

LINUX COMMANDS DOCUMENTATION

YOGA SRI VARSHAN V

CED18I049

1. Test drive and understand the usage of all the commands given in the 50 Most Frequently Used UNIX / Linux Commands and linuxcommands.pdf

1)cp -copy command

Description:

Copy 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

Syntax:

- cp [OPTION] Source Destination //to copy source file contents in destination file.If the Destination file does not exist ,it creates the file else overwrites the Destination file content with source content
- cp [OPTION] Source Directory //to copy source file in the directory folder
- cp [OPTION] Source-1 Source-2 Source-3 ...Source-n Directory//to copy multiple files i.e all the files mentioned from Source-1 to Source-n into directory folder
- cp -r Source-Directory Destination-Directory

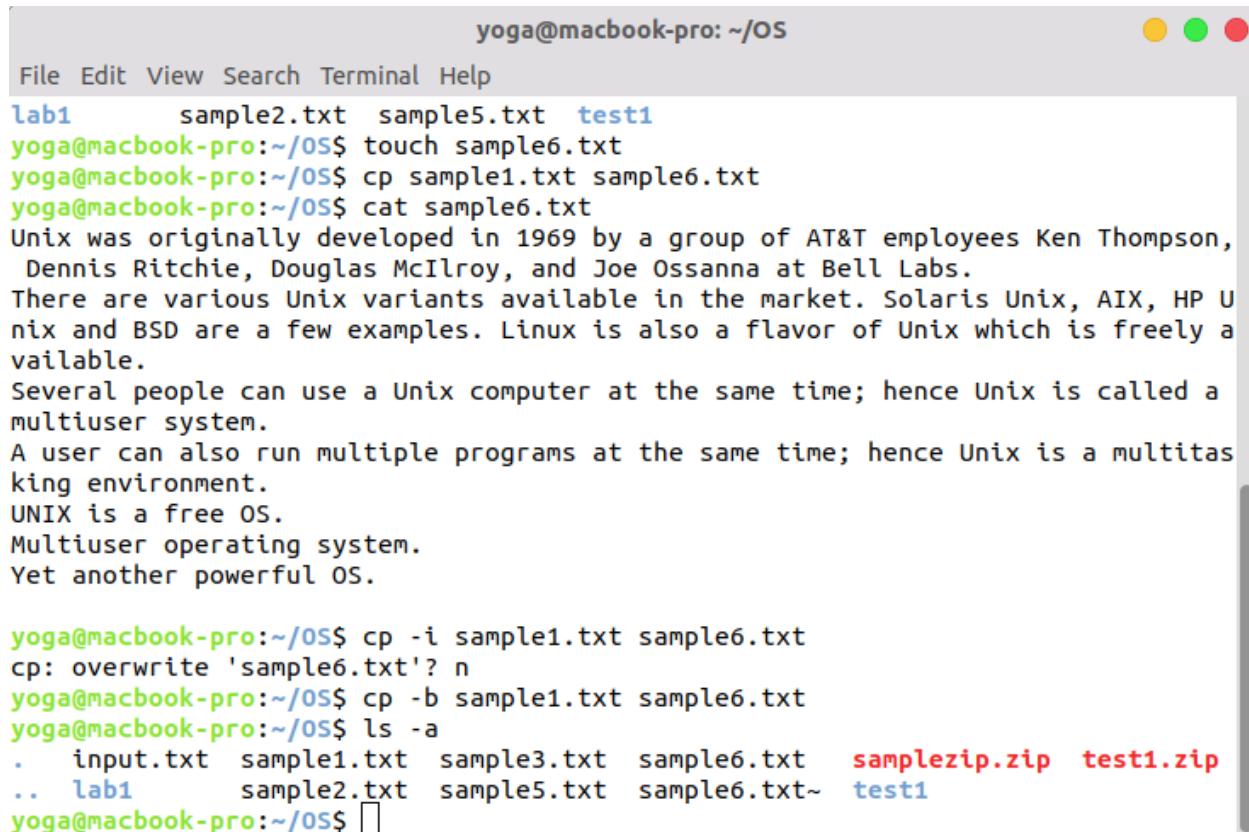
```
yoga@macbook-pro:~/OS$ ls
input.txt sample1.txt sample3.txt samplezip.zip test1.zip
lab1 sample2.txt sample5.txt test1
yoga@macbook-pro:~/OS$ touch sample6.txt
yoga@macbook-pro:~/OS$ cp sample1.txt sample6.txt
yoga@macbook-pro:~/OS$ cat sample6.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$
```

- Note:Requires at least two number of arguments

[OPTIONS]:

- -i (interactive):With this option enabled ,it warns the user before copying the files and only when 'y' is entered the process is executed.



yoga@macbook-pro: ~/OS

File Edit View Search Terminal Help

```
lab1      sample2.txt  sample5.txt  test1
yoga@macbook-pro:~/OS$ touch sample6.txt
yoga@macbook-pro:~/OS$ cp sample1.txt sample6.txt
yoga@macbook-pro:~/OS$ cat sample6.txt
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yoga@macbook-pro:~/OS$ cp -i sample1.txt sample6.txt
cp: overwrite 'sample6.txt'? n
yoga@macbook-pro:~/OS$ cp -b sample1.txt sample6.txt
yoga@macbook-pro:~/OS$ ls -a
.  input.txt  sample1.txt  sample3.txt  sample6.txt  samplezip.zip  test1.zip
..  lab1      sample2.txt  sample5.txt  sample6.txt~  test1
yoga@macbook-pro:~/OS$
```

- -b(backup):With this option enabled ,it creates a backup file of the destination file in the same folder with different format

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
lab1      sample2.txt sample5.txt test1
yoga@macbook-pro:~/OS$ touch sample6.txt
yoga@macbook-pro:~/OS$ cp sample1.txt sample6.txt
yoga@macbook-pro:~/OS$ cat sample6.txt
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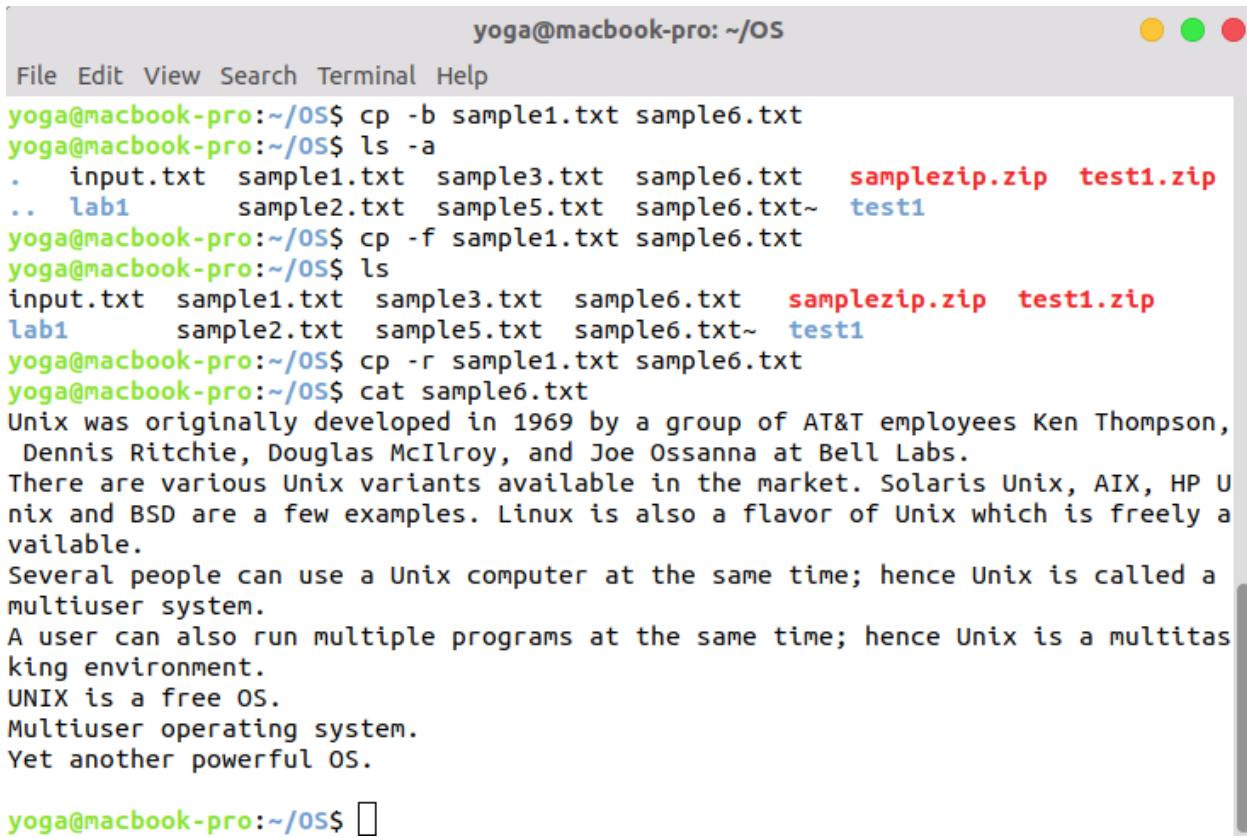
yoga@macbook-pro:~/OS$ cp -i sample1.txt sample6.txt
cp: overwrite 'sample6.txt'? n
yoga@macbook-pro:~/OS$ cp -b sample1.txt sample6.txt
yoga@macbook-pro:~/OS$ ls -a
.  input.txt  sample1.txt  sample3.txt  sample6.txt  samplezip.zip  test1.zip
..  lab1      sample2.txt  sample5.txt  sample6.txt~  test1
yoga@macbook-pro:~/OS$ 
```

- -f(force):This option has to be enabled if the user does not have read/write permissions for the destination file .Thereby when enabled ,the destination file is deleted first and a new file is created and the data is copied into it

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cp -b sample1.txt sample6.txt
yoga@macbook-pro:~/OS$ ls -a
.  input.txt  sample1.txt  sample3.txt  sample6.txt  samplezip.zip  test1.zip
..  lab1      sample2.txt  sample5.txt  sample6.txt~  test1
yoga@macbook-pro:~/OS$ cp -f sample1.txt sample6.txt
yoga@macbook-pro:~/OS$ ls
input.txt  sample1.txt  sample3.txt  sample6.txt  samplezip.zip  test1.zip
lab1      sample2.txt  sample5.txt  sample6.txt~  test1
yoga@macbook-pro:~/OS$ cp -r sample1.txt sample6.txt
yoga@macbook-pro:~/OS$ cat sample6.txt
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yoga@macbook-pro:~/OS$ 
```

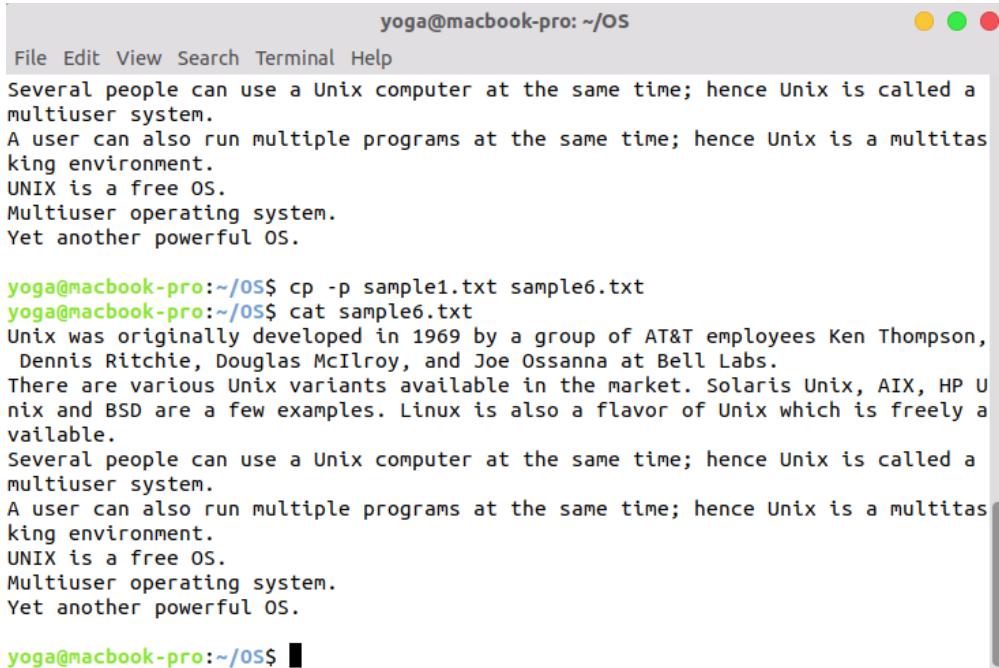
- -r or R(recursive): This option has to be enabled if the user has to copy contents of a directory itself to another directory.



```
yoga@macbook-pro:~/OS$ cp -b sample1.txt sample6.txt
yoga@macbook-pro:~/OS$ ls -a
.
.. input.txt sample1.txt sample3.txt sample6.txt samplezip.zip test1.zip
.. lab1 sample2.txt sample5.txt sample6.txt~ test1
yoga@macbook-pro:~/OS$ cp -f sample1.txt sample6.txt
yoga@macbook-pro:~/OS$ ls
input.txt sample1.txt sample3.txt sample6.txt samplezip.zip test1.zip
lab1 sample2.txt sample5.txt sample6.txt~ test1
yoga@macbook-pro:~/OS$ cp -r sample1.txt sample6.txt
yoga@macbook-pro:~/OS$ cat sample6.txt
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yoga@macbook-pro:~/OS$
```

- -p(preserve): With this option enabled ,the destination file is also entitled with the properties of source file like read /write permissions ,last date modified ,etc



```
yoga@macbook-pro:~/OS$ cp -p sample1.txt sample6.txt
yoga@macbook-pro:~/OS$ cat sample6.txt
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yoga@macbook-pro:~/OS$
```

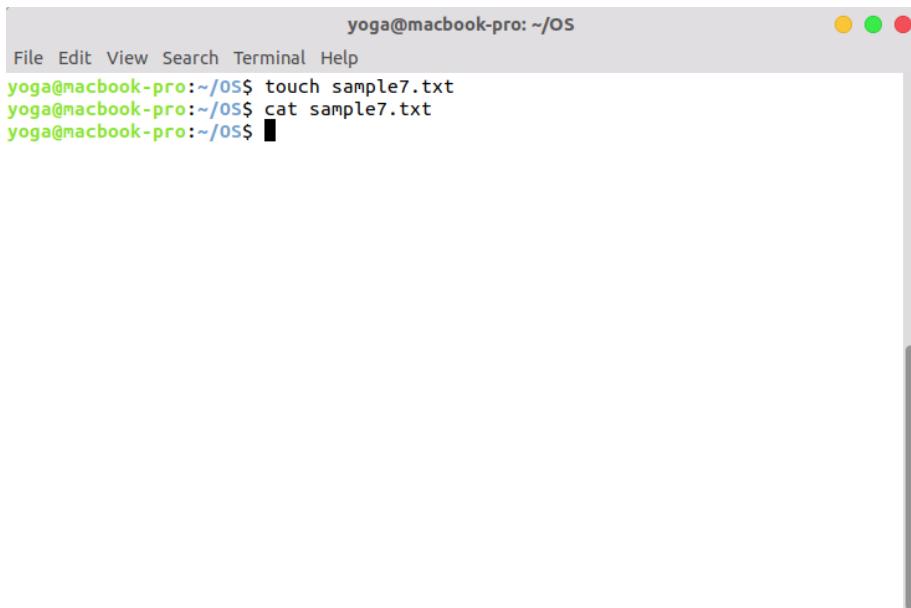
2)touch :

Description:

Touch command is used to create ,change and modify timestamps of a file.
It is also used to create a file without any content(empty file)

Syntax:

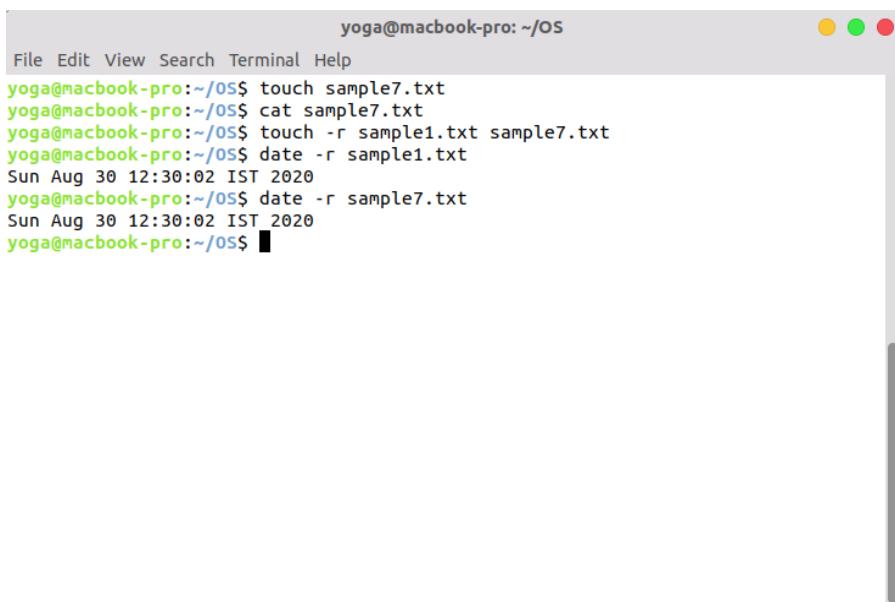
- touch [OPTION] filename //use to create a file



A screenshot of a macOS Terminal window titled "yoga@macbook-pro: ~/OS". The menu bar includes File, Edit, View, Search, Terminal, and Help. The title bar shows the terminal session name. The main pane displays the following command sequence:

```
yoga@macbook-pro:~/OS$ touch sample7.txt
yoga@macbook-pro:~/OS$ cat sample7.txt
yoga@macbook-pro:~/OS$
```

- touch -r file1 file2//to update timestamp of file2 with that of file1

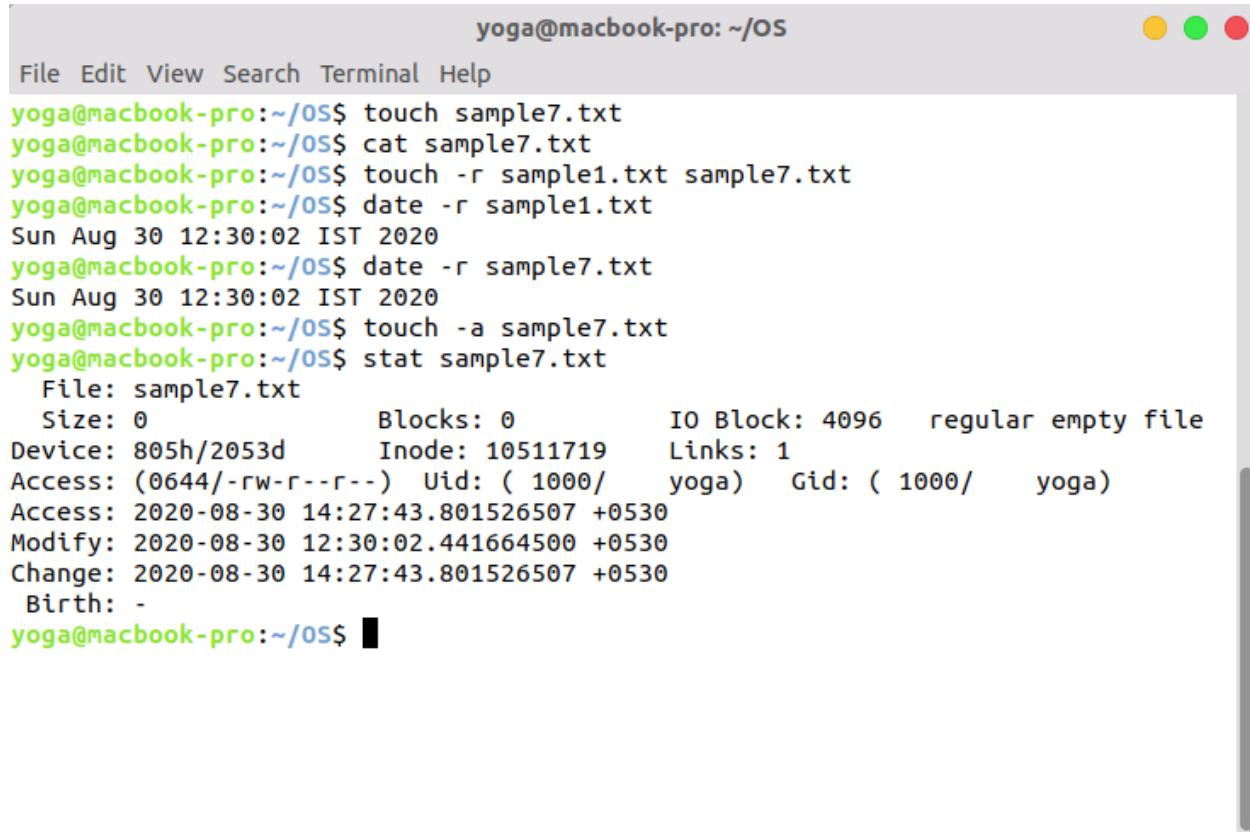


A screenshot of a macOS Terminal window titled "yoga@macbook-pro: ~/OS". The menu bar includes File, Edit, View, Search, Terminal, and Help. The title bar shows the terminal session name. The main pane displays the following command sequence:

```
yoga@macbook-pro:~/OS$ touch sample7.txt
yoga@macbook-pro:~/OS$ cat sample7.txt
yoga@macbook-pro:~/OS$ touch -r sample1.txt sample7.txt
yoga@macbook-pro:~/OS$ date -r sample1.txt
Sun Aug 30 12:30:02 IST 2020
yoga@macbook-pro:~/OS$ date -r sample7.txt
Sun Aug 30 12:30:02 IST 2020
yoga@macbook-pro:~/OS$
```

[OPTIONS]:

- -a:This command is used only to change/update modification time or last accessed time of a file



The screenshot shows a macOS Terminal window with the title "yoga@macbook-pro: ~/OS". The menu bar includes File, Edit, View, Search, Terminal, and Help. The window contains the following terminal session:

```
yoga@macbook-pro:~/OS$ touch sample7.txt
yoga@macbook-pro:~/OS$ cat sample7.txt
yoga@macbook-pro:~/OS$ touch -r sample1.txt sample7.txt
yoga@macbook-pro:~/OS$ date -r sample1.txt
Sun Aug 30 12:30:02 IST 2020
yoga@macbook-pro:~/OS$ date -r sample7.txt
Sun Aug 30 12:30:02 IST 2020
yoga@macbook-pro:~/OS$ touch -a sample7.txt
yoga@macbook-pro:~/OS$ stat sample7.txt
  File: sample7.txt
  Size: 0          Blocks: 0          IO Block: 4096   regular empty file
Device: 805h/2053d  Inode: 10511719  Links: 1
Access: (0644/-rw-r--r--)  Uid: ( 1000/    yoga)  Gid: ( 1000/    yoga)
Access: 2020-08-30 14:27:43.801526507 +0530
Modify: 2020-08-30 12:30:02.441664500 +0530
Change: 2020-08-30 14:27:43.801526507 +0530
 Birth: -
yoga@macbook-pro:~/OS$
```

- -c:This command is used to check whether a file is created or not and if not created then it does not create a file.

```
yoga@macbook-pro:~/OS$ touch sample7.txt
yoga@macbook-pro:~/OS$ cat sample7.txt
yoga@macbook-pro:~/OS$ touch -r sample1.txt sample7.txt
yoga@macbook-pro:~/OS$ date -r sample1.txt
Sun Aug 30 12:30:02 IST 2020
yoga@macbook-pro:~/OS$ date -r sample7.txt
Sun Aug 30 12:30:02 IST 2020
yoga@macbook-pro:~/OS$ touch -a sample7.txt
yoga@macbook-pro:~/OS$ stat sample7.txt
  File: sample7.txt
  Size: 0          Blocks: 0          IO Block: 4096   regular empty file
Device: 805h/2053d  Inode: 10511719  Links: 1
Access: (0644/-rw-r--r--)  Uid: ( 1000/      yoga)  Gid: ( 1000/      yoga)
Access: 2020-08-30 14:27:43.801526507 +0530
Modify: 2020-08-30 12:30:02.441664500 +0530
Change: 2020-08-30 14:27:43.801526507 +0530
 Birth: -
yoga@macbook-pro:~/OS$ touch -c sample7.txt
yoga@macbook-pro:~/OS$ ls
input.txt  sample1.txt  sample3.txt  sample6.txt  sample7.txt  test1
lab1       sample2.txt  sample5.txt  sample6.txt~  samplezip.zip  test1.zip
yoga@macbook-pro:~/OS$
```

- -c-d 'Date':This command is used to update access and modification time.(Date Format:DD Month)

```
yoga@macbook-pro:~/OS$ File Edit View Search Terminal Help
Access: 2020-08-30 14:27:43.801526507 +0530
Modify: 2020-08-30 12:30:02.441664500 +0530
Change: 2020-08-30 14:27:43.801526507 +0530
 Birth: -
yoga@macbook-pro:~/OS$ touch -c sample7.txt
yoga@macbook-pro:~/OS$ ls
input.txt  sample1.txt  sample3.txt  sample6.txt  sample7.txt  test1
lab1       sample2.txt  sample5.txt  sample6.txt~  samplezip.zip  test1.zip
yoga@macbook-pro:~/OS$ touch -c-d sample7.txt
touch: invalid option -- '-'
Try 'touch --help' for more information.
yoga@macbook-pro:~/OS$ touch -c -d sample7.txt
touch: invalid date format 'sample7.txt'
yoga@macbook-pro:~/OS$ touch -c -d '30 Aug' sample7.txt
yoga@macbook-pro:~/OS$ stat sample7.txt
  File: sample7.txt
  Size: 0          Blocks: 0          IO Block: 4096   regular empty file
Device: 805h/2053d  Inode: 10511719  Links: 1
Access: (0644/-rw-r--r--)  Uid: ( 1000/      yoga)  Gid: ( 1000/      yoga)
Access: 2020-08-30 00:00:00.000000000 +0530
Modify: 2020-08-30 00:00:00.000000000 +0530
Change: 2020-08-30 14:29:10.551439804 +0530
 Birth: -
yoga@macbook-pro:~/OS$
```

- -m:This command is used to change only the modification time.

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
Try 'touch --help' for more information.
yoga@macbook-pro:~/OS$ touch -c -d sample7.txt
touch: invalid date format 'sample7.txt'
yoga@macbook-pro:~/OS$ touch -c -d '30 Aug' sample7.txt
yoga@macbook-pro:~/OS$ stat sample7.txt
  File: sample7.txt
  Size: 0          Blocks: 0          IO Block: 4096   regular empty file
Device: 805h/2053d      Inode: 10511719      Links: 1
Access: (0644/-rw-r--r--) Uid: ( 1000/    yoga)  Gid: ( 1000/    yoga)
Access: 2020-08-30 00:00:00.000000000 +0530
Modify: 2020-08-30 00:00:00.000000000 +0530
Change: 2020-08-30 14:29:10.551439804 +0530
 Birth: -
yoga@macbook-pro:~/OS$ touch -m '30 Aug' sample7.txt
yoga@macbook-pro:~/OS$ stat sample7.txt
  File: sample7.txt
  Size: 0          Blocks: 0          IO Block: 4096   regular empty file
Device: 805h/2053d      Inode: 10511719      Links: 1
Access: (0644/-rw-r--r--) Uid: ( 1000/    yoga)  Gid: ( 1000/    yoga)
Access: 2020-08-30 00:00:00.000000000 +0530
Modify: 2020-08-30 14:29:29.203851409 +0530
Change: 2020-08-30 14:29:29.203851409 +0530
 Birth: -
yoga@macbook-pro:~/OS$
```

- -r: This command is used to update timestamp of file2 with that of file1

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
Modify: 2020-08-30 00:00:00.000000000 +0530
Change: 2020-08-30 14:29:10.551439804 +0530
 Birth: -
yoga@macbook-pro:~/OS$ touch -m '30 Aug' sample7.txt
yoga@macbook-pro:~/OS$ stat sample7.txt
  File: sample7.txt
  Size: 0          Blocks: 0          IO Block: 4096   regular empty file
Device: 805h/2053d      Inode: 10511719      Links: 1
Access: (0644/-rw-r--r--) Uid: ( 1000/    yoga)  Gid: ( 1000/    yoga)
Access: 2020-08-30 00:00:00.000000000 +0530
Modify: 2020-08-30 14:29:29.203851409 +0530
Change: 2020-08-30 14:29:29.203851409 +0530
 Birth: -
yoga@macbook-pro:~/OS$ touch -r sample1.txt sample7.txt
yoga@macbook-pro:~/OS$ stat sample7.txt
  File: sample7.txt
  Size: 0          Blocks: 0          IO Block: 4096   regular empty file
Device: 805h/2053d      Inode: 10511719      Links: 1
Access: (0644/-rw-r--r--) Uid: ( 1000/    yoga)  Gid: ( 1000/    yoga)
Access: 2020-08-30 12:50:32.084104681 +0530
Modify: 2020-08-30 12:30:02.441664500 +0530
Change: 2020-08-30 14:30:07.436695320 +0530
 Birth: -
yoga@macbook-pro:~/OS$
```

- -t: This option enables to create a file using a specified time format(YYYYMMDDHHMM)

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
Modify: 2020-08-30 14:29:29.203851409 +0530
Change: 2020-08-30 14:29:29.203851409 +0530
Birth: -
yoga@macbook-pro:~/OS$ touch -r sample1.txt sample7.txt
yoga@macbook-pro:~/OS$ stat sample7.txt
  File: sample7.txt
  Size: 0          Blocks: 0          IO Block: 4096   regular empty file
Device: 805h/2053d      Inode: 10511719      Links: 1
Access: (0644/-rw-r--r--) Uid: ( 1000/    yoga)  Gid: ( 1000/    yoga)
Access: 2020-08-30 12:50:32.084104681 +0530
Modify: 2020-08-30 12:30:02.441664500 +0530
Change: 2020-08-30 14:30:07.436695320 +0530
 Birth: -
yoga@macbook-pro:~/OS$ touch -t 201909272016 sample7.txt
yoga@macbook-pro:~/OS$ stat sample7.txt
  File: sample7.txt
  Size: 0          Blocks: 0          IO Block: 4096   regular empty file
Device: 805h/2053d      Inode: 10511719      Links: 1
Access: (0644/-rw-r--r--) Uid: ( 1000/    yoga)  Gid: ( 1000/    yoga)
Access: 2019-09-27 20:16:00.000000000 +0530
Modify: 2019-09-27 20:16:00.000000000 +0530
Change: 2020-08-30 14:31:13.670157936 +0530
 Birth: -
yoga@macbook-pro:~/OS$
```

3)cat :

Description:

It is used to read and display the file content as output

It is also used to create a file and concatenate files

Syntax:

- cat [OPTION1] file1 file2...file n [OPTION2] //to display file data

```

Terminal ▾ Sun Aug 30, 14:37:25
yoga@macbook-pro:~/OS

File Edit View Search Terminal Help
Device: 805h/2053d Inode: 10511719 Links: 1
Access: (0644/-rw-r--r--) Uid: ( 1000/    yoga) Gid: ( 1000/    yoga)
Access: 2020-08-30 12:50:32.084104681 +0530
Modify: 2020-08-30 12:30:02.441664500 +0530
Change: 2020-08-30 14:30:07.436695320 +0530
Birth: -
yoga@macbook-pro:~/OS$ touch -t 201909272016 sample7.txt
yoga@macbook-pro:~/OS$ stat sample7.txt
  File: sample7.txt
  Size: 0          Blocks: 0      IO Block: 4096   regular empty file
Device: 805h/2053d Inode: 10511719 Links: 1
Access: (0644/-rw-r--r--) Uid: ( 1000/    yoga) Gid: ( 1000/    yoga)
Access: 2019-09-27 20:16:00.000000000 +0530
Modify: 2019-09-27 20:16:00.000000000 +0530
Change: 2020-08-30 14:31:13.670157936 +0530
Birth: -
yoga@macbook-pro:~/OS$ clear

yoga@macbook-pro:~/OS$ cat sample1.txt sample2.txt
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yoga@macbook-pro:~/OS$ 
```

- cat >newfile //to create a new file

```

yoga@macbook-pro:~/OS

File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt    sample5.txt    sample7.txt    test1
input.txt    sample2.txt    sample6.txt    sample8.txt    test1.zip
lab1        sample3.txt    sample6.txt~   samplezip.zip
yoga@macbook-pro:~/OS$ cat > sample9.txt
^C
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt    sample5.txt    sample7.txt    samplezip.zip
input.txt    sample2.txt    sample6.txt    sample8.txt    test1
lab1        sample3.txt    sample6.txt~   sample9.txt    test1.zip
yoga@macbook-pro:~/OS$ 
```

- cat sourcefile > newfile //overwrites newfile with sourcefile content if file already exists ,else creates a new file and copies the data into newfile

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
input.txt    sample2.txt    sample6.txt    sample8.txt    test1.zip
lab1        sample3.txt    sample6.txt~  samplezip.zip
yoga@macbook-pro:~/OS$ cat > sample9.txt
^C
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt    sample5.txt    sample7.txt    samplezip.zip
input.txt    sample2.txt    sample6.txt    sample8.txt    test1
lab1        sample3.txt    sample6.txt~  sample9.txt    test1.zip
yoga@macbook-pro:~/OS$ cat sample1.txt > sample9.txt
yoga@macbook-pro:~/OS$ cat sample9.txt
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yoga@macbook-pro:~/OS$
```

- cat sourcefile >> newfile // appends new file data with source file

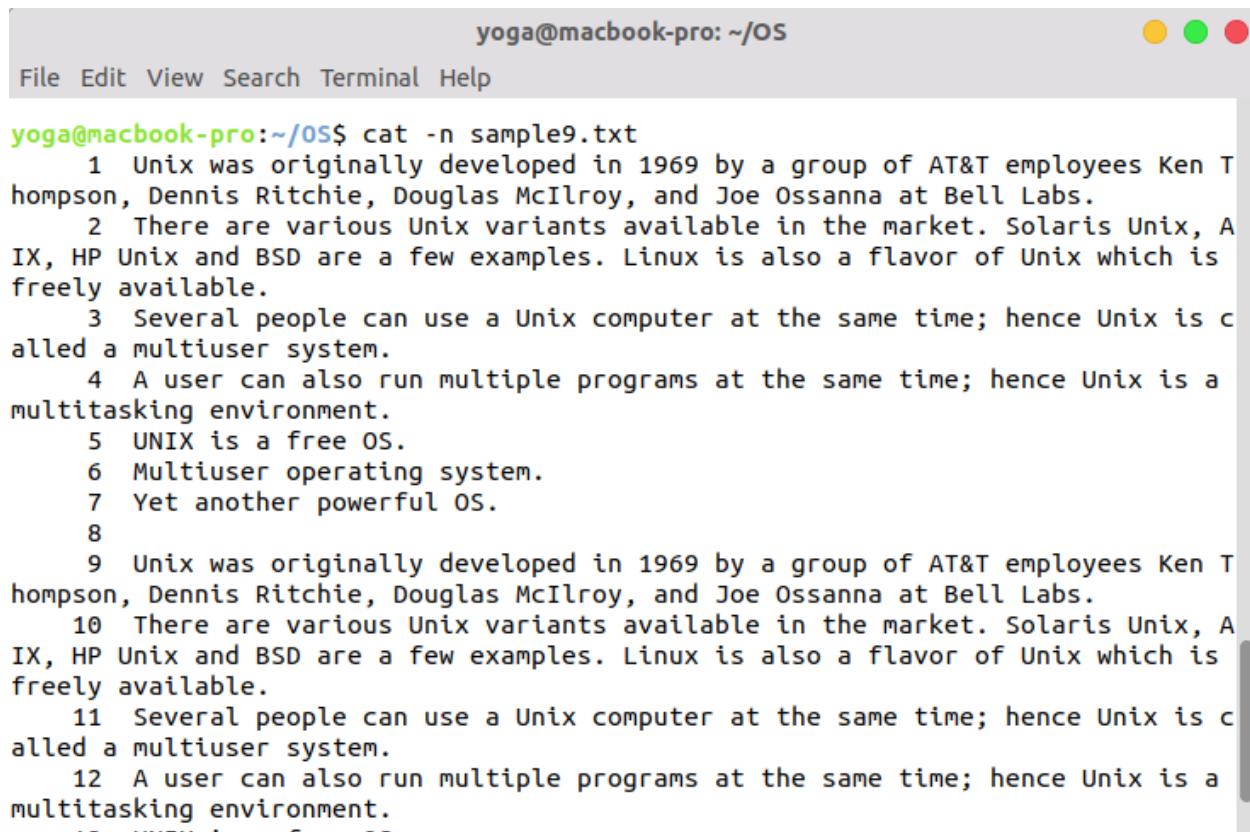
```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cat sample1.txt >> sample9.txt
yoga@macbook-pro:~/OS$ cat sample9.txt
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Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
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Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
```

- cat "source-1" "source-2"..."source-n" >/>> "newfile"//use '>>' to overwrite new file with source-1 to source-n file contents one by one and to append the new file with these file contents use ">>"

[OPTION1]:

- -n:This command is used to display output with line numbers



The screenshot shows a macOS Terminal window with the title bar "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The window contains the following text:

```
yoga@macbook-pro:~/OS$ cat -n sample9.txt
 1 Unix was originally developed in 1969 by a group of AT&T employees Ken T
hompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
 2 There are various Unix variants available in the market. Solaris Unix, A
IX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is
freely available.
 3 Several people can use a Unix computer at the same time; hence Unix is c
alled a multiuser system.
 4 A user can also run multiple programs at the same time; hence Unix is a
multitasking environment.
 5 UNIX is a free OS.
 6 Multiuser operating system.
 7 Yet another powerful OS.
 8
 9 Unix was originally developed in 1969 by a group of AT&T employees Ken T
hompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
10 There are various Unix variants available in the market. Solaris Unix, A
IX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is
freely available.
11 Several people can use a Unix computer at the same time; hence Unix is c
alled a multiuser system.
12 A user can also run multiple programs at the same time; hence Unix is a
multitasking environment.
```

- -s:To suppress error in accessing file /to suppress empty lines in the output

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cat -s sample9.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
vailable.
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitas
king environment.
UNIX is a free OS.
Multiuser operating system.
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Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
vailable.
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitas
king environment.
UNTX is a free OS.
```

- -v: This command is used to show non-printable characters

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cat -v sample9.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.^M
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
vailable.^M
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.^M
A user can also run multiple programs at the same time; hence Unix is a multitas
king environment.^M
UNIX is a free OS.^M
Multiuser operating system.^M
Yet another powerful OS.^M
^M
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.^M
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
vailable.^M
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.^M
A user can also run multiple programs at the same time; hence Unix is a multitas
king environment.^M
UNTX is a free OS.^M
```

- -e: This command is used to character that ends a line. Displayed as '\$'

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cat -e sample9.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.^M$
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
available.^M$
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.^M$
A user can also run multiple programs at the same time; hence Unix is a multitas
king environment.^M$
UNIX is a free OS.^M$
Multiuser operating system.^M$
Yet another powerful OS.^M$
^M$
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.^M$
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
available.^M$
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.^M$
A user can also run multiple programs at the same time; hence Unix is a multitas
king environment.^M$
UNIX is a free OS.^M$
```

- -T:This command is used to display tab spaces as '^I' to distinguish between tab and spaces

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cat -T sample9.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
available.
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitas
king environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
available.
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitas
king environment.
UNIX is a free OS.
```

- -A:It features all the functionalities of v,e,T i.e,to show all possible features

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cat -A sample9.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.^M$
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
available.^M$
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.^M$
A user can also run multiple programs at the same time; hence Unix is a multitask
ing environment.^M$
UNIX is a free OS.^M$
Multiuser operating system.^M$
Yet another powerful OS.^M$
^M$
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.^M$
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
available.^M$
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.^M$
A user can also run multiple programs at the same time; hence Unix is a multitask
ing environment.^M$
UNTX is a free OS.^M$
```

4)seq :

Description:

- >It is used to generate numbers from FIRST to LAST in steps of INCREMENT.
- >It is a very useful command where we had to generate list of numbers in while, for, until loop.

Syntax:

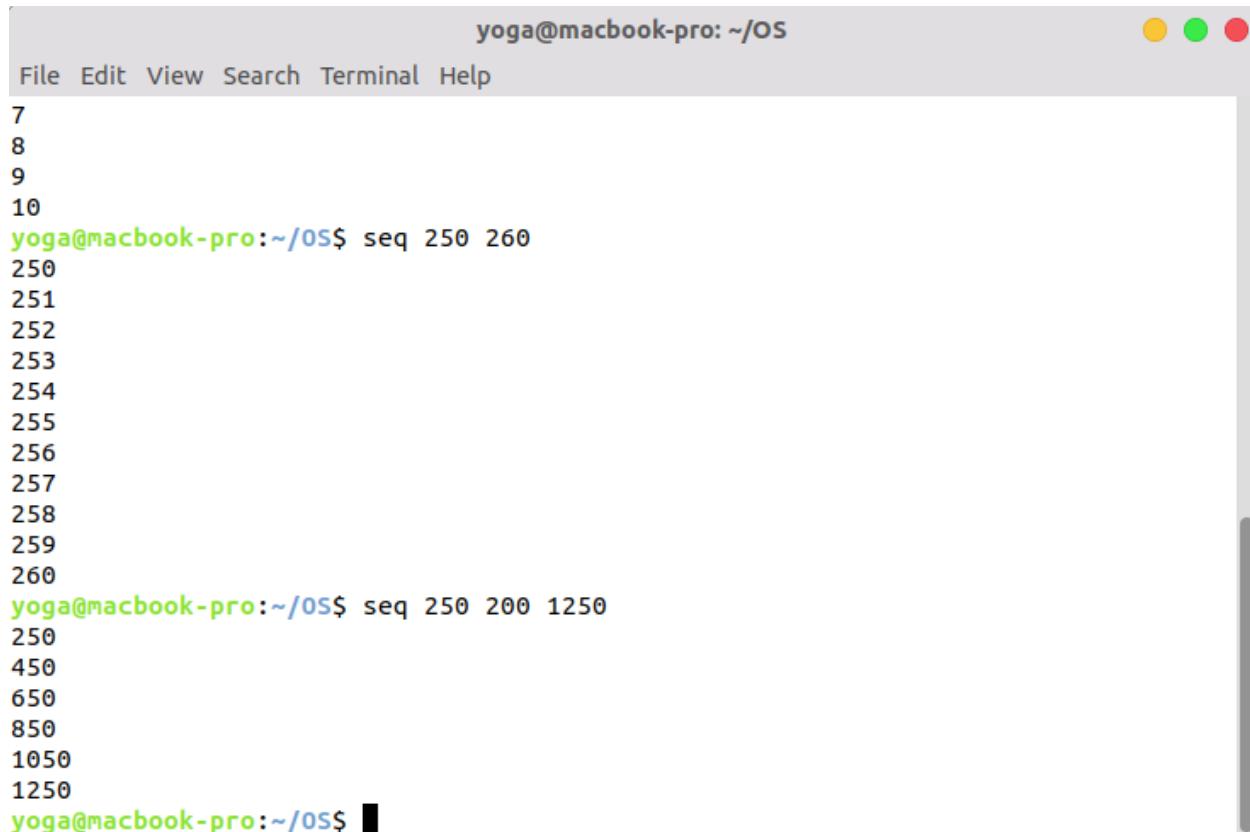
- seq [OPTION] [FORMAT] [STRING] [FIRST] [INCREMENT][LAST]
- seq [LAST]//prints sequence of numbers from 1 till LAST;INCREMENT=1

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ seq 10
1
2
3
4
5
6
7
8
9
10
yoga@macbook-pro:~/OS$ █
```

- seq [FIRST][LAST] //prints sequence of numbers from start till LAST;INCREMENT=1;

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
7
8
9
10
yoga@macbook-pro:~/OS$ seq 250 260
250
251
252
253
254
255
256
257
258
259
260
yoga@macbook-pro:~/OS$ seq 250 200 1250
250
450
650
850
1050
1250
yoga@macbook-pro:~/OS$ █
```

- seq [FIRST][INCREMENT][LAST] //prints sequence of numbers from FIRST till LAST incremented by INCREMENT argument



The screenshot shows a terminal window titled "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The window title bar also displays "yoga@macbook-pro: ~/OS". The terminal content shows two examples of the seq command:

```
7
8
9
10
yoga@macbook-pro:~/OS$ seq 250 260
250
251
252
253
254
255
256
257
258
259
260
yoga@macbook-pro:~/OS$ seq 250 200 1250
250
450
650
850
1050
1250
yoga@macbook-pro:~/OS$ █
```

Note: Minimum arguments required last

[OPTION]:

- -f: This Option when enabled requires 'Format' argument. So that the output is display as a sequence of 'Format's.

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ seq -f "COE18B%02g" 2 2 10
"COE18B002"
"COE18B004"
"COE18B006"
"COE18B008"
"COE18B010"
yoga@macbook-pro:~/OS$
```

- -s: This Option requires “String “ argument such that the output is displayed as sequence of numbers from 1 (start:by default is 1) till ‘LAST’ with “STRING” in between .//“FIRST” and “INCREMENT” are optional arguments.

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ seq -f "COE18B%02g" 2 2 10
"COE18B002"
"COE18B004"
"COE18B006"
"COE18B008"
"COE18B010"
yoga@macbook-pro:~/OS$ seq -s "COE18B%02g" 2 2 10
2"COE18B0%02g"4"COE18B0%02g"6"COE18B0%02g"8"COE18B0%02g"10
yoga@macbook-pro:~/OS$ █
```

- -w: This Option enables padding with leading zeroes



The screenshot shows a terminal window titled "yoga@macbook-pro: ~/OS". The window contains the following command and its output:

```
yoga@macbook-pro:~/OS$ seq -f "COE18B%02g" 2 2 10
"COE18B002"
"COE18B004"
"COE18B006"
"COE18B008"
"COE18B010"
yoga@macbook-pro:~/OS$ seq -s "COE18B%02g" 2 2 10
2"COE18B0%02g"4"COE18B0%02g"6"COE18B0%02g"8"COE18B0%02g"10
yoga@macbook-pro:~/OS$ seq -w 1 10 120
001
011
021
031
041
051
061
071
081
091
101
111
yoga@macbook-pro:~/OS$
```

5)W command:

Description:

- >It is used to show the activity of logged in users and their processes in execution.
- >It is used to display the user's Logged in time and the system load averaged for the past 5,10 ,15 minutes ,etc

Syntax:

w [OPTION] [USER]...

NOTE:

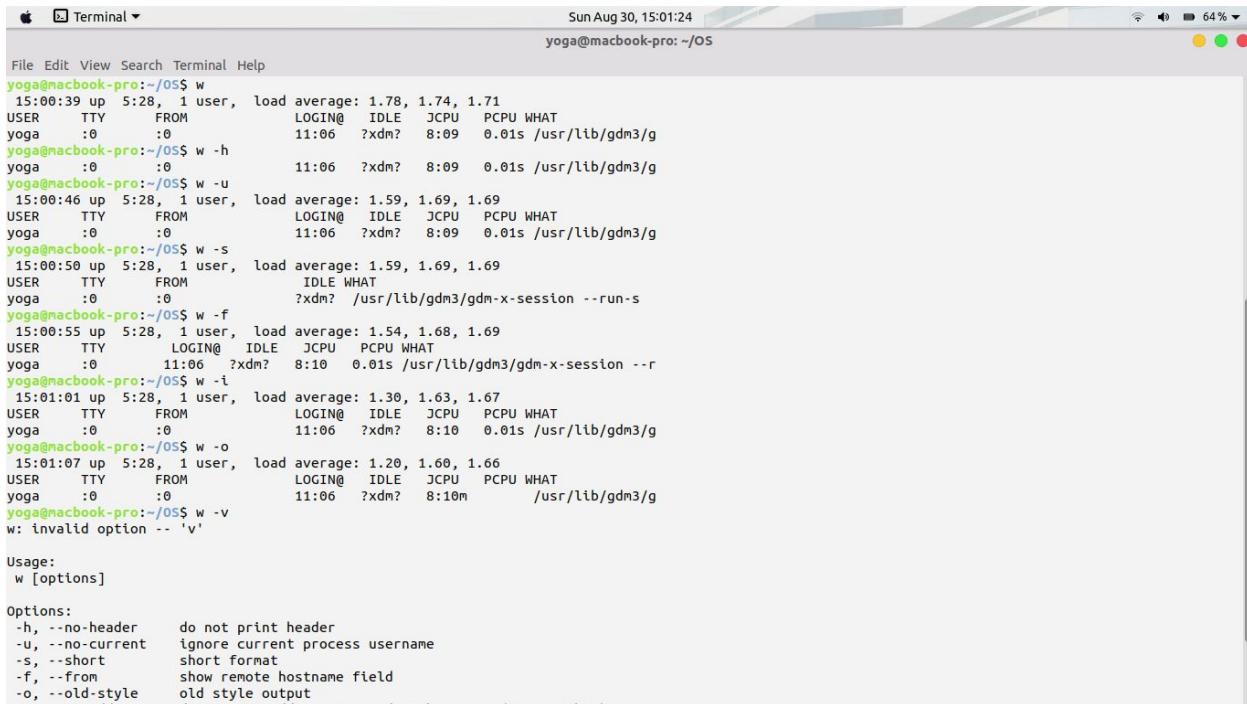
OPTION and USER arguments are optional

If user is given ,Output is displayed only about that particular user

[OPTION]:

- -h:This Option does not print header
- -u:This option ignores username while finding out current processes and time
- -s:This Options prints output without JCPU/ PCPU or login time(short form)

- -f: This Option enables remote hostname field as “from”
- -i: In from field ,it displays IP address instead host address
- -o: This Options Prints black space for idle time less than 1 minute
- -V: Displays Version Information



The screenshot shows a macOS Terminal window with the title bar "Terminal" and status bar "Sun Aug 30, 15:01:24" and "yoga@macbook-pro: ~/OS". The window content displays the usage of the 'w' command:

```

yoga@macbook-pro:~/OS$ w
15:00:39 up 5:28, 1 user, load average: 1.78, 1.74, 1.71
USER   TTY      FROM          LOGIN@    IDLE    JCPU   PCPU WHAT
yoga   :0       :0           11:06 ?xdm?  8:09  0.01s /usr/lib/gdm3/g
yoga@macbook-pro:~/OS$ w -h
yoga   :0       :0           11:06 ?xdm?  8:09  0.01s /usr/lib/gdm3/g
yoga@macbook-pro:~/OS$ w -u
15:00:46 up 5:28, 1 user, load average: 1.59, 1.69, 1.69
USER   TTY      FROM          LOGIN@    IDLE    JCPU   PCPU WHAT
yoga   :0       :0           11:06 ?xdm?  8:09  0.01s /usr/lib/gdm3/g
yoga@macbook-pro:~/OS$ w -s
15:00:50 up 5:28, 1 user, load average: 1.59, 1.69, 1.69
USER   TTY      FROM          IDLE     WHAT
yoga   :0       :0           11:06 ?xdm?  /usr/lib/gdm3/gdm-x-session --run-s
yoga@macbook-pro:~/OS$ w -f
15:00:55 up 5:28, 1 user, load average: 1.54, 1.68, 1.69
USER   TTY      FROM          LOGIN@    IDLE    JCPU   PCPU WHAT
yoga   :0       :0           11:06 ?xdm?  8:10  0.01s /usr/lib/gdm3/gdm-x-session --r
yoga@macbook-pro:~/OS$ w -i
15:01:01 up 5:28, 1 user, load average: 1.30, 1.63, 1.67
USER   TTY      FROM          LOGIN@    IDLE    JCPU   PCPU WHAT
yoga   :0       :0           11:06 ?xdm?  8:10  0.01s /usr/lib/gdm3/g
yoga@macbook-pro:~/OS$ w -o
15:01:07 up 5:28, 1 user, load average: 1.20, 1.60, 1.66
USER   TTY      FROM          LOGIN@    IDLE    JCPU   PCPU WHAT
yoga   :0       :0           11:06 ?xdm?  8:10m /usr/lib/gdm3/g
yoga@macbook-pro:~/OS$ w -v
w: invalid option -- 'v'

Usage:
w [options]

Options:
-h, --no-header      do not print header
-u, --no-current    ignore current process username
-s, --short          short format
-f, --from           show remote hostname field
-o, --old-style      old style output

```

6)Id Command:

Description:

It is used for the following functions:

- >To display user and group names and numeric ID's of the current user or any other user.
- >To find out specific user's UID
- >Display security context of the current user.
- >List out all groups a user belongs to

Syntax:

id [OPTION]..[USER]//to display the UID or real name

[OPTION]:

Following symbols facilitate functions such as:

- -g: To Print only the effective group id
- -G: To Print all Group ID's
- -n: Print names instead of number//It has to accompanied with -g,u,G .Ex:-nu,-nG
- -r: Print real ID instead of numbers//It has to accompanied with -g,u,G .Ex:-r u,-r G
- -u: Print only the effective user ID
- --v: Display the version information and exit

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ id -g
1000
yoga@macbook-pro:~/OS$ id -G
1000 4 24 27 30 46 116 126
yoga@macbook-pro:~/OS$ id -nu
yoga
yoga@macbook-pro:~/OS$ id --v
id (GNU coreutils) 8.28
Copyright (C) 2017 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>.
This is free software: you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

Written by Arnold Robbins and David MacKenzie.
yoga@macbook-pro:~/OS$ id -u
1000
yoga@macbook-pro:~/OS$
```

7)Zip:

Description:

->It is used to compress the files and store it as a .zip file.

Syntax:

zip [OPTION] zipfilename files_list

```
yoga@macbook-pro: ~/OS
```

```
File Edit View Search Terminal Help
```

```
yoga@macbook-pro:~/OS/lab1$ ls
sample3.txt
```

```
yoga@macbook-pro:~/OS/lab1$ tar cvf tarfile.tar *
sample3.txt
```

```
yoga@macbook-pro:~/OS/lab1$ cd ..
yoga@macbook-pro:~/OS$ ls
input.txt lab1 sample1.txt sample2.txt sample3.txt sample4.txt test1
```

```
yoga@macbook-pro:~/OS$ cd lab1
yoga@macbook-pro:~/OS/lab1$ ls
sample3.txt tarfile.tar
```

```
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar *
sample3.txt
```

```
tar: tarfile.tar: Not found in archive
tar: Exiting with failure status due to previous errors
```

```
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar
sample3.txt
```

```
yoga@macbook-pro:~/OS/lab1$ cd ..
yoga@macbook-pro:~/OS$ touch sample5.txt
```

```
yoga@macbook-pro:~/OS$ zip -m samplezip.zip sample4.txt
adding: sample4.txt (deflated 69%)
```

```
yoga@macbook-pro:~/OS$ ls
input.txt sample1.txt sample3.txt sample5.txt samplezip.zip
lab1 sample2.txt sample5.txt test1
```

```
yoga@macbook-pro:~/OS$ 
```

[OPTION]:

- -d: It is used to remove the files_list from the mentioned zip file.

```
yoga@macbook-pro: ~/OS
```

```
File Edit View Search Terminal Help
```

```
yoga@macbook-pro:~/OS$ ls
'30 Aug' sample1.txt sample5.txt sample7.txt samplezip.zip
input.txt sample2.txt sample6.txt sample8.txt test1
lab1 sample3.txt sample6.txt~ sample9.txt
```

```
yoga@macbook-pro:~/OS$ zip test1zip sample6.txt sample7.txt
adding: sample6.txt (deflated 40%)
adding: sample7.txt (stored 0%)
```

```
yoga@macbook-pro:~/OS$ ls
'30 Aug' sample1.txt sample5.txt sample7.txt samplezip.zip
input.txt sample2.txt sample6.txt sample8.txt test1
lab1 sample3.txt sample6.txt~ sample9.txt test1zip.zip
```

```
yoga@macbook-pro:~/OS$ zip -d test1zip sample7.txt
deleting: sample7.txt
```

```
yoga@macbook-pro:~/OS$ 
```

- -u: It is used to update the specified files_list or add the new files_list to existing zip file

```
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt    sample5.txt    sample7.txt    samplezip.zip
input.txt    sample2.txt    sample6.txt    sample8.txt    test1
lab1        sample3.txt    sample6.txt~   sample9.txt
yoga@macbook-pro:~/OS$ zip test1zip sample6.txt sample7.txt
adding: sample6.txt (deflated 40%)
adding: sample7.txt (stored 0%)
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt    sample5.txt    sample7.txt    samplezip.zip
input.txt    sample2.txt    sample6.txt    sample8.txt    test1
lab1        sample3.txt    sample6.txt~   sample9.txt
yoga@macbook-pro:~/OS$ zip -d test1zip sample7.txt
deleting: sample7.txt
yoga@macbook-pro:~/OS$ zip -u test1zip sample5.txt
adding: sample5.txt (stored 0%)
yoga@macbook-pro:~/OS$ 
```

- -m: Delete the files_list from the directory after moving the files into the zip file.

```
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt    sample5.txt    sample7.txt    samplezip.zip
input.txt    sample2.txt    sample6.txt    sample8.txt    test1
lab1        sample3.txt    sample6.txt~   sample9.txt
yoga@macbook-pro:~/OS$ zip test1zip sample6.txt sample7.txt
adding: sample6.txt (deflated 40%)
adding: sample7.txt (stored 0%)
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt    sample5.txt    sample7.txt    samplezip.zip
input.txt    sample2.txt    sample6.txt    sample8.txt    test1
lab1        sample3.txt    sample6.txt~   sample9.txt
yoga@macbook-pro:~/OS$ zip -d test1zip sample7.txt
deleting: sample7.txt
yoga@macbook-pro:~/OS$ zip -u test1zip sample5.txt
adding: sample5.txt (stored 0%)
yoga@macbook-pro:~/OS$ zip -m test1zip sample5.txt
updating: sample5.txt (stored 0%)
yoga@macbook-pro:~/OS$ zip -r test1rzip test1
adding: test1/ (stored 0%)
adding: test1/s2.txt (stored 0%)
adding: test1/s1.txt (stored 0%)
yoga@macbook-pro:~/OS$ 
```

- -r: To zip a directory along with all its sub-directories(recursively).

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt  sample5.txt  sample7.txt  samplezip.zip
input.txt   sample2.txt  sample6.txt  sample8.txt  test1
lab1        sample3.txt  sample6.txt~ sample9.txt
yoga@macbook-pro:~/OS$ zip test1zip sample6.txt sample7.txt
  adding: sample6.txt (deflated 40%)
  adding: sample7.txt (stored 0%)
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt  sample5.txt  sample7.txt  samplezip.zip
input.txt   sample2.txt  sample6.txt  sample8.txt  test1
lab1        sample3.txt  sample6.txt~ sample9.txt  test1zip.zip
yoga@macbook-pro:~/OS$ zip -d test1zip sample7.txt
deleting: sample7.txt
yoga@macbook-pro:~/OS$ zip -u test1zip sample5.txt
  adding: sample5.txt (stored 0%)
yoga@macbook-pro:~/OS$ zip -m test1zip sample5.txt
updating: sample5.txt (stored 0%)
yoga@macbook-pro:~/OS$ zip -r test1rzip test1
  adding: test1/ (stored 0%)
  adding: test1/s2.txt (stored 0%)
  adding: test1/s1.txt (stored 0%)
yoga@macbook-pro:~/OS$
```

- -x: This option excludes the files_list when the entire directory is recursively zipped into a zip file
- -v: This option enables the display of progress indicator during compression.

8)grep:

Description:

->It is used to searches a file for a particular pattern of characters and displays the lines of those files if contains the matching pattern

Syntax:

Grep [OPTION] pattern [files]//Used to search for “pattern” in the filename/file list mentioned

[OPTION]

Following Options enable functions such as:

- -c : This command prints only the no of lines that matches the pattern

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ ls
's 30 Aug'      sample1.txt    sample5.txt    sample7.txt    samplezip.zip
input.txt       sample2.txt    sample6.txt    sample8.txt    test1
lab1           sample3.txt    sample6.txt~   sample9.txt
yoga@macbook-pro:~/OS$ zip test1zip sample6.txt sample7.txt
  adding: sample6.txt (deflated 40%)
  adding: sample7.txt (stored 0%)
yoga@macbook-pro:~/OS$ ls
's 30 Aug'      sample1.txt    sample5.txt    sample7.txt    samplezip.zip
input.txt       sample2.txt    sample6.txt    sample8.txt    test1
lab1           sample3.txt    sample6.txt~   sample9.txt
yoga@macbook-pro:~/OS$ zip -d test1zip sample7.txt
deleting: sample7.txt
yoga@macbook-pro:~/OS$ zip -u test1zip sample5.txt
  adding: sample5.txt (stored 0%)
yoga@macbook-pro:~/OS$ zip -m test1zip sample5.txt
updating: sample5.txt (stored 0%)
yoga@macbook-pro:~/OS$ zip -r test1rzip test1
  adding: test1/ (stored 0%)
  adding: test1/s2.txt (stored 0%)
  adding: test1/s1.txt (stored 0%)
yoga@macbook-pro:~/OS$ grep -c UNIX sample1.txt
1
yoga@macbook-pro:~/OS$ 
```

- -h: Displays the matched lines but not the filenames

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
adding: test1/ (stored 0%)
adding: test1/s2.txt (stored 0%)
adding: test1/s1.txt (stored 0%)
yoga@macbook-pro:~/OS$ grep -c UNIX sample1.txt
1
yoga@macbook-pro:~/OS$ grep -h UNIX sample1.txt
UNIX is a free OS.
yoga@macbook-pro:~/OS$ grep -i UNIX sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix
and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking
environment.
Unix is a free OS.
yoga@macbook-pro:~/OS$ grep -L UNIX sample1.txt
yoga@macbook-pro:~/OS$ grep -l UNIX sample1.txt
sample1.txt
yoga@macbook-pro:~/OS$ grep -n UNIX sample1.txt
5:UNIX is a free OS.
yoga@macbook-pro:~/OS$ 
```

- -i: Ignores case sensitivity for searching pattern

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
adding: test1/ (stored 0%)
adding: test1/s2.txt (stored 0%)
adding: test1/s1.txt (stored 0%)
yoga@macbook-pro:~/OS$ grep -c UNIX sample1.txt
1
yoga@macbook-pro:~/OS$ grep -h UNIX sample1.txt
UNIX is a free OS.
yoga@macbook-pro:~/OS$ grep -i UNIX sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
yoga@macbook-pro:~/OS$ grep -L UNIX sample1.txt
yoga@macbook-pro:~/OS$ grep -l UNIX sample1.txt
sample1.txt
yoga@macbook-pro:~/OS$ grep -n UNIX sample1.txt
5:UNIX is a free OS.
yoga@macbook-pro:~/OS$ 
```

- -l:Display the list of filename that contains data with matching pattern

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
adding: test1/ (stored 0%)
adding: test1/s2.txt (stored 0%)
adding: test1/s1.txt (stored 0%)
yoga@macbook-pro:~/OS$ grep -c UNIX sample1.txt
1
yoga@macbook-pro:~/OS$ grep -h UNIX sample1.txt
UNIX is a free OS.
yoga@macbook-pro:~/OS$ grep -i UNIX sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
yoga@macbook-pro:~/OS$ grep -L UNIX sample1.txt
yoga@macbook-pro:~/OS$ grep -l UNIX sample1.txt
sample1.txt
yoga@macbook-pro:~/OS$ grep -n UNIX sample1.txt
5:UNIX is a free OS.
yoga@macbook-pro:~/OS$ 
```

- -n:Display the matched lines and their line number.

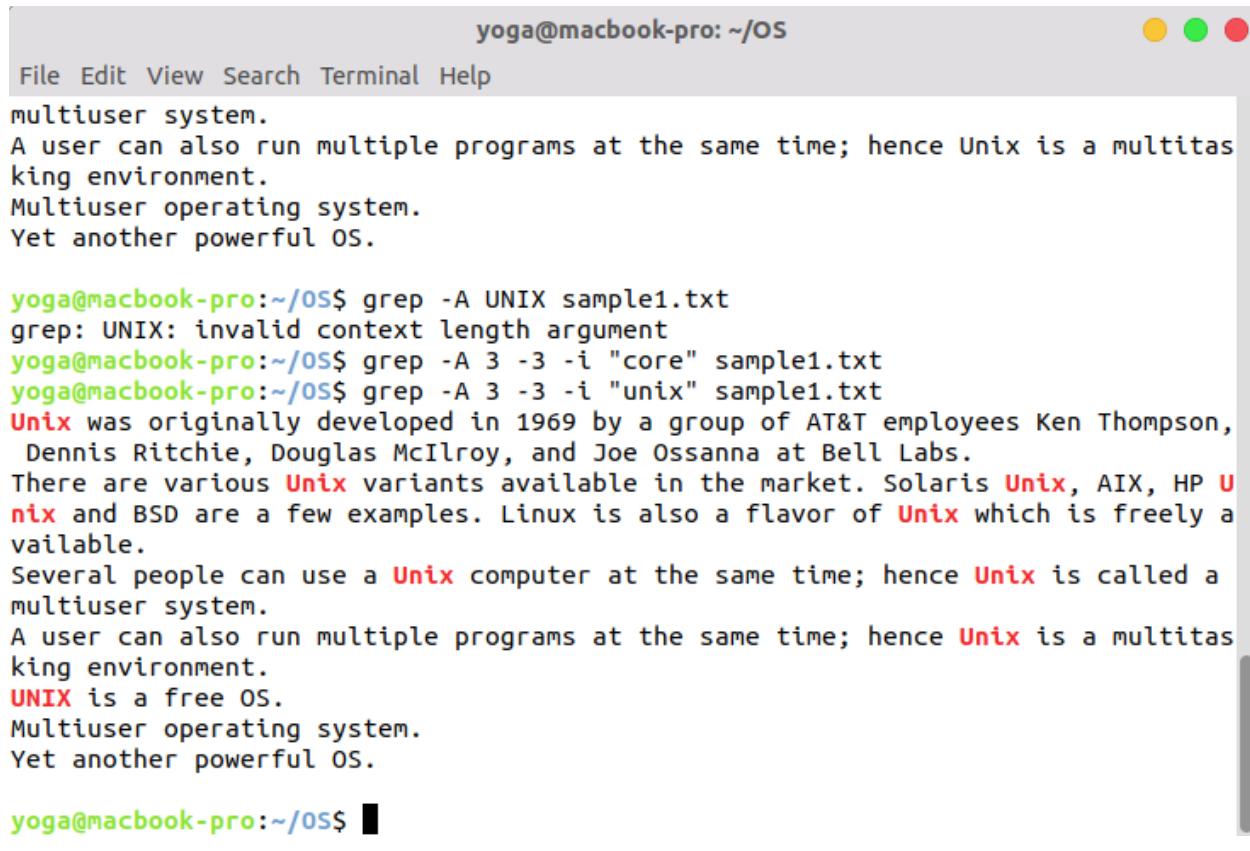
```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
adding: test1/ (stored 0%)
adding: test1/s2.txt (stored 0%)
adding: test1/s1.txt (stored 0%)
yoga@macbook-pro:~/OS$ grep -c UNIX sample1.txt
1
yoga@macbook-pro:~/OS$ grep -h UNIX sample1.txt
UNIX is a free OS.
yoga@macbook-pro:~/OS$ grep -i UNIX sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
yoga@macbook-pro:~/OS$ grep -L UNIX sample1.txt
yoga@macbook-pro:~/OS$ grep -l UNIX sample1.txt
sample1.txt
yoga@macbook-pro:~/OS$ grep -n UNIX sample1.txt
5:UNIX is a free OS.
yoga@macbook-pro:~/OS$ 
```

- -v: Displays all lines that do not contain matching pattern

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
yoga@macbook-pro:~/OS$ grep -L UNIX sample1.txt
yoga@macbook-pro:~/OS$ grep -l UNIX sample1.txt
sample1.txt
yoga@macbook-pro:~/OS$ grep -n UNIX sample1.txt
5:UNIX is a free OS.
yoga@macbook-pro:~/OS$ grep -v UNIX sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$ 
```

- -A [argument]:Displays [argument] no of lines before /after(if the number entered as argument is negative then before the matching pattern else after the matching pattern) the matching line



yoga@macbook-pro: ~/OS

File Edit View Search Terminal Help

```
multiuser system.  
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.  
Multiuser operating system.  
Yet another powerful OS.
```

```
yoga@macbook-pro:~/OS$ grep -A UNIX sample1.txt  
grep: UNIX: invalid context length argument  
yoga@macbook-pro:~/OS$ grep -A 3 -3 -i "core" sample1.txt  
yoga@macbook-pro:~/OS$ grep -A 3 -3 -i "unix" sample1.txt  
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,  
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.  
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.  
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.  
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.  
UNIX is a free OS.  
Multiuser operating system.  
Yet another powerful OS.
```

yoga@macbook-pro:~/OS\$ █

- -f file:Takes matching pattern as patterns from file .

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
available.
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking
environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$ grep -f sample1.txt sample2.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
Several people can use a Unix computer at the same time; hence Unix is called a
A user can also run multiple programs at the same time; hence Unix is a multitask
```

yoga@macbook-pro:~/OS\$

- -E:This Option enables matching pattern as some extended regular expression

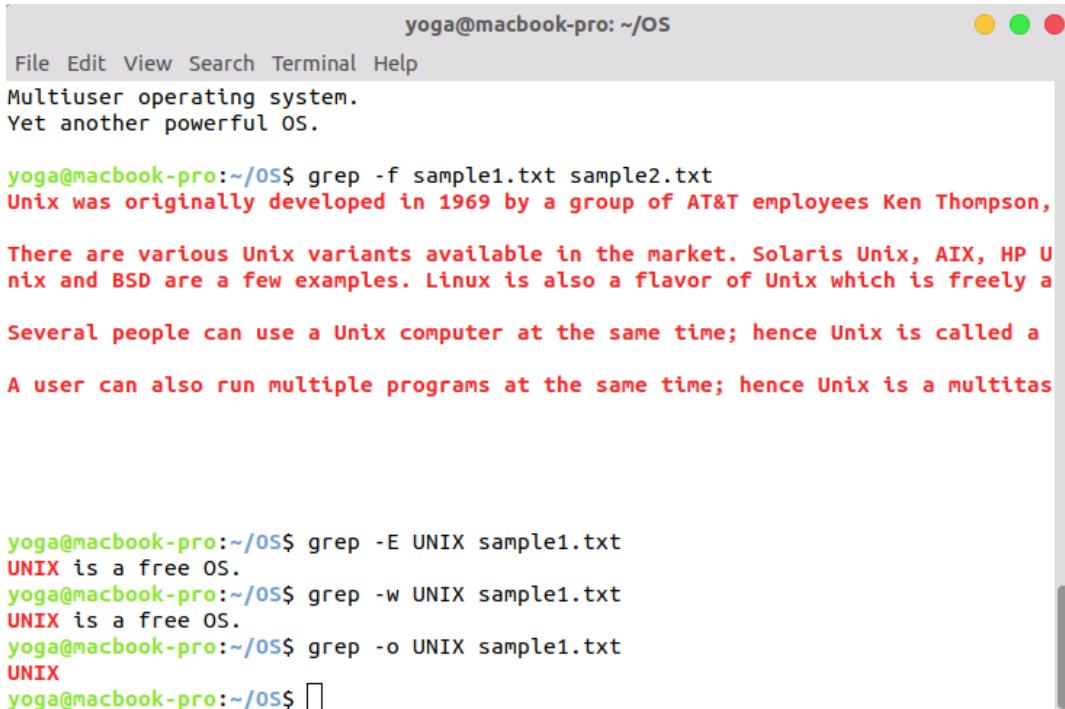
```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking
environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$ grep -f sample1.txt sample2.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
Several people can use a Unix computer at the same time; hence Unix is called a
A user can also run multiple programs at the same time; hence Unix is a multitask
```

yoga@macbook-pro:~/OS\$ grep -E UNIX sample1.txt
UNIX is a free OS.
yoga@macbook-pro:~/OS\$

- -w:Treats the pattern as a single word

- -o: Displays only the matched parts of a matching line.



The screenshot shows a macOS Terminal window with the following content:

```

yoga@macbook-pro:~/OS$ grep -f sample1.txt sample2.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
Several people can use a Unix computer at the same time; hence Unix is called a
A user can also run multiple programs at the same time; hence Unix is a multitas

yoga@macbook-pro:~/OS$ grep -E UNIX sample1.txt
UNIX is a free OS.
yoga@macbook-pro:~/OS$ grep -w UNIX sample1.txt
UNIX is a free OS.
yoga@macbook-pro:~/OS$ grep -o UNIX sample1.txt
UNIX
yoga@macbook-pro:~/OS$ 
```

9)Sort Command:

Description :

->To sort the contents of the file ,line by line and according to alphabet ,numeric,by month,in reverse order

->It prints the file /concatenated file in sorted order

Order of priority in sorting

Lines starting with number >Lines starting with lowercase alphabet>Lines starting with uppercase alphabet

Syntax:

- sort [OPTION] filename // To Display the contents of the file in sorted order
- sort sourcefile > destination file //To overwrite the destination file with sorted source file content.

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ sort sample1.txt > sample9.txt
yoga@macbook-pro:~/OS$ cat sample9.txt

A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
Multiuser operating system.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
UNIX is a free OS.
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
Yet another powerful OS.
yoga@macbook-pro:~/OS$
```

- Sort sourcefile >> destination file //To append the destination file with sorted source file content.

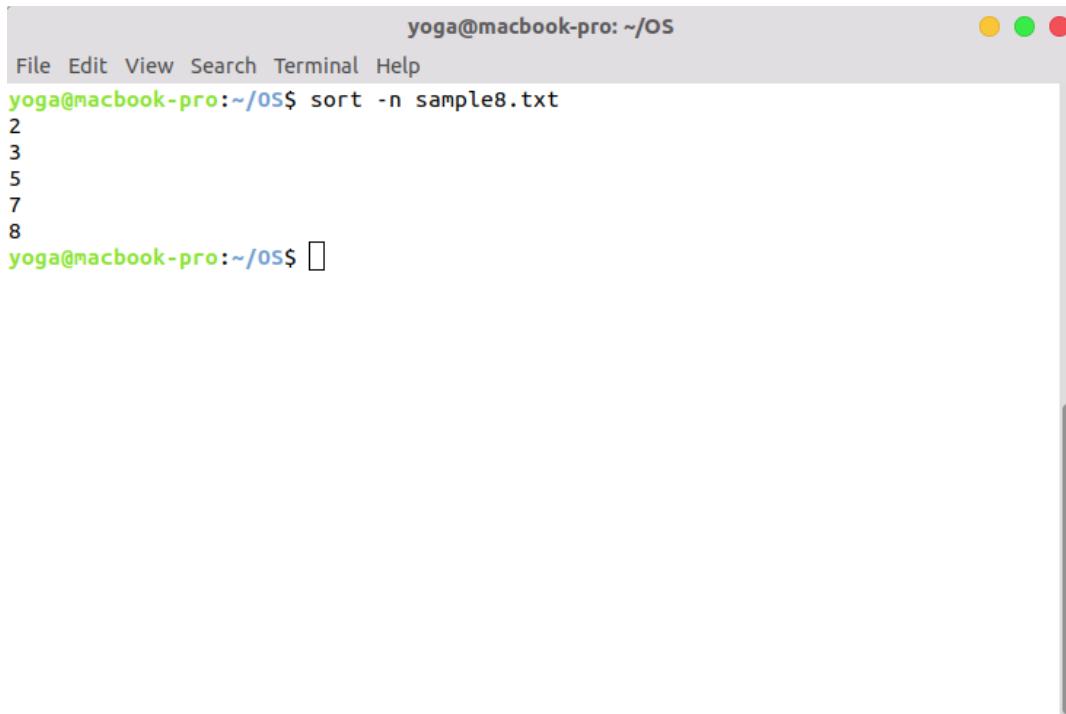
```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ sort sample1.txt >> sample9.txt
yoga@macbook-pro:~/OS$ cat sample9.txt

A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
Multiuser operating system.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
UNIX is a free OS.
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
Yet another powerful OS.

A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
Multiuser operating system.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
```

[OPTION]:

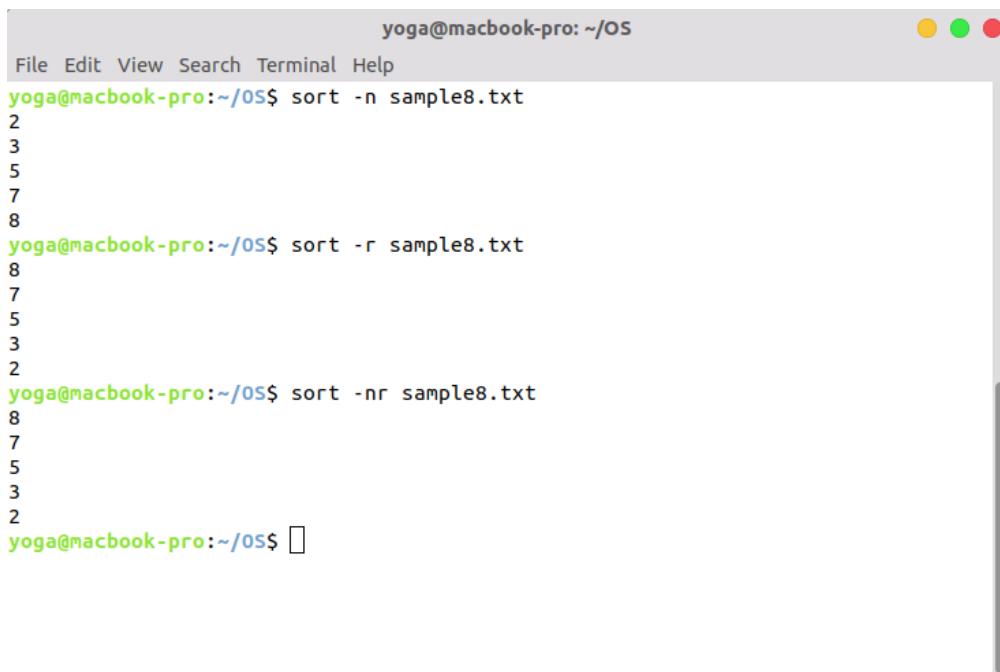
- -o:Enables output to be overwritten into a new file .Requires source filename and destination filename
- -n:To Display the file with numeric content in sorted order



yoga@macbook-pro: ~/OS

```
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ sort -n sample8.txt
2
3
5
7
8
yoga@macbook-pro:~/OS$
```

- -r:To Display the file content in reverse-sorted order /descending order by default
- -nr:To Display the file with numeric content in reverse sorted order



yoga@macbook-pro: ~/OS

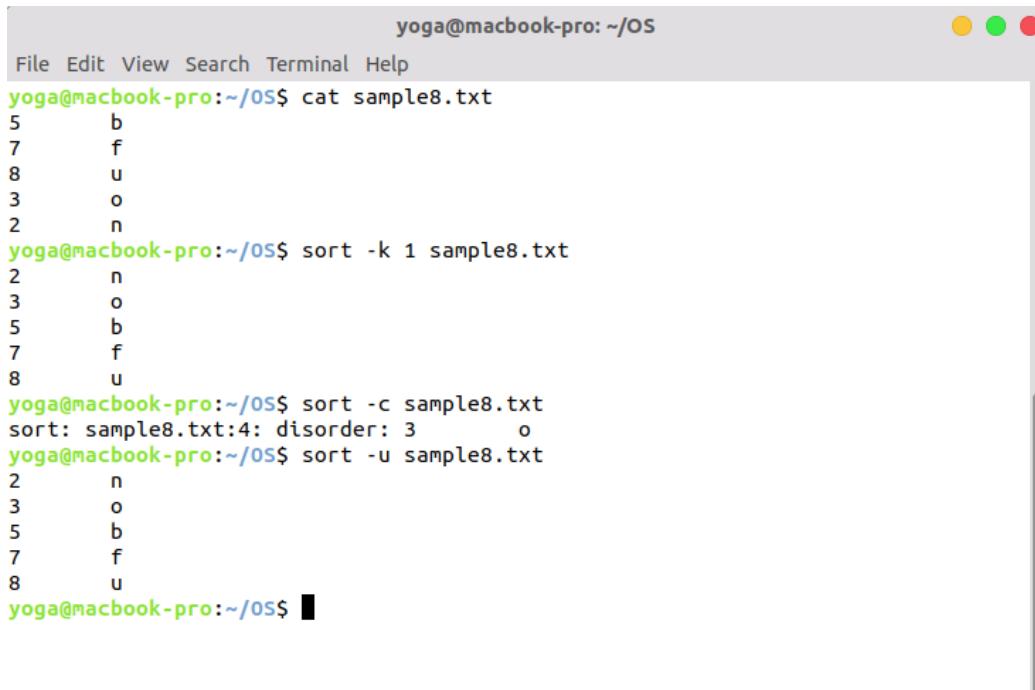
```
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ sort -n sample8.txt
2
3
5
7
8
yoga@macbook-pro:~/OS$ sort -r sample8.txt
8
7
5
3
2
yoga@macbook-pro:~/OS$ sort -nr sample8.txt
8
7
5
3
2
yoga@macbook-pro:~/OS$
```

- -k [argument]:Sorts the file containing a table in sorted order based on the [argument]th column or by default :the first column



```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cat sample8.txt
5      b
7      f
8      u
3      o
2      n
yoga@macbook-pro:~/OS$ sort -k 1 sample8.txt
2      n
3      o
5      b
7      f
8      u
yoga@macbook-pro:~/OS$ █
```

- -c:Displays disorder if the file is not already in sorted order .If the file is already in sorted order ,it displays no output
- -u:To sort and remove duplicates in the output



```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cat sample8.txt
5      b
7      f
8      u
3      o
2      n
yoga@macbook-pro:~/OS$ sort -k 1 sample8.txt
2      n
3      o
5      b
7      f
8      u
yoga@macbook-pro:~/OS$ sort -c sample8.txt
sort: sample8.txt:4: disorder: 3      o
yoga@macbook-pro:~/OS$ sort -u sample8.txt
2      n
3      o
5      b
7      f
8      u
yoga@macbook-pro:~/OS$ █
```

- -M:To sort the content of a file (containing months as data) month wise

yoga@macbook-pro: ~/OS

File Edit View Search Terminal Help

```
yoga@macbook-pro:~/OS$ cat sample8.txt
sept    b
march   f
jan     u

yoga@macbook-pro:~/OS$ cat -M sample8.txt
cat: invalid option -- 'M'
Try 'cat --help' for more information.
yoga@macbook-pro:~/OS$ sort -M sample8.txt

jan     u
march   f
sept    b
yoga@macbook-pro:~/OS$
```

10)join command:

Description:

The join command is used for joining two files on a common field i.e based on a key field present in both the files.

Syntax:

join [OPTION] file1 file2//to join file1 and file2

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ join sample1.txt sample8.txt
join: sample8.txt:3: is not sorted: jan u
join: sample1.txt:2: is not sorted: There are various Unix variants available in
the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
yoga@macbook-pro:~/OS$ 
```

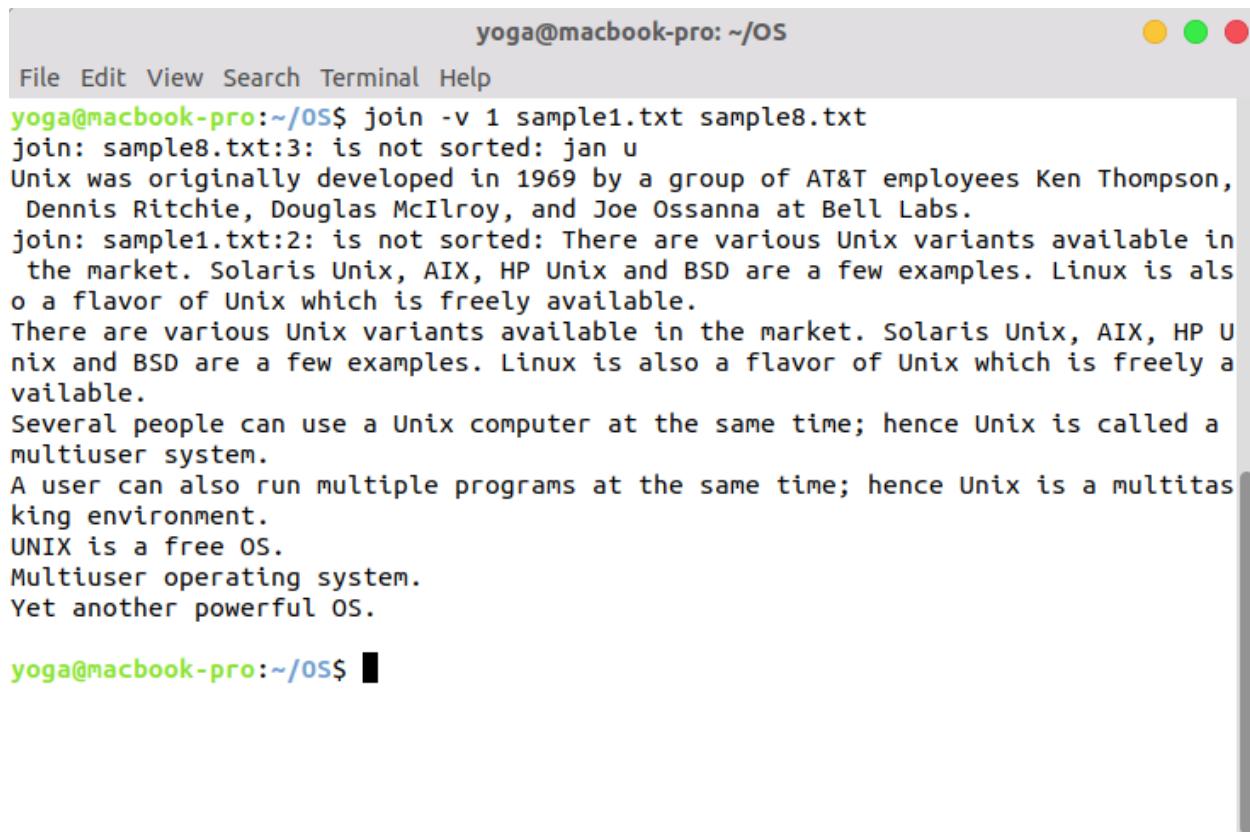
[OPTION]:

- -a [argument]: This option is used when any of the row in one file can't be matched with the other file .Ex : when file1 contains 5 rows but file2 contains only 4 rows.[argument] denotes the filename that has excess rows ,in above case argument is 1.

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ join sample1.txt sample8.txt
join: sample8.txt:3: is not sorted: jan u
join: sample1.txt:2: is not sorted: There are various Unix variants available in
the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
yoga@macbook-pro:~/OS$ join -a 1 sample1.txt sample8.txt
join: sample8.txt:3: is not sorted: jan u
join: sample1.txt:2: is not sorted: There are various Unix variants available in
the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$ 
```

- -v [argument]:Functions/serves the same purpose as that of -a but the only difference it prints only the unprintable lines



yoga@macbook-pro: ~/OS

File Edit View Search Terminal Help

```
yoga@macbook-pro:~/OS$ join -v 1 sample1.txt sample8.txt
join: sample8.txt:3: is not sorted: jan u
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
join: sample1.txt:2: is not sorted: There are various Unix variants available in
the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also
a flavor of Unix which is freely available.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix
and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking
environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$
```

- -t [argument] :This functions displays the argument passed(ex:like "", ",") as delimiter between the output of each file while joining i.e,to separate the columns with delimiter.

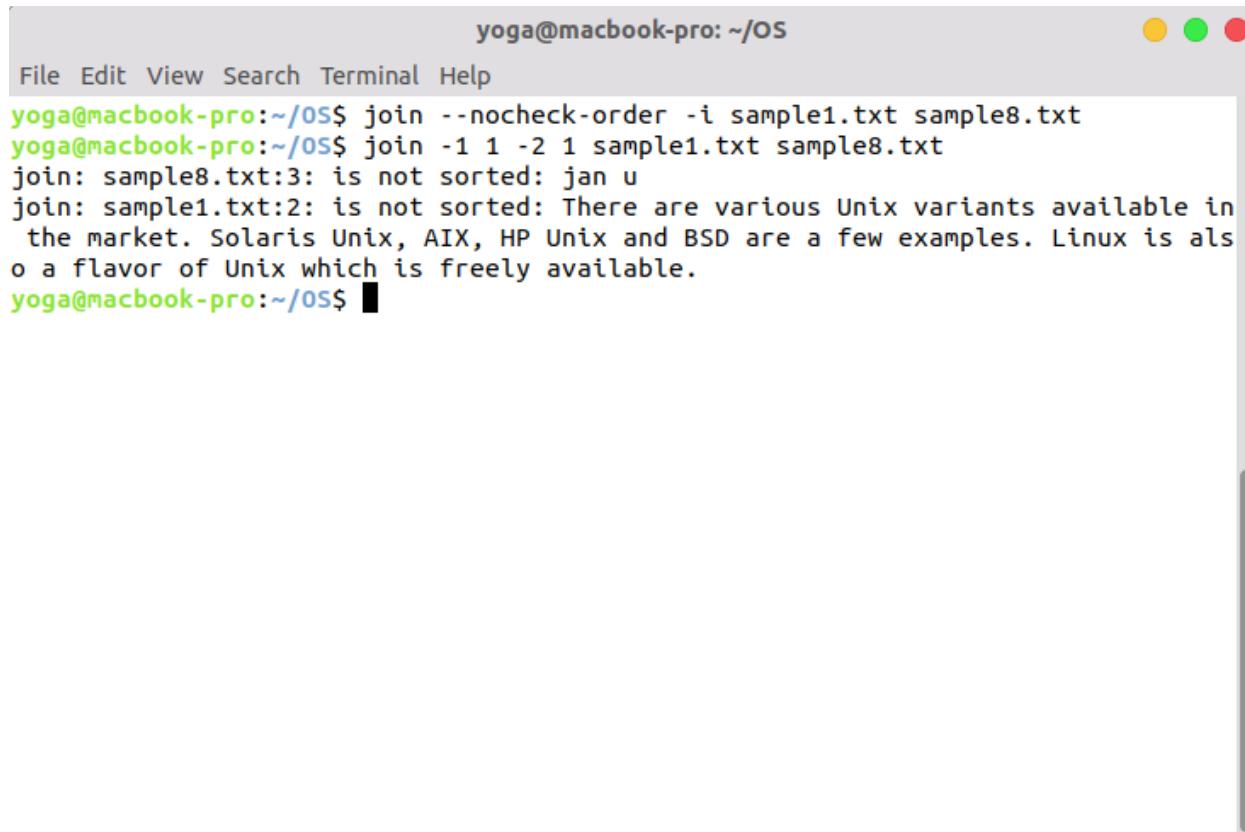
```
yoga@macbook-pro:~/OS$ File Edit View Search Terminal Help  
yoga@macbook-pro:~/OS$ join -t 1 sample1.txt sample8.txt  
join: sample8.txt:3: is not sorted: jan u  
join: sample1.txt:2: is not sorted: There are various Unix variants available in  
the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is als  
o a flavor of Unix which is freely available.  
yoga@macbook-pro:~/OS$
```

- --nocheck-order: To suppress the errors displayed when the files are being checked for sortedness of the file.

```
yoga@macbook-pro:~/OS$ File Edit View Search Terminal Help  
yoga@macbook-pro:~/OS$ join -t 1 sample1.txt sample8.txt  
join: sample8.txt:3: is not sorted: jan u  
join: sample1.txt:2: is not sorted: There are various Unix variants available in  
the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is als  
o a flavor of Unix which is freely available.  
yoga@macbook-pro:~/OS$ join --nocheck-order sample1.txt sample8.txt  
yoga@macbook-pro:~/OS$
```

- -i: To ignore case sensitivity

- -1 [argument1]1 -2 [argument2] :These options when mentioned joins the two files by taking argument1 as the key field of file1 and argument2 as key field of file2 for joining.(Argument 1/argument2 are field number are column number)



The screenshot shows a terminal window with the title "yoga@macbook-pro: ~/OS". The window has three red circular close buttons in the top right corner. The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal itself displays the following text:

```
yoga@macbook-pro:~/OS$ join --nocheck-order -i sample1.txt sample8.txt
yoga@macbook-pro:~/OS$ join -1 1 -2 1 sample1.txt sample8.txt
join: sample8.txt:3: is not sorted: jan u
join: sample1.txt:2: is not sorted: There are various Unix variants available in
      the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is als
o a flavor of Unix which is freely available.
yoga@macbook-pro:~/OS$
```

11)sed:

Description:

It stands for text stream editor and are used for the following functions:

- a)It is used for substitution or to find and replace any text and also used for purposes like to insert and delete any text
- b)Allows to perform complex pattern matching

Syntax:

Output File before using sed

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cat sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$
```

sed [OPTION] ...[SCRIPT][FILES_LIST]

or

sed 's/word1/word2/' files_list //Used to replace 1st occurrence of word1 in each line with word2 in all the files in the files_list

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$ sed 's/Unix/Linux/' sample1.txt
Linux was originally developed in 1969 by a group of AT&T employees Ken Thompson , Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Linux variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Linux computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Linux is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

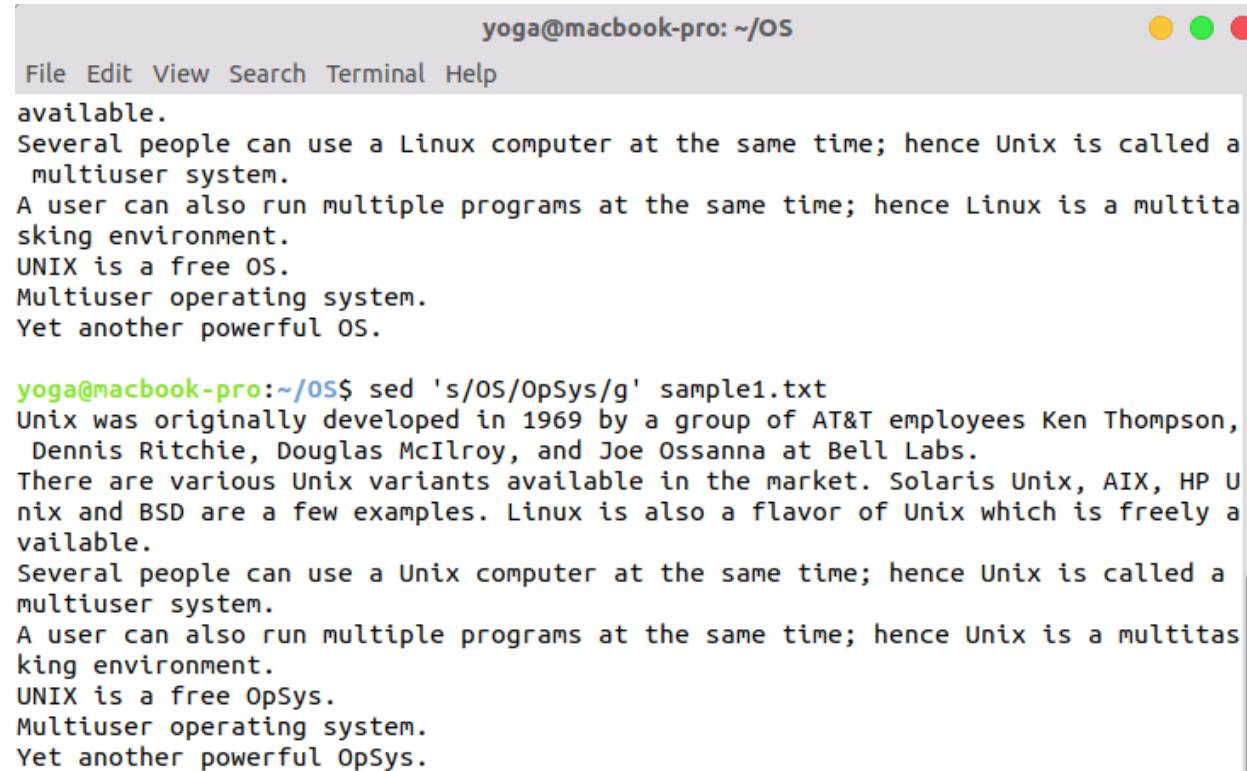
yoga@macbook-pro:~/OS$
```

Or

```
sed 's/word1/word2/ n' files_list //Used to replace nth occurrence of word1 in each line with word2 in all the files in the files_list
```

Or

```
sed 's/word1/word2/ g' files_list //Used to replace all occurrence of word1 in each line with word2 in all the files in the files_list
```



The screenshot shows a terminal window titled "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The title bar has three colored window control buttons (yellow, green, red). The terminal window displays the following text:

```
available.  
Several people can use a Linux computer at the same time; hence Unix is called a  
multiuser system.  
A user can also run multiple programs at the same time; hence Linux is a multita  
sking environment.  
UNIX is a free OS.  
Multiuser operating system.  
Yet another powerful OS.
```

yoga@macbook-pro:~/OS\$ sed 's/OS/OpSys/g' sample1.txt

```
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,  
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.  
There are various Unix variants available in the market. Solaris Unix, AIX, HP U  
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a  
vailable.  
Several people can use a Unix computer at the same time; hence Unix is called a  
multiuser system.  
A user can also run multiple programs at the same time; hence Unix is a multitas  
king environment.  
UNIX is a free OpSys.  
Multiuser operating system.  
Yet another powerful OpSys.
```

```
yoga@macbook-pro:~/OS$ █
```

Or

```
sed 's/word1/word2/ p' files_list //Used to print the replaced-with line or the line containing the  
replaced pattern twice and prints the none replace line once
```

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
available.
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking
environment.
UNIX is a free OpSys.
Multiuser operating system.
Yet another powerful OpSys.

yoga@macbook-pro:~/OS$ sed 's/OpSys/OS/p' sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
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Multiuser operating system.
Yet another powerful OS.
```

```
yoga@macbook-pro:~/OS$ █
```

Or

```
sed 's/word1/word2/ ng' files_list //Used to replace all occurrence of word1 (after n-1
occurrences of word 1) in each line with word2 in all the files in the files_list
```

Or

```
sed 's/(\b[A-Z]\)/\1/g'//Used to Parenthesize first character of each word
```

Or

```
sed 'n s/word1/word2/ g' //Used to replace the occurrences of word1 only in nth line
```

Or

```
sed -n ' s/word1/word2/ p' //Used to Print Only the replaced line
```

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
king environment.
UNIX is a free OpSys.
Multiuser operating system.
Yet another powerful OpSys.

yoga@macbook-pro:~/OS$ sed 's/OpSys/OS/p' sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
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Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$ sed -n 's/OpSys/OS/p' sample1.txt
yoga@macbook-pro:~/OS$ sed -n 's/OS/OPS/p' sample1.txt
UNIX is a free OPS.
Yet another powerful OPS.
yoga@macbook-pro:~/OS$
```

Or

sed ' n1,n2 s/word1/word2/ g' //Used to replace only for the occurrences of pattern in the range of lines from n1,n2 .If n2 is \$ then it represents last line

or

sed ' nd' or sed 'n1,n2d'//Used to delete the nth line or range of lines from n1 to n2

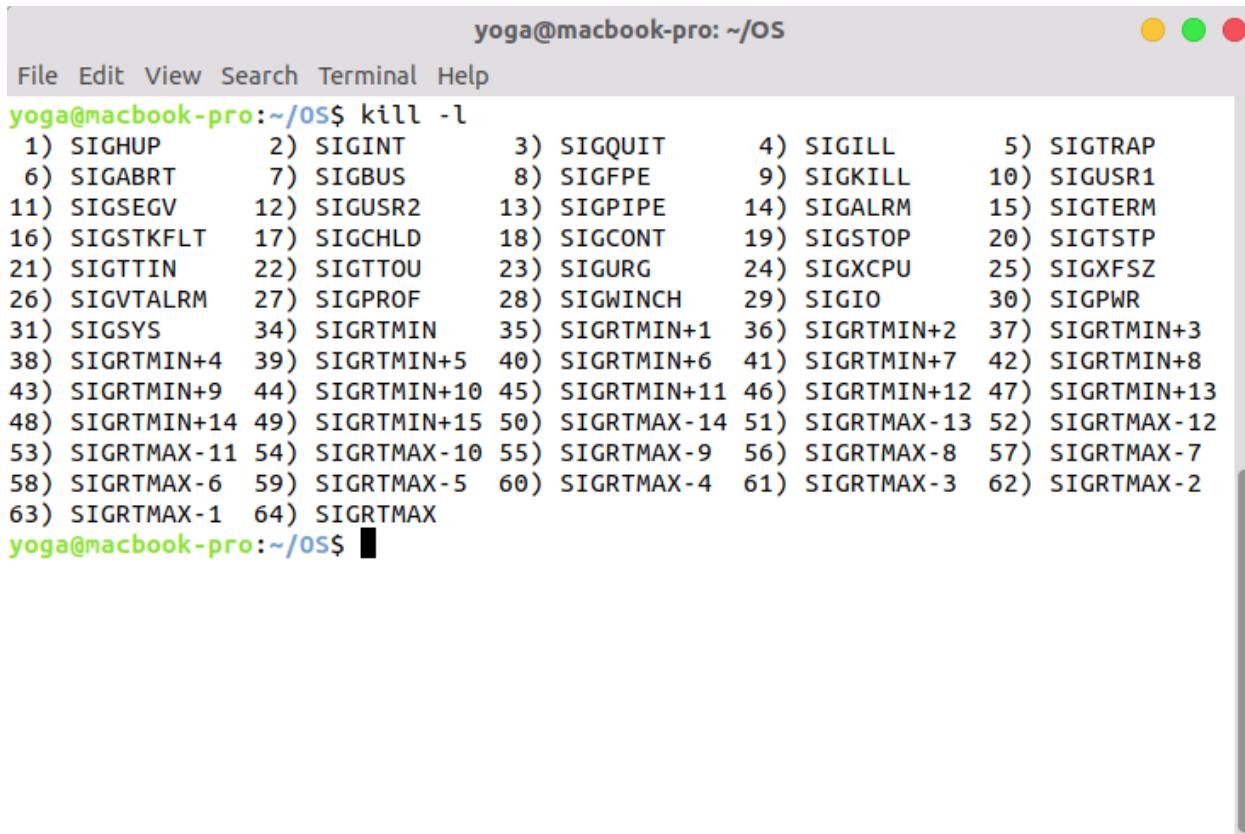
12)Kill command:

Description:

Used to Terminate process manually

Syntax:

kill -l/-Lkilp//This Option displays all signals available for use



yoga@macbook-pro: ~/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) SIGTTOUT	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			

yoga@macbook-pro: ~/OS\$ █

or

kill pid//To Terminate the process with the mentioned pid

Or

kill {-signal | -s signal} pid//To send particular signal .For ex: send signal as -9 or -1 to terminate pid

13)ps command:

Description:

To view information related to currently running processes on a system along with their PIDs which is read from the virtual files in /proc file system

Syntax:

ps [OPTION]//By Default without any option shows the process of the current shell

```
yoga@macbook-pro: ~/OS$ ps
 PID TTY      TIME CMD
 13255 pts/0    00:00:00 bash
 13266 pts/0    00:00:00 ps
yoga@macbook-pro:~/OS$
```

[OPTION]:

- -A/-e/-r: To show all the running processes

```
yoga@macbook-pro:~/OS$ ps -A
 PID TTY      TIME CMD
  1 ?        00:00:21 systemd
  2 ?        00:00:00 kthreadd
  4 ?        00:00:00 kworker/0:0H
  6 ?        00:00:00 mm_percpu_wq
  7 ?        00:00:01 ksoftirqd/0
  8 ?        00:00:34 rcu_sched
  9 ?        00:00:00 rcu_bh
 10 ?       00:00:00 migration/0
 11 ?       00:00:00 watchdog/0
 12 ?       00:00:00 cpuhp/0
 13 ?       00:00:00 cpuhp/1
 14 ?       00:00:00 watchdog/1
 15 ?       00:00:00 migration/1
 16 ?       00:00:00 ksoftirqd/1
 18 ?       00:00:00 kworker/1:0H
 19 ?       00:00:00 cpuhp/2
 20 ?       00:00:00 watchdog/2
 21 ?       00:00:00 migration/2
 22 ?       00:00:01 ksoftirqd/2
 24 ?       00:00:00 kworker/2:0H
 25 ?       00:00:00 cpuhp/3
 26 ?       00:00:00 watchdog/3
 27 ?       00:00:00 migration/3
 28 ?       00:00:03 ksoftirqd/3
 30 ?       00:00:00 kworker/3:0H
 31 ?       00:00:00 kdevtmpfs
 32 ?       00:00:00 netns
 33 ?       00:00:00 rcu_tasks_kthre
 34 ?       00:00:00 kauditfd
 39 ?       00:00:00 khungtaskd
 40 ?       00:00:00 oom_reaper
 41 ?       00:00:00 writeback
 42 ?       00:00:00 kcompactd0
 43 ?       00:00:00 ksmd
 44 ?       00:00:00 khugepaged
 45 ?       00:00:00 crypto ...
```

- -a: To show all the running processes not associated with a terminal

```
yoga@macbook-pro:~/OS$ ps -a
  PID TTY      TIME CMD
 13255 pts/0    00:00:00 bash
 13275 pts/0    00:00:00 ps
yoga@macbook-pro:~/OS$ ps -a
  PID TTY      TIME CMD
 1727 tty2    00:22:22 Xorg
 1745 tty2    00:00:03 gnome-session-b
 1869 tty2    00:31:33 gnome-shell
 1909 tty2    00:01:26 ibus-daemon
 1913 tty2    00:00:00 ibus-dconf
 1916 tty2    00:00:00 ibus-x11
 1988 tty2    00:00:02 gsd-power
 1989 tty2    00:00:00 gsd-print-notif
 1991 tty2    00:00:00 gsd-rfkill
 1992 tty2    00:00:01 gsd-screensaver
 1997 tty2    00:00:04 gsd-sharing
 2001 tty2    00:00:01 gsd-xsettings
 2009 tty2    00:00:00 gsd-smartcard
 2010 tty2    00:00:00 gsd-sound
 2012 tty2    00:00:01 gsd-wacom
 2022 tty2    00:00:01 gsd-clipboard
 2025 tty2    00:00:00 gsd-a11y-settin
 2026 tty2    00:00:00 gsd-datetime
 2029 tty2    00:00:04 gsd-color
 2030 tty2    00:00:01 gsd-keyboard
```

- -d: To show all the running processes excluding session leaders

```
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ ps -d
  PID TTY      TIME CMD
 2 ?    00:00:00 kthreadd
 4 ?    00:00:00 kworker/0:0H
 6 ?    00:00:00 mm_percpu_wq
 7 ?    00:00:01 ksoftirqd/0
 8 ?    00:00:35 rcu_sched
 9 ?    00:00:00 rcu_bh
10 ?    00:00:00 migration/0
11 ?    00:00:00 watchdog/0
12 ?    00:00:00 cpuhp/0
13 ?    00:00:00 cpuhp/1
14 ?    00:00:00 watchdog/1
15 ?    00:00:00 migration/1
16 ?    00:00:00 ksoftirqd/1
18 ?    00:00:00 kworker/1:0H
19 ?    00:00:00 cpuhp/2
20 ?    00:00:00 watchdog/2
21 ?    00:00:00 migration/2
22 ?    00:00:01 ksoftirqd/2
24 ?    00:00:00 kworker/2:0H
25 ?    00:00:00 cpuhp/3
26 ?    00:00:00 watchdog/3
27 ?    00:00:00 migration/3
28 ?    00:00:03 ksoftirqd/3
30 ?    00:00:00 kworker/3:0H
31 ?    00:00:00 kdevtmpfs
32 ?    00:00:00 netns
33 ?    00:00:00 rcu_tasks_kthre
34 ?    00:00:00 kaudited
39 ?    00:00:00 khungtaskd
40 ?    00:00:00 oom_reaper
41 ?    00:00:00 writeback
42 ?    00:00:00 kcompactd0
43 ?    00:00:00 ksm
44 ?    00:00:00 khugepaged
45 ?    00:00:00 crypto
46 ?    00:00:00 kintegrityd
```

- -T: To show all the running processes associated with the terminal

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
12701 ? 00:00:01 kworker/u8:1
12707 ? 00:00:00 kworker/1:0
12776 tty2 00:02:14 Web Content
12891 ? 00:00:00 kworker/0:2
12893 ? 00:00:00 kworker/3:1
12900 ? 00:00:00 kworker/1:1
12901 ? 00:00:00 kworker/u8:0
12902 ? 00:00:00 kworker/2:1
12977 tty2 00:00:00 Web Content
13208 ? 00:00:00 kworker/0:0
13209 ? 00:00:00 kworker/3:2
13220 ? 00:00:00 kworker/1:2
13221 ? 00:00:00 kworker/u8:3
13222 ? 00:00:00 kworker/2:0
13291 pts/0 00:00:00 ps
yoga@macbook-pro:~/OS$ ps -T
  PID  SPID TTY      TIME CMD
13255 13255 pts/0 00:00:00 bash
13300 13300 pts/0 00:00:00 ps
yoga@macbook-pro:~/OS$ ps -x
  PID TTY      STAT   TIME COMMAND
1707 ?        Ss    0:00 /lib/systemd/systemd --user
1708 ?        S     0:00 (sd-pam)
1721 ?        Sl    0:00 /usr/bin/gnome-keyring-daemon --daemonize --login
```

- -x: To show processes which has same EUID (Effective User ID) as ps

```
yoga@macbook-pro: ~/OS$ ps -x
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ ps -x
  PID TTY      STAT   TIME COMMAND
1707 ?        Ss    0:00 /lib/systemd/systemd --user
1708 ?        S     0:00 (sd-pam)
1721 ?        Sl    0:00 /usr/bin/gnome-keyring-daemon --daemonize --login
1725 tty2  Ssl+ 0:00 /usr/lib/gdm3/gdm-x-session --run-script env GNOME_SHELL_SESSION_MODE=ubuntu gnome-session --session=ubuntu
1727 tty2  Sl+ 22:26 /usr/lib/xorg/Xorg vt2 -displayfd 3 -auth /run/user/1000/gdm/Xauthority -background none -noreset -keeptty -verbose 3
1742 ?        Ss    0:04 /usr/bin/dbus-daemon --session --address=/systemd: --nofork --nopidfile --systemd-activation --syslog-only
1745 tty2  Sl+ 0:03 /usr/lib/gnome-session/gnome-session-binary --session=ubuntu
1841 ?        Ss    0:00 /usr/bin/ssh-agent /usr/bin/im-launch env GNOME_SHELL_SESSION_MODE=ubuntu gnome-session --session=ubuntu
1844 ?        Ssl   0:00 /usr/lib/at-spi2-core/at-spi-bus-launcher
1849 ?        S     0:01 /usr/bin/dbus-daemon --config-file=/usr/share/defaults/at-spi2/accessibility.conf --nofork --print-address 3
1851 ?        Sl    0:19 /usr/lib/at-spi2-core/at-spi2-registrayd --use-gnome-session
1869 tty2  Sl+ 31:38 /usr/bin/gnome-shell
1876 ?        Ssl   0:00 /usr/lib/gvfs/gvfsd
1881 ?        Sl    0:00 /usr/lib/gvfs/gvfsd-fuse /run/user/1000/gvfs -f -o big_writes
1892 ?        S<l  3:34 /usr/bin/pulseaudio --start --log-target=syslog
1909 tty2  Sl    1:27 ibus-daemon --xim --panel disable
1913 tty2  Sl    0:00 /usr/lib/ibus/ibus-dconf
1916 tty2  Sl    0:00 /usr/lib/ibus/ibus-x11 --kill-daemon
1919 ?        Sl    0:00 /usr/lib/ibus/ibus-portal
1927 ?        Ssl   0:00 /usr/libexec/xdg-permission-store
1932 ?        Sl    0:00 /usr/lib/gnome-shell/gnome-shell-calendar-server
1941 ?        Sl    0:00 /usr/lib/dconf/dconf-service
1944 ?        Ssl   0:02 /usr/lib/gvfs/gvfs-udisks2-volume-monitor
1948 ?        Ssl   0:00 /usr/lib/gvfs/gvfs-afc-volume-monitor
1953 ?        Ssl   0:00 /usr/lib/gvfs/gvfs-mtp-volume-monitor
1957 ?        Ssl   0:00 /usr/lib/gvfs/gvfs-goa-volume-monitor
1961 ?        Sl    0:00 /usr/lib/gnome-online-accounts/goa-daemon
1965 ?        Ssl   0:00 /usr/lib/evolution/evolution-source-registry
1978 ?        Sl    0:00 /usr/lib/gnome-online-accounts/goa-identity-service
1984 ?        Ssl   0:00 /usr/lib/gvfs/gvfs-qphoto2-volume-monitor
1988 tty2  Sl+  0:02 /usr/lib/gnome-settings-daemon/gsd-power
1989 tty2  Sl+  0:00 /usr/lib/gnome-settings-daemon/gsd-print-notifications
1991 tty2  Sl+  0:00 /usr/lib/gnome-settings-daemon/gsd-rfkill
1992 tty2  Sl+  0:01 /usr/lib/gnome-settings-daemon/gsd-screensaver-proxy
1997 tty2  Sl+  0:04 /usr/lib/gnome-settings-daemon/gsd-sharing
2001 tty2  Sl+  0:01 /usr/lib/gnome-settings-daemon/gsd-xsettings
2000 +ru2  c1.  0:00 /usr/lib/gnome-settings-daemon/gsd-smartcard
```

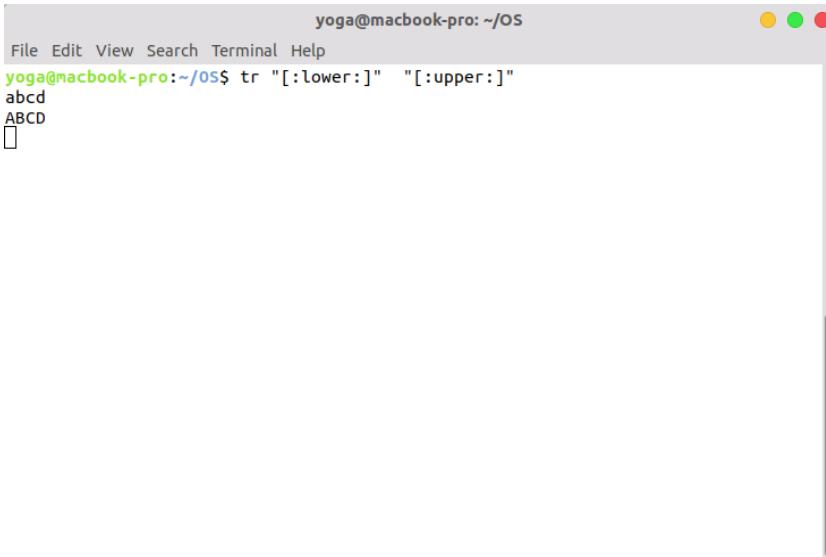
14)tr Command:

Description:

- >It is used for translating or deleting specific character.
- >Translating involves uppercase to lowercase
- >Also used for basic find and replace functions

Syntax:

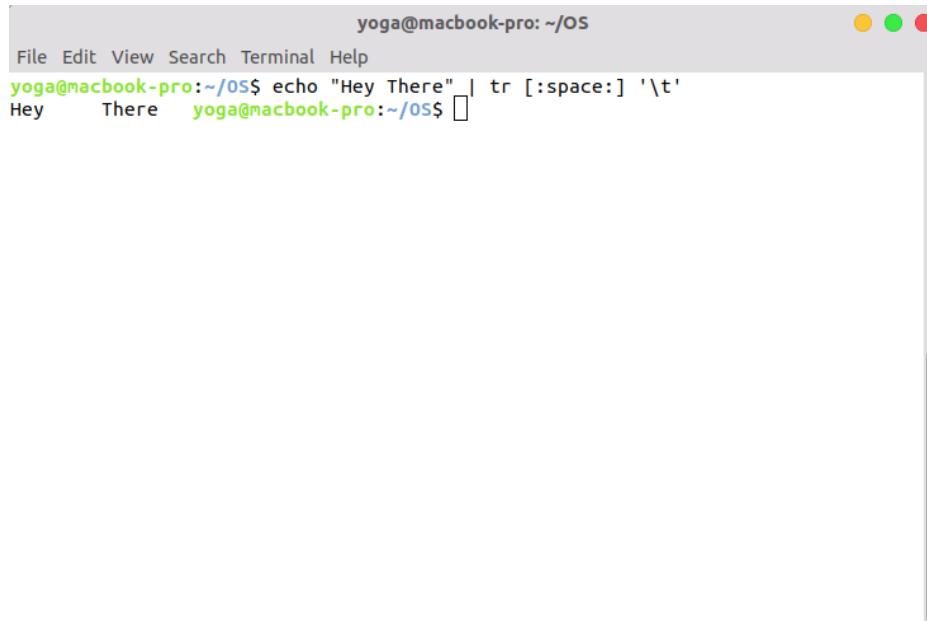
- tr [OPTION] SET1 [SET2]
- tr "[lower]" "[upper]" //to Convert/translate lower case to uppercase letters



A screenshot of a macOS Terminal window titled "yoga@macbook-pro: ~/OS". The window has three colored title bar buttons (yellow, green, red). The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The command entered is "tr "[lower]" "[upper]"". The output shows the input "abcd" being converted to "ABCD".

```
yoga@macbook-pro:~/OS$ tr "[lower]" "[upper]"
abcd
ABCD
```

- tr [:space:] '\t' //to Convert/translate white spaces to tab spaces

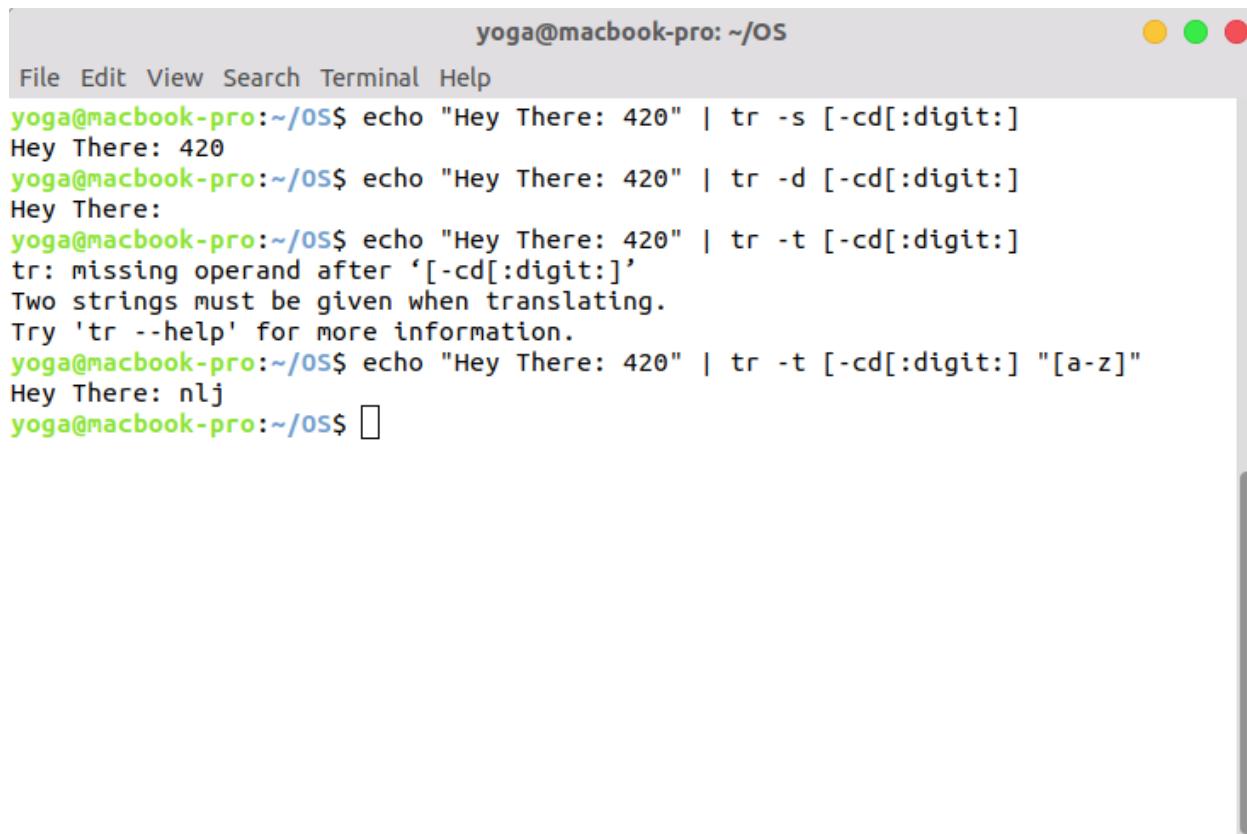


A screenshot of a macOS Terminal window titled "yoga@macbook-pro: ~/OS". The window has three colored title bar buttons (yellow, green, red). The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The command entered is "echo "Hey There" | tr [:space:] '\t'". The output shows the input "Hey There" with a tab character between "Hey" and "There".

```
yoga@macbook-pro:~/OS$ echo "Hey There" | tr [:space:] '\t'
Hey      There  yoga@macbook-pro:~/OS$
```

[OPTION]:

- -c: Complements the set of characters in string //displays only the string mentioned in SET
- -d:Delete characters in the SET1 from the output
- -s:replaces repeated characters in SET1 with single occurrence
- -t:truncates SET1



The screenshot shows a macOS Terminal window with the title "yoga@macbook-pro: ~/OS". The window contains the following text:

```
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ echo "Hey There: 420" | tr -s [-cd[:digit:]]
Hey There: 420
yoga@macbook-pro:~/OS$ echo "Hey There: 420" | tr -d [-cd[:digit:]]
Hey There:
yoga@macbook-pro:~/OS$ echo "Hey There: 420" | tr -t [-cd[:digit:]]
tr: missing operand after '[-cd[:digit:]]'
Two strings must be given when translating.
Try 'tr --help' for more information.
yoga@macbook-pro:~/OS$ echo "Hey There: 420" | tr -t [-cd[:digit:]] "[a-z]"
Hey There: nlj
yoga@macbook-pro:~/OS$ 
```

15)df command:

Description:

Used to display information related to file systems about available and total space.

Syntax:

df [OPTION]...[FILE]//default argument df displays spaces available on all currently mounted file system

[OPTION]:

- -a/-all:Include all file systems including inaccessible and duplicate file systems

```
yoga@macbook-pro: ~/OS$ df -a
Filesystem      1K-blocks    Used Available Use% Mounted on
sysfs            0        0        0   - /sys
proc              0        0        0   - /proc
udev             1706716     0  1706716  0% /dev
devpts            0        0        0   - /dev/pts
tmpfs             345832   1908  343924  1% /run
/dev/sda5       372869356 122747692 231111208 35% /
securityfs       0        0        0   - /sys/kernel/security
tmpfs             1729148  98464  1630684  6% /dev/shm
tmpfs              5120     4    5116  1% /run/lock
tmpfs             1729148     0  1729148  0% /sys/fs/cgroup
cgroup            0        0        0   - /sys/fs/cgroup/unified
cgroup            0        0        0   - /sys/fs/cgroup/systemd
pstore            0        0        0   - /sys/fs/pstore
cgroup            0        0        0   - /sys/fs/cgroup/devices
cgroup            0        0        0   - /sys/fs/cgroup/cpu,cpuacct
cgroup            0        0        0   - /sys/fs/cgroup/freezer
cgroup            0        0        0   - /sys/fs/cgroup/net_cls,net_prio
0
cgroup            0        0        0   - /sys/fs/cgroup/hugetlb
cgroup            0        0        0   - /sys/fs/cgroup/perf_event
cgroup            0        0        0   - /sys/fs/cgroup/pids
cgroup            0        0        0   - /sys/fs/cgroup/hlink
```

- -B/-block-size=SIZE:Scales sizes by SIZE before printing them

```
yoga@macbook-pro:~/OS$ df -B 1024
Filesystem      1K-blocks    Used Available Use% Mounted on
udev            1706716       0   1706716  0% /dev
tmpfs           345832     1908   343924  1% /run
/dev/sda5      372869356 122748584 231110316 35% /
tmpfs           1729148    98464   1630684  6% /dev/shm
tmpfs            5120        4    5116  1% /run/lock
tmpfs           1729148       0   1729148  0% /sys/fs/cgroup
/dev/loop0      280576    280576       0 100% /snap/wps-office-multilang/1
/dev/loop1      98944     98944       0 100% /snap/core/9804
/dev/loop2      144128    144128       0 100% /snap/gnome-3-26-1604/98
/dev/loop3      348544    348544       0 100% /snap/datagrip/93
/dev/loop4      2560       2560       0 100% /snap/gnome-calculator/748
/dev/loop9       128       128       0 100% /snap/green-recorder/74
/dev/loop11     144128    144128       0 100% /snap/gnome-3-26-1604/100
/dev/loop12     2304       2304       0 100% /snap/gnome-system-monitor/148
/dev/loop7      157312    157312       0 100% /snap/telegram-desktop/2064
/dev/loop10     1024       1024       0 100% /snap/gnome-logs/93
/dev/loop8      261760    261760       0 100% /snap/gnome-3-34-1804/36
/dev/loop13     384       384       0 100% /snap/gnome-characters/539
/dev/loop15     261760    261760       0 100% /snap/gnome-3-34-1804/33
/dev/loop19     99328    99328       0 100% /snap/core/9665
/dev/loop6      148480   148480       0 100% /snap/code/41
/dev/loop21     384       384       0 100% /snap/gnome-characters/550
```

- -h: Prints sizes in power of 1024

```
yoga@macbook-pro:~/OS$ df -h
Filesystem      Size  Used Avail Use% Mounted on
udev            1.7G   0    1.7G  0% /dev
tmpfs           338M  1.9M  336M  1% /run
/dev/sda5      356G  118G  221G  35% /
tmpfs           1.7G  97M  1.6G  6% /dev/shm
tmpfs           5.0M  4.0K  5.0M  1% /run/lock
tmpfs           1.7G   0    1.7G  0% /sys/fs/cgroup
/dev/loop0      274M  274M   0 100% /snap/wps-office-multilang/1
/dev/loop1      97M   97M   0 100% /snap/core/9804
/dev/loop2      141M  141M   0 100% /snap/gnome-3-26-1604/98
/dev/loop3      341M  341M   0 100% /snap/datagrip/93
/dev/loop4      2.5M  2.5M   0 100% /snap/gnome-calculator/748
/dev/loop9      128K  128K   0 100% /snap/green-recorder/74
/dev/loop11     141M  141M   0 100% /snap/gnome-3-26-1604/100
/dev/loop12     2.3M  2.3M   0 100% /snap/gnome-system-monitor/148
/dev/loop7      154M  154M   0 100% /snap/telegram-desktop/2064
/dev/loop10     1.0M  1.0M   0 100% /snap/gnome-logs/93
/dev/loop8      256M  256M   0 100% /snap/gnome-3-34-1804/36
/dev/loop13     384K  384K   0 100% /snap/gnome-characters/539
/dev/loop15     256M  256M   0 100% /snap/gnome-3-34-1804/33
/dev/loop19     97M   97M   0 100% /snap/core/9665
/dev/loop6      145M  145M   0 100% /snap/code/41
/dev/loop21     384K  384K   0 100% /snap/gnome-characters/550
```

- -H: Print Sizes in power of 1000

```
yoga@macbook-pro: ~/OS$ df -H
Filesystem      Size  Used Avail Use% Mounted on
udev            1.8G   0    1.8G  0% /dev
tmpfs           355M  2.0M  353M  1% /run
/dev/sda5        382G 126G  237G  35% /
tmpfs           1.8G 101M  1.7G  6% /dev/shm
tmpfs            5.3M  4.1k  5.3M  1% /run/lock
tmpfs           1.8G   0    1.8G  0% /sys/fs/cgroup
/dev/loop0       288M  288M  0     100% /snap/wps-office-multilang/1
/dev/loop1       102M  102M  0     100% /snap/core/9804
/dev/loop2       148M  148M  0     100% /snap/gnome-3-26-1604/98
/dev/loop3       357M  357M  0     100% /snap/datagrip/93
/dev/loop4       2.7M  2.7M  0     100% /snap/gnome-calculator/748
/dev/loop9       132k  132k  0     100% /snap/green-recorder/74
/dev/loop11      148M  148M  0     100% /snap/gnome-3-26-1604/100
/dev/loop12      2.4M  2.4M  0     100% /snap/gnome-system-monitor/148
/dev/loop7       162M  162M  0     100% /snap/telegram-desktop/2064
/dev/loop10      1.1M  1.1M  0     100% /snap/gnome-logs/93
/dev/loop8       269M  269M  0     100% /snap/gnome-3-34-1804/36
/dev/loop13      394k  394k  0     100% /snap/gnome-characters/539
/dev/loop15      269M  269M  0     100% /snap/gnome-3-34-1804/33
/dev/loop19      102M  102M  0     100% /snap/core/9665
/dev/loop6        153M  153M  0     100% /snap/code/41
/dev/loop21      394k  394k  0     100% /snap/gnome-characters/550
```

- -i :list inode information instead of block usage

```
yoga@macbook-pro: ~/OS$ df -i
Filesystem      Inodes IUsed IFree IUse% Mounted on
udev            426679  596  426083   1% /dev
tmpfs           432287 1117  431170   1% /run
/dev/sda5        23748608 895962 22852646   4% /
tmpfs           432287   107  432180   1% /dev/shm
tmpfs           432287     6  432281   1% /run/lock
tmpfs           432287    18  432269   1% /sys/fs/cgroup
/dev/loop0       35540  35540  0     100% /snap/wps-office-multilang/1
/dev/loop1       12796  12796  0     100% /snap/core/9804
/dev/loop2       27631  27631  0     100% /snap/gnome-3-26-1604/98
/dev/loop3       1543   1543  0     100% /snap/datagrip/93
/dev/loop4       1351   1351  0     100% /snap/gnome-calculator/748
/dev/loop9        6     6  0     100% /snap/green-recorder/74
/dev/loop11      27624  27624  0     100% /snap/gnome-3-26-1604/100
/dev/loop12      784    784  0     100% /snap/gnome-system-monitor/148
/dev/loop7       26048  26048  0     100% /snap/telegram-desktop/2064
/dev/loop10      353    353  0     100% /snap/gnome-logs/93
/dev/loop8       24339  24339  0     100% /snap/gnome-3-34-1804/36
/dev/loop13      230    230  0     100% /snap/gnome-characters/539
/dev/loop15      24339  24339  0     100% /snap/gnome-3-34-1804/33
/dev/loop19      12862  12862  0     100% /snap/core/9665
/dev/loop6        4304  4304  0     100% /snap/code/41
/dev/loop21      230    230  0     100% /snap/gnome-characters/550
```

- -l:Display only local file systems

```
yoga@macbook-pro: ~/OS$ df -l
Filesystem      1K-blocks      Used Available Use% Mounted on
udev            1706716         0   1706716   0% /dev
tmpfs           345832       1908   343924   1% /run
/dev/sda5     372869356 122748508 231110392 35% /
tmpfs           1729148      98464  1630684   6% /dev/shm
tmpfs            5120          4    5116   1% /run/lock
tmpfs           1729148         0  1729148   0% /sys/fs/cgroup
/dev/loop0        280576     280576         0 100% /snap/wps-office-multilang/1
/dev/loop1        98944      98944         0 100% /snap/core/9804
/dev/loop2        144128     144128         0 100% /snap/gnome-3-26-1604/98
/dev/loop3        348544     348544         0 100% /snap/datagrip/93
/dev/loop4         2560       2560         0 100% /snap/gnome-calculator/748
/dev/loop9         128        128         0 100% /snap/green-recorder/74
/dev/loop11        144128     144128         0 100% /snap/gnome-3-26-1604/100
/dev/loop12        2304       2304         0 100% /snap/gnome-system-monitor/148
/dev/loop7        157312     157312         0 100% /snap/telegram-desktop/2064
/dev/loop10        1024       1024         0 100% /snap/gnome-logs/93
/dev/loop8        261760     261760         0 100% /snap/gnome-3-34-1804/36
/dev/loop13        384        384         0 100% /snap/gnome-characters/539
/dev/loop15        261760     261760         0 100% /snap/gnome-3-34-1804/33
/dev/loop19        99328      99328         0 100% /snap/core/9665
/dev/loop6        148480     148480         0 100% /snap/code/41
/dev/loop21        384        384         0 100% /snap/gnome-characters/550
```

- -P:Use POSIX output format

yoga@macbook-pro: ~/OS

File Edit View Search Terminal Help

```
yoga@macbook-pro:~/OS$ df -P
Filesystem      1024-blocks    Used Available Capacity Mounted on
udev              1706716        0   1706716      0% /dev
tmpfs             345832     1908   343924      1% /run
/dev/sda5       372869356 122748752 231110148    35% /
tmpfs             1729148    98464   1630684      6% /dev/shm
tmpfs               5120         4    5116      1% /run/lock
tmpfs             1729148        0   1729148      0% /sys/fs/cgroup
/dev/loop0        280576   280576        0   100% /snap/wps-office-multila
ng/1
/dev/loop1        98944   98944        0  100% /snap/core/9804
/dev/loop2        144128  144128        0  100% /snap/gnome-3-26-1604/98
/dev/loop3        348544  348544        0  100% /snap/datagrip/93
/dev/loop4        2560    2560        0  100% /snap/gnome-calculator/7
48
/dev/loop9          128     128        0  100% /snap/green-recorder/74
/dev/loop11       144128  144128        0  100% /snap/gnome-3-26-1604/10
0
/dev/loop12       2304    2304        0  100% /snap/gnome-system-monit
or/148
/dev/loop7        157312  157312        0  100% /snap/telegram-desktop/2
064
/dev/loop10       1024    1024        0  100% /snap/gnome-logs/93
/dev/loop8        261760  261760        0  100% /snap/gnome-3-34-1804/36
```

- **--sync:**This option is used to invoke sync before getting usage info

```
yoga@macbook-pro:~/OS$ df --sync
Filesystem      1K-blocks    Used Available Use% Mounted on
udev              1706716       0   1706716  0% /dev
tmpfs             345832   1908   343924  1% /run
/dev/sda5        372869356 122748908 231109992 35% /
tmpfs             1729148   98464   1630684  6% /dev/shm
tmpfs               5120       4     5116  1% /run/lock
tmpfs             1729148       0   1729148  0% /sys/fs/cgroup
/dev/loop0         280576   280576       0 100% /snap/wps-office-multilang/1
/dev/loop1         98944   98944       0 100% /snap/core/9804
/dev/loop2         144128   144128       0 100% /snap/gnome-3-26-1604/98
/dev/loop3         348544   348544       0 100% /snap/datagrip/93
/dev/loop4           2560     2560       0 100% /snap/gnome-calculator/748
/dev/loop9           128     128       0 100% /snap/green-recorder/74
/dev/loop11          128     128       0 100% /snap/gnome-3-26-1604/100
/dev/loop12          2304    2304       0 100% /snap/gnome-system-monitor/148
/dev/loop7          157312   157312       0 100% /snap/telegram-desktop/2064
/dev/loop10          1024    1024       0 100% /snap/gnome-logs/93
/dev/loop8          261760   261760       0 100% /snap/gnome-3-34-1804/36
/dev/loop13          384     384       0 100% /snap/gnome-characters/539
/dev/loop15          261760   261760       0 100% /snap/gnome-3-34-1804/33
/dev/loop19          99328   99328       0 100% /snap/core/9665
/dev/loop6          148480   148480       0 100% /snap/code/41
/dev/loop21           384     384       0 100% /snap/gnome-characters/550
```

- **--total :**Display total space used

```
yoga@macbook-pro:~/OS$ df --total
Filesystem      1K-blocks    Used Available Use% Mounted on
udev              1706716       0   1706716  0% /dev
tmpfs             345832   1908   343924  1% /run
/dev/sda5        372869356 122749100 231109800 35% /
tmpfs             1729148   98464   1630684  6% /dev/shm
tmpfs               5120       4     5116  1% /run/lock
tmpfs             1729148       0   1729148  0% /sys/fs/cgroup
/dev/loop0         280576   280576       0 100% /snap/wps-office-multilang/1
/dev/loop1         98944   98944       0 100% /snap/core/9804
/dev/loop2         144128   144128       0 100% /snap/gnome-3-26-1604/98
/dev/loop3         348544   348544       0 100% /snap/datagrip/93
/dev/loop4           2560     2560       0 100% /snap/gnome-calculator/748
/dev/loop9           128     128       0 100% /snap/green-recorder/74
/dev/loop11          128     128       0 100% /snap/gnome-3-26-1604/100
/dev/loop12          2304    2304       0 100% /snap/gnome-system-monitor/148
/dev/loop7          157312   157312       0 100% /snap/telegram-desktop/2064
/dev/loop10          1024    1024       0 100% /snap/gnome-logs/93
/dev/loop8          261760   261760       0 100% /snap/gnome-3-34-1804/36
/dev/loop13          384     384       0 100% /snap/gnome-characters/539
/dev/loop15          261760   261760       0 100% /snap/gnome-3-34-1804/33
/dev/loop19          99328   99328       0 100% /snap/core/9665
/dev/loop6          148480   148480       0 100% /snap/code/41
/dev/loop21           384     384       0 100% /snap/gnome-characters/550
```

16)du Command:

Description:

->It is used to estimate /display files/directory space usage

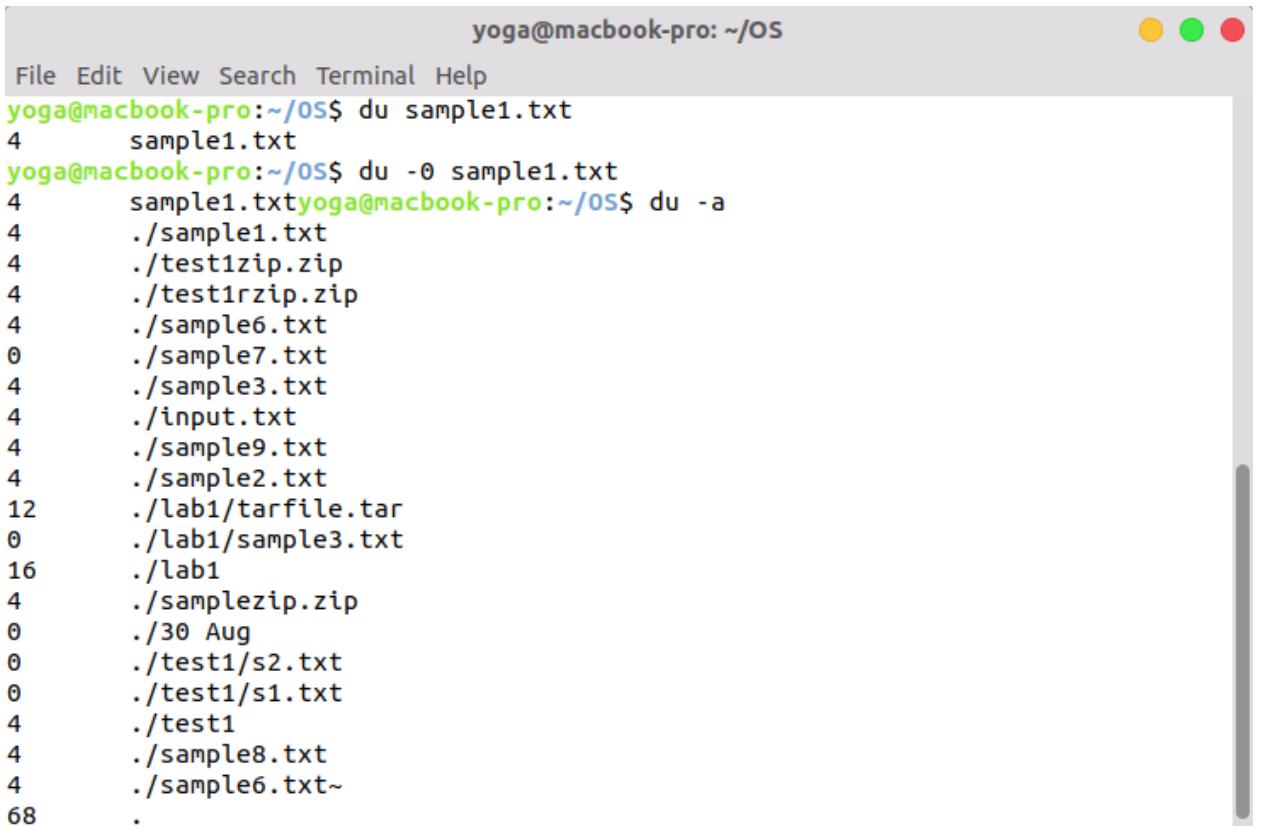
Syntax:

du[OPTION].....[FILE]

[OPTION]:

- -0/-null: Displays output with each line ending with NULL
- -a/-all:
- --apparent-size:Print apparent sizes ,rather than disk usage
- -B:scale sizes to SIZE before printing the output
- -c,total:Display output as grand total
- -d,--max-depth=N:Print output with total for directories with N or fewer levels
- -h:Display output i.e file size in readable format(K,M,G)
- -S:Prints output with including sizes of sub-directories
- -s:Display only total for each directory

- --time: Displays last modification time



```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ du sample1.txt
4      sample1.txt
yoga@macbook-pro:~/OS$ du -0 sample1.txt
4      sample1.txt
yoga@macbook-pro:~/OS$ du -a
4      ./sample1.txt
4      ./test1zip.zip
4      ./test1rzip.zip
4      ./sample6.txt
0      ./sample7.txt
4      ./sample3.txt
4      ./input.txt
4      ./sample9.txt
4      ./sample2.txt
12     ./lab1/tarfile.tar
0      ./lab1/sample3.txt
16     ./lab1
4      ./samplezip.zip
0      ./30 Aug
0      ./test1/s2.txt
0      ./test1/s1.txt
4      ./test1
4      ./sample8.txt
4      ./sample6.txt~
68     .
```




```
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ ./test1
4      ./sample8.txt
4      ./sample6.txt~
68     .
yoga@macbook-pro:~/OS$ clear
yoga@macbook-pro:~/OS$ du -B 5
3277   ./lab1
820    ./test1
13927  .
yoga@macbook-pro:~/OS$ du -B 1024
16     ./lab1
4      ./test1
68     .
yoga@macbook-pro:~/OS$ du -c
16     ./lab1
4      ./test1
68     .
68     total
yoga@macbook-pro:~/OS$ du -d 2
16     ./lab1
4      ./test1
68     .
yoga@macbook-pro:~/OS$ du -d 1
16     ./lab1
4      ./test1
68     .
yoga@macbook-pro:~/OS$ du -h sample1.txt
4.0K   sample1.txt
yoga@macbook-pro:~/OS$ du -s
16     ./lab1
4      ./test1
48     .
yoga@macbook-pro:~/OS$ du --time sample1.txt
4      2020-08-30 12:30      sample1.txt
yoga@macbook-pro:~/OS$
```

17)fc Command:

Description:

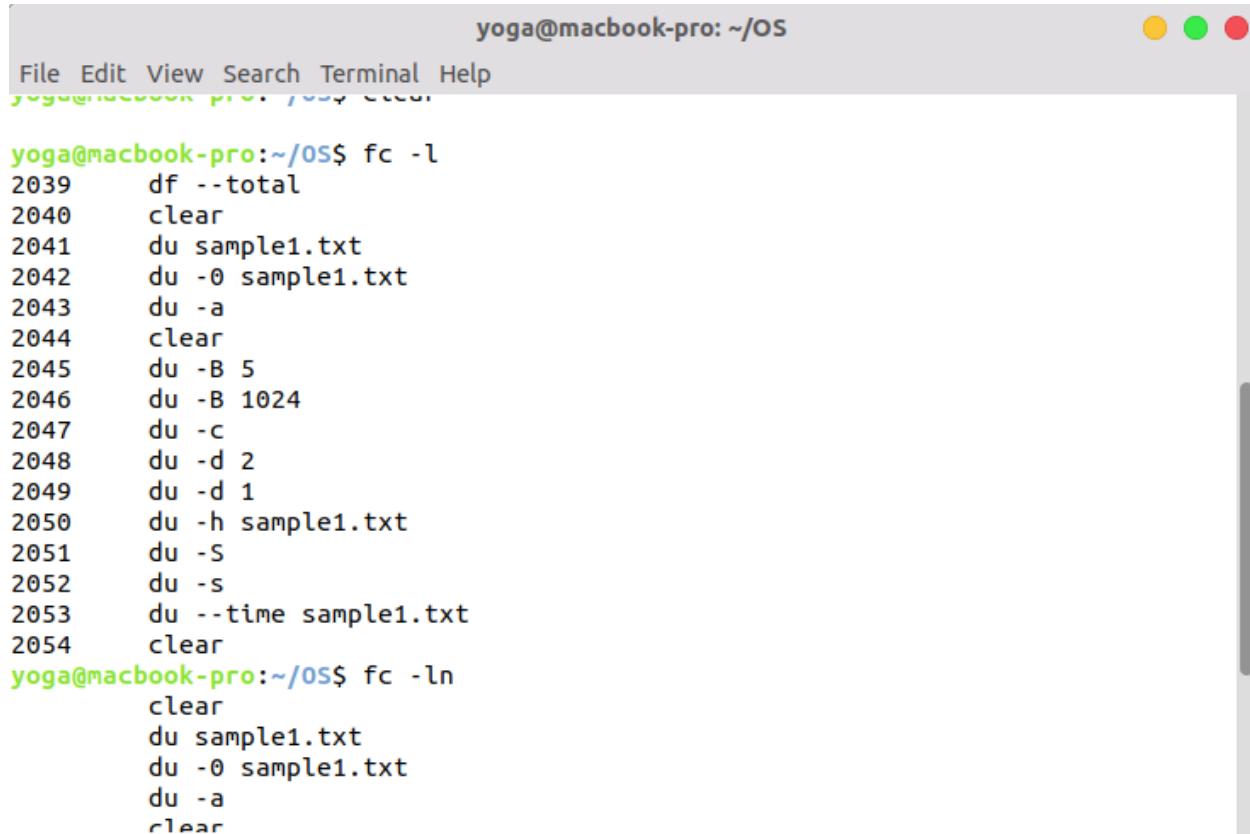
It is used to edit and re-execute the previously entered commands in a shell without re-writing them

Syntax:

```
fc [-e ename] [OPTION] [first] [last]
// ename :Refers to editor to be used
// first and last used for specifying the commands to be edited
fc -s [pat=rep] [command]
echo "shutdown -h now" | at -m HH:MM //to shutdown at HH:MM today
```

[OPTION]:

- -l :Used to only display the previously entered commands .



The screenshot shows a macOS Terminal window with the title bar "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The main pane displays command history with line numbers and command details. The first command is "fc -l". The output shows various "du" and "clear" commands with line numbers from 2039 to 2054. The second command is "fc -ln", which shows the same commands without line numbers.

```
yoga@macbook-pro:~/OS$ fc -l
2039    df --total
2040    clear
2041    du sample1.txt
2042    du -0 sample1.txt
2043    du -a
2044    clear
2045    du -B 5
2046    du -B 1024
2047    du -c
2048    du -d 2
2049    du -d 1
2050    du -h sample1.txt
2051    du -S
2052    du -s
2053    du --time sample1.txt
2054    clear
yoga@macbook-pro:~/OS$ fc -ln
    clear
    du sample1.txt
    du -0 sample1.txt
    du -a
    clear
```

- -ln: Used to list the numbers without line numbers(by default ,output is printed with line numbers)

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
2049    du -d 1
2050    du -h sample1.txt
2051    du -S
2052    du -s
2053    du --time sample1.txt
2054    clear
yoga@macbook-pro:~/OS$ fc -ln
      clear
      du sample1.txt
      du -0 sample1.txt
      du -a
      clear
      du -B 5
      du -B 1024
      du -c
      du -d 2
      du -d 1
      du -h sample1.txt
      du -S
      du -s
      du --time sample1.txt
      clear
      fc -l
yoga@macbook-pro:~/OS$ █
```

- -lr: Used to list the newest/recently entered commands first

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
      du -h sample1.txt
      du -S
      du -s
      du --time sample1.txt
      clear
      fc -l
yoga@macbook-pro:~/OS$ fc -lr
2056    fc -ln
2055    fc -l
2054    clear
2053    du --time sample1.txt
2052    du -s
2051    du -S
2050    du -h sample1.txt
2049    du -d 1
2048    du -d 2
2047    du -c
2046    du -B 1024
2045    du -B 5
2044    clear
2043    du -a
2042    du -0 sample1.txt
2041    du sample1.txt
yoga@macbook-pro:~/OS$ █
```

- -e ename: Used to open the last typed commands in editor “ename”

18)at command:

Description:

->This command is used to schedule a command to be executed at a particular time in the future.

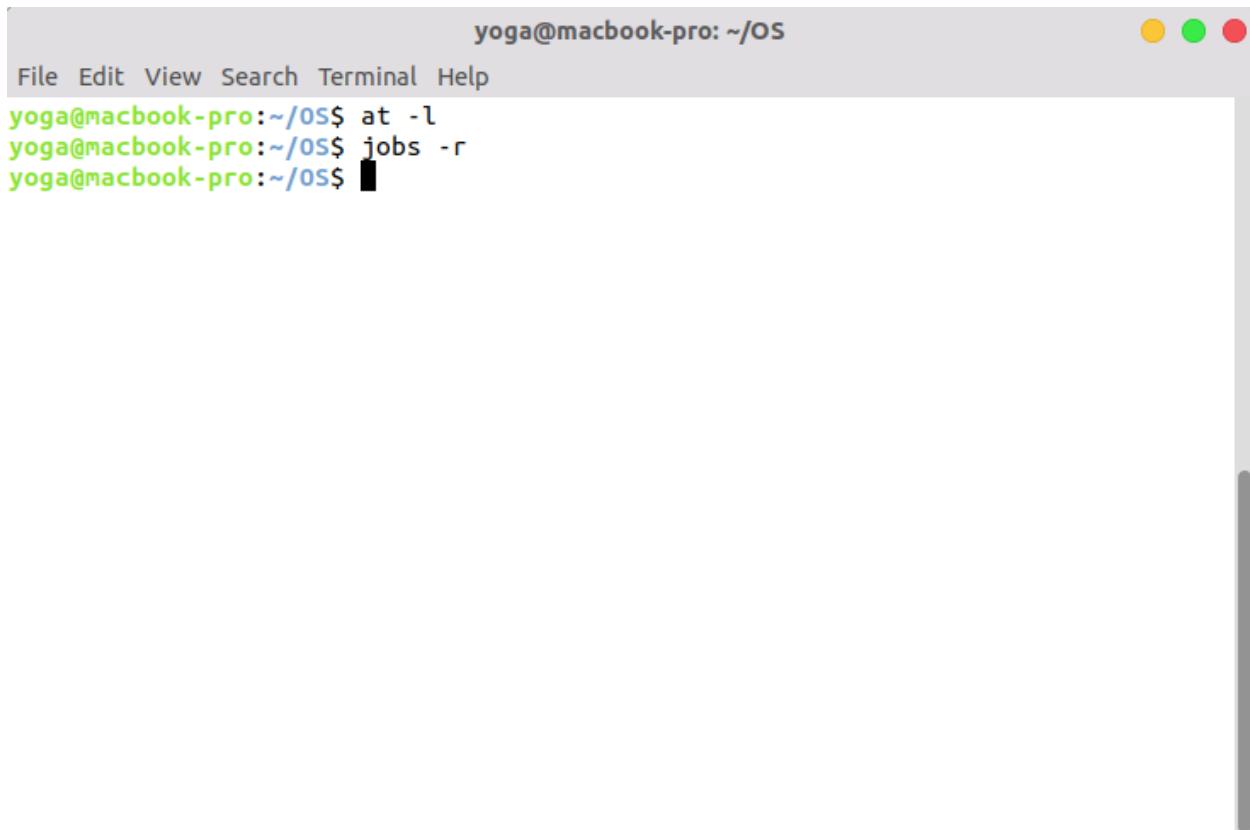
->It can also be used to mail at any time

Syntax:

at [OPTION..] runtime

[OPTION]:

- -l :To list the user's pending jobs



The screenshot shows a macOS Terminal window with the title bar "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The window contains the following text:

```
yoga@macbook-pro:~/OS$ at -l
yoga@macbook-pro:~/OS$ jobs -r
yoga@macbook-pro:~/OS$ █
```

- day +n minutes:To schedule a job at "DAY"(Ex:MONDAY) at a time n minutes later than current time (Ctrl-d to schedule)

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ at -l
yoga@macbook-pro:~/OS$ jobs -r
yoga@macbook-pro:~/OS$ at sat +2minutes
warning: commands will be executed using /bin/sh
at> echo "Testing"
at> <EOT>
at> ^Cyoga@macbook-pro:~/OS$
```

- HH:MM MMDDYY:To schedule a job at HH:MM time and at date “MMDDYY”

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ at 08:00 PM
warning: commands will be executed using /bin/sh
at> echo "To Sleep"<EOT>
at>
```

- now +n days:To schedule a job at n time(MINUTES/HOURS) from now

The screenshot shows a terminal window titled "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The title bar also displays the terminal path. The main pane contains the following text:

```
yoga@macbook-pro:~/OS$ at now +5 days
warning: commands will be executed using /bin/sh
at> echo"TEST"
at> <EOT>
at> 
```

- -r jobid:To delete a job

19) Shutdown Command:

Description:

->It is used to shutdown the system in a safe way.

->It can be used to schedule the shutdown.

//NOTE :Only Root user can execute shutdown command

Syntax:

shutdown [OPTIONS] [TIME] [MESSAGE]

sudo shutdown [TIME] [MESSAGE]

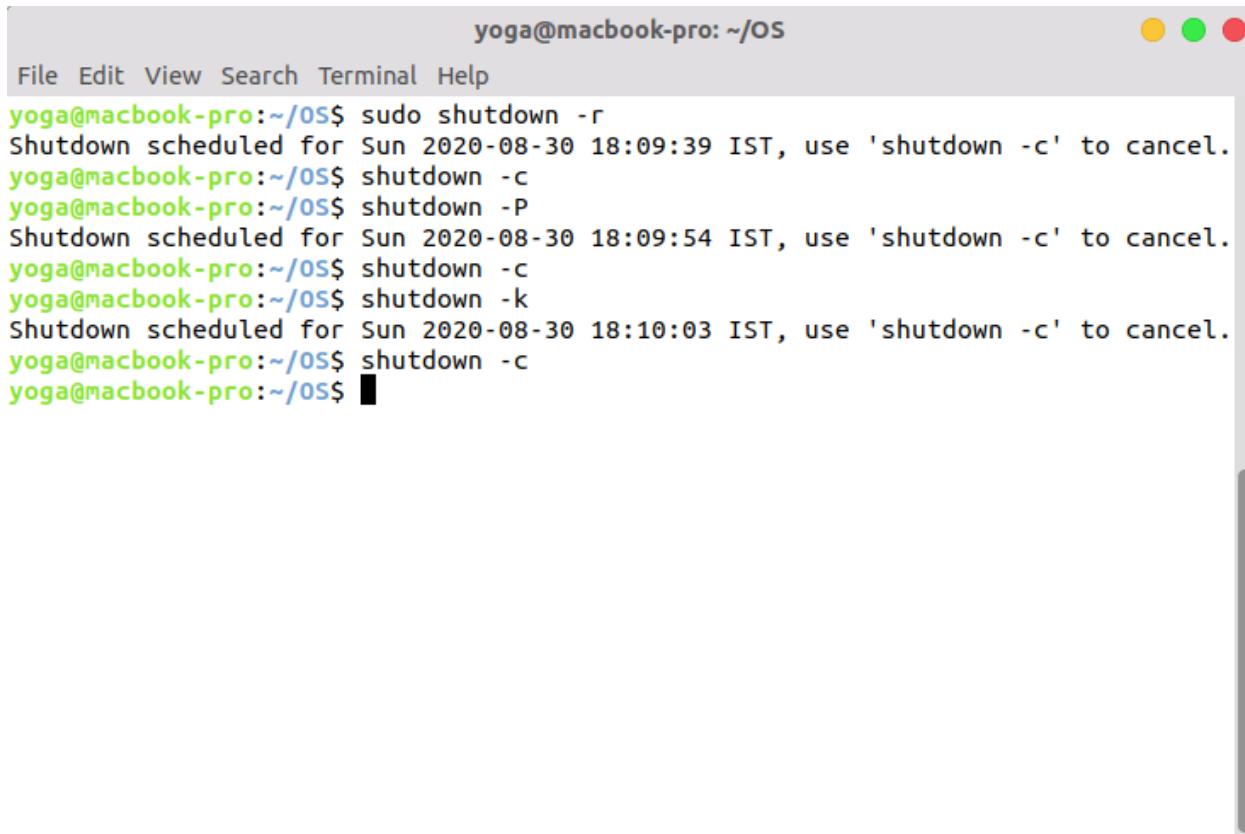
//OPTIONS :used for commands like halt power-off

//TIME :Used To specify shutdown process Ex:=+n (after n minutes) ,HH:MM //format,now,etc

//MESSAGE:Used to specify a message to display it to all users who are logged in

[OPTIONS]:

- -r:This Option Requests system to be restarted after shutdown and use
- -c:Cancels a running shutdown //TIME will not be specified but message can be specified
- -h:To Request system to halt or power off after shutdown
- -P:Requests system to be powered off
- -k:Only display warning messages and disable logins.



A screenshot of a macOS Terminal window. The title bar shows "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The main pane displays the following command history:

```
yoga@macbook-pro:~/OS$ sudo shutdown -r
Shutdown scheduled for Sun 2020-08-30 18:09:39 IST, use 'shutdown -c' to cancel.
yoga@macbook-pro:~/OS$ shutdown -c
yoga@macbook-pro:~/OS$ shutdown -P
Shutdown scheduled for Sun 2020-08-30 18:09:54 IST, use 'shutdown -c' to cancel.
yoga@macbook-pro:~/OS$ shutdown -c
yoga@macbook-pro:~/OS$ shutdown -k
Shutdown scheduled for Sun 2020-08-30 18:10:03 IST, use 'shutdown -c' to cancel.
yoga@macbook-pro:~/OS$ shutdown -c
yoga@macbook-pro:~/OS$
```

20)diff Command:

Description:

It is used to display differences in the files by comparing the files line by line

Syntax:

```
diff [OPTION] file1 file2
```

```

yoga@macbook-pro:~/OS$ diff sample1.txt sample2.txt
1,1c1,3
< This is a test document.
< An OS is an interface between a computer user and a computer hardware.
< An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
< Operating system is one of the core subjects in computer science.
< Operating system is one of the core subjects in computer science.
< Unix is a great OS.
< UNIX is a free OS.
< Unix systems use a centralized operating system kernel which manages system and process activities.
< Unix is a great OS.
< UNIX is a free OS.
< UnixOS systems use a centralized operating system kernel which manages system and process activities.
---
> Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
> There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which

```

[OPTION]:

- -c:To view differences between files in context mode

```

yoga@macbook-pro:~/OS$ diff -c sample1.txt sample2.txt
*** sample1.txt 2020-08-30 18:13:17.635590198 +0530
--- sample2.txt 2020-08-30 11:10:00.833589577 +0530
*****
*** 1,15 ****
! This is a test document.
! An OS is an interface between a computer user and a computer hardware.
! An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
! Operating system is one of the core subjects in computer science.
! Operating system is one of the core subjects in computer science.
! Unix is a great OS.
! UNIX is a free OS.
! Unix systems use a centralized operating system kernel which manages system and process activities.
! Unix is a great OS.
! UNIX is a free OS.
! UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
! Yet another powerful OS.
\ No newline at end of file
--- 1,8 ----
! Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
! There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
! Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
! Yet another powerful OS.
!

```

- -u:To view differences in Unified Mode.

```

File Edit View Search Terminal Help
--- 1,8 ----
! Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
! There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which
is freely available.
! Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
! Yet another powerful OS.

!
yoga@macbook-pro:~/OS$ diff -u sample1.txt sample2.txt
--- sample1.txt 2020-08-30 18:13:17.635590198 +0530
+++ sample2.txt 2020-08-30 11:11:00.833589577 +0530
@@ -1,15 +1,8 @@
-This is a test document.
-An OS is an interface between a computer user and a computer hardware.
-An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and co
ntrolling peripheral devices such as disk drives and printers.
-Operating system is one of the core subjects in computer science.
-Operating system is one of the core subjects in computer science.
-Unix is a great OS.
-UNIX is a free OS.
-Unix systems use a centralized operating system kernel which manages system and process activities.
-Unix is a great OS.
-UNIX is a free OS.
-UNIXOS systems use a centralized operating system kernel which manages system and process activities.
+Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
+There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which
is freely available.
+Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
-Yet another powerful OS.
\ No newline at end of file
+Yet another powerful OS.
+
yoga@macbook-pro:~/OS$ 

```

//DIFFERENCE BETWEEN UNIFIED AND CONTEXT MODE IS THAT UNIFIED MODE DOES NOT DISPLAY ANY REDUNDANT INFORMATION(IN CONCISE FORM)

- -i: This Command ignores case sensitivity while comparing the file

```

File Edit View Search Terminal Help
Sun Aug 30, 18:14:59
yoga@macbook-pro: ~/OS

1,1c1,3
< This is a test document.
< An OS is an interface between a computer user and a computer hardware.
< An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and co
ntrolling peripheral devices such as disk drives and printers.
< Operating system is one of the core subjects in computer science.
< Operating system is one of the core subjects in computer science.
< Unix is a great OS.
< UNIX is a free OS.
< Unix systems use a centralized operating system kernel which manages system and process activities.
< Unix is a great OS.
< UNIX is a free OS.
< UNIXOS systems use a centralized operating system kernel which manages system and process activities.
---
> Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
> There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which
is freely available.
> Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
15c7,8
< Yet another powerful OS.
\ No newline at end of file
...
> Yet another powerful OS.
>

yoga@macbook-pro:~/OS$ 

```

- -q: Reports only when files differ

```

Terminal Sun Aug 30, 18:15:12 yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
+There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which
is freely available.
+Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.
\ No newline at end of file
+Yet another powerful OS.
+
yoga@macbook-pro:~/OS$ diff -i sample1.txt sample2.txt
1,1c1,3
< This is a test document.
< An OS is an interface between a computer user and a computer hardware.
< An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and c
ontrolling peripheral devices such as disk drives and printers.
< Operating system is one of the core subjects in computer science.
< Operating system is one of the core subjects in computer science.
< Unix is a great OS.
< UNIX is a free OS.
< Unix systems use a centralized operating system kernel which manages system and process activities.
< Unix is a great OS.
< UNIX is a free OS.
< UnixOS systems use a centralized operating system kernel which manages system and process activities.
...
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> There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which
is freely available.
> Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
15c7,8
< Yet another powerful OS.
\ No newline at end of file
...
> Yet another powerful OS.
>
yoga@macbook-pro:~/OS$ diff -q sample1.txt sample2.txt
Files sample1.txt and sample2.txt differ
yoga@macbook-pro:~/OS$ 

```

- -s:Reports when two files are same

```

Terminal Sun Aug 30, 18:15:27 yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
> Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
> There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which
is freely available.
> Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
15c7,8
< Yet another powerful OS.
\ No newline at end of file
...
> Yet another powerful OS.
>
yoga@macbook-pro:~/OS$ diff -q sample1.txt sample2.txt
Files sample1.txt and sample2.txt differ
yoga@macbook-pro:~/OS$ diff -s sample1.txt sample2.txt
1,1c1,3
< This is a test document.
< An OS is an interface between a computer user and a computer hardware.
< An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and c
ontrolling peripheral devices such as disk drives and printers.
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< Unix is a great OS.
< UNIX is a free OS.
< Unix systems use a centralized operating system kernel which manages system and process activities.
< Unix is a great OS.
< UNIX is a free OS.
< UnixOS systems use a centralized operating system kernel which manages system and process activities.
...
> Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
> There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which
is freely available.
> Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
15c7,8
< Yet another powerful OS.
\ No newline at end of file
...
> Yet another powerful OS.
>
yoga@macbook-pro:~/OS$ 

```

- -y:Displays output in two columns

```
File Edit View Search Terminal Help
controlling peripheral devices such as disk drives and printers.
< Operating system is one of the core subjects in computer science.
< Operating system is one of the core subjects in computer science.
Unix is a great OS.
< UNIX is a free OS.
< Unix systems use a centralized operating system kernel which manages system and process activities.
< Unix is a great OS.
< UNIX is a free OS.
< UnixOS systems use a centralized operating system kernel which manages system and process activities.
---
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> There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
> Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
15C7,8
< Yet another powerful OS.
\ No newline at end of file
---
> Yet another powerful OS.
>
yoga@macbook-pro:~/OS$ diff -y sample1.txt sample2.txt
This is a test document.
An OS is an interface between a computer user and a comp
An OS is a software which performs all the basic tasks l
Operating system is one of the core subjects in computer
Operating system is one of the core subjects in computer
Unix is a great OS.
< UNIX is a free OS.
Unix systems use a centralized operating system kernel w
Unix is a great OS.
UNIX is a free OS.
< UnixOS systems use a centralized operating system kernel
A user can also run multiple programs at the same time; hence
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.
| Unix was originally developed in 1969 by a group of AT&T empl
| There are various Unix variants available in the market. Sola
| Several people can use a Unix computer at the same time; henc
<
<
<
<
<
<
<
<
A user can also run multiple programs at the same time; hence
UNIX is a free OS.
Multiuser operating system.
\ Yet another powerful OS.
>

yoga@macbook-pro:~/OS$ 
```

- -r: Recursively compares any sub-directories found

```
File Edit View Search Terminal Help
Operating system is one of the core subjects in computer      <
Unix is a great OS.                                         <
UNIX is a free OS.                                         <
Unix systems use a centralized operating system kernel w   <
Unix is a great OS.                                         <
UNIX is a free OS.                                         <
<                                                 <
UNIXOS systems use a centralized operating system kernel   <
A user can also run multiple programs at the same time; hence  A user can also run multiple programs at the same time; hence
UNIX is a free OS.                                         <
Multiuser operating system.                                <
Yet another powerful OS.                                \ Yet another powerful OS.
>

yoga@nacbook-pro:~/OS$ diff -r sample1.txt sample2.txt
1,1c1,3
< This is a test document.
< An OS is an interface between a computer user and a computer hardware.
< An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and c
ontrolling peripheral devices such as disk drives and printers.
< Operating system is one of the core subjects in computer science.
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< Unix is a great OS.
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< Unix systems use a centralized operating system kernel which manages system and process activities.
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< UNIX is a free OS.
< UNIXOS systems use a centralized operating system kernel which manages system and process activities.
---
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is freely available.
> Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
15c7,8
< Yet another powerful OS.
\ No newline at end of file
---
> Yet another powerful OS.
>
yoga@nacbook-pro:~/OS$
```

- -w:Ignores all white space

```

File Edit View Search Terminal Help
Sun Aug 30, 18:15:54
yoga@macbook-pro:~/OS

< UNIX is a free OS.
< Unix systems use a centralized operating system kernel which manages system and process activities.
< Unix is a great OS.
< UNIX is a free OS.
< UnixOS systems use a centralized operating system kernel which manages system and process activities.
...
> Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
> There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
> Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
15c7,8
< Yet another powerful OS.
\ No newline at end of file
...
> Yet another powerful OS.
>
yoga@macbook-pre:~/OS$ diff -w sample1.txt sample2.txt
1,1c1,3
< This is a test document.
< An OS is an interface between a computer user and a computer hardware.
< An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
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< UNIX is a free OS.
< UnixOS systems use a centralized operating system kernel which manages system and process activities.
...
> Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
> There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
> Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
15a8
>
yoga@macbook-pre:~/OS$ 

```

- **-b:**Ignores changes where lines are all blank

```

File Edit View Search Terminal Help
Sun Aug 30, 18:15:58
yoga@macbook-pro:~/OS

controlling peripheral devices such as disk drives and printers.
< Operating system is one of the core subjects in computer science.
< Operating system is one of the core subjects in computer science.
< Unix is a great OS.
< UNIX is a free OS.
< Unix systems use a centralized operating system kernel which manages system and process activities.
< Unix is a great OS.
< UNIX is a free OS.
< UnixOS systems use a centralized operating system kernel which manages system and process activities.
...
> Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
> There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
> Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
15a8
>
yoga@macbook-pre:~/OS$ diff -b sample1.txt sample2.txt
1,1c1,3
< This is a test document.
< An OS is an interface between a computer user and a computer hardware.
< An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
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< Unix systems use a centralized operating system kernel which manages system and process activities.
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...
> Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
> There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
> Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
15a8
>
yoga@macbook-pre:~/OS$ 

```

- **--version:**This option is used to display the version of diff currently running on system

21)Find command:

Description:

->It can be used to find files and directories and to perform operations on them

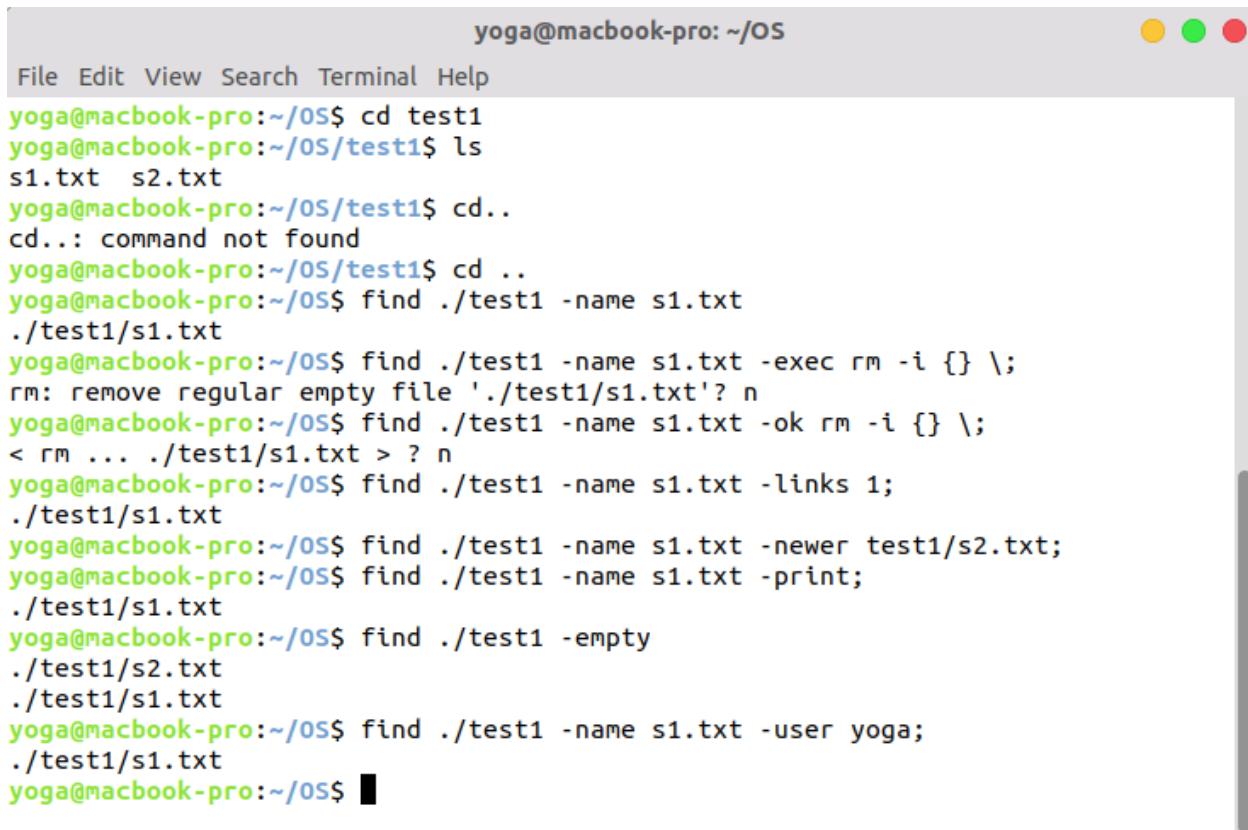
Syntax:

find [location to start searching from] [pattern] [FILENAME] [OPTIONS]

Ex:find ./new -name sample.txt

[OPTION]:

- -exec CMD:Return 0 and successful command execution.
- -ok CMD:This option prompts user first and functions similar to exec cmd
- -links N:Search for files with 'N' links
- -newer file:Facilitates search for files that were modified or created after "File"
- -print:Displays the path name of the files found by using the rest of the criteria
- -empty:Search for empty files and directories
- -size+N/-N:Search for files of 'N' blocks ;If 'c' is mentioned after 'N' :it can be measured size in characters '+N' means size greater and '-N' means size lesser than 'N' blocks
- -user name:Search for files owned by username or ID "name".



The screenshot shows a terminal window on a Mac OS X desktop. The title bar reads "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The main pane displays the following terminal session:

```
yoga@macbook-pro:~/OS$ cd test1
yoga@macbook-pro:~/OS/test1$ ls
s1.txt s2.txt
yoga@macbook-pro:~/OS/test1$ cd..
cd..: command not found
yoga@macbook-pro:~/OS/test1$ cd ..
yoga@macbook-pro:~/OS$ find ./test1 -name s1.txt
./test1/s1.txt
yoga@macbook-pro:~/OS$ find ./test1 -name s1.txt -exec rm -i {} \;
rm: remove regular empty file './test1/s1.txt'? n
yoga@macbook-pro:~/OS$ find ./test1 -name s1.txt -ok rm -i {} \;
< rm ... ./test1/s1.txt > ? n
yoga@macbook-pro:~/OS$ find ./test1 -name s1.txt -links 1;
./test1/s1.txt
yoga@macbook-pro:~/OS$ find ./test1 -name s1.txt -newer test1/s2.txt;
yoga@macbook-pro:~/OS$ find ./test1 -name s1.txt -print;
./test1/s1.txt
yoga@macbook-pro:~/OS$ find ./test1 -empty
./test1/s2.txt
./test1/s1.txt
yoga@macbook-pro:~/OS$ find ./test1 -name s1.txt -user yoga;
./test1/s1.txt
yoga@macbook-pro:~/OS$
```

22)locate command:

Description:

It is used to find the files by name.

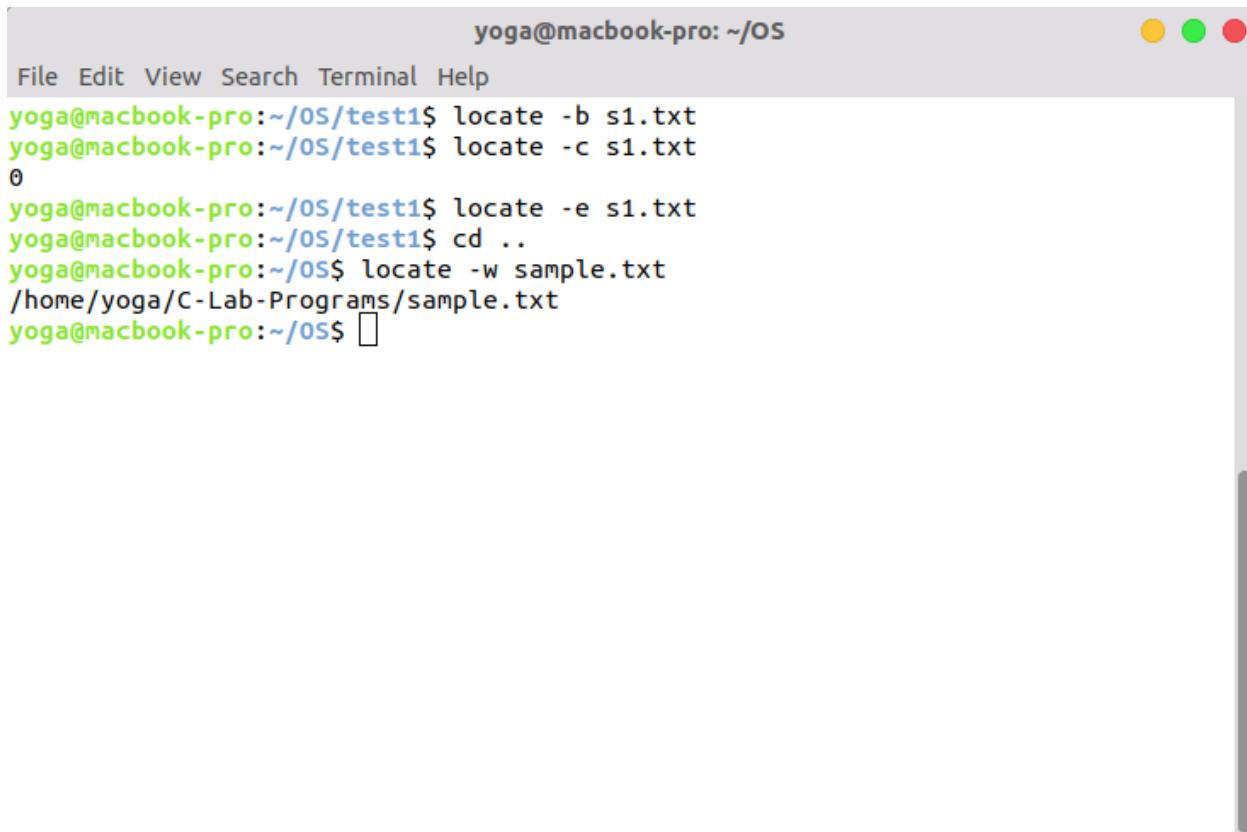
It works faster than find command because instead of searching the file system when a file system is initiated ,it would look through a database.

Syntax:

locate [OPTION] [PATTERN] [FILENAME]

[OPTION]:

- -b,--basename:Match only the base name against the specified pattern
- -c,--count:Displays only the no of matching entries
- -e:Displays only the files that exist during the time locate is run
- -L,--follow:While checking for files,if -e option is specified then it follows trailing symbolic links.This cause broken symbolic links to be omitted.
- -i,--ignore case:Ignores case sensitivity while matching patterns
- -l num-limit,-n LIMIT :Stops after finding “LIMIT” entries.
- -0,--null:Separate the entries on output using the ASCII NULL character instead of displaying each entry on separate line.
- -q:Suppresses errors displayed while reading and processing databases.
- -w,--wholename :Matches only the whole path name against the specified pattern



The screenshot shows a terminal window titled "yoga@macbook-pro: ~/OS". The window has three colored status icons (yellow, green, red) in the top right corner. The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal session shows the following commands and outputs:

```
yoga@macbook-pro:~/OS/test1$ locate -b s1.txt
yoga@macbook-pro:~/OS/test1$ locate -c s1.txt
0
yoga@macbook-pro:~/OS/test1$ locate -e s1.txt
yoga@macbook-pro:~/OS/test1$ cd ..
yoga@macbook-pro:~/OS$ locate -w sample.txt
/home/yoga/C-Lab-Programs/sample.txt
yoga@macbook-pro:~/OS$
```

23)ifconfig command:

Description:

It is used to configure the kernel-resident network interfaces.

It is also used to assign IP address and netmask to an interface or disable an interface

Syntax:

ifconfig [OPTION] [INTERFACE]

```
yoga@macbook-pro:~/OS$ ifconfig
enp3s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
        ether 54:ee:75:de:e4:06 txqueuelen 1000 (Ethernet)
        RX packets 0 bytes 0 (0.0 B)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 0 bytes 0 (0.0 B)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
        loop txqueuelen 1000 (Local Loopback)
        RX packets 40450 bytes 3743576 (3.7 MB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 40450 bytes 3743576 (3.7 MB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlp2s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 192.168.1.6 netmask 255.255.255.0 broadcast 192.168.1.255
        inet6 fe80::2164:7a98:ad5a:573c prefixlen 64 scopeid 0x20<link>
        ether 60:14:b3:a9:75:8b txqueuelen 1000 (Ethernet)
        RX packets 659155 bytes 741667901 (741.6 MB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 445473 bytes 97698817 (97.6 MB)
```

[OPTION]:

- -a:It is used to display all interfaces available

```
yoga@macbook-pro:~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ ifconfig -a
enp3s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
        ether 54:ee:75:de:e4:06 txqueuelen 1000 (Ethernet)
        RX packets 0 bytes 0 (0.0 B)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 0 bytes 0 (0.0 B)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
        loop txqueuelen 1000 (Local Loopback)
        RX packets 40474 bytes 3745568 (3.7 MB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 40474 bytes 3745568 (3.7 MB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlp2s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 192.168.1.6 netmask 255.255.255.0 broadcast 192.168.1.255
        inet6 fe80::2164:7a98:ad5a:573c prefixlen 64 scopeid 0x20<link>
        ether 60:14:b3:a9:75:8b txqueuelen 1000 (Ethernet)
        RX packets 659466 bytes 742026469 (742.0 MB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 445668 bytes 97748778 (97.7 MB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

- -s:Display a shorter version of option “-a”

```
yoga@macbook-pro:~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ ifconfig -s
lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
        inet 127.0.0.1 netmask 255.0.0.0
        inet6 ::1 prefixlen 128 scopeid 0x10<host>
        loop txqueuelen 1000 (Local Loopback)
        RX packets 40474 bytes 3745568 (3.7 MB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 40474 bytes 3745568 (3.7 MB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlp2s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
        inet 192.168.1.6 netmask 255.255.255.0 broadcast 192.168.1.255
        inet6 fe80::2164:7a98:ad5a:573c prefixlen 64 scopeid 0x20<link>
        ether 60:14:b3:a9:75:8b txqueuelen 1000 (Ethernet)
        RX packets 659466 bytes 742026469 (742.0 MB)
        RX errors 0 dropped 0 overruns 0 frame 0
        TX packets 445668 bytes 97748778 (97.7 MB)
        TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

yoga@macbook-pro:~/OS$ ifconfig -v
```

- -v :Include more details about execution(opens in verbose mode)

```

yoga@macbook-pro:~/OS$ ifconfig -v
enp3s0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
      ether 54:ee:75:de:e4:06 txqueuelen 1000 (Ethernet)
      RX packets 0 bytes 0 (0.0 B)
      RX errors 0 dropped 0 overruns 0 frame 0
      TX packets 0 bytes 0 (0.0 B)
      TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
      inet 127.0.0.1 netmask 255.0.0.0
      inet6 ::1 prefixlen 128 scopeid 0x10<host>
          loop txqueuelen 1000 (Local Loopback)
          RX packets 40480 bytes 3746132 (3.7 MB)
          RX errors 0 dropped 0 overruns 0 frame 0
          TX packets 40480 bytes 3746132 (3.7 MB)
          TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

wlp2s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
      inet 192.168.1.6 netmask 255.255.255.0 broadcast 192.168.1.255
      inet6 fe80::2164:7a98:ad5a:573c prefixlen 64 scopeid 0x20<link>
          ether 60:14:b3:a9:75:8b txqueuelen 1000 (Ethernet)
          RX packets 659728 bytes 742380214 (742.3 MB)
          RX errors 0 dropped 0 overruns 0 frame 0
          TX packets 445821 bytes 977660009 (97.7 MB)

```

- [INTERFACE]://Note this requires no OPTION to be included
-
- “INTERFACE” UP:This option is used to activate the driver for the given interface
- “INTERFACE” DOWN:This option is used to de-activate the driver for the given interface
- “INTERFACE” add addr/prefixlen:This option is used to assign IPv6 address to an interface.
- “INTERFACE” del addr/prefixlen:This option is used to remove an IPv6 address to an interface.
- [-]arp:This option is used to enable/disable the use of ARP protocol

24)chmod command:

Description:

It is used to change the access mode of a file

Syntax:

- chmod [OPTION].... MODE[,...]....FILENAME...
- chmod [OPTION]... OCTAL-MODE FILENAME..
- chmod [REFERENCES][OPERATOR][MODES] FILENAME....

[OPTION]:

- -f :Suppress error messages
- -R:Change files and directories respectively

[OCTAL-MODE]:

Represented in 3 three bits:xyz(And each of the bit is converted in octal and each bit from msb to lsb represents read,write and execute permissions with 1 representing inclusion and 0 for not included)

x:User

y:Group

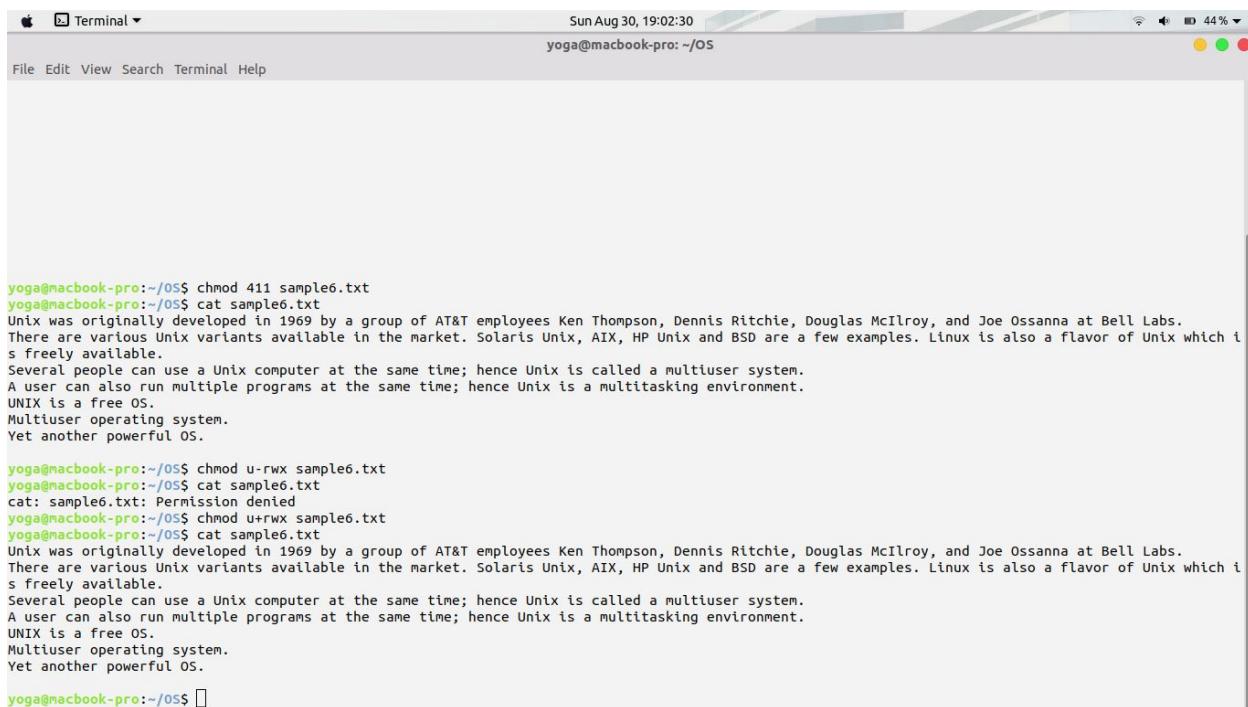
z:Other

[REFERENCE MODE]:

- u:Stands for user
- g:Stands for group
- o:users who are neither the file's owner nor members of the file's group
- a :all three of the above users

[OPERATOR]:

- +:Adds the specified modes
- -:Removes the specified modes
- =:The modes specified are to be made the exact modes for the specified classes



The screenshot shows a Mac OS X terminal window titled "Terminal". The status bar indicates the date and time as "Sun Aug 30, 19:02:30" and the user as "yoga@macbook-pro: ~/OS". The terminal window contains the following command-line session:

```
yoga@macbook-pro:~/OS$ chmod 411 sample6.txt
yoga@macbook-pro:~/OS$ cat sample6.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs. There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$ chmod u-rwx sample6.txt
yoga@macbook-pro:~/OS$ cat sample6.txt
cat: sample6.txt: Permission denied
yoga@macbook-pro:~/OS$ chmod u+rwx sample6.txt
yoga@macbook-pro:~/OS$ cat sample6.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs. There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$
```

25)Free command:

Description:

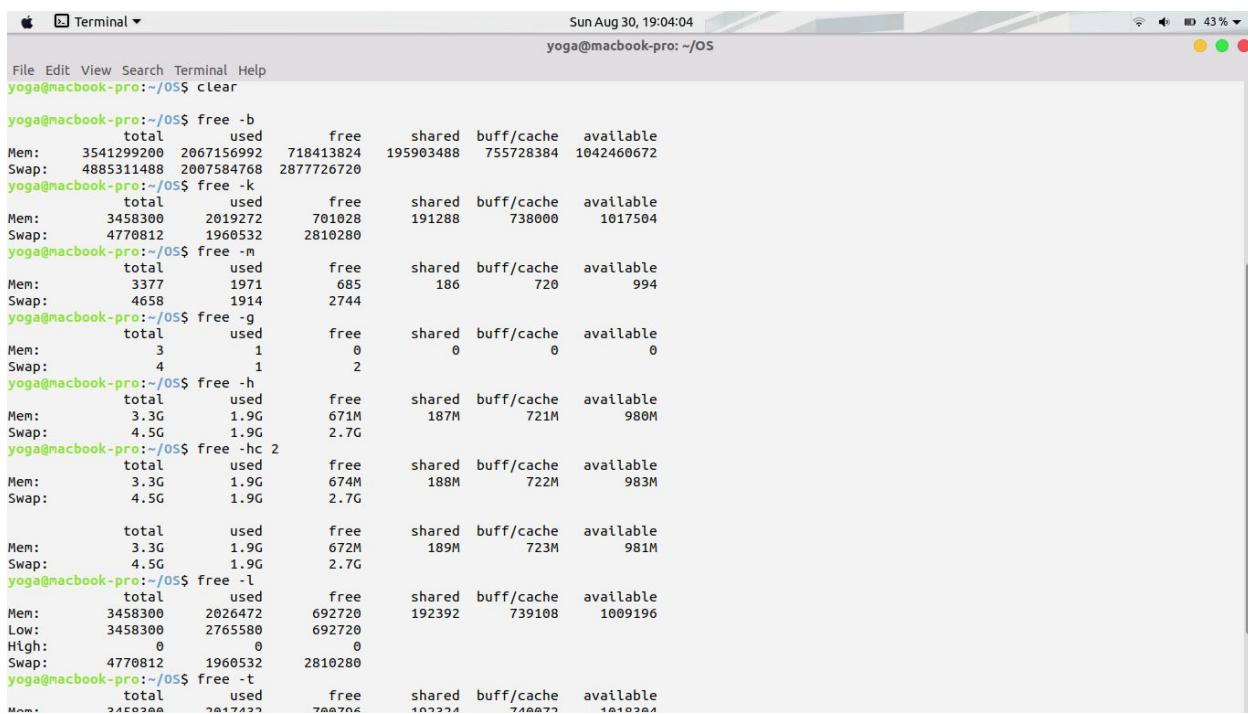
This command is used to display the total amount of free space available along with amount of memory used and swap memory in the system and also buffers used by the kernel.

Syntax:

free [OPTION]

[OPTION]:

- -b: Displays the memory in bytes
- -k/-m/-g/--tera:It Displays the amount of memory in kb(mb/gb/tb)
- -h:Shows output in shortest three digit unit and also display the units like B(bytes),K(Kilos)
- -c,- -count:It Displays the Output c number of times
- -l,--lohi:Display detailed low and high memory statistics
- -t,--total:Displays output along with additional columns showing column total



The screenshot shows a macOS Terminal window titled "Terminal". The status bar at the top right indicates the date and time as "Sun Aug 30, 19:04:04" and the battery level as "43%". The window title bar says "yoga@macbook-pro: ~/OS". The terminal window displays the following sequence of commands and their outputs:

```
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ clear
yoga@macbook-pro:~/OS$ free -b
total used free shared buff/cache available
Mem: 3541299200 2067156992 718413824 195903488 755728384 1042460672
Swap: 4885311488 2007584768 2877726720
yoga@macbook-pro:~/OS$ free -k
total used free shared buff/cache available
Mem: 3458300 2019272 701028 191288 738000 1017504
Swap: 4770812 1960532 2810280
yoga@macbook-pro:~/OS$ free -m
total used free shared buff/cache available
Mem: 3377 1971 685 186 720 994
Swap: 4658 1914 2744
yoga@macbook-pro:~/OS$ free -g
total used free shared buff/cache available
Mem: 3 1 0 0 0 0
Swap: 4 1 2
yoga@macbook-pro:~/OS$ free -h
total used free shared buff/cache available
Mem: 3.3G 1.9G 671M 187M 721M 980M
Swap: 4.5G 1.9G 2.7G
yoga@macbook-pro:~/OS$ free -hc 2
total used free shared buff/cache available
Mem: 3.3G 1.9G 674M 188M 722M 983M
Swap: 4.5G 1.9G 2.7G
yoga@macbook-pro:~/OS$ free -l
total used free shared buff/cache available
Mem: 3458300 2026472 692720 192392 739108 1009196
Low: 3458300 2765580 692720
High: 0 0 0
Swap: 4770812 1960532 2810280
yoga@macbook-pro:~/OS$ free -t
total used free shared buff/cache available
Mem: 3458300 2017427 700704 102224 710077 1010204
```

26)top command:

Description:

It Provides a real-time view of the running system i.e It shows the summary of the information of the system and the list of processes or threads which are currently managed by the Linux Kernel

Syntax:

- top [OPTIONS]//No Options are required by default

```

File Edit View Search Terminal Help
top - 19:04:51 up 9:32, 1 user, load average: 1.35, 1.38, 1.72
Tasks: 245 total, 1 running, 194 sleeping, 0 stopped, 0 zombie
%Cpu(s): 12.2 us, 6.6 sy, 0.0 ni, 80.7 id, 0.2 wa, 0.0 hi, 0.3 si, 0.0 st
KiB Mem : 3458300 total, 669900 free, 2015648 used, 772752 buff/cache
KiB Swap: 4770812 total, 2811364 free, 1959508 used. 989408 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
2539 yoga 20 0 3289436 195128 60048 S 34.6 5.6 95:49.79 Web Content
2193 yoga 20 0 4284708 441744 144428 S 9.8 12.8 101:40.70 MainThread
1869 yoga 20 0 4097408 122864 31744 S 9.2 3.6 41:16.93 gnome-shell
1727 yoga 20 0 1154784 38492 26204 S 7.2 1.1 29:06.95 Xorg
11424 yoga 20 0 360272 10600 8568 S 6.5 0.3 8:35.87 MainThread
13246 yoga 20 0 723308 20776 9532 S 4.6 0.6 0:40.17 gnome-terminal-
2319 yoga 20 0 3286764 155280 60460 S 2.6 4.5 21:51.22 Web Content
1892 yoga 9 -11 2383604 9508 6840 S 1.6 0.3 5:14.53 pulseaudio
2790 yoga 20 0 3305604 361140 62624 S 1.3 10.4 30:27.47 Web Content
17347 yoga 20 0 44216 4072 3332 R 1.3 0.1 0:00.27 top
2668 yoga 20 0 3112596 339352 88560 S 0.7 9.8 15:13.78 Web Content
12776 yoga 20 0 3230216 181736 71280 S 0.7 5.3 3:30.23 Web Content
1 root 20 0 226076 5376 2988 S 0.3 0.2 0:31.33 systemd
7 root 20 0 0 0 0 S 0.3 0.0 0:01.82 ksoftirqd/0
8 root 20 0 0 0 0 I 0.3 0.0 0:51.34 rcu_sched
1183 mysql 20 0 1356676 140 0 S 0.3 0.0 0:26.86 mysqld
2091 yoga 20 0 816992 1564 464 S 0.3 0.0 0:23.49 kdeconnectd
17032 root 20 0 0 0 0 I 0.3 0.0 0:00.82 kworker/u8:0
2 root 20 0 0 0 0 S 0.0 0.0 0:00.03 kthreadd
4 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker/u8:0H
6 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 mm_percpu_wq
9 root 20 0 0 0 0 I 0.0 0.0 0:00.00 rcu_bh
10 root rt 0 0 0 0 S 0.0 0.0 0:00.08 migration/0
11 root rt 0 0 0 0 S 0.0 0.0 0:00.11 watchdog/0
12 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/0
13 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/1
14 root rt 0 0 0 0 S 0.0 0.0 0:00.13 watchdog/1
15 root rt 0 0 0 0 S 0.0 0.0 0:00.07 migration/1
16 root 20 0 0 0 0 S 0.0 0.0 0:01.35 ksoftirqd/1
18 root 0 -20 0 0 0 I 0.0 0.0 0:00.06 kworker/1:0H
19 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/2

```

[OPTION]:

- -u [PROCESSNAME]: Displays specific User Process

```

File Edit View Search Terminal Help
top - 19:05:18 up 9:32, 1 user, load average: 1.22, 1.35, 1.70
Tasks: 245 total, 2 running, 193 sleeping, 0 stopped, 0 zombie
%Cpu(s): 16.1 us, 7.5 sy, 0.0 ni, 76.1 id, 0.1 wa, 0.0 hi, 0.3 si, 0.0 st
KiB Mem : 3458300 total, 685512 free, 2018700 used, 754088 buff/cache
KiB Swap: 4770812 total, 2811560 free, 1959252 used. 1005316 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
2539 yoga 20 0 3289444 197680 60048 S 32.7 5.7 95:58.72 Web Content
1869 yoga 20 0 4098448 122844 32368 S 16.7 3.6 41:20.58 gnome-shell
2193 yoga 20 0 4284708 425572 130828 S 15.5 12.3 101:45.20 MainThread
1727 yoga 20 0 1152968 36728 24432 R 8.6 1.1 29:08.70 Xorg
11424 yoga 20 0 360272 10600 8568 S 6.5 0.3 8:37.61 MainThread
2790 yoga 20 0 3305604 362928 62624 S 4.1 10.5 30:28.07 Web Content
2668 yoga 20 0 3112594 340156 88588 S 3.3 9.8 15:15.13 Web Content
2319 yoga 20 0 3286764 155352 60460 S 2.4 4.5 21:51.80 Web Content
13246 yoga 20 0 723308 20776 9532 S 2.0 0.6 0:40.89 gnome-terminal-
1892 yoga 9 -11 2383604 9676 6908 S 1.6 0.3 5:15.06 pulseaudio
12776 yoga 20 0 3230216 181992 71280 S 0.8 5.3 3:30.51 Web Content
17358 yoga 20 0 44216 4004 3272 R 0.8 0.1 0:00.09 top
2378 yoga 20 0 3185920 245420 43156 S 0.4 7.1 5:50.25 WebExtensions
1707 yoga 20 0 77300 1776 1460 S 0.0 0.1 0:00.65 systemd
1708 yoga 20 0 114380 48 0 S 0.0 0.0 0:00.00 (sd-pam)
1721 yoga 20 0 281376 444 0 S 0.0 0.0 0:00.55 gnome-keyring-d
1725 yoga 20 0 285028 864 864 S 0.0 0.0 0:00.01 gdm-x-session
1742 yoga 20 0 51196 3156 1672 S 0.0 0.1 0:05.86 dbus-daemon
1745 yoga 20 0 560852 4576 3220 S 0.0 0.1 0:03.35 gnome-session-b
1841 yoga 20 0 11304 36 0 S 0.0 0.0 0:00.16 ssh-agent
1844 yoga 20 0 349324 784 784 S 0.0 0.0 0:00.01 at-spi-bus-laun
1849 yoga 20 0 50056 924 698 S 0.0 0.0 0:02.61 dbus-daemon
1851 yoga 20 0 220792 2216 1836 S 0.0 0.1 0:27.07 at-spi2-registr
1876 yoga 20 0 284964 2376 1896 S 0.0 0.1 0:00.31 gvfsd
1881 yoga 20 0 416116 940 940 S 0.0 0.0 0:00.01 gvfsd-fuse
1909 yoga 20 0 354968 4052 2192 S 0.0 0.1 1:57.92 ibus-daemon
1913 yoga 20 0 273668 952 952 S 0.0 0.0 0:00.00 ibus-dconf
1916 yoga 20 0 338820 2404 2055 S 0.0 0.1 0:00.57 ibus-x11
1919 yoga 20 0 271452 1608 1216 S 0.0 0.0 0:00.30 ibus-portal
1927 yoga 20 0 264456 692 692 S 0.0 0.0 0:00.01 xdg-permission-
1932 yoga 20 0 689680 0 0 S 0.0 0.0 0:00.10 gnome-shell-cal

```

- -b: Sends output from top to file or any other program//Opens in Batch mode

- -s: Opens top in Secure mode

```
File Edit View Search Terminal Help
top - 19:06:38 up 9:34, 1 user, load average: 2.10, 1.52, 1.73
Tasks: 245 total, 1 running, 194 sleeping, 0 stopped, 0 zombie
%CPU(s): 22.5 us, 7.4 sy, 0.0 ni, 67.3 id, 2.4 wa, 0.0 hi, 0.4 si, 0.0 st
KiB Mem : 3458300 total, 695724 free, 2003176 used, 759400 buff/cache
KiB Swap: 4770812 total, 2813608 free, 1957204 used. 1023032 avail Mem

PID USER      PR  NI    VIRT    RES   SHR S %CPU %MEM TIME+ COMMAND
2539 yoga      20   0 3293532 213024 60004 S 30.0  6.2 96:23.48 Web Content
17403 yoga     20   0 44212  4008 3244 R 20.0  0.1 0:00.08 top
2193 yoga      20   0 4280612 402460 134752 S 15.0 11.6 102:03.35 MainThread
12776 yoga     20   0 3230216 181868 71324 S 5.0  5.3 3:31.37 Web Content
 1 root       20   0 226076  5376 2988 S 0.0  0.2 0:31.50 systemd
 2 root       20   0      0      0   0 S 0.0  0.0 0:00.03 kthread
 4 root      0 -20      0      0   0 I 0.0  0.0 0:00.00 kworker/0:0H
 6 root      0 -20      0      0   0 I 0.0  0.0 0:00.00 mm_percpu_wq
 7 root      20   0      0      0   0 S 0.0  0.0 0:01.83 ksoftirqd/0
 8 root      20   0      0      0   0 I 0.0  0.0 0:51.63 rcu_sched
 9 root      20   0      0      0   0 I 0.0  0.0 0:00.00 rcu_bh
10 root      rt  0      0      0   0 S 0.0  0.0 0:00.08 migration/0
11 root      rt  0      0      0   0 S 0.0  0.0 0:00.11 watchdog/0
12 root      20   0      0      0   0 S 0.0  0.0 0:00.00 cpuhp/0
13 root      20   0      0      0   0 S 0.0  0.0 0:00.00 cpuhp/1
14 root      rt  0      0      0   0 S 0.0  0.0 0:00.13 watchdog/1
15 root      rt  0      0      0   0 S 0.0  0.0 0:00.07 migration/1
16 root      20   0      0      0   0 S 0.0  0.0 0:01.30 ksoftirqd/1
18 root      0 -20      0      0   0 I 0.0  0.0 0:00.00 kworker/1:0H
19 root      20   0      0      0   0 S 0.0  0.0 0:00.00 cpuhp/2
20 root      rt  0      0      0   0 S 0.0  0.0 0:00.14 watchdog/2
21 root      rt  0      0      0   0 S 0.0  0.0 0:00.07 migration/2
22 root      20   0      0      0   0 S 0.0  0.0 0:01.49 ksoftirqd/2
24 root      0 -20      0      0   0 I 0.0  0.0 0:00.00 kworker/2:0H
25 root      20   0      0      0   0 S 0.0  0.0 0:00.00 cpuhp/3
26 root      rt  0      0      0   0 S 0.0  0.0 0:00.12 watchdog/3
27 root      rt  0      0      0   0 S 0.0  0.0 0:00.10 migration/3
28 root      20   0      0      0   0 S 0.0  0.0 0:04.60 ksoftirqd/3
30 root      0 -20      0      0   0 I 0.0  0.0 0:00.00 kworker/3:0H
31 root      20   0      0      0   0 S 0.0  0.0 0:00.00 kdevtmpfs
32 root      0 -20      0      0   0 I 0.0  0.0 0:00.00 netns
```

- -c: Starts top with last closed state

Sun Aug 30, 19:05:39
yoga@macbook-pro: ~/OS

```
File Edit View Search Terminal Help
top - 19:05:38 up 9:33, 1 user, load average: 1.21, 1.35, 1.69
Tasks: 245 total, 2 running, 193 sleeping, 0 stopped, 0 zombie
%Cpu(s): 11.5 us, 6.2 sy, 0.0 ni, 81.2 id, 0.9 wa, 0.0 hi, 0.1 si, 0.0 st
KiB Mem : 3458300 total, 708860 free, 2000900 used, 748540 buff/cache
KiB Swap: 4770812 total, 2813352 free, 1957460 used. 1032612 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
2539 yoga 20 0 3289436 198596 60048 S 33.7 5.7 96:05.07 Web Content
1869 yoga 20 0 4098448 122976 31988 R 12.0 3.6 41:24.64 gnome-shell
2193 yoga 20 0 4283684 414100 143168 S 9.6 12.0 101:50.03 MainThread
11424 yoga 20 0 360272 10600 8568 S 6.4 0.3 8:38.89 MainThread
1727 yoga 20 0 1152984 36500 24212 S 6.0 1.1 29:10.68 Xorg
1892 yoga 9 -11 2383604 9676 6908 S 2.0 0.3 5:15.44 pulseaudio
13246 yoga 20 0 723308 20776 9532 S 2.0 0.6 0:41.32 gnome-terminal-
2319 yoga 20 0 3286764 155268 60460 S 1.2 4.5 21:52.19 Web Content
17367 yoga 20 0 44216 3936 3196 R 1.2 0.1 0:00.12 top
2668 yoga 20 0 3112594 340360 88344 S 0.8 9.8 15:17.49 Web Content
2799 yoga 20 0 3305604 362928 62624 S 0.8 10.5 30:28.25 Web Content
12776 yoga 20 0 3230216 182024 71324 S 0.8 5.3 3:30.73 Web Content
1 root 20 0 226076 5376 2988 S 0.4 0.2 0:31.40 systemd
8 root 20 0 0 0 0 I 0.4 0.0 0:51.48 rcu_sched
989 root 20 0 767064 8036 5224 S 0.4 0.2 0:11.84 NetworkManager
1183 mysql 20 0 1356676 140 0 S 0.4 0.0 0:26.92 mysqld
2091 yoga 20 0 816992 1564 464 S 0.4 0.0 0:23.46 kdeconnectd
16884 root 20 0 0 0 0 I 0.4 0.0 0:01.68 kworker/u8:1
2 root 20 0 0 0 0 S 0.0 0.0 0:00.03 kthreadd
4 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker/0:0H
6 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 mm_percpu_wq
7 root 20 0 0 0 0 S 0.0 0.0 0:01.82 ksoftirqd/0
9 root 20 0 0 0 0 I 0.0 0.0 0:00.00 rcu_bh
10 root rt 0 0 0 0 S 0.0 0.0 0:00.08 migration/0
11 root rt 0 0 0 0 S 0.0 0.0 0:00.11 watchdog/0
12 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/0
13 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/1
14 root rt 0 0 0 0 S 0.0 0.0 0:00.13 watchdog/1
15 root rt 0 0 0 0 S 0.0 0.0 0:00.07 migration/1
16 root 20 0 0 0 0 S 0.0 0.0 0:01.35 ksoftirqd/1
18 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker/1:0H
```

- **-d seconds.tenths:** Informs delay time between screen updates

Sun Aug 30, 19:06:32
yoga@macbook-pro: ~/OS

```
File Edit View Search Terminal Help
top - 19:06:31 up 9:34, 1 user, load average: 1.85, 1.46, 1.71
Tasks: 245 total, 1 running, 194 sleeping, 0 stopped, 0 zombie
%Cpu(s): 22.5 us, 7.4 sy, 0.0 ni, 67.3 id, 2.4 wa, 0.0 hi, 0.4 si, 0.0 st
KiB Mem : 3458300 total, 691384 free, 2000420 used, 766496 buff/cache
KiB Swap: 4770812 total, 2813608 free, 1957204 used. 1018452 avail Mem

PID USER PR NI VIRT RES SHR S %CPU %MEM TIME+ COMMAND
2539 yoga 20 0 3292508 212100 60004 S 26.3 6.1 96:21.74 Web Content
17398 yoga 20 0 44212 3988 3224 R 26.3 0.1 0:00.08 top
1869 yoga 20 0 4095896 121896 30756 S 5.3 3.5 41:33.84 gnome-shell
1892 yoga 9 -11 2383604 9884 7116 S 5.3 0.3 5:16.75 pulseaudio
2193 yoga 20 0 4280612 402160 134752 S 5.3 11.6 102:02.62 MainThread
12776 yoga 20 0 3230216 181884 71324 S 5.3 5.3 3:31.30 Web Content
1 root 20 0 226076 5376 2988 S 0.0 0.2 0:31.50 systemd
2 root 20 0 0 0 0 S 0.0 0.0 0:00.03 kthreadd
4 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker/0:0H
6 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 mm_percpu_wq
7 root 20 0 0 0 0 S 0.0 0.0 0:01.83 ksoftirqd/0
8 root 20 0 0 0 0 I 0.0 0.0 0:51.62 rcu_sched
9 root 20 0 0 0 0 I 0.0 0.0 0:00.00 rcu_bh
10 root rt 0 0 0 0 S 0.0 0.0 0:00.08 migration/0
11 root rt 0 0 0 0 S 0.0 0.0 0:00.11 watchdog/0
12 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/0
13 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/1
14 root rt 0 0 0 0 S 0.0 0.0 0:00.13 watchdog/1
15 root rt 0 0 0 0 S 0.0 0.0 0:00.07 migration/1
16 root 20 0 0 0 0 S 0.0 0.0 0:01.36 ksoftirqd/1
18 root 0 -20 0 0 0 I 0.0 0.0 0:00.06 kworker/1:0H
19 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/2
20 root rt 0 0 0 0 S 0.0 0.0 0:00.14 watchdog/2
21 root rt 0 0 0 0 S 0.0 0.0 0:00.07 migration/2
22 root 20 0 0 0 0 S 0.0 0.0 0:01.49 ksoftirqd/2
24 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker/2:0H
25 root 20 0 0 0 0 S 0.0 0.0 0:00.00 cpuhp/3
26 root rt 0 0 0 0 S 0.0 0.0 0:00.12 watchdog/3
27 root rt 0 0 0 0 S 0.0 0.0 0:00.10 migration/3
28 root 20 0 0 0 0 S 0.0 0.0 0:04.60 ksoftirqd/3
30 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 kworker/3:0H
```

- **-n number:** Stops after n number of iterations

```

File Edit View Search Terminal Help
Sun Aug 30, 19:06:17
yoga@macbook-pro: ~/OS
top - 19:06:16 up 9:33, 1 user, load average: 1.39, 1.36, 1.68
Tasks: 245 total, 1 running, 194 sleeping, 0 stopped, 0 zombie
%Cpu(s): 22.5 us, 7.4 sy, 0.0 ni, 67.3 id, 2.4 wa, 0.0 hi, 0.4 si, 0.0 st
KiB Mem : 3458300 total, 697048 free, 1998184 used, 763068 buff/cache
KiB Swap: 4770812 total, 2813608 free, 1957204 used. 1022320 avail Mem

PID USER PR NI VIRT RES SHR %CPU %MEM TIME+ COMMAND
2539 yoga 20 0 3290460 206540 60048 S 5.9 6.0 96:17.58 /usr/lib/firefox/firefox -contentproc -childID 5 -isForBrowser -prefsLen 7914 -p+
17380 yoga 20 0 44244 4052 3264 R 5.9 0.1 0:00.12 top -c
1892 yoga 9 -11 2383604 9940 7172 S 2.0 0.3 5:16.19 /usr/bin/pulseaudio --start --log-target=syslog
2193 yoga 20 0 4283684 422804 151168 S 2.0 12.2 101:59.59 /usr/lib/firefox/firefox -new-window
2668 yoga 20 0 3112596 343692 88564 S 2.0 9.9 15:23.15 /usr/lib/firefox/firefox -contentproc -childID 6 -isForBrowser -prefsLen 7962 -p+
27990 yoga 20 0 3303556 351616 62624 S 2.0 10.2 30:28.72 /usr/lib/firefox/firefox -contentproc -childID 7 -isForBrowser -prefsLen 8009 -p+
1 root 20 0 226076 5376 2988 S 0.0 0.2 0:31.47 /sbin/init splash
2 root 20 0 0 0 0 S 0.0 0.0 0:00.03 [kthreadd]
4 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 [kworker/0:0H]
6 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 [mm_percpu_wq]
7 root 20 0 0 0 0 S 0.0 0.0 0:01.83 [ksoftirqd/0]
8 root 20 0 0 0 0 I 0.0 0.0 0:51.60 [rcu_sched]
9 root 20 0 0 0 0 I 0.0 0.0 0:00.00 [rcu_bh]
10 root rt 0 0 0 0 S 0.0 0.0 0:00.08 [migration/0]
11 root rt 0 0 0 0 S 0.0 0.0 0:00.11 [watchdog/0]
12 root 20 0 0 0 0 S 0.0 0.0 0:00.00 [cpuhp/0]
13 root 20 0 0 0 0 S 0.0 0.0 0:00.00 [cpuhp/1]
14 root rt 0 0 0 0 S 0.0 0.0 0:00.13 [watchdog/1]
15 root rt 0 0 0 0 S 0.0 0.0 0:00.07 [migration/1]
16 root 20 0 0 0 0 S 0.0 0.0 0:01.36 [ksoftirqd/1]
18 root 0 -20 0 0 0 I 0.0 0.0 0:00.06 [kworker/1:0H]
19 root 20 0 0 0 0 S 0.0 0.0 0:00.00 [cpuhp/2]
20 root rt 0 0 0 0 S 0.0 0.0 0:00.14 [watchdog/2]
21 root rt 0 0 0 0 S 0.0 0.0 0:00.07 [migration/2]
22 root 20 0 0 0 0 S 0.0 0.0 0:01.49 [ksoftirqd/2]
24 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 [kworker/2:0H]
25 root 20 0 0 0 0 S 0.0 0.0 0:00.00 [cpuhp/3]
26 root rt 0 0 0 0 S 0.0 0.0 0:00.12 [watchdog/3]
27 root rt 0 0 0 0 S 0.0 0.0 0:00.10 [migration/3]
28 root 20 0 0 0 0 S 0.0 0.0 0:04.59 [ksoftirqd/3]
30 root 0 -20 0 0 0 I 0.0 0.0 0:00.00 [kworker/3:0H]

```

27)Head command:

Description:

It is used to print top N number of data of the given input

Syntax:

`head [OPTION]..[FILE]...`

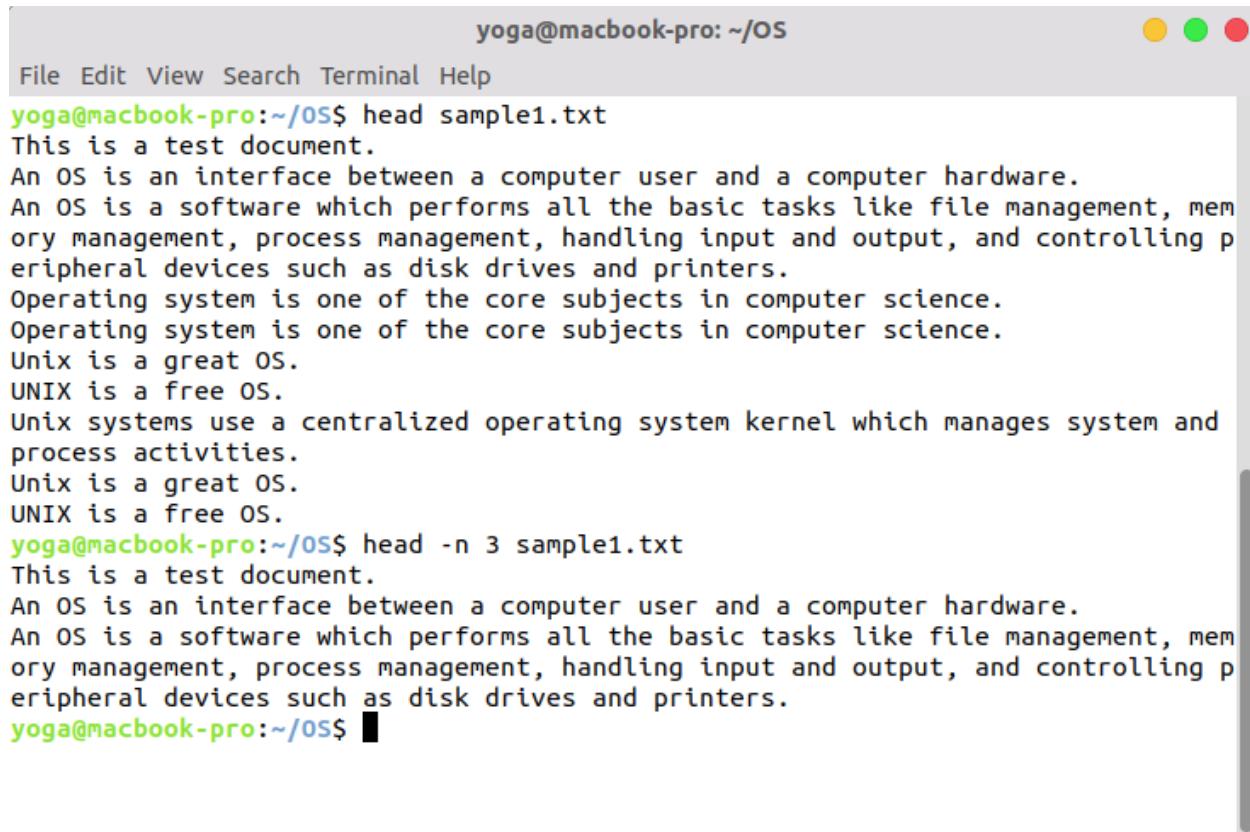
```

yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ head sample1.txt
This is a test document.
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
yoga@macbook-pro:~/OS$ 

```

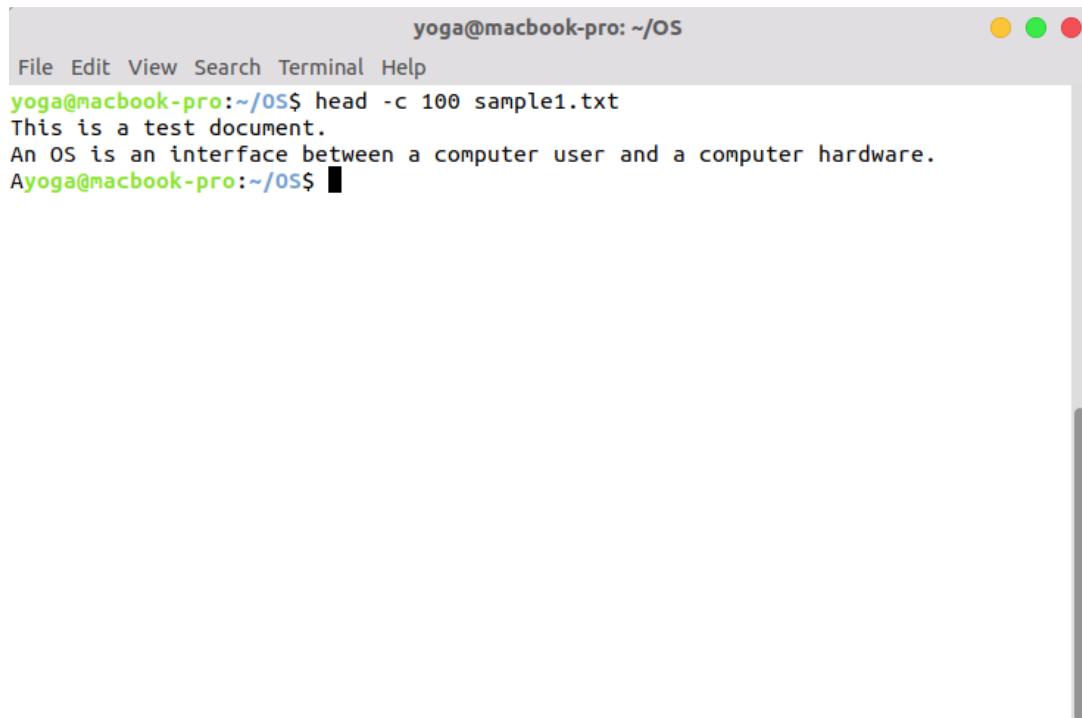
[OPTION]

- -n num: Prints the first 'num' lines of a file. Num is a mandatory argument .



```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ head sample1.txt
This is a test document.
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
yoga@macbook-pro:~/OS$ head -n 3 sample1.txt
This is a test document.
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
yoga@macbook-pro:~/OS$
```

- -c num: Prints the first 'num' bytes from the file specified



```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ head -c 100 sample1.txt
This is a test document.
An OS is an interface between a computer user and a computer hardware.
yoga@macbook-pro:~/OS$
```

- -q: Used to print without giving file names as headers

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ head -c 100 sample1.txt
This is a test document.
An OS is an interface between a computer user and a computer hardware.
Ayoga@macbook-pro:~/OS$ head -q sample1.txt
This is a test document.
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
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Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
yoga@macbook-pro:~/OS$
```

- -v:Used to print output with headers giving file names

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
yoga@macbook-pro:~/OS$ head -v sample1.txt
==> sample1.txt <==
This is a test document.
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
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Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
yoga@macbook-pro:~/OS$
```

- -z:Used to print output with line delimiter as NULL instead of newline

28)Tail command:

Description:

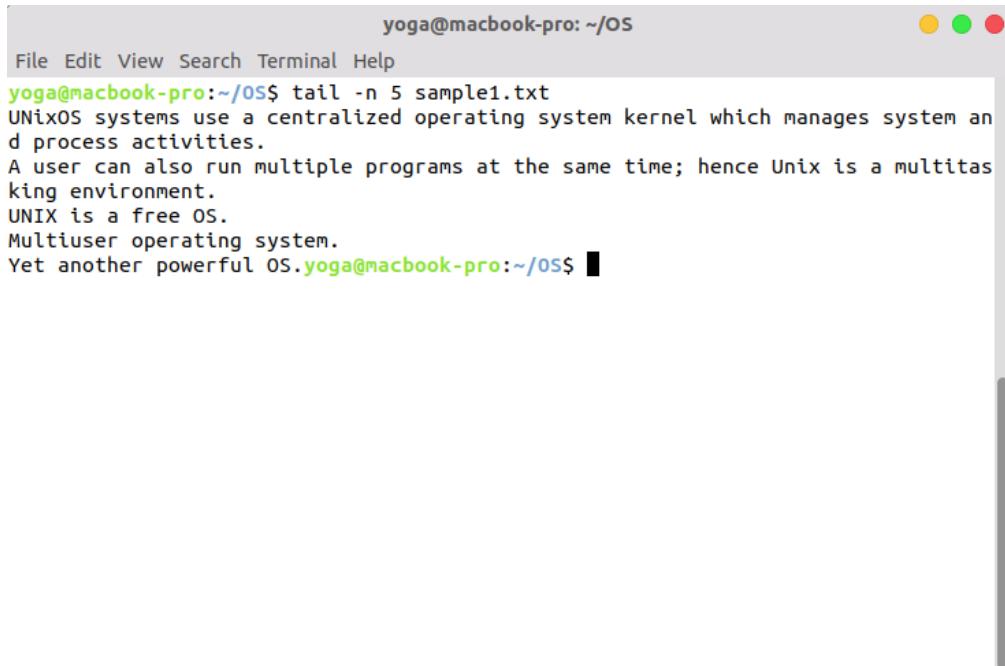
It is used to print last N number of data of the given input

Syntax:

tail [OPTION]..[FILE]...

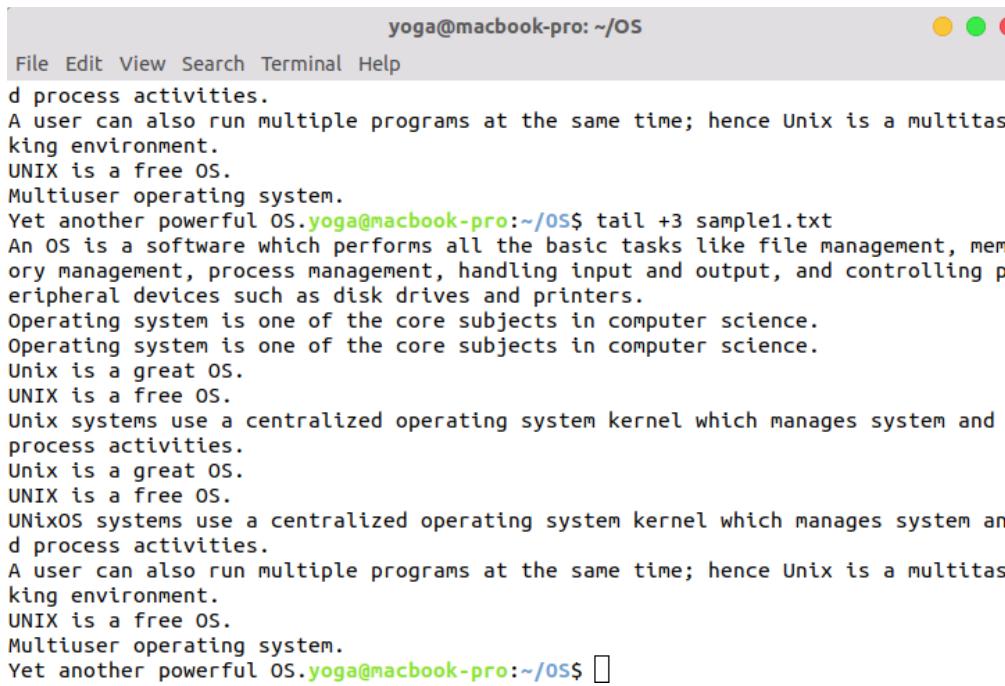
[OPTION]

- -n num:Prints the last 'num' lines of a file.Num is a mandatory argument .



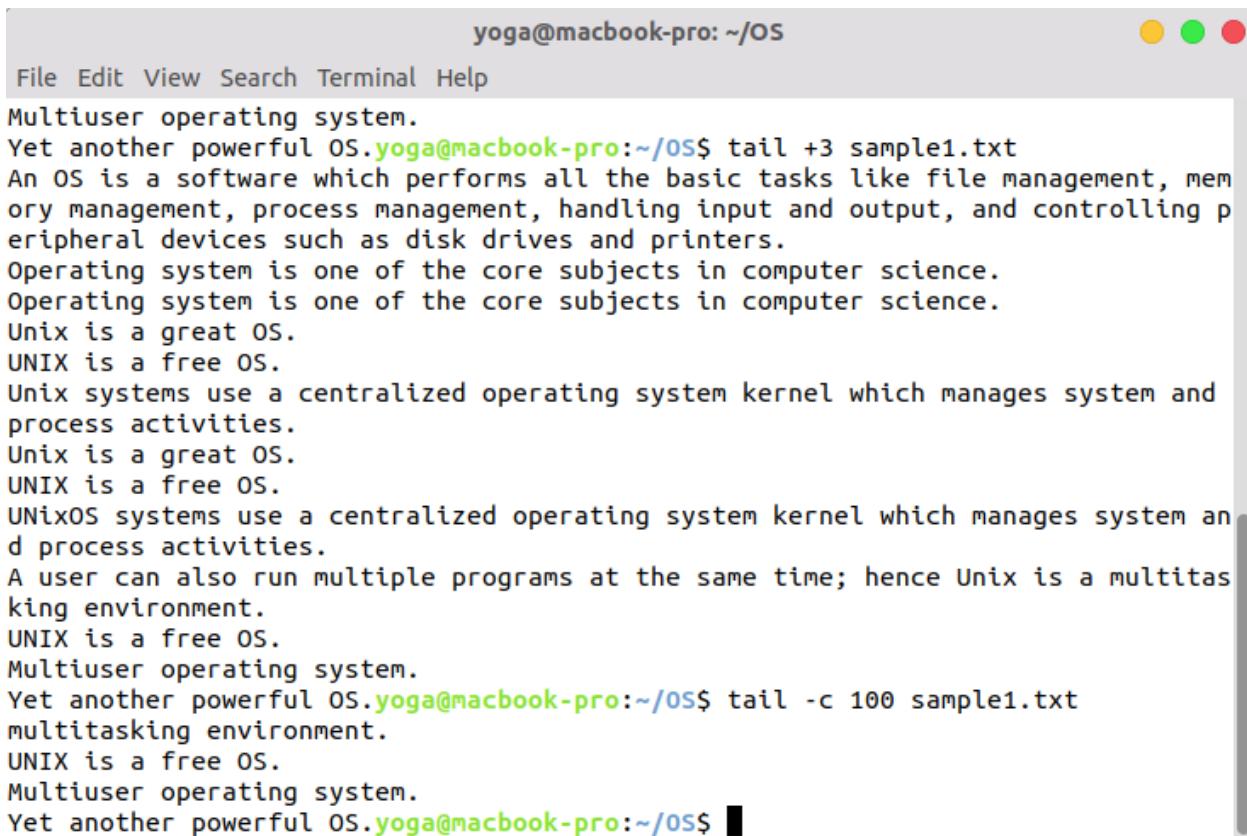
yoga@macbook-pro:~/OS\$ tail -n 5 sample1.txt
d process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS\$

- +num:Prints the range of lines from num to end of the file



d process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS\$ tail +3 sample1.txt
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
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Operating system is one of the core subjects in computer science.
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UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS\$

- -c num: Prints the last 'num' bytes from the file specified (Exception if num is given as '+num' like +26 then it skips num bytes from starting of the file and prints the rest)

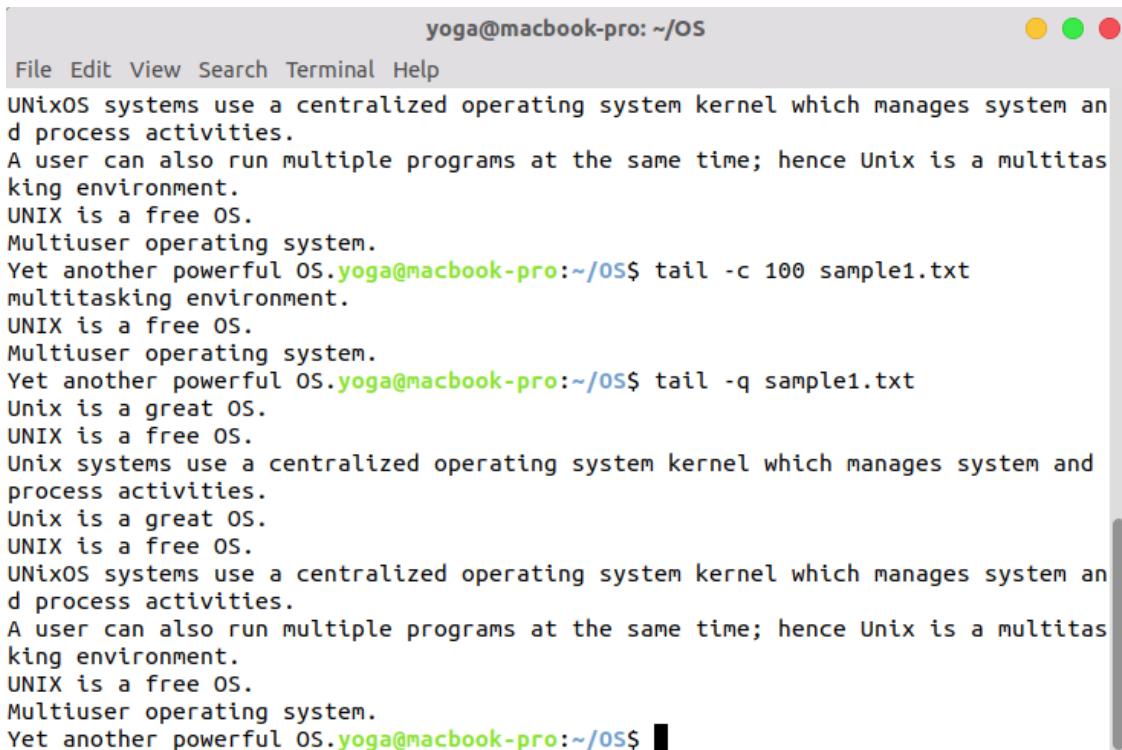


yoga@macbook-pro: ~/OS

File Edit View Search Terminal Help

```
Multiuser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS$ tail +3 sample1.txt
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
Unix is a great OS.
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Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS$ tail -c 100 sample1.txt
multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS$
```

- -q: Used to print without giving file names as headers

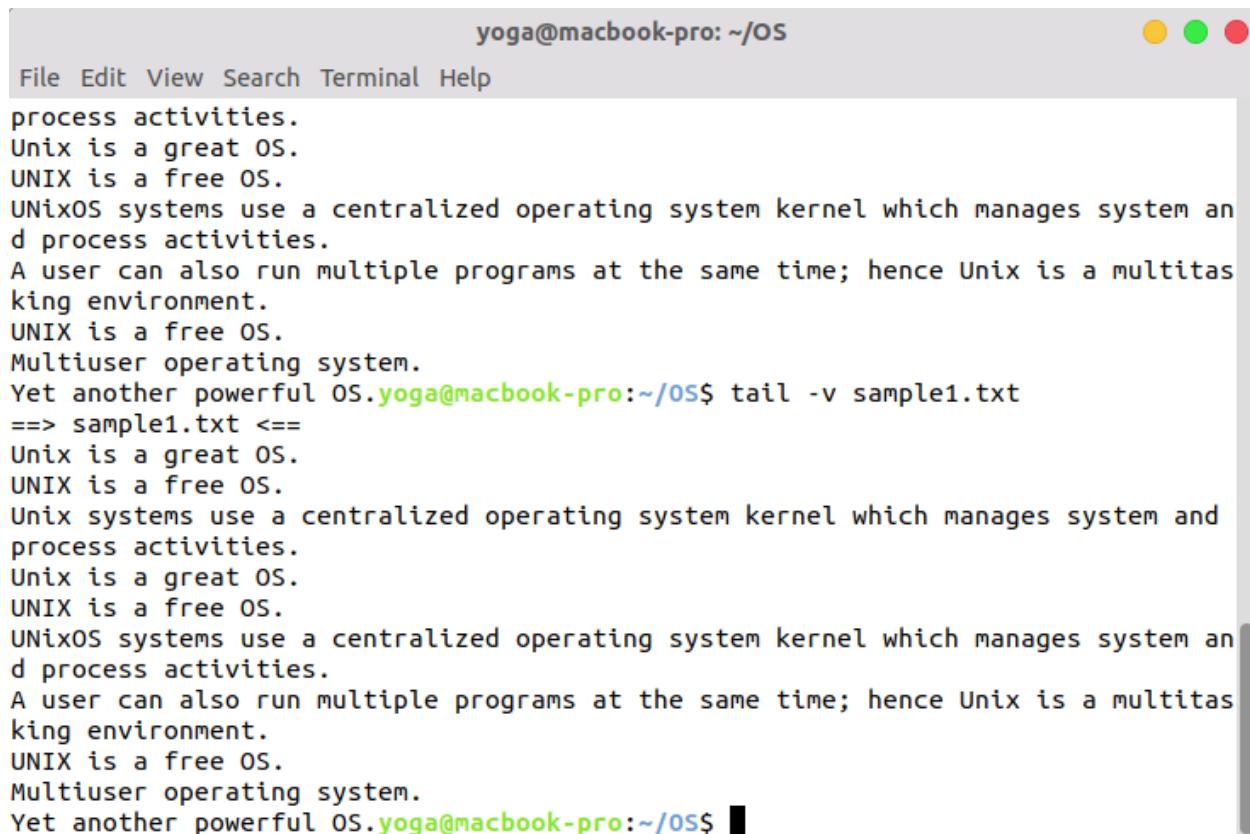


yoga@macbook-pro: ~/OS

File Edit View Search Terminal Help

```
UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS$ tail -c 100 sample1.txt
multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS$ tail -q sample1.txt
Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS$
```

- -v: Used to print output with headers giving file names

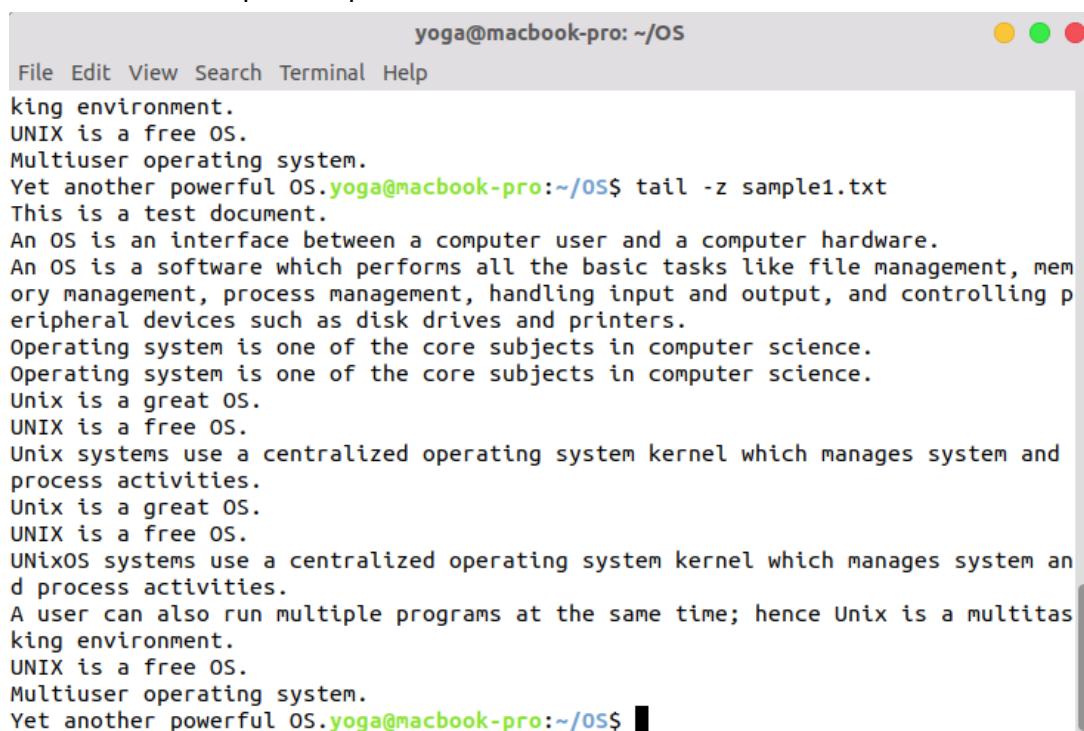


```

yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
process activities.
Unix is a great OS.
UNIX is a free OS.
UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS$ tail -v sample1.txt
==> sample1.txt <==
Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS$ █

```

- -z: Used to print output with line delimiter as NULL instead of newline



```

yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
king environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS$ tail -z sample1.txt
This is a test document.
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
Operating system is one of the core subjects in computer science.
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Unix is a great OS.
UNIX is a free OS.
UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS$ █

```

- --retry : keep trying to open a file if it is inaccessible

- -f:It is used to display the last ten lines of the log file written by many Unix program.Use interrupt key(ctrl+c) to abort

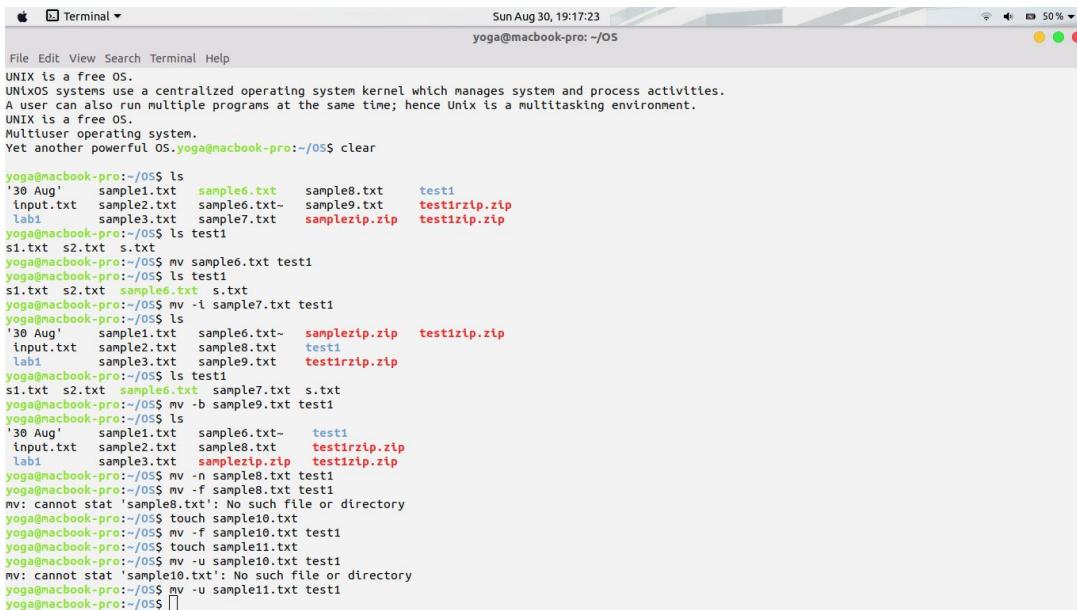
29)mv command:

Description:

It is used to move one or more files or directories from one directory to another in file system
It can also be used to rename a file or folder

Syntax:

- mv [OPTION] source destination //Overwrites the destination file if it exists ,else the destination file will be created
- [OPTION]:
- -i (interactive):With this option enabled ,it warns the user before moving the files and only when
- 'y' is entered the process is executed.(Does not work if file does not exist)
- -b(backup):With this option enabled ,it creates a backup file of the destination file in the same folder with different format(previous format with '~' character appended to it)
- -n:This option prevents an existing file from being overwritten
- -f(force):This option has to be enabled if the user does not have write permissions for the destination file .Thereby when enabled ,the destination
- file is forcefully overwritten after confirmation(Overrides minor protection)
- -T:Treat Destination as a normal file
- -u:Move only when the source file is newer than the destination file or when the destination file is missing



```

File Edit View Search Terminal Help
Sun Aug 30, 19:17:23
yoga@macbook-pro: ~/OS
UNIX is a free OS.
UNIX systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiluser operating system.
Yet another powerful OS.yoga@macbook-pro:~/OS$ clear
yoga@macbook-pro:~/OS$ ls
's 30 Aug' sample1.txt sample6.txt sample8.txt test1
input.txt sample2.txt sample6.txt~ sample9.txt test1.zip.zip
lab1 sample3.txt sample7.txt samplezip.zip test1.zip.zip
yoga@macbook-pro:~/OS$ ls test1
s1.txt s2.txt s.txt
yoga@macbook-pro:~/OS$ mv sample6.txt test1
yoga@macbook-pro:~/OS$ ls test1
s1.txt s2.txt sample6.txt s.txt
yoga@macbook-pro:~/OS$ mv -i sample7.txt test1
yoga@macbook-pro:~/OS$ ls
's 30 Aug' sample1.txt sample6.txt~ samplezip.zip test1.zip.zip
input.txt sample2.txt sample8.txt test1
lab1 sample3.txt sample9.txt test1.zip.zip
yoga@macbook-pro:~/OS$ ls test1
s1.txt s2.txt sample6.txt sample7.txt s.txt
yoga@macbook-pro:~/OS$ mv -b sample9.txt test1
yoga@macbook-pro:~/OS$ ls
's 30 Aug' sample1.txt sample6.txt~ test1
input.txt sample2.txt sample8.txt test1.zip.zip
lab1 sample3.txt samplezip.zip test1.zip.zip
yoga@macbook-pro:~/OS$ mv -f sample8.txt test1
yoga@macbook-pro:~/OS$ mv -f sample8.txt test1
mv: cannot stat 'sample8.txt': No such file or directory
yoga@macbook-pro:~/OS$ touch sample10.txt
yoga@macbook-pro:~/OS$ mv -f sample10.txt test1
yoga@macbook-pro:~/OS$ touch sample11.txt
yoga@macbook-pro:~/OS$ mv -f sample10.txt test1
mv: cannot stat 'sample10.txt': No such file or directory
yoga@macbook-pro:~/OS$ mv -f sample11.txt test1
yoga@macbook-pro:~/OS$ 

```

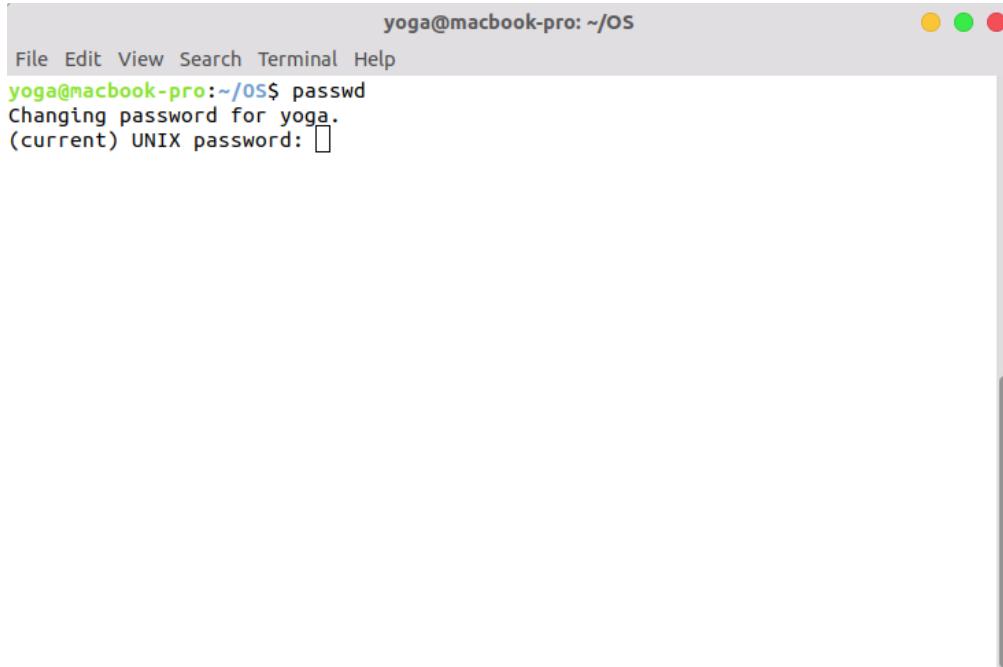
30)passwd command:

Description:

This Command is used to change the user account passwords. Only the root user has the privilege to change the password for any user on the system, while a normal user can change the password for their account.

Syntax:

```
passwd [OPTION] [username]  
sudo passwd root //used to invoke root privileges
```



The screenshot shows a macOS Terminal window titled "yoga@macbook-pro: ~/OS". The window includes a menu bar with File, Edit, View, Search, Terminal, and Help. The main pane displays the command "yoga@macbook-pro:~/OS\$ passwd" followed by the message "Changing password for yoga." and "(current) UNIX password: [redacted]". The terminal window has a standard OS X look with red, green, and yellow close buttons in the top right corner.

[OPTION]:

- -d,-delete: This option deletes the user password and makes the account password-less
- -e,-expire: This option immediately expires the account password and forces the user to change password on their next login
- -i,--inactive INACTIVE_DAYS: This option will disable the user's account if the user has had an expired password for "INACTIVE" days.
- -n,--mindays MIN_DAYS: Change the minimum no of days for which user can't change the password
- -q,-quiet: This option is used for quiet mode
- -S,-status: Shows the password status of the user
- -u: unlocks the password for the account
- -w,-warndays WARN_DAYS: Used to change the number of days before the password is set to expire and to display the warning for expiring password
- -x,-maxdays MAX_DAYS: Sets the maximum no of days for which the password will be valid.

31)Tar command:**Description:**

It is used to create compressed or uncompressed Archive files and also maintain and modify them

Syntax:

```
tar [OPTIONS] [archive-filename] [FILES_LIST]
```

//in files list * can be used for example *.txt adds all .txt files into tar archive

[OPTION]:

- -f : Used to create archive with given filename
- -v : Displays Verbose Information
- -A : Concatenates the archive files
- -z : This option enables tar file is created using gzip
- -j : filter archive tar file using tbzip
- -W : Verify a archive file
- -cvf:Used to Creates Archive
- -xvf:Used to extract the archive
- -t :Used to display or list files in archived file
- -u/-rf : This option archives and adds to an existing archive file

```
yoga@macbook-pro:~/OS/test2
File Edit View Search Terminal Help
yoga@macbook-pro:~$ cd OS
yoga@macbook-pro:~/OS$ ls
's0 Aug'    sample1.txt  sample6.txt~  test1rzip.zip
input.txt   sample2.txt  samplezip.zip  test1zip.zip
lab1        sample3.txt  test1
yoga@macbook-pro:~/OS$ mkdir test2
yoga@macbook-pro:~/OS$ cd test2
yoga@macbook-pro:~/OS/test2$ touch s1.txt
yoga@macbook-pro:~/OS/test2$ touch s2.txt
yoga@macbook-pro:~/OS/test2$ ls
s1.txt  s2.txt
yoga@macbook-pro:~/OS/test2$ █
```

```
yoga@macbook-pro:~/OS/test2
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS/test2$ ls
s1.txt  s2.txt  tarfile.tar
yoga@macbook-pro:~/OS/test2$ tar xvf tarfile.tar
s1.txt
s2.txt
yoga@macbook-pro:~/OS/test2$ tar -tf tarfile.tar
s1.txt
s2.txt
yoga@macbook-pro:~/OS/test2$ tar -rf tarfile.tar
yoga@macbook-pro:~/OS/test2$ █
```

32)uname command:

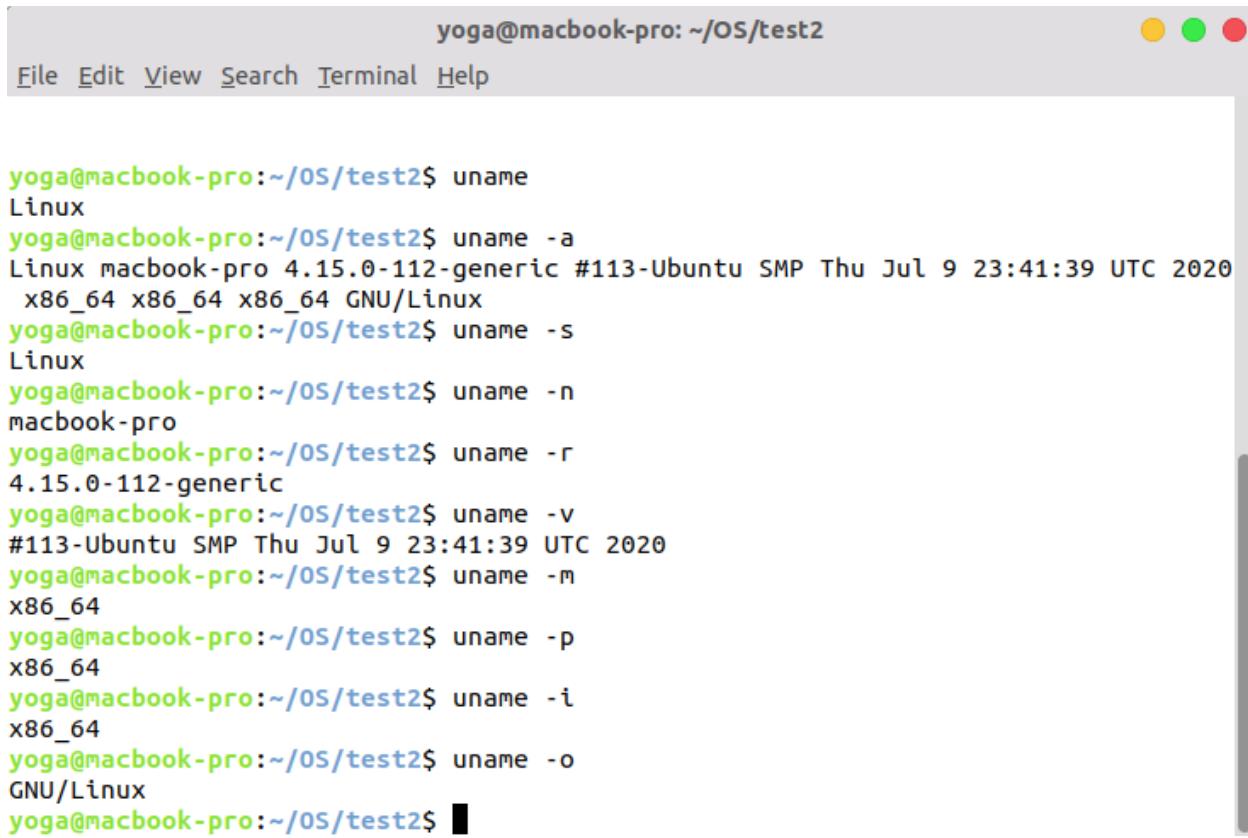
Description:This command is used to display the information about the system

Syntax:

 uname [OPTION]

[OPTION]:

- -a:It prints all the system Information(Kernel name, network node hostname, kernel release date, kernel version, machine hardware name, hardware platform, operating system)
- -s:It prints the kernel name
- -n:It prints the hostname of the network node
- -r:Prints the kernel release date
- -v:Prints the version of the current kernel
- -m:Prints the machine hardware name
- -p:Prints the type of the processor
- -i:Prints the platform of the hardware
- -o:Prints the name of the operating system



yoga@macbook-pro: ~/OS/test2

File Edit View Search Terminal Help

```
yoga@macbook-pro:~/OS/test2$ uname
Linux
yoga@macbook-pro:~/OS/test2$ uname -a
Linux macbook-pro 4.15.0-112-generic #113-Ubuntu SMP Thu Jul 9 23:41:39 UTC 2020
x86_64 x86_64 x86_64 GNU/Linux
yoga@macbook-pro:~/OS/test2$ uname -s
Linux
yoga@macbook-pro:~/OS/test2$ uname -n
macbook-pro
yoga@macbook-pro:~/OS/test2$ uname -r
4.15.0-112-generic
yoga@macbook-pro:~/OS/test2$ uname -v
#113-Ubuntu SMP Thu Jul 9 23:41:39 UTC 2020
yoga@macbook-pro:~/OS/test2$ uname -m
x86_64
yoga@macbook-pro:~/OS/test2$ uname -p
x86_64
yoga@macbook-pro:~/OS/test2$ uname -i
x86_64
yoga@macbook-pro:~/OS/test2$ uname -o
GNU/Linux
yoga@macbook-pro:~/OS/test2$ █
```

33)Ping command:

Description:

It is used to check the network connectivity between host and server/host. This command takes as input the IP address or the URL.

Syntax:

- ping url/IP Address

```
yoga@macbook-pro: ~/OS/test2
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS/test2$ ping google.com
PING google.com (216.58.196.174) 56(84) bytes of data.
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=1 ttl=118 time=6.44 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=2 ttl=118 time=4.22 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=3 ttl=118 time=6.27 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=4 ttl=118 time=4.08 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=5 ttl=118 time=3.59 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=6 ttl=118 time=8.70 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=7 ttl=118 time=4.90 ms
64 bytes from maa03s31-in-f14.1e100.net (216.58.196.174): icmp_seq=8 ttl=118 time=5.82 ms
```

- ping -c n url/IP Address //To ping n times

```
yoga@macbook-pro: ~/OS/test2
File Edit View Search Terminal Help
icmp_seq=4 ttl=118 time=4.18 ms
[1598795753.826578] 64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174):
icmp_seq=5 ttl=118 time=12.9 ms

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 4.187/7.253/12.903/3.172 ms
yoga@macbook-pro:~/OS/test2$ ping -i 2 -c 5 google.com
PING google.com (216.58.196.174) 56(84) bytes of data.
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=1 ttl=118 time=5.44 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=2 ttl=118 time=4.80 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=3 ttl=118 time=4.60 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=4 ttl=118 time=6.26 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=5 ttl=118 time=18.9 ms

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 8011ms
rtt min/avg/max/mdev = 4.604/8.005/18.908/5.483 ms
yoga@macbook-pro:~/OS/test2$
```

- ping -s default sized packets sent to light and heavy packet by using -s option

```
yoga@macbook-pro: ~/OS/test2
File Edit View Search Terminal Help
me=10.8 ms
^C
--- google.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 9013ms
rtt min/avg/max/mdev = 3.599/5.868/10.890/2.242 ms
yoga@macbook-pro:~/OS/test2$ ping -n 5 google.com
connect: Invalid argument
yoga@macbook-pro:~/OS/test2$ ping -c 5 google.com
PING google.com (216.58.196.174) 56(84) bytes of data.
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=1 ttl=118 time=6.67 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=2 ttl=118 time=24.0 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=3 ttl=118 time=4.89 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=4 ttl=118 time=3.58 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=5 ttl=118 time=10.6 ms

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4004ms
rtt min/avg/max/mdev = 3.586/9.974/24.087/7.445 ms
yoga@macbook-pro:~/OS/test2$ 
```

[OPTION]:

- -4:To use IPv4
- -6:To use IPv6
- -a :For audible ping
- -b:Allows pinging a broadcast address
- -c count:Stops after sending “count” ECHO_REQUEST packets
- -D :print timestamp before each line

```
yoga@macbook-pro: ~/OS/test2
File Edit View Search Terminal Help
ime=3.58 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=5 ttl=118 t
ime=10.6 ms

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4004ms
rtt min/avg/max/mdev = 3.586/9.974/24.087/7.445 ms
yoga@macbook-pro:~/OS/test2$ ping -s 50 -c 5 google.com
PING google.com (216.58.196.174) 50(78) bytes of data.
58 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=1 ttl=118 t
ime=3.97 ms
58 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=2 ttl=118 t
ime=3.62 ms
58 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=3 ttl=118 t
ime=4.34 ms
58 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=4 ttl=118 t
ime=6.98 ms
58 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=5 ttl=118 t
ime=3.31 ms

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 3.318/4.450/6.984/1.312 ms
yoga@macbook-pro:~/OS/test2$ █
```

- -i interval: Waits for “interval” seconds before sending each packet

```
yoga@macbook-pro: ~/OS/test2
File Edit View Search Terminal Help
[1598795753.826578] 64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174):
icmp_seq=5 ttl=118 time=12.9 ms

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 4.187/7.253/12.903/3.172 ms
yoga@macbook-pro:~/OS/test2$ ping -i 2 -c 5 google.com
PING google.com (216.58.196.174) 56(84) bytes of data.
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=1 ttl=118 time=5.44 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=2 ttl=118 time=4.80 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=3 ttl=118 time=4.60 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=4 ttl=118 time=6.26 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=5 ttl=118 time=18.9 ms

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 8011ms
rtt min/avg/max/mdev = 4.604/8.005/18.908/5.483 ms
yoga@macbook-pro:~/OS/test2$ ping -q -c 5 google.com
PING google.com (216.58.196.174) 56(84) bytes of data.
```

- -q: Display summary lines at startup time and when finished

```
yoga@macbook-pro: ~/OS/test2
File Edit View Search Terminal Help
rtt min/avg/max/mdev = 4.187/7.253/12.903/3.172 ms
yoga@macbook-pro:~/OS/test2$ ping -i 2 -c 5 google.com
PING google.com (216.58.196.174) 56(84) bytes of data.
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=1 ttl=118 time=5.44 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=2 ttl=118 time=4.80 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=3 ttl=118 time=4.60 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=4 ttl=118 time=6.26 ms
64 bytes from 174.196.58.216.in-addr.arpa (216.58.196.174): icmp_seq=5 ttl=118 time=18.9 ms

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 8011ms
rtt min/avg/max/mdev = 4.604/8.005/18.908/5.483 ms
yoga@macbook-pro:~/OS/test2$ ping -q -c 5 google.com
PING google.com (216.58.196.174) 56(84) bytes of data.

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 3.533/20.429/84.681/32.138 ms
yoga@macbook-pro:~/OS/test2$
```

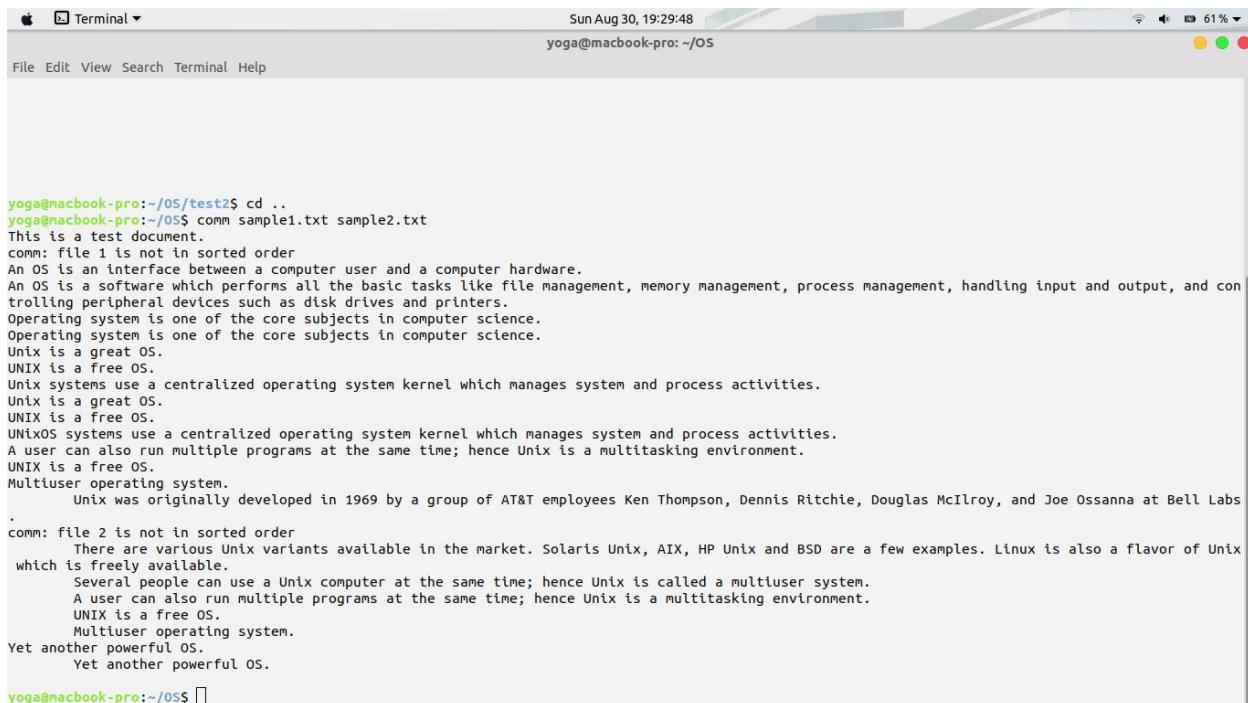
34)comm command:

Description:

Comm compare two sorted files line by line and write to standard output

Syntax:

comm [OPTION] FILE1 FILE2//can be used without option given



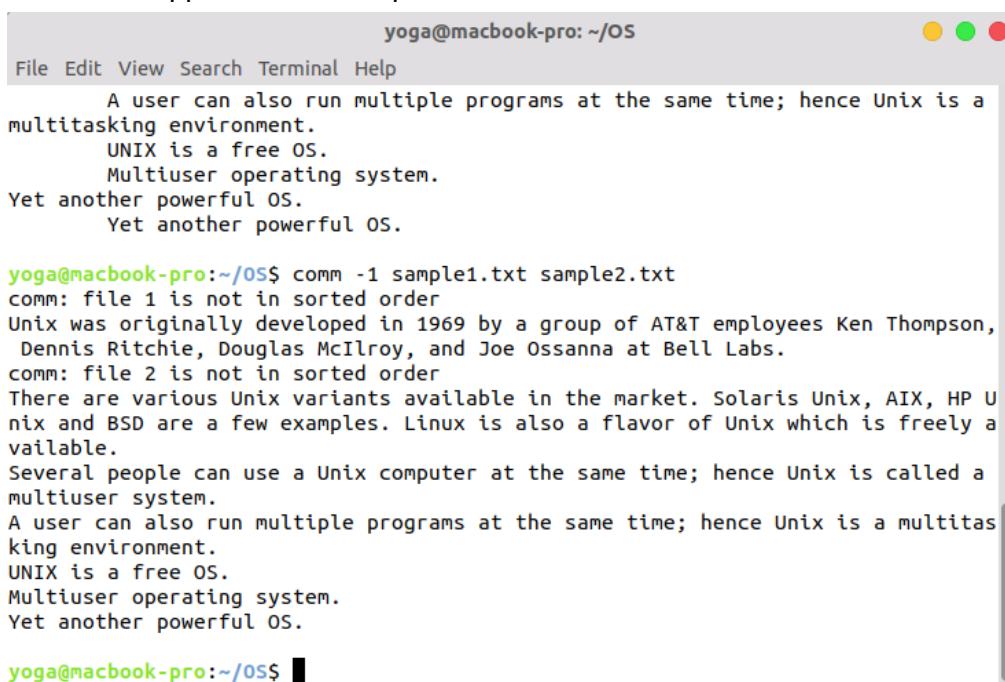
The screenshot shows a terminal window titled "Terminal". The status bar indicates it's Sunday, August 30, 19:29:48, and the user is at yoga@macbook-pro: ~/OS. The terminal window contains the following text:

```
yoga@macbook-pro:~/OS$ cd ..
yoga@macbook-pro:~/OS$ comm sample1.txt sample2.txt
This is a test document.
comm: file 1 is not in sorted order
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
    Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs
.
comm: file 2 is not in sorted order
    There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
    Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
    A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
    UNIX is a free OS.
    Multiuser operating system.
Yet another powerful OS.
    Yet another powerful OS.

yoga@macbook-pro:~/OS$
```

[OPTION]:

- -1: Suppress Lines unique to first file



The screenshot shows a terminal window titled "Terminal". The status bar indicates it's Sunday, August 30, 19:29:48, and the user is at yoga@macbook-pro: ~/OS. The terminal window contains the following text:

```
yoga@macbook-pro:~/OS$ comm -1 sample1.txt sample2.txt
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
    UNIX is a free OS.
    Multiuser operating system.
Yet another powerful OS.
    Yet another powerful OS.

yoga@macbook-pro:~/OS$ comm -1 sample1.txt sample2.txt
comm: file 1 is not in sorted order
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
comm: file 2 is not in sorted order
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$
```

- -2: Suppress Lines unique to second file

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ comm -2 sample1.txt sample2.txt
This is a test document.
comm: file 1 is not in sorted order
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
comm: file 2 is not in sorted order
Yet another powerful OS.
yoga@macbook-pro:~/OS$
```

- -3: Suppress Lines unique to third file

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
Unix is a great OS.
UNIX is a free OS.
UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
comm: file 2 is not in sorted order
Yet another powerful OS.
yoga@macbook-pro:~/OS$ comm -3 sample1.txt sample2.txt
This is a test document.
comm: file 1 is not in sorted order
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
        Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs
.
comm: file 2 is not in sorted order
        There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix
which is freely available.
        Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
        A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
        UNIX is a free OS.
        Multiuser operating system.
Yet another powerful OS.
        Yet another powerful OS.

yoga@macbook-pro:~/OS$
```

- **--check-order** :checks whether that the input is correctly sorted, even if all input lines are pairable.

```
yoga@macbook-pro:~/OS$ comm --check-order sample1.txt sample2.txt
This is a test document.
comm: file 1 is not in sorted order
yoga@macbook-pro:~/OS$ 
```

- **--nocheck-order** :does not check whether the input is correctly sorted or not

```
yoga@macbook-pro:~/OS$ comm --nocheck-order sample1.txt sample2.txt
This is a test document.
comm: file 1 is not in sorted order
yoga@macbook-pro:~/OS$ comm --nocheck-order sample1.txt sample2.txt
This is a test document.
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
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Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
    Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs
    .
    There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
    Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
    A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
    UNIX is a free OS.
    Multiuser operating system.
    Yet another powerful OS.
    Yet another powerful OS.

yoga@macbook-pro:~/OS$ 
```

- **--output-delimiter=STR** :separate columns with string “STR”

The screenshot shows a terminal window titled "yoga@macbook-pro: ~/OS". The terminal displays the output of the "comm" command with the option "--output-delimiter='\n'". The input files, "sample1.txt" and "sample2.txt", contain various Unix-related text. The "comm" command compares these files and outputs the differences, separated by newlines, which are then used as column separators. The resulting output shows two columns of text, where each row is a pair of corresponding lines from the two files, separated by a single space.

```

yoga@macbook-pro:~/OS$ comm --output-delimiter="\n" sample1.txt sample2.txt
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.
Yet another powerful OS.

yoga@macbook-pro:~/OS$ This is a test document.
comm: file 1 is not in sorted order
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
UnixOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
\n Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
comm: file 2 is not in sorted order
\n There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
\n Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
\n A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
\n UNIX is a free OS.
\n Multiuser operating system.
Yet another powerful OS.
\n Yet another powerful OS.
\n
yoga@macbook-pro:~/OS$ █

```

35)alias command:

Description:

This command instructs the shell to replace one string with another string while executing the commands.

Syntax:

- alias [-p] [name[=value]...] //value can be a string for Ex: alias rm='rm -i'
- alias name= "value" //creates an alias

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ alias rm='rm -i'
yoga@macbook-pro:~/OS$ alias -p
alias alert='notify-send --urgency=low -i "$( [ $? = 0 ] && echo terminal || echo error)" "$(history|tail -n1|sed -e '\''s/^\\s*[0-9]+\\s*//;s/[;&|]\\s*alert$//'\''))"
alias egrep='egrep --color=auto'
alias fgrep='fgrep --color=auto'
alias grep='grep --color=auto'
alias l='ls -CF'
alias la='ls -A'
alias ll='ls -alF'
alias ls='ls --color=auto'
alias rm='rm -i'
yoga@macbook-pro:~/OS$
```

- unalias[alias name] // Removing an alias

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
alias alert='notify-send --urgency=low -i "$( [ $? = 0 ] && echo terminal || echo error)" "$(history|tail -n1|sed -e '\''s/^\\s*[0-9]+\\s*//;s/[;&|]\\s*alert$//'\''))"
alias egrep='egrep --color=auto'
alias fgrep='fgrep --color=auto'
alias grep='grep --color=auto'
alias l='ls -CF'
alias la='ls -A'
alias ll='ls -alF'
alias ls='ls --color=auto'
alias rm='rm -i'
yoga@macbook-pro:~/OS$ unalias rm
yoga@macbook-pro:~/OS$ alias -p
alias alert='notify-send --urgency=low -i "$( [ $? = 0 ] && echo terminal || echo error)" "$(history|tail -n1|sed -e '\''s/^\\s*[0-9]+\\s*//;s/[;&|]\\s*alert$//'\''))"
alias egrep='egrep --color=auto'
alias fgrep='fgrep --color=auto'
alias grep='grep --color=auto'
alias l='ls -CF'
alias la='ls -A'
alias ll='ls -alF'
alias ls='ls --color=auto'
yoga@macbook-pro:~/OS$
```

[OPTION]

- -p:Displays all defined aliases in reusable format

36)history command:

Description:

This command is used to view the previously executed command.

Syntax:

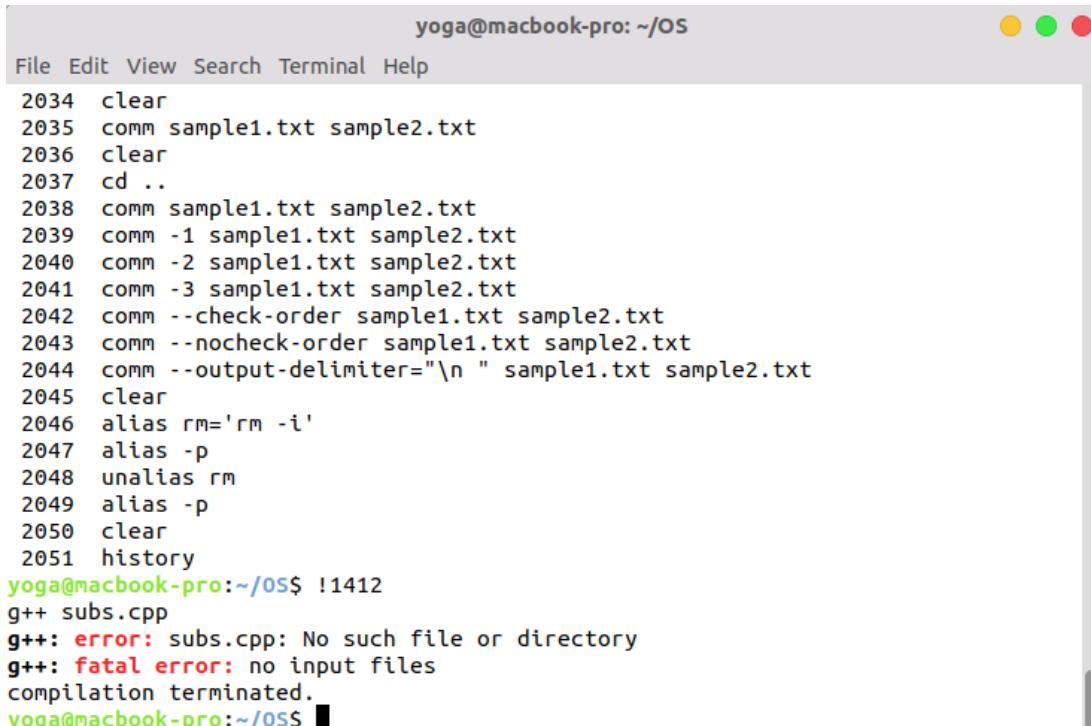
- history [OPTIONS]//without options displays all the previous commands



A screenshot of a macOS Terminal window titled "Terminal". The window shows the command "yoga@macbook-pro:~/OS\$ history" followed by a list of command entries from event numbers 1052 to 1088. The entries include various shell commands like "clear", "comm", "cd", "alias", and "g++". The terminal interface includes a menu bar with File, Edit, View, Search, Terminal, Help, and a status bar at the bottom.

```
yoga@macbook-pro:~/OS$ history
1052 1 2 1 2 3 4 3 5 4 5
1053 3
1054 1 2 3 1 2 3
1055 4
1056 2 3 2 4 1 3 4 1
1057 g++ palr.cpp
1058 2 3 2 4 1 3 4 1
1059 ./a.out
1060 g++ make.cpp
1061 ./a.out
1062 g++ make.cpp
1063 ./a.out
1064 g++ make.cpp
1065 ./a.out
1066 g++ make.cpp
1067 ./a.out
1068 g++ make.cpp
1069 ./a.out
1070 g++ make.cpp
1071 ./a.out
1072 g++ make.cpp
1073 ./a.out
1074 g++ make.cpp
1075 ./a.out
1076 g++ make.cpp
1077 ./a.out
1078 g++ make.cpp
1079 ./a.out
1080 g++ make.cpp
1081 ./a.out
1082 g++ make.cpp
1083 ./a.out
1084 g++ make.cpp
1085 ./a.out
1086 g++ make.cpp
1087 ./a.out
1088 g++ make.cpp
```

- !event-number //The mentioned event number is called



A screenshot of a macOS Terminal window titled "yoga@macbook-pro: ~/OS". The window shows the command "yoga@macbook-pro:~/OS\$!1412" followed by the output of the "g++" command. The output indicates that "subs.cpp" was not found and compilation terminated. The terminal interface includes a menu bar with File, Edit, View, Search, Terminal, Help, and a status bar at the bottom.

```
yoga@macbook-pro:~/OS$ !1412
g++ subs.cpp
g++: error: subs.cpp: No such file or directory
g++: fatal error: no input files
compilation terminated.
yoga@macbook-pro:~/OS$
```

- !event-number:p //Prints before executing
- history | grep PATTERN //To allow usage along with grep

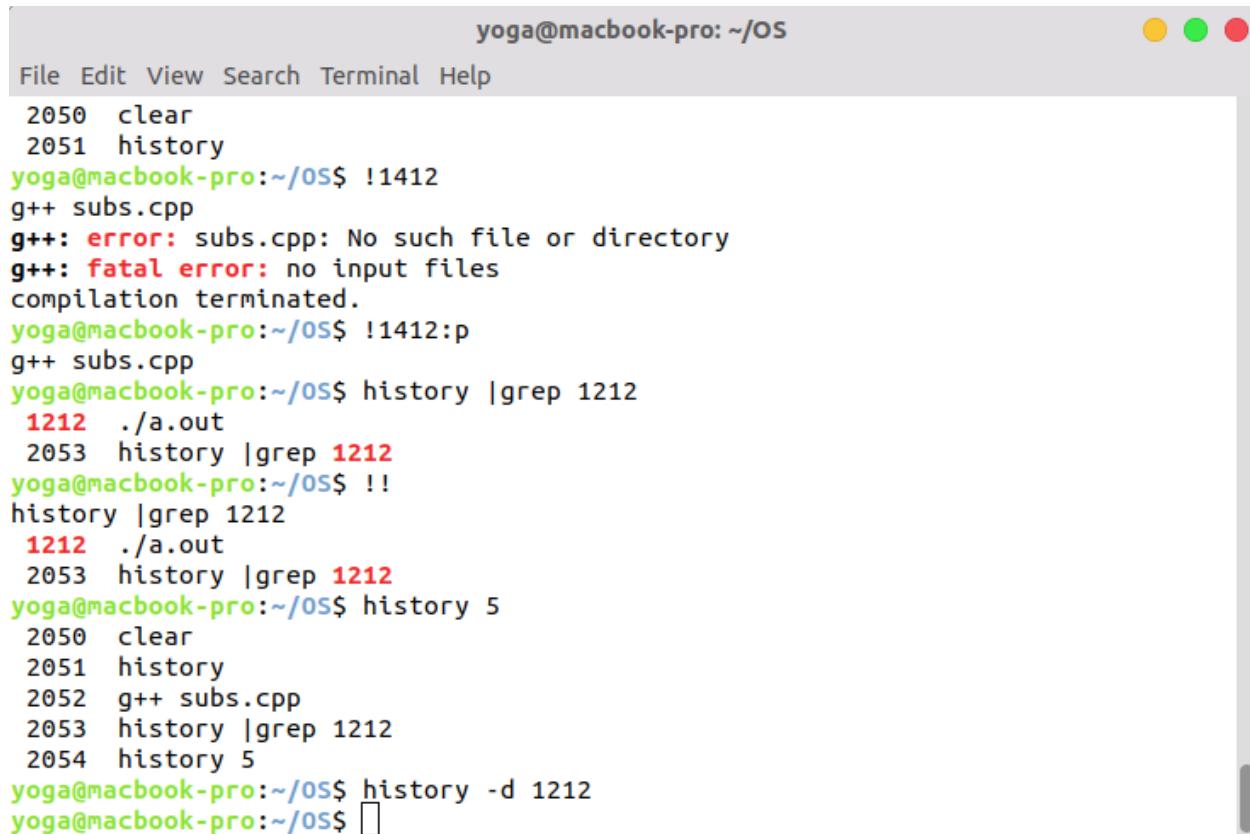
```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
2039 comm -1 sample1.txt sample2.txt
2040 comm -2 sample1.txt sample2.txt
2041 comm -3 sample1.txt sample2.txt
2042 comm --check-order sample1.txt sample2.txt
2043 comm --nocheck-order sample1.txt sample2.txt
2044 comm --output-delimiter="\n " sample1.txt sample2.txt
2045 clear
2046 alias rm='rm -i'
2047 alias -p
2048 unalias rm
2049 alias -p
2050 clear
2051 history
yoga@macbook-pro:~/OS$ !1412
g++ subs.cpp
g++: error: subs.cpp: No such file or directory
g++: fatal error: no input files
compilation terminated.
yoga@macbook-pro:~/OS$ !1412:p
g++ subs.cpp
yoga@macbook-pro:~/OS$ history |grep 1212
1212 ./a.out
2053 history |grep 1212
yoga@macbook-pro:~/OS$ 
```

- !! //To display the most recent command

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
2043 comm --nocheck-order sample1.txt sample2.txt
2044 comm --output-delimiter="\n " sample1.txt sample2.txt
2045 clear
2046 alias rm='rm -i'
2047 alias -p
2048 unalias rm
2049 alias -p
2050 clear
2051 history
yoga@macbook-pro:~/OS$ !1412
g++ subs.cpp
g++: error: subs.cpp: No such file or directory
g++: fatal error: no input files
compilation terminated.
yoga@macbook-pro:~/OS$ !1412:p
g++ subs.cpp
yoga@macbook-pro:~/OS$ history |grep 1212
1212 ./a.out
2053 history |grep 1212
yoga@macbook-pro:~/OS$ !!
history |grep 1212
1212 ./a.out
2053 history |grep 1212
yoga@macbook-pro:~/OS$ 
```

[OPTION]

- n:To show n number of previously executed commands



The screenshot shows a macOS Terminal window with the title bar "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The window contains the following terminal session:

```
yoga@macbook-pro:~/OS$ !1412
g++ subs.cpp
g++: error: subs.cpp: No such file or directory
g++: fatal error: no input files
compilation terminated.
yoga@macbook-pro:~/OS$ !1412:p
g++ subs.cpp
yoga@macbook-pro:~/OS$ history |grep 1212
 1212 ./a.out
 2053 history |grep 1212
yoga@macbook-pro:~/OS$ !!
history |grep 1212
 1212 ./a.out
 2053 history |grep 1212
yoga@macbook-pro:~/OS$ history 5
2050 clear
2051 history
2052 g++ subs.cpp
2053 history |grep 1212
2054 history 5
yoga@macbook-pro:~/OS$ history -d 1212
yoga@macbook-pro:~/OS$ 
```

- -d event-number:This Option is used to remove “event_number” from history
- -c:To remove entire history

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
g++: fatal error: no input files
compilation terminated.
yoga@macbook-pro:~/OS$ !1412:p
g++ subs.cpp
yoga@macbook-pro:~/OS$ history |grep 1212
1212 ./a.out
2053 history |grep 1212
yoga@macbook-pro:~/OS$ !!
history |grep 1212
1212 ./a.out
2053 history |grep 1212
yoga@macbook-pro:~/OS$ history 5
2050 clear
2051 history
2052 g++ subs.cpp
2053 history |grep 1212
2054 history 5
yoga@macbook-pro:~/OS$ history -d 1212
yoga@macbook-pro:~/OS$ histort -c
^C
yoga@macbook-pro:~/OS$ history -c
yoga@macbook-pro:~/OS$ history
1057 history
yoga@macbook-pro:~/OS$ 
```

37)traceroute command:

Description:

This command is used to print the route that a packet takes to reach the host.

Syntax:

traceroute [OPTION] host_Address [pathlength]

traceroute host_Address n//This Syntax sets the packet length to n

[OPTION]

- -4 :This Option uses ip version IPv4

```
yoga@macbook-pro:~/OS
File Edit View Search Terminal Help
Need to get 45.4 kB of archives.
After this operation, 152 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 traceroute amd64 1:2.1.0-2 [45.4 kB]
Fetched 45.4 kB in 3s (16.0 kB/s)
Selecting previously unselected package traceroute.
(Reading database ... 196852 files and directories currently installed.)
Preparing to unpack .../traceroute_1%3a2.1.0-2_amd64.deb ...
Unpacking traceroute (1:2.1.0-2) ...
Setting up traceroute (1:2.1.0-2) ...
update-alternatives: using /usr/bin/traceroute.db to provide /usr/bin/traceroute (traceroute) in auto mode
update-alternatives: using /usr/bin/lft.db to provide /usr/bin/lft (lft) in auto mode
update-alternatives: using /usr/bin/traceproto.db to provide /usr/bin/traceproto (traceproto) in auto mode
update-alternatives: using /usr/sbin/tcptraceroute.db to provide /usr/sbin/tcptraceroute (tcptraceroute) in auto mode
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
yoga@macbook-pro:~/OS$ clear

yoga@macbook-pro:~/OS$ traceroute -4 iiitdm.ac.in
traceroute to iiitdm.ac.in (64.111.105.105), 30 hops max, 60 byte packets
1 * *
2 60.243.51.1 (60.243.51.1) 3.825 ms 4.027 ms 3.945 ms
3 202.88.153.205 (202.88.153.205) 4.459 ms 4.746 ms 4.663 ms
4 10.241.1.6 (10.241.1.6) 6.871 ms 7.885 ms 7.816 ms
5 10.240.254.130 (10.240.254.130) 4.785 ms 4.183 ms 4.088 ms
6 10.240.254.1 (10.240.254.1) 7.490 ms 6.875 ms 6.575 ms
7 10.241.1.1 (10.241.1.1) 3.091 ms 4.256 ms 3.248 ms
8 136.232.29.73.static.jio.com (136.232.29.73) 3.782 ms 5.408 ms 5.304 ms
9 49.45.4.251 (49.45.4.251) 5.070 ms 103.198.140.62 (103.198.140.62) 4.113 ms 49.45.4.251 (49.45.4.251) 3.680 ms
10 49.45.4.103 (49.45.4.103) 215.527 ms 49.45.4.85 (49.45.4.85) 213.931 ms 49.45.4.103 (49.45.4.103) 215.264 ms
11 49.45.4.82 (49.45.4.82) 209.300 ms 103.198.140.83 (103.198.140.83) 299.452 ms 299.386 ms
12 be4844.ccr41.lax05.atlas.cogentco.com (38.104.84.209) 213.489 ms 57.85.104.38.in-addr.arpa (38.104.85.57) 208.461 ms 216.234 ms
13 be3359.ccr42.lax01.atlas.cogentco.com (154.54.3.69) 212.810 ms be3243.ccr41.lax01.atlas.cogentco.com (154.54.27.117) 216.474 ms be3359.ccr42.lax
01.atlas.cogentco.com (154.54.3.69) 212.561 ms
14 be2932.ccr32.phx01.atlas.cogentco.com (154.54.45.161) 219.533 ms be2931.ccr31.phx01.atlas.cogentco.com (154.54.44.85) 222.515 ms 221.284 ms
15 be2929.ccr21.elp01.atlas.cogentco.com (154.54.42.66) 236.940 ms be2930.ccr21.elp01.atlas.cogentco.com (154.54.42.78) 237.618 ms be2929.ccr21.elp
01.atlas.cogentco.com (154.54.42.66) 241.558 ms
16 221.29.54.154.in-addr.arpa (154.54.29.221) 249.096 ms 250.979 ms 251.212 ms
```

- -6:This Option uses ip verizon IPv6
- -F:This Option does not fragment packet

```
yoga@macbook-pro:~/OS
File Edit View Search Terminal Help
Need to get 45.4 kB of archives.
After this operation, 152 kB of additional disk space will be used.
Get:1 http://in.archive.ubuntu.com/ubuntu bionic/universe amd64 traceroute amd64 1:2.1.0-2 [45.4 kB]
Fetched 45.4 kB in 3s (16.0 kB/s)
Selecting previously unselected package traceroute.
(Reading database ... 196852 files and directories currently installed.)
Preparing to unpack .../traceroute_1%3a2.1.0-2_amd64.deb ...
Unpacking traceroute (1:2.1.0-2) ...
Setting up traceroute (1:2.1.0-2) ...
update-alternatives: using /usr/bin/traceroute.db to provide /usr/bin/traceroute (traceroute) in auto mode
update-alternatives: using /usr/bin/lft.db to provide /usr/bin/lft (lft) in auto mode
update-alternatives: using /usr/bin/traceproto.db to provide /usr/bin/traceproto (traceproto) in auto mode
update-alternatives: using /usr/sbin/tcptraceroute.db to provide /usr/sbin/tcptraceroute (tcptraceroute) in auto mode
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...
yoga@macbook-pro:~/OS$ clear

yoga@macbook-pro:~/OS$ traceroute -4 iiitdm.ac.in
traceroute to iiitdm.ac.in (64.111.105.105), 30 hops max, 60 byte packets
1 * *
2 60.243.51.1 (60.243.51.1) 3.825 ms 4.027 ms 3.945 ms
3 202.88.153.205 (202.88.153.205) 4.459 ms 4.746 ms 4.663 ms
4 10.241.1.6 (10.241.1.6) 6.871 ms 7.885 ms 7.816 ms
5 10.240.254.130 (10.240.254.130) 4.785 ms 4.183 ms 4.088 ms
6 10.240.254.1 (10.240.254.1) 7.490 ms 6.875 ms 6.575 ms
7 10.241.1.1 (10.241.1.1) 3.091 ms 4.256 ms 3.248 ms
8 136.232.29.73.static.jio.com (136.232.29.73) 3.782 ms 5.408 ms 5.304 ms
9 49.45.4.251 (49.45.4.251) 5.070 ms 103.198.140.62 (103.198.140.62) 4.113 ms 49.45.4.251 (49.45.4.251) 3.680 ms
10 49.45.4.103 (49.45.4.103) 215.527 ms 49.45.4.85 (49.45.4.85) 213.931 ms 49.45.4.103 (49.45.4.103) 215.264 ms
11 49.45.4.82 (49.45.4.82) 209.300 ms 103.198.140.83 (103.198.140.83) 299.452 ms 299.386 ms
12 be4844.ccr41.lax05.atlas.cogentco.com (38.104.84.209) 213.489 ms 57.85.104.38.in-addr.arpa (38.104.85.57) 208.461 ms 216.234 ms
13 be3359.ccr42.lax01.atlas.cogentco.com (154.54.3.69) 212.810 ms be3243.ccr41.lax01.atlas.cogentco.com (154.54.27.117) 216.474 ms be3359.ccr42.lax
01.atlas.cogentco.com (154.54.3.69) 212.561 ms
14 be2932.ccr32.phx01.atlas.cogentco.com (154.54.45.161) 219.533 ms be2931.ccr31.phx01.atlas.cogentco.com (154.54.44.85) 222.515 ms 221.284 ms
15 be2929.ccr21.elp01.atlas.cogentco.com (154.54.42.66) 236.940 ms be2930.ccr21.elp01.atlas.cogentco.com (154.54.42.78) 237.618 ms be2929.ccr21.elp
01.atlas.cogentco.com (154.54.42.66) 241.558 ms
16 221.29.54.154.in-addr.arpa (154.54.29.221) 249.096 ms 250.979 ms 251.212 ms
```

- -f num:This Option display the hops from n instead of 1

```
yoga@macbook-pro:~/OS$ traceroute -f 5 github.com
traceroute to github.com (13.234.176.102), 30 hops max, 60 byte packets
 5  10.240.254.140 (10.240.254.140)  9.978 ms  9.876 ms  9.712 ms
 6  10.240.254.1 (10.240.254.1)  9.871 ms  10.112 ms  10.309 ms
 7  10.241.1.1 (10.241.1.1)  9.247 ms  9.713 ms  9.009 ms
 8  73.29.232.136.in-addr.arpa (136.232.29.73)  8.894 ms  14.473 ms  9.970 ms
 9  * * *
10  * * *
11  99.83.67.46 (99.83.67.46)  12.101 ms  11.911 ms  11.730 ms
12  * * *
13  * * *
14  * * *
15  * * *
16  52.95.66.124 (52.95.66.124)  24.364 ms  52.95.66.54 (52.95.66.54)  27.676 ms
*
17  52.95.66.146 (52.95.66.146)  32.068 ms  52.95.66.98 (52.95.66.98)  28.992 ms
52.95.64.128 (52.95.64.128)  24.282 ms
18  52.95.64.188 (52.95.64.188)  25.522 ms  52.95.64.141 (52.95.64.141)  26.609 ms
52.95.64.176 (52.95.64.176)  28.202 ms
19  52.95.64.131 (52.95.64.131)  27.994 ms  52.95.66.215 (52.95.66.215)  68.270 ms
52.95.64.149 (52.95.64.149)  27.542 ms
20  52.95.67.180 (52.95.67.180)  28.857 ms  52.95.65.129 (52.95.65.129)  27.275 ms
52.95.67.180 (52.95.67.180)  28.387 ms
21  52.95.65.133 (52.95.65.133)  32.450 ms
```

- -g gate:Route the packet through gate
- -m num:This option sets the max no of hops as num

```
yoga@macbook-pro:~/OS$ traceroute -f 5 github.com
traceroute to github.com (13.234.176.102), 30 hops max, 60 byte packets
 5  * * *
16  52.95.66.124 (52.95.66.124)  24.364 ms  52.95.66.54 (52.95.66.54)  27.676 ms
*
17  52.95.66.146 (52.95.66.146)  32.068 ms  52.95.66.98 (52.95.66.98)  28.992 ms
52.95.64.128 (52.95.64.128)  24.282 ms
18  52.95.64.188 (52.95.64.188)  25.522 ms  52.95.64.141 (52.95.64.141)  26.609 ms
52.95.64.176 (52.95.64.176)  28.202 ms
19  52.95.64.131 (52.95.64.131)  27.994 ms  52.95.66.215 (52.95.66.215)  68.270 ms
52.95.64.149 (52.95.64.149)  27.542 ms
20  52.95.67.180 (52.95.67.180)  28.857 ms  52.95.65.129 (52.95.65.129)  27.275 ms
52.95.67.180 (52.95.67.180)  28.387 ms
21  52.95.65.133 (52.95.65.133)  32.450 ms^C
yoga@macbook-pro:~/OS$ traceroute -g 5 github.com
traceroute to github.com (13.234.176.102), 30 hops max, 72 byte packets
send: Invalid argument
yoga@macbook-pro:~/OS$ traceroute -m 5 github.com
traceroute to github.com (13.234.176.102), 5 hops max, 60 byte packets
 1  * * *
 2  60.243.51.1 (60.243.51.1)  2.684 ms  2.655 ms  3.722 ms
 3  202.88.153.205 (202.88.153.205)  6.370 ms  6.313 ms  6.219 ms
 4  10.241.1.6 (10.241.1.6)  8.772 ms  8.732 ms  8.654 ms
 5  10.240.254.140 (10.240.254.140)  5.927 ms  5.807 ms  5.563 ms
yoga@macbook-pro:~/OS$
```

- -n:Does not resolve IP address to their domain names

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
16 52.95.66.124 (52.95.66.124) 24.364 ms 52.95.66.54 (52.95.66.54) 27.676 ms
*
17 52.95.66.146 (52.95.66.146) 32.068 ms 52.95.66.98 (52.95.66.98) 28.992 ms
52.95.64.128 (52.95.64.128) 24.282 ms
18 52.95.64.188 (52.95.64.188) 25.522 ms 52.95.64.141 (52.95.64.141) 26.609 m
s 52.95.64.176 (52.95.64.176) 28.202 ms
19 52.95.64.131 (52.95.64.131) 27.994 ms 52.95.66.215 (52.95.66.215) 68.270 m
s 52.95.64.149 (52.95.64.149) 27.542 ms
20 52.95.67.180 (52.95.67.180) 28.857 ms 52.95.65.129 (52.95.65.129) 27.275 m
s 52.95.67.180 (52.95.67.180) 28.387 ms
21 52.95.65.133 (52.95.65.133) 32.450 ms^C
yoga@macbook-pro:~/OS$ traceroute -g 5 github.com
traceroute to github.com (13.234.176.102), 30 hops max, 72 byte packets
send: Invalid argument
yoga@macbook-pro:~/OS$ traceroute -m 5 github.com
traceroute to github.com (13.234.176.102), 5 hops max, 60 byte packets
1 * * *
2 60.243.51.1 (60.243.51.1) 2.684 ms 2.655 ms 3.722 ms
3 202.88.153.205 (202.88.153.205) 6.370 ms 6.313 ms 6.219 ms
4 10.241.1.6 (10.241.1.6) 8.772 ms 8.732 ms 8.654 ms
5 10.240.254.140 (10.240.254.140) 5.927 ms 5.807 ms 5.563 ms
yoga@macbook-pro:~/OS$ traceroute -n 5 github.com
Cannot handle "packetlen" cmdline arg 'github.com' on position 2 (argc 3)
yoga@macbook-pro:~/OS$
```

- -p port: This option allows destination port to be used

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
s 52.95.67.180 (52.95.67.180) 28.387 ms
21 52.95.65.133 (52.95.65.133) 32.450 ms^C
yoga@macbook-pro:~/OS$ traceroute -g 5 github.com
traceroute to github.com (13.234.176.102), 30 hops max, 72 byte packets
send: Invalid argument
yoga@macbook-pro:~/OS$ traceroute -m 5 github.com
traceroute to github.com (13.234.176.102), 5 hops max, 60 byte packets
1 * * *
2 60.243.51.1 (60.243.51.1) 2.684 ms 2.655 ms 3.722 ms
3 202.88.153.205 (202.88.153.205) 6.370 ms 6.313 ms 6.219 ms
4 10.241.1.6 (10.241.1.6) 8.772 ms 8.732 ms 8.654 ms
5 10.240.254.140 (10.240.254.140) 5.927 ms 5.807 ms 5.563 ms
yoga@macbook-pro:~/OS$ traceroute -n 5 github.com
Cannot handle "packetlen" cmdline arg 'github.com' on position 2 (argc 3)
yoga@macbook-pro:~/OS$ traceroute -p 10 github.com
traceroute to github.com (13.234.176.102), 30 hops max, 60 byte packets
1 * * *
2 60.243.51.1 (60.243.51.1) 3.967 ms 3.898 ms 3.758 ms
3 202.88.153.205 (202.88.153.205) 3.674 ms 3.591 ms 3.500 ms
4 73.29.232.136.in-addr.arpa (136.232.29.73) 5.156 ms 5.446 ms 5.653 ms
5 * * *
6 * * *
7 52.95.217.214 (52.95.217.214) 5.099 ms^C
yoga@macbook-pro:~/OS$
```

38)which command:

Description:

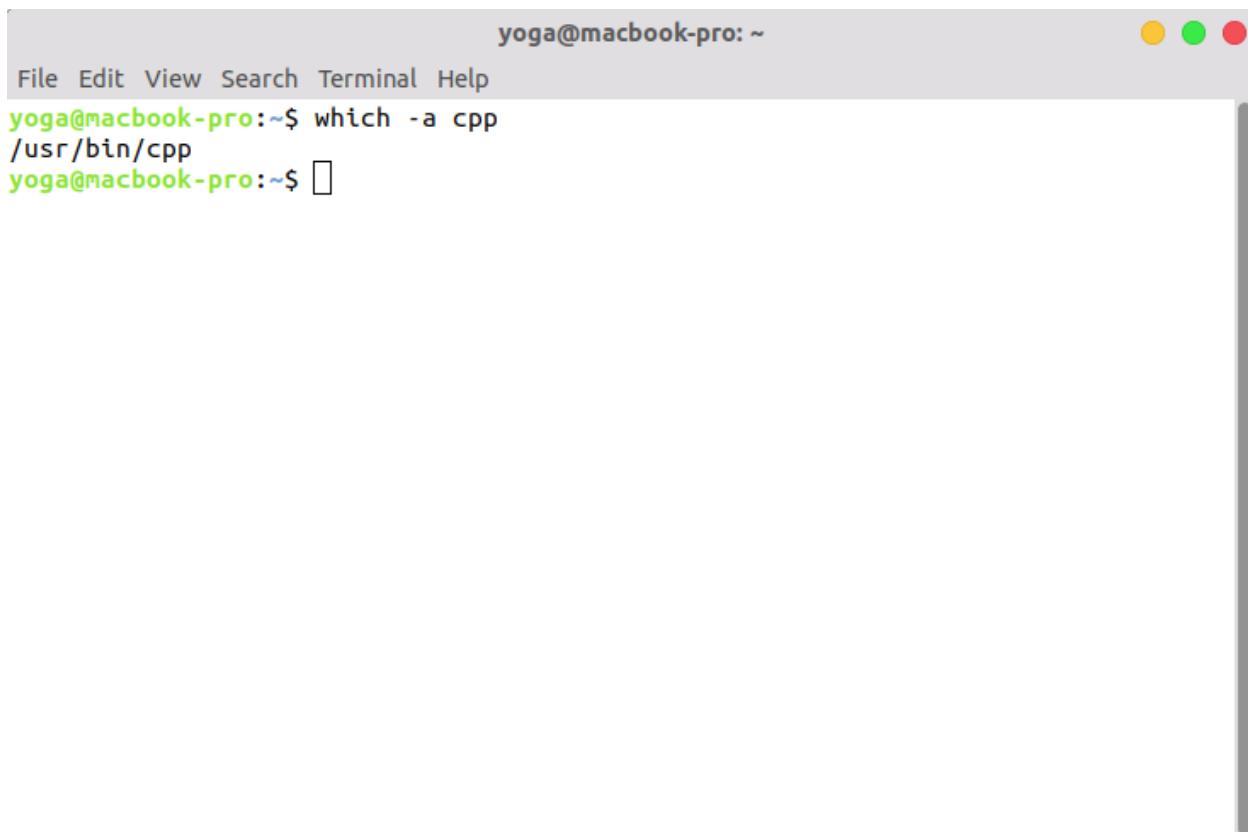
It is used to locate the executable file associated with the given command by searching it in the path environment variable.

Follows values are returned:

- 0 : If all specified commands are found and executable.
- 1 : If one or more specified commands is nonexistent or not executable.
- 2 : If an invalid option is specified.

Syntax:

```
which [FILENAME1] [FILENAME2]....  
[OPTION]  
● -a:Displays all matching pathnames of each argument
```



The screenshot shows a macOS Terminal window with a light gray background. At the top, there's a menu bar with options: File, Edit, View, Search, Terminal, and Help. The title bar displays "yoga@macbook-pro: ~". On the right side of the title bar are three colored circular icons: yellow, green, and red. The main area of the terminal contains the following text:
`yoga@macbook-pro:~$ which -a cpp
/usr/bin/cpp
yoga@macbook-pro:~$`

39)Clear command:**Description:**

This command is used to clear the terminal screen.

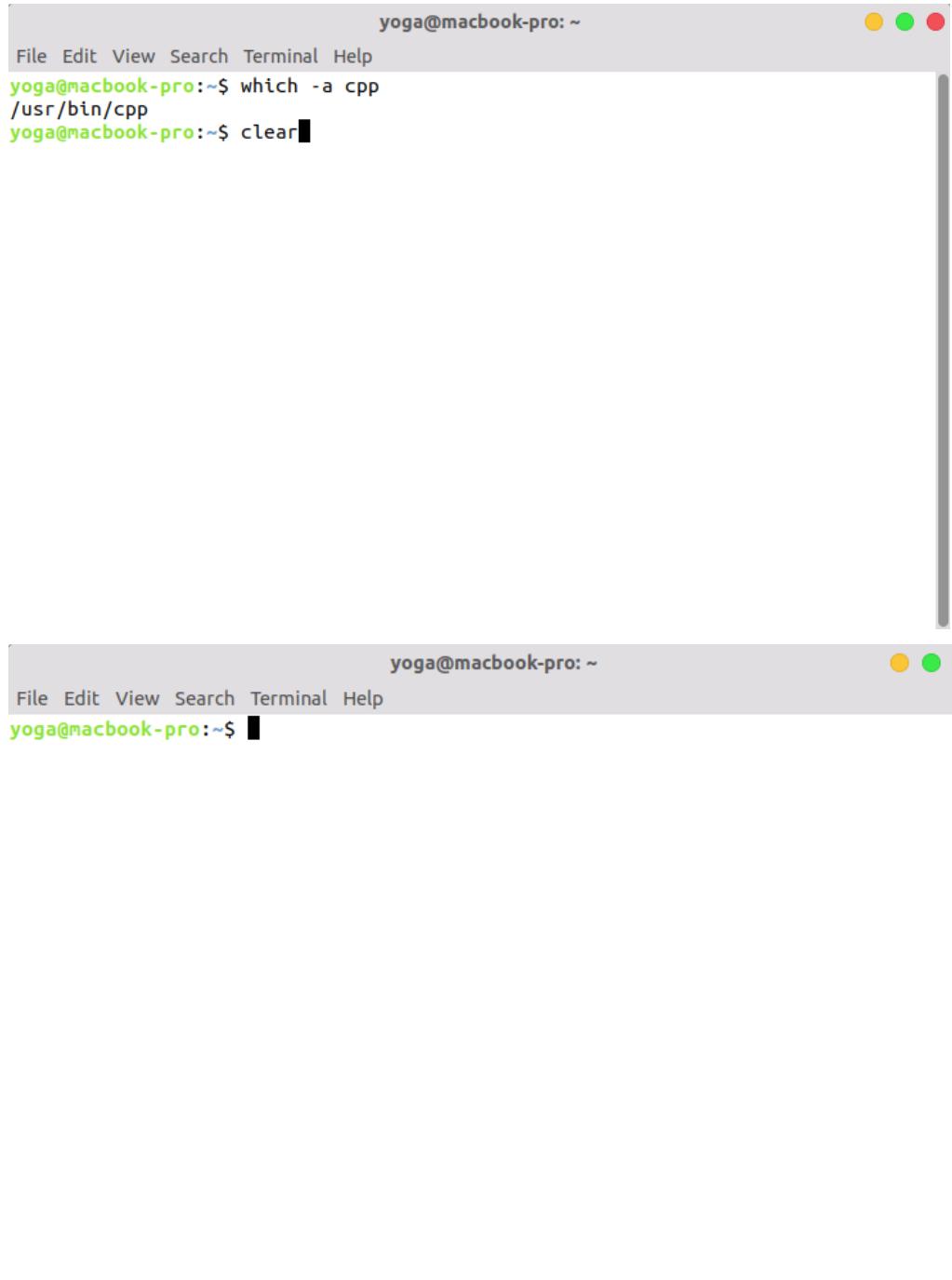
//NOTE:This command ignores any command line argument present

Syntax:

```
clear
```

```
[OPTION]
```

- -T: It is used to indicate the type of terminal. Normally the default terminal type is taken from the environment variable TERM
- -x: Does not attempt to clear the terminal's scrollback buffer using the extended "E3" capability.



The image contains two side-by-side screenshots of a macOS Terminal window. Both windows have a title bar with the text "yoga@macbook-pro: ~" and three colored window control buttons (yellow, green, red) in the top right corner. The first window shows a command-line session where the user types "which -a cpp" followed by the output "/usr/bin/cpp". Then, the user types "clear" and the screen is cleared. The second window shows a blank command-line interface with the cursor at the prompt, indicating the effect of the "clear" command.

40)whatis command:

Description:

This command in Linux is used to get a one-line manual page

descriptions.

This command search for the manual pages names and show the manual page description of the specified filename or argument.

Syntax:

whatis [OPTIONS] KEYWORD//KEYWORD involves commands like

[OPTION]:

- -d:This option prints the debugging information.



The screenshot shows a terminal window titled "yoga@macbook-pro: ~/OS". The command entered is "whatis -d tac". The output lists various man pages and their paths, including sections 1 through 9. It also shows global mappings for sections 1, 2, 3, and 5.

```
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ whatis -d tac
From the config file /etc/manpath.config:

Mandatory mandir '/usr/man'.
Mandatory mandir '/usr/share/man'.
Mandatory mandir '/usr/local/share/man'.
Path '/bin' mapped to mandir '/usr/share/man'.
Path '/usr/bin' mapped to mandir '/usr/share/man'.
Path '/sbin' mapped to mandir '/usr/share/man'.
Path '/usr/sbin' mapped to mandir '/usr/share/man'.
Path '/usr/local/bin' mapped to mandir '/usr/local/man'.
Path '/usr/local/bin' mapped to mandir '/usr/local/share/man'.
Path '/usr/local/sbin' mapped to mandir '/usr/local/man'.
Path '/usr/X11R6/bin' mapped to mandir '/usr/X11R6/man'.
Path '/usr/bin/X11' mapped to mandir '/usr/X11R6/man'.
Path '/usr/games' mapped to mandir '/usr/share/man'.
Path '/opt/bin' mapped to mandir '/opt/man'.
Path '/opt/sbin' mapped to mandir '/opt/man'.
Global mandir '/usr/man', catdir '/var/cache/man/fsstnd'.
Global mandir '/usr/share/man', catdir '/var/cache/man'.
Global mandir '/usr/local/man', catdir '/var/cache/man/oldlocal'.
Global mandir '/usr/local/share/man', catdir '/var/cache/man/local'.
Global mandir '/usr/X11R6/man', catdir '/var/cache/man/X11R6'.
Global mandir '/opt/man', catdir '/var/cache/man/opt'.
Added section '1'.
Added section 'n'.
Added section 'l'.
Added section 'B'.
Added section '3'.
Added section '2'.
Added section '3posix'.
Added section '3pm'.
Added section '3perl'.
Added section '3am'.
Added section '5'.
Added section '4'.
Added section '9'.
...
```

- -v:This option displays verbose warning messages

```

yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
Removing duplicate manpath entry /usr/local/share/man (3) -> /usr/local/man (1)
Removing duplicate manpath entry /usr/share/man (3) -> /usr/share/man (2)
final search path = /home/yoga/.local/share/man:/usr/local/man:/usr/share/man
path=/home/yoga/.local/share/man
warning: can't read the fallback whatis text database /home/yoga/.local/share/man/whatis
path=/usr/local/man
warning: can't read the fallback whatis text database /usr/local/man/whatis
path=/usr/share/man
name:      tac
sec. ext:   1
section:    1
comp. ext:  gz
id:        A
mtime:     1516268629.000000000
pointer:   -
filter:    -
whatis:    concatenate and print files in reverse

tac (1)          - concatenate and print files in reverse
hashtable_free: 1 entries, 1 (100%) unique
yoga@macbook-pro:~/OS$ whatis -v tac
tac (1)          - concatenate and print files in reverse
yoga@macbook-pro:~/OS$ █

```

- -r: This option interprets each of the name as a regular expression. If any part of the page involves that name, then it will be a match and display all such files.

```

yoga@macbook-pro:~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ whatis -r tac
btattach (1)      - attach serial devices to BlueZ stack
fattach (2)       - unimplemented system calls
fattach (3posix)  - attach a STREAMS-based file descriptor to a file in th...
fdetach (2)       - unimplemented system calls
fdetach (3posix)  - detach a name from a STREAMS-based file descriptor (ST...
hciattach (1)     - attach serial devices via UART HCI to BlueZ stack
inputattach (1)   - attach a serial line to an input-layer device
jstack (1)         - Prints Java thread stack traces for a Java process, co...
ldattach (8)       - attach a line discipline to a serial line
pamstack (1)       - stack planes of multiple PAM images into one PAM image
pdfdetach (1)      - Portable Document Format (PDF) document embedded file ...
pthead_attr_getdetachstate (3) - set/get detach state attribute in thread at...
pthead_attr_getdetachstate (3posix) - get and set the detachstate attribute
pthead_attr_getstack (3) - set/get stack attributes in thread attributes object
pthead_attr_getstack (3posix) - get and set stack attributes
pthead_attr_getstackaddr (3) - set/get stack address attribute in thread att...
pthead_attr_getstacksize (3) - set/get stack size attribute in thread attrib...
pthead_attr_getstacksize (3posix) - get and set the stacksize attribute
pthead_attr_setdetachstate (3) - set/get detach state attribute in thread at...
pthead_attr_setdetachstate (3posix) - set the detachstate attribute
pthead_attr_setsstack (3) - set/get stack attributes in thread attributes object
pthead_attr_setsstack (3posix) - set the stack attribute
pthead_attr_setsstackaddr (3) - set/get stack address attribute in thread att...
pthead_attr_setsstacksize (3) - set/get stack size attribute in thread attrib...
pthead_attr_setsstacksize (3posix) - set the stacksize attribute
pthead_detach (3)  - detach a thread
pthead_detach (3posix) - detach a thread
quotactl (2)       - manipulate disk quotas
resolve_stack_dump (1) - resolve numeric stack trace dump to symbols
rtacct (8)         - network statistics tools.
sbattach (1)       - UEFI secure boot detached signature tool
sigaltstack (2)   - set and/or get signal alternate stack context
sigaltstack (3posix) - set and get signal alternate stack context
sigstack (3)       - set and/or get signal stack context
slattach (8)       - attach a network interface to a serial line
systemd-quotacheck (8) - File system quota checker logic
systemd-quotacheck.service (8) - File system quota checker logic

```

- -w: This option takes each name as a pattern containing shell style wildcards. In this option a match will happen if it matches the entire page name

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
pthread_attr_setstacksize (3) - set/get stack size attribute in thread attrib...
pthread_attr_setstacksize (3posix) - set the stacksize attribute
pthread_detach (3) - detach a thread
pthread_detach (3posix) - detach a thread
quotactl (2) - manipulate disk quotas
resolve_stack_dump (1) - resolve numeric stack trace dump to symbols
rtacct (8) - network statistics tools.
sbattach (1) - UEFI secure boot detached signature tool
sigaltstack (2) - set and/or get signal stack context
sigaltstack (3posix) - set and get signal alternate stack context
sigstack (3) - set and/or get signal stack context
slattach (8) - attach a network interface to a serial line
systemd-quotacheck (8) - File system quota checker logic
systemd-quotacheck.service (8) - File system quota checker logic
tac (1) - concatenate and print files in reverse
XkbGetAccessXTimeout (3) - Queries the current AccessXTimeout options for a k...
XkbSetAccessXTimeout (3) - Configures the AccessXTimeout options for a keyboa...
XRestackWindows (3) - change window stacking order
XSetAccessControl (3) - control host access and host control structure
XtGetActionKeysym (3) - obtain corresponding keysym
XtGetActionList (3) - obtain class action list
yoga@macbook-pro:~/OS$ whatis -w tac
tac (1) - concatenate and print files in reverse
yoga@macbook-pro:~/OS$
```

- -l:This option does not trim output to the terminal width .
- -C:This option uses the user configuration file rather than the default file in
- ~/.manpath
- -m:This option is used to access any other operating system's manual page name

41)rmdir command:

Description:

This command is used to remove an empty directories from the filesystem in Linux.

Syntax:

rmdir [OPTION] ...[DIRECTORY]//Mandatory Arguments involve rmdir and Directory name

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ mkdir test3
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt    sample6.txt~    test1rzip.zip    test3
input.txt    sample2.txt    samplezip.zip    test1zip.zip
lab1        sample3.txt    test1                  test2
yoga@macbook-pro:~/OS$ rmdir test3
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt    sample6.txt~    test1rzip.zip
input.txt    sample2.txt    samplezip.zip    test1zip.zip
lab1        sample3.txt    test1                  test2
yoga@macbook-pro:~/OS$
```

[OPTION]:

- -p: This Options enables directory argument to be treated as a pathname of which all components will be removed ,if they are already empty.

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ mkdir test3
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt    sample6.txt~    test1rzip.zip    test3
input.txt   sample2.txt    samplezip.zip   test1zip.zip
lab1        sample3.txt    test1           test2
yoga@macbook-pro:~/OS$ rmdir -p test3
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt    sample6.txt~    test1rzip.zip
input.txt   sample2.txt    samplezip.zip   test1zip.zip
lab1        sample3.txt    test1           test2
yoga@macbook-pro:~/OS$
```

- -v: Displays verbose information for every directory being processed.
- rmdir --ignore-fail-on-non-empty: This option does not report a failure which occurs due to a directory being non-empty.

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ mkdir test3
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt    sample6.txt~    test1rzip.zip    test3
input.txt   sample2.txt    samplezip.zip   test1zip.zip
lab1        sample3.txt    test1           test2
yoga@macbook-pro:~/OS$ rmdir -v test3
rmdir: removing directory, 'test3'
yoga@macbook-pro:~/OS$ ls
'30 Aug'    sample1.txt    sample6.txt~    test1rzip.zip
input.txt   sample2.txt    samplezip.zip   test1zip.zip
lab1        sample3.txt    test1           test2
yoga@macbook-pro:~/OS$ rmdir --ignore-fail-on-non-empty test2
yoga@macbook-pro:~/OS$
```

42)echo command:

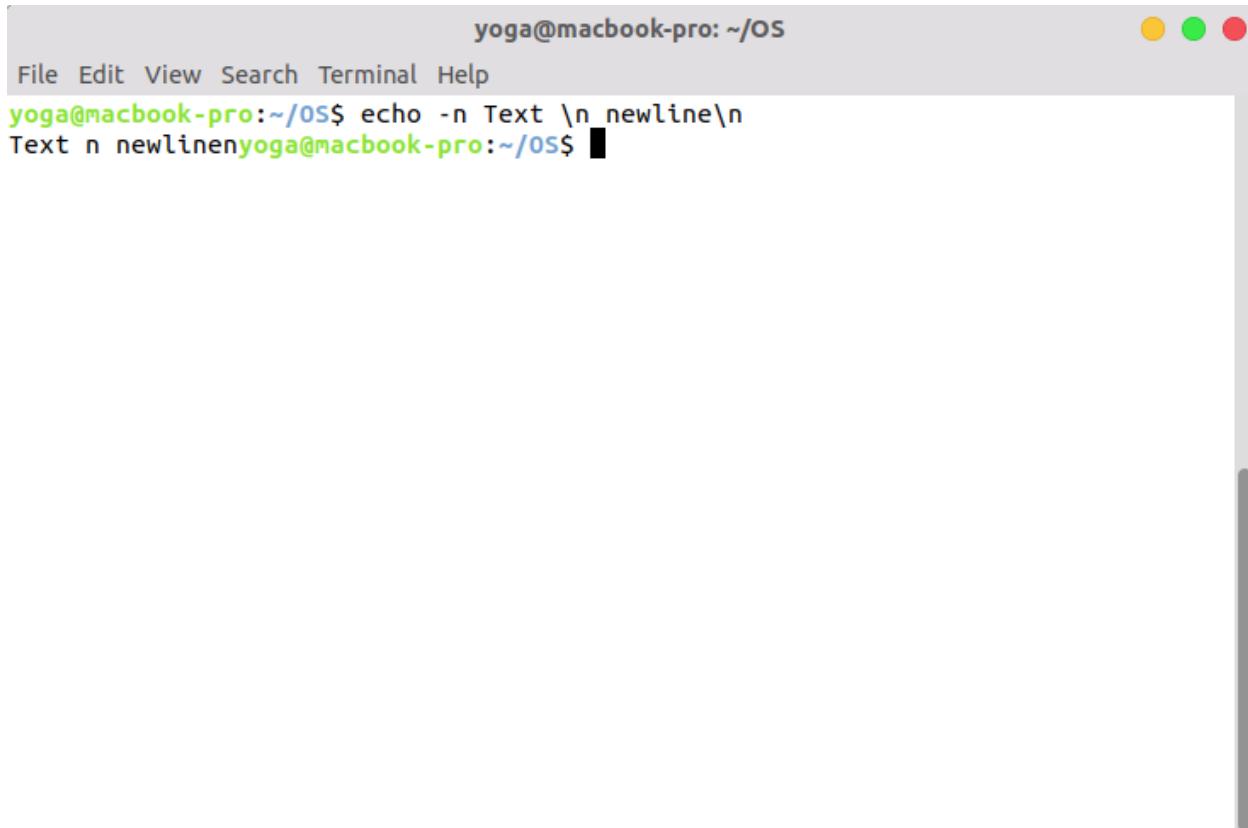
Description:

It is used to display line of text/string that are passed as an argument.

Syntax:

echo [OPTION] [string]

echo * //Prints all files/folders in the directory



The screenshot shows a macOS Terminal window with the title bar "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The main pane displays the command "echo -n Text \n newline\n" followed by its output "Text n newline". The terminal has a dark theme with yellow, green, and red window controls.

[OPTION]:

- -n:This option is used to omit echoing trailing newline
- -e:This option Enables the interpretation of backslash escapes

Ex:echo -e "abcde [n] fgh"

[n] Available n options with -e enabled:

->\b:It removes all the spaces in between the text.

->\c:Suppress trailing new line with backspace interpreter '-e' to continue without emitting new line

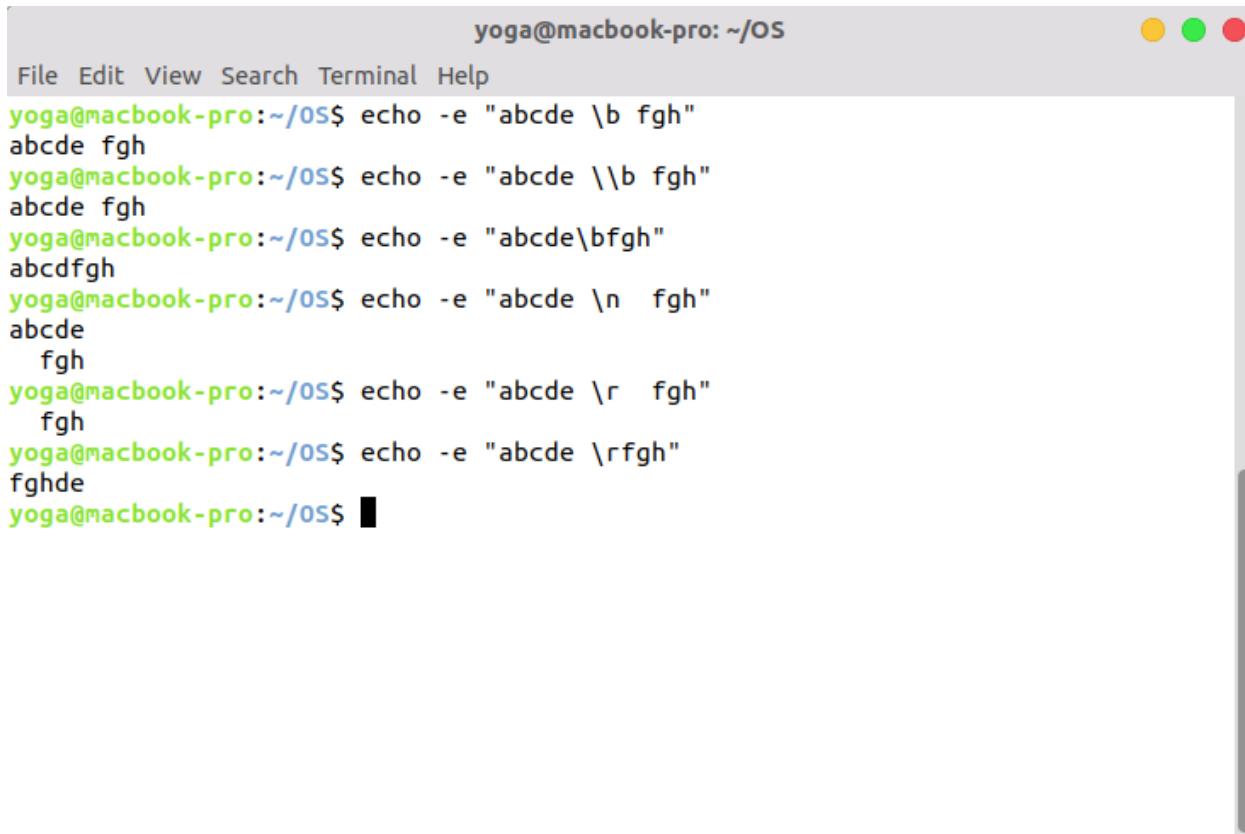
->\n:This option creates new line

->\t:To create tab spaces

->\r:To Display carriage return

->\v:To create vertical tab spaces

->\a:To alert return with backspace interpreter '-e' to have sound alert



yoga@macbook-pro: ~/OS

File Edit View Search Terminal Help

```
yoga@macbook-pro:~/OS$ echo -e "abcde \b fgh"
abcde fgh
yoga@macbook-pro:~/OS$ echo -e "abcde \\b fgh"
abcde fgh
yoga@macbook-pro:~/OS$ echo -e "abcde\b\bfgh"
abcdefgfh
yoga@macbook-pro:~/OS$ echo -e "abcde \n  fgh"
abcde
  fgh
yoga@macbook-pro:~/OS$ echo -e "abcde \r  fgh"
  fgh
yoga@macbook-pro:~/OS$ echo -e "abcde \r\rfgh"
fghde
yoga@macbook-pro:~/OS$ █
```

43)cal command:

Description:

This command shows calendar of the specific month or year

Syntax:

- cal //Shows current month calendar
- cal MM YYYY:Shows the calendar of MM month and of year YYYY

```
yoga@macbook-pro: ~/OS$ cal
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cal
August 2020
Su Mo Tu We Th Fr Sa
        1
 2 3 4 5 6 7 8
 9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31
yoga@macbook-pro:~/OS$ cal 08 2021
August 2021
Su Mo Tu We Th Fr Sa
 1 2 3 4 5 6 7
 8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31

yoga@macbook-pro:~/OS$
```

- `cal YYYY`:Shows the calendar of year YYYY

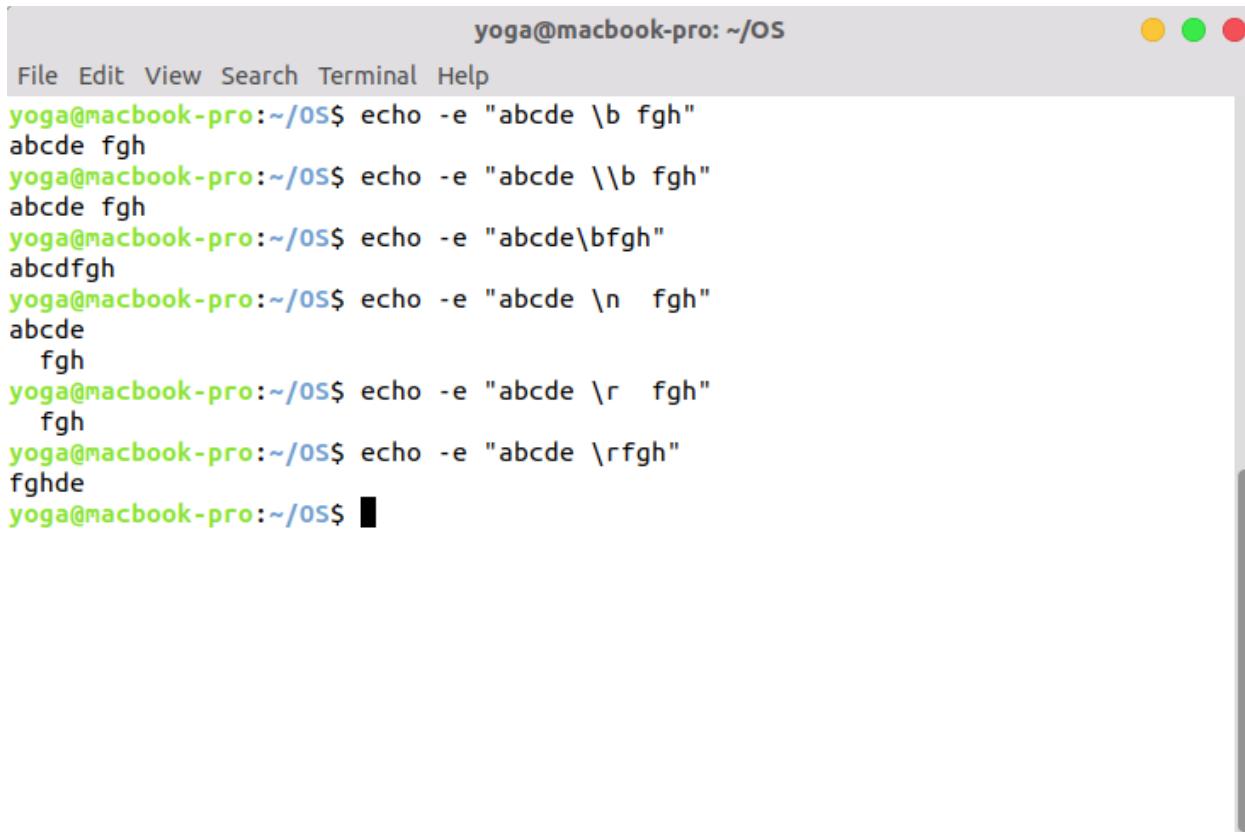
```
Sun Aug 30, 20:04:17
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cal 2020
2020
January February March
Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa
 1 2 3 4           1 2 3 4 5 6 7           1 2 3 4 5 6 7
 5 6 7 8 9 10 11  2 3 4 5 6 7 8   8 9 10 11 12 13 14
12 13 14 15 16 17 18  9 10 11 12 13 14 15 15 16 17 18 19 20 21
19 20 21 22 23 24 25 16 17 18 19 20 21 22 22 23 24 25 26 27 28
26 27 28 29 30 31 23 24 25 26 27 28 29 29 30 31

April May June
Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa
 1 2 3 4           1 2 3 4 5 6           1 2 3 4 5 6
 5 6 7 8 9 10 11  3 4 5 6 7 8 9   7 8 9 10 11 12 13
12 13 14 15 16 17 18 10 11 12 13 14 15 16 14 15 16 17 18 19 20
19 20 21 22 23 24 25 17 18 19 20 21 22 23 21 22 23 24 25 26 27
26 27 28 29 30 31 24 25 26 27 28 29 30 28 29 30
31

July August September
Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa
 1 2 3 4           1 2 3 4 5 6           1 2 3 4 5
 5 6 7 8 9 10 11  2 3 4 5 6 7 8   6 7 8 9 10 11 12
12 13 14 15 16 17 18 9 10 11 12 13 14 15 13 14 15 16 17 18 19
19 20 21 22 23 24 25 16 17 18 19 20 21 22 20 21 22 23 24 25 26
26 27 28 29 30 31 23 24 25 26 27 28 29 27 28 29 30
31

October November December
Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa
 1 2 3 4           1 2 3 4 5 6 7           1 2 3 4 5
 4 5 6 7 8 9 10  8 9 10 11 12 13 14  6 7 8 9 10 11 12
11 12 13 14 15 16 17 15 16 17 18 19 20 21 13 14 15 16 17 18 19
18 19 20 21 22 23 24 22 23 24 25 26 27 28 20 21 22 23 24 25 26
25 26 27 28 29 30 31 29 30 27 28 29 30 31
```

- `cal -3`:Displays current month ,previous and next month



The screenshot shows a macOS Terminal window with the title bar "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The window contains the following terminal session:

```
yoga@macbook-pro:~/OS$ echo -e "abcde \b fgh"
abcde fgh
yoga@macbook-pro:~/OS$ echo -e "abcde \\b fgh"
abcde fgh
yoga@macbook-pro:~/OS$ echo -e "abcde\bfg"
abcdefg
yoga@macbook-pro:~/OS$ echo -e "abcde \n  fgh"
abcde
  fgh
yoga@macbook-pro:~/OS$ echo -e "abcde \r  fgh"
  fgh
yoga@macbook-pro:~/OS$ echo -e "abcde \rfgh"
fghde
yoga@macbook-pro:~/OS$
```

44)date command:

Description:

This command is used to display the system date and time. It is also used to set date and time of the system.

Syntax:

- date //Displays the current date and time.
- date -u //Displays the time in GMT/UTC time zone
- date --date="string" Displays the given data string in the format of date.

//String can be:"2 days" for date and time after two days

- date --set="data to be set"//Sets the system date and time
- date --file=filename//This option is used to display the date string present at each line of file in the date and time format
- date -r filename //This option is used to display the last modified timestamp of the file
- date +[%[format-option]]:Lists the current date according to particular format specifiers
- [FORMAT-OPTION]:
- %D: Display date as mm/dd/yy.
- %d: Display the day of the month
- %a: Displays the name for weekdays

- %A: Displays full weekdays
- %h: Displays month name
- %B: Displays full month name
- %m: Displays the month of year
- %y: Displays last two digits of the year
- %Y: Display four-digit year.
- %T: Display the time in 24 hour format as HH:MM:SS.
- %H: Display the hour.
- %M: Display the minute.
- %S: Display the seconds.

```
yoga@macbook-pro:~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ date
Sun Aug 30 20:05:50 IST 2020
yoga@macbook-pro:~/OS$ date -u
Sun Aug 30 14:35:56 UTC 2020
yoga@macbook-pro:~/OS$ date --date "3days"
Wed Sep 2 20:06:07 IST 2020
yoga@macbook-pro:~/OS$ date --r "sample6.txt"
date: option '--r' is ambiguous; possibilities: '--reference' '--rfc-email' '--rfc-822' '--rfc-2822' '--rfc-3339'
Try 'date --help' for more information.
yoga@macbook-pro:~/OS$ date -r "sample6.txt"
date: sample6.txt: No such file or directory
yoga@macbook-pro:~/OS$ date -r sample6.txt
date: sample6.txt: No such file or directory
yoga@macbook-pro:~/OS$ date -r sample1.txt
Sun Aug 30 18:13:17 IST 2020
yoga@macbook-pro:~/OS$
```

```
yoga@macbook-pro:~/OS
File Edit View Search Terminal Help
date: sample6.txt: No such file or directory
yoga@macbook-pro:~/OS$ date -r sample1.txt
Sun Aug 30 18:13:17 IST 2020
yoga@macbook-pro:~/OS$ clear

yoga@macbook-pro:~/OS$ date +%D
08/30/20
yoga@macbook-pro:~/OS$ date +%d
30
yoga@macbook-pro:~/OS$ date +%a
Sun
yoga@macbook-pro:~/OS$ date +%A
Sunday
yoga@macbook-pro:~/OS$ date +%h
Aug
yoga@macbook-pro:~/OS$ date +%B
August
yoga@macbook-pro:~/OS$ date +%m
08
yoga@macbook-pro:~/OS$ date +%y
20
yoga@macbook-pro:~/OS$ date +%Y
2020
yoga@macbook-pro:~/OS$ date +%T
20:07:46
yoga@macbook-pro:~/OS$ date +%H
20
yoga@macbook-pro:~/OS$ date +%M
08
yoga@macbook-pro:~/OS$ date +%S
08
yoga@macbook-pro:~/OS$
```

45)dir command:

Description:

This command is used to list the contents of a directory

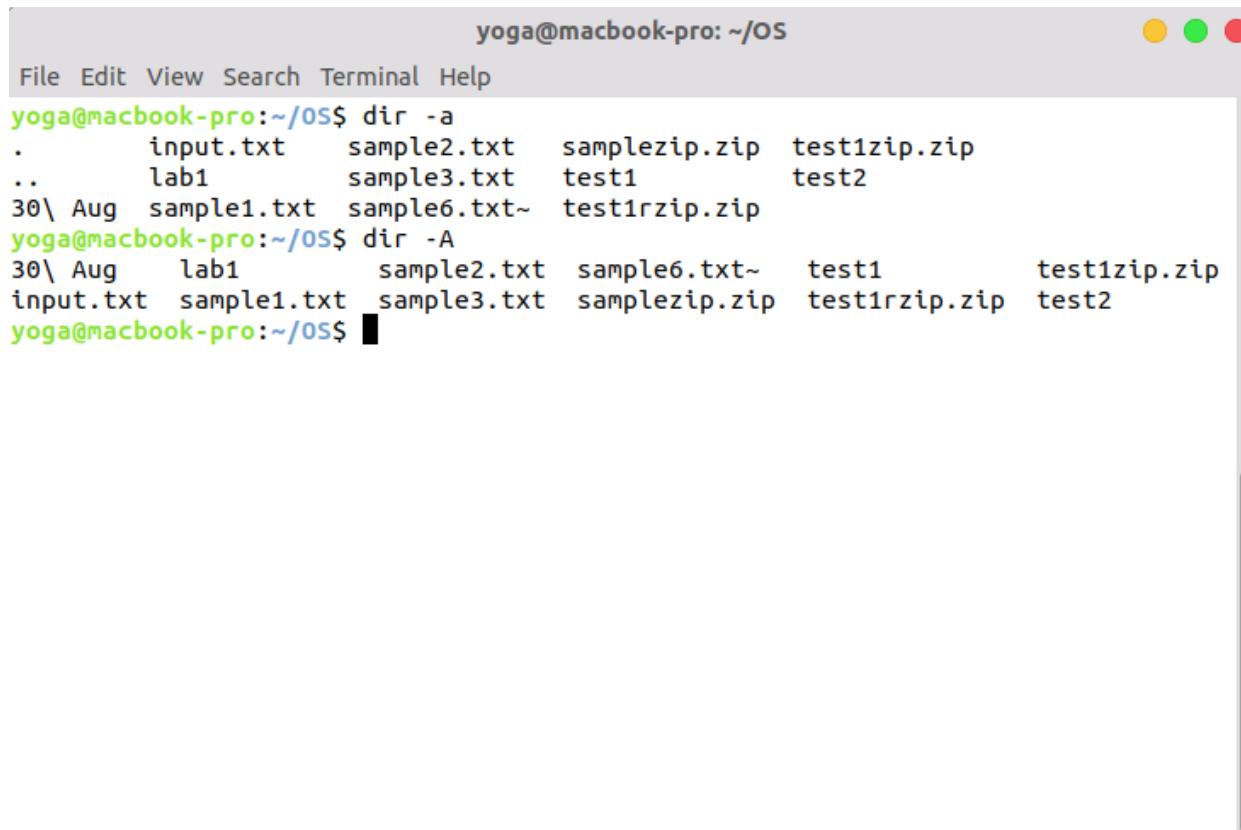
NOTE:dir command differs from ls command in the format of listing contents that is in default listing options i.e it does not display colored output as ls does

Syntax:

dir [OPTION] [FILE]

[OPTION]

- -a: It displays all the hidden files along with two files denoted '.' and '..' which stands for current and previous directory respectively
- -A: Similar to -a option but does not display files of current and previous directory



The screenshot shows a terminal window titled "yoga@macbook-pro: ~/OS". The menu bar includes File, Edit, View, Search, Terminal, and Help. The terminal prompt is "yoga@macbook-pro:~/OS\$". The user runs the command "dir -a" followed by "dir -A". The output shows the contents of the current directory, including hidden files like ".input.txt" and "..lab1", as well as backup files like "sample6.txt~". The second "dir -A" command shows the same files but excludes the hidden files and backup files.

```
yoga@macbook-pro:~/OS$ dir -a
.
..input.txt      sample2.txt    samplezip.zip   test1zip.zip
..lab1          sample3.txt    test1           test2
30\ Aug sample1.txt  sample6.txt~  test1rzip.zip
yoga@macbook-pro:~/OS$ dir -A
30\ Aug lab1      sample2.txt    sample6.txt~  test1           test1zip.zip
input.txt sample1.txt  sample3.txt  samplezip.zip  test1rzip.zip  test2
yoga@macbook-pro:~/OS$
```

-l --author :Displays author of all the files.

-B:Ignores listing of backed up files(ends with '~')

--color :This option is used to colorize the output

yoga@macbook-pro: ~/OS

File Edit View Search Terminal Help

```
yoga@macbook-pro:~/OS$ dir -l --author
total 44
-rw-r--r-- 1 yoga yoga yoga    0 Aug 30 14:29 30\ Aug
-rw-r--r-- 1 yoga yoga yoga 1497 Aug 30 12:46 input.txt
drwxr-xr-x 2 yoga yoga yoga 4096 Aug 30 14:07 lab1
-rw-rw-r-- 1 yoga yoga yoga  906 Aug 30 18:13 sample1.txt
-rw-rw-r-- 1 yoga yoga yoga  591 Aug 30 11:11 sample2.txt
----- 1 yoga yoga yoga 1497 Aug 30 12:29 sample3.txt
-rw-r--r-- 1 yoga yoga yoga  591 Aug 30 14:22 sample6.txt~
-rw-r--r-- 1 yoga yoga yoga  541 Aug 30 14:11 samplezip.zip
drwxr-xr-x 2 yoga yoga yoga 4096 Aug 30 19:17 test1
-rw-r--r-- 1 yoga yoga yoga  466 Aug 30 15:35 test1rzip.zip
-rw-r--r-- 1 yoga yoga yoga  679 Aug 30 15:08 test1zip.zip
drwxr-xr-x 2 yoga yoga yoga 4096 Aug 30 19:21 test2
yoga@macbook-pro:~/OS$ dir -B
30\ Aug      lab1      sample2.txt  samplezip.zip  test1rzip.zip  test2
input.txt  sample1.txt  sample3.txt  test1      test1zip.zip
yoga@macbook-pro:~/OS$ dir --color
30\ Aug      lab1      sample2.txt  sample6.txt~  test1      test1zip.zip
input.txt  sample1.txt  sample3.txt  samplezip.zip  test1rzip.zip  test2
yoga@macbook-pro:~/OS$
```

- -r: Lists files in reverse order while sorting
- -R: List all subdirectories recursively
- -F: Append indicator to the file names which classifies them into their type.

Ex:

- A slash ('/') indicates a directory.
- An asterisk ('*') indicates an executable.
- An at sign ('@') indicates a symbolic link.
- A percent sign ('%') indicates a whiteout.
- An equal sign ('=') indicates a socket.
- A vertical bar ('|') indicates a FIFO.

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ dir -r
test2          test1rzip.zip  samplezip.zip  sample3.txt  sample1.txt  input.txt
test1zip.zip   test1           sample6.txt~  sample2.txt  lab1           30\ Aug
yoga@macbook-pro:~/OS$ dir -R
.:
30\ Aug    lab1           sample2.txt  sample6.txt~  test1           test1zip.zip
input.txt  sample1.txt  sample3.txt  samplezip.zip  test1rzip.zip  test2

./lab1:
sample3.txt  tarfile.tar

./test1:
s1.txt  sample10.txt  sample6.txt  sample8.txt  s.txt
s2.txt  sample11.txt  sample7.txt  sample9.txt

./test2:
s1.txt  s2.txt  tarfile.tar
yoga@macbook-pro:~/OS$ dir -F
30\ Aug    lab1/           sample2.txt  sample6.txt~  test1/           test1zip.zip
input.txt  sample1.txt  sample3.txt  samplezip.zip  test1rzip.zip  test2/
yoga@macbook-pro:~/OS$ 
```

46)look command:

Description:

This command shows the lines beginning with a given string. Uses binary search for files not sorted

Syntax:

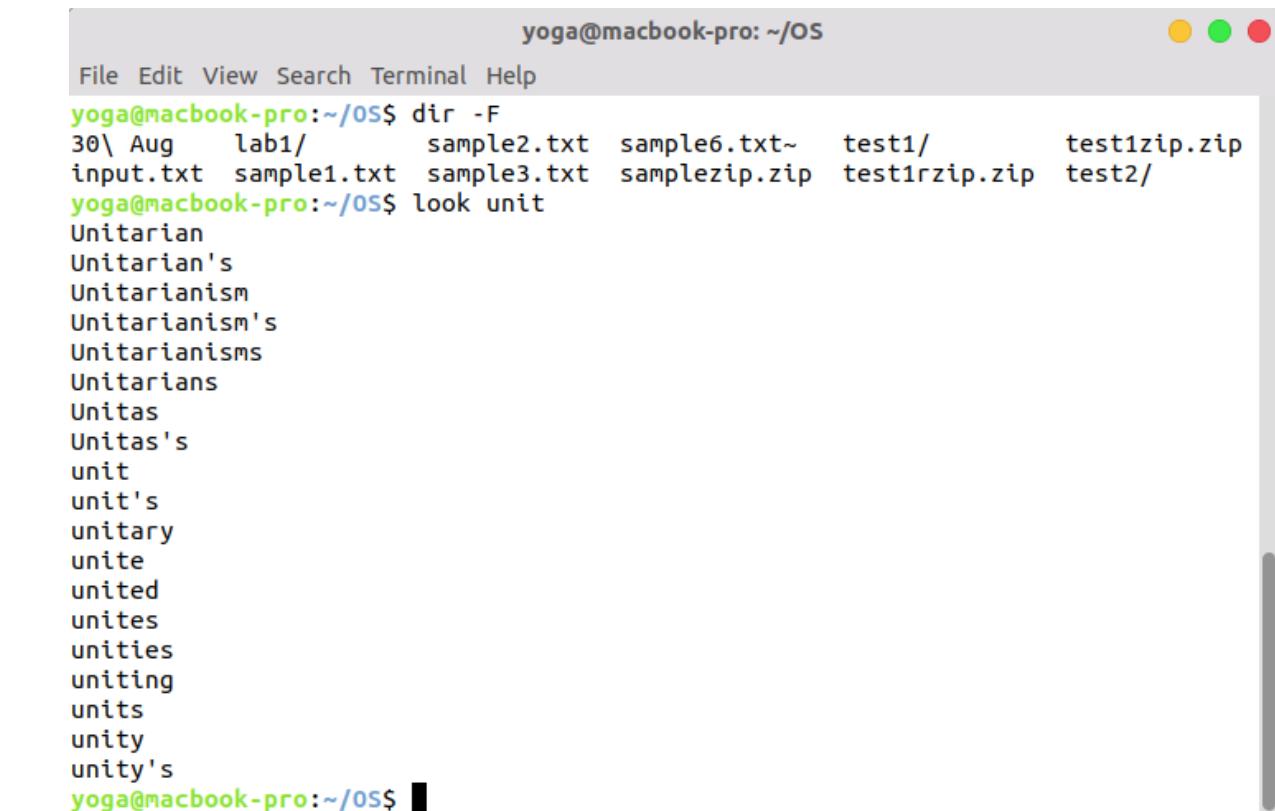
look [-bdf] [-t termchar] string [file....]

look -bf/-bd characters words// This option uses binary search on the given word list (Without filename, it searches in dictionary)

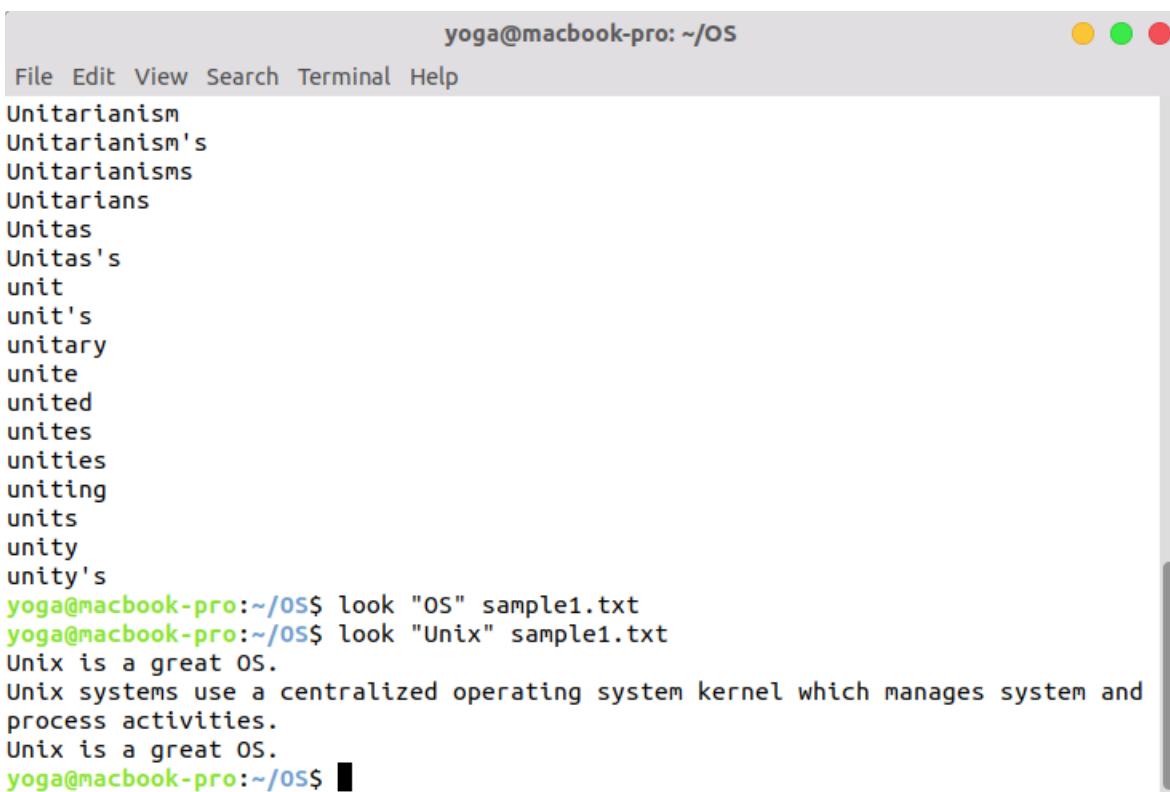
[OPTION]:

- -[string]: This option is used to search for the given string in a specified file
- -f: This option is used to ignore case sensitivity
- -t: This option is used to specify a string termination character

- -d: This command is used to compare only alphanumeric characters



```
yoga@macbook-pro:~/OS$ dir -F
30\ Aug lab1/ sample2.txt sample6.txt~ test1/ test1zip.zip
input.txt sample1.txt sample3.txt samplezip.zip test1rzip.zip test2/
yoga@macbook-pro:~/OS$ look unit
Unitarian
Unitarian's
Unitarianism
Unitarianism's
Unitarianisms
Unitarians
Unitas
Unitas's
unit
unit's
unitary
unite
united
unites
unities
uniting
units
unity
unity's
yoga@macbook-pro:~/OS$
```



```
File Edit View Search Terminal Help
Unitarianism
Unitarianism's
Unitarianisms
Unitarians
Unitas
Unitas's
unit
unit's
unitary
unite
united
unites
unities
uniting
units
unity
unity's
yoga@macbook-pro:~/OS$ look "OS" sample1.txt
yoga@macbook-pro:~/OS$ look "Unix" sample1.txt
Unix is a great OS.
Unix systems use a centralized operating system kernel which manages system and
process activities.
Unix is a great OS.
yoga@macbook-pro:~/OS$
```

47)wc command:

Description:

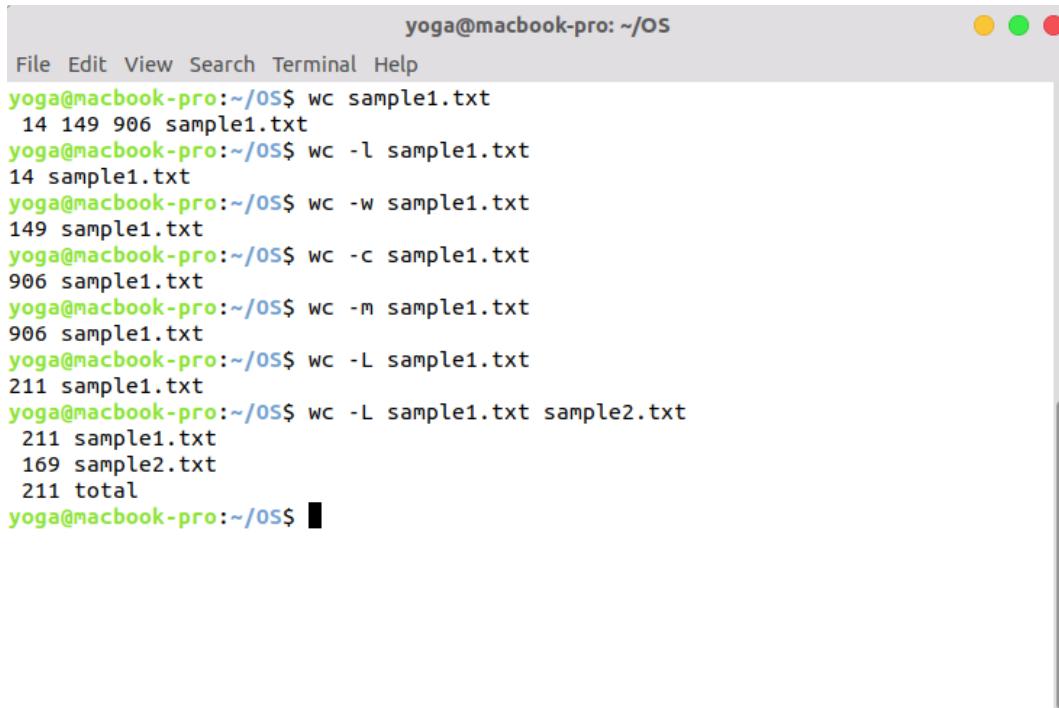
It is used for counting purpose(to count number of lines,word count ,byte and character count)

Syntax:

 wc [OPTION]....[FILE]....

[OPTION]:

- -l:This command is used to print the number of lines
- -w:Prints the number of words
- -c:Prints the count of bytes
- -m:Prints the count of characters in a file
- -L:It is used to print out the length of longest line a file.



The screenshot shows a macOS Terminal window with the title bar "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The main pane displays the following terminal session:

```
yoga@macbook-pro:~/OS$ wc sample1.txt
14 149 906 sample1.txt
yoga@macbook-pro:~/OS$ wc -l sample1.txt
14 sample1.txt
yoga@macbook-pro:~/OS$ wc -w sample1.txt
149 sample1.txt
yoga@macbook-pro:~/OS$ wc -c sample1.txt
906 sample1.txt
yoga@macbook-pro:~/OS$ wc -m sample1.txt
906 sample1.txt
yoga@macbook-pro:~/OS$ wc -L sample1.txt
211 sample1.txt
yoga@macbook-pro:~/OS$ wc -L sample1.txt sample2.txt
211 sample1.txt
169 sample2.txt
211 total
yoga@macbook-pro:~/OS$ █
```

48)tac command:

Description:

This command is used to concatenate and print the files in reverse order.

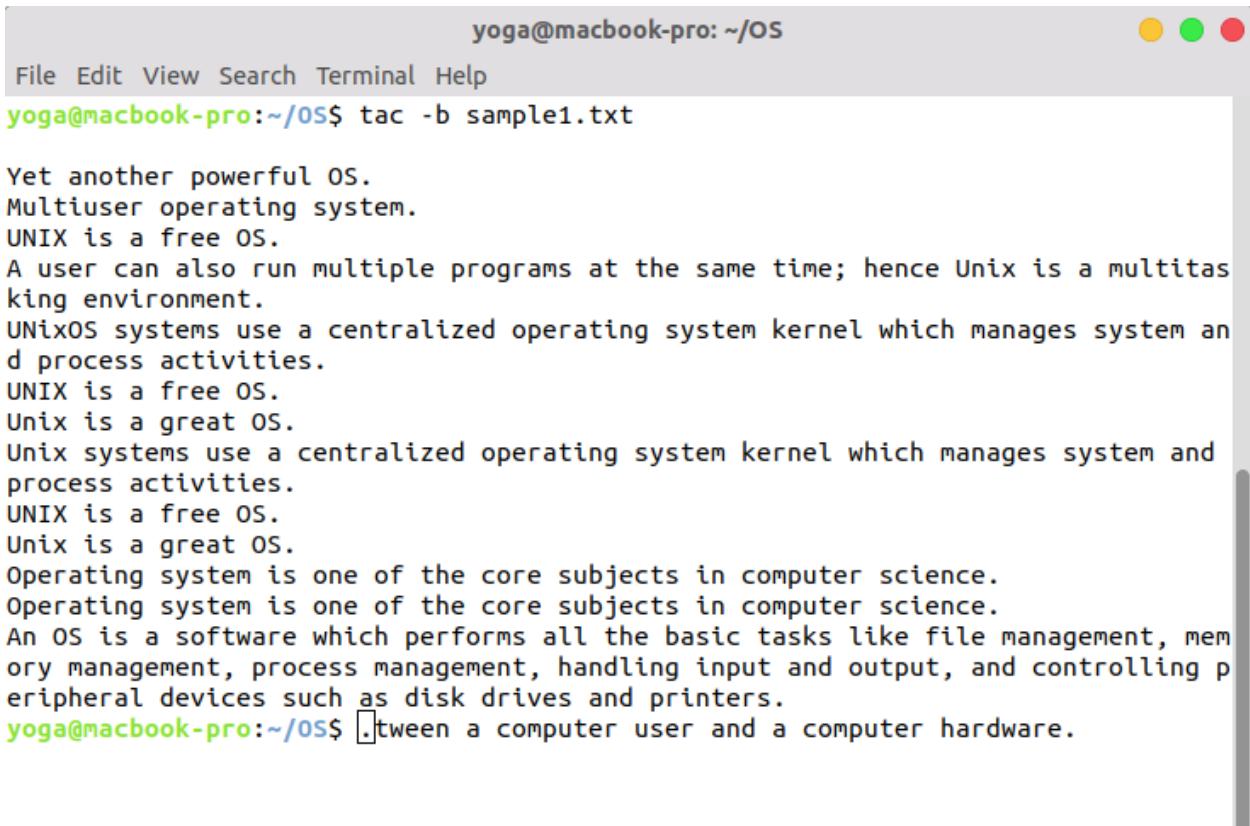
Syntax:

 tac [OPTION]...[FILE]...

[OPTION]:

- -b:This command attaches a separator before each file
- -r:This option interprets separator as regular expression

- -s: This Option use String as separator



The screenshot shows a terminal window titled "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The title bar also displays "yoga@macbook-pro: ~/OS". The terminal content shows the output of the command "tac -b sample1.txt". The text is reversed, starting with "Yet another powerful OS." and ending with ".tween a computer user and a computer hardware."

```

yoga@macbook-pro:~/OS$ tac -b sample1.txt

Yet another powerful OS.
Multiuser operating system.
UNIX is a free OS.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UnixOS systems use a centralized operating system kernel which manages system and process activities.
UNIX is a free OS.
Unix is a great OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
UNIX is a free OS.
Unix is a great OS.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
yoga@macbook-pro:~/OS$ .tween a computer user and a computer hardware.

```

49)awk command:

Description:

Awk is a utility that enable user to write effective programs in the form of statements that define text patterns that are to be searched in each line of a document

Mostly used for pattern scanning and processing.

Also can be used for arithmetic and string operations

Using built in Variables:

NR:Keeps count of number of input records

NF:Keeps count of number of fields

FS:Contains the field separator character

RS:Stores the current record separator character

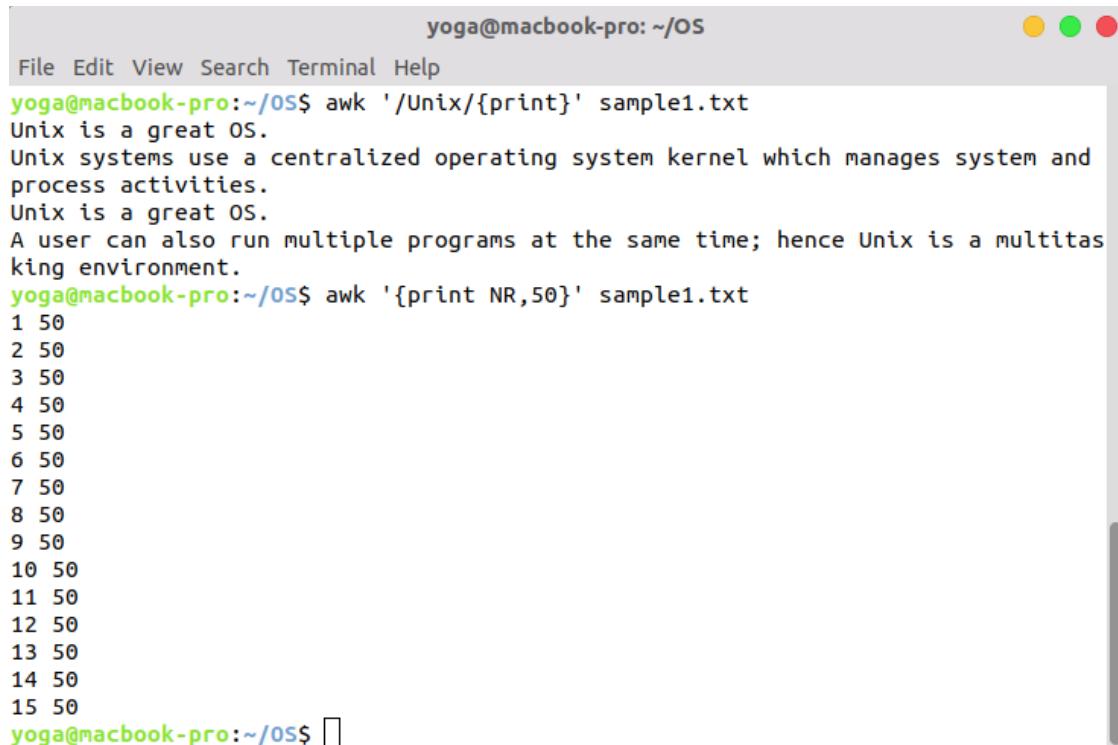
OFS:Stores the current output field separator

ORS:Stores the current output record separator

Syntax:

- awk options 'selection_criteria {action}' input-file>output-file
- awk '{print}' FILE// Prints every line of data from the file

- awk '/ pattern / {print}' FILE Print lines of a file that matches the pattern
- awk '{print NR,\$0}' FILE//Prints Line number



```
yoga@macbook-pro:~/OS$ awk '/Unix/{print}' sample1.txt
Unix is a great OS.
Unix systems use a centralized operating system kernel which manages system and
process activities.
Unix is a great OS.
A user can also run multiple programs at the same time; hence Unix is a multitasking
environment.

yoga@macbook-pro:~/OS$ awk '{print NR,50}' sample1.txt
1 50
2 50
3 50
4 50
5 50
6 50
7 50
8 50
9 50
10 50
11 50
12 50
13 50
14 50
15 50
```

- awk '{print \$n}' FILE// Prints nth row data

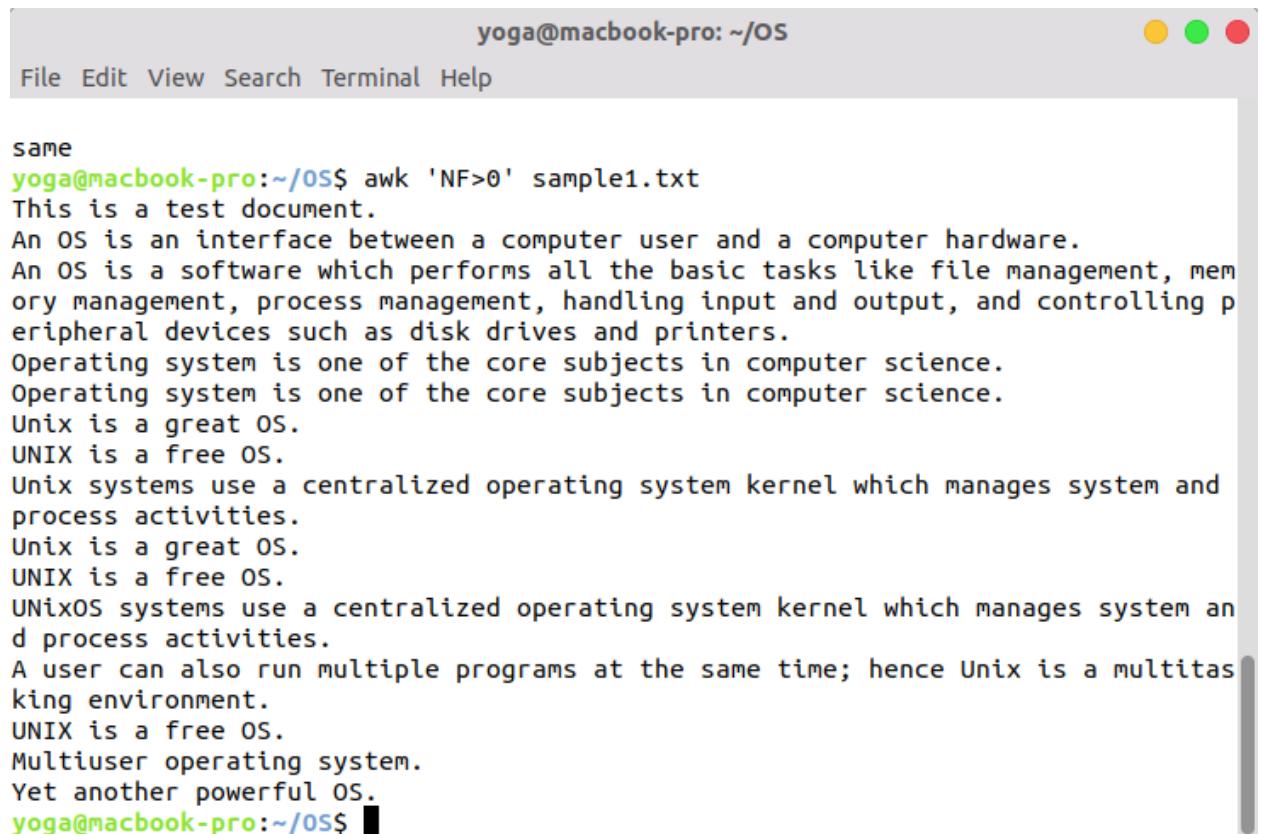


```
yoga@macbook-pro:~/OS$ awk '{print NR,50}' sample1.txt
1 50
2 50
3 50
4 50
5 50
6 50
7 50
8 50
9 50
10 50
11 50
12 50
13 50
14 50
15 50

yoga@macbook-pro:~/OS$ awk '/Unix/{print $10}' sample1.txt
manages

same
```

- awk 'NF >0' FILE //Prints any non-empty line



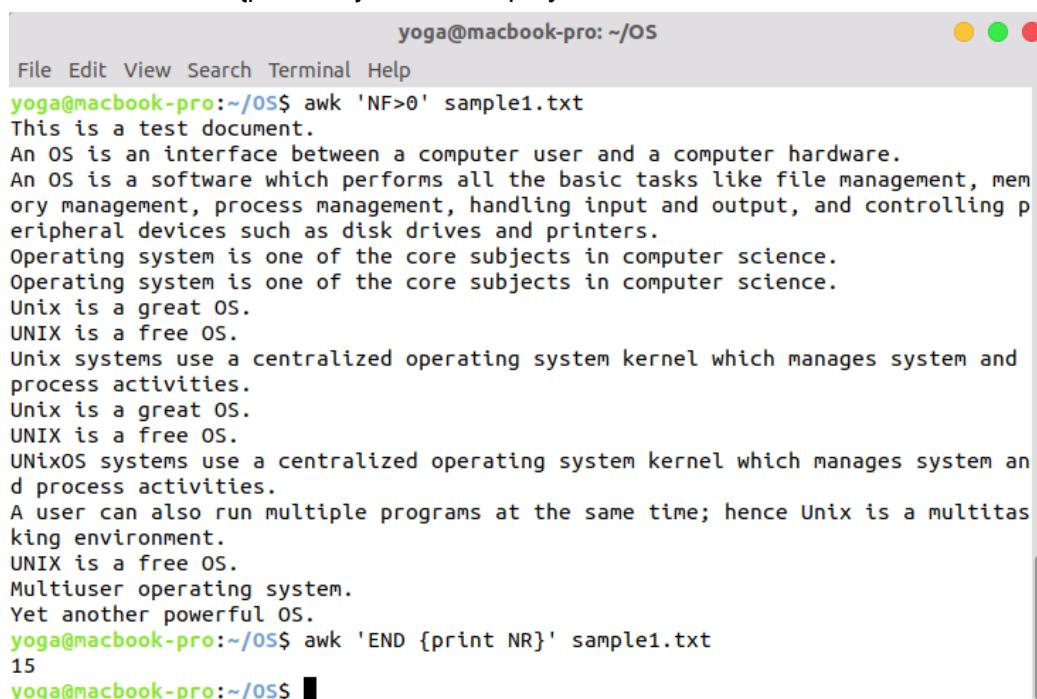
```

yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help

same
yoga@macbook-pro:~/OS$ awk 'NF>0' sample1.txt
This is a test document.
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
UNIXOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.
yoga@macbook-pro:~/OS$ █

```

- awk 'END {print NR}' FILE// Displays the count of lines



```

yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help

yoga@macbook-pro:~/OS$ awk 'NF>0' sample1.txt
This is a test document.
An OS is an interface between a computer user and a computer hardware.
An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
Operating system is one of the core subjects in computer science.
Operating system is one of the core subjects in computer science.
Unix is a great OS.
UNIX is a free OS.
Unix systems use a centralized operating system kernel which manages system and process activities.
Unix is a great OS.
UNIX is a free OS.
UNIXOS systems use a centralized operating system kernel which manages system and process activities.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.
yoga@macbook-pro:~/OS$ awk 'END {print NR}' sample1.txt
15
yoga@macbook-pro:~/OS$ █

```

50)jobs command:

Description:

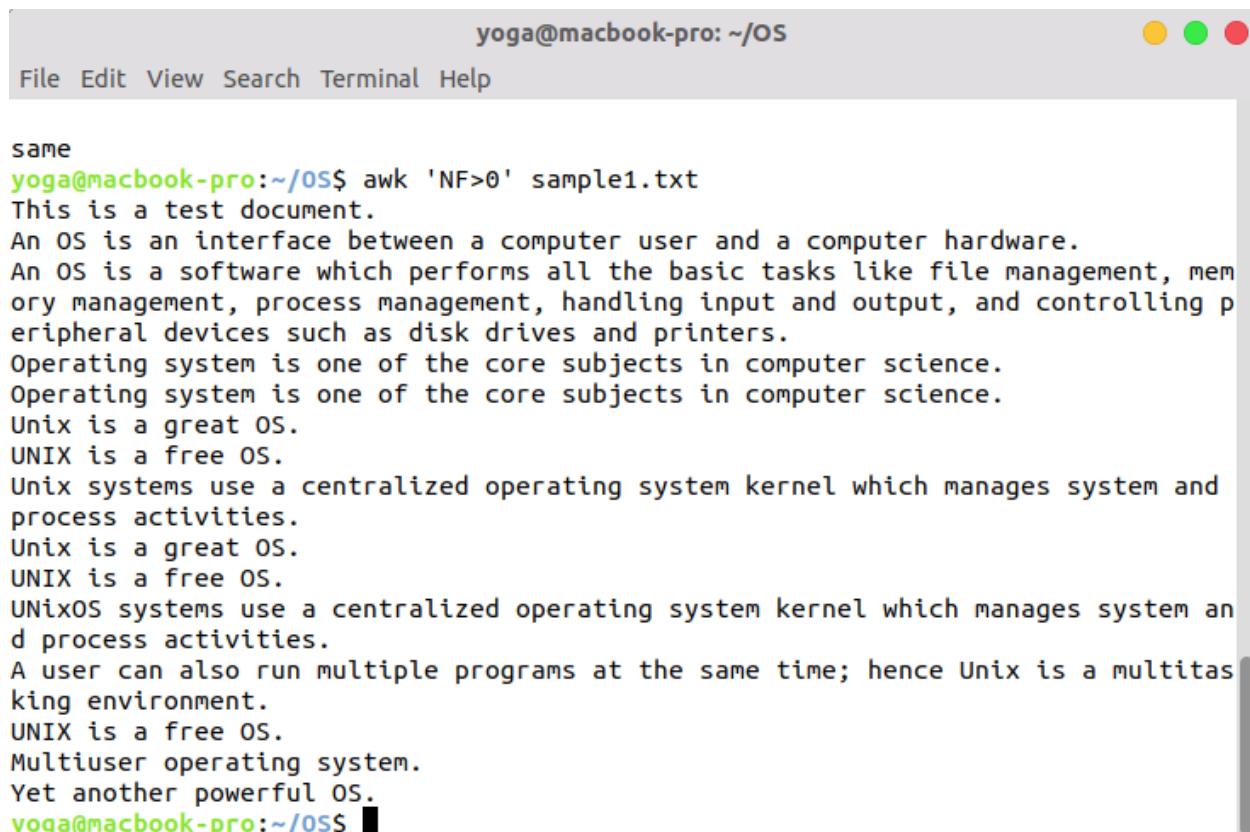
This command is used to list the jobs that are running in the background and in the foreground.

Syntax:

jobs [OPTION]//By Default jobs does not require any OPTIONS

[OPTION]:

- -l:Lists process IDs in addition to the normal information.
- -p:Lists process IDs only.
- -r:Restricts output to running jobs.
- -s:Restricts output to stopped jobs.



The screenshot shows a terminal window titled "yoga@macbook-pro: ~/OS". The window has three colored status icons (yellow, green, red) in the top right corner. The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal output displays the contents of a file named "sample1.txt" which was processed by the command "awk 'NF>0'". The file contains several lines of text, all of which begin with "Operating system is one of the core subjects in computer science.", except for the first line which starts with "same". The terminal prompt "yoga@macbook-pro:~/OS\$" is visible at the bottom.

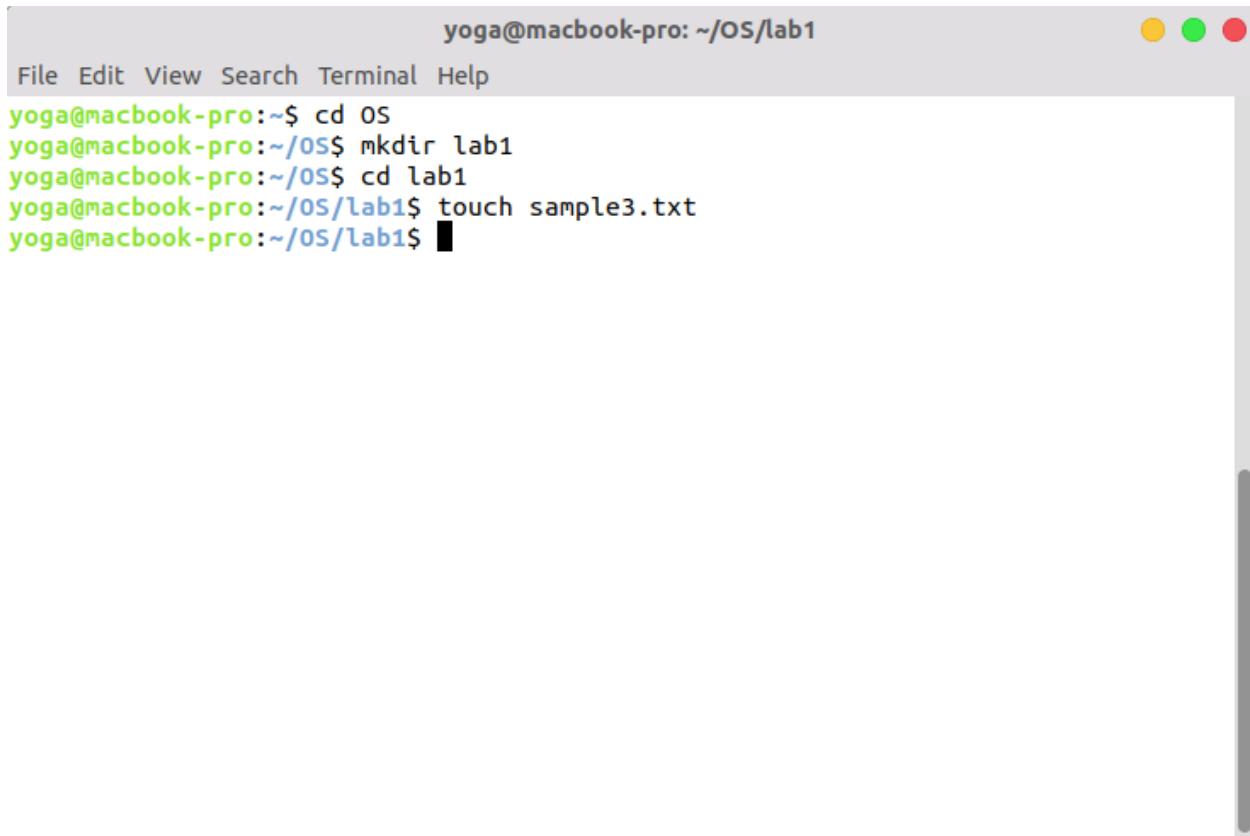
```
same
yoga@macbook-pro:~/OS$ awk 'NF>0' sample1.txt
This is a test document.
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UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.
yoga@macbook-pro:~/OS$
```

2. Create a directory and create a file inside that directory.

ANS:

- i)mkdir <directory_name> creates the required directory
- ii)cd <directory_name> to move to that specified directory
- iii)cat > <filename> to create the file

iv) touch <filename> to create the file



The screenshot shows a macOS Terminal window with the following session:

```
yoga@macbook-pro: ~/OS/lab1
File Edit View Search Terminal Help
yoga@macbook-pro:~$ cd OS
yoga@macbook-pro:~/OS$ mkdir lab1
yoga@macbook-pro:~/OS$ cd lab1
yoga@macbook-pro:~/OS/lab1$ touch sample3.txt
yoga@macbook-pro:~/OS/lab1$ █
```

3. List the files and directories that are empty in a working directory.

ANS:find -empty

```
yoga@macbook-pro:~/OS/lab1
File Edit View Search Terminal Help
yoga@macbook-pro:~$ cd OS
yoga@macbook-pro:~/OS$ mkdir lab1
yoga@macbook-pro:~/OS$ cd lab1
yoga@macbook-pro:~/OS/lab1$ touch sample3.txt
yoga@macbook-pro:~/OS/lab1$ find -emptyyy
find: unknown predicate '-emptyyy'
yoga@macbook-pro:~/OS/lab1$ find -empty
./sample3.txt
yoga@macbook-pro:~/OS/lab1$ █
```

4. Show commands to delete empty and non-empty directory.

ANS:

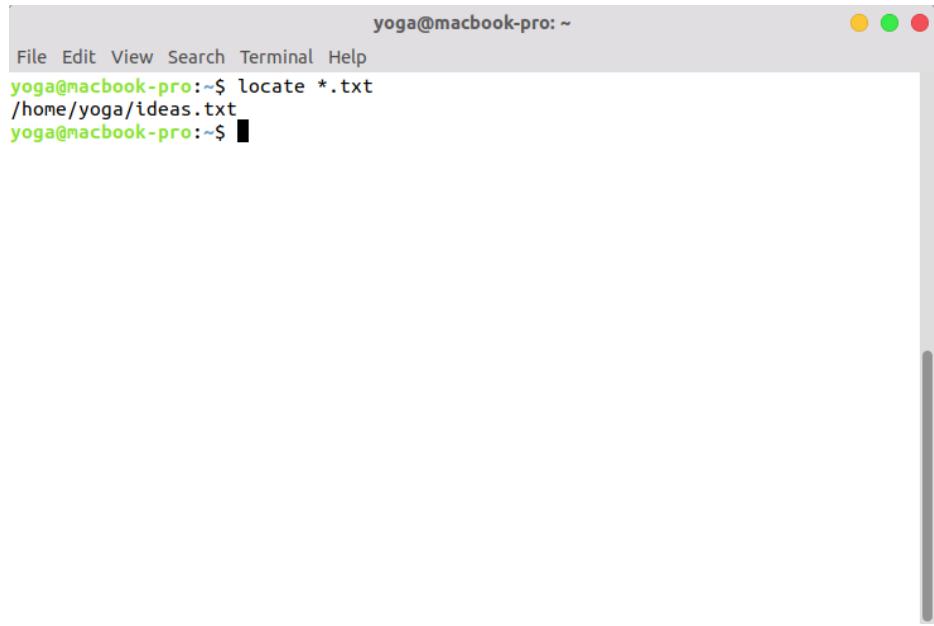
rm -d to delete empty directory rm and
rm -r to delete non empty directory

```
yoga@macbook-pro:~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ mkdir spare
yoga@macbook-pro:~/OS$ rm -d spare
yoga@macbook-pro:~/OS$ ls
lab1 sample1.txt sample2.txt
yoga@macbook-pro:~/OS$ rm -r lab1
yoga@macbook-pro:~/OS$ ls
sample1.txt sample2.txt
yoga@macbook-pro:~/OS$ █
```

5. Find the location of the input files using locate and find command.

Locate Command:

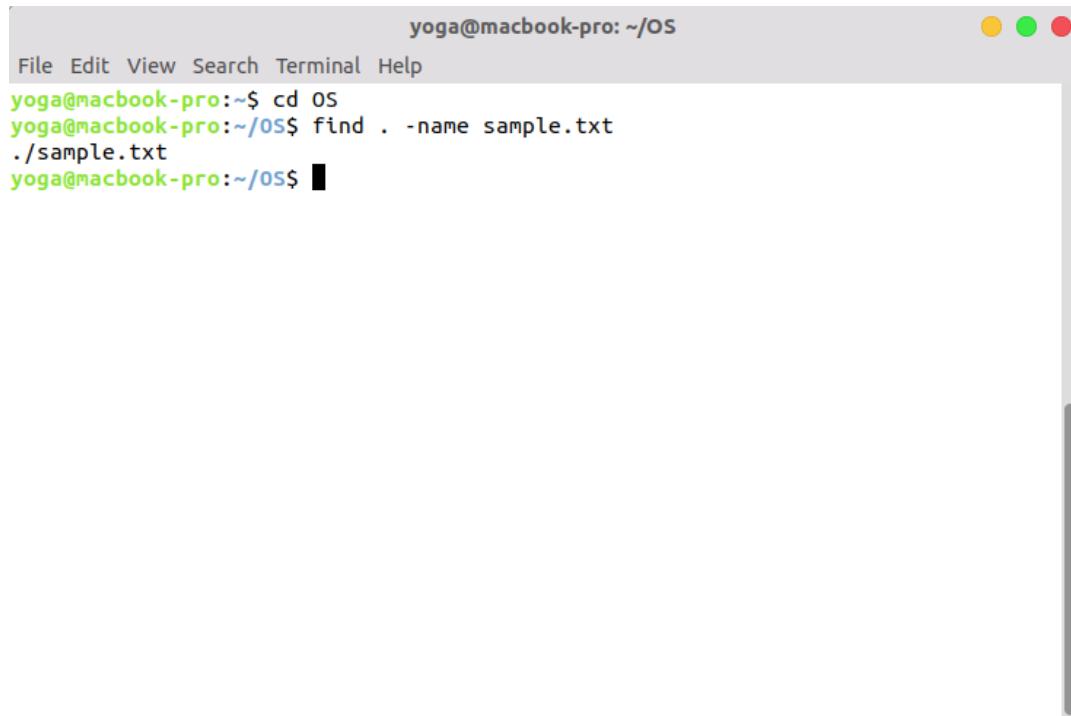
ANS:locate *.txt



```
yoga@macbook-pro: ~
File Edit View Search Terminal Help
yoga@macbook-pro:~$ locate *.txt
/home/yoga/ideas.txt
yoga@macbook-pro:~$ █
```

A screenshot of a macOS Terminal window. The title bar says "yoga@macbook-pro: ~". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The main pane shows the command "locate *.txt" and its output, "/home/yoga/ideas.txt", in green text. The window has the standard OS X look with red, yellow, and green close buttons in the top right corner.

ANS:Find Command:find directoryname -name *.txt

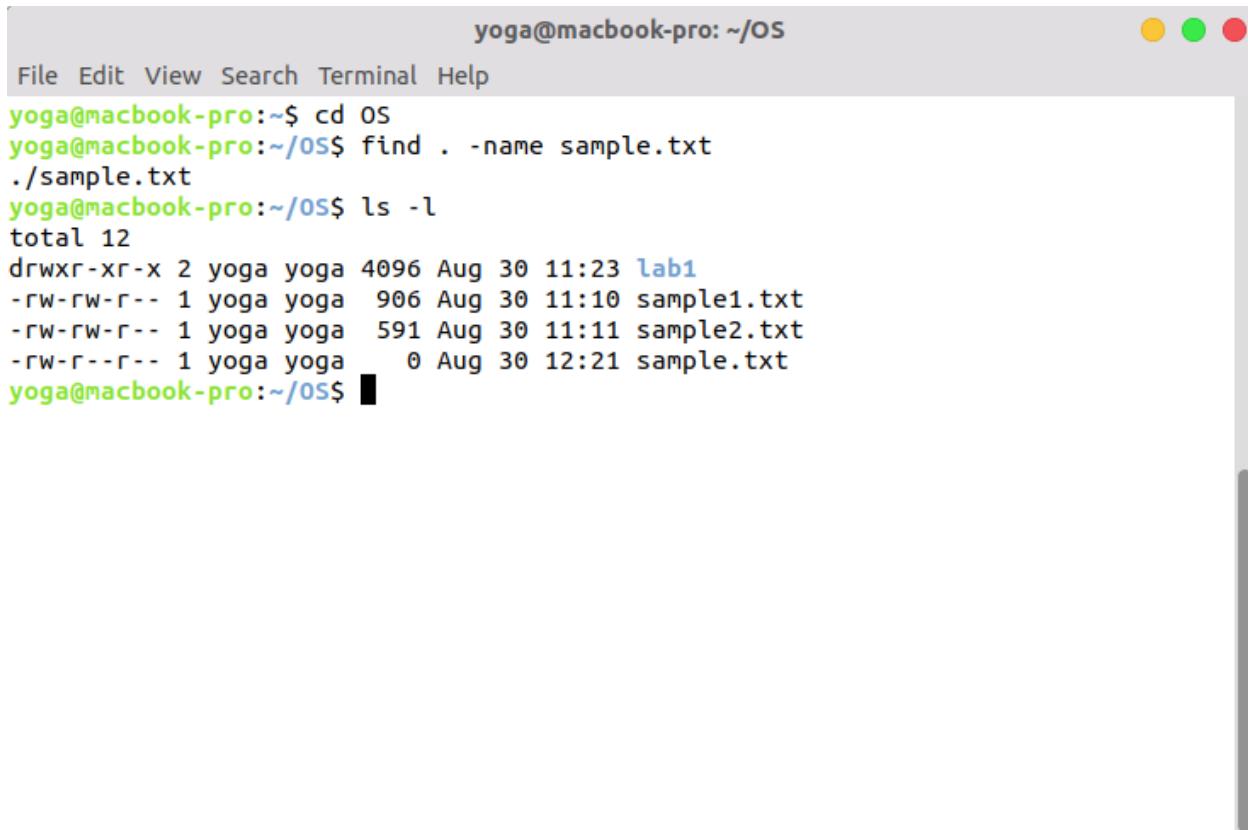


```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~$ cd OS
yoga@macbook-pro:~/OS$ find . -name sample.txt
./sample.txt
yoga@macbook-pro:~/OS$ █
```

A screenshot of a macOS Terminal window. The title bar says "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The main pane shows the command "find . -name sample.txt" and its output, "./sample.txt", in green text. The window has the standard OS X look with red, yellow, and green close buttons in the top right corner.

6. View the user permissions and ownership of the files in the current directory and change the ownership of some selected files to another user.

ANS:ls -l



The screenshot shows a terminal window titled "yoga@macbook-pro: ~/OS". The window has three colored status icons (yellow, green, red) in the top right corner. The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal session shows the following commands and output:

```
yoga@macbook-pro:~$ cd OS
yoga@macbook-pro:~/OS$ find . -name sample.txt
./sample.txt
yoga@macbook-pro:~/OS$ ls -l
total 12
drwxr-xr-x 2 yoga yoga 4096 Aug 30 11:23 lab1
-rw-rw-r-- 1 yoga yoga  906 Aug 30 11:10 sample1.txt
-rw-rw-r-- 1 yoga yoga  591 Aug 30 11:11 sample2.txt
-rw-r--r-- 1 yoga yoga     0 Aug 30 12:21 sample.txt
yoga@macbook-pro:~/OS$
```

7. List all the files in the current directory and subdirectories.

ANS:ls -R

```
yoga@macbook-pro:~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~$ cd OS
yoga@macbook-pro:~/OS$ find . -name sample.txt
./sample.txt
yoga@macbook-pro:~/OS$ ls -l
total 12
drwxr-xr-x 2 yoga yoga 4096 Aug 30 11:23 lab1
-rw-rw-r-- 1 yoga yoga 906 Aug 30 11:10 sample1.txt
-rw-rw-r-- 1 yoga yoga 591 Aug 30 11:11 sample2.txt
-rw-r--r-- 1 yoga yoga 0 Aug 30 12:21 sample.txt
yoga@macbook-pro:~/OS$ ls -R
.:
lab1 sample1.txt sample2.txt sample.txt

./lab1:
sample3.txt
yoga@macbook-pro:~/OS$
```

8. Concatenate the two input files: “sample1.txt” and “sample2.txt” and save it to a new file named “Input”.

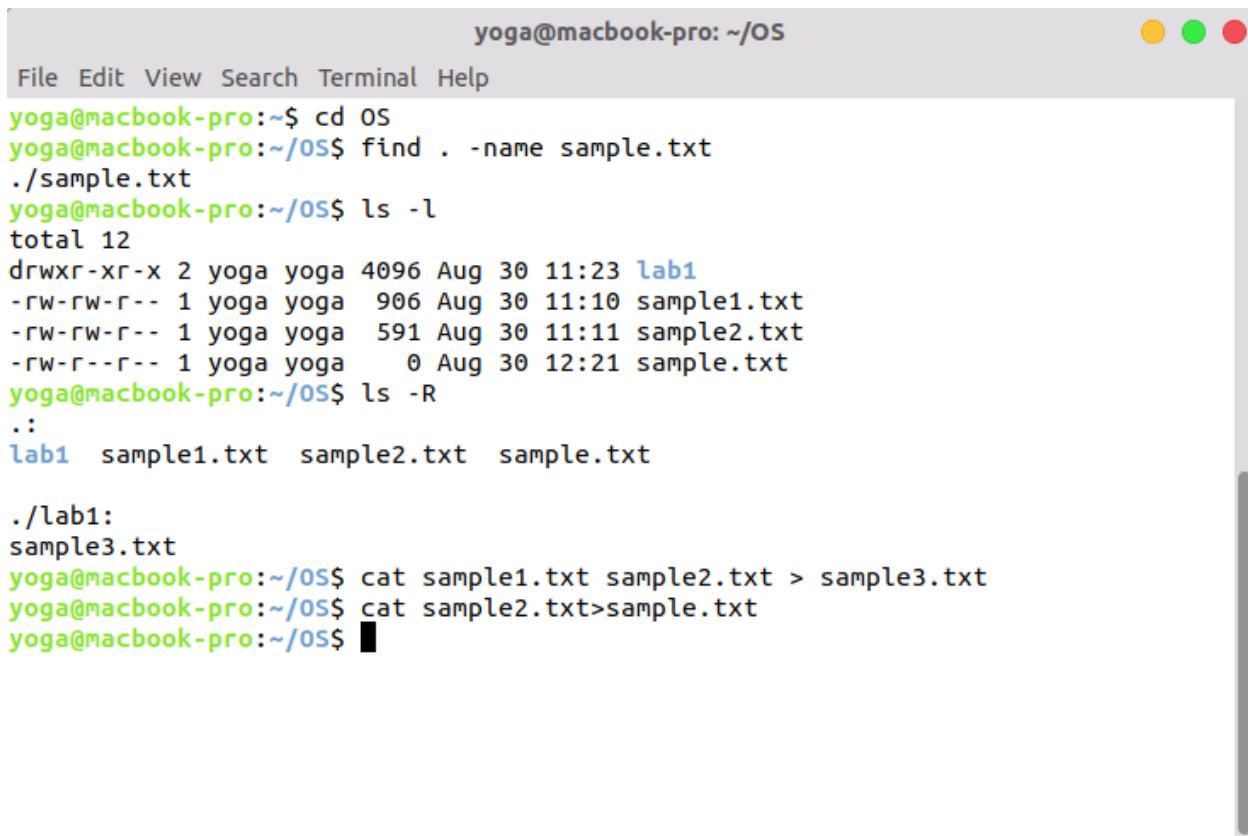
ANS:cat sample1.txt sample2.txt > sample3.txt

```
yoga@macbook-pro:~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~$ cd OS
yoga@macbook-pro:~/OS$ find . -name sample.txt
./sample.txt
yoga@macbook-pro:~/OS$ ls -l
total 12
drwxr-xr-x 2 yoga yoga 4096 Aug 30 11:23 lab1
-rw-rw-r-- 1 yoga yoga 906 Aug 30 11:10 sample1.txt
-rw-rw-r-- 1 yoga yoga 591 Aug 30 11:11 sample2.txt
-rw-r--r-- 1 yoga yoga 0 Aug 30 12:21 sample.txt
yoga@macbook-pro:~/OS$ ls -R
.:
lab1 sample1.txt sample2.txt sample.txt

./lab1:
sample3.txt
yoga@macbook-pro:~/OS$ cat sample1.txt sample2.txt > sample3.txt
yoga@macbook-pro:~/OS$
```

9. Copy the contents of file 'sample2.txt' to 'sample.txt'

ANS:cat sample2.txt>sample.txt



```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~$ cd OS
yoga@macbook-pro:~/OS$ find . -name sample.txt
./sample.txt
yoga@macbook-pro:~/OS$ ls -l
total 12
drwxr-xr-x 2 yoga yoga 4096 Aug 30 11:23 lab1
-rw-rw-r-- 1 yoga yoga 906 Aug 30 11:10 sample1.txt
-rw-rw-r-- 1 yoga yoga 591 Aug 30 11:11 sample2.txt
-rw-r--r-- 1 yoga yoga 0 Aug 30 12:21 sample.txt
yoga@macbook-pro:~/OS$ ls -R
.:
lab1  sample1.txt  sample2.txt  sample.txt

./lab1:
sample3.txt
yoga@macbook-pro:~/OS$ cat sample1.txt sample2.txt > sample3.txt
yoga@macbook-pro:~/OS$ cat sample2.txt>sample.txt
yoga@macbook-pro:~/OS$ █
```

10. Append the file contents of input file 'sample2.txt' to the end of the first input file

'Sample1.txt'.

ANS:cat sample2.txt >>sample1.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cd OS
yoga@macbook-pro:~/OS$ find . -name sample.txt
./sample.txt
yoga@macbook-pro:~/OS$ ls -l
total 12
drwxr-xr-x 2 yoga yoga 4096 Aug 30 11:23 lab1
-rw-rw-r-- 1 yoga yoga 906 Aug 30 11:10 sample1.txt
-rw-rw-r-- 1 yoga yoga 591 Aug 30 11:11 sample2.txt
-rw-r--r-- 1 yoga yoga 0 Aug 30 12:21 sample.txt
yoga@macbook-pro:~/OS$ ls -R
.:
lab1 sample1.txt sample2.txt sample.txt

./lab1:
sample3.txt
yoga@macbook-pro:~/OS$ cat sample1.txt sample2.txt > sample3.txt
yoga@macbook-pro:~/OS$ cat sample2.txt>sample.txt
yoga@macbook-pro:~/OS$ cat sample2.txt >>sample1.txt
yoga@macbook-pro:~/OS$ █
```

11. Remove the permission for the users to read, write and execute the file 'sample.txt'.
chmod -rwx 'sample.txt'

```
Terminal ▾ Sun Aug 30, 12:32:29 yoga@macbook-pro: ~/OS
yoga Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ clear

yoga@macbook-pro:~/OS$ chmod -rwx 'sample3.txt'
chmod: cannot access ''sample3.txt'': No such file or directory
yoga@macbook-pro:~/OS$ ls
lab1 sample1.txt sample2.txt sample3.txt sample.txt
yoga@macbook-pro:~/OS$ cat sample3.txt
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Operating system is one of the core subjects in computer science.
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Multouser operating system.
Yet another powerful OS.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Osso
nna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which i
s freely available.
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yoga@macbook-pro:~/OS$ chmod -rwx 'sample3.txt'
yoga@macbook-pro:~/OS$ cat sample3.txt
cat: sample3.txt: Permission denied
yoga@macbook-pro:~/OS$
```

12. Display the current date with the day of week, month, time and the year.

ANS:

date +"Date:%D Day of the Week:%u Day of the Month:%d Day of the Year:%j Time:%T"

%D displays Date

%u displays Day of the week

%d displays Day of the Month with leading zeroes

%j displays Day of the year with upto two leading zeroes

%T displays Time in HH:MM:SS format

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ date +"Date:%D Day of the Week:%u Day of the Month:%d Day
of the Year:%j Time:%T"
Date:08/30/20 Day of the Week:7 Day of the Month:30 Day of the Year:243 Time:12:
33:31
yoga@macbook-pro:~/OS$
```

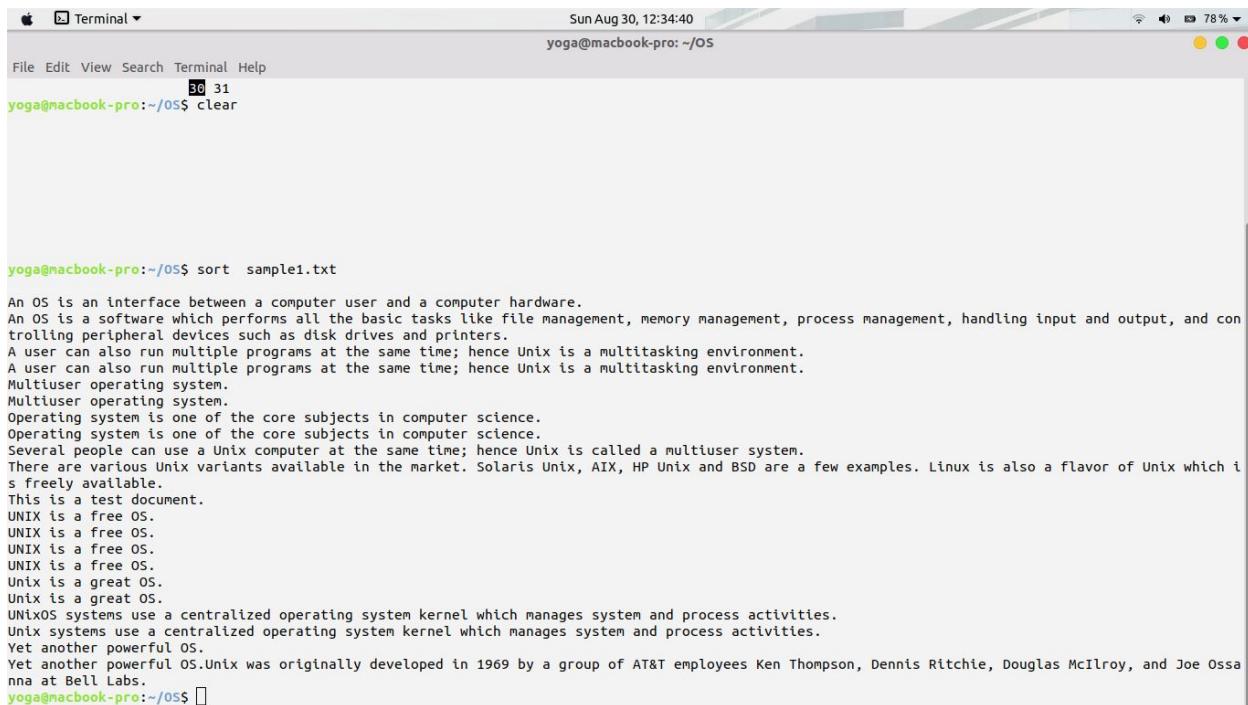
13. Show the calendar of previous, current and next month.

ANS:cal -3

```
yoga@macbook-pro:~/OS$ date +"Date:%D Day of the Week:%u Day of the Month:%d Day of the Year:%j Time:%T"
Date:08/30/20 Day of the Week:7 Day of the Month:30 Day of the Year:243 Time:12:33:31
yoga@macbook-pro:~/OS$ cal -3
              2020
July           August          September
Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa   Su Mo Tu We Th Fr Sa
      1  2  3  4       2  3  4  5  6  7  8     1  2  3  4  5
  5  6  7  8  9 10 11    9 10 11 12 13 14 15  6  7  8  9 10 11 12
12 13 14 15 16 17 18   16 17 18 19 20 21 22 13 14 15 16 17 18 19
19 20 21 22 23 24 25   23 24 25 26 27 28 29 20 21 22 23 24 25 26
26 27 28 29 30 31      30
yoga@macbook-pro:~/OS$
```

14. Sort the contents of the file 'sample1.txt' in alphabetical order.

ANS:sort sample1.txt



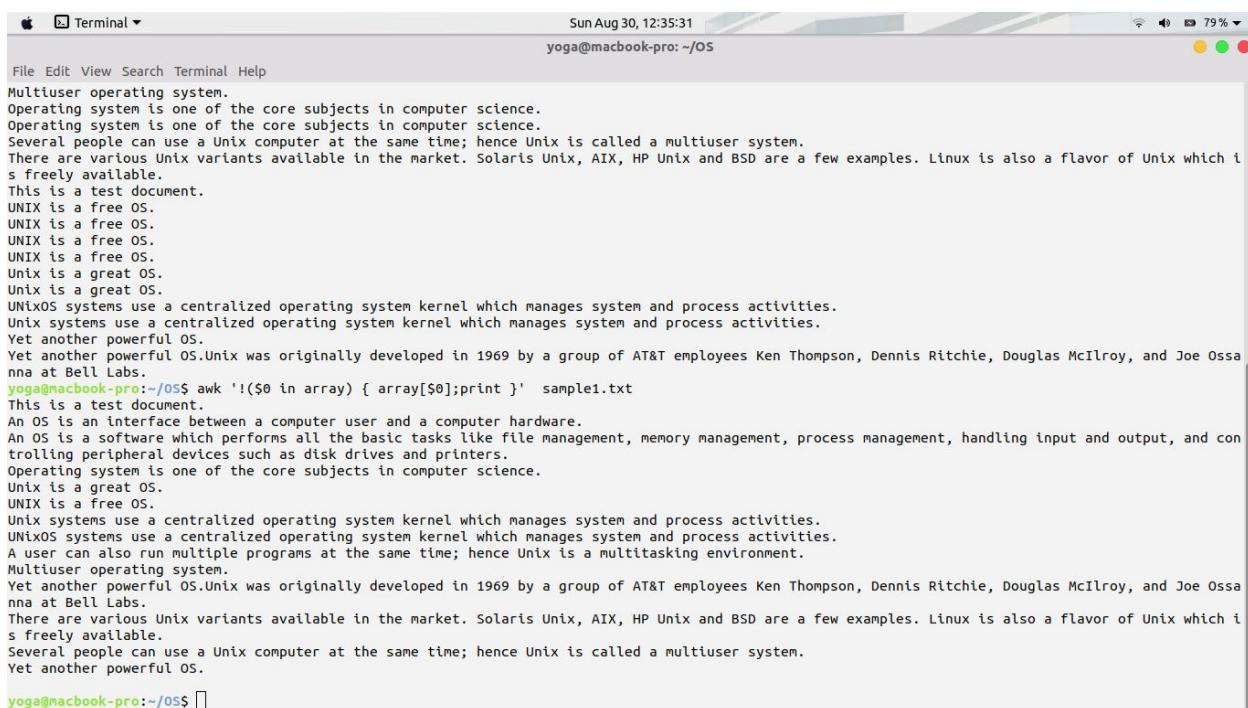
```
Terminal Sun Aug 30, 12:34:40 yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
B0 31
yoga@macbook-pro:~/OS$ clear

yoga@macbook-pro:~/OS$ sort sample1.txt

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Yet another powerful OS.
Yet another powerful OS.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
yoga@macbook-pro:~/OS$
```

15. Erase duplicate records in the file 'sample1.txt' and display only the unique records

ANS:awk '!(\$0 in array) { array[\$0];print }' sample1.txt

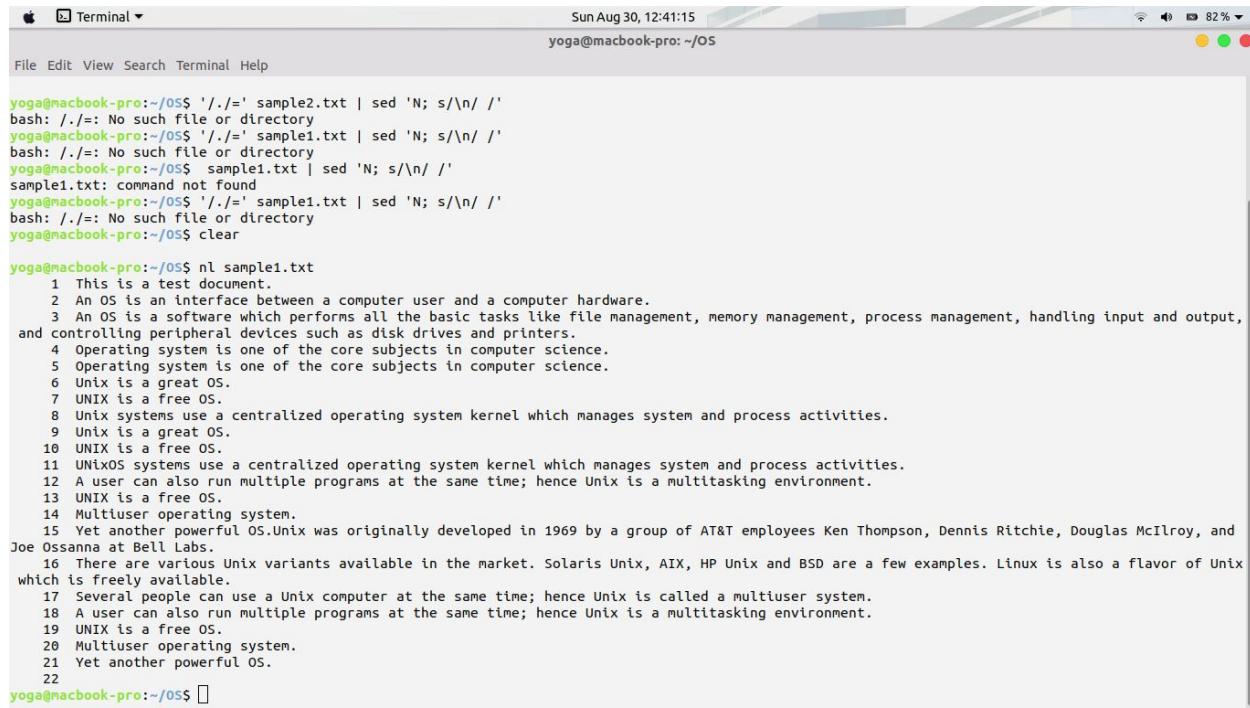


```
Terminal Sun Aug 30, 12:35:31 yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
Multisuser operating system.
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Yet another powerful OS.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
yoga@macbook-pro:~/OS$ awk '!($0 in array) { array[$0];print }' sample1.txt
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Yet another powerful OS.
yoga@macbook-pro:~/OS$
```

16. Add line numbers to the file 'sample2.txt'

ANS:

nl sample1.txt



The screenshot shows a Mac OS X terminal window titled "Terminal". The status bar at the top indicates the date and time as "Sun Aug 30, 12:41:15" and the battery level as "82%". The command prompt is "yoga@macbook-pro:~/OS". The terminal window displays the following text:

```
yoga@macbook-pro:~/OS$ ./=' sample2.txt | sed 'N; s/\n/ /'
bash: ./=: No such file or directory
yoga@macbook-pro:~/OS$ './=' sample1.txt | sed 'N; s/\n/ /'
bash: ./=: No such file or directory
yoga@macbook-pro:~/OS$ sample1.txt | sed 'N; s/\n/ /'
sample1.txt: command not found
yoga@macbook-pro:~/OS$ './=' sample1.txt | sed 'N; s/\n/ /'
bash: ./=: No such file or directory
yoga@macbook-pro:~/OS$ clear

yoga@macbook-pro:~/OS$ nl sample1.txt
 1 This is a test document.
 2 An OS is an interface between a computer user and a computer hardware.
 3 An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
 4 Operating system is one of the core subjects in computer science.
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 6 Unix is a great OS.
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 9 Unix is a great OS.
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20 Multiuser operating system.
21 Yet another powerful OS.
22
```

17. Find out whether the two pairs of input files are identical or not.

Compare sample1.txt and sample2.txt

ANS:cmp sample1.txt sample2.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
10 UNIX is a free OS.
11 UnixOS systems use a centralized operating system kernel which manages s
ystem and process activities.
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18 A user can also run multiple programs at the same time; hence Unix is a
multitasking environment.
19 UNIX is a free OS.
20 Multiuser operating system.
21 Yet another powerful OS.
22
yoga@macbook-pro:~/OS$ cmp sample1.txt sample2.txt
sample1.txt sample2.txt differ: byte 1, line 1
yoga@macbook-pro:~/OS$
```

Displays where the first difference is found.Hence the files are not identical from the above screenshot.

18. Show how the input file “sample1.txt” differs line by line from “sample2.txt” in context and unified mode.

ANS:

Context mode:

```
diff -c sample1.txt sample2.txt
```

```

Sun Aug 30, 12:43:19
yoga@macbook-pro:~/OS

File Edit View Search Terminal Help
22
yoga@macbook-pro:~/OS$ cmp sample1.txt sample2.txt
sample1.txt sample2.txt differ: byte 1, line 1
yoga@macbook-pro:~/OS$ clear

yoga@macbook-pro:~/OS$ diff -c sample1.txt sample2.txt
*** sample1.txt 2020-08-30 12:30:26.560056987 +0530
--- sample2.txt 2020-08-30 11:11:00.833589577 +0530
*****
*** 1,18 ****
! This is a test document.
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--- 1,4 ----
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A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
yoga@macbook-pro:~/OS$ 

```

Unified Mode:

`diff -u sample1.txt sample2.txt`

```

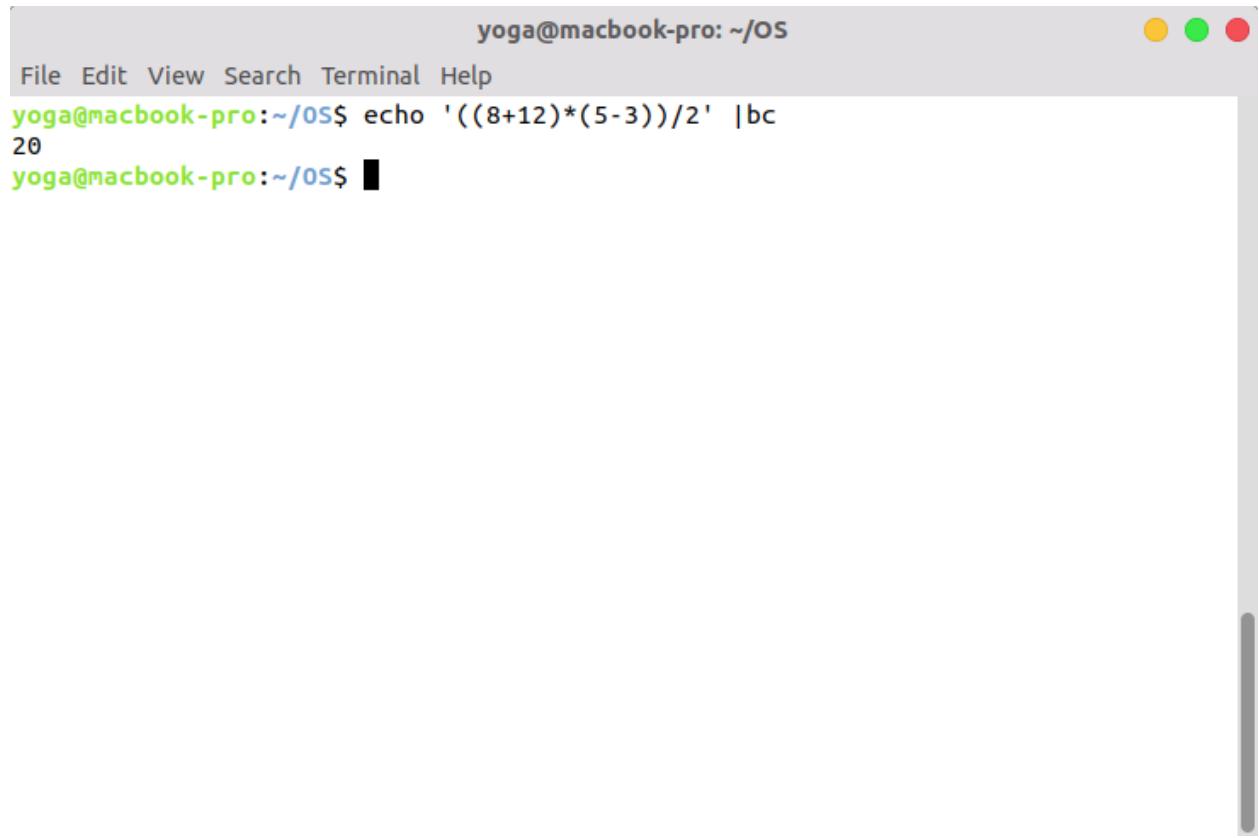
Sun Aug 30, 12:43:34
yoga@macbook-pro:~/OS

File Edit View Search Terminal Help
sanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which
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is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
yoga@macbook-pro:~/OS$ diff -u sample1.txt sample2.txt
--- sample1.txt 2020-08-30 12:30:26.560056987 +0530
+++ sample2.txt 2020-08-30 11:11:00.833589577 +0530
@@ -1,18 +1,4 @@
This is a test document.
-An OS is an interface between a computer user and a computer hardware.
-An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and co
ntrolling peripheral devices such as disk drives and printers.
-Operating system is one of the core subjects in computer science.
-Operating system is one of the core subjects in computer science.
-Unix is a great OS.
-UNIX is a free OS.
-Unix systems use a centralized operating system kernel which manages system and process activities.
-Unix is a great OS.
-UNIX is a free OS.
-UNIXOS systems use a centralized operating system kernel which manages system and process activities.
-A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
-UNIX is a free OS.
-Multiuser operating system.
-Yet another powerful OS.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Os
sanna at Bell Labs.
+Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
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is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
yoga@macbook-pro:~/OS$ 

```

19. Solve the arithmetic expression: $((8+12)*(5-3))/2$ using linux commands

ANS:`echo '((8+12)*(5-3))/2' |bc`



A screenshot of a macOS Terminal window. The title bar shows "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The main pane displays the following command and its output:

```
yoga@macbook-pro:~/OS$ echo '((8+12)*(5-3))/2' |bc
20
yoga@macbook-pro:~/OS$
```

20. Cut and display the first 10 characters of every line of the file “Input.txt”.

ANS:cut -c1 -10 Input.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cut -c1-10 input.txt
This is a
An OS is a
An OS is a
Operating
Operating
Unix is a
UNIX is a
Unix syste
Unix is a
UNIX is a
UNIxOS sys
A user can
UNIX is a
Multiuser
Yet anothe
There are
Several pe
A user can
UNIX is a
Multiuser
Yet anothe
```

yoga@macbook-pro:~/OS\$ □

21. Print the name of the current working directory.

ANS:pwd

```
yoga@macbook-pro: ~/OS$ pwd  
/home/yoga/OS  
yoga@macbook-pro: ~/OS$ 
```

22. Process Status

- a. List all the running processes with their corresponding PIDs.

ANS:ps -A

```
Terminal ▾ Sun Aug 30, 12:48:52 84 %  
yoga@macbook-pro: ~/OS  
File Edit View Search Terminal Help  
  
yoga@macbook-pro:~/OS$ ps -A  
PID TTY      TIME CMD  
 1 ?        00:00:05 systemd  
 2 ?        00:00:00 kthreadad  
 4 ?        00:00:00 kworker/0:0H  
 6 ?        00:00:00 mm_percpu_wq  
 7 ?        00:00:00 ksoftirqd/0  
 8 ?        00:00:06 rcu_sched  
 9 ?        00:00:00 rcu_bh  
10 ?       00:00:00 migration/0  
11 ?       00:00:00 watchdog/0  
12 ?       00:00:00 cpuhp/0  
13 ?       00:00:00 cpuhp/1  
14 ?       00:00:00 watchdog/1  
15 ?       00:00:00 migration/1  
16 ?       00:00:00 ksoftirqd/1  
18 ?       00:00:00 kworker/1:0H  
19 ?       00:00:00 cpuhp/2  
20 ?       00:00:00 watchdog/2  
21 ?       00:00:00 migration/2  
22 ?       00:00:00 ksoftirqd/2  
24 ?       00:00:00 kworker/2:0H  
25 ?       00:00:00 cpuhp/3  
26 ?       00:00:00 watchdog/3  
27 ?       00:00:00 migration/3  
28 ?       00:00:00 ksoftirqd/3  
30 ?       00:00:00 kworker/3:0H  
31 ?       00:00:00 kdevtmpfs  
32 ?       00:00:00 netns  
33 ?       00:00:00 rcu_tasks_kthre  
34 ?       00:00:00 kauditd  
39 ?       00:00:00 khungtaskd  
40 ?       00:00:00 oom_reaper  
41 ?       00:00:00 writeback  
42 ?       00:00:00 kcompactd0  
43 ?       00:00:00 ksmd  
44 ?       00:00:00 khugepaged
```

- b. List the processes that are not associated with the terminal.

ANS:ps -a

```
Terminal Sun Aug 30, 12:49:11 85%
yoga@macbook-pro:~/OS$ ps -a
File Edit View Search Terminal Help
PID TTY TIME CMD
5043 pts/0 00:00:00 ps
yoga@macbook-pro:~/OS$ ps -a
1727 tty2 00:04:21 Xorg
1745 tty2 00:00:00 gnome-session-b
1869 tty2 00:06:14 gnome-shell
1909 tty2 00:00:23 ibus-daemon
1913 tty2 00:00:00 ibus-dconf
1916 tty2 00:00:00 ibus-x11
1988 tty2 00:00:00 gsd-power
1989 tty2 00:00:00 gsd-print-notif
1991 tty2 00:00:00 gsd-rfkill
1992 tty2 00:00:00 gsd-screensaver
1997 tty2 00:00:00 gsd-sharing
2001 tty2 00:00:00 gsd-xsettings
2009 tty2 00:00:00 gsd-smartcard
2010 tty2 00:00:00 gsd-sound
2012 tty2 00:00:00 gsd-wacom
2022 tty2 00:00:00 gsd-clipboard
2025 tty2 00:00:00 gsd-a11y-settin
2026 tty2 00:00:00 gsd-datetime
2029 tty2 00:00:00 gsd-color
2030 tty2 00:00:00 gsd-keyboard
2034 tty2 00:00:00 gsd-housekeepin
2040 tty2 00:00:00 gsd-mouse
2041 tty2 00:00:03 gsd-media-keys
2064 tty2 00:00:00 gsd-printer
2086 tty2 00:00:00 gsd-disk-utilit
2091 tty2 00:00:03 kdeconnectd
2093 tty2 00:00:02 nautilus-deskt
2112 tty2 00:00:06 ibus-engine-sim
2193 tty2 00:11:07 MainThread
2291 tty2 00:00:19 Privileged Cont
2319 tty2 00:01:05 Web Content
2378 tty2 00:01:13 WebExtensions
2432 tty2 00:00:00 chrome-gnome-sh
2474 tty2 00:00:00 update-notifier
2476 tty2 00:00:07 gnome-software
2539 tty2 00:07:12 Web Content
2668 tty2 00:02:21 Web Content
2685 tty2 00:00:00 deja-dup-monito
2790 tty2 00:04:17 Web Content
3824 tty2 00:00:54 Web Content
4099 tty2 00:01:03 MainThread
4907 tty2 00:00:01 file:// Content
4947 tty2 00:00:00 Web Content
5050 pts/0 00:00:00 ps
yoga@macbook-pro:~/OS$
```

c. List the processes that are associated with the terminal.

ANS:ps -T

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
2091 tty2 00:00:03 kdeconnectd
2093 tty2 00:00:02 nautilus-deskt
2112 tty2 00:00:06 ibus-engine-sim
2193 tty2 00:11:07 MainThread
2291 tty2 00:00:19 Privileged Cont
2319 tty2 00:01:05 Web Content
2378 tty2 00:01:13 WebExtensions
2432 tty2 00:00:00 chrome-gnome-sh
2474 tty2 00:00:00 update-notifier
2476 tty2 00:00:07 gnome-software
2539 tty2 00:07:12 Web Content
2668 tty2 00:02:21 Web Content
2685 tty2 00:00:00 deja-dup-monito
2790 tty2 00:04:17 Web Content
3824 tty2 00:00:54 Web Content
4099 tty2 00:01:03 MainThread
4907 tty2 00:00:01 file:// Content
4947 tty2 00:00:00 Web Content
5050 pts/0 00:00:00 ps
yoga@macbook-pro:~/OS$ ps -T
  PID  SPID TTY      TIME CMD
 2221  2221 pts/0    00:00:00 bash
 5083  5083 pts/0    00:00:00 ps
yoga@macbook-pro:~/OS$
```

23. Print the number of characters, number of lines and number of words all the given input files.

ANS:

wc -mwl sample1.txt sample2.txt

“m” displays no of characters ,”w” for no of words and “l” for no of lines

In Terminal ,No of lines ,no of words and no of characters are displayed in order respectively along with filename

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
2291 ttys2      00:00:19 Privileged Cont
2319 ttys2      00:01:05 Web Content
2378 ttys2      00:01:13 WebExtensions
2432 ttys2      00:00:00 chrome-gnome-sh
2474 ttys2      00:00:00 update-notifier
2476 ttys2      00:00:07 gnome-software
2539 ttys2      00:07:12 Web Content
2668 ttys2      00:02:21 Web Content
2685 ttys2      00:00:00 deja-dup-monito
2790 ttys2      00:04:17 Web Content
3824 ttys2      00:00:54 Web Content
4099 ttys2      00:01:03 MainThread
4907 ttys2      00:00:01 file:// Content
4947 ttys2      00:00:00 Web Content
5050 pts/0      00:00:00 ps
yoga@macbook-pro:~/OS$ ps -T
 PID  SPID TTY          TIME CMD
2221  2221 pts/0    00:00:00 bash
5083  5083 pts/0    00:00:00 ps
yoga@macbook-pro:~/OS$ wc -mwl sample1.txt sample2.txt
 22 250 1497 sample1.txt
   8 102  591 sample2.txt
  30 352 2088 total
yoga@macbook-pro:~/OS$
```

24.Print the length of the longest line from all the input files.

ANS:wc -L sample1.txt sample2.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
2474 ttys2    00:00:00 update-notifier
2476 ttys2    00:00:07 gnome-software
2539 ttys2    00:07:12 Web Content
2668 ttys2    00:02:21 Web Content
2685 ttys2    00:00:00 deja-dup-monito
2790 ttys2    00:04:17 Web Content
3824 ttys2    00:00:54 Web Content
4099 ttys2    00:01:03 MainThread
4907 ttys2    00:00:01 file:// Content
4947 ttys2    00:00:00 Web Content
5050 pts/0    00:00:00 ps
yoga@macbook-pro:~/OS$ ps -T
  PID  SPID TTY      TIME CMD
2221  2221 pts/0    00:00:00 bash
5083  5083 pts/0    00:00:00 ps
yoga@macbook-pro:~/OS$ wc -mwl sample1.txt sample2.txt
 22  250 1497 sample1.txt
   8  102  591 sample2.txt
  30  352 2088 total
yoga@macbook-pro:~/OS$ wc -L sample1.txt sample2.txt
211 sample1.txt
169 sample2.txt
211 total
yoga@macbook-pro:~/OS$
```

25. Move the contents of the input file sample.txt to a new file.

ANS:mv sample.txt sample1.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ wc -mwl sample1.txt sample2.txt
22 250 1497 sample1.txt
8 102 591 sample2.txt
30 352 2088 total
yoga@macbook-pro:~/OS$ wc -L sample1.txt sample2.txt
211 sample1.txt
169 sample2.txt
211 total
yoga@macbook-pro:~/OS$ mv sample.txt sample1.txt
yoga@macbook-pro:~/OS$ cat sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$
```

26. Copy the contents of one directory to another directory.

ANS:

cp -R <From-directory name> <To-directory name>

Example:

cp -R lab new.2

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cp -R lab1 test1
yoga@macbook-pro:~/OS$ ls test
ls: cannot access 'test': No such file or directory
yoga@macbook-pro:~/OS$ ls test1
sample3.txt
yoga@macbook-pro:~/OS$ 
```

27. Reverse the lines of the two input files and concatenate the file contents using a single Command.

ANS:tac sample1.txt sample2.txt >> sample3.txt

```
Terminal ▾ Sun Aug 30, 12:59:08 yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ tac --help
Usage: tac [OPTION]... [FILE]...
Write each FILE to standard output, last line first.

With no FILE, or when FILE is -, read standard input.

Mandatory arguments to long options are mandatory for short options too.
 -b, --before           attach the separator before instead of after
 -r, --regex             interpret the separator as a regular expression
 -s, --separator=STRING use STRING as the separator instead of newline
 --help                display this help and exit
 --version              output version information and exit

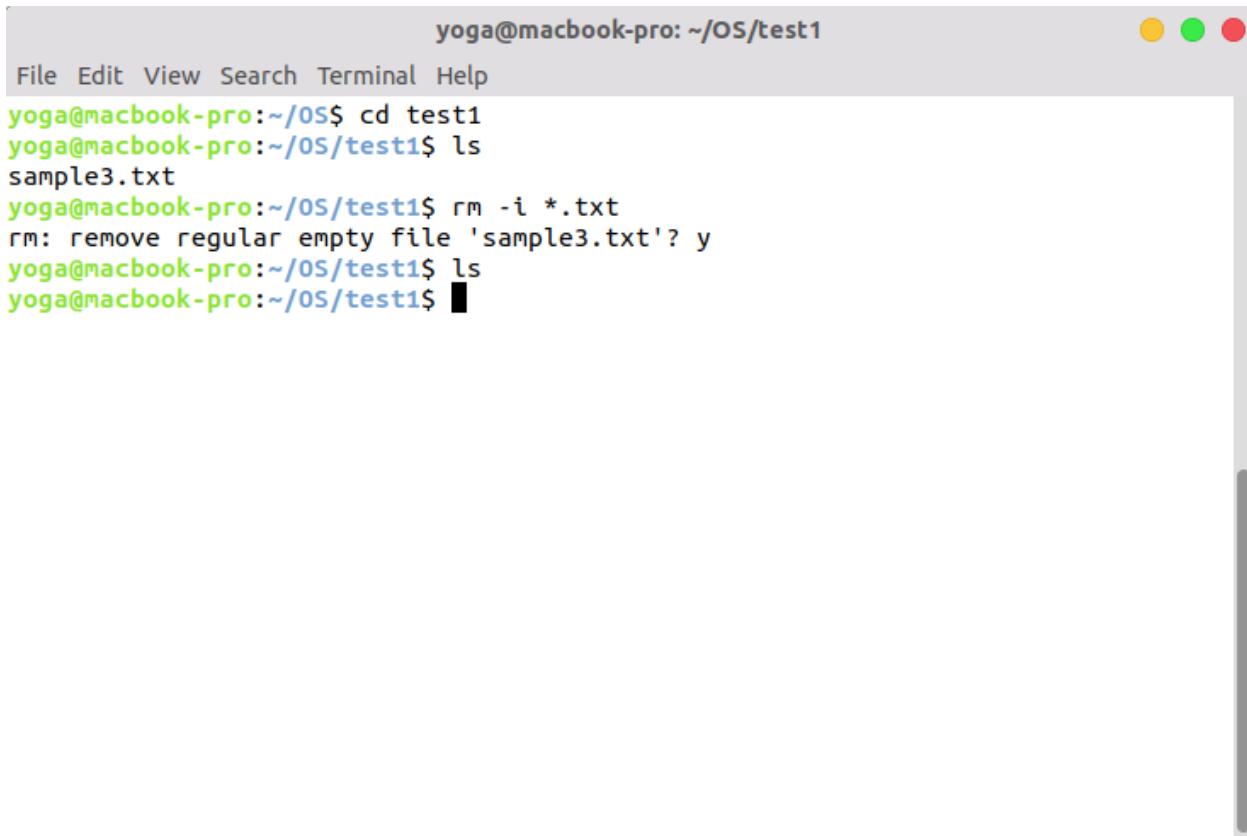
GNU coreutils online help: <http://www.gnu.org/software/coreutils/>
Full documentation at: <http://www.gnu.org/software/coreutils/tac>
or available locally via: info '(coreutils) tac invocation'
yoga@macbook-pro:~/OS$ tac sample1.txt sample2.txt >> sample4.txt
yoga@macbook-pro:~/OS$ cat sample4.txt

Yet another powerful OS.
Multiuser operating system.
UNIX is a free OS.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
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Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
yoga@macbook-pro:~/OS$ 
```

28. Delete all the files with *.txt extension from the working directory using yes command.

ANS:rm -i *.txt

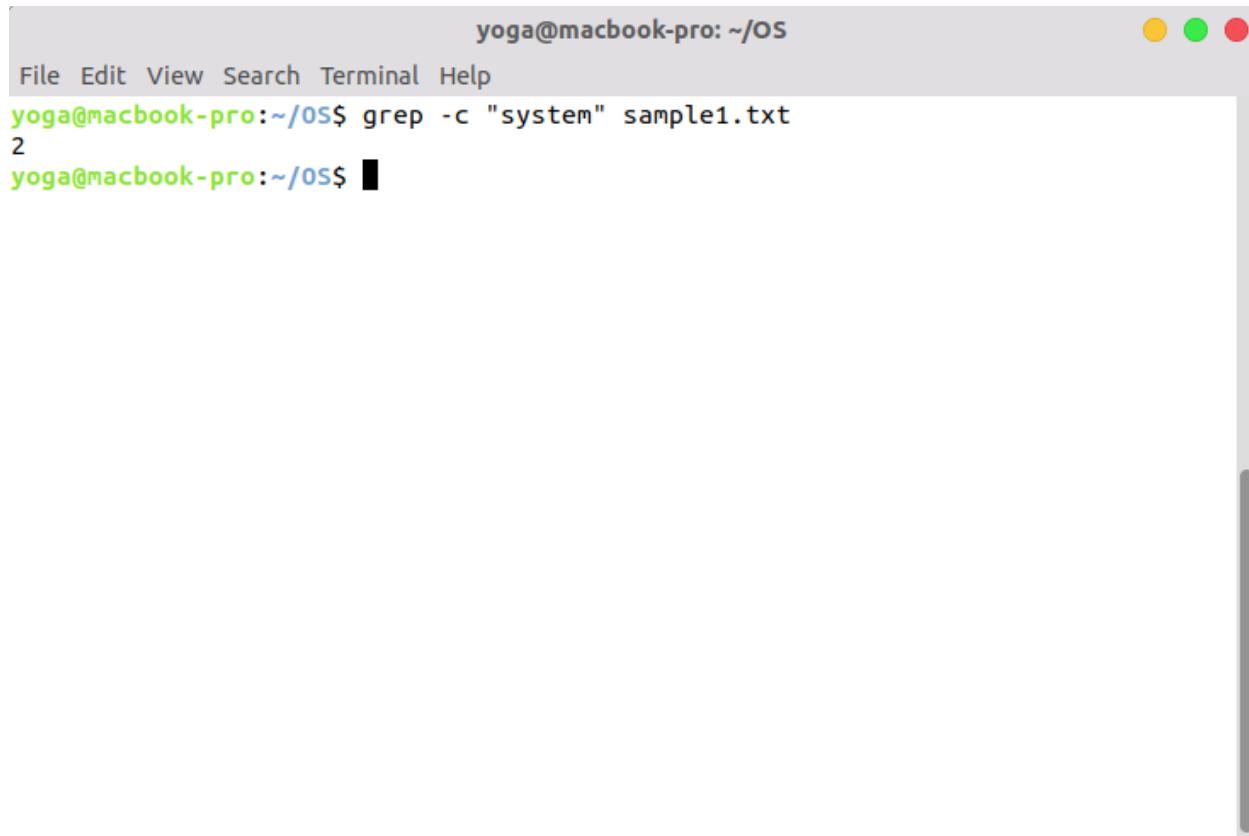


The screenshot shows a terminal window titled "yoga@macbook-pro: ~/OS/test1". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The title bar shows the path "yoga@macbook-pro: ~/OS/test1". The terminal content is as follows:

```
yoga@macbook-pro:~/OS$ cd test1
yoga@macbook-pro:~/OS/test1$ ls
sample3.txt
yoga@macbook-pro:~/OS/test1$ rm -i *.txt
rm: remove regular empty file 'sample3.txt'? y
yoga@macbook-pro:~/OS/test1$ ls
yoga@macbook-pro:~/OS/test1$ █
```

29. Given the input file “sample1.txt”, print the number of the lines that match the pattern “system”.

ANS:grep -c “system” sample1.txt



A screenshot of a macOS Terminal window. The title bar says "yoga@macbook-pro: ~/OS". The menu bar includes "File", "Edit", "View", "Search", "Terminal", and "Help". The main pane shows the command "grep -c \"system\" sample1.txt" followed by the output "2". The window has the standard OS X look with red, green, and yellow close buttons in the top right corner.

```
yoga@macbook-pro:~/OS$ grep -c "system" sample1.txt
2
yoga@macbook-pro:~/OS$
```

30. Having sample1 file as input, print the matched lines that contain the pattern “Unix” as whole Words.

ANS:grep -w “Unix” sample1.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ grep -c "system" sample1.txt
2
yoga@macbook-pro:~/OS$ grep -w "Unix" sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
yoga@macbook-pro:~/OS$ █
```

31. Print the lines from “sample1.txt” that do not match the pattern “OS”.

ANS:grep -v “OS” sample1.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
2
yoga@macbook-pro:~/OS$ grep -w "Unix" sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
yoga@macbook-pro:~/OS$ grep -v "OS" sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
Multiuser operating system.
yoga@macbook-pro:~/OS$ █
```

32. Fetch the files that contain the word “OS”, “Operating System”, “Operating Systems” with its respective line number. (Ignore the case).

ANS:

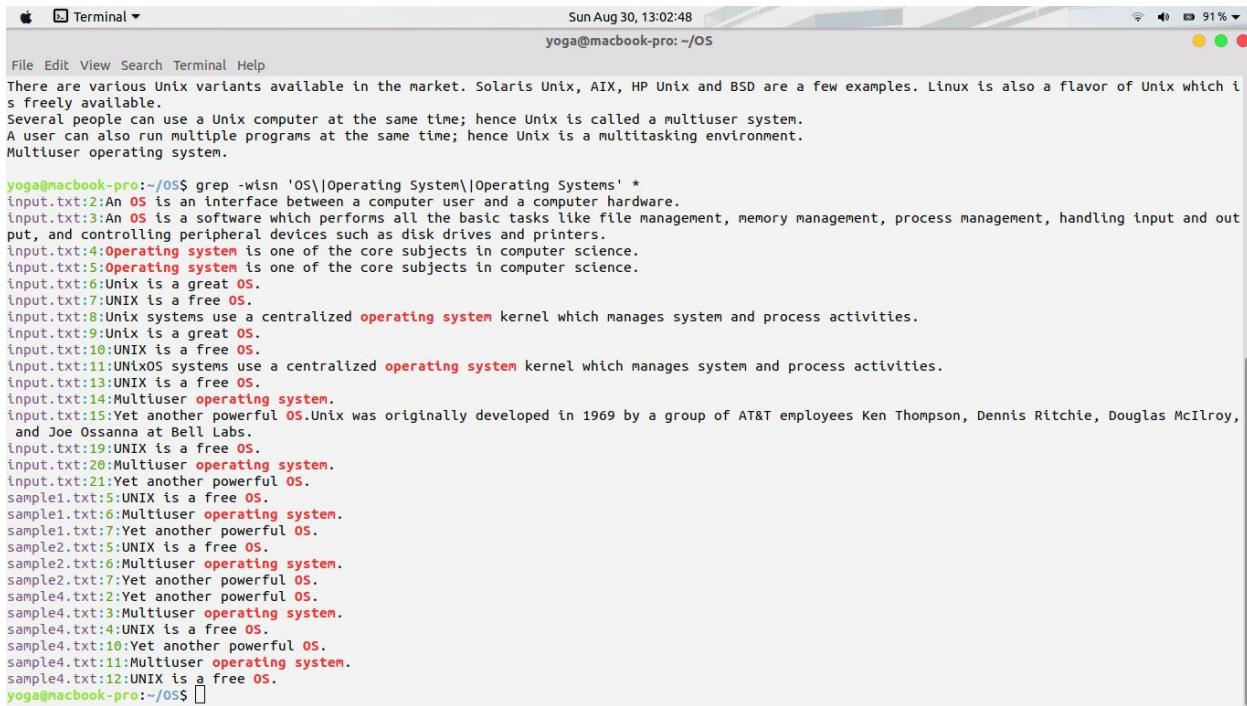
grep -wisen 'OS\|Operating System\|Operating Systems' *

w for exact matching of word

i to ignore case sensitivity

s for suppressing error based on accessing the file

n to display line number



The screenshot shows a macOS Terminal window titled "Terminal". The status bar at the top indicates the date and time as "Sun Aug 30, 13:02:48" and the user as "yoga@macbook-pro: ~/OS". The terminal window displays the output of a grep command. The command is "grep -wisen 'OS\|Operating System\|Operating Systems' *". The output lists various Unix variants and their descriptions, with the word "OS" highlighted in red. The output includes:

```
File Edit View Search Terminal Help
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
Multiuser operating system.

yoga@macbook-pro:~/OS$ grep -wisen 'OS\|Operating System\|Operating Systems' *
input.txt:2:An OS is an interface between a computer user and a computer hardware.
input.txt:3:An OS is a software which performs all the basic tasks like file management, memory management, process management, handling input and output, and controlling peripheral devices such as disk drives and printers.
input.txt:4:Operating system is one of the core subjects in computer science.
input.txt:5:Operating system is one of the core subjects in computer science.
input.txt:6:Unix is a great OS.
input.txt:7:UNIX is a free OS.
input.txt:8:Unix systems use a centralized operating system kernel which manages system and process activities.
input.txt:9:Unix is a great OS.
input.txt:10:UNIX is a free OS.
input.txt:11:UNIX systems use a centralized operating system kernel which manages system and process activities.
input.txt:12:UNIX is a free OS.
input.txt:13:Multiuser operating system.
input.txt:14:Yet another powerful OS.Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
input.txt:15:Yet another powerful OS.
input.txt:16:Multiuser operating system.
input.txt:17:Yet another powerful OS.
sample1.txt:5:UNIX is a free OS.
sample1.txt:6:Multiuser operating system.
sample1.txt:7:Yet another powerful OS.
sample2.txt:5:UNIX is a free OS.
sample2.txt:6:Multiuser operating system.
sample2.txt:7:Yet another powerful OS.
sample4.txt:2:Yet another powerful OS.
sample4.txt:3:Multiuser operating system.
sample4.txt:4:UNIX is a free OS.
sample4.txt:10:Yet another powerful OS.
sample4.txt:11:Multiuser operating system.
sample4.txt:12:UNIX is a free OS.
yoga@macbook-pro:~/OS$
```

33. Having “sample1.txt” and “core” as the input and pattern respectively, along with the matched line print three lines before and after the pattern match.

ANS:

grep -A 3 -3 -i "core" sample1.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.
Yet another powerful OS.

yoga@macbook-pro:~/OS$ grep -A 3 -3 -i "market" sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
yoga@macbook-pro:~/OS$ █
```

34. Find and replace the string “OS” with “Operating System”.

ANS:sed ‘s/OS/Operating System/g’ sample1.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
yoga@macbook-pro:~/OS$ sed 's/OS/Operating System/g' sample1.txt
sed: -e expression #1, char 1: unknown command: `♦'
yoga@macbook-pro:~/OS$ sed 's/OS/Operating System/g' sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free Operating System.
Multiuser operating system.
Yet another powerful Operating System.

yoga@macbook-pro:~/OS$
```

35. List only the text files in the current working directory with its corresponding disk space Occupied.

ANS:du *.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
UNIX is a free OS.
yoga@macbook-pro:~/OS$ sed 's/OS/Operating System/g' sample1.txt
sed: -e expression #1, char 1: unknown command: `^'
yoga@macbook-pro:~/OS$ sed 's/OS/Operating System/g' sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
available.
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitas
king environment.
UNIX is a free Operating System.
Multiuser operating system.
Yet another powerful Operating System.

yoga@macbook-pro:~/OS$ du *.txt
4      input.txt
4      sample1.txt
4      sample2.txt
4      sample3.txt
4      sample4.txt
yoga@macbook-pro:~/OS$
```

36. Show the last modification time of all the input text files.

ANS:ls -l *.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
available.
Several people can use a Unix computer at the same time; hence Unix is called a
multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitas
king environment.
UNIX is a free Operating System.
Multiuser operating system.
Yet another powerful Operating System.

yoga@macbook-pro:~/OS$ du *.txt
4      input.txt
4      sample1.txt
4      sample2.txt
4      sample3.txt
4      sample4.txt
yoga@macbook-pro:~/OS$ ls -l *.txt
-rw-r--r-- 1 yoga yoga 1497 Aug 30 12:46 input.txt
-rw-r--r-- 1 yoga yoga 591 Aug 30 12:30 sample1.txt
-rw-rw-r-- 1 yoga yoga 591 Aug 30 11:11 sample2.txt
----- 1 yoga yoga 1497 Aug 30 12:29 sample3.txt
-rw-r--r-- 1 yoga yoga 1182 Aug 30 12:58 sample4.txt
yoga@macbook-pro:~/OS$
```

37. Delete the line that has the word “Powerful” from text file “sample2.txt”.

ANS:sed '/powerful/d' sample2.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
4      sample1.txt
4      sample2.txt
4      sample3.txt
4      sample4.txt
yoga@macbook-pro:~/OS$ ls -l *.txt
-rw-r--r-- 1 yoga yoga 1497 Aug 30 12:46 input.txt
-rw-r--r-- 1 yoga yoga 591 Aug 30 12:30 sample1.txt
-rw-rw-r-- 1 yoga yoga 591 Aug 30 11:11 sample2.txt
----- 1 yoga yoga 1497 Aug 30 12:29 sample3.txt
-rw-r--r-- 1 yoga yoga 1182 Aug 30 12:58 sample4.txt
yoga@macbook-pro:~/OS$ sed '/powerful/d' sample2.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.

yoga@macbook-pro:~/OS$
```

38. Print the roll numbers that end with even numbers in the format (COE18B002) up to COE18B050.

ANS:seq -f "COE18B0%02g" 2 2 50

```
Apple Terminal ▾ Sun Aug 30, 13:06:24
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
----- 1 yoga yoga 1497 Aug 30 12:29 sample3.txt
-rw-r--r-- 1 yoga yoga 1182 Aug 30 12:58 sample4.txt
yoga@macbook-pro:~/OS$ sed '/powerful/d' sample2.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson, Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP Unix and BSD are a few examples. Linux is also a flavor of Unix which is freely available.
Several people can use a Unix computer at the same time; hence Unix is called a multiuser system.
A user can also run multiple programs at the same time; hence Unix is a multitasking environment.
UNIX is a free OS.
Multiuser operating system.

yoga@macbook-pro:~/OS$ seq -f "COE18B0%02g" 2 2 50
COE18B002
COE18B004
COE18B006
COE18B008
COE18B010
COE18B012
COE18B014
COE18B016
COE18B018
COE18B020
COE18B022
COE18B024
COE18B026
COE18B028
COE18B030
COE18B032
COE18B034
COE18B036
COE18B038
COE18B040
COE18B042
COE18B044
COE18B046
COE18B048
COE18B050
yoga@macbook-pro:~/OS$
```

39. Use filter commands like head, tail, more to view the file contents page by page.

ANS:more -n inputfile

```
yoga@macbook-pro: ~/OS$ more -5 sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
available.
--More--(53%)
```

ANS:head inputfile | more -n

```
yoga@macbook-pro: ~/OS/lab1$ ls
sample3.txt
yoga@macbook-pro:~/OS/lab1$ tar cvf tarfile.tar *
sample3.txt
yoga@macbook-pro:~/OS/lab1$ cd ..
yoga@macbook-pro:~/OS$ ls
input.txt  lab1  sample1.txt  sample2.txt  sample3.txt  sample4.txt  test1
yoga@macbook-pro:~/OS$ cd lab1
yoga@macbook-pro:~/OS/lab1$ ls
sample3.txt  tarfile.tar
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar *
sample3.txt
tar: tarfile.tar: Not found in archive
tar: Exiting with failure status due to previous errors
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar
sample3.txt
yoga@macbook-pro:~/OS/lab1$
```

ANS:tail inputfile | more -n

```
yoga@macbook-pro:~/OS$ tail inputfile | more -n
yoga@macbook-pro:~/OS$ more -5 sample1.txt
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
available.
yoga@macbook-pro:~/OS$ head sample1.txt | more -4
Unix was originally developed in 1969 by a group of AT&T employees Ken Thompson,
Dennis Ritchie, Douglas McIlroy, and Joe Ossanna at Bell Labs.
There are various Unix variants available in the market. Solaris Unix, AIX, HP U
nix and BSD are a few examples. Linux is also a flavor of Unix which is freely a
--More-->
```

40. Compress the current working directory contents to a tar file and extract those files from the compressed tar file.

ANS:tar cvf tarfile.tar *

```
yoga@macbook-pro:~/OS/lab1$ ls
sample3.txt
yoga@macbook-pro:~/OS/lab1$ tar cvf tarfile.tar *
sample3.txt
yoga@macbook-pro:~/OS/lab1$ cd ..
yoga@macbook-pro:~/OS$ ls
input.txt lab1 sample1.txt sample2.txt sample3.txt sample4.txt test1
yoga@macbook-pro:~/OS$ cd lab1
yoga@macbook-pro:~/OS/lab1$ ls
sample3.txt tarfile.tar
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar *
sample3.txt
tar: tarfile.tar: Not found in archive
tar: Exiting with failure status due to previous errors
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar
sample3.txt
yoga@macbook-pro:~/OS/lab1$
```

tar xvf tarfile.tar

41. Compress the files using zip command.

a. Zip the input file “sample1.txt” as samplezip.zip and remove the file from the current directory after zipping.

ANS:zip -m samplezip.zip sample2.txt

```
yoga@macbook-pro: ~/OS
```

File Edit View Search Terminal Help

```
yoga@macbook-pro:~/OS/lab1$ ls
sample3.txt
yoga@macbook-pro:~/OS/lab1$ tar cvf tarfile.tar *
sample3.txt
yoga@macbook-pro:~/OS/lab1$ cd ..
yoga@macbook-pro:~/OS$ ls
input.txt lab1 sample1.txt sample2.txt sample3.txt sample4.txt test1
yoga@macbook-pro:~/OS$ cd lab1
yoga@macbook-pro:~/OS/lab1$ ls
sample3.txt tarfile.tar
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar *
sample3.txt
tar: tarfile.tar: Not found in archive
tar: Exiting with failure status due to previous errors
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar
sample3.txt
yoga@macbook-pro:~/OS/lab1$ cd ..
yoga@macbook-pro:~/OS$ touch sample5.txt
yoga@macbook-pro:~/OS$ zip -m samplezip.zip sample4.txt
  adding: sample4.txt (deflated 69%)
yoga@macbook-pro:~/OS$ ls
input.txt sample1.txt sample3.txt samplezip.zip
lab1 sample2.txt sample5.txt test1
yoga@macbook-pro:~/OS$ 
```

b. Add “sample2.txt” and update the zip archive.

ANS:zip -u samplezip.zip sample2.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
sample3.txt
yoga@macbook-pro:~/OS/lab1$ cd ..
yoga@macbook-pro:~/OS$ ls
input.txt lab1 sample1.txt sample2.txt sample3.txt sample4.txt test1
yoga@macbook-pro:~/OS$ cd lab1
yoga@macbook-pro:~/OS/lab1$ ls
sample3.txt tarfile.tar
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar *
sample3.txt
tar: tarfile.tar: Not found in archive
tar: Exiting with failure status due to previous errors
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar
sample3.txt
yoga@macbook-pro:~/OS/lab1$ cd ..
yoga@macbook-pro:~/OS$ touch sample5.txt
yoga@macbook-pro:~/OS$ zip -m samplezip.zip sample4.txt
  adding: sample4.txt (deflated 69%)
yoga@macbook-pro:~/OS$ ls
input.txt sample1.txt sample3.txt samplezip.zip
lab1 sample2.txt sample5.txt test1
yoga@macbook-pro:~/OS$ zip -u samplezip.zip sample4.txt
yoga@macbook-pro:~/OS$ zip -r test1.zip test1
  adding: test1/ (stored 0%)
yoga@macbook-pro:~/OS$ 
```

c. Zip a directory with all its contents.

ANS:zip -r test1.zip test1

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
sample3.txt
yoga@macbook-pro:~/OS/lab1$ cd ..
yoga@macbook-pro:~/OS$ ls
input.txt lab1 sample1.txt sample2.txt sample3.txt sample4.txt test1
yoga@macbook-pro:~/OS$ cd lab1
yoga@macbook-pro:~/OS/lab1$ ls
sample3.txt tarfile.tar
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar *
sample3.txt
tar: tarfile.tar: Not found in archive
tar: Exiting with failure status due to previous errors
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar
sample3.txt
yoga@macbook-pro:~/OS/lab1$ cd ..
yoga@macbook-pro:~/OS$ touch sample5.txt
yoga@macbook-pro:~/OS$ zip -m samplezip.zip sample4.txt
  adding: sample4.txt (deflated 69%)
yoga@macbook-pro:~/OS$ ls
input.txt sample1.txt sample3.txt samplezip.zip
lab1 sample2.txt sample5.txt test1
yoga@macbook-pro:~/OS$ zip -u samplezip.zip sample4.txt
yoga@macbook-pro:~/OS$ zip -r test1.zip test1
  adding: test1/ (stored 0%)
yoga@macbook-pro:~/OS$ 
```

d. Remove a file from the zip archive

ANS:zip -d samplezip.zip sample2.txt

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
yoga@macbook-pro:~/OS$ cd lab1
yoga@macbook-pro:~/OS/lab1$ ls
sample3.txt tarfile.tar
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar *
sample3.txt
tar: tarfile.tar: Not found in archive
tar: Exiting with failure status due to previous errors
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar
sample3.txt
yoga@macbook-pro:~/OS/lab1$ cd ..
yoga@macbook-pro:~/OS$ touch sample5.txt
yoga@macbook-pro:~/OS$ zip -m samplezip.zip sample4.txt
  adding: sample4.txt (deflated 69%)
yoga@macbook-pro:~/OS$ ls
input.txt sample1.txt sample3.txt samplezip.zip
lab1      sample2.txt sample5.txt test1
yoga@macbook-pro:~/OS$ zip -u samplezip.zip sample4.txt
yoga@macbook-pro:~/OS$ zip -r test1.zip test1
  adding: test1/ (stored 0%)
yoga@macbook-pro:~/OS$ zip -d test.zip sample3.txt
  zip warning: test.zip not found or empty

zip error: Nothing to do! (test.zip)
yoga@macbook-pro:~/OS$
```

e. Unzip the contents from samplezip.zip

ANS:unzip samplezip.zip

```
yoga@macbook-pro: ~/OS
File Edit View Search Terminal Help
sample3.txt
tar: tarfile.tar: Not found in archive
tar: Exiting with failure status due to previous errors
yoga@macbook-pro:~/OS/lab1$ tar xvf tarfile.tar
sample3.txt
yoga@macbook-pro:~/OS/lab1$ cd ..
yoga@macbook-pro:~/OS$ touch sample5.txt
yoga@macbook-pro:~/OS$ zip -m samplezip.zip sample4.txt
  adding: sample4.txt (deflated 69%)
yoga@macbook-pro:~/OS$ ls
input.txt sample1.txt sample3.txt samplezip.zip
lab1      sample2.txt sample5.txt test1
yoga@macbook-pro:~/OS$ zip -u samplezip.zip sample4.txt
yoga@macbook-pro:~/OS$ zip -r test1.zip test1
  adding: test1/ (stored 0%)
yoga@macbook-pro:~/OS$ zip -d test.zip sample3.txt
  zip warning: test.zip not found or empty

zip error: Nothing to do! (test.zip)
yoga@macbook-pro:~/OS$ unzip test1
Archive:  test1.zip
yoga@macbook-pro:~/OS$ unzip test1.zip
Archive:  test1.zip
yoga@macbook-pro:~/OS$
```