Manipulating Files and Directories

mkdir –make directories

-p will also create all directories leading up to the given directory that do not exist already. If the given directory already exists, ignore the error.

```
eureka@ubuntu:~/test$ ls
eureka@ubuntu:~/test$ pwd
/home/eureka/test
eureka@ubuntu:~/test$ mkdir -p
/home/eureka/test/another_dir/final_dir
eureka@ubuntu:~/test$ ls -l *
another_dir:
total 4
drwxrwxr-x 2 eureka eureka 4096 Jul  2 07:41 final_dir
```

cp – copy files

```
eureka@ubuntu:~/test$ ls -l */*
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:39 a_dir/file.txt

another_dir/final_dir:
total 0
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:30 1.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:30 2.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:30 3.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:29 test
eureka@ubuntu:~/test$ cp another_dir/final_dir/* a_dir
eureka@ubuntu:~/test$ ls -l */*
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:39 a_dir/1.mp3
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:39 a_dir/2.mp3
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:39 a_dir/3.mp3
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:39 a_dir/file.txt
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:39 a_dir/test

another_dir/final_dir:
total 0
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:30 1.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:30 2.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:30 3.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:29 test
```

-u copy only when the SOURCE file is newer than the destination file or when the destination file is missing

```
eureka@ubuntu:~/test$ ls -l */*
-rw-rw-r-- 1 eureka eureka     0 Jul  2 07:28 a_dir/test

another_dir/final_dir:
total 0
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:25 1.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:25 2.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:25 3.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:25 test
eureka@ubuntu:~/test$ cp -u another_dir/final_dir/* a_dir
eureka@ubuntu:~/test$ ls -l */*
-rw-rw-r-- 1 eureka eureka     0 Jul  2 07:29 a_dir/1.mp3
-rw-rw-r-- 1 eureka eureka     0 Jul  2 07:29 a_dir/2.mp3
-rw-rw-r-- 1 eureka eureka     0 Jul  2 07:29 a_dir/3.mp3
-rw-rw-r-- 1 eureka eureka     0 Jul  2 07:28 a_dir/test

another_dir/final_dir:
total 0
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:25 1.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:25 2.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:25 3.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:25 test
```

mv – move and rename files

```
eureka@ubuntu:~/test/a_dir$ ls
1.mp3  2.mp3  3.mp3  file.txt  test
eureka@ubuntu:~/test/a_dir$ mv test test.txt
eureka@ubuntu:~/test/a_dir$ ls
1.mp3  2.mp3  3.mp3  file.txt  test.txt
```

Move directories

```
eureka@ubuntu:~/test$ ls -l */*
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:39 a_dir/1.mp3
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:39 a_dir/2.mp3
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:39 a_dir/3.mp3
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:39 a_dir/file.txt
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:39 a_dir/test

another_dir/final_dir:
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:30 1.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:30 2.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:30 3.mp3
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:29 test
eureka@ubuntu:~/test$ mv another_dir/final_dir/* a_dir
eureka@ubuntu:~/test$ ls -l */*
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:30 a_dir/1.mp3
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:30 a_dir/2.mp3
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:30 a_dir/3.mp3
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:39 a_dir/file.txt
-rw-rw-r-- 1 eureka eureka    0 Jul  2 07:29 a_dir/test

another_dir/final_dir:
total 0
```

rsync - a fast, versatile, remote (and local) file-copying tool

rsync algo http://cs.anu.edu.au/techreports/1996/TR-CS-96-05.html

-n option to dry run

-v verbose

-a archive. equals -rlptgoD

/./ to copy directories so they line up

-R use relative paths. This means that the full path names specified on the command line are sent to the server rather than just the last parts of the filenames. This is particularly useful when you want to send several different directories at the same time.

Ex: `rsync -Ravn  /target/blah/./ /destination/blah`

rm – remove files. I recommend doing a dry run of file deletes with something like print, if not using interactive. When using wildcards, remember to not have spaces where you don't want them!

```
eureka@ubuntu:~/test/a_dir$ ls
1.mp3   2.mp3   3.mp3   test.txt
eureka@ubuntu:~/test/a_dir$ rm *.mp3
eureka@ubuntu:~/test/a_dir$ ls
test.txt
```

-i interactive

```
eureka@ubuntu:~/test/a_dir$ ls
1.mp3   2.mp3   3.mp3   test.txt
eureka@ubuntu:~/test/a_dir$ rm -i *.mp3
rm: remove regular empty file `1.mp3'? y
rm: remove regular empty file `2.mp3'? y
rm: remove regular empty file `3.mp3'? y
```

-r recursive

```
eureka@ubuntu:~/test$ ls */*
a_dir/new_test   a_dir/test.txt

another_dir/final_dir:
eureka@ubuntu:~/test$ rm -r a_dir
eureka@ubuntu:~/test$ ls
another_dir
```

Show how many files will be deleted and how long it will take to delete

```
eureka@ubuntu:~/test/a_dir$ ls -1 | wc -l && time find . -type f -
printf
4
./4.mp3
./2.mp3
./3.mp3
./1.mp3

real  0m0.021s
user  0m0.000s
sys   0m0.012s
```
```
eureka@ubuntu:~/test/a_dir$ ls
1.mp3  2.mp3  3.mp3  4.mp3
```
```
eureka@ubuntu:~/test/a_dir$ ls -1 | wc -l && time find . -type f -
delete
4

real  0m0.020s
user  0m0.004s
sys   0m0.004s
```
```
eureka@ubuntu:~/test/a_dir$ ls
eureka@ubuntu:~/test/a_dir$
```

To delete a file that starts with '-', use absolute path

ex: `rm /home/-f`

Safety protection on files and need to manually say delete?

yes- outputs an affirmative response

`eureka@ubuntu:~/test/a_dir$ yes|rm -I *mp3`

ln – create links

-s symbolic link. This is a short cut or reference to an actual file or directory.
Might be helpful if you don't want to move your files all around if the file/directory
structure changes.

```
eureka@ubuntu:~/test/a_dir$ ls -l
total 0
-rw-rw-r-- 1 eureka eureka 0 Jul  2 07:52 test.txt
```
```
eureka@ubuntu:~/test/a_dir$ ln -s test.txt new_test
```
```
eureka@ubuntu:~/test/a_dir$ ls -l
total 4
lrwxrwxrwx 1 eureka eureka  8 Jul  2 08:08 new_test -> test.txt
-rw-rw-r-- 1 eureka eureka 10 Jul  2 08:08 test.txt
```

readlink - - read the contents of a symbolic link

```
eureka@ubuntu:~/test/a_dir$ ls -l
total 4
lrwxrwxrwx 1 eureka eureka    8 Jul  2 08:12 new_test -> test.txt
drwxrwxr-x 2 eureka eureka 4096 Jul  2 08:12 test.txt
eureka@ubuntu:~/test/a_dir$ readlink new_test
test.txt
```

tar – tape archive

-c create a new archive

-v verbose

-f following is the archive file name

-z filter the archive through gzip

-x extract files from archive

gzip – gnu zip

ex: `tar cvzf archive.tar.gz dirname/`

ex: `tar xvfz archive_name.tar.gz`