

## Linux

### Introduction to Linux and Terminal Commands

Q) What is a terminal emulator?

A) A terminal emulator is basically a program that will let us use the terminal in a graphical way.

Q) What is a shell?

A) A shell in linux is basically a command line interface that will take all my commands as inputs and convert those to tell the Operating System what ~~to~~ do basically.  
Ex:- Bourne Shell, Bash, etc.

Q) Command to list all the items in the current folder

A) ls

Q) To create a new folder in the current directory

A) mkdir folder-name

Q) Command to change directory

A) cd folder-name/

Q) Command to exit the current directory and go back.

A) folder-name cd ..

Q) What are environment variables?

A) Environment variables basically are just named values that are used to change how the commands and processes and everything are executed.

Q) What is a process?

A) Any instance of a running command <sup>will be known</sup> as a process.

Q) echo

A) It is a built-in command in the home bin directory. It is ~~is~~ used to display values and variables in the shell.

Q) Path Environment Variable

A) echo \$PATH

Q) Command to find the location of any .exe file/other files

A) where git → [This is an example.  
Instead of git you can write  
python or anything else.]

Q) Command to open a folder with its path

A) open /usr/bin → [This is an example.  
You can give other path you want]

Note:- Whenever you open a terminal like bash or zsh, ~~or~~ something else like this, few files and commands are executed automatically. These are dependent on the bash shell.

If you are using the bash shell, then you have the .bash file, the ~~.bashrc~~ .bashprofile, .bash-profile and the .bashrc file. These are hidden files.

Q) Command to see the hidden files of the current directory

A) ls -a

Q) Command to see and print what lies in ~~the~~ a file

A) cat file-name

cat is short for "concatenate"

Q) ZSH\_THEME

A) It is an environment variable which contains the theme name of the zsh terminal.

Q) alias

A) Aliases are shortcuts (or shortcut command) to the long commands you're writing in the terminal again and again.

Q) PS1

A) It is an environment variable that is used to add information to your particular shell on the command prompt.

Some special characters:- ① -w ② /w ③ /n

~~for/w/n~~ Using PS1 you can customize these special characters accordingly.

Q) .zprofile in zsh

A) .zprofile is a system-wide profile for interactive login shells.

Q) Command to edit .zprofile ~~file~~ of zsh and add something to the PATH variable

A) vi ~/.zprofile

Then add the new path of any file to the PATH variable.

export PATH → This means it will be exported and would be used in the command prompt.

Q) Command to set ~~the~~ a temporary environment variable in the current working directory

A) `export MY_PATH="Kunal"`

environment variable

value assigned to the variable

To print the value of this variable:

`echo $MY_PATH`

Q) `pwd`

A) `pwd` stands for "print working directory". It basically shows which ~~direct~~ directory you're currently in.

Note:-

- means "current directory"
- .. means "previous directory"

Q) `ls -l`

A) This command is used to display all the details of the files and folders of the current directory.

Q) `ls -al`

details of

A) It displays all the files and folders along with the hidden files of the current directory.

Q) `ls -R`

A) It will also show the files that are in the sub-directories.

Q) Creating two files and merging it into one file.

A) cat > file.txt

2| My name is Susmita.

3| ^C

4| cat > two.txt

5| My name is Mistu.

6| ^C

7| cat file.txt two.txt > total.txt

8| cat total.txt

9| My name is Susmita.

10| My name is Mistu.

Q) Command to know information of a particular command

A) man

Ex:- man echo

Q) Translate the contents of file ~~file~~ from lowercase to uppercase and copy the contents to another file.

A) cat file.txt

2| Hello World

3| cat file.txt | tr a-z A-Z > upper.txt

4| cat upper.txt

5| HELLO WORLD

Here, tr command is used to translate from lower case to upper case.

'>' is known as redirection.

'|' is known as pipe.

Q) Create a subfolder

A) ~~cd random~~ \$ mkdir random

cd random \$ mkdir random/hello

Q) Create a folder in the middle of the above two folders

A) mkdir -p random/middle/hello

Q) Creating a new file

A) touch names.txt

Q) Copy file

A) cp file.txt copy-file.txt

Q) Move a file into a folder

A) mv names.txt random [names.txt will be moved to the "random" folder]

Q) ~~Ren~~ Rename a file

A) mv file.txt newName.txt [renamed file.txt as newName.txt]

Q) To remove or delete a file ~~or folder~~ permanently

A) rm copy-file.txt [This will delete the "copy-file.txt" permanently]

Q) To remove or delete a folder permanently

A) rm -R folder-name

Q) Copy the files and ~~folders~~ from a folder and paste it to another

A) cp -R test random

Q) Move a folder to another folder

A) mv renamedTest random

Q) Move a subfolder to the current directory

A) mv random/renamedTest .

Q) To delete a file forcefully when it is opened

A) rm -rf file-name

Q) sudo

A) sudo stands for "super user do". You can use this to execute a command for the administrative purpose work (as an administrator). This will ask you for password to execute the command associated with it.

Q) df

A) It is used to check disk space usage in kb.

To see the values in mb, use this:- df -m

To see the values in gigabytes, use this:- df -hg

Q) du

A) Displays disk usage statistics.

Q) du -h

A) Displays disk usage statistics in human readable format

Q) head

A) It is used to display the first 10 lines of any file.

Q) head -n 4 file.txt

A) This will display the first 4 lines of file.txt

Q) tail

A) It is used to display the last 10 lines of any file.

Q) tail -n 2 file.txt

A) This will display the last 2 lines of file.txt

Q) diff

A) It compares the file line by line and outputs the contents that don't match.

Ex:- diff total.txt two.txt

Q) To find any file or folder

A) locate

Ex:- locate "\*.txt"

This will find all the files with the .txt extension

Q) Find files of the present directory

A) find .

Q) Find files of the previous directory

A) find ..

Q) Find files inside a particular directory

A) find random [This will show all the files in the "random" directory.  
[It also shows the hidden files]

Q) Find only the directories and not the files of the current directory

A) find . -type d

Q) Find only the files and not the folders of the current directory

A) find . -type f

Q) Find a particular file in the current directory with its name

A) find . -type f -name "two.txt"

Note:- Here the name of the file is case-sensitive.  
If you wanna find files with name "two", then  
use this:- `find . -type f -name "two*`

Here \* means anything can come over here  
(wild card).

If you dont want the name to be case-sensitive then use `-iname` instead of `-name`.

Q) Find files modified less than 20 mins ago in the current directory

A) `find . -type f -mmin -20`

Q) Find files modified more than 15 mins ago in the current directory

A) `find . -type f -mmin +15`

Q) Find files modified more than 2 mins ago and less than 10 mins ago in the current directory

A) `find . -type f -mmin +2 -mmin -10`

Q) Find files in the current directory that were modified ~~to~~ less than 10 days ago.

A) `find . -type f -mtime -10`

Q) Find files in the current directory of size <sup>more than</sup> 1kb  
A) `find . -size +1K` [Use G for gb and M for mb]

Q) Find files that are empty in the current directory

A) `find . -empty`

Run the command `man find` to see other operations to be done using find command



## File Permissions

There are 3 types of File Permissions -

- ① Read (r)
- ② Write (w)
- ③ Execute (x)

Q) To check the permissions allotted to a file

A) ls -l file.txt

Q) To change file permissions

A) chmod u=rwx, g=rx, o=-- file.txt

[Here, u stands for user; g for group; o for other]

If you wanna use numbers instead of u,g,x  
then -i) i) stands for read

ii) 2 stands for write

iii) 1 stand for execute

iv) 0 stand for no permission

v) 7 stand for all read, write, execute  
permissions.

Q) whoami

A) This command is used to check which person is  
logged in and display the name.

Q) To change the ownership to root

A) sudo chown root file.txt

Q) What is root?

A) Root is like the super user ~~an~~ account in  
the unix-based system and posix systems and it's  
basically used for administrative ~~purposes~~ purposes

and has the most highest number of access rights in the system.

Q) Find all the files in the current directory whose permission is set to 777.

A) `find . -perm 777`

Q) Delete multiple files of type .txt at the same time from the current directory.

A) `find . -type f -name "*.txt" -exec rm -rf {} +`

Q) grep

A) It is used to ~~not~~ search for some text within ~~the~~ files in our system and it's case-sensitive. Ex:- `grep "Kunal" names.txt`

Q) grep -V

A) It checks for the version of grep.

Q) grep -w "Kunal" names.txt

or

`grep -w "Kunal Kush" names.txt`

A) This will return complete name Kunal Kushwaha from the file names.txt

Q) To make it not case sensitive, use the following:

`grep -i "Kunal" names.txt`

or

`grep -iw "Kunal" names.txt`

Q) To find the line number with the text

A) `grep -n "Kunal" names.txt`

Combining all the 3, we can write—

grep -win "Rahul" names.txt

To see the previous 3 lines, we can write—

grep -B 3 "Rahul" names.txt

To search for "Rahul" in all the text files of the current directory, we can write—

grep -win "Rahul" /\*.txt

Q) To check all the files containing "Kunal" in the current directory

A) grep -wir "Kunal".

Q) To count the no. of files containing "Kunal" in the current directory

A) grep -wirc "Kunal".

Q) To see the history of all the commands we have been using

A) history

Q) To see the history of all the commands having ls

A) history | grep "ls"

### Terminal Shortcuts

Ctrl+A → move the cursor to the very first character

Ctrl+E → move the cursor to the end

Ctrl+K → remove everything after the cursor

Ctrl+U → remove everything in general

Tab → autocomplete

Arrow keys → Left, Right, Up, Down (Move Cursor)

! find → This will return the previously used find command.

Ctrl+R → Search for previous commands

clear → This command will clear the terminal

Q) Sort the contents of a text file in alphabetical order

A) sort file.txt

Q) Sort the contents of a text file in case insensitive manner

A) sort -f file.txt

Q) Sort the contents of a text file in ~~order~~ numerical order

A) sort -n file.txt

Q) jobs

A) This command is used to display all the current jobs that are running along with the ~~status~~ ~~status~~ statuses.

• What is a job?

→ job is a process that is started by the shell.

Q) ping google.com

A) You can use ping command for your ~~con~~ connectivity status and it's basically going to connect us to the server and get all the information.

In this case, it will connect to "google.com"

①) wget

→ You can download any file using this command.

Ex:- wget url

give the link of  
the item to be downloaded

To give a user-defined file name to the file to be downloaded, take the help of the following example -

②) wget -o myfile.pdf http://www.ugcncau.edu/images/default/sample.pdf

↓  
url of file  
to be downloaded

↓  
user-defined  
name

③) top

→ You can use this command in order to find all processes that are running currently and how many CPU usage is taking.

④) To kill a process which is running

→ kill process-id

↓  
This is a certain number related to the process.

⑤) uname

→ This command gives you information about your linux system.

⑥) Make files compressed and zip them into one

→ It can be done using zip command

Ex:- zip files.zip companies.txt

Ex:- zip files2.zip companies.txt file.txt

Q) How to unzip files?

A) Using the unzip command.

Ex:- unzip files2.zip

Q) hostname

A) It is basically used to obtain the domain name system(dns) and get the information of that domain.

Ex:- hostname -i

↳ This will give the IP address

Q) Adding a new user

A) useradd User

Q) Setting a password for the ~~User~~ new user added

A) passwd User

Q) Delete a user

A) userdel Kunal

### Operating System Info

Q) uname

A) Get the operating system name

Q) uname -o

A) Get the type of operating system

Q) uname -m

A) Get the architecture type of operating ~~system~~ system.

Q) uname -r

A) Get the kernel version

Q) cat /etc/os-release

A) Get all the information about the operating system.

Q) lscpu

A) Get all the CPU details

Q) free

A) Check the memory that is free.

Q) free -h

A) Check the used and free memory.

Q) vmstat

A) Check the virtual memory.

To display this in mbs, write the following-

vmstat -S m

Q) id

A) Get the id of groups

Q) id -g

A) Get the id

Q) id -G

A) Get the group id

Q) id -r

A) Get the real id

Q) To check if a user exist or not

A) getent group User

Q) To get the id of the User

A) id User

Q) List all the open files

A) lsof

Q) List all the files that are open by a particular user

A) lsof -u Kunal

This will list all the opened files by the user Kunal.

Q) nslookup google.com

A) nslookup is used to checkout the IP address for a particular domain.

Here it will checkout for google.com

If you write — nslookup ip-address

ip address of a domain

Then it will give more information of the same.

Q) To print all the ports that are currently up

A) netstat

Q) sed

A) It is a stream editor.

Q) cut

A) It is used to cut out selected portions of each line of a file.

Ex:- cut -c 1-2 companies.txt

↳ This will cut the first two columns of each line of the file companies.txt

Note:- This command comes in handy when working with the log files.

Q) htop

A) It allows the user to interactively monitor the system's vital resources or server's processes in real time.

Q) ps aux

A) This will print all the processes that are running along with the process id

Q) echo "first" && echo "second"

A) Here "second" will be printed only ~~when~~ after the "first" is printed.

Note:- When you wanna add multiple commands in the same line, you can use ; to separate the commands  
Ex:- whoami;echo "Hello"

Q) echo "one" || echo "two"

A) Here "one" will be printed only as it is an OR condition.

Q) rm -r !(names.txt)

A) This will delete all the files permanently except names.txt file.

Q) echo "hey">> names.txt

A) This will append "hey" to names.txt file

Q) echo "hey">> names.txt

A) This will remove all the other contents from the file and only append "hey" to the file.  
This simply does overriding.

Q) echo "hey" && {echo "hi"; echo "i am good"}

Ans Output:-

hey

hi

i am good

Basically, this is a combination operators.

Explore more by yourself by doing.  
Keep calm and chill.