CS241 : Assignment I

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Problem 1
List all files in the /Home directory, in reverse alphabetical order.

Problem 2
Delete the files with different extensions like file1.txt and file2.doc . Note that this must be done with a single command and not multiple commands. (**Hint**: Many commands can accept more than one parameter.)

Problem 3
Display the contents of all files whose names begin with example and end with the extension .txt, such as example1.txt and example2.txt . (**Hint**: Write a single command that displays all their contents concatenated.)

Problem 4
Copy all the files containing "hello" to the directory iitg using one command.

Problem 5
What is the command for listing all files which end in small letters but not 'a' and 'z'?

Problem 6
Find the space occupied (in Bytes) by your current directory including all its sub-directories.

Problem 7
Suppose you have a folder called "IITG", it contains .c and .h files, it also contains some other .txt files and .pdf files. Write a Linux command that will count the number of lines of your .c files. That means total line count of every file.

Problem 8
Creating an account - *useradd* and *passwd*
You need root privileges to run the following commands. The useradd command creates a new account and stores the user and group information in the

/etc/passwd and the /etc/group file. The passwd command sets a password for the user account by storing the password in the /etc/shadow file. A new account cannot be used until the password has been sent. All the group information for the different existing accounts are stored in the /etc/gshadow.

- **Part 1.** Write a command to create a user "Abhishek" and its home directory.

Follow up Commands
root $ passwd Abhishek *(assign the password for the new user Abhishek - remember it !)*
root $ su - Abhishek *(changes the user from root to Abhishek)*

- **Part 2.** Write the commands to record the home directory, user (both id and name) and group (both id and name) information of Abhishek user.

Follow up Commands
Abhishek $ mkdir second_user_home *(creates the directory)*
Abhishek $ cd second_user_home *(change the directory)*
Abhishek $ touch file1.txt *(creates a file file1.txt inside the present directory)*
Abhishek $ exit *(exit the user Abhishek shell and return to the previous shell root)*

- **Part 3.** Write a command to create a user "Rishi" whose group is the same as the group of "Abhishek" and the home directory is "second_user_home".

Follow up Commands
root $ cd /home/Abhishek/second_user_home *(change the directory from the current directory to second_user_home directory)*
root $ touch file2.txt *(creates a file file2.txt inside the present directory)*
root $ su - Rishi *(change the user from root to Rishi)*
Rishi $ touch file3.txt *(creates a file file3.txt)*
Rishi $ exit *(exit the user Abhishek shell and return to the previous shell root)*

- **Part 4.** Write and record the owner and group information for the files (file1.txt, file2.txt and file3.txt) in the second_user_home directory.

Problem 9
Modify a user account and group - *usermod* and *groupmod*
This part deals with the modification of user and group information by using the usermod and groupmod commands. Use only these commands to make the necessary changes. Note that the modification of the account information does not automatically modify the file owned by the account. To change them, you need to go through the entire file system and changes the attribute of each file owned by the account.

- **Part 1.** Modify the account name of the Abhishek to Sakshi and write the command you used.

- **Part 2.** Modify the group name of Abhishek to the Sakshi and report the command you used.

- **Part 3.** The new account Sakshi still uses the old home directory /home/ Abhishek. Modify (in one command line) the old home directory and change the Abhishek in the path with new name "oman" and record the command you used here. Similarly change the home directory for the user account Rishi

- **Part 4.** Change the shell of the user Sakshi to the one that inhibits login ("no login"). Report the command the you used, followd by the output message of the su - Sakshi showing the disable account message. (**Hint**: use chsh or usermod -s)

Problem 10

Deleting an acount - *userdel* and *groupdel*

This problem of the assignment deals with the deletion of the user and group account.

- **Part 1.** Write a command to delete a user account "Sakshi" and record the output.

- **Part 2.** Write a command to delete a user account "Rishi" along with its home directory and record the output.

- **Part 3.** Write a command to delete the group Sakshi.

- **Part 4.** Deletion of user account and group account does not means that the deletion of the file that is owned by the user. Record the owner and group information of the files (file1.txt, file2.txt and file3.txt) in the second_user_home directory.

Problem 11

This problem deals with the logging in the system. To complete this problem, make sure that ssh server is installed on your system. Write a command to record the log file for the entries of the SSH service. What messages are logged when the login attempts are successful or unsuccessful. (**Hint**: Create a new user and do ssh from the your local host and make some successful and unsuccessful attempts)

Problem 12

- **Part 1.**You have very less space left in a disk. You cannot extract a tar file to see the content of it. Display the contents of .tar file without untaring it.

- **Part 2.** Suppose you have a huge folder with 2gb+ size of files and folders. You need to create an archive (Only tar) such that each archive is of xmb each. So if your folder is size 1056mb the output should have 11 files, 10 of 100mb each and 11th of 56mb. After taring join the multiple files and extract the content to your /home/extract folder. **Use only tar command to divide and join the multitar files**.

Problem 13

Format a pendrive using mkfs and mke2fs commands

- **Part 1.**How do you format a pendrive through commandline and customize their file systems (ntfs, vfat, ext3, ext4)?
  Note: vfat is for fat32 file system.

- **Part 2.** How can you switch from one file system to another file system in a pendrive? (Hint: format it)
  Note: Unmount the pendrive using **umount** before doing any operation.

Follow up Commands
Refer tutorial sheet format pendrive and visit link:
https://www.techinfected.net/2015/06/format-usb-drive-ubuntu-through-terminal.html

Problem 14
Create partitions on a pendrive using parted and fdisk commands
Parted and fdisk are useful and powerful utility that can help you to manage your disk partitions in Linux systems. You can see all the functionalities of parted using **$ man parted** likewise **$man fdisk** in the terminal. Using manual you can learn how to customize its output and find more information about its capabilities. You need to have root access to the machine while using the parted command. If you plan on testing parted, the better option would be to simply use a virtual machine or old computer/laptop without any valuable information on it.

- **Part 1.** How do you create single primary partition in USB using **parted** command?

- **Part 2.** How do you create multiple partitions in USB using **fdisk** command?

- **Part 3.** How do you resize the partitions?

- **Part 4.** How do you delete the partitions one by one using **parted** and also demonstrate how it is different than deleting the partition using **fdisk**?

Follow up Commands
Refer tutorial sheet T1 & T2
you may visit the link https://www.tecmint.com/parted-command-to-create-resize-rescue-linux-disk-partitions/
fdisk tutorial: https://www.youtube.com/watch?v=5kVAzxTwy5Q Parted Basic Tutorial: https://www.youtube.com/watch?v=i7j5H6AxO9w
Using Parted Command in Linux: https://www.youtube.com/watch?v=YlV_6UrxVHw

Problem 15
Make a pendrive bootable

- **Part 1.** Suppose you want to boot your Desktop/Laptop using USB pendrive. Then how you will make your pendrive bootable using iso of the operating system?
  Hint: dd command make a pendrive bootable using iso

- **Part 2.** Suppose you have a bootable disk/USB and you want to make iso from that bootable USB. How do you make it?

- **Part 3.** How do you mount and unmount the contents of an iso?

Follow up Commands
To make a bootable USB stick using Linux Terminal
https://www.youtube.com/watch?v=tmF6Pj5BnaA
Create iso using USB: https://ubuntuforums.org/showthread.php?t=1043014
To mount and unmount iso: https://www.youtube.com/watch?v=V1n_Z3drqKc

Problem 16
Create soft link using ln command
How do you maintain more than one version of a programming language simultaneously using soft links in ubuntu?

Problem for bonus marks

- **Part 1.** How can you recover a deleted partition using testdisk?

- **Part 2.** Is there another way to recover the data of deleted partition? If yes, then demonstrate it.

- **Part 3.** Is there any way to relocate the deleted boot device in ubuntu? If yes, then demonstrate it.

Problem 1-16 are some set of problems. During the evaluation, we may ask similar kind of questions. For the doubts in the assignment, you can contact to Chinmaya (Problem 1-7), Sukarn (Problem 8-12), Sonal (Problem 13-16).