Learning Linux command line

Shell: provides you with an interface to UNIX system.
- Gathers i/p from you and executes programs based on that input.

It is an environment in which we can run our commands, programs and shell scripts.

$ → command prompt
% → ——————

Types of Bourne shell

Bourne shell (sh)
Korn shell (ksh)
Bourne Again shell (bash)
POSIX shell (sh)

Types of C shell

C shell (csh)
TENEX / TOPS C shell (tcsh)

Shell script

#! /bin/sh } → shebang construct
#! /bin/bash } - first line of script

$ chmod +x test.sh
$ ./test.sh

Command syntax-

command Option(s) arguments

sort users.txt
ls /usr/bin
grep -i "needle" haystack

Harshali5@ Harshalis-macbook-air linux %
username hostname folder.

ls -l → long listing

Shortcuts:

tab - type letters & press tab, it autofills folder names
tab enter - if more than 1 item with same start

Ctrl-A — Beginning of line
Ctrl-E — end of line
Ctrl U — Remove (cop) from cursor to start
Ctrl K — ——→—— end
Ctrl+Shift+C — copy
Ctrl+Shift+V — paste
Ctrl R — Search command history
Ctrl C → cancel command

ls --help
help
apropos

Files, folders & navigation.

file filename → determines file type.

stat filename → display ownership, modification information etc

pwd - print working directory

If there is space b/w file/foldername
eg- AI HW
use escape character.
cd AI\ HW

OR another way use string to write foldername
cd "AI HW"

ls -R foldername
-R → Recursive, looks everything inside the folder

cd ../../finance/test.sh
→ goes 2 levels up.

cd - → takes back to previously used folder

cd → takes to home

Create and remove folders -

mkdir foldername
mkdir department/filename.
Path

rmdir foldername

Copy, move, delete

cp poems.txt poems2.txt
- poems.txt: file you want to copy
- poems2.txt: file u want to copy to

Move ← move / rename

mv poems.txt departments/marketing → move

mv poems.txt literature.txt → rename

Single dot → represents current folder

mv dept/literature.txt . → moves txt file to current folder

Wildcards -
* - asterik - all (any no. of char

? question mark - one char

mv *.txt dept/marketing → move all text files in current folder to dept/marketing

mv dept/marketing/* . → move all files from marketing to current directory.

Remove files -
rm filename

rm poems?.txt → delete files with name poem and only one char after them

rm -r dept/marketing → recursively deletes all files in marketing folder before deleting it.

find . -name "poe*" → finds poems.txt
- . : scope of search
- match based on name

User Roles and sudo

su - set user / switch user

su username

User roles

- normaluser
- superuser (root)

normal user can temporarily have power of root using sudo command.

sudo -k ⇒ Give up sudo priviledges

sudo -s ⇒ change to root user

exit

File Permissions.

rwx rwx rwx — r — w — x

User Group Others — read — write — execute

chmod - changes file permissions

Octal notation - 755, 777, 644...

Symbolic rwx, g+w, o-x

↳ Assign values

Read	Write	Execute
4	2	1

	r (4)	w (2)	x (1)	Result
User	r	w	x	7
Group	r	-	x	5
Others	r	-	-	4

Symbolic file permissions

	Read(r)	Write(w)	Execute(x)	Result
User(u)	+	+	+	u+rwx
Group(g)	=	-	-	g=r
others(o)	-	-	-	o-rwx

All (a)

+ → adds permissions

- → removes permissions

= → adds permissions but removes others

Octal	Symbolic	Result
777	a+rwx	rwxrwxrwx
755	u+rwx, g=rx, o=rx	rwxr-xr-x
644	u=rw, g=r, o=r	rw-r--r--
700	u=rwx, g-rwx, o-rwx	rwx------

touch newfile
init permissions 644

chmod 755 test.sh → octal
chmod a-x test.sh → symbolic
— u+rwx —

chown → change ownership

sudo chown root test.sh

Links: - pointer, reference to a file

Hard link
points to data on the disk (inode)
- can be moved around even if original file is moved

Softlink
points to a file on the disk (relative path)
- cannot be moved, it's lost

Softlink-
ln -s poems.txt link.txt
link to poems.txt file

Hard-
ln poems.txt link.txt
points to content of poems.txt

Filesystem Hierarchy Standard
Each system has only 1 filesystem

/ root
- home - user's home folders
- root - stores root's home folders
- etc - config files for tools
- bin - stores binaries (programs)
- sbin — u —
- lib - libraries & shared modules
- dev - represents devices on system
- mnt
- media
- proc

+ sys

wc - word count
lines words characters

'|' pipes connects commands

echo "hello" | wc. op - 1 1 6

Text files
- cat => concatenate / view

- head filename => first 10 lines
- tail —"— last 10

head -n5 poems.txt => 5 lines

cat poems.txt | cat -n | tail -n5
numbers added
write to tail

less poems.txt

Searching for text
grep - searches text or files for a given string or pattern of text

grep "the" poems.txt
grep -n "the" poems.txt

grep is case sensitive

-i → ignore case.

-v → omit the lines that match search term

-E → implies a regex
grep -E "[hijk]" poems.txt → matches h, i, j, k

awk, sed, sort → manipulate data

Env var-
→ env
-PATH

which ls → where is ls located

uname -a → kernel version etc

APT - Advanced Package Tools
`Debian, ubuntu

sudo apt update
apt install tree → installs tree package
sudo apt upgrade → upgrades version

Create and extract tar

Extract:

tar -xf archive.tar -C /opt/files

x - extract
v - print names of files extracted
f - file

Create

tar -cf archive.tar /home/user