**Homework :1 Deepika Wali**

1. **Navigate to your user’s home directory. How do you know you’re there? What is the shortest command you can type to get you there?**

1.1) pwd is the command to know we are in which path.

walid@20cb4a715e4b:~$ pwd

/home/walid

1.2) cd is the shortest command we can use to get to the home directory.

walid@20cb4a715e4b:~$ cd

walid@20cb4a715e4b:~$

1. **In the home directory, create a subdirectory (folder) called 'Desktop'. Now create other folders called 'Projects', 'Music', 'Downtown', and 'Pictures'.**

2.1) We can use mkdir command to create the directory.

walid@20cb4a715e4b:~$ mkdir Desktop

walid@20cb4a715e4b:~$ mkdir Projects

walid@20cb4a715e4b:~$ mkdir Music

walid@20cb4a715e4b:~$ mkdir Downtown

walid@20cb4a715e4b:~$ mkdir Pictures

walid@20cb4a715e4b:~$ ls

Desktop Downtown Music Pictures Projects

1. **The Downtown folder was mistakenly named. What are two alternative methods (commands) you could use to correct your mistake and rename the folder? Rename the folder as ‘Downloads’.**

3.1) Method 1- Use mv command

walid@20cb4a715e4b:~$ mv Downtown Downloads

walid@20cb4a715e4b:~$ ls

Desktop Downloads Music Pictures Projects

3.2) Method 2- Use rmdir and mkdir to delete and create the directory with correct name.

walid@20cb4a715e4b:~$ rmdir Downtown

walid@20cb4a715e4b:~$ mkdir Downloads

walid@20cb4a715e4b:~$ ls

Desktop Downloads Music Pictures Projects

1. **Copy the contents of /data into a new folder of the same name on your home directory, in the 'Desktop' folder. Hint: A wildcard '\*' could be used to copy all the folder's contents at once.**

4.1) We first created data folder inside Desktop then we used cp command to copy the content from the source /data to target folder Desktop/data. We were able to see the files are copied into a new folder.

walid@20cb4a715e4b:~$ cd Desktop

walid@20cb4a715e4b:~/Desktop$ mkdir data

walid@20cb4a715e4b:~/Desktop$ cp /data/\* ~/Desktop/data

walid@20cb4a715e4b:~/Desktop$ ls

data

walid@20cb4a715e4b:~/Desktop$ cd data

walid@20cb4a715e4b:~/Desktop/data$ ls

Mov10\_oe\_1.subset.fq cpg.bed gwas.bed

Mov10\_oe\_2.subset.fq exons.bed hesc.chromHmm.bed

Mov10\_oe\_3.subset.fq gencode.v39.annotation.gtf sample\_sheet.txt

chr1-hg19\_genes.gtf genome.txt

walid@20cb4a715e4b:~/Desktop/data$ ls

1. **Use the 'ls' command to determine the size of the fastq files (only!) in your new ~/Desktop/data folder. If you're not sure which options to use to include size, use the 'man' tool.**

5.1) ls command is used to list the files. -s option calculates the size if the listed files. \*.fq is used to filter only the files ending with fq (fastq files).

walid@20cb4a715e4b:~/Desktop/data$ ls -s \*.fq

73936 Mov10\_oe\_1.subset.fq 41744 Mov10\_oe\_3.subset.fq

67068 Mov10\_oe\_2.subset.fq

1. **Can you confirm that the fastq files are the same size as the originals you copied from the root directory? (Show your terminal interactions)**

6.1) We will go to the source data directory and calculate the size of the files and compare them with the copied files in the Desktop/data directory.

Step1- go to /data folder

walid@20cb4a715e4b:/data$ cd /data

walid@20cb4a715e4b:/data$ ls -s \*.fq

73936 Mov10\_oe\_1.subset.fq 41744 Mov10\_oe\_3.subset.fq

67068 Mov10\_oe\_2.subset.fq

Step2- Compare the values with the output of question 5

walid@20cb4a715e4b:~/Desktop/data$ ls -s \*.fq

73936 Mov10\_oe\_1.subset.fq 41744 Mov10\_oe\_3.subset.fq

67068 Mov10\_oe\_2.subset.fq

From Step 1 and 2, we can conclude the copied files are of same size.

1. **The keyword '..' denotes "one folder up in the filesystem tree". Navigate to the Desktop folder you created. Type the following command at your terminal prompt:**

**mv data ..**

**What is the result of this command?**

7.1) This mv data .. command move the folder data one step ahead in the tree and as there is no folder in Desktop so it will go on the home directory.

walid@20cb4a715e4b:~/Desktop$ mv data ..

walid@20cb4a715e4b:~/Desktop$ ls

walid@20cb4a715e4b:~/Desktop$ cd ../

walid@20cb4a715e4b:~$ ls

Desktop Downloads Music Pictures Projects data

1. **From within the Desktop directory (you may have to navigate there if you changed your present working directory to answer the previous question) move the data folder and its contents back into 'Desktop' using a pathname composed with '..' and using '.' as the target location. '.' is shorthand for "the present working directory".**

8.1) We will use mv command with source as ../data (as the data is in one up directory) and target as . (which represents the Desktop directory).

walid@20cb4a715e4b:~$ cd Desktop

walid@20cb4a715e4b:~/Desktop$ mv ../data .

walid@20cb4a715e4b:~/Desktop$ ls

data

walid@20cb4a715e4b:~/Desktop$ cd data

walid@20cb4a715e4b:~/Desktop/data$ ls

Mov10\_oe\_1.subset.fq cpg.bed gwas.bed

Mov10\_oe\_2.subset.fq exons.bed hesc.chromHmm.bed

Mov10\_oe\_3.subset.fq gencode.v39.annotation.gtf sample\_sheet.txt

chr1-hg19\_genes.gtf genome.txt

1. **Navigate to your home directory. Type the following command exactly:**

**rmdir Desktop/data**

**From the error message, can you explain why the command didn't work?**

9.1) We get the directory not empty error because the data folder has files. Rmdir command does not all the directory which is not empty. If we have to make this command work we have to either empty the folder first or force delete the directory by using -rf option.

walid@20cb4a715e4b:~$ rmdir Desktop/data

rmdir: failed to remove 'Desktop/data': Directory not empty

1. **Now try the following command:**

**rm -rf Desktop/data**

**What do the '-r' and '-f' flags do in this instance? (Hint: consult the 'man' tool)**

10.1) rm -rf forcefully and recursively delete the files of the directory data also the folder.

walid@20cb4a715e4b:~$ rm -rf Desktop/data

walid@20cb4a715e4b:~$

**-r**, **-R**, **--recursive**- remove directories and their contents recursively.

**-f**, **--force** -ignore nonexistent files and arguments, never prompt.

1. **Use 'man' to figure out which options to re-copy *recursively* the data directory from the root /data and all its contents *in a single command* back into the home directory ('~/'). Use ls to confirm that it worked, and then remove the directory and its contents once more (we need to conserve space for now and don't want to keep 2 copies after this assignment as some of these files are large).**

11.1) Copying recursively data directory using -R option from root /data to home directory ~/

walid@20cb4a715e4b:/$ cp -R /data ~/

walid@20cb4a715e4b:/$ cd

walid@20cb4a715e4b:~$ ls

Desktop Downloads Music Pictures Projects data

11.2) Removing the data file from home directory to conserve space.

walid@20cb4a715e4b:~$ rm -rf ~/data

walid@20cb4a715e4b:~$ ls

Desktop Downloads Music Pictures Projects

walid@20cb4a715e4b:~$

1. **Bonus: As we discovered in lecture, /data files are off limits to editing. Are you able to edit the contents of files in the copied directory? Why or why not?:**

12.1) As we can see from the commands that we were able to edit the files successfully. The reason is when the files are copied to a new directory, they do not copy the permissions on the file only the content is copied.

If we want same read only permissions we have to specifically give it again on the new copied folder.

walid@20cb4a715e4b:~/data$ vim genome.txt

walid@20cb4a715e4b:~/data$ vi genome.txt