

Jul 24 2025 BDBP106: Linux and Python programming Lab 3

Learning goals: Linux OS and shell - continued. You may not have seen some of the commands in the theory class, so this is the time to explore and learn! Use should learn to use the man command extensively in this lab, please resist the urge to look up Google/ChatGPT. NOTE: Please upload your work to your github account as Lab3.pdf by end of Thursday Jul 24. EXERCISES

(1) What does each of the following commands do? Print the output and attach it as part of your Lab3 document

- (a) `cd /` **changes the home directory to Root directory**
- (b) `cd ~` **changes the Root Directory to Home Directory**
- (c) `cd` **changes the current directory of terminal**
- (d) `cd ..` **changes the current directory to its parent directory**
- (e) `cd .` **. single dot represents current directory, thus `cd .` Command changes current directory to current directory**

```
ibab@IBAB-MSc-BDB-Comp03:~$ cd /
ibab@IBAB-MSc-BDB-Comp03:/$ cd ~
ibab@IBAB-MSc-BDB-Comp03:~$ cd
ibab@IBAB-MSc-BDB-Comp03:~$ cd ..
ibab@IBAB-MSc-BDB-Comp03:/home$ cd .
ibab@IBAB-MSc-BDB-Comp03:/home$ cd -
/home
ibab@IBAB-MSc-BDB-Comp03:/home$ |
```

- (f) `cd -`

(2) When using the `ls` command, what is the difference between `-R` option and `-r` option? Demonstrate the difference by typing the appropriate commands and printing the output to your Lab3 document.

```
ibab@IBAB-MSc-BDB-Comp03:~$ ls -r
Videos      snap        'exportPS1=\u@\H\d\t'   Desktop
testfile2   Public      export
testfile    Pictures    Downloads
Templates   Music       Documents
ibab@IBAB-MSc-BDB-Comp03:~$ |
```

(Snap1)

```
ibab@IBAB-MSc-BDB-Comp03:~$ ls -R
.:
Desktop      'exportPS1=\u@\H\d\t'   snap        Videos
Documents    Music                   Templates
Downloads    Pictures                testfile
export        Public                  testfile2

./Desktop:

./Documents:
'BDBP1-06 Linux EX1'      'Nilesh Learning Shell.odt'
'Kambale Nilesh 014.pdf'  'Nilesh Learning Shell.pdf'
'linux nilesh'           'Untitled 2.odt'

'./Documents/BDBP1-06 Linux EX1':
student014  student014BDB.pdf

'./Documents/linux nilesh':

./Downloads:
file new testfile testfile2

./Downloads/file:

./Downloads/new:

./Music:

./Pictures:
Screenshots

./Pictures/Screenshots:
'Screenshot from 2025-07-17 14-31-15.png'
```

(snap2)

ANS:- **ls -r** lists all directories where as **ls -R** list all directories as well all files in those directories

(3) How do I find out what directory I am currently in?

```
ibab@IBAB-MSc-BDB-Comp03:~$ pwd
/home/ibab
ibab@IBAB-MSc-BDB-Comp03:~$ |
```

(Snap 3)

ANS:- To check the current directory (**pwd**) command is used which stands for **present working directory**, So i give it on home directory Its gives result **/ home/ibab**

(4) How do I list files sorted by modification time, but with oldest first? Find the correct combination of options to do this task. Print the output of your command with appropriate screenshots to demonstrate this in your Lab3 document.

```
ibab@IBAB-MSc-BDB-Comp03:~$ ls -ltr
total 36
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Videos
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Templates
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Public
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Music
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Desktop
drwxr-xr-x 3 ibab ibab 4096 Jul 17 14:31 Pictures
drwx----- 5 ibab ibab 4096 Jul 17 15:51 snap
-rw-rw-r-- 1 ibab ibab 0 Jul 18 16:00 export
-rw-rw-r-- 1 ibab ibab 0 Jul 18 16:02 'exportPS1=\u@\H\d\t'
drwxr-xr-x 4 ibab ibab 4096 Jul 21 11:30 Documents
-rw-rw-r-- 1 ibab ibab 0 Jul 23 09:07 testfile
-rw-rw-r-- 1 ibab ibab 0 Jul 23 09:13 testfile2
drwxr-xr-x 4 ibab ibab 4096 Jul 23 09:44 Downloads
```

(Snap 4)

ANS:- We can list the files by modification time , but oldest first is by the command (**ls -ltr**) , where as ltr stands for **list time reverses**

(5) What is the difference between (explain in your own words) `ls -ltr` and `ls -l`? Demonstrate the difference with appropriate screenshot and explanations.

```
ibab@IBAB-MSc-BDB-Comp03:~$ ls -ltr
total 36
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Videos
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Templates
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Public
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Music
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Desktop
drwxr-xr-x 3 ibab ibab 4096 Jul 17 14:31 Pictures
drwx----- 5 ibab ibab 4096 Jul 17 15:51 snap
-rw-rw-r-- 1 ibab ibab  0 Jul 18 16:00 export
-rw-rw-r-- 1 ibab ibab  0 Jul 18 16:02 'exportPS1=\u@\H\d\t'
drwxr-xr-x 4 ibab ibab 4096 Jul 21 11:30 Documents
-rw-rw-r-- 1 ibab ibab  0 Jul 23 09:07 testfile
-rw-rw-r-- 1 ibab ibab  0 Jul 23 09:13 testfile2
drwxr-xr-x 4 ibab ibab 4096 Jul 23 09:44 Downloads
```

(Snap 5 :- **ls -ltr**)

```
ibab@IBAB-MSc-BDB-Comp03:~$ ls -l
total 36
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Desktop
drwxr-xr-x 4 ibab ibab 4096 Jul 21 11:30 Documents
drwxr-xr-x 4 ibab ibab 4096 Jul 23 09:44 Downloads
-rw-rw-r-- 1 ibab ibab  0 Jul 18 16:00 export
-rw-rw-r-- 1 ibab ibab  0 Jul 18 16:02 'exportPS1=\u@\H\d\t'
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Music
drwxr-xr-x 3 ibab ibab 4096 Jul 17 14:31 Pictures
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Public
drwx----- 5 ibab ibab 4096 Jul 17 15:51 snap
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Templates
-rw-rw-r-- 1 ibab ibab  0 Jul 23 09:07 testfile
-rw-rw-r-- 1 ibab ibab  0 Jul 23 09:13 testfile2
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Videos
```

(Snap 6 :- **ls -l**)

ANS:- A) We can list the files by modification time, but oldest first is by the command (**ls -ltr**), where as `ltr` stands for **list time reverses** (Snap 5)

B) In **ls -l** command the files or directories will get listed as per the alphabetical order of the files (Snap 6)

(6) What is the difference between `ls -alF`, `ls -A` and `ls -CF`. Demonstrate the differences with appropriate examples as screenshot and explanations.

```
ibab@IBAB-MSc-BDB-Comp03:~$ ls -alF
total 108
drwxr-xr-x 19 ibab ibab 4096 Jul 23 09:39 ./
drwxr-xr-x  6 root root 4096 Jul 15 14:59 ../
drwxr-xr-x  3 ibab ibab 4096 Jul 23 11:49 .anydesk/
-rw-----  1 ibab ibab 2444 Jul 24 15:31 .bash_history
-rw-r--r--  1 ibab ibab  220 Jul 15 14:59 .bash_logout
-rw-r--r--  1 ibab ibab 3771 Jul 15 14:59 .bashrc
drwx----- 18 ibab ibab 4096 Jul 17 16:31 .cache/
drwx----- 17 ibab ibab 4096 Jul 17 16:16 .config/
drwxr-xr-x  2 ibab ibab 4096 Jul 17 09:04 Desktop/
drwxr-xr-x  4 ibab ibab 4096 Jul 21 11:30 Documents/
drwxr-xr-x  4 ibab ibab 4096 Jul 23 09:44 Downloads/
-rw-rw-r--  1 ibab ibab  0 Jul 18 16:00 export
-rw-rw-r--  1 ibab ibab  0 Jul 18 16:02 'exportPS1=\u@\H\d\t'
drwx-----  2 ibab ibab 4096 Jul 24 13:56 .gnupg/
```

(Snap 7 :- **ls -alF**)

ANS:- A) **ls -alF** Command stands for **-a = All**, **-l long format**, **-F Directories** from files by adding special characters at end for directories / is seen


```
ibab@IBAB-MSc-BDB-Comp03:~$ ls -A
.anydesk      .cache      Downloads   .lesshtq    Pictures     snap         .testfiel.swp  Videos
.bash_history .config     export      .local       .profile     .ssh         testfile
.bash_logout  Desktop     'exportPS1=\u@\H\d\t' .mozilla     Public       .sudo_as_admin_successful testfile2
.bashrc       Documents   .gnupg      Music        .python_history Templates     .thunderbird
ibab@IBAB-MSc-BDB-Comp03:~$ ls CF
ls: cannot access 'CF': No such file or directory
```

(Snap 8 :- **ls -A**)

ANS:- B) **ls -A** (almost all): This option tells **ls** to **include hidden files** (those starting with a dot) in the output, but it **omits the . and . . entries** that represent the **current** and **parent directories**, respectively.

```
ibab@IBAB-MSc-BDB-Comp03:~$ ls -CF
Desktop/      Downloads/   'exportPS1=\u@\H\d\t' Pictures/     snap/        testfile     Videos/
Documents/    export      Music/       Public/      Templates/   testfile2
```

(Snap 9 :- **ls -CF**)

ANS:- C) **ls -CF** **-C** list directories in multiple column & **-F** stands for adding special character at end of directories for identification

(7) Describe how you would use a combination of color codes in the command prompt appearance. Demonstrate this using an example where you managed to combine the colors blue and green?

```
ibab@IBAB-MSc-BDB-Comp03:~$ export PS1="\e[1;34m[\u@\h\W]$ \e[0m"
[ibab@IBAB-MSc-BDB-Comp03~]$ export PS1="\e[1;32m[\u@\h\W]$ \e[0m"
[ibab@IBAB-MSc-BDB-Comp03~]$ export PS1="\[\e[1;34m\]\u@\[\e[1;32m\]\h:\[\e[0m\]\w\$ "
ibab@IBAB-MSc-BDB-Comp03:~$ export PS1="\e[1;34m[\u@\h\W]$ \e[0m"~
[ibab@IBAB-MSc-BDB-Comp03~]$~export PS1="\e[1;44;34m[\u@\h\W]$ \e[0m"~
[ibab@IBAB-MSc-BDB-Comp03~]$~export PS1="\e[1;32*34m[\u@\h\W]$ \e[0m"~
```

(Snap 10 :- **export PS1="\[\e[1;34m\]\u@\[\e[1;32m\]\h:\[\e[0m\]\w\\$ "**)

(8) Find the option of ls that lists the contents of a directory in the long format, but without the primary group information. (Note: ls -l lists files in the long format with the primary group information)

```
ibab@IBAB-MSc-BDB-Comp03:~$ ls -o
total 36
drwxr-xr-x 2 ibab 4096 Jul 17 09:04 Desktop
drwxr-xr-x 4 ibab 4096 Jul 21 11:30 Documents
drwxr-xr-x 4 ibab 4096 Jul 23 09:44 Downloads
-rw-rw-r-- 1 ibab 0 Jul 18 16:00 export
-rw-rw-r-- 1 ibab 0 Jul 18 16:02 'exportPS1=\u@\H\d\t'
drwxr-xr-x 2 ibab 4096 Jul 17 09:04 Music
drwxr-xr-x 3 ibab 4096 Jul 17 14:31 Pictures
drwxr-xr-x 2 ibab 4096 Jul 17 09:04 Public
drwx----- 5 ibab 4096 Jul 17 15:51 snap
drwxr-xr-x 2 ibab 4096 Jul 17 09:04 Templates
-rw-rw-r-- 1 ibab 0 Jul 23 09:07 testfile
-rw-rw-r-- 1 ibab 0 Jul 23 09:13 testfile2
drwxr-xr-x 2 ibab 4096 Jul 17 09:04 Videos
```

(Snap 11 :- **ls -G**)

```
ibab@IBAB-MSc-BDB-Comp03:~$ ls -l
total 36
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Desktop
drwxr-xr-x 4 ibab ibab 4096 Jul 21 11:30 Documents
drwxr-xr-x 4 ibab ibab 4096 Jul 23 09:44 Downloads
-rw-rw-r-- 1 ibab ibab 0 Jul 18 16:00 export
-rw-rw-r-- 1 ibab ibab 0 Jul 18 16:02 'exportPS1=\u@\H\d\t'
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Music
drwxr-xr-x 3 ibab ibab 4096 Jul 17 14:31 Pictures
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Public
drwx----- 5 ibab ibab 4096 Jul 17 15:51 snap
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Templates
-rw-rw-r-- 1 ibab ibab 0 Jul 23 09:07 testfile
-rw-rw-r-- 1 ibab ibab 0 Jul 23 09:13 testfile2
drwxr-xr-x 2 ibab ibab 4096 Jul 17 09:04 Videos
```

(Snap 12 :- **ls -l**)

Ans **ls -G** command is for listing contents of a directory in the long format, but without the primary group information. For comparison reason see the snap 12 has ibab as user name & ibab as Primary group name for my prompt command so it appears as ibab ibab where as in snap 11 has only ibab as the user name

(9) Download the etc.zip folder sent to you by email, unzip it and rename it as etc_learn. Change your directory to etc_learn. In this directory do the following using the necessary wild cards:

ANS:-
 ibab@IBAB-MSc-BDB-Comp03:~\$ **cd Downloads**
 ibab@IBAB-MSc-BDB-Comp03:~/Downloads\$ **mkdir etc_learn**
 ibab@IBAB-MSc-BDB-Comp03:~/Downloads\$ **cd etc_learn/etc**
 ibab@IBAB-MSc-BDB-Comp03:~/Downloads/etc_learn/etc\$ **ls**

- (a) list the files or directories starting with b = **ls b***
- (b) list the files or directories starting with any of the letters from a-k = **ls [a-k]***
- (c) list files or directories ending with d = **ls *d**
- (d) list the files or directories containing the pattern with conf. How many are there? = **ls *conf*** **there are 3 files**
- (e) Output the last three lines of the file /etc/resolv.conf = not solved sorry
- (f) list files that begin with g or l =

(10) Create the following directories: /home/ibab/lab3/Q10/q1 and /home/ibab/lab3/Q10/q2 using one command. Attach a screenshot of the commands and the outputs of this and below exercises in your document.

```
ibab@IBAB-MSc-BDB-Comp03:~$ mkdir -p /home/ibab/lab3/Q10/q1 /home/ibab/lab3/Q10/q2
ibab@IBAB-MSc-BDB-Comp03:~$ ls
Desktop  Documents  Downloads  export  'exportPS1=\u@\H\d\t'  lab3  Music  Pictures  Public
ibab@IBAB-MSc-BDB-Comp03:~$ cd lab3/Q10
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10$ ls
q1  q2
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10$ |
```

(i) Enter the q1 directory using one command

(ii) Change directories from q1 to q2 using one command

```
ibab@IBAB-MSc-BDB-Comp03:~$ cd lab3/Q10
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10$ ls
q1  q2
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10$ cd
ibab@IBAB-MSc-BDB-Comp03:~$ cd
ibab@IBAB-MSc-BDB-Comp03:~$ cd lab3/Q10/q1
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10/q1$ cd ../q2
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10/q2$ |
```

(iii) copy the q1 directory to q1_copy

```
ibab@IBAB-MSc-BDB-Comp03:~$ cd
ibab@IBAB-MSc-BDB-Comp03:~$ cd lab3/Q10/q1
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10/q1$ cd ../q2
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10/q2$ cd ..
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10$ cp q1 q1_copy
cp: -r not specified; omitting directory 'q1'
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10$ cp -r q1 q1_copy
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10$ ls
q1  q1_copy  q2
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10$ |
```

(iv) delete the q1_copy interactively

```
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10$ rm -i q1_copy/
rm: cannot remove 'q1_copy/': Is a directory
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10$ rm -id q1_copy/
rm: remove directory 'q1_copy/'? y
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10$ ls
q1  q2
ibab@IBAB-MSc-BDB-Comp03:~/lab3/Q10$ |
```

