**Useful commands**

**1. Login:**

Might be useful for Mac users to connect to the VM as an alternative to MobaXterm.

$ ssh -X labadmin@<your\_ip\_address>

**2. whoami {who, w}**

*whoami* tells you who you are

*who* tells who is logged to the system

*w* tells who is connected and what they are doing

### 3. pwd

*pwd* is Print working directory.

$ pwd

/home/bernard/Documents/Bioinfo-BootCamp

### 4. ls

Display file size in human readable format (e.g. KB, MB etc.,)

$ ls -lh

-rw-r----- 1 bernard biggs 8.9M Jun 12 15:27 gwas-sumstat.txt

Order files based on last modified time (in reverse order) using ls -ltr

$ ls -ltr

Visual classification of files with special characters using ls -F

$ ls -F

### 5. cp

Copy file1 to file2 preserving the mode, ownership and timestamp.

$ cp -p gwas-sumstat.txt gwas-sumstat\_backup.txt

In general, copying file1 to file2 will overwrite file2. To prompt for confirmation before overwriting, use this.

$ cp -i file1 file2

### 6. mkdir

Following example creates a directory called *temp* under your home directory.

$ mkdir ~/temp

Creating the directory *BootCamDir* in the current directory

$ mkdir BootCampDir

***Create nested directories*** using one mkdir command. If any of these directories exist already, it will not display any error. If any of these directories doesn’t exist, it will create them.

$ mkdir -p dir1/dir2/dir3/dir4/

$ mkdir -p BootCampDir/LinuxIntro

Let’s come back to cp

$ cp gwas-sumstat.txt BootCampDir/LinuxIntro

### 7. mv

Rename file1 to file2. if file2 exists prompt for confirmation before overwriting it.

$ mv -i file1 file2

$ mv -i gwas-sumstat\_backup.txt gwas-sumstat\_old.txt

$ mv -i gwas-sumstat\_old.txt BootCampDir/LinuxIntro

Note: mv -f is just the opposite, which will overwrite file2 without prompting.

mv -v will print what is happening during file rename, which is useful while specifying shell metacharacters in the file name argument.

$ mv -v file1 file2

### 8. cd

Change directory

$ cd ~

$ cd ..

$ cd .

$ cd –

$cd BootCampDir/LinuxIntro

“cd -” to toggle between the last two directories

### 9. rm

Get confirmation before removing the file.

$ rm -i filename.txt

$ rm -i gwas-sumstat\_old.txt

It is very useful while giving shell metacharacters in the file name argument.

Print the filename and get confirmation before removing the file.

$ rm -i file\*

Following example recursively removes all files and directories under the example directory. This also removes the example directory itself.

$ rm -r example

Let’s go back to cp

$ cp ../../gwas-sumstat.txt gwas-sumstat\_old.txt

**10. top**

Task manager, know what is going on

$top

### 11. kill

Use kill command to terminate a process. First get the process id using ps -ef command, then use kill -9 to kill the running Linux process as shown below. You can also use killall, pkill, xkill to terminate a unix process.

$ ps -ef | grep vim

bernard 7243 7222 9 22:43 pts/2 00:00:00 vim

$ kill -9 7243

### 12. less

less is very efficient while viewing huge log files, as it doesn’t need to load the full file while opening.

$ less gwas-sumstat\_old.txt

### 13. tail / head

Print the last/first 10 lines of a file by default.

$ tail gwas-sumstat\_old.txt

$ head gwas-sumstat\_old.txt

Print N number of lines from the file named filename.txt

$ tail -n N gwas-sumstat\_old.txt

$ head -n 100 gwas-sumstat\_old.txt > gwas-sumstat\_old\_100.txt

$ head gwas-sumstat\_old.txt gwas-sumstat\_old\_100.txt

View the content of the file in real time using tail -f. This is useful to view the log files, that keeps growing. The command can be terminated using CTRL-C.

$ tail -f log-file

### 14. vim

Go to the 143rd line of file

$ vim +143 filename.txt

Go to the first match of the specified (:q, :q!, :wq)

$ vim +/search-term filename.txt

$ vim +/rs10469747 gwas-sumstat.txt

Open the file in read only mode.

$ vim -R /etc/passwd

### 15. diff [vimdiff]

Ignore white space while comparing.

# diff -w name\_list.txt name\_list\_new.txt

2c2,3

< John Doe --- > John M Doe

> Jason Bourne

### 16. sort

Sort a file in ascending order

$ sort names.txt

Sort a file in descending order

$ sort -r names.txt

Sort gwas file by 8th field (P-value).

$ sort -gk8 gwas-sumstat.txt | head

### 17. grep

Search for a given string in a file (case in-sensitive search).

$ grep -i "the" demo\_file

$ grep -i "rs10138807" gwas-sumstat.txt

Print the matched line, along with the 3 lines after it.

$ grep -A 3 -i "rs10138807" gwas-sumstat.txt

Search for a given string in all files recursively

$ grep -r "rs10138807" \*

### 18. find

Find files using file-name ( case in-sensitve find)

# find -iname "hello.cpp"

Execute commands on files found by the find command

$ find -iname "hello.cpp" -exec md5sum {} \;

Find all empty files in home directory

# find ~ -empty

### 19. sed

**Replacing or substituting string :** Sed command is mostly used to replace the text in a file.

$sed 's/ rs10138810/chr1:100002018/' gwas-sumstat.txt

**Replacing all the occurrence of a pattern in a line :** Use the g flags to replace all the occurrence of a pattern in a line.

$sed 's/ rs10138810/chr1:100002018/g' gwas-sumstat.txt

### 20. awk

Remove duplicate lines using awk

$ awk '!($0 in array) { array[$0]; print }' temp

Print all lines from /etc/passwd that has the same uid and gid

$awk -F ':' '$3==$4' passwd.txt

Print only specific field from a file.

$ awk '{print $2,$5;}' gwas-sumstat.txt

Print only ‘significant’ (p<0.005) SNPs from the gwas file

$ awk '{if($8 <0.005) {print $0}}' gwas-sumstat.txt

$ awk '{if($8 <0.005) {print $0}}' gwas-sumstat.txt | sort -gk8

**21. tar**

Create a new tar archive.

$ tar cvf archive\_name.tar dirname/

$ tar cvf LinuxIntro.tar ../LinuxIntro/

Extract from an existing tar archive.

$ tar xvf LinuxIntro.tar

View an existing tar archive.

$ tar tvf LinuxIntro.tar

### 22. gzip

To create a \*.gz compressed file:

$ gzip gwas-sumstat.txt

To uncompress a \*.gz file:

$ gzip -d gwas-sumstat.txt.gz

Display compression ratio of the compressed file using gzip -l

$ gzip -l \*.gz

compressed uncompressed ratio uncompressed\_name

23709 97975 75.8% gwas-sumstat.txt

### Combine tar and gzip

$ tar cvzf LinuxIntro.tar.gz ../LinuxIntro/

$ tar xvzf LinuxIntro.tar.gz

### 23. unzip

To extract a \*.zip compressed file:

$ unzip gwas-sumstat.txt.zip

View the contents of \*.zip file (Without unzipping it):

$ unzip -l gwas-sumstat.txt.zip

### 24. whereis

When you want to find out where a specific Unix command exists (for example, where does ls command exists?), you can execute the following command.

$ whereis ls

ls: /bin/ls /usr/share/man/man1/ls.1.gz /usr/share/man/man1p/ls.1p.gz

### 25. whatis

Whatis command displays description about a command.

$ whatis ls

ls (1) - list directory contents

$ whatis ifconfig

ifconfig (8) - configure a network interface

### 26. locate

Using locate command you can quickly search for the location of a specific file (or group of files). Locate command uses the database created by updatedb.

The example below shows all files in the system that contains the word crontab in it.

$ locate crontab

/etc/anacrontab

/etc/crontab

### 27. man

Display the man page of a specific command.

$ man crontab

When a man page for a command is located under more than one section, you can view the man page for that command from a specific section as shown below.

$ man SECTION-NUMBER commandname

### 28. chmod

chmod command is used to change the permissions for a file or directory.

Give full access to user and group (i.e read, write and execute ) on a specific file.

$ chmod ug+rwx file.txt

Revoke all access for the group (i.e read, write and execute ) on a specific file.

$ chmod g-rwx file.txt

Apply the file permissions recursively to all the files in the sub-directories.

$ chmod -R ug+rwx file.txt

### 29. chown

chown command is used to change the owner and group of a file.

To change owner to oracle and group to db on a file. i.e Change both owner and group at the same time.

$ chown bernard:biggs dbora.sh

Use -R to change the ownership recursively.

$ chown -R bernard:biggs /home/oracle

### 23. passwd

Change your password from command line using passwd. This will prompt for the old password followed by the new password.

$ passwd

Super user can use passwd command to reset others password. This will not prompt for current password of the user.

# passwd USERNAME

Remove password for a specific user. Root user can disable password for a specific user. Once the password is disabled, the user can login without entering the password.

# passwd -d USERNAME