

MAWLANA BHASHANI SCIENCE AND TECHNOLOGY UNIVERSITY

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DEPARTMENT OF INFORMATION AND COMMUNICATION TECHNOLOGY

Lab Report

Lab Report No : 03

Lab Report on : Linux Command Practice

Course Title : Operating System Lab

Course Code : ICT-2202

Submitted By	Submitted To
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Introduction:

The Linux Command Line Interface (CLI) is a robust tool for interacting with the operating system through text-based commands. Accessible via a terminal emulator, the Linux CLI empowers users to perform a wide range of tasks, including system administration, file management, networking, troubleshooting, and automation. Mastering Linux commands enhances efficiency, simplifies system management, and builds valuable technical expertise for users and administrators alike.

Objectives:

- **Learn Basic Commands:** Gain a solid understanding of fundamental commands for navigating and managing files and directories.
- **Master Administrative Commands:** Explore commands for system configuration, user management, and process control.
- **Troubleshoot with System Commands:** Utilize diagnostic and monitoring tools to identify and resolve system issues effectively.
- **Automate Tasks:** Learn to create shell scripts for automating repetitive tasks and improving workflow.
- **Enhance Networking Knowledge:** Familiarize yourself with network-related commands for communication, diagnostics, and troubleshooting.
- **Develop Command-Line Proficiency:** Build confidence and competence in using the Linux CLI for both routine and advanced operations.

All Linux command and their execution on command prompts:

1. **pwd:** Displays the current directory's full path.



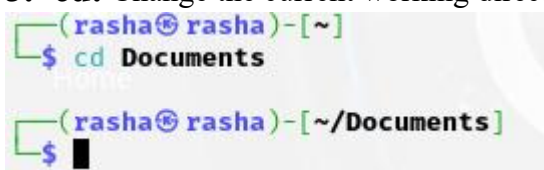
```
(rasha@rasha) ~  
$ pwd  
/home/rasha
```

2. **ls:** Lists files and directories in the current directory.



```
(rasha@rasha) ~  
$ ls  
Desktop Documents Downloads Music Pictures Public Templates Videos
```

3. **cd:** Change the current working directory.



```
(rasha@rasha) ~  
$ cd Documents  
  
(rasha@rasha) ~/Documents  
$
```

4. **mkdir**: Creates a new directory.

```
(rasha@rasha) - [~/Documents]
$ mkdir naima

(rasha@rasha) - [~/Documents]
$
```

5. **rmdir**: Deletes an empty directory. Deletes files or directories.

```
(rasha@rasha) - [~/Documents]
$ rmdir naima

(rasha@rasha) - [~/Documents]
$
```

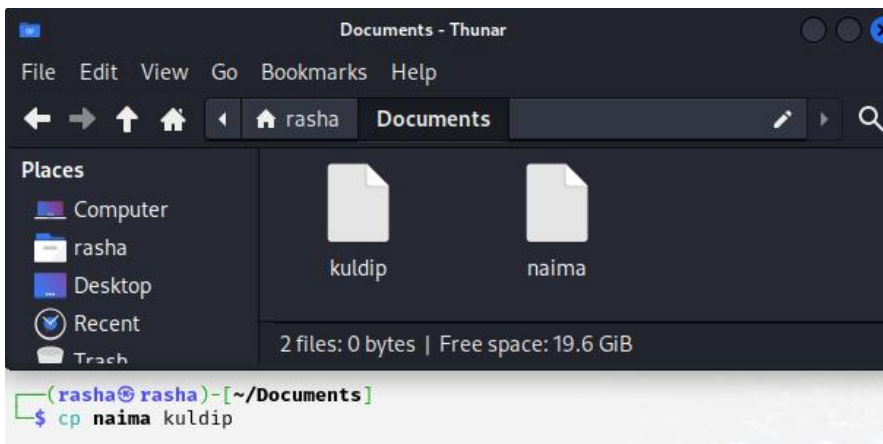
6. **rm**: Deletes files or directories.

```
(rasha@rasha) - [~/Documents]
$ rm naima
rm: cannot remove 'naima': No such file or directory
```

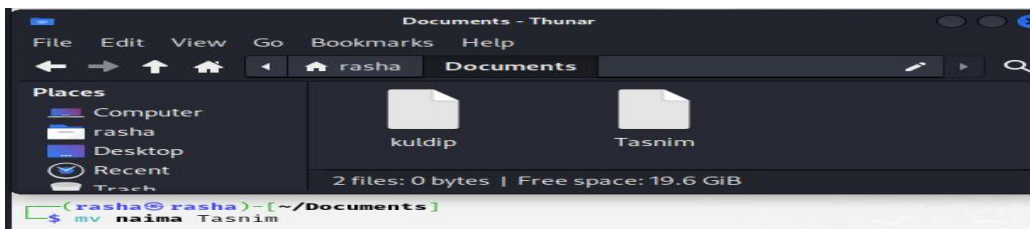
7. **touch**: Creates an empty file or updates the timestamp of an existing file.

```
(rasha@rasha) - [~/Documents]
$ touch naima
```

8. **cp**: Copies files or directories.



9. **mv**: Moves or rename files/directories.



10. cat: Displays the content of a file.

```
(rasha@rasha) - [~/Documents]
$ cat Tasnim
```

11. echo: Prints text or variables to the terminal.

```
(rasha@rasha) - [~/Documents]
$ echo I am sorry kuldu
I am sorry kuldu
```

12. find: Searches for files or directories.

```
(rasha@rasha) - [~/Documents]
$ find Tasnim
Tasnim
```

13. chmod: Changes file or directory permissions.

```
(rasha@rasha) - [~/Documents]
$ chmod 755 Tasnim
```

14. df: Displays disk space usage.

```
(rasha@rasha) - [~/Documents]
$ df
```

Filesystem	1K-blocks	Used	Available	Use%	Mounted on
udev	1875624	0	1875624	0%	/dev
tmpfs	387912	1420	386492	1%	/run
/dev/sda1	38818336	16278000	20536268	45%	/
tmpfs	1939548	4	1939544	1%	/dev/shm
tmpfs	5120	0	5120	0%	/run/lock
tmpfs	1024	0	1024	0%	/run/credentials/systemd-jou
rnald.service					
tmpfs	1939548	84	1939464	1%	/tmp
tmpfs	1024	0	1024	0%	/run/credentials/getty@tty1.
service					
tmpfs	387908	124	387784	1%	/run/user/1000

15. du: Displays the size of directories or files.

```
(rasha@rasha) - [~/Documents]
$ du
4 .
```

16. ps: Lists running processes

```
(rasha@rasha) - [~/Documents]
$ ps
```

PID	TTY	TIME	CMD
2900	pts/0	00:00:08	zsh
21882	pts/0	00:00:00	ps

17. top: Monitors real-time system resource usage.

```
(rasha@rasha)-[~/Documents]
$ top
top - 10:22:22 up 44 min,  2 users,  load average: 0.07, 0.17, 0.20
Tasks: 238 total,  1 running, 237 sleeping,  0 stopped,  0 zombie
%Cpu(s):  2.7 us,  2.7 sy,  0.0 ni, 94.6 id,  0.0 wa,  0.0 hi,  0.0 si,  0.0
MiB Mem :  3788.2 total,  2258.4 free,   899.0 used,   891.6 buff/cache
MiB Swap:  2135.0 total,  2135.0 free,    0.0 used.  2889.2 avail Mem
```

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+
1157	root	20	0	431788	111764	64648	S	2.0	2.9	0:46.89
2889	rasha	20	0	533968	100940	86920	S	0.7	2.6	0:04.01
1533	rasha	20	0	694820	141244	92696	S	0.3	3.6	0:13.99
1574	rasha	20	0	597320	78092	43744	S	0.3	2.0	0:08.03
1582	rasha	20	0	354128	44288	22620	S	0.3	1.1	0:17.32
1584	rasha	20	0	338204	28516	21316	S	0.3	0.7	0:09.71
13104	root	20	0	0	0	0	I	0.3	0.0	0:01.96
22789	rasha	20	0	10368	5560	3512	R	0.3	0.1	0:01.74
1	root	20	0	22832	13980	10512	S	0.0	0.4	0:03.03
2	root	20	0	0	0	0	S	0.0	0.0	0:00.02
3	root	20	0	0	0	0	S	0.0	0.0	0:00.00
4	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
5	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
6	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
7	root	0	-20	0	0	0	I	0.0	0.0	0:00.00
9	root	0	-20	0	0	0	I	0.0	0.0	0:00.70
12	root	0	-20	0	0	0	I	0.0	0.0	0:00.00

18. kill: Terminates processes by ID.

```
(rasha@rasha)-[~]
$ kill Tasnim
kill: illegal pid: Tasnim
```

19. tar: Archives files or extracts archives.

```
(rasha@rasha)-[~/Documents]
$ tar -czvf archive.tar.gz naima kuldip
naima
kuldip
```

20. zip: Compresses files into a zip archive.

```
(rasha@rasha)-[~/Documents]
$ zip archive.zip naima
adding: naima (stored 0%)
```

21. unzip: Extracts files from a zip archive.


```
(rasha@rasha)~[~/Documents]
$ unzip archive.zip
Archive: archive.zip
replace naima? [y]es, [n]o, [A]ll, [N]one, [r]ename: y
extracting: naima
```

22. wget: Downloads files from the internet.

```
(rasha@rasha)~[~/Documents]
$ wget https://mbstu.com/naima
--2025-04-14 10:52:03-- https://mbstu.com/naima
Resolving mbstu.com (mbstu.com)... 3.19.116.195, 3.18.7.81
Connecting to mbstu.com (mbstu.com)|3.19.116.195|:443... failed: Connection refused
Connecting to mbstu.com (mbstu.com)|3.18.7.81|:443... failed: Connection refused.
```

23. curl: Transfers data from or to a server.

```
(rasha@rasha)~[~/Documents]
$ curl https://Tasnim.com
<!doctype html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <meta http-equiv="x-ua-compatible" content="ie=edge">
  <title>503 Error</title>
  <meta name="viewport" content="width=device-width, initial-scale=1">
  <meta name="robots" content="noindex, nofollow">
  <style>
    @media screen and (max-width:500px) {
      body { font-size: .6em; }
    }
  </style>
</head>

<body style="text-align: center;">

  <h1 style="font-family: Georgia, serif; color: #4a4a4a; margin-top: 4em; line-height: 1.5;">
    Sorry, that didn't work. <br>Please try again or come back later.
  </h1>

  <h2 style="font-family: Verdana, sans-serif; color: #7d7d7d; font-weight: 300;">
    503 Error. Service Unavailable.
```

24. ifconfig: Displays or configures network interfaces.

```
(rasha@rasha)~[~/Documents]
$ ifconfig
eth0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.230.130 netmask 255.255.255.0 broadcast 192.168.230.255
    inet6 fe80::20c:29ff:fec3:e3a6 prefixlen 64 scopeid 0x20<link>
    ether 00:0c:29:c3:e3:a6 txqueuelen 1000 (Ethernet)
    RX packets 66 bytes 11842 (11.5 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 125 bytes 15669 (15.3 KiB)
    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 8 bytes 480 (480.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 8 bytes 480 (480.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

25. ping: Tests network connectivity to a host.

```
(rasha@rasha)-[~/Documents]
$ ping google.com
PING google.com (142.250.205.238) 56(84) bytes of data.
64 bytes from maa05s28-in-f14.1e100.net (142.250.205.238): icmp_seq=1 ttl=128 time=47.5 ms
64 bytes from maa05s28-in-f14.1e100.net (142.250.205.238): icmp_seq=2 ttl=128 time=38.4 ms
64 bytes from maa05s28-in-f14.1e100.net (142.250.205.238): icmp_seq=3 ttl=128 time=49.4 ms
64 bytes from maa05s28-in-f14.1e100.net (142.250.205.238): icmp_seq=4 ttl=128 time=50.6 ms
64 bytes from maa05s28-in-f14.1e100.net (142.250.205.238): icmp_seq=5 ttl=128 time=40.7 ms
64 bytes from maa05s28-in-f14.1e100.net (142.250.205.238): icmp_seq=6 ttl=128 time=38.7 ms
64 bytes from maa05s28-in-f14.1e100.net (142.250.205.238): icmp_seq=7 ttl=128 time=38.1 ms
64 bytes from maa05s28-in-f14.1e100.net (142.250.205.238): icmp_seq=8 ttl=128 time=50.8 ms
```

26. netstat: Displays network connections and statistics.

```
(rasha@rasha)-[~]
$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 192.168.230.130:bootpc 192.168.230.254:bootps  ESTABLISHED
Active UNIX domain sockets (w/o servers)
Proto RefCnt Flags       Type       State         I-Node    Path
unix   3      [ ]         STREAM     CONNECTED    15300
unix   3      [ ]         DGRAM      CONNECTED    7869
unix   3      [ ]         STREAM     CONNECTED    14319
unix   3      [ ]         STREAM     CONNECTED    13140
unix   3      [ ]         STREAM     CONNECTED    12821
unix   3      [ ]         STREAM     CONNECTED    12375    /run/dbus/system_bus_sock
et
unix   3      [ ]         STREAM     CONNECTED    12544
unix   3      [ ]         DGRAM      CONNECTED    8610
unix   3      [ ]         STREAM     CONNECTED    14385    /run/user/1000/bus
unix   3      [ ]         STREAM     CONNECTED    14339
unix   3      [ ]         STREAM     CONNECTED    12844
unix   3      [ ]         STREAM     CONNECTED    12423    /run/user/1000/pipewire-0
unix   3      [ ]         STREAM     CONNECTED    12346    /run/user/1000/bus
unix   3      [ ]         STREAM     CONNECTED    13124    /run/user/1000/at-spi/bus
_0
unix   3      [ ]         STREAM     CONNECTED    13116
unix   3      [ ]         STREAM     CONNECTED    12902
unix   3      [ ]         STREAM     CONNECTED    12413    /run/user/1000/bus
unix   3      [ ]         STREAM     CONNECTED    12319
```

27. ssh: Connects to a remote machine securely.

```
(rasha@rasha)-[~]
$ ssh rasha
ssh: connect to host rasha port 22: Connection refused
```

28. man: Displays the manual for a command.

```
(rasha@rasha)-[~]
$ man ls
```

```
LS(1) User Commands LS(1)
NAME
  ls - list directory contents
SYNOPSIS
  ls [OPTION]... [FILE]...
DESCRIPTION
  List information about the FILES (the current directory by default). Sort
  entries alphabetically if none of -cftuvSUX nor --sort is specified.

  Mandatory arguments to long options are mandatory for short options too.

  -a, --all
      do not ignore entries starting with .

  -A, --almost-all
      do not list implied . and ..

  --author
      with -l, print the author of each file

  -b, --escape
      print C-style escapes for nongraphic characters

  --block-size=SIZE
      with -l, scale sizes by SIZE when printing them; e.g.,
      '--block-size=M'; see SIZE format below

  -B, --ignore-backups
      do not list implied . and ..

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

29. alias: Creates shortcuts for commands.

```
(rasha@rasha)~$ alias
diff='diff --color=auto'
egrep='egrep --color=auto'
fgrep='fgrep --color=auto'
grep='grep --color=auto'
history='history 0'
ip='ip --color=auto'
l='ls -CF'
la='ls -A'
ll='ls -l'
ls='ls --color=auto'
which-command=whence
```

30. history: Displays previously executed commands.

```
(rasha@rasha)~$ history
1  pwd
2  ls
3  cd
4  cd Documents
5  mkdir naima
6  rmdir naima
7  rm naima
8  touch naima
9  cp naima kuldip
10 mv naima Tasnim
11 cat Tasnim
```



```
48 mkdir naima
49 touch naima
50 cp naima kuldip
51 rm naima
52 rmdir naima
53 rm naima
54 touch naima
55 cp naima mugdha
56 mv mugdha kuldip
57 tar -czvf archive.tar.gz naima kuldip
58 zip archive.zip naima
59 unzip archive.zip
60 unzip archive.zip
61 wget https://mbstu.com/naima
62 curl https://naima.com
63 curl https://Tasnim.com
64 ifconfig
65 ping google.com
66 netstat
67 ssh rasha
68 man ls
```

Discussion:

The Linux Command-Line Interface is an invaluable resource for efficiently performing system-related tasks. By mastering a wide range of commands, users can streamline workflows, enhance troubleshooting skills, and execute essential administrative operations with precision. Developing command-line expertise empowers users to work faster, solve problems effectively, and fully utilize the powerful capabilities of the Linux operating system.