

# DS ASSIGNMENT-1

**ADMISSION NO: U19CS082**

**NAME: SOURABH PATEL**

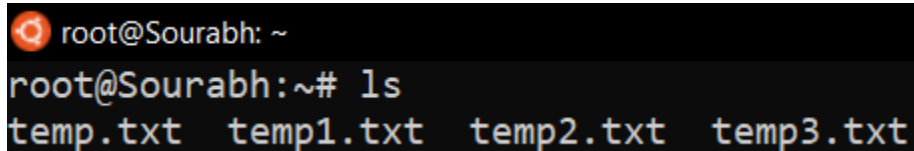
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Execute all commands on Linux terminal and note down the functionality of each.

1. Basic Unix/Linux commands:

ls

The `ls` command lists files and directories within the file system, and shows detailed information about them.

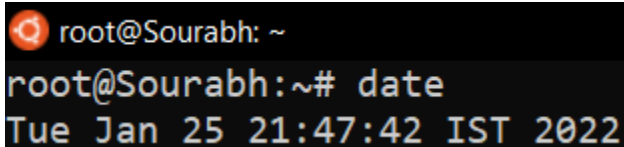
A terminal window with a black background and orange prompt characters. The prompt is 'root@Sourabh: ~'. The command 'ls' has been entered, and the output is 'temp.txt temp1.txt temp2.txt temp3.txt'.

```
root@Sourabh: ~  
root@Sourabh:~# ls  
temp.txt temp1.txt temp2.txt temp3.txt
```

---

date

date command is used to display the system date and time. date command is also used to set date and time of the system. By default the date command displays the date in the time zone on which unix/linux operating system is configured.

A terminal window with a black background and orange prompt characters. The prompt is 'root@Sourabh: ~'. The command 'date' has been entered, and the output is 'Tue Jan 25 21:47:42 IST 2022'.

```
root@Sourabh: ~  
root@Sourabh:~# date  
Tue Jan 25 21:47:42 IST 2022
```

---

help

If you are new to LINUX operating system and having trouble dealing with the command-line utilities provided by LINUX then you really need to know first of all about the help command which as its name says help you to learn about any built-in command. Help command itself offers three options:

- -d: display only a brief description of the specified command.
- -m: organize the available information just as the [man command](#) does.
- -s: display the command syntax of the specified command.

```
root@Sourabh: ~  
root@Sourabh:~# help  
GNU bash, version 5.0.17(1)-release (x86_64-pc-linux-gnu)  
These shell commands are defined internally. Type 'help' to see this list.  
Type 'help name' to find out more about the function 'name'.  
Use 'info bash' to find out more about the shell in general.  
Use 'man -k' or 'info' to find out more about commands not in this list.  
  
A star (*) next to a name means that the command is disabled.  
  
job_spec [&]  
([ expression ])  
. filename [arguments]  
:  
[ arg... ]  
[[ expression ]]  
alias [-p] [name[-value] ... ]  
bg [job_spec ...]  
bind [-lpsvPSVX] [-m keymap] [-f filename] [-q name] [-u >  
break [n]  
builtin [shell-builtin [arg ...]]  
caller [expr]  
case WORD in [PATTERN [ | PATTERN]...] COMMANDS ;;)... esac  
cd [-L][[-P [-e]] [-@]] [dir]  
command [-pv] command [arg ...]  
compgen [-abcdefgjkusv] [-o option] [-A action] [-G globp>  
complete [-abcdefgjkusv] [-pr] [-DEI] [-o option] [-A act>  
comptopt [-o|+o option] [-DEI] [name ...]  
continue [n]  
coproc [NAME] command [redirections]  
declare [-aAfFgIlNrtux] [-p] [name[-value] ...]  
dirs [-clpv] [+N] [-N]  
disown [-h] [-ar] [jobspec ... | pid ...]  
echo [-neE] [arg ...]  
enable [-a] [-dnps] [-f filename] [name ...]  
eval [arg ...]  
exec [-cl] [-a name] [command [arguments ...]] [redirecti>  
exit [n]  
export [-fn] [name[-value] ...] or export -p  
false  
fc [-e ename] [-lnr] [first] [last] or fc -s [pat=rep] [c>  
fg [job_spec]  
for NAME in WORDS ... ] ; do COMMANDS; done  
for (( exp1; exp2; exp3 )); do COMMANDS; done  
  
history [-c] [-d offset] [n] or history -anrw [filename]>  
if COMMANDS; then COMMANDS; [ elif COMMANDS; then COMMAND>  
jobs [-Inprs] [jobspec ...] or jobs -x command [args]  
kill [-s sigspec | -n signum | -sigspec] pid | jobspec .>  
let arg [arg ...]  
local [option] name[-value] ...  
logout [n]  
mapfile [-d delim] [-n count] [-O origin] [-s count] [-t>  
popd [-n] [+N | -N]  
printf [-v var] format [arguments]  
pushd [-n] [+N | -N | dir]  
pwd [-LP]  
read [-ers] [-a array] [-d delim] [-i text] [-n nchars] >  
readarray [-d delim] [-n count] [-O origin] [-s count] [>  
readonly [-aAf] [name[-value] ...] or readonly -p  
return [n]  
select NAME in WORDS ... ;] do COMMANDS; done  
set [-abefghkmnpuvxBCHP] [-o option-name] [--] [arg ...]  
shift [n]  
shopt [-pqsu] [-o] [optname ...]  
source filename [arguments]  
suspend [-f]  
test [expr]  
time [-p] pipeline  
times  
trap [-lp] [[arg] signal_spec ...]  
true  
type [-afptP] name [name ...]  
typeset [-aAfFgIlNrtux] [-p] name[-value] ...  
ulimit [-SHabcdefiklmnpqrstuvxPT] [limit]  
umask [-p] [-S] [mode]  
unalias [-a] name [name ...]  
unset [-f] [-v] [-n] [name ...]  
until COMMANDS; do COMMANDS; done
```

□

## info

info command reads documentation in the info format. It will give detailed information for a command when compared with the man page. The pages are made using the texinfo tools because of which it can link with other pages, create menus and easy navigation.

SYNTAX: info [OPTION]... [MENU-ITEM...]

Options:

- -a, -all: It use all matching manuals.
- -k, -apropos=STRING: It look up STRING in all indices of all manuals.
- -d, -directory=DIR: It add DIR to INFOPATH.
- -f, -file=MANUAL: It specify Info manual to visit.
- -h, -help: It display this help and exit.
- -n, -node=NODENAME: It specify nodes in first visited Info file.
- -o, -output=FILE: It output selected nodes to FILE.
- -O, -show-options, -usage: It go to command-line options node.
- -v, -variable VAR=VALUE: It assign VALUE to Info variable VAR.
- -version: It display version information and exit.
- -w, -where, -location: It print physical location of Info file.

root@Sourabh: ~

root@Sourabh:~# info -h help

Usage: info [OPTION]... [MENU-ITEM...]

Read documentation in Info format.

Frequently-used options:

|                             |  |
|-----------------------------|--|
| -a, --all                   | use all matching manuals                     |
| -k, --apropos=STRING        | look up STRING in all indices of all manuals |
| -d, --directory=DIR         | add DIR to INFOPATH                          |
| -f, --file=MANUAL           | specify Info manual to visit                 |
| -h, --help                  | display this help and exit                   |
| --index-search=STRING       | go to node pointed by index entry STRING     |
| -n, --node=NODENAME         | specify nodes in first visited Info file     |
| -o, --output=FILE           | output selected nodes to FILE                |
| -O, --show-options, --usage | go to command-line options node              |
| --subnodes                  | recursively output menu items                |
| -v, --variable VAR=VALUE    | assign VALUE to Info variable VAR            |
| --version                   | display version information and exit         |
| -w, --where, --location     | print physical location of Info file         |

The first non-option argument, if present, is the menu entry to start from; it is searched for in all 'dir' files along INFOPATH.

If it is not present, info merges all 'dir' files and shows the result.

Any remaining arguments are treated as the names of menu items relative to the initial node visited.

For a summary of key bindings, type H within Info.

Examples:

|                                  |  |
|----------------------------------|--|
| info                             | show top-level dir menu                        |
| info info-stdn                   | show the manual for this Info program          |
| info emacs                       | start at emacs node from top-level dir         |
| info emacs buffers               | select buffers menu entry in emacs manual      |
| info emacs -n Files              | start at Files node within emacs manual        |
| info '(emacs)Files'              | alternative way to start at Files node         |
| info --show-options emacs        | start at node with emacs' command line options |
| info --subnodes -o out.txt emacs |  |
|                                  | dump entire emacs manual to out.txt            |
| info -f ./foo.info               | show file ./foo.info, not searching dir        |

Email bug reports to [bug-texinfo@gnu.org](mailto:bug-texinfo@gnu.org),

general questions and discussion to [help-texinfo@gnu.org](mailto:help-texinfo@gnu.org).

Texinfo home page: <http://www.gnu.org/software/texinfo/>

root@Sourabh:~# █

## man

man command in Linux is used to display the user manual of any command that we can run on the terminal. It provides a detailed view of the command which includes NAME, SYNOPSIS, DESCRIPTION, OPTIONS, EXIT STATUS, RETURN VALUES, ERRORS, FILES, VERSIONS, EXAMPLES, AUTHORS and SEE ALSO.

## man printf

```
root@Sourcebit: ~# man printf
printf(1)                                User Commands                                printf(1)

NAME
    printf - format and print data

SYNOPSIS
    printf FORMAT [ARGUMENT]...
    printf OPTION

DESCRIPTION
    Print ARGUMENT(s) according to FORMAT, or execute according to OPTION:

    --help display this help and exit
    --version
        output version information and exit

    FORMAT controls the output as in C printf.  Interpreted sequences are:

    \*    double quote
    \\    backslash
    \a    alert (BEL)
    \b    backspace
    \c    produce no further output
    \e    escape
    \f    form feed
    \n    new line
    \r    carriage return
    \t    horizontal tab
    \v    vertical tab
    \NNN  byte with octal value NNN (1 to 3 digits)
    \xHH  byte with hexadecimal value HH (1 to 2 digits)

Manual page printf(1) line 1 (press h for help or q to quit)
```

## who

who command is used to find out the following information :

1. Time of last system boot
2. Current run level of the system
3. List of logged in users and more.

who -H:            To print the heading of the columns displayed.

`who -q:` To print the login names and total number of logged on users.

```
root@Sourabh: ~  
root@Sourabh:~# who -H  
NAME      LINE      TIME      COMMENT  
root@Sourabh:~# who -q  
  
# users=0  
root@Sourabh:~# x
```

---

## pwd

pwd stands for Print Working Directory. It prints the path of the working directory, starting from the root.

```
root@Sourabh: ~  
root@Sourabh:~# pwd  
/root  
root@Sourabh:~#
```

---

## Cat

It reads data from the file and gives their content as output. It helps us to create, view, concatenate files.

In case of reading an existing file:

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# cat Q1.sh
#!/bin/bash

read -p "Enter a character: " CHAR
case "$CHAR" in
[aeiouAEIOU])
echo "Vowel" ;;
[A-Z])
echo "Upper Case" ;;
[a-z])
echo "Lower Case" ;;
[0-9])
echo "Digit" ;;
['!@#$%^&*()_+'])
echo "Special Character" ;;
*)
echo "None" ;;
esac
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#
```

---

## more

more command is used to view the text files in the command prompt, displaying one screen at a time in case the file is large (For example log files). The more command also allows the user to scroll up and down through the page.

```

root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# more -d Q1.sh
#!/bin/bash

read -p "Enter a character: " CHAR
case "$CHAR" in
[aeiouAEIOU])
echo "Vowel" ;;
[A-Z])
echo "Upper Case" ;;
[a-z])
echo "Lower Case" ;;
[0-9])
echo "Digit" ;;
['!@#\$%^&*()_+'])
echo "Special Character" ;;
*)
echo "None" ;;
esac
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#

```

---

## mv

mv stands for move. mv is used to move one or more files or directories from one place to another in a file system like UNIX. It has two distinct functions:

- (i) It renames a file or folder.
- (ii) It moves a group of files to a different directory.

```

root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# ls
Q1.sh  Q11.sh  Q13.sh  Q15.sh  Q2.sh  Q4.sh  Q6.sh  Q8.sh  Q9.sh.save  temp.sh
Q10.sh Q12.sh  Q14.sh  Q16.sh  Q3.sh  Q5.sh  Q7.sh  Q9.sh  U19CS082.pdf temp.txt
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# mv Q1.sh new.sh
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# ls
Q10.sh Q12.sh  Q14.sh  Q16.sh  Q3.sh  Q5.sh  Q7.sh  Q9.sh  U19CS082.pdf temp.sh
Q11.sh Q13.sh  Q15.sh  Q2.sh  Q4.sh  Q6.sh  Q8.sh  Q9.sh.save new.sh      temp.txt
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#

```

---

## rm



rm command is used to remove objects such as files, directories, symbolic links and so on from the file system.

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# ls
Q10.sh  Q12.sh  Q14.sh  Q16.sh  Q3.sh  Q5.sh  Q7.sh  Q9.sh  U19CS082.pdf  temp.sh
Q11.sh  Q13.sh  Q15.sh  Q2.sh  Q4.sh  Q6.sh  Q8.sh  Q9.sh.save  new.sh  temp.txt
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# rm new.sh
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# ls
Q10.sh  Q12.sh  Q14.sh  Q16.sh  Q3.sh  Q5.sh  Q7.sh  Q9.sh  U19CS082.pdf  temp.txt
Q11.sh  Q13.sh  Q15.sh  Q2.sh  Q4.sh  Q6.sh  Q8.sh  Q9.sh.save  temp.sh
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#
```

---

## chmod

chmod command is used to change the access mode of a file.

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# chmod a+x Q2.sh
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# ls -l
total 392
-rwxrwxrwx 1 root root 424 Aug 15 21:41 Q10.sh
-rwxrwxrwx 1 root root 144 Aug 15 21:41 Q11.sh
-rwxrwxrwx 1 root root 140 Aug 15 21:41 Q12.sh
-rwxrwxrwx 1 root root 130 Aug 15 21:41 Q13.sh
-rwxrwxrwx 1 root root 244 Aug 15 21:56 Q14.sh
-rwxrwxrwx 1 root root 244 Aug 15 21:42 Q15.sh
-rwxrwxrwx 1 root root 222 Aug 15 21:42 Q16.sh
-rwxrwxrwx 1 root root 314 Aug 15 17:17 Q2.sh
-rwxrwxrwx 1 root root 116 Aug 15 17:23 Q3.sh
-rwxrwxrwx 1 root root 37 Aug 15 22:30 Q4.sh
-rwxrwxrwx 1 root root 288 Aug 15 21:07 Q5.sh
-rwxrwxrwx 1 root root 81 Aug 15 21:12 Q6.sh
-rwxrwxrwx 1 root root 239 Aug 15 21:19 Q7.sh
-rwxrwxrwx 1 root root 249 Aug 15 21:33 Q8.sh
-rwxrwxrwx 1 root root 94 Aug 15 21:40 Q9.sh
-rwxrwxrwx 1 root root 218 Aug 15 22:33 Q9.sh.save
-rwxrwxrwx 1 root root 400057 Aug 15 22:33 U19CS082.pdf
-rwxrwxrwx 1 root root 258 Aug 15 21:09 temp.sh
-rwxrwxrwx 1 root root 464 Aug 15 22:07 temp.txt
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#
```

whoami

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# whoami
root
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#
```

It displays the username of the current user when this command is invoked. **logout**

---

logout command allows you to programmatically logout from your session. causes the session manager to take the requested action immediately.

```
Command Prompt
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# logout
C:\Users\Sourabh Patel>
```

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS# wc U19CS082.pdf
wc: U19CS082.pdf: No such file or directory
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS#
```

wc

grep

wc stands for word count. It is used to find out number of lines, word count, byte and characters count in the files specified in the file arguments.

The grep filter searches a file for a particular pattern of characters, and displays all lines that contain that pattern. The pattern that is searched in the file is referred to as the regular expression (grep stands for global search for regular expression and print out).

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# grep -c "the" temp.txt
4
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#
```

## sort

SORT command is used to sort a file, arranging the records in a particular order. By default, the sort command sorts file assuming the contents are ASCII.

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# cat temp.txt
A Kernel is at the nucleus of a computer. It makes the communication between the hardware and software possible.
While the Kernel is the innermost part of an operating system, a shell is the outermost one.
A shell in a Linux operating system takes input from you in the form of commands, processes it,
and then gives an output. It is the interface through which a user works on the programs, commands, and scripts. A shell
is accessed by a terminal which runs it.
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#
```

---

## mkdir

mkdir command in Linux allows the user to create directories (also referred to as folders in some operating systems ). This command can create multiple directories at once as well as set the permissions for the directories.

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# mkdir newdirec
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# ls
Q10.sh  Q12.sh  Q14.sh  Q16.sh  Q3.sh  Q5.sh  Q7.sh  Q9.sh  U19CS082.pdf  temp.sh
Q11.sh  Q13.sh  Q15.sh  Q2.sh   Q4.sh  Q6.sh  Q8.sh  Q9.sh.save  newdirec      temp.txt
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#
```

---

## rmdir

rmdir command is used remove empty directories from the filesystem in Linux. The rmdir command removes each and every directory specified in the command line only if these directories are empty. S

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# ls
Q10.sh  Q12.sh  Q14.sh  Q16.sh  Q3.sh  Q5.sh  Q7.sh  Q9.sh  U19CS082.pdf  temp.sh
Q11.sh  Q13.sh  Q15.sh  Q2.sh  Q4.sh  Q6.sh  Q8.sh  Q9.sh.save  newdirec  temp.txt
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# rmdir newdirec
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# ls
Q10.sh  Q12.sh  Q14.sh  Q16.sh  Q3.sh  Q5.sh  Q7.sh  Q9.sh  U19CS082.pdf  temp.txt
Q11.sh  Q13.sh  Q15.sh  Q2.sh  Q4.sh  Q6.sh  Q8.sh  Q9.sh.save  temp.sh
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#
```

## cd

cd command in linux known as change directory command. It is used to change current working directory.

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS# cd ..
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82# cd OS
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS#
```

---

## tail

The tail command, as the name implies, print the last N number of data of the given input. By default it prints the last 10 lines of the specified files. If more than one file name is provided then data from each file is precedes by its file name.

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# cat temp.txt
A Kernel is at the nucleus of a computer. It makes the communication between the hardware and software possible.
While the Kernel is the innermost part of an operating system, a shell is the outermost one.
A shell in a Linux operating system takes input from you in the form of commands, processes it,
and then gives an output. It is the interface through which a user works on the programs, commands, and scripts. A shell
is accessed by a terminal which runs it.
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# tail -n 3 temp.txt
While the Kernel is the innermost part of an operating system, a shell is the outermost one.
A shell in a Linux operating system takes input from you in the form of commands, processes it,
and then gives an output. It is the interface through which a user works on the programs, commands, and scripts. A shell
is accessed by a terminal which runs it.
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#
```

## Cmp

cmp command in Linux/UNIX is used to compare the two files byte by byte and helps you to find out whether the two files are identical or not.

- When cmp is used for comparison between two files, it reports the location of the first mismatch to the screen if difference is found and if no difference is found i.e the files compared are identical.
- cmp displays no message and simply returns the prompt if the the files compared are identical.

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# cmp -b temp.txt temp1.txt
temp.txt temp1.txt differ: byte 1, line 1 is 101 A 104 D
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#
```

---

## diff

diff stands for difference. This command is used to display the differences in the files by comparing the files line by line.

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# diff temp.txt temp1.txt
1,4c1,10
< A Kernel is at the nucleus of a computer. It makes the communication between the hardware and software possible.
< While the Kernel is the innermost part of an operating system, a shell is the outermost one.
< A shell in a Linux operating system takes input from you in the form of commands, processes it,
< and then gives an output. It is the interface through which a user works on the programs, commands, and scripts. A she
ll is accessed by a terminal which runs it.
---
> Department
> Men's T-Shirts & Polos
> Men's T-Shirts
> Men's Polos
> Boys' T-Shirts & Polos
> Boys' T-Shirts
> Women's Tops, T-Shirts & Shirts
> Women's T-Shirts
> See All 4 Departments
> Customer Review
\ No newline at end of file
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#
```

---

## cp

cp stands for copy. This command is used to copy files or group of files or directory. It creates an exact image of a file on a disk with different file name. cp command require at least two filenames in its arguments



```

root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# cp temp.txt temp1.txt
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# cat temp1.txt
A Kernel is at the nucleus of a computer. It makes the communication between the hardware and software possible.
While the Kernel is the innermost part of an operating system, a shell is the outermost one.
A shell in a linux operating system takes input from you in the form of commands, processes it,
and then gives an output. It is the interface through which a user works on the programs, commands, and scripts. A shell is accessed by a terminal
which runs it.
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#

```

---

**clear** clear is a standard Unix computer operating system command that is used to clear the terminal screen.

---

**df**

The df command (short for disk free), is used to display information related to file systems about total space and available space.

```

root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# df

```

| Filesystem | 1K-blocks | Used      | Available | Use% | Mounted on     |
|------------|-----------|-----------|-----------|------|----------------|
| rootfs     | 283759612 | 214729616 | 69029996  | 76%  | /              |
| none       | 283759612 | 214729616 | 69029996  | 76%  | /dev           |
| none       | 283759612 | 214729616 | 69029996  | 76%  | /run           |
| none       | 283759612 | 214729616 | 69029996  | 76%  | /run/lock      |
| none       | 283759612 | 214729616 | 69029996  | 76%  | /run/shm       |
| none       | 283759612 | 214729616 | 69029996  | 76%  | /run/user      |
| tmpfs      | 283759612 | 214729616 | 69029996  | 76%  | /sys/fs/cgroup |
| C:\        | 283759612 | 214729616 | 69029996  | 76%  | /mnt/c         |
| D:\        | 215038972 | 8677216   | 206361756 | 5%   | /mnt/d         |

```

root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#

```

---

**du**

du command, short for disk usage, is used to estimate file space usage. The du command can be used to track the files and directories which are consuming excessive amount of space on hard disk drive. du -a : List all files and directories size.

```

root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# du -a
0      ./Q10.sh
0      ./Q11.sh
0      ./Q12.sh
0      ./Q13.sh
0      ./Q14.sh
0      ./Q15.sh
0      ./Q16.sh
0      ./Q2.sh
0      ./Q3.sh
0      ./Q4.sh
0      ./Q5.sh
0      ./Q6.sh
0      ./Q7.sh
0      ./Q8.sh
0      ./Q9.sh
0      ./Q9.sh.save
0      ./temp.sh
0      ./temp.txt
0      ./temp1.txt
392    ./U19CS082.pdf
392    .

```

---

## uname

The command ‘uname’ displays the information about the system.

-a option: It prints all the system information in the following order: Kernel name, network node hostname, kernel release date, kernel version, machine hardware name, hardware platform, operating system

```

root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# uname -a
Linux Sourabh 4.4.0-19041-Microsoft #1237-Microsoft Sat Sep 11 14:32:00 PST 2021 x86_64 x86_64 x86_64 GNU/Linux
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#

```

---

## apt-get

apt-get is a command-line tool which helps in handling packages in Linux. Its main task is to retrieve the information and packages from the authenticated sources for installation, upgrade and removal of packages along with their dependencies. Here APT stands for the Advanced Packaging Tool.

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# apt-get update
Hit:1 http://archive.ubuntu.com/ubuntu focal InRelease
Get:2 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Get:3 http://archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:4 http://archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Get:5 http://security.ubuntu.com/ubuntu focal-security/main amd64 Packages [1178 kB]
Get:6 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [1510 kB]
Get:7 http://security.ubuntu.com/ubuntu focal-security/main Translation-en [210 kB]
Get:8 http://security.ubuntu.com/ubuntu focal-security/main amd64 c-n-f Metadata [9132 B]
Get:9 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 Packages [686 kB]
Get:10 http://archive.ubuntu.com/ubuntu focal-updates/main Translation-en [296 kB]
Get:11 http://archive.ubuntu.com/ubuntu focal-updates/main amd64 c-n-f Metadata [14.7 kB]
Get:12 http://security.ubuntu.com/ubuntu focal-security/restricted Translation-en [97.9 kB]
Get:13 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [736 kB]
Get:14 http://security.ubuntu.com/ubuntu focal-security/restricted amd64 c-n-f Metadata [536 B]
Get:15 http://security.ubuntu.com/ubuntu focal-security/universe amd64 Packages [677 kB]
Get:16 http://archive.ubuntu.com/ubuntu focal-updates/restricted Translation-en [105 kB]
Get:17 http://archive.ubuntu.com/ubuntu focal-updates/restricted amd64 c-n-f Metadata [532 B]
Get:18 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [894 kB]
Get:19 http://archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [196 kB]
Get:20 http://security.ubuntu.com/ubuntu focal-security/universe Translation-en [115 kB]
Get:21 http://security.ubuntu.com/ubuntu focal-security/universe amd64 c-n-f Metadata [13.0 kB]
Get:22 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 Packages [21.8 kB]
Get:23 http://security.ubuntu.com/ubuntu focal-security/multiverse Translation-en [4948 B]
Get:24 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 c-n-f Metadata [536 B]
Get:25 http://archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [20.1 kB]
Get:26 http://archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 Packages [24.8 kB]
Get:27 http://archive.ubuntu.com/ubuntu focal-updates/multiverse Translation-en [6928 B]
Get:28 http://archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 c-n-f Metadata [620 B]
Get:29 http://archive.ubuntu.com/ubuntu focal-backports/main amd64 Packages [42.0 kB]
Get:30 http://archive.ubuntu.com/ubuntu focal-backports/main Translation-en [10.0 kB]
Get:31 http://archive.ubuntu.com/ubuntu focal-backports/main amd64 c-n-f Metadata [864 B]
Get:32 http://archive.ubuntu.com/ubuntu focal-backports/restricted amd64 c-n-f Metadata [116 B]
Get:33 http://archive.ubuntu.com/ubuntu focal-backports/universe amd64 Packages [20.2 kB]
Get:34 http://archive.ubuntu.com/ubuntu focal-backports/universe Translation-en [13.9 kB]
Get:35 http://archive.ubuntu.com/ubuntu focal-backports/universe amd64 c-n-f Metadata [692 B]
Get:36 http://archive.ubuntu.com/ubuntu focal-backports/multiverse amd64 c-n-f Metadata [116 B]
Fetched 7243 kB in 39s (185 kB/s)
Reading package lists... Done
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#
```

---

## Find

The find command in UNIX is a command line utility for walking a file hierarchy. It can be used to find files and directories and perform subsequent operations on them. It supports searching by file, folder, name, creation date, modification date, owner and permissions. By using the '-exec' other UNIX commands can be executed on files or folders found.



```

root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# find ./ -name temp1.txt
./temp1.txt
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#

```

## wget

Wget is the non-interactive network downloader which is used to download files from the server even when the user has not logged on to the system and it can work in the background without hindering the current process.

```

root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2# wget https://mail.google.com
--2022-01-25 22:39:38-- https://mail.google.com/
Resolving mail.google.com (mail.google.com)... 7404:6800:4009:804::2005, 142.250.199.5
Connecting to mail.google.com (mail.google.com)[7404:6800:4009:804::2005]:443... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
location: /mail/ [following]
--2022-01-25 22:39:39-- https://mail.google.com/mail/
Reusing existing connection to [mail.google.com]:443.
HTTP request sent, awaiting response... 302 Moved Temporarily
location: https://mail.google.com/mail/u/0/ [following]
--2022-01-25 22:39:40-- https://mail.google.com/mail/u/0/
Reusing existing connection to [mail.google.com]:443.
HTTP request sent, awaiting response... 302 Moved Temporarily
location: https://accounts.google.com/ServiceLogin?service=mail&passive=1209600&osid=1&continue=https://mail.google.com/mail/u/0/&followup=https://mail.google.com/mail/u/0/&next=1 [following]
--2022-01-25 22:39:41-- https://accounts.google.com/ServiceLogin?service=mail&passive=1209600&osid=1&continue=https://mail.google.com/mail/u/0/&followup=https://mail.google.com/mail/u/0/&next=1
Resolving accounts.google.com (accounts.google.com)... 7404:6800:4009:828::200d, 142.250.199.141
Connecting to accounts.google.com (accounts.google.com)[7404:6800:4009:828::200d]:443... connected.
HTTP request sent, awaiting response... 200 OK
length: unspecified [text/html]
saving to: 'index.html'
index.html [ c=0 03.95K 473KB/s in 0.2s]
2022-01-25 22:39:42 (473 KB/s) - 'index.html' saved [96206]
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2#

```

## top

top command is used to show the Linux processes. It provides a dynamic realtime view of the running system. Usually, this command shows the summary information of the system and the list of processes or threads which are currently managed by the Linux Kernel.

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS/assig2
top - 22:41:00 up 24 min,  0 users,  load average: 0.52, 0.58, 0.59
Tasks:  4 total,   1 running,  3 sleeping,   0 stopped,   0 zombie
%Cpu(s):  0.8 us,  2.3 sy,   0.0 ni, 96.8 id,   0.0 wa,   0.2 hi,   0.0 si,   0.0 st
MiB Mem :  8066.3 total,   864.1 free,  6978.2 used,   224.0 buff/cache
MiB Swap: 24576.0 total, 21047.6 free,   3528.4 used.  957.5 avail Mem

  PID USER      PR  NI   VIRT   RES   SHR S  %CPU  %MEM     TIME+ COMMAND
    1 root        20   0   8944    332    288 S   0.0   0.0   0:00.10 init
    8 root        20   0   8944    228    180 S   0.0   0.0   0:00.00 init
    9 root        20   0  18244   3824   3720 S   0.0   0.0   0:00.20 bash
  446 root        20   0  18948   2172   1528 R   0.0   0.0   0:00.06 top
```

---

## mpstat

mpstat is a command that is used to report processor related statistics. It accurately displays the statistics of the CPU usage of the system. It displays information about CPU utilization and performance. It initializes the first processor with CPU 0, the second one with CPU 1, and so on.

---

## netstat

Netstat command displays various network related information such as network connections, routing tables, interface statistics, masquerade connections, multicast memberships etc.

---

```
sj@DESKTOP-F3K5LHU:~$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
Active UNIX domain sockets (servers and established)
Proto RefCnt Flags       Type        State         I-Node      Path
sj@DESKTOP-F3K5LHU:~$
```

---

**sar** sar : System Activity

Report

It can be used to monitor Linux system's resources like CPU usage, Memory utilization, I/O devices consumption, Network monitoring, Disk usage, process and thread allocation, battery performance, Plug and play devices, Processor performance, file system and more.

---

## Chown

chown command is used to change the file Owner or group. Whenever you want to change ownership you can use chown command.

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS# ls -l
total 484
-rwxrwxrwx 1 root root 123125 Oct 18 10:48 U19CS082_ASS7.pdf
-rwxrwxrwx 1 root root 111551 Nov  8 15:45 U19CS082_ASS8.pdf
-rwxrwxrwx 1 root root 124144 Nov 14 23:34 U19CS082_ASS9_OS.pdf
-rwxrwxrwx 1 root root 126886 Aug 11 08:32 U19CS082_TUT1_OS.pdf
drwxrwxrwx 1 root root  4096 Aug 17 14:14 assig1
drwxrwxrwx 1 root root  4096 Jan 25 22:39 assig2
drwxrwxrwx 1 root root  4096 Aug 23 15:14 assig3
drwxrwxrwx 1 root root  4096 Aug 30 23:57 assig4
drwxrwxrwx 1 root root  4096 Sep 23 17:28 assig5
drwxrwxrwx 1 root root  4096 Sep 24 21:47 assig6
drwxrwxrwx 1 root root  4096 Oct 12 00:04 seminar
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS#
```

---

## 2. Linux commands related with process:

### ps

Linux provides us a utility called ps for viewing information related with the processes on a system which stands as abbreviation for "Process Status". ps command is used to list the currently running processes and their PIDs along with some other information

depends on different options. It reads the process information from the virtual files in /proc file-system. /proc contains virtual files, this is the reason it's referred as a virtual file system.

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS# ps
  PID TTY          TIME CMD
  447 tty1        00:00:00 init
  448 tty1        00:00:00 bash
  484 tty1        00:00:00 ps
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS#
```

## kill

kill command in Linux (located in /bin/kill), is a built-in command which is used to terminate processes manually. kill command sends a signal to a process which terminates the process. If the user doesn't specify any signal which is to be sent along with kill command then default TERM signal is sent that terminates the process. kill -l :To display all the available signals

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS# kill -l
 1) SIGHUP      2) SIGINT      3) SIGQUIT     4) SIGILL      5) SIGTRAP
 6) SIGABRT     7) SIGBUS     8) SIGFPE      9) SIGKILL     10) SIGUSR1
11) SIGSEGV    12) SIGUSR2    13) SIGPIPE     14) SIGALRM     15) SIGTERM
16) SIGSTKFLT  17) SIGCHLD    18) SIGCONT     19) SIGSTOP     20) SIGTSTP
21) SIGTTIN    22) SIGTTOU    23) SIGURG      24) SIGXCPU     25) SIGXFSZ
26) SIGVTALRM  27) SIGPROF    28) SIGWINCH    29) SIGIO        30) SIGPWR
31) SIGSYS     34) SIGRTMIN   35) SIGRTMIN+1  36) SIGRTMIN+2  37) SIGRTMIN+3
38) SIGRTMIN+4 39) SIGRTMIN+5 40) SIGRTMIN+6  41) SIGRTMIN+7  42) SIGRTMIN+8
43) SIGRTMIN+9 44) SIGRTMIN+10 45) SIGRTMIN+11 46) SIGRTMIN+12 47) SIGRTMIN+13
48) SIGRTMIN+14 49) SIGRTMIN+15 50) SIGRTMAX-14 51) SIGRTMAX-13 52) SIGRTMAX-12
53) SIGRTMAX-11 54) SIGRTMAX-10 55) SIGRTMAX-9  56) SIGRTMAX-8  57) SIGRTMAX-7
58) SIGRTMAX-6 59) SIGRTMAX-5 60) SIGRTMAX-4  61) SIGRTMAX-3  62) SIGRTMAX-2
63) SIGRTMAX-1 64) SIGRTMAX
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS#
```

To display a list of running processes use the command `ps` and this will show you running processes with their PID number. To specify which process should receive the kill signal we need to provide the PID.

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS# ps
  PID TTY          TIME CMD
  447 tty1        00:00:00 init
  448 tty1        00:00:00 bash
  485 tty1        00:00:00 ps
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS#
```

## background processing (with &)

To run a command in the background, add the ampersand symbol (&) at the end of the command:

The shell job ID (surrounded with brackets) and process ID will be printed on the terminal:

```
root@Sourabh: /mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS# command &
[1] 486
root@Sourabh:/mnt/c/Users/Sourabh Patel/Desktop/assignment/82/OS#
```

---