Scripting and Computer Environments

Solutions to Lab - 1

August 13, 2018

Question 1

It was clearly mentioned to used “mkdir” command to make the directories. So the answer to this one is pretty simple:

```
mkdir Kachra
```

Question 2

Pwd (**P**resent **W**orking **D**irectory) command is used to check the present working directory in Unix. **$HOME** environment variable stores the path of the Home Directory and **echo** command can be used to print its values. So the answer to these are:

```
pwd
echo $HOME
```

Question 3

Since it was mentioned to make the file using touch command, we are going to do that. Cat can be used to append content to that file using redirection operator **>** . The EOF (End of File Character Ctrl+D) can be used to exit from cat mode. So the answers to these are:

```
touch Gaitonde.txt
cat > Gaitonde.txt
      Created by Vikram
      [Ctrl+D]
```

Another variation of this, we can use the append mode of cat and specify an esc sequence. An example of that is: (When you use ‘<<’ , it keeps on reading/appending input until the sequence after it appears)

```
touch Gaitonde.txt
cat > Gaitonde.txt <<END
      Created by Vikram
      END
```

Question 4

The folder can be made using mkdir command and ls can be used to verify whether it is made or not (Also try to use various flags of ls like ls -l for detailed information). To go to the folder, we can use the cd (**C**hange **D**irectory) command.

```
mkdir Bhagwan
ls
cd Bhagwan
```

Question 5

You can use touch or cat to create the 3 files in the folder. (Assuming you are already in the Bhagwan folder). Now **chmod** command can be used to change the permissions of the files in that folder. Permissions for chmod can be applied using octal digits and they are specified in **ugo** format (**u**ser **g**roup **organization**). 4 is for write, 2 is for read, and 1 is for executable. (We'll change the permissions for user only). To mix the permissions, you can use 6 (4+2) for read and write, 7 (4+2+1) for read, write and executable. There is also a symbolic mode that you can try. For more reference, visit : https://www.tutorialspoint.com/unix_commands/chmod.htm

Try appending content to the file which had read only permissions and read the files which had write only permissions and try various combinations and play around with it! :)

```
touch file1 file2 file3
chmod 400 file1 #Only Read permissions for the owner
chmod 200 file2 #Only Write Permissions for the owner
chmod 100 file3 #Executable Permissions for the owner
ls -l      #To check various permissions for the various files
```

Question 6

First you had to make the directory using mkdir and change to that directory using cd. Then like above touch can be used to make 3 files using same command

```
mkdir Setting
cd Setting
touch Kukkoo.txt Mandir.txt
```

Question 7

Cat command can be used to add contents to the file by using the redirection operator **>**. Here is the solution:

```
cat > Kukoo.txt
     Apun Kukoo ke peechhe bhag raha ta
     [Ctrl+D]
cat > Mandir.txt
     Desh mandir ke peechhe bhag raha ta
     [Ctrl+D]
```

Question 8

Cat command can also be used to append contents to a file using the redirection operator **>>**. Remember the difference between **>** and **>>** (> is used to write content and existing content will be replaced. >> is used to append content and existing content stays:

```
cat >> Kukoo.txt
     By Ganesh Gaitonde
     [Ctrl+D]
```

Question 9

Cat command can be used to con**cat**enate files. Unless redirected, the output is shown on the terminal screen and hence it can be used to view the contents of both the files:

```
cat Kukoo.txt Mandir.txt
```

(Due to a slight mishap in numbering, question number 10 was missed.)

Question 11

Hidden files in Unix are the files that begin with a "." and they wont be displayed when you do normal ls. To check hidden files, you can use ls with -a flag. Here is the solution for the same: (Note the file is made using cat in this solution but it can be made using touch too.) (You can use chmod to change the permissions)

```
cat >.Anjali_Mathur.txt
      Agar mard field pe kaam karna chahe toh passion. Agar aurat
karna chahe toh bhoot.
      [Ctrl+D]
chmod 400 .Anjali_Mathur.txt
ls                #The file shouldn't be visible here
```

Question 12

Again Overwriting a file's content can be accomplished via cat.

```
cat >Mandir.txt
      Apun socha jab desh mein PM ka imaan nahi, toh apun seedhe raaste chal ke kya
karega?.
      [Ctrl+D]
```

Question 13

Creation of an entire directory tree can be accomplished with the *mkdir* command, which (as its name suggests) is used to make directories. The *-p* option tells mkdir to create not only a subdirectory but also any of its *parent* directories that do not already exist. Also you can specify more than one directory in mkdir command to make multiple directories

```
mkdir -p ScriptingGames/Parulkar/Zoya ScriptingGames/Trivedi
ScriptingGames/Sartaj/Megha ScriptingGames/GaneshGaitonde/Cuckoo
```

Question 14

Copying can be achieved using cp command. Its syntax is cp [options] SOURCE DEST. To maintain the timestamp and other details of a file, flag **-p** is used (preserve) (man for details).

Here using the -p flag was important rather than the directory structure and thus marks are given who have used the cp command and -p flag correctly.

```
cp -p Setting/Kukkoo.txt ScriptingGames/GaneshGaitonde/Kukkoo.txt
cp -p Setting/Mandir.txt ScritpingGames/Trivedi/Mandir.txt
```

Question 15

To copy the files and folders inside a directory, you have to use **-R** or **-r** (Recursive Flag). Correct use of flag is a must

```
cp -R ScriptingGames/ CopyOfScriptingGames     #OR
cp -r ScriptingGames/ CopyOfScriptingGames
```

Question 16

Moving is done using mv command. Syntax is same as copying. (NOTE : mv has recursive moving by default and thus there is no need for -r flag here)

```
mv ScriptingGames/Gaitonde ScriptingGames/Trivedi
```

Question 17

Ssh can be used to remote login to your web account. Every student has a web account for them whose password is same as your students mail password (E.g. mitesh.shah@students.iiit.ac.in has the web account mitesh.shah@web.iiit.ac.in). Doing this will change the prompt of shell (on the left hand side) with your username. This opens a terminal session in the remote machine and works like a normal shell on that machine. (For more details, you can read : https://www.folkstalk.com/2012/07/ssh-command-examples-unix-linux.html)

```
ssh mitesh.shah@web.iiit.ac.in

[Enter your students mail password here when prompted]
```

Question 18

Tee command is used to print the input of standard input to standard output and the file specified. Since we wanted the output of pwd to be printed, we use piping (|) to send the output of pwd to tee command

```
pwd | tee Confidential.txt
```

Question 19

Just like cp command is used to copy files into local machines, scp can be used to copy files from remote locations. Syntax for scp is scp [options] user@host:file user@host:file ...

There are 2 ways to accomplish this task. You can either exit from ssh and then in your local machine, download the file from the remote machine.

```
scp mitesh.shah@web.iiit.ac.in:Confidential.txt ./Confidential.txt
```

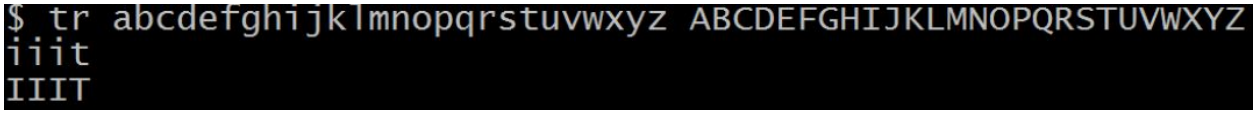
Or you can (upload) the file from your remote machine to your local machine (provided you know its ip). Ip can be found using “ifconfig” command. (You can find the ip of your machine before hand). And also the username (& password) for the local machine.
Assume here the ip is 192.168.3.1 and username is test:

```
scp ./Confidential.txt test@192.168.3.1:~/Confidential.txt
```

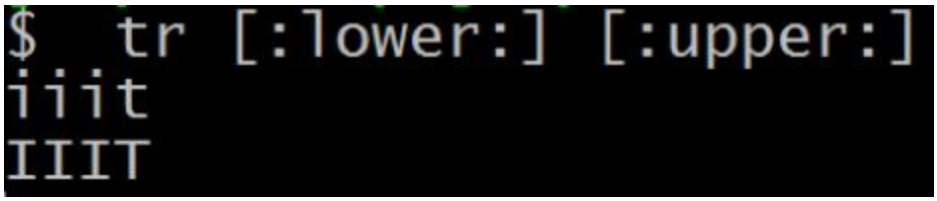
Both ways were allowed and marks will be given for both!

Question 20

Tr command is used to transform characters from one set to another.



(or)



Tr takes input from standard input but we want the text from file to be passed to tr and hence we’ll use piping (**|**) to pass it to tr. Moreover tr prints to standard output and thus we’ll use redirection operator **>** to redirect the output to a new file. (This is a great question to test your stdin, stdout, piping and redirection concepts). So the answer is:

```
cat Confidential.txt | tr [:lower:] [:upper:] >Confidential1.txt
```

(People who didn’t use [:lower:] and [:upper:] and wrote the whole character set will also be given marks but always know this simpler way)

Question 21

You can either use rm -rf to remove the directories (using **rmdir** will fail if the directory is empty).

```
rm -rf CopyOfScriptingGames/
```

Question 22

Tar command can be used to create archives from a folder. Tar has some important flags to note for.

`tar` [options] <archive name> <files>

- A utility to archive multiple files together.
- No compression!
- Common options: -c (create), -x (extract), -t (list), -f (lename)

- `tar -cvf Myarchive.tar file1 file2 file3` (creates)
- `tar -xvf Myarchive.tar` (extracts)
- `tar -tvf Myarchive.tar` (displays contents)

So to create a tar file from your folder, you can use the following command:

```
tar -cvf 20172010_lab01.tar 20172010_lab01/
```

[**Bonus:** You can google/man what the script command does and the usage of -a flag with it.]

If there are any doubts with these solutions, reply to the thread on Moodle.