



Bachelor of Science in Computer Science and
Information Technology

**Laboratory
Report
Of**

Operating System

Submitted By :
Name : Basanta Rai
Semester : 4th
Section : B
Rollno : 23473

Submitted To :
Department Of Computer
Science

Lab 1: Learning basic Linux commands

OS Used: Ubuntu(22.04 LTS)

1.1. Command Name: ls

Syntax: ls [options] [file]

Usage: used for listing directory contents

Commands Used:

- ls -> lists all the unhidden files and directories within current directory
- ls laravel -> lists all the files and directories of laravel directory
- ls -l cc -> lists files in long listing format which includes:
 - The file type.
 - The file permissions.
 - Number of hard links to the file.
 - File owner.
 - File group.
 - File size.
 - Date and Time.
 - File name.

Output:

```
basanta@machine:~ $ cd Code/
basanta@machine:~/Code $ ls
cc  html  js  laravel  portfolio  portfolio.zip  ushits
basanta@machine:~/Code $ ls laravel/
itc  pitc  testing-laravel-blog-phpunit-main  Wordle-Workshop
basanta@machine:~/Code $ ls -l cc
total 20
drwxrwxr-x 3 basanta basanta 4096 Apr 25 09:57 1st-sem
drwxrwxr-x 4 basanta basanta 4096 May 30 15:52 2nd-sem
drwxrwxr-x 6 basanta basanta 4096 Apr 25 09:57 3rd-sem
drwxrwxr-x 4 basanta basanta 4096 May 30 15:53 4th-sem
drwxrwxr-x 4 basanta basanta 4096 Apr 25 09:57 presentations
basanta@machine:~/Code $ █
```

1.2. Command Name: cd

Syntax: cd [-L][-P [-e]] [-@]] [dir]

Usage: used for the shell working directory

Commands Used:

- cd cc -> change working directory to cc
- cd presentations -> change directory to presentations
- cd .. -> get back to cc directory
- cd 4th-sem/toc -> change directory to 4th-sem/toc
- cd ../../ -> move to upper directory
- cd ~ -> move to home directory

Output:

```
basanta@machine:~/Code/cc $ cd ..
basanta@machine:~/Code $ ls
cc html js laravel portfolio portfolio.zip ushits
basanta@machine:~/Code $ cd cc
basanta@machine:~/Code/cc $ ls
1st-sem 2nd-sem 3rd-sem 4th-sem presentations
basanta@machine:~/Code/cc $ cd presentations/
basanta@machine:~/Code/cc/presentations $ cd ..
basanta@machine:~/Code/cc $ cd 4th-sem/toc/
basanta@machine:~/Code/cc/4th-sem/toc $ cd ../../..
basanta@machine:~/Code/cc $ cd ~
basanta@machine:~ $ █
```

1.3. Command Name: grep

Syntax: grep [option] patterns [file]

Usage: used for searching patterns in each file

Commands Used:

- grep html index.html -> prints the whole line of matched term
- grep -o body index.html -> prints only matched term

- grep -n head index.html -> prints matched content with line number
- grep -s container index.html -> suppress error message if any

Output:

```
basanta@machine:~/Code/portfolio $ grep html index.html
<!DOCTYPE html>
<html lang="en">
</html>
basanta@machine:~/Code/portfolio $ grep -o body index.html
body
body
basanta@machine:~/Code/portfolio $ grep -n head index.html
4:<head>
10:</head>
17:          <h2 class="heading">Basanta</h2>
basanta@machine:~/Code/portfolio $ grep -s container index.html
      <div class="container">
basanta@machine:~/Code/portfolio $
```

1.4. Command Name: sudo

Syntax: sudo [option]

Usage: used for executing command as a super user or other user

Commands Used:

- sudo -i -> runs login shell for current user (basanta)
- whoami -> prints current user name associated with current effective user ID
- sudo whoami -> prints root user
- sudo -u layla whoami -> runs whoami command as another user (layla)
- sudo apt-get update -> resynchronizes the package index files from their sources
- sudo apt-get upgrade -y -> install the newest versions of all packages

Output:

```
basanta@machine:~ $ sudo -i  
[sudo] password for basanta:  
root@machine:~# exit  
logout  
basanta@machine:~ $ whoami  
basanta  
basanta@machine:~ $ sudo whoami  
root  
basanta@machine:~ $ sudo -u layla whoami  
layla  
basanta@machine:~ $ sudo apt-get update  
Hit:1 http://packages.microsoft.com/repos/code stable InRelease  
Hit:2 http://np.archive.ubuntu.com/ubuntu jammy InRelease  
Get:3 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]  
Get:4 http://np.archive.ubuntu.com/ubuntu jammy-updates InRelease [109 kB]  
Hit:5 https://ppa.launchpadcontent.net/saiarcot895/chromium-beta/ubuntu jammy InRelease  
Get:6 http://np.archive.ubuntu.com/ubuntu jammy-backports InRelease [99.8 kB]  
Fetched 320 kB in 2s (145 kB/s)  
Reading package lists... Done  
basanta@machine:~ $ sudo apt-get upgrade -y  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
Calculating upgrade... Done  
The following packages have been kept back:  
  linux-generic-hwe-22.04 linux-headers-generic-hwe-22.04 linux-image-generic-hwe-22.04 snapd  
0 upgraded, 0 newly installed, 0 to remove and 4 not upgraded.
```

1.5. Command Name: pwd

Syntax: `pwd [option]`

Usage: used for printing the name of current working directory

Commands Used:

- `pwd` -> prints current working directory
- `pwd --help` -> prints help menu for `pwd`
- `pwd -P` -> prints the physical directory without symbolic links

Output:

```
basanta@machine:~ $ pwd
/home/basanta
basanta@machine:~ $ pwd --help
pwd: pwd [-LP]
    Print the name of the current working directory.

Options:
  -L      print the value of $PWD if it names the current working
          directory
  -P      print the physical directory, without any symbolic links

By default, `pwd` behaves as if `-L` were specified.

Exit Status:
Returns 0 unless an invalid option is given or the current directory
cannot be read.
basanta@machine:~ $ pwd -P
/home/basanta
basanta@machine:~ $
```

1.6. Command Name: mv

Syntax: mv [option] SOURCE DESTINATION

Usage: used for moving/renameing files

Commands Used:

- mv styles.css css/ -> moves styles.css file to css directory
- mv errors.html error.html -> renames errors.html file as error.html
- mv -v blogs.html blog.html -> explains what is being done

Output:

```
basanta@machine:~/Code/web $ ls
blogs.html  css  errors.html  index.html  styles.css
basanta@machine:~/Code/web $ mv styles.css css/
basanta@machine:~/Code/web $ ls
blogs.html  css  errors.html  index.html
basanta@machine:~/Code/web $ mv errors.html error.html
basanta@machine:~/Code/web $ ls
blogs.html  css  error.html  index.html
basanta@machine:~/Code/web $ mv -v blogs.html blog.html
renamed 'blogs.html' -> 'blog.html'
```

1.7. Command Name: cp

Syntax: cp [option] SOURCE DESTINATION

Usage: used for copying files and directories

Commands Used:

- cp index.html error.html -> copies contents of index.html to error.html
- cp -r src web/ -> recursively copies src directory to web directory
- cp src/main.js js/ -> copies main.js file to js directory

Output:

```
basanta@machine:~/Code/web $ ls
blog.html  css  error.html  index.html
basanta@machine:~/Code/web $ cat index.html
<html>
  <head>

  </head>
  <body>

  </body>
</html>
basanta@machine:~/Code/web $ cp index.html error.html
basanta@machine:~/Code/web $ ls
blog.html  css  error.html  index.html
basanta@machine:~/Code/web $ cat error.html
<html>
  <head>

  </head>
  <body>

  </body>
</html>
```

```
basanta@machine:~/Code $ ls
cc go js laravel portfolio portfolio.zip src ushits web
basanta@machine:~/Code $ ls src/
main.js
basanta@machine:~/Code $ cp -r src web/
basanta@machine:~/Code $ ls
cc go js laravel portfolio portfolio.zip src ushits web
basanta@machine:~/Code $ cd web/
basanta@machine:~/Code/web $ ls
blog.html css error.html index.html src
basanta@machine:~/Code/web $ ls src/
main.js
basanta@machine:~/Code/web $ ls
blog.html css error.html index.html src
basanta@machine:~/Code/web $ mkdir js
basanta@machine:~/Code/web $ cp src/main.js js/
basanta@machine:~/Code/web $ ls js/
main.js
basanta@machine:~/Code/web $
```

1.8. Command Name: rm

Syntax: rm [option] [file]

Usage: used for removing files and directories

Commands Used:

- rm blog.html -> removes blog.html file
- rm -v error.html -> removes error.html and explains what is being done
- rm -rd src/ -> removes src folder
- rm -vrdf js -> removes directory and files contained by it
- rm -ird css/ -> removes directory and files contained and prompts before every removal

Output:

```
basanta@machine:~/Code/web $ ls
blog.html  css  error.html  index.html  js  src
basanta@machine:~/Code/web $ rm blog.html
basanta@machine:~/Code/web $ rm -v error.html
removed 'error.html'
basanta@machine:~/Code/web $ rm -rd src/
basanta@machine:~/Code/web $ rm -vrdf js
removed 'js/main.js'
removed directory 'js'
basanta@machine:~/Code/web $ rm -ird css/
rm: descend into directory 'css/'? y
rm: remove regular empty file 'css/styles.css'? y
rm: remove directory 'css/'? y
basanta@machine:~/Code/web $
```

1.9. Command Name: mkdir

Syntax: mkdir [option] DIRECTORY

Usage: used for making directories

Commands Used:

- mkdir html -> creates html directory
- mkdir -v css -> creates css directory and prints message for it
- mkdir -m 567 js -> creates js directory with 567 mods

Output:

```
basanta@machine:~/Code/web $ mkdir html
basanta@machine:~/Code/web $ ls
html  index.html
basanta@machine:~/Code/web $ mkdir -v css
mkdir: created directory 'css'
basanta@machine:~/Code/web $ mkdir -m 567 js
basanta@machine:~/Code/web $ ls
css  html  index.html  js
basanta@machine:~/Code/web $
```

1.10. Command Name: rmdir

Syntax: rmdir [option] DIRECTORY

Usage: used for removing empty directory

Commands Used:

- rmdir js/ -> removes js directory
- rmdir -v css/ -> removes css directory and prints message for it

Output:

```
basanta@machine:~/Code/web $ ls
css  html  index.html  js
basanta@machine:~/Code/web $ rmdir js/
basanta@machine:~/Code/web $ ls
css  html  index.html
basanta@machine:~/Code/web $ rmdir -v html/
rmdir: removing directory, 'html/'
basanta@machine:~/Code/web $
```

1.11. Command Name: chmod

Syntax: chmod [MODE] FILE

r -> read

w-> write

x-> execute

Usage: used for changing file mode/permissions

Commands Used:

- chmod +rwx index.html -> adds read,write and execute permission to index.html
- chmod -rwx index.html -> removes read,write and execute permission from index.html
- chmod +x file.bash -> adds executable permission to file.fash file

Output:

```
basanta@machine:~/Code/web $ ls -la
total 16
drwxrwxr-x 4 basanta basanta 4096 Jun 21 12:35 .
drwxrwxr-x 10 basanta basanta 4096 Jun 21 11:38 ..
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 css
-rw-rw-r-- 1 basanta basanta 0 Jun 21 12:32 error.html
-rw-rw-r-- 1 basanta basanta 0 Jun 21 12:34 file.bash
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 html
-rw-rw-r-- 1 basanta basanta 0 Jun 21 12:35 index.html
basanta@machine:~/Code/web $ chmod +rwx index.html
basanta@machine:~/Code/web $ ls -la
total 16
drwxrwxr-x 4 basanta basanta 4096 Jun 21 12:35 .
drwxrwxr-x 10 basanta basanta 4096 Jun 21 11:38 ..
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 css
-rw-rw-r-- 1 basanta basanta 0 Jun 21 12:32 error.html
-rw-rw-r-- 1 basanta basanta 0 Jun 21 12:34 file.bash
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 html
-rw-rw-r-- 1 basanta basanta 0 Jun 21 12:35 index.html
basanta@machine:~/Code/web $ chmod -rwx index.html
basanta@machine:~/Code/web $ ls -la
total 16
drwxrwxr-x 4 basanta basanta 4096 Jun 21 12:35 .
drwxrwxr-x 10 basanta basanta 4096 Jun 21 11:38 ..
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 css
-rw-rw-r-- 1 basanta basanta 0 Jun 21 12:32 error.html
-rw-rw-r-- 1 basanta basanta 0 Jun 21 12:34 file.bash
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 html
----- 1 basanta basanta 0 Jun 21 12:35 index.html
basanta@machine:~/Code/web $ chmod +x file.bash
basanta@machine:~/Code/web $ ls -la
total 16
drwxrwxr-x 4 basanta basanta 4096 Jun 21 12:35 .
drwxrwxr-x 10 basanta basanta 4096 Jun 21 11:38 ..
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 css
-rw-rw-r-- 1 basanta basanta 0 Jun 21 12:32 error.html
-rwxrwxr-x 1 basanta basanta 0 Jun 21 12:34 file.bash
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 html
----- 1 basanta basanta 0 Jun 21 12:35 index.html
basanta@machine:~/Code/web $
```

1.12. Command Name: cat

Syntax: cat [option] FILE

Usage: used for concatenating and printing on the standard output

Commands Used:

- cat index.html -> prints the content of index.html
- cat -b index.html -> numbers non empty lines
- cat -s index.html -> suppresses repeated empty output lines
- cat -n index.html -> number all output lines

Output:

```
basanta@machine:~/Code/web $ cat index.html
<html>
  <head>

  </head>
  <body>
    <header></header>
    <section>
      <h1></h1>
      <p></p>
      <<img src="" alt="">>
    </section>
    <footer>
      <a href=""></a>
    </footer>
  </body>
</html>
basanta@machine:~/Code/web $ cat -b index.html
1  <html>
2    <head>

3    </head>
4    <body>
5      <header></header>
6      <section>
7        <h1></h1>
8        <p></p>
9        <<img src="" alt="">>
10     </section>
11     <footer>
12       <a href=""></a>
13     </footer>
14   </body>
15 </html>
```

```
basanta@machine:~/Code/web $ cat -s index.html
<html>
  <head>

  </head>
  <body>
    <header></header>
    <section>
      <h1></h1>
      <p></p>
      <<img src="" alt="">>
    </section>
    <footer>
      <a href=""></a>
    </footer>
  </body>
</html>
```

```
basanta@machine:~/Code/web $ cat -n index.html
 1 <html>
 2   <head>
 3
 4   </head>
 5   <body>
 6     <header></header>
 7     <section>
 8       <h1></h1>
 9       <p></p>
10       <<img src="" alt="">>
11     </section>
12     <footer>
13       <a href=""></a>
14     </footer>
15   </body>
16 </html>
```

```
basanta@machine:~/Code/web $ █
```

1.13. Command Name: chown

Syntax: chown [option] [owner] [:group] FILE

Usage: used for changing the user and group ownership of file

Commands Used:

- chown layla index.html -> changes ownership of index.html file to layla
- chown -v root index.html -> changes ownership to root and prints diagnostics for it
- chwon layla:developers error.html -> changes owner as well as group (user->layla , group->developers)
- chown -- reference=error.html index.html -> copies ownership from error.html to index.html
- chown -- from=:developers basanta index.html error.html -> changes group from one to another

Output:

```
basanta@machine:~/Code/web $ ls -l
total 8
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 css
-rw-rw-r-- 1 basanta basanta    0 Jun 21 12:32 error.html
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 html
----- 1 basanta basanta    0 Jun 21 12:35 index.html
basanta@machine:~/Code/web $ chown layla index.html
chown: changing ownership of 'index.html': Operation not permitted
basanta@machine:~/Code/web $ sudo chown layla index.html
[sudo] password for basanta:
basanta@machine:~/Code/web $ ls -l
total 8
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 css
-rw-rw-r-- 1 basanta basanta    0 Jun 21 12:32 error.html
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 html
----- 1 layla   basanta    0 Jun 21 12:35 index.html
basanta@machine:~/Code/web $ sudo chown -v root index.html
changed ownership of 'index.html' from layla to root
basanta@machine:~/Code/web $ ls -l
total 8
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 css
-rw-rw-r-- 1 basanta basanta    0 Jun 21 12:32 error.html
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 html
----- 1 root    basanta    0 Jun 21 12:35 index.html
```

```
basanta@machine:~/Code/web $ sudo chown basanta:developers error.html
basanta@machine:~/Code/web $ ls
css  error.html  html  index.html
basanta@machine:~/Code/web $ ls -l
total 8
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 css
-rw-rw-r-- 1 layla  developers 0 Jun 21 12:32 error.html
drwxrwxr-x 2 layla  developers 4096 Jun 21 12:32 html
----- 1 root   basanta 0 Jun 21 12:35 index.html
basanta@machine:~/Code/web $ chown --reference=error.html index.html
chown: changing ownership of 'index.html': Operation not permitted
basanta@machine:~/Code/web $ sudo chown --reference=error.html index.html
basanta@machine:~/Code/web $ ls -l
total 8
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 css
-rw-rw-r-- 1 layla  developers 0 Jun 21 12:32 error.html
drwxrwxr-x 2 layla  developers 4096 Jun 21 12:32 html
----- 1 layla  developers 0 Jun 21 12:35 index.html
basanta@machine:~/Code/web $ sudo chown --from=:developers basanta index.html error.html
basanta@machine:~/Code/web $ ls -l
total 8
drwxrwxr-x 2 basanta basanta 4096 Jun 21 12:32 css
-rw-rw-r-- 1 basanta developers 0 Jun 21 12:32 error.html
drwxrwxr-x 2 layla  developers 4096 Jun 21 12:32 html
----- 1 basanta developers 0 Jun 21 12:35 index.html
basanta@machine:~/Code/web $
```

1.14. Command Name: echo

Syntax: echo [option] [string]

Usage: used for printing string to standard output

Commands Used:

- echo Mark -> prints Mark
- echo -n "Hello MOM" -> do not output the trailing newline
- echo -e "Khonshu \bGod \bof \bMOON" -> removes all the spaces between words
- echo -e "Apple \nBall \nCat" -> outputs each word in new line

Output:

```
basanta@machine:~/Code/web $ echo Mark
Mark
basanta@machine:~/Code/web $ echo -n "Hello MOM"
Hello MOMbasanta@machine:~/Code/web $ echo -e "Khonshu \bGod \bof \bMOON"
KhonshuGodofMOON
basanta@machine:~/Code/web $ echo -e "Apple \nBall \nCat"
Apple
Ball
Cat
basanta@machine:~/Code/web $ 
```

1.15. Command Name: wc

Syntax: wc [option] [file]

Usage: used for printing newline, word, and byte counts for each FILE

Commands Used:

- wc Dockerfile -> prints number of lines, words and characters in Dockerfile
- wc -c Dockerfile -> prints byte counts in Dockerfile
- wc -m Dockerfile -> prints the character counts in Dockerfile
- wc -w Dockerfile -> prints the word counts in Dockerfile
- wc -l Dockerfile -> prints the newline counts in Dockerfile

Output:

```
basanta@machine:~/Code/go/basics $ cat Dockerfile
FROM golang:1.15 as dev

WORKDIR /work
basanta@machine:~/Code/go/basics $ wc Dockerfile
3 6 39 Dockerfile
basanta@machine:~/Code/go/basics $ wc -c Dockerfile
39 Dockerfile
basanta@machine:~/Code/go/basics $ wc -m Dockerfile
39 Dockerfile
basanta@machine:~/Code/go/basics $ wc -w Dockerfile
6 Dockerfile
basanta@machine:~/Code/go/basics $ wc -l Dockerfile
3 Dockerfile
basanta@machine:~/Code/go/basics $ 
```

1.16. Command Name: man

Syntax: man [command]

Usage: used for displaying manual page for commands

Commands Used:

- man echo -> displays manual page for echo
- man -f grep -> displays short description about grep
- man -k mkdir -> searches the given command as a regular expression in all the manuals and it returns the manual pages with the section number in which it is found
- man -w pkill -> returns the location in which the manual page of a pkill command is present

Output:

```
basanta@machine:~ $ man echo
basanta@machine:~ $ man -f grep
grep (1)           - print lines that match patterns
basanta@machine:~ $ man -k mkdir
mkdir (1)          - make directories
mkdir (2)          - create a directory
mkdirat (2)         - create a directory
basanta@machine:~ $ man -w pkill
/usr/share/man/man1/pgrep.1.gz
basanta@machine:~ $
```

ECHO(1)	User Commands
NAME	echo - display a line of text
SYNOPSIS	<code>echo [SHORT-OPTION]... [STRING]...</code> <code>echo <u>LONG-OPTION</u></code>
DESCRIPTION	Echo the STRING(s) to standard output. -n do not output the trailing newline -e enable interpretation of backslash escapes -E disable interpretation of backslash escapes (default) --help display this help and exit --version output version information and exit

1.17. Command Name: history

Syntax: history [option]

Usage: used for viewing the list of previously executed commands

Commands Used:

- history -> lists previously executed commands
- history 10 -> shows the limited number of previously executed commands
- !! -> shows most recently executed command
- history -d 2003 -> removes history by event number
- history -c -> removes all history

Output:

```
basanta@machine:~ $ history
1003 nv sample.txt
1004 cut -f 2 sample.txt
1005 nv sample.txt
1006 cut -f 2 sample.txt
1007 cut -d: sample.txt
1008 cut -d: -f 2 sample.txt
1009 cut -d: -f 1,6 sample.txt
1010 cut -d: -f 1,2 sample.txt
1011 cut -d: -f 1 sample.txt
1012 cut sample.txt -f 1,2 --output-delimiter=_ 
1013 cut sample.txt -f 1 --output-delimiter=_ 
1014 cut sample.txt -f 1 --output-delimiter='_' 
1015 cut -d: -f 0 sample.txt
1016 cut -f 0 sample.txt
1017 cut --help
1018 cut -n sample.txt
1019 cut -n 3 sample.txt
1020 cut -c 3 sample.txt
1021 cut -s --- sample.txt
1022 cut -s "----" sample.txt
1023 cut -c 1 -z sample.txt
1024 cut -c 1 -s sample.txt
1025 cut -d sample.txt
1026 cut -d=" " sample.txt
1027 cut -d h sample.txt
1028 cut -c 4 -d h sample.txt
```

```
basanta@machine:~ $ history 10
1997 man wc
1998 man man
1999 exit
2000 poweroff
2001 man history
2002 history
2003 hiostory 10
2004 history 5
2005 history
2006 history 10
basanta@machine:~ $ !!
history 10
1997 man wc
1998 man man
1999 exit
2000 poweroff
2001 man history
2002 history
2003 hiostory 10
2004 history 5
2005 history
2006 history 10
```

```
basanta@machine:~ $ history 5
2003 history 5
2004 history
2005 history 10
2006 history -d 1997
2007 history 5
basanta@machine:~ $ history -d 2003
basanta@machine:~ $ history 5
2004 history 10
2005 history -d 1997
2006 history 5
2007 history -d 2003
2008 history 5
basanta@machine:~ $ history -c
basanta@machine:~ $ history
1 history
basanta@machine:~ $
```

1.18. Command Name: clear

Syntax: clear

Usage: used for clearing the terminal screen

Commands Used:

- clear -> cleans terminal screen

Output:

```
basanta@machine:~/Code/portfolio $ ls -l
total 20
drwxrwxr-x 2 basanta basanta 4096 Jun 11 20:09 assets
-rw-rw-r-- 1 basanta basanta    21 May 21 20:09 CNAME
drwxrwxr-x 2 basanta basanta 4096 Jun 18 13:41 css
-rw-rw-r-- 1 basanta basanta 2770 Jun 11 20:09 index.html
drwxrwxr-x 2 basanta basanta 4096 Jun  4 18:29 js
basanta@machine:~/Code/portfolio $ clear
```

```
basanta@machine:~/Code/portfolio $
```

1.19. Command Name: touch

Syntax: touch [option] FILE

Usage: used for creating, changing and modifying timestamps of a file

Commands Used:

- touch detail.txt hello.txt random.txt -> creates files named as details.txt,hello.txt and random.txt
- touch -c help.txt -> does not creates any file
- touch -d 2022 khonshu.txt -> uses string (2022) instead of current time

Output:

```
basanta@machine:~/Code/ushits/practice $ ls
basanta@machine:~/Code/ushits/practice $ touch detail.txt hello.txt random.txt
basanta@machine:~/Code/ushits/practice $ ls
detail.txt hello.txt random.txt
basanta@machine:~/Code/ushits/practice $ ls -l
total 0
-rw-rw-r-- 1 basanta basanta 0 Jun 22 19:55 detail.txt
-rw-rw-r-- 1 basanta basanta 0 Jun 22 19:55 hello.txt
-rw-rw-r-- 1 basanta basanta 0 Jun 22 19:55 random.txt
basanta@machine:~/Code/ushits/practice $ touch -a detail.txt
basanta@machine:~/Code/ushits/practice $ ls -l
total 0
-rw-rw-r-- 1 basanta basanta 0 Jun 22 19:55 detail.txt
-rw-rw-r-- 1 basanta basanta 0 Jun 22 19:55 hello.txt
-rw-rw-r-- 1 basanta basanta 0 Jun 22 19:55 random.txt
basanta@machine:~/Code/ushits/practice $ touch -c help.txt
basanta@machine:~/Code/ushits/practice $ ls
detail.txt hello.txt random.txt
basanta@machine:~/Code/ushits/practice $ touch -d 2022 khonshu.txt
basanta@machine:~/Code/ushits/practice $ ls
detail.txt hello.txt khonshu.txt random.txt
basanta@machine:~/Code/ushits/practice $ ls -l
total 0
-rw-rw-r-- 1 basanta basanta 0 Jun 22 19:55 detail.txt
-rw-rw-r-- 1 basanta basanta 0 Jun 22 19:55 hello.txt
-rw-rw-r-- 1 basanta basanta 0 Jun 22 2022 khonshu.txt
-rw-rw-r-- 1 basanta basanta 0 Jun 22 19:55 random.txt
```

1.20. Command Name: locate or plocate

Syntax: locate [option] PATTERN

Usage: used for finding files by name, quickly

Commands Used:

- locate random.txt -> searches for random.txt file
- locate “*.blade.php” -n 10 -> limits search query to specific number (10)
- locate “*.html” -l 5 -> stops searching after limit (5) matches have been found

Output:

```
basanta@machine:~/Code/ushits/practice $ ls
detail.txt hello.txt khonshu.txt random.txt
basanta@machine:~/Code/ushits/practice $ cd
basanta@machine:~ $ plocate random.txt
/home/basanta/Code/ushits/practice/random.txt
basanta@machine:~ $ plocate create.blade.php -c
32
basanta@machine:~ $ locate "*.blade.php" -n 10
/home/basanta/.vim/undodir/%home%basanta%Code%laravel%itc%resources%views%admin%albums%show.blade.php
/home/basanta/.vim/undodir/%home%basanta%Code%laravel%itc%resources%views%admin%blog-categories%create.blade.php
/home/basanta/.vim/undodir/%home%basanta%Code%laravel%itc%resources%views%admin%blog-categories%edit.blade.php
/home/basanta/.vim/undodir/%home%basanta%Code%laravel%itc%resources%views%admin%blog-categories%index.blade.php
/home/basanta/.vim/undodir/%home%basanta%Code%laravel%itc%resources%views%admin%blogs%create.blade.php
/home/basanta/.vim/undodir/%home%basanta%Code%laravel%itc%resources%views%admin%blogs%index.blade.php
/home/basanta/.vim/undodir/%home%basanta%Code%laravel%itc%resources%views%admin%event-categories%create.blade.php
/home/basanta/.vim/undodir/%home%basanta%Code%laravel%itc%resources%views%admin%event-categories%edit.blade.php
/home/basanta/.vim/undodir/%home%basanta%Code%laravel%itc%resources%views%admin%event-categories%index.blade.php
/home/basanta/.vim/undodir/%home%basanta%Code%laravel%itc%resources%views%admin%events%create.blade.php
basanta@machine:~ $ locate "*.*html" -l 5
/home/basanta/.config/Code/User/History/728c1d19/A0oa.html
/home/basanta/.config/Code/User/History/728c1d19/HpuQ.html
/home/basanta/.config/Code/User/History/728c1d19/OnME.html
/home/basanta/.config/Code/User/History/728c1d19/rkIb.html
/home/basanta/.config/chromium/Default/Extensions/bnjngeaknajbdcgpfkgnonkmififhfo/3.3.1_0/options.html
basanta@machine:~ $
```

1.21. Command Name: df

Syntax: df [option] [file]

Usage: used for reporting file system disk space usages

Commands Used:

- df -a -> displays all the file systems
- df -h -> prints sizes in powers of 1024
- df -T -> prints the file system type
- df ~/.vimrc -> shows mount information of particular file (.vimrc)

Output:

```

basanta@machine:~ $ df -a
df: /run/user/1000/doc: Operation not permitted
Filesystem      1K-blocks      Used Available Use% Mounted on
sysfs            0          0          0   - /sys
proc             0          0          0   - /proc
udev            3976252      0  3976252  0% /dev
devpts           0          0          0   - /dev/pts
tmpfs            802188     1756    800432  1% /run
/dev/nvme0n1p3  240605740  15352580  212958248 7% /
securityfs       0          0          0   - /sys/kernel/security
tmpfs            4010928     47252   3963676  2% /dev/shm
tmpfs            5120        4      5116  1% /run/lock
cgroup2          0          0          0   - /sys/fs/cgroup
pstore           0          0          0   - /sys/fs/pstore
efivarfs         0          0          0   - /sys/firmware/efi/efivars
bpf              0          0          0   - /sys/fs/bpf
systemd-1        -          -          -   - /proc/sys/fs/binfmt_misc
hugetlbfs         0          0          0   - /dev/hugepages
mqueue            0          0          0   - /dev/mqueue
debugfs          0          0          0   - /sys/kernel/debug
tracefs          0          0          0   - /sys/kernel/tracing
fusectl          0          0          0   - /sys/fs/fuse/connections
configfs         0          0          0   - /sys/kernel/config
none              0          0          0   - /run/credentials/systemd-sysusers.service
/dev/nvme0n1p1   486456     5364    481092  2% /boot/efi
/dev/sda1        960302096  285019276  626428396 32% /home
tmpfs            802184      80    802104  1% /run/user/1000
gvfsd-fuse       0          0          0   - /run/user/1000/gvfs
binfmt_misc      0          0          0   - /proc/sys/fs/binfmt_misc
basanta@machine:~ $ df -h
Filesystem      Size   Used  Avail Use% Mounted on
tmpfs          784M  1.8M  782M  1% /run
/dev/nvme0n1p3  230G  15G  204G  7% /
tmpfs          3.9G  47M  3.8G  2% /dev/shm
tmpfs          5.0M  4.0K  5.0M  1% /run/lock
/dev/nvme0n1p1  476M  5.3M  470M  2% /boot/efi
/dev/sda1        916G 272G  598G  32% /home
tmpfs          784M  80K  784M  1% /run/user/1000
basanta@machine:~ $ 

```

```

basanta@machine:~ $ df -T
Filesystem      Type  1K-blocks      Used Available Use% Mounted on
tmpfs          tmpfs   802188     1756    800432  1% /run
/dev/nvme0n1p3 ext4   240605740  15352580  212958248 7% /
tmpfs          tmpfs   4010928     47252   3963676  2% /dev/shm
tmpfs          tmpfs   5120        4      5116  1% /run/lock
/dev/nvme0n1p1 vfat   486456     5364    481092  2% /boot/efi
/dev/sda1        ext4   960302096  285019768  626427904 32% /home
tmpfs          tmpfs   802184      80    802104  1% /run/user/1000
basanta@machine:~ $ df ~/.vimrc
Filesystem      1K-blocks      Used Available Use% Mounted on
/dev/sda1        960302096  285029328  626418344  32% /home
basanta@machine:~ $ 

```

1.22. Command Name: du

Syntax: du [option] [file]

Usage: summarizes disk usage of the set of FILES, recursively for directories

Commands Used:

- du ushits -> prints disk usages
- du -s ushits -> prints summary of file system
- du -c ushits -> prints total size
- du -sh ushits -> prints summary of file system in human readable format
- du -a ushits -> write counts for all files, not just directories

Output:

```
basanta@machine:~/Code/ushits $ cd ..
basanta@machine:~/Code $ du ushits/
4      ushits/practice
24      ushits/
basanta@machine:~/Code $ du -s ushits/
24      ushits/
basanta@machine:~/Code $ du --time -h ushits/
4.0K    2022-06-22 20:22      ushits/practice
24K     2022-06-22 20:42      ushits/
basanta@machine:~/Code $ du -c ushits/
4      ushits/practice
24      ushits/
24      total
basanta@machine:~/Code $ du -sh ushits/
24K     ushits/
basanta@machine:~/Code $ du -a ushits/
4      ushits/commands.md
4      ushits/sample.txt
0      ushits/practice/detail.txt
0      ushits/practice/hello.txt
0      ushits/practice/random.txt
0      ushits/practice/khonshu.txt
4      ushits/practice
4      ushits/README.md
4      ushits/laravel-testing.md
24      ushits/
basanta@machine:~/Code $ █
```

1.23. Command Name: passwd

Syntax: passwd [option] [login]

Usage: used for changing the user password

Commands Used:

- passwd -> change current user's password
- sudo passwd layla -> change layla's password
- sudo passwd -d layla -> delete user's password
- sudo passwd -e layla -> immediately expires an account's password
- sudo passwd -q mark -> quiet mode
- sudo passwd -u mark -> unlocks the password of the named account

Output:

```
basanta@machine:~ $ passwd
Changing password for basanta.
Current password:
New password:
Retype new password:
passwd: password updated successfully
```

```
basanta@machine:~ $ sudo passwd layla
New password:
BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word
Retype new password:
Sorry, passwords do not match.
New password:
Retype new password:
passwd: password updated successfully
basanta@machine:~ $
```

```
basanta@machine:~ $ sudo passwd layla
New password:
BAD PASSWORD: The password fails the dictionary check - it is based on a dictionary word
Retype new password:
Sorry, passwords do not match.
New password:
Retype new password:
passwd: password updated successfully
basanta@machine:~ $ sudo passwd -d layla
passwd: password expiry information changed.
basanta@machine:~ $ sudo passwd -e layla
passwd: password expiry information changed.
basanta@machine:~ $ sudo passwd -q mark
New password:
BAD PASSWORD: The password contains the user name in some form
Retype new password:
Sorry, passwords do not match.
New password:
BAD PASSWORD: The password contains the user name in some form
Retype new password:
passwd: password updated successfully
basanta@machine:~ $ sudo passwd -u mark
passwd: password expiry information changed.
basanta@machine:~ $
```

1.24. Command Name: lsblk

Syntax: lsblk [option] [device]

Usage: used for listing information about all available or the specified block devices

Commands Used:

- lsblk -> lists block devices
- lsblk -a -> lists empty devices and RAM disk devices as well
- lsblk -b -> prints the SIZE column in bytes
- lsblk -f -> outputs info about filesystems
- lsblk -i -> use ASCII characters for tree fromatting

Output:

```
basanta@machine:~ $ lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINTS
sda	8:0	0	931.5G	0	disk	
└─sda1	8:1	0	931.5G	0	part	/home
nvme0n1	259:0	0	238.5G	0	disk	
├─nvme0n1p1	259:1	0	476M	0	part	/boot/efi
├─nvme0n1p2	259:2	0	3.8G	0	part	[SWAP]
└─nvme0n1p3	259:3	0	234.2G	0	part	/

```
basanta@machine:~ $ lsblk -a
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINTS
loop0	7:0	0	0B	0	loop	
loop1	7:1	0	0B	0	loop	
loop2	7:2	0	0B	0	loop	
loop3	7:3	0	0B	0	loop	
loop4	7:4	0	0B	0	loop	
loop5	7:5	0	0B	0	loop	
loop6	7:6	0	0B	0	loop	
loop7	7:7	0	0B	0	loop	
sda	8:0	0	931.5G	0	disk	
└─sda1	8:1	0	931.5G	0	part	/home
nvme0n1	259:0	0	238.5G	0	disk	
├─nvme0n1p1	259:1	0	476M	0	part	/boot/efi
├─nvme0n1p2	259:2	0	3.8G	0	part	[SWAP]
└─nvme0n1p3	259:3	0	234.2G	0	part	/

```
basanta@machine:~ $ lsblk -b
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINTS
sda	8:0	0	1000204886016	0	disk	
└─sda1	8:1	0	1000203091968	0	part	/home
nvme0n1	259:0	0	256060514304	0	disk	
├─nvme0n1p1	259:1	0	499122176	0	part	/boot/efi
├─nvme0n1p2	259:2	0	4095737856	0	part	[SWAP]
└─nvme0n1p3	259:3	0	251464253440	0	part	/

```
basanta@machine:~ $ lsblk -f
```

NAME	FSTYPE	FSVER	LABEL	UUID	FSAVAIL	FSUSE%	MOUNTPOINTS
sda							
└─sda1	ext4	1.0		a6475348-e065-4116-85ef-0a30d9ee9f78	597.4G	30%	/home
nvme0n1							
├─nvme0n1p1	vfat	FAT32		A6D8-5AD2		469.8M	1% /boot/efi
├─nvme0n1p2	swap	1		62c5fb51-580d-493a-930c-8665da75271b			[SWAP]
└─nvme0n1p3	ext4	1.0		56dc1d82-7f84-46a5-96a2-1a6194fba21a	203.1G	6%	/

```
basanta@machine:~ $ lsblk -i
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINTS
sda	8:0	0	931.5G	0	disk	
└─sda1	8:1	0	931.5G	0	part	/home
nvme0n1	259:0	0	238.5G	0	disk	
├─nvme0n1p1	259:1	0	476M	0	part	/boot/efi
├─nvme0n1p2	259:2	0	3.8G	0	part	[SWAP]
└─nvme0n1p3	259:3	0	234.2G	0	part	/

1.26. Command Na

me: useradd

Syntax: useradd [options]

Usage: used for creating new users

Commands Used:

- useradd khonshu -> creates a new user with the name khonshu
- useradd -m mark -> creates the user's home directory
- useradd layla -c "Layla is cute" -> adds short description of login
- useradd -G developers steven -> adds user steven to the developers group

Output:

```
basanta@machine:~ $ sudo su
root@machine:/home/basanta# useradd khonshu
root@machine:/home/basanta# grep khonshu /etc/passwd
khonshu:x:1001:1002::/home/khonshu:/bin/sh
root@machine:/home/basanta# useradd -m mark
root@machine:/home/basanta# ls /home
basanta lost+found mark
root@machine:/home/basanta# useradd layla -c "Layla is cute"
root@machine:/home/basanta# grep layla /etc/passwd
layla:x:1003:1004:Layla is cute:/home/layla:/bin/sh
root@machine:/home/basanta# useradd -G developers steven
root@machine:/home/basanta# grep developers /etc/group
developers:x:1001:steven
root@machine:/home/basanta# █
```

1.27. Command Name: userdel

Syntax: userdel [options]

Usage: used for removing user

Commands Used:

- userdel khonshu -> removes user with the name khonshu
- userdel -f steven -> forces the removal of user's(steven) account
- userdel -r mark -> mark's home directory will be removed along with mark's mail spool

Output:

```
root@machine:/home/basanta# userdel khonshu
root@machine:/home/basanta# grep khonshu /etc/passwd
root@machine:/home/basanta# userdel -f steven
root@machine:/home/basanta# grep steven /etc/passwd
root@machine:/home/basanta# grep steven /etc/group
root@machine:/home/basanta# userdel -r mark
userdel: mark mail spool (/var/mail/mark) not found
root@machine:/home/basanta# ls /home/
basanta lost+found
root@machine:/home/basanta# grep mark /etc/passwd
root@machine:/home/basanta# █
```

1.28. Command Name: apt-get**Syntax:** apt-get [options]**Usage:** used for handling packages**Commands Used:**

- apt-get update -> resynchronizes the package index files from their sources
- apt-get upgrade -y -> install the newest versions of all packages currently installed on the system from the sources
- apt-get install gimp -> installs gimp software
- apt-get purge gimp -> uninstalls gimp
- apt-get autoclean -> clears out the local repository of retrieved package files
- apt-get autoremove -> removes packages that were automatically installed to satisfy dependencies for other packages and are now no longer needed

Output:

```
basanta@machine:~ $ sudo apt-get update
Hit:1 http://packages.microsoft.com/repos/code stable InRelease
Hit:2 http://np.archive.ubuntu.com/ubuntu jammy InRelease
Get:3 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:4 http://np.archive.ubuntu.com/ubuntu jammy-updates InRelease [109 kB]
Hit:5 https://ppa.launchpadcontent.net/saiarcot895/chromium-beta/ubuntu jammy InRelease
Get:6 http://np.archive.ubuntu.com/ubuntu jammy-backports InRelease [99.8 kB]
Get:7 http://security.ubuntu.com/ubuntu jammy-security/main amd64 DEP-11 Metadata [11.4 kB]
Get:8 http://np.archive.ubuntu.com/ubuntu jammy-updates/main i386 Packages [129 kB]
Get:9 http://np.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [303 kB]
Get:10 http://np.archive.ubuntu.com/ubuntu jammy-updates/main amd64 DEP-11 Metadata [73.4 kB]
Get:11 http://np.archive.ubuntu.com/ubuntu jammy-updates/universe i386 Packages [56.8 kB]
Get:12 http://np.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [124 kB]
Get:13 http://np.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 DEP-11 Metadata [91.9 kB]
Get:14 http://np.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 DEP-11 Metadata [1,192 B]
Fetched 1,110 kB in 3s (406 kB/s)
Reading package lists... Done
```

```
basanta@machine:~ $ sudo apt-get upgrade -y
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following packages have been kept back:
  linux-generic-hwe-22.04 linux-headers-generic-hwe-22.04 linux-image-generic-hwe-22.04 snapd
0 upgraded, 0 newly installed, 0 to remove and 4 not upgraded.
```

```
basanta@machine:~ $ sudo apt-get install gimp
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Suggested packages:
  gimp-help-en | gimp-help gimp-data-extras
The following NEW packages will be installed:
  gimp
0 upgraded, 1 newly installed, 0 to remove and 4 not upgraded.
Need to get 0 B/4,921 kB of archives.
After this operation, 21.1 MB of additional disk space will be used.
Selecting previously unselected package gimp.
(Reading database ... 241667 files and directories currently installed.)
Preparing to unpack .../gimp_2.10.30-1build1_amd64.deb ...
Unpacking gimp (2.10.30-1build1) ...
Setting up gimp (2.10.30-1build1) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu3) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for mailcap (3.70+nmulubuntu1) ...
Processing triggers for desktop-file-utils (0.26-1ubuntu3) ...
```

```
basanta@machine:~ $ sudo apt-get purge gimp
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  gimp-data graphviz libabdl0 libabbdl0.1-0 libcamd2 libcolamd2 libcdt5 libcgraph6 libcholmod3 libcolamd2 libgegl-0.4-0 libgegl-common libgimp2.0 libgts-0.7-5 libgts-bin libgvx6
  libgvpr2 liblab-gamut1 libmetis5 libmng2 libmypaint-1.5-1 libmypaint-common libpathplan4 libraw20 libsuitesparseconfig5 libumfpack5 libwmf0.2-7
Use 'sudo apt autoremove' to remove them.
The following packages will be REMOVED:
  gimp*
0 upgraded, 0 newly installed, 1 to remove and 4 not upgraded.
After this operation, 21.1 MB disk space will be freed.
Do you want to continue? [Y/n]
(Reading database ... 241949 files and directories currently installed.)
Removing gimp (2.10.30-1build1) ...
Processing triggers for gnome-menus (3.36.0-1ubuntu3) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for mailcap (3.70+mmulubuntu1) ...
Processing triggers for desktop-file-utils (0.26-1ubuntu3) ...
```

```
basanta@machine:~ $ sudo apt-get autoclean
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Del libfreerdp2-2 2.6.1+dfsg1-3ubuntu2 [557 kB]
Del linux-headers-generic-hwe-22.04 5.15.0.37.39 [2,296 B]
Del nautilus-data 1:42.1.1-0ubuntu1 [11.3 kB]
Del libnautilus-extension1a 1:42.1.1-0ubuntu1 [16.1 kB]
Del linux-libc-dev 5.15.0-37.39 [1,313 kB]
Del libfreerdp-server2-2 2.6.1+dfsg1-3ubuntu2 [99.9 kB]
Del linux-generic-hwe-22.04 5.15.0.37.39 [1,670 B]
Del linux-image-generic-hwe-22.04 5.15.0.37.39 [2,408 B]
Del nautilus 1:42.1.1-0ubuntu1 [631 kB]
Del libfreerdp-client2-2 2.6.1+dfsg1-3ubuntu2 [283 kB]
Del libwinpr2-2 2.6.1+dfsg1-3ubuntu2 [353 kB]
basanta@machine:~ $ sudo apt-get autoremove
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
0 upgraded, 0 newly installed, 0 to remove and 4 not upgraded.
```

1.29. Command Name: ping

Syntax: ping [options] {destination}

Usage: used for sending ICMP ECHO_REQUEST to network hosts

Commands Used:

- ping google.com -> pings google.com
- ping -c 3 google.com -> stops after sending 3 ECHO_REQUEST packets
- ping -4 -c 5 google.com -> uses ipv4 only and stops after sending 5 ECHO_REQUEST packets
- ping -6 -c 5 google.com -> uses ipv6 only and stops after sending 5 ECHO_REQUEST packets

➤ ping -i 10 -c 3 google.com -> send 3 ECHO_REQUEST packets in the interval of 10 seconds

Output:

```
basanta@machine:~ $ ping google.com
PING google.com(bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e)) 56 data bytes
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=1 ttl=114 time=101 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=2 ttl=114 time=123 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=3 ttl=114 time=147 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=4 ttl=114 time=167 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=5 ttl=114 time=86.8 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=6 ttl=114 time=109 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=7 ttl=114 time=132 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=8 ttl=114 time=66.3 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=9 ttl=114 time=66.0 ms
^C
--- google.com ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 8013ms
rtt min/avg/max/mdev = 65.987/110.904/167.307/32.944 ms
```

```
basanta@machine:~ $ ping -c 3 google.com
PING google.com(bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e)) 56 data bytes
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=1 ttl=114 time=164 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=2 ttl=114 time=84.2 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=3 ttl=114 time=106 ms

--- google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 84.218/118.265/164.326/33.789 ms
```

```
basanta@machine:~ $ ping -4 -c 5 google.com
PING (142.250.192.46) 56(84) bytes of data.
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=1 ttl=56 time=142 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=2 ttl=56 time=165 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=3 ttl=56 time=188 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=4 ttl=56 time=210 ms
64 bytes from bom12s15-in-f14.1e100.net (142.250.192.46): icmp_seq=5 ttl=56 time=131 ms

--- ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 130.766/167.047/210.044/29.082 ms
basanta@machine:~ $ ping -6 -c 5 google.com
PING google.com(bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e)) 56 data bytes
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=1 ttl=114 time=140 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=2 ttl=114 time=163 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=3 ttl=114 time=83.6 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=4 ttl=114 time=106 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=5 ttl=114 time=129 ms

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4004ms
rtt min/avg/max/mdev = 83.623/124.273/162.618/27.212 ms
```

```
basanta@machine:~ $ ping -i 10 -c 3 google.com
PING google.com(bom07s35-in-x0e.1e100.net (2404:6800:4009:82c::200e)) 56 data bytes
64 bytes from bom07s35-in-x0e.1e100.net (2404:6800:4009:82c::200e): icmp_seq=1 ttl=114 time=102 ms
64 bytes from bom07s35-in-x0e.1e100.net (2404:6800:4009:82c::200e): icmp_seq=2 ttl=114 time=128 ms
64 bytes from bom07s35-in-x0e.1e100.net (2404:6800:4009:82c::200e): icmp_seq=3 ttl=114 time=157 ms

--- google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 20016ms
rtt min/avg/max/mdev = 102.130/128.997/157.313/22.551 ms
```

1.30. Command Name: find

Syntax: find [options] [path] [expression]

Usage: used for searching for files in a directory hierarchy

Commands Used:

- find ~/.vimrc -> searches for `vimrc` file
- find ~/.config/nvim -type d -> find all directories in the `~/.config/nvim` directory
- find ~/.config/polybar -mtime +10 -daystart -> list all files in the `~/.config/polybar` directory that were modified 10 or more days ago

Output:

```
basanta@machine:~ $ find .vimrc
.vimrc
basanta@machine:~ $ find ~/.config/nvim -type d
/home/basanta/.config/nvim
/home/basanta/.config/nvim/lua
/home/basanta/.config/nvim/lua/config
/home/basanta/.config/nvim/plugin
basanta@machine:~ $ find ~/.config/polybar -mtime +10 -daystart
/home/basanta/.config/polybar
/home/basanta/.config/polybar/config.def
/home/basanta/.config/polybar/launch.sh
basanta@machine:~ $ █
```

1.31. Command Name: head

Syntax: head [options] [file]

Usage: used for printing the first part of file

Commands Used:

- head ~/.vimrc -> prints the first 10 lines of `vimrc` file

- head -v ~/.vimrc -> prints first 10 lines of `vimrc` file with header giving file name
- head -n 5 ~/.vimrc -> prints the first 5 lines of `vimrc` file

Output:

```
basanta@machine:~ $ head ~/.vimrc
"-----SETS-----
syntax on
set encoding=UTF-8
set shortmess+=c
set nu
set rnu
set hidden
set shiftwidth=4
set tabstop=4
set softtabstop=4
basanta@machine:~ $ head -v ~/.vimrc
==> /home/basanta/.vimrc <==
"-----SETS-----
syntax on
set encoding=UTF-8
set shortmess+=c
set nu
set rnu
set hidden
set shiftwidth=4
set tabstop=4
set softtabstop=4
basanta@machine:~ $ head -n 5 ~/.vimrc
"-----SETS-----
syntax on
set encoding=UTF-8
set shortmess+=c
set nu
basanta@machine:~ $
```

1.32. Command Name: uname

Syntax: uname [option]

Usage: used for printing system information

Commands Used:

- uname -s -> prints the kernel name
- uname -n -> prints the hostname
- uname -v -> prints the kernel version
- uname -r -> prints the kernel release
- uname -m -> prints machine hardware name
- uname -p -> prints the processor type
- uname -i -> prints the hardware platform
- uname -o -> prints the operating system

Output:

```
basanta@machine:~ $ uname -s
Linux
basanta@machine:~ $ uname -n
machine
basanta@machine:~ $ uname -r
5.15.0-37-generic
basanta@machine:~ $ uname -v
#39-Ubuntu SMP Wed Jun 1 19:16:45 UTC 2022
basanta@machine:~ $ uname -m
x86_64
basanta@machine:~ $ uname -p
x86_64
basanta@machine:~ $ uname -i
x86_64
basanta@machine:~ $ uname -o
GNU/Linux
basanta@machine:~ $ █
```

1.33. Command Name: tail

Syntax: tail [option] [file]

Usage: used for printing the last 10 lines of a file

Commands Used:

- tail ~/.bashrc -> prints the last 10 lines of the `~/.bashrc` file
- Tail -n 5 ~/.bashrc -> prints the last 5 lines of the `~/.bashrc` file
- Tail -v ~/.bashrc -> prints last 10 lines of the `~/.bashrc` file along with filename as a header

cat

Output:

```
basanta@machine:~ $ tail ~/.bashrc
# enable programmable completion features (you don't need to enable
# this, if it's already enabled in /etc/bash.bashrc and /etc/profile
# sources /etc/bash.bashrc).
if ! shopt -oq posix; then
    if [ -f /usr/share/bash-completion/bash_completion ]; then
        . /usr/share/bash-completion/bash_completion
    elif [ -f /etc/bash_completion ]; then
        . /etc/bash_completion
    fi
fi
basanta@machine:~ $ tail -n 5 ~/.bashrc
    . /usr/share/bash-completion/bash_completion
elif [ -f /etc/bash_completion ]; then
    . /etc/bash_completion
fi
fi
basanta@machine:~ $ tail -v ~/.bashrc
==> /home/basanta/.bashrc <==
# enable programmable completion features (you don't need to enable
# this, if it's already enabled in /etc/bash.bashrc and /etc/profile
# sources /etc/bash.bashrc).
if ! shopt -oq posix; then
    if [ -f /usr/share/bash-completion/bash_completion ]; then
        . /usr/share/bash-completion/bash_completion
    elif [ -f /etc/bash_completion ]; then
        . /etc/bash_completion
    fi
fi
```

1.34. Command Name: tac

Syntax: tac [option] [file]

Usage: used for concatenating printing files in reverse

Commands Used:

- cat nnone.js -> prints file content from `nnone.js` in normal form
- tac nnone.js -> prints file content from `nnone.js` in reverse
- tac nltwo.js nnone.js -> prints file contents in reverse
- tac -b nnone.js -> attach the separator before instead of after
- tac -s nnone.js nltwo.js -> use string as separator instead of newline
- tac -r nnone.js nltwo.js -> interpret the separator as regular expression

Output:

```
basanta@machine:~/Code/js $ cat nnone.js
one
two
three
basanta@machine:~/Code/js $ tac nnone.js
three
two
one
basanta@machine:~/Code/js $ tac nltwo.js
five
four
basanta@machine:~/Code/js $ tac nltwo.js nnone.js
five
four
three
two
one
```

```
basanta@machine:~/Code/js $ tac -b nnone.js

three
twoonebasanta@machine:~/Code/js $ tac -s nnone.js nltwo.js
four
five
basanta@machine:~/Code/js $ tac -r nnone.js nltwo.js
three
two
one
five
four
```

1.35. Command Name: comm

Syntax: comm [option] FILE1 FILE2

Usage: used for comparing different files

Commands Used:

- cat nnone.js -> print contents of nnone.js file
- cat nltwo.js -> print contents of nltwo.js file
- comm nnone.js nltwo.js -> compares two files
- comm --nocheck-order nnone.js nltwo.js -> compares two files and suppresses warning
- comm -1 --nocheck-order nnone.js nltwo.js -> suppress column 1 and display column 2 only
- comm -12 --nocheck-order nnone.js nltwo.js -> suppress column 1 and 2
- comm --total --nocheck-order nnone.js nltwo.js -> output summary
- comm --zero-terminated nnone.js nltwo.js -> line delimiter will be null not a new line
- comm --output-delimiter=--- nnone.js nltwo.js -> separate columns with ---

Output:

```
basanta@machine:~/Code/js $ cat nnone.js
one
two
three
basanta@machine:~/Code/js $ cat nltwo.js
four
five
basanta@machine:~/Code/js $ comm nnone.js nltwo.js
        four
comm: file 2 is not in sorted order
        five
one
two
comm: file 1 is not in sorted order
three
comm: input is not in sorted order
basanta@machine:~/Code/js $ comm --nocheck-order nnone.js nltwo.js
        four
        five
one
two
three
basanta@machine:~/Code/js $ comm -1 --nocheck-order nnone.js nltwo.js
four
five
```

```
basanta@machine:~/Code/js $ comm -1 --nocheck-order nnone.js nltwo.js
four
five
basanta@machine:~/Code/js $ comm -12 --nocheck-order nnone.js nltwo.js
basanta@machine:~/Code/js $ comm --total --nocheck-order nnone.js nltwo.js
    four
    five
one
two
three
3      2      0      total
basanta@machine:~/Code/js $ comm --zero-terminated nnone.js nltwo.js
        four
five
one
two
three
basanta@machine:~/Code/js $ comm --output-delimiter=--- nnone.js nltwo.js
---four
comm: file 2 is not in sorted order
---five
one
two
comm: file 1 is not in sorted order
three
comm: input is not in sorted order
basanta@machine:~/Code/js $
```

1.36. Command Name: cut

Syntax: cut [option] [file]

Usage: used for cutting parts of a line by field, delimiter, byte position, and character and printing the result to standard output

Commands Used:

- cut -c 1 sample.txt -> extracts first character from each line
- cut -c 1,3 sample.txt -> extracts two character from each line
- cut -d: -f 1,6 /etc/passwd -> returns each user in the system and their home directory, corresponding to fields 1 and 6, respectively

Output:

```
basanta@machine:~/Code/ushits $ cat sample.txt
Apple    fruit
Ball     object
Cat      animal
Dog      animal
Elephant animal
basanta@machine:~/Code/ushits $ cut -c 1 sample.txt
A
B
C
D
E
basanta@machine:~/Code/ushits $ cut -c 1,3 sample.txt
Ap
Bl
Ct
Dg
Ee
basanta@machine:~/Code/ushits $ cd
basanta@machine:~ $ cut -d: -f 1,6 /etc/passwd
root:/root
daemon:/usr/sbin
bin:/bin
sys:/dev
sync:/bin
games:/usr/games
man:/var/cache/man
lp:/var/spool/lpd
mail:/var/mail
news:/var/spool/news
uucp:/var/spool/uucp
proxy:/bin
www-data:/var/www
```

1.37. Command Name: sort

Syntax: sort [option] [file]

Usage: used for sorting the content of files

Commands Used:

- sort sample.txt -> sort the content of `sample.txt`
- sort -r sample.txt -> sort contents of `sample.txt` in reverse order
- sort -c sample.txt -> checks whether the file is already sorted or not
- sort -u sample.txt -> sorts the contents and removes the duplication

Output:

```
basanta@machine:~/Code/ushits $ cat sample.txt
Ball      object
Dog       animal
Elephant animal
Dog       animal
Cat       animal
Apple    fruit
basanta@machine:~/Code/ushits $ sort sample.txt
Apple    fruit
Ball      object
Cat       animal
Dog       animal
Dog       animal
Elephant animal
basanta@machine:~/Code/ushits $ sort -r sample.txt
Elephant animal
Dog       animal
Dog       animal
Cat       animal
Ball      object
Apple    fruit
basanta@machine:~/Code/ushits $ sort -c sample.txt
sort: sample.txt:4: disorder: Dog      animal
basanta@machine:~/Code/ushits $ sort -u sample.txt
Apple    fruit
Ball      object
Cat       animal
Dog       animal
Elephant animal
basanta@machine:~/Code/ushits $
```

1.38. Command Name: date

Syntax: date [option] [format]

Usage: used for displaying current date in given format

Commands Used:

- Date -> prints the current date
- date -R -> prints date in RFC format
- date +'%a, %b %d' -> print date in given format
- date -d yesterday -> prints yesterday's date
- date -u -> prints in UTC format

Output:

```
basanta@machine:~ $ date
Sun Jun 19 05:04:19 PM +0545 2022
basanta@machine:~ $ date -R
Sun, 19 Jun 2022 17:04:23 +0545
basanta@machine:~ $ date +'%a, %b %d'
Sun, Jun 19
basanta@machine:~ $ date -d yesterday
Sat Jun 18 05:05:26 PM +0545 2022
basanta@machine:~ $ date -u
Sun Jun 19 11:20:50 AM UTC 2022
basanta@machine:~ $ █
```

1.39. Command Name: time

Syntax: time [option] [command]

Usage: used for printing the a summary of system resource usage

Commands Used:

- time
- time -p prints time in POSIX format\
- time sleep 5

Output:

```
basanta@machine:~ $ time  
  
real    0m0.000s  
user    0m0.000s  
sys     0m0.000s  
basanta@machine:~ $ time -p  
real 0.00  
user 0.00  
sys 0.00  
basanta@machine:~ $ time sleep 5  
  
real    0m5.004s  
user    0m0.003s  
sys     0m0.001s  
basanta@machine:~ $
```

1.40. Command Name: host

Syntax: host [-aACdlnrsTUwv] [-c class] [-N ndots] [-p port] [-R number] [-t type] [-W wait] [-m flag] [[-4] | [-6]] [-v] [-V] {name} [server]

Usage: used for DNS lookup operations

Commands Used:

- host -4 google.com -> uses ipv4 for query
- host -t ns google.com -> specifies type of the query
- host -a google.com -> enables verbose output

Output:

```

basanta@machine:~ $ host -4 google.com
google.com has address 142.250.66.14
google.com has IPv6 address 2404:6800:4009:827::200e
google.com mail is handled by 10 smtp.google.com.
basanta@machine:~ $ host -t ns google.com
google.com name server ns3.google.com.
google.com name server ns4.google.com.
google.com name server ns1.google.com.
google.com name server ns2.google.com.
basanta@machine:~ $ host -a google.com
Trying "google.com"
;; ->>HEADER<- opcode: QUERY, status: NOERROR, id: 52043
;; flags: qr rd ra; QUERY: 1, ANSWER: 8, AUTHORITY: 0, ADDITIONAL: 0

;; QUESTION SECTION:
;google.com.           IN      ANY

;; ANSWER SECTION:
google.com.          230    IN      A      142.250.66.14
google.com.          106    IN      AAAA   2404:6800:4009:82f::200e
google.com.          165    IN      MX     10 smtp.google.com.
google.com.          16     IN      SOA    ns1.google.com. dns-admin.google.com. 455902470 900 900 1800 60
google.com.         79885   IN      NS     ns3.google.com.
google.com.         79885   IN      NS     ns4.google.com.
google.com.         79885   IN      NS     ns1.google.com.
google.com.         79885   IN      NS     ns2.google.com.

Received 211 bytes from 127.0.0.53#53 in 8 ms
basanta@machine:~ $ 

```

1.41. Command Name: id

Syntax: id [option] [user]

Usage: used for printing the user and group information for each specified USER

Commands Used:

- id -> prints the user and group information for current user(basanta)
- id -a layla -> prints user and group information for layla
- id -G basanta -> prints all group IDs
- id -G layla -> prints all group ID

Output:

```

basanta@machine:~ $ id
uid=1000(basanta) gid=1000(basanta) groups=1000(basanta),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),122(lpadmin),134(lxd),135(sambashare),138(docker)
basanta@machine:~ $ id -a layla
uid=1001(layla) gid=1002(layla) groups=1002(layla)
basanta@machine:~ $ id -G basanta
1000 4 24 27 30 46 122 134 135 138
basanta@machine:~ $ id -G layla
1002
basanta@machine:~ $ id -r layla
id: cannot print only names or real IDs in default format
basanta@machine:~ $ 

```

1.42. Command Name: ps

Syntax: ps [options]

Usage: used for displaying information about a selection of the active processes

Commands Used:

- ps -> displays processes for the current shell
- ps -t -> selects the processes associated with terminal
- ps -u -> selects the processes whose effective user name or ID is in userlist
- ps -s -> displays process in signal format
- ps ax -> displays every process on the system using BSD syntax

Output:

```
basanta@machine:~ $ ps
  PID TTY      TIME CMD
 4541 pts/0    00:00:00 bash
 9235 pts/0    00:00:00 ps
basanta@machine:~ $ ps -t
  PID TTY      STAT   TIME COMMAND
 4541 pts/0    Ss      0:00 bash
 9237 pts/0    R+      0:00 ps -t
basanta@machine:~ $ ps -u
USER        PID %CPU %MEM   VSZ   RSS TTY      STAT START  TIME COMMAND
basanta     2916  0.0  0.0 171428  6100 tty2      Ssl+ 09:22  0:00 /usr/libexec/gdm-x-session -
basanta     2918  4.5  1.4 2503372 115924 tty2      Sl+  09:22  2:27 /usr/lib/xorg/Xorg vt2 -disp
basanta     3001  0.0  0.2 208528 16264 tty2      S+   09:22  0:02 i3
basanta     4541  0.0  0.0 20412   5424 pts/0      Ss   09:31  0:00 bash
basanta     8399  0.0  0.0 20412   5280 pts/1      Ss   10:12  0:00 bash
basanta     8406  0.0  0.0 20144   4144 pts/1      S+   10:12  0:00 man ps
basanta     8414  0.0  0.0 17760   2748 pts/1      S+   10:12  0:00 pager
basanta     9242  0.0  0.0 21676   3560 pts/0      R+   10:16  0:00 ps -u
```

```
basanta@machine:~ $ ps -s
   UID   PID  PENDING  BLOCKED  IGNORED  CAUGHT STAT TTY      TIME COMMAND
1000  2916  00000000  00000000  00001000 <00014000 Ssl+  tty2      0:00 /usr/libexec/gdm-x-s
1000  2918  00000000  00000000  00001000 <418066ef Sl+  tty2      2:26 /usr/lib/xorg/Xorg v
1000  3001  00000000  00000000  00001000 <000166af S+   tty2      0:02 i3
1000  4541  00000000  00010000  00384004 4b813efb Ss   pts/0      0:00 bash
1000  8399  00000000  00010000  00384004 4b813efb Ss   pts/1      0:00 bash
1000  8406  00000000  00000000  00000006  00014001 S+   pts/1      0:00 man ps
1000  8414  00000000  00010000  00000004  08084002 S+   pts/1      0:00 pager
1000  9232  00000000  00000000  00000000  73d1fef9 R+   pts/0      0:00 ps -s
```

```
basanta@machine:~ $ ps ax
  PID TTY      STAT   TIME  COMMAND
    1 ?        Ss      0:03 /sbin/init splash
    2 ?        S      0:00 [kthreadd]
    3 ?        I<     0:00 [rcu_gp]
    4 ?        I<     0:00 [rcu_par_gp]
    5 ?        I<     0:00 [netns]
    7 ?        I<     0:00 [kworker/0:0H-acpi_thermal_pm]
   10 ?       I<     0:00 [mm_percpu_wq]
   11 ?       S      0:00 [rcu_tasks_rude_]
   12 ?       S      0:00 [rcu_tasks_trace]
   13 ?       S      0:00 [ksoftirqd/0]
   14 ?       I      0:07 [rcu_sched]
   15 ?       S      0:00 [migration/0]
   16 ?       S      0:00 [idle_inject/0]
```

1.43. Command Name: top

Syntax: top -hv|bcEeHiOSs1 -d secs -n max -u|U user -p pids -o field -w [cols]

Usage: used for displaying system summary information as well as a list of processes or threads currently being managed by the Linux kernel

Commands Used:

- top -> displays user processes for current user(basanta)
- top -u layla -> displays user processes for specified user(layla)

Output:

```
top - 10:31:37 up 1:12, 1 user, load average: 1.11, 1.49, 1.84
Tasks: 282 total, 2 running, 280 sleeping, 0 stopped, 0 zombie
%Cpu(s): 10.9 us, 3.2 sy, 0.0 ni, 85.8 id, 0.0 wa, 0.0 hi, 0.1 si, 0.0 st
Mib Mem : 7833.8 total, 3097.5 free, 2546.0 used, 2190.4 buff/cache
Mib Swap: 3906.0 total, 3906.0 free, 0.0 used. 4767.5 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
4797	basanta	20	0	1118.7g	586556	118748	R	73.2	7.3	28:09.55	chromium-browse
3437	basanta	20	0	2285784	192216	107420	S	15.9	2.4	9:40.91	chromium-browse
3396	basanta	20	0	3176056	425244	178768	S	7.3	5.3	7:03.81	chromium-browse
2918	basanta	20	0	2496820	117124	83148	S	5.0	1.5	3:18.26	Xorg
2887	basanta	9	-11	1246952	31172	21864	S	4.6	0.4	2:35.53	pulseaudio
7284	basanta	20	0	1110.1g	175224	93892	S	3.0	2.2	1:23.90	chromium-browse
4290	basanta	20	0	1114.0g	342784	110424	S	2.3	4.3	7:22.72	chromium-browse
4515	basanta	20	0	706872	57020	40936	S	2.0	0.7	0:35.17	gnome-terminal-
3820	basanta	20	0	1450680	30960	19364	S	1.7	0.4	0:55.40	chromium-browse
236	root	-51	0	0	0	0	S	1.0	0.0	0:18.88	irq/108-CUST000

```
basanta@machine:~ $ top -u layla
top - 10:30:33 up 1:11, 1 user, load average: 0.88, 1.58, 1.90
Tasks: 286 total, 1 running, 285 sleeping, 0 stopped, 0 zombie
%Cpu(s): 9.1 us, 2.9 sy, 0.0 ni, 85.3 id, 2.6 wa, 0.0 hi, 0.0 si, 0.0 st
Mib Mem : 7833.8 total, 3092.3 free, 2550.5 used, 2191.1 buff/cache
Mib Swap: 3906.0 total, 3906.0 free, 0.0 used. 4761.4 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND

1.44. Command Name: kill

Syntax: kill [option] <pid>

Usage: used for sending a signal to a process

Commands Used:

- kill -9 3396 -> kill all process of id 3396
- kill -l -> lists signal name
- kill 13986 -> process receives a kill signal

Output:

```
top - 10:59:18 up 1:40, 1 user, load average: 1.84, 1.87, 2.34
Tasks: 299 total, 1 running, 298 sleeping, 0 stopped, 0 zombie
%Cpu(s): 31.7 us, 6.1 sy, 0.0 ni, 54.5 id, 7.7 wa, 0.0 hi, 0.1 si, 0.0 st
Mib Mem : 7833.8 total, 2190.9 free, 3229.0 used, 2414.0 buff/cache
Mib Swap: 3906.0 total, 3906.0 free, 0.0 used. 4007.9 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
11364	basanta	20	0	1122.1g	342380	102940	S	69.5	4.3	2:00.32	chromium-browse
3396	basanta	20	0	3274576	495004	184336	S	65.9	6.2	12:00.99	chromium-browse
7284	basanta	20	0	1110.1g	197116	94824	S	52.6	2.5	2:43.83	chromium-browse
3439	basanta	20	0	1664120	118788	67204	S	16.6	1.5	2:54.88	chromium-browse
3437	basanta	20	0	2322464	219972	112960	S	15.6	2.7	12:49.43	chromium-browse

```

basanta@machine:~ $ kill -9 3396
basanta@machine:~ $ kill -l
 1) SIGHUP      2) SIGINT      3) SIGQUIT      4) SIGILL      5) SIGTRAP
 6) SIGABRT     7) SIGBUS      8) SIGFPE       9) SIGKILL     10) SIGUSR1
11) SIGSEGV     12) SIGUSR2     13) SIGPIPE     14) SIGALRM     15) SIGTERM
16) SIGSTKFLT   17) SIGCHLD     18) SIGCONT     19) SIGSTOP     20) SIGTSTP
21) SIGTTIN     22) SIGTTOU     23) SIGURG      24) SIGXCPU     25) SIGXFSZ
26) SIGVTALRM   27) SIGPROF     28) SIGWINCH    29) SIGIO       30) SIGPWR
31) SIGSYS      34) SIGRTMIN    35) SIGRTMIN+1  36) SIGRTMIN+2  37) SIGRTMIN+3
38) SIGRTMIN+4  39) SIGRTMIN+5  40) SIGRTMIN+6  41) SIGRTMIN+7  42) SIGRTMIN+8
43) SIGRTMIN+9  44) SIGRTMIN+10 45) SIGRTMIN+11 46) SIGRTMIN+12 47) SIGRTMIN+13
48) SIGRTMIN+14 49) SIGRTMIN+15 50) SIGRTMAX-14 51) SIGRTMAX-13 52) SIGRTMAX-12
53) SIGRTMAX-11 54) SIGRTMAX-10 55) SIGRTMAX-9  56) SIGRTMAX-8  57) SIGRTMAX-7
58) SIGRTMAX-6  59) SIGRTMAX-5  60) SIGRTMAX-4  61) SIGRTMAX-3  62) SIGRTMAX-2
63) SIGRTMAX-1  64) SIGRTMAX

basanta@machine:~ $ ps
  PID TTY      TIME CMD
 10037 pts/1    00:00:00 bash
 13986 pts/1    00:00:00 ps
basanta@machine:~ $ kill 13986
bash: kill: (13986) - No such process
basanta@machine:~ $ █

```

1.45. Command Name: pkill

Syntax: pkill [options] pattern

Usage: used for sending signals to the processes of a running program based on given criteria

Commands Used:

- pkill polybar -> kills processes for polybar
- pkill -e chromium-browse -> displays name and PID of the process being killed (chromium-browse)

Output:

```
top - 14:57:43 up 25 min, 1 user, load average: 1.02, 1.63, 1.68
Tasks: 277 total, 1 running, 276 sleeping, 0 stopped, 0 zombie
%Cpu(s): 2.7 us, 0.8 sy, 0.0 ni, 96.4 id, 0.1 wa, 0.0 hi, 0.0 si, 0.0 st
MiB Mem : 7833.8 total, 4137.1 free, 1751.5 used, 1945.2 buff/cache
MiB Swap: 3906.0 total, 3906.0 free, 0.0 used. 5605.9 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+	COMMAND
6059	basanta	20	0	1110.2g	222920	99268	S	12.0	2.8	0:15.34	chromium-browse
5846	basanta	20	0	2568880	269900	155036	S	4.7	3.4	0:11.14	chromium-browse
2078	basanta	20	0	2439464	92532	61456	S	4.3	1.2	1:02.24	Xorg
5888	basanta	20	0	1133900	92736	65864	S	1.7	1.2	0:02.90	chromium-browse
237	root	-51	0	0	0	0	S	1.3	0.0	0:05.19	irq/108-CUST000
2393	basanta	20	0	1003436	21696	18228	S	1.3	0.3	0:07.54	polybar
6094	basanta	20	0	1109.8g	308844	100984	S	1.3	3.9	0:23.94	chromium-browse
831	root	20	0	1707480	35364	25332	S	0.7	0.4	0:07.27	containerd
935	mysql	20	0	2171996	391276	34836	S	0.7	4.9	0:06.46	mysqld
6225	basanta	20	0	22224	4132	3260	R	0.7	0.1	0:00.10	top

```
basanta@machine:~ $ pkill polybar
basanta@machine:~ $ █
```

MiB Mem :	7833.8	total,	4114.8	free,	1761.7	used,	1957.3	buff/cache		
MiB Swap:	3906.0	total,	3906.0	free,	0.0	used.	5598.9	avail Mem		
PID	USER	PR	NI	VIRT	RES	SHR	S	TIME+ COMMAND		
5846	basanta	20	0	2553916	272384	155376	S	4.0	3.4	0:15.79 chromium-browse
6059	basanta	20	0	1110.2g	236948	99556	S	3.0	3.0	0:19.22 chromium-browse
6094	basanta	20	0	1109.8g	302080	101236	S	1.0	3.8	0:25.44 chromium-browse
831	root	20	0	1707480	35744	25512	S	0.7	0.4	0:07.71 containerd
555	root	-51	0	0	0	0	S	0.3	0.0	0:13.54 irq/139-rtw88_p
2320	basanta	20	0	823644	65288	44628	S	0.3	0.8	0:40.09 picom
4424	basanta	20	0	687500	43508	32004	S	0.3	0.5	0:07.92 gnome-terminal-
5507	root	20	0	0	0	0	I	0.3	0.0	0:00.31 kworker/u16:0-phy0
5888	basanta	20	0	1133900	92956	65920	S	0.3	1.2	0:03.48 chromium-browse
6119	basanta	20	0	1109.6g	90468	70032	S	0.3	1.1	0:00.80 chromium-browse
6431	basanta	20	0	22228	4136	3264	R	0.3	0.1	0:00.03 top

```
basanta@machine:~ $ pkill -e chromium-browse
chromium-browse killed (pid 5846)
chromium-browse killed (pid 5863)
chromium-browse killed (pid 5864)
chromium-browse killed (pid 5866)
chromium-browse killed (pid 5887)
chromium-browse killed (pid 5888)
chromium-browse killed (pid 5889)
chromium-browse killed (pid 5953)
chromium-browse killed (pid 6059)
chromium-browse killed (pid 6094)
chromium-browse killed (pid 6119)
chromium-browse killed (pid 6139)
chromium-browse killed (pid 6141)
chromium-browse killed (pid 6156)
basanta@machine:~ $ █
```

1.46. Command Name: killall

Syntax: killall [-Z, --context pattern] [-e, --exact] [-g, --process-group] [-i, --interactive] [-n, --ns PID] [-o, --older-than TIME] [-q, --quiet] [-r, --regexp] [-s, --signal SIG-NAL, -SIGNAL] [-u, --user user] [-v, --verbose] [-w, --wait] [-y, --younger-than TIME] [-I, --ignore-case] [-V, --version] [--] name ...

Usage: useful for killing process by name

Commands Used:

- killall nautilus -> kills all process having name nautilus
- killall -v gnome-calculator -> reports if signal is sent successfully or not
- killall -i gnome-calculator -> interactively asks for confirmation before killing

Output:

```
basanta@machine:~ $ ps aux | grep nautilus
basanta    5512  0.9  1.0 947060 80432 ?          Sl   15:57  0:04 nautilus
basanta    6074  0.0  0.0 18216  2360 pts/0      S+   16:04  0:00 grep --color=auto nautilus
basanta@machine:~ $ killall nautilus
basanta@machine:~ $ ps aux | grep nautilus
basanta    6092  0.0  0.0 18216  2356 pts/0      S+   16:05  0:00 grep --color=auto nautilus
basanta@machine:~ $ 

basanta@machine:~ $ ps aux | grep gimp
basanta    5791  0.4  1.5 1340980 124224 ?          SLL  16:01  0:02 gimp
basanta    5823  0.0  0.2 198408 18156 ?          Sl   16:01  0:00 /usr/lib/gimp/2.0/plug-ins/script-fu/script-fu -gimp 12 11 -run 0
basanta    6451  0.0  0.0 18084  2332 pts/0      R+   16:09  0:00 grep --color=auto gimp
basanta@machine:~ $ killall -i gimp
Kill gimp(5791) ? (y/N) y
basanta@machine:~ $ ps aux | grep gimp
basanta    6470  0.0  0.0 18084  2368 pts/0      S+   16:09  0:00 grep --color=auto gimp
basanta@machine:~ $ 

basanta@machine:~ $ ps aux | grep gnome-calculator
basanta    6769 10.3  0.7 573604 61976 ?          Sl   16:13  0:02 gnome-calculator
basanta    6821  8.7  0.6 563648 51992 ?          Sl   16:13  0:01 gnome-calculator
basanta    6867  0.0  0.0 18220  2320 pts/1      S+   16:13  0:00 grep --color=auto gnome-calculator
basanta@machine:~ $ killall -v gnome-calculator
Killed gnome-calculator(6769) with signal 15
Killed gnome-calculator(6821) with signal 15
basanta@machine:~ $ 
```

1.47. Command Name: bg

Syntax: bg [job_spec ...]

Usage: used for moving jobs to the background

Commands Used:

- jobs -> lists all jobs
- bg %1 -> moves stopped job having id 1 to background
- bg "%ping" -> moves stopped job to background

Output:

```
basanta@machine:~ $ jobs
basanta@machine:~ $ sleep 100
^Z
[1]+  Stopped                  sleep 100
basanta@machine:~ $ jobs
[1]+  Stopped                  sleep 100
basanta@machine:~ $ bg %1
[1]+ sleep 100 &
basanta@machine:~ $ jobs
[1]+  Running                  sleep 100 &
basanta@machine:~ $ ping -c 5 google.com
PING google.com(bom07s35-in-x0e.1e100.net (2404:6800:4009:82c::200e)) 56 data bytes
64 bytes from bom07s35-in-x0e.1e100.net (2404:6800:4009:82c::200e): icmp_seq=1 ttl=114 time=54.7 ms
^Z
[2]+  Stopped                  ping -c 5 google.com
basanta@machine:~ $ jobs
[1]-  Running                  sleep 100 &
[2]+  Stopped                  ping -c 5 google.com
basanta@machine:~ $ bg "%ping"
[2]+ ping -c 5 google.com &
basanta@machine:~ $ 64 bytes from bom07s35-in-x0e.1e100.net (2404:6800:4009:82c::200e): icmp_seq=2 ttl=114 time=156 ms
64 bytes from bom07s35-in-x0e.1e100.net (2404:6800:4009:82c::200e): icmp_seq=3 ttl=114 time=75.5 ms
64 bytes from bom07s35-in-x0e.1e100.net (2404:6800:4009:82c::200e): icmp_seq=4 ttl=114 time=98.0 ms
64 bytes from bom07s35-in-x0e.1e100.net (2404:6800:4009:82c::200e): icmp_seq=5 ttl=114 time=120 ms

--- google.com ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 16094ms
rtt min/avg/max/mdev = 54.692/100.795/155.694/35.098 ms
^C
[2]+ Done                      ping -c 5 google.com
basanta@machine:~ $ jobs
[1]+  Running                  sleep 100 &
basanta@machine:~ $
```

1.48. Command Name: fg

Syntax: fg [job_spec]

Usage: used for moving job to the foreground

Commands Used:

- fg %- -> brings previous job to foreground
- fg %1 -> brings job having id 1 to the foreground

Output:

```
basanta@machine:~ $ sleep 10
^Z
[1]+  Stopped                  sleep 10
basanta@machine:~ $ fg %-
sleep 10
basanta@machine:~ $ ping google.com -c 10
PING google.com(bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e)) 56 data bytes
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=1 ttl=114 time=78.8 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=2 ttl=114 time=75.7 ms
^Z
[1]+  Stopped                  ping google.com -c 10
basanta@machine:~ $ jobs
[1]+  Stopped                  ping google.com -c 10
basanta@machine:~ $ fg %1
ping google.com -c 10
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=3 ttl=114 time=77.7 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=4 ttl=114 time=88.1 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=5 ttl=114 time=78.0 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=6 ttl=114 time=77.3 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=7 ttl=114 time=155 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=8 ttl=114 time=169 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=9 ttl=114 time=98.4 ms
64 bytes from bom12s14-in-x0e.1e100.net (2404:6800:4009:827::200e): icmp_seq=10 ttl=114 time=117 ms
--- google.com ping statistics ---
10 packets transmitted, 10 received, 0% packet loss, time 25841ms
rtt min/avg/max/mdev = 75.704/101.505/168.642/32.749 ms
basanta@machine:~ $ jobs -l
basanta@machine:~ $
```

1.49. Command Name: tar

Syntax: tar [options] [archive-file] [file or directory to be archived]

Usage: used for create Archive and extract the Archive files

Commands Used:

- tar cvf blog.tar *.html -> creates a tar file called `blog.tar` which is the Archive of all .html files in current directory
- tar xvf blog.tar *.html -> extracts files from Archives

Output:

```
basanta@machine:~/Code/html $ ls
blogs.html error.html index.html
basanta@machine:~/Code/html $ tar cvf blog.tar *.html
blogs.html
error.html
index.html
basanta@machine:~/Code/html $ ls
blogs.html blog.tar error.html index.html
basanta@machine:~/Code/html $ tar xvf blog.tar
blogs.html
error.html
index.html
```

1.50. Command Name: gzip

Syntax: gzip [Options] [filenames]

Usage: used for compressing the files

Commands Used:

- gzip index.html -> creates a compressed file of index.html named as index.html.gz and deletes the original file
- gzip -k error.html -> creates compressed file of error.html named as error.html.gz and also keeps the original file
- gzip -L contact.html -> displays the gzip license
- gzip -r html -> compresses every file in the folder and its subfolders
- gzip -v blog.html -> displays the name and percentage reduction for each file compressed
- gzip -d blog.html.gz -> decompress a file
- gzip -vd contact.html.gz -> displays the name and percentage reduction for each file decompressed

Output:

```
basanta@machine:~/Code/html $ gzip index.html
basanta@machine:~/Code/html $ ls
blog.html contact.html error.html index.html.gz
basanta@machine:~/Code/html $ gzip -k error.html
basanta@machine:~/Code/html $ ls
blog.html contact.html error.html error.html.gz index.html.gz
basanta@machine:~/Code/html $ gzip -L contact.html
gzip 1.10
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Copyright (C) 1993 Jean-loup Gailly.
This is free software. You may redistribute copies of it under the terms of
the GNU General Public License <https://www.gnu.org/licenses/gpl.html>.
There is NO WARRANTY, to the extent permitted by law.
basanta@machine:~/Code/html $ ls
blog.html contact.html error.html error.html.gz index.html.gz
basanta@machine:~/Code/html $ cd ..
basanta@machine:~/Code $ gzip -r html/
gzip: html/error.html.gz already exists; do you wish to overwrite (y or n)? y
basanta@machine:~/Code $ ls html/
blog.html.gz contact.html.gz error.html.gz index.html.gz

basanta@machine:~/Code/html $ ls
blog.html contact.html.gz error.html.gz index.html.gz
basanta@machine:~/Code/html $ gzip -v blog.html
blog.html:          0.0% -- replaced with blog.html.gz
basanta@machine:~/Code/html $ ls
blog.html.gz contact.html.gz error.html.gz index.html.gz
basanta@machine:~/Code/html $ gzip -d blog.html.gz
basanta@machine:~/Code/html $ ls
blog.html contact.html.gz error.html.gz index.html.gz
basanta@machine:~/Code/html $ gzip -vd contact.html.gz
contact.html.gz:          0.0% -- replaced with contact.html
```