lab3 submission) completed lab before due date.

## Materials

- Student laptop computer
- Ubuntu 14.04.1 installed in VMWare Workstation

## Procedure

## Command touch

The **touch** command updates different time stamps. As a side benefit it is used to create empty files.

***Exercise #1: Creating empty files & updating the modification time***

1) user@localhost :~$ **`touch clock`**
2) user@localhost :~$ **`ls -l clock`**
    - Record the time stamp:

      `-rw-rw-r - - 1 amin amin 0 Jan 22 16:53 clock`
3) user@localhost :~$ **`sleep 61`**

   Wait for one minute.

4) user@localhost :~$ **`touch clock`**
5) user@localhost :~$ **`ls -l clock`**
    - Record the time stamp:

      `-rw-r2-r- - 1 amin amin 0 Jan 22 16:56 clock`

## Command: cp

The **cp** command makes a copy of an existing set of files or directories into another area of the system.
The syntax for the cp command is:

- **cp** ***[-r] source destination***

***Exercise #2: Copying files to a directory***

1) user@localhost :~$ **`mkdir lab3ex`**
2) user@localhost :~$ **`cd lab3ex`**
3) user@localhost :~/lab3ex$ **`touch f1 f2 f3`**
4) user@localhost :~/lab3ex$ **`ls`**
    - What is the output of that command?

      `f1 f2 f3`

**5)** user@localhost :~/lab3ex$ **`mkdir lab3`**

**6)** user@localhost :~/lab3ex$ **`ls`**

- What is the output of that command?

`f1 f2 f3 lab3`

**7)** user@localhost :~/lab3ex$ **`cp f1 f2 f3 lab3`**

**8)** user@localhost :~/lab3ex$ **`ls lab3`**

- What is the output of that command?

`f1 f2 f3`

**9)** user@localhost :~/lab3ex$ **`mkdir coffee`**

**10)** user@localhost :~/lab3ex$ **`cd coffee`**

**11)** user@localhost :~/lab3ex/coffee$ **`touch cream sugar`**

**12)** user@localhost :~/lab3ex/coffee$ **`cd ..`**

**13)** user@localhost :~/lab3ex$ **`cp coffee/cream coffee/sugar lab3`**

**14)** user@localhost :~/lab3ex$ **`ls lab3`**

- What is the output of the command?

`cream f1 f2 f3 sugar`

***Exercise #3: Copying directories to a directory (-r option)***

**1)** user@localhost :~/lab3ex$ **`mkdir dir1 dir2 dir3`**

- Record the command that you use to verify that the directories have been created? `ls`

**2)** user@localhost :~/lab3ex$ **`cp dir1 dir2 dir3 lab3`**

- Record one of the messages displayed on the screen:

```
cp: omitting directory 'dir1'
cp: omitting directory 'dir2'
cp: omitting directory 'dir3'
```

**3)** user@localhost :~/lab3ex$ **`ls lab3`**

- Have the directories been copied? `no`

4) user@localhost :~/lab3ex$ **cp -r dir1 dir2 dir3 lab3**

5) user@localhost :~/lab3ex$ **ls lab3**

- Have the directories been copied? yes

6) user@localhost:~/lab3ex$ **sudo apt-get install tree**

- *(hint: the above command installs "tree" command which is not included in the default Ubuntu installation)*

7) user@localhost:~/lab3ex$ **tree**

***Exercise #4: Copying directories to a directory , cont'd (-r & --parents option)***

1) user@localhost :~/lab3ex$ **mkdir -p parent/child**

2) user@localhost :~/lab3ex$ **cd parent ; touch f1 ; cd ..**

3) user@localhost :~/lab3ex$ **cp -r --parents parent/child lab3**

4) user@localhost :~/lab3ex$ **tree lab3**

What is the output of the command?

```
Lab3
|- cream
|- dir1
|- dir2
|- dir3
|- f1
|- f2
|- f3
|- parent
|        |__child
|__ sugar
```

## Command: mv

The **mv**, for Move File or Directory, command moves files and directories to a different directory. It is also used to rename files within the same directory.
The syntax for the mv command is:

- **mv** ***source destination***

***Exercise #5: Renaming files***

1) user@localhost :~/lab3ex$ **cd lab3**

2) user@localhost :~/lab3ex/lab3$ **mv f1 m1**

**3)** user@localhost :~/lab3ex/lab3$ **`ls`**

- Has the file been renamed from **f1** to **m1**?

  yes

*Exercise #6: Moving files*

**1)** user@localhost :~/lab3ex/lab3$ **`touch red green blue`**

**2)** user@localhost :~/lab3ex/lab3$ **`mkdir colors`**

**3)** user@localhost :~/lab3ex/lab3$ **`mv red green blue`**

**4)** Record the error message:

`mv : target 'blue' is not a directory`

**5)** user@localhost :~/lab3ex/lab3$ **`mv red green blue colors`**

**6)** user@localhost :~/lab3ex/lab3$ **`ls`**

- Are the files red, green and blue still in the current directory?

  no

**7)** user@localhost :~/lab3ex/lab3$ **`ls colors`**

- Have the files been moved?

  yes

*Exercise #7: Moving directories*

**1)** user@localhost :~/lab3ex/lab3$ **`mkdir toddlers children sandbox`**

**2)** user@localhost :~/lab3ex/lab3$ **`mv toddlers children sandbox`**

- Are the toddlers and children in the **sandbox**?

yes

3) user@localhost :~/lab3ex/lab3$ **cd ..**

**Command: rm**

The **rm** or Remove Files or Directory command allows you to delete the content of any directory. It is both a dangerous and useful command because of its flexibility. Unlike DOS and Windows, a file that is deleted in Linux is gone.
The syntax for the rm command is:

- **rm** ***file_list***

***Exercise #8: Deleting files***

1) user@localhost :~/lab3ex$ **cd lab3/sandbox**
2) user@localhost :~/lab3ex/lab3/sandbox$ **touch child1 child2 child3**
3) user@localhost :~/lab3ex/lab3/sandbox$ **ls**
   - Are child1,child2 and child3 in the sandbox? yes
4) user@localhost :~/lab3ex/lab3/sandbox$ **rm child1 child2 child3**
5) user@localhost :~/lab3ex/lab3/sandbox$ **ls**
   - Are child1,child2 and child3 still in the sandbox? no
6) user@localhost :~/lab3ex/lab3/sandbox$ **cd ..**
7) user@localhost :~/lab3ex/lab3$ **rmdir sandbox**
   - Record the error message

     rmdir : failed to remove 'sandbox' : Directory not empty
8) user@localhost :~/lab3ex/lab3$ **cd ..**

***Exercise #9: Deleting directories***

1) user@localhost :~/lab3ex$ **`rmdir lab3`**
   - Record the error message:

`rmdir : failed to remove 'lab3' : Directory not empty`

2) user@localhost :~/lab3ex$ **`rm -r lab3`**
   - Has the directory been deleted?

`yes`

## Command: cat

Cat is an utility to view, create, or append to small files.

***Exercise #10: Viewing files with cat***

1) user@localhost :~/lab3ex$ **`cd ; cat /etc/issue`**
2) user@localhost :~$ **`cat /etc/fstab`**
3) user@localhost :~$ **`cat /etc/issue /etc/fstab`**
4) user@localhost :~$ **`cat .bashrc | more`**

***Exercise #11: Clear screen with command clear***

- user@localhost :~$ **`clear`**

## Output redirection

***Exercise #12: Redirect output to a file***

- user@localhost:~$ **`ls -al ~/ > lsout`**
- user@localhost:~$ **`cat lsout`**
- user@localhost:~$ **`ls -al / > lsout`**

- user@localhost:~$ **`cat lsout`**

  Is "**lsout**" overwritten? yes

- user@localhost:~/ $ **`ls –a /etc >> lsout`**
- user@localhost:~/lab6$ **`cat lsout | more`**

  Is "**lsout**" overwritten? yes

***Exercise #13: Not to overwrite a file***

- user@localhost:~$ **`set –C`**

- user@localhost:~$ **`ls /home > lsout`**

  Record the message: bash: lsout : cannot overwrite existing file

## Review exercise

Assume that the commands listed below are executed in the **user's home directory**.

1. **`cd ; mkdir –p ~/lab3rv/linux`**
2. **`cd lab3rv/linux`**
3. **`touch ubuntu fedora`**
4. **`cp ubuntu fedora ../`**
5. **`cp fedora mint`**
6. **`mv fedora ~/lab3rv`**
7. **`mv ubuntu arch`**
8. **`mkdir –p ~/lab3rv/windows ; cd ~/lab3rv/windows`**
9. **`touch win7 win8`**
10. **`cp –r ~/lab3rv/windows ~/lab3rv/linux`**
11. **`cd ..`**
12. **`rm –r ~/lab3rv/windows`**

Answer the following questions after executing the 12 commands above:

1. How many **directories** are created during the review exercise? (Including deleted directories) 2

   List them using absolute paths:

```
~/home/amin/lab3rv
~/home/amin/lab3rv/linux
```

**2.** How many **regular files** remain in the directory ~/**lab3rv**? 2

(Do not include files in sub-directories).

List them using absolute paths:

```
~/home/amin/lab3rv/fedora
~/home/amin/lab3rv/ubuntu
```

**3.** How many **regular files** are left in the directory **~/lab3rv/linux**? 2

(Do not include files in sub-directories).

List them using relative paths ( Assume the current directory is the user's home directory):

```
/linux/arch
/linux/mint
```

4. What is the **current** directory at the end of the review exercise?

```
/home/amin/lab3rv
```

**5.** How many directories are deleted successfully? 1

List them using absolute paths:

```
~/home/amin/lab3rv/windows
```