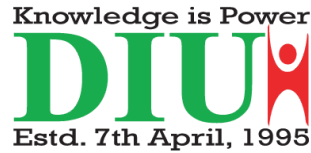


# Dhaka International University

Department of Computer Science & Engineering



## LAB REPORT

**Course Name:** Operating Systems Lab

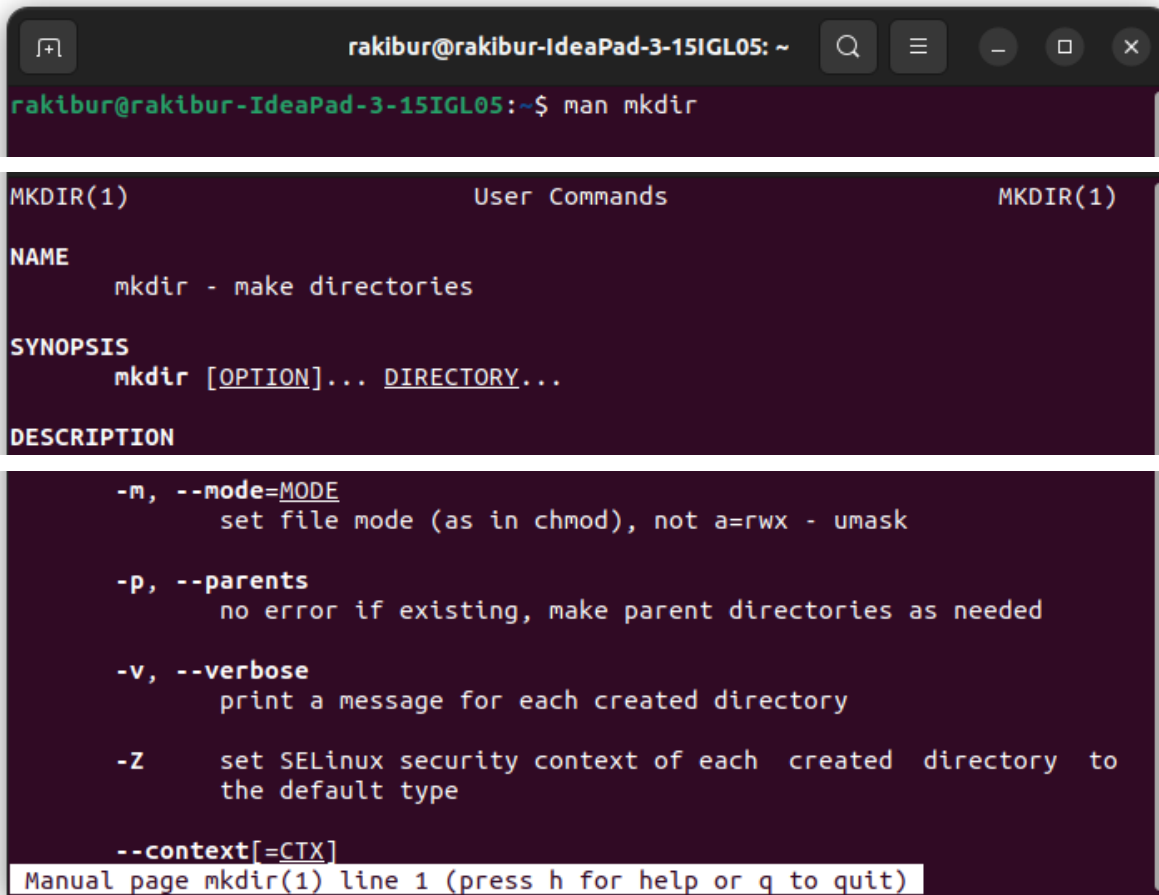
**Course Code:** CSE - 310

Submitted By	Submitted To
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**Date of Submission:** 10/09/2022

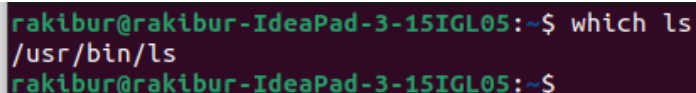
## Getting help in Linux

### 1. man — Show help (the manual)



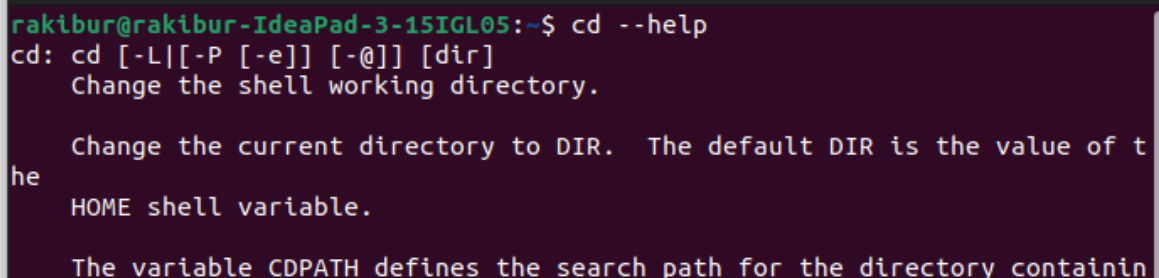
```
rakibur@rakibur-IdeaPad-3-15IGL05: ~  
rakibur@rakibur-IdeaPad-3-15IGL05:~$ man mkdir  
  
MKDIR(1)                                User Commands                                MKDIR(1)  
  
NAME  
    mkdir - make directories  
  
SYNOPSIS  
    mkdir [OPTION]... DIRECTORY...  
  
DESCRIPTION  
  
    -m, --mode=MODE  
        set file mode (as in chmod), not a=rwx - umask  
  
    -p, --parents  
        no error if existing, make parent directories as needed  
  
    -v, --verbose  
        print a message for each created directory  
  
    -Z      set SELinux security context of each created directory to  
            the default type  
  
    --context[=CTX]  
Manual page mkdir(1) line 1 (press h for help or q to quit)
```

### 2. which — Find out where a command is



```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ which ls  
/usr/bin/ls  
rakibur@rakibur-IdeaPad-3-15IGL05:~$
```

### 3. <command> --help — Find help on any command



```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ cd --help  
cd: cd [-L|[-P [-e]] [-@]] [dir]  
    Change the shell working directory.  
  
    Change the current directory to DIR. The default DIR is the value of the  
HOME shell variable.  
  
    The variable CDPATH defines the search path for the directory containing
```

### Logging in and out

4. exit — Exit or terminate the current login shell

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ exit
```

5. passwd — Change the password

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ passwd
Changing password for rakibur.
Current password:
New password:
Retype new password:
passwd: password updated successfully
rakibur@rakibur-IdeaPad-3-15IGL05:~$
```

### File system management

6. pwd — To show current location or path

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ pwd
/home/rakibur
rakibur@rakibur-IdeaPad-3-15IGL05:~$
```

7. cd — Change the current directory (folder)

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ cd Downloads
rakibur@rakibur-IdeaPad-3-15IGL05:~/Downloads$ cd Rakibur\ Rahman
rakibur@rakibur-IdeaPad-3-15IGL05:~/Downloads/Rakibur Rahman$ cd ..
rakibur@rakibur-IdeaPad-3-15IGL05:~/Downloads$
```

8. dir or ls — List files in a directory

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ ls
Desktop  Downloads  Music      Public  Templates
Documents file.txt   Pictures   snap    Videos
rakibur@rakibur-IdeaPad-3-15IGL05:~$ ls -a
.          .config    .gnupg     Public
..         Desktop    .lesshtst  snap
.bash_history Documents   .local      .ssh
.bash_logout Downloads   Music       .sudo_as_admin_successful
.bashrc    file.txt   Pictures    Templates
.cache     .fontconfig .profile    Videos
rakibur@rakibur-IdeaPad-3-15IGL05:~$
```

## 9. cp — Copy files and directories

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ cp file.txt /home/rakibur/rakib
rakibur@rakibur-IdeaPad-3-15IGL05:~$ cd rakib
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ cd ..
rakibur@rakibur-IdeaPad-3-15IGL05:~$ ls
Desktop  Downloads  Music      Public    snap      Videos
Documents file.txt   Pictures  rakib     Templates
rakibur@rakibur-IdeaPad-3-15IGL05:~$ cp -rp rakib /home/rakibur/Documents
rakibur@rakibur-IdeaPad-3-15IGL05:~$ ls
Desktop  Downloads  Music      Public    snap      Videos
Documents file.txt   Pictures  rakib     Templates
rakibur@rakibur-IdeaPad-3-15IGL05:~$ cd Documents
rakibur@rakibur-IdeaPad-3-15IGL05:~/Documents$ ls
rakib
rakibur@rakibur-IdeaPad-3-15IGL05:~/Documents$
```

## 10. rm — Delete files and directories

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/Documents/rakib$ ls
file.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/Documents/rakib$ rm file.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/Documents/rakib$ ls
rakibur@rakibur-IdeaPad-3-15IGL05:~/Documents/rakib$ cd ..
rakibur@rakibur-IdeaPad-3-15IGL05:~/Documents$ ls
rakib
rakibur@rakibur-IdeaPad-3-15IGL05:~/Documents$ rm -r rakib
rakibur@rakibur-IdeaPad-3-15IGL05:~/Documents$ ls
rakibur@rakibur-IdeaPad-3-15IGL05:~/Documents$
```

## Find, view and edit files

## 11. touch — Create a new file or update an existing one

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ touch menu.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt  menu.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

## 12. cat — Print the contents of a file

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt  menu.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ cat file.txt
Hey! helloo.
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

13. less — Browse the contents of a file: It is very handy for big contents.

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ less file.txt
```

Bangladesh is a small country with a huge population. The total area of Bangladesh is 147,570 square kilometers but the total population is more than 164 million. Still, it is a green and naturally beautiful country. Our country is growing economically and it is doing well in export too.

We are the leader in world garments exporting right after china. Not only in the economy, but we also good at sports too. Our cricket team is one of the top seven teams in the world. Bangladesh has a very heart touching history behind. In 1971 this country got independence from Pakistan after a nine months war.

14. diff — Show the difference between two files: Sometimes we want to see which changes were made to a file, or find out if two files are exactly the same.

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ diff file.txt menu.txt
1c1,4
< Bangladesh is a small country with a huge population. The total area of
f Bangladesh is 147,570 square kilometers but the total population is mo
re than 164 million. Still, it is a green and naturally beautiful countr
y. Our country is growing economically and it is doing well in export to
o.
---
> Menu of dinner:
> 1. Fried Rice
> 2. Shripms
> 3. Chicken
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

15. nano — An interactive file editor

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ nano menu.txt
```

GNU nano 6.2 menu.txt

Menu of dinner:  
1. Fried Rice  
2. Shripms  
3. Chicken

**^G** Help      **^O** Write Out    **^W** Where Is    **^K** Cut        **^T** Execute  
**^X** Exit      **^R** Read File   **^I** Replace    **^U** Paste     **^J** Justify

16. file — Show the type of a file

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt  iphone.mp3  menu.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ file iphone.mp3
iphone.mp3: Audio file with ID3 version 2.4.0, contains: MPEG ADTS, layer III, v1, 128 kbps, 44.1 kHz, Stereo
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

17. locate — Find files with names matching a pattern

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ locate -i iphone
/snap/gtk-common-themes/1535/share/icons/Adwaita/scalable/devices/phone-apple-iphone-symbolic.svg
/snap/gtk-common-themes/1535/share/icons/HighContrast/16x16/devices/phone-apple-iphone.png
/snap/gtk-common-themes/1535/share/icons/HighContrast/22x22/devices/phone-apple-iphone.png
/snap/gtk-common-themes/1535/share/icons/HighContrast/24x24/devices/phone-apple-iphone.png
/snap/gtk-common-themes/1535/share/icons/HighContrast/256x256/devices/phone-apple-iphone.png
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

18. mkdir — Make a directory or folder.

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt  iphone.mp3  menu.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ mkdir music
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt  iphone.mp3  menu.txt  music
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

19. rmdir — Remove a directory

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt  iphone.mp3  menu.txt  music
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ rmdir music
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt  iphone.mp3  menu.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

20. mv — To move a file or rename a file

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt  iphone.mp3  menu.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ mv menu.txt foodmenu.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt  iphone.mp3  foodmenu.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ mv foodmenu.txt /home/rakibur
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ cd ..
rakibur@rakibur-IdeaPad-3-15IGL05:~$ ls
Desktop  Downloads  Music      Public    snap       Videos
Documents foodmenu.txt Pictures  rakib    Templates
rakibur@rakibur-IdeaPad-3-15IGL05:~$
```

21. echo — To create a file with already made text

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt foodmenu.txt iphone.mp3
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ echo File is created successfully >> newfile.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt foodmenu.txt iphone.mp3 newfile.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ cat newfile.txt
File is created successfully
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

22. chmod — Change the permissions of a file or directory

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt foodmenu.txt hello.py iphone.mp3 newfile.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ chmod +x hello.py
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt foodmenu.txt hello.py iphone.mp3 newfile.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ chmod 755 hello.py
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt foodmenu.txt hello.py iphone.mp3 newfile.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

## Networking

23. dig — Lookup DNS information

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ dig

; <<>> DiG 9.18.1-1ubuntu1.1-Ubuntu <<>>
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 2360
;; flags: qr rd ra; QUERY: 1, ANSWER: 13, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 65494
;; QUESTION SECTION:
;.                               IN      NS

;; ANSWER SECTION:
.           373153  IN      NS      a.root-servers.net.
.           373153  IN      NS      b.root-servers.net.

;; Query time: 0 msec
;; SERVER: 127.0.0.53#53(127.0.0.53) (UDP)
;; WHEN: Mon Sep 05 15:44:24 +06 2022
;; MSG SIZE rcvd: 239

rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```



24. hostname — Find out the IP address and hostname

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ hostname
rakibur-IdeaPad-3-15IGL05
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ hostname -I
192.168.189.12
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

25. ping — Check to see if a server is alive

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ping www.google.com
PING www.google.com (142.250.67.68) 56(84) bytes of data.
64 bytes from maa05s13-in-f4.1e100.net (142.250.67.68): icmp_seq=1 ttl=11
1 time=101 ms
64 bytes from maa05s13-in-f4.1e100.net (142.250.67.68): icmp_seq=2 ttl=11
1 time=100 ms
64 bytes from maa05s13-in-f4.1e100.net (142.250.67.68): icmp_seq=3 ttl=11
1 time=173 ms
^C
--- www.google.com ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 100.171/124.772/172.648/33.857 ms
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

## System Managements

26. uname — Use uname to show the information about the system

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ uname
Linux
rakibur@rakibur-IdeaPad-3-15IGL05:~$
```

27. du — Show disk space usage

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ du rakib
172      rakib
rakibur@rakibur-IdeaPad-3-15IGL05:~$
```

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ du -h rakib
172K      rakib
rakibur@rakibur-IdeaPad-3-15IGL05:~$
```

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls -lah
total 176K
drwxrwxr-x  2 rakibur rakibur 4.0K সেপ্টেম্বর  5 15:37 .
drwxr-x--- 18 rakibur rakibur 4.0K সেপ্টেম্বর  5 15:23 ..
-rw-r--r--  1 rakibur rakibur  890 সেপ্টেম্বর  5 14:09 file.txt
-rw-rw-r--  1 rakibur rakibur   52 সেপ্টেম্বর  5 13:58 foodmenu.txt
-rwxr-xr-x  1 rakibur rakibur    0 সেপ্টেম্বর  5 15:37 hello.py
-rw-rw-r--  1 rakibur rakibur 156K সেপ্টেম্বর  5 14:16 iphone.mp3
-rw-rw-r--  1 rakibur rakibur   29 সেপ্টেম্বর  5 15:24 newfile.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```



28. df — Show free disk space

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ df -h
Filesystem      Size  Used Avail Use% Mounted on
tmpfs            348M  2.1M  346M   1% /run
/dev/sda4        78G   8.3G   66G  12% /
tmpfs            1.7G    0    1.7G   0% /dev/shm
tmpfs            5.0M  4.0K  5.0M   1% /run/lock
/dev/nvme0n1p1   96M   33M   64M  34% /boot/efi
/dev/sda5        46G   1.2G   43G   3% /home
tmpfs            348M  4.7M  343M   2% /run/user/1000
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

29. date — Show the current date and time

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ date
সেম্বার ০৫ সেপ্টেম্বর ২০২২ ০৪:০৭:০০ অপরাহ্ন +০৬
rakibur@rakibur-IdeaPad-3-15IGL05:~$
```

30. shutdown — Halt or reboot the machine

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ shutdown -r now
```

31. uptime — Show how long the system has been running

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ uptime
16:10:21 up 3:40, 1 user, load average: 1.16, 0.92, 0.82
rakibur@rakibur-IdeaPad-3-15IGL05:~$
```

## Manage processes

32. top — Show the top processes

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ top

top - 16:14:12 up 3:44, 1 user, load average: 0.76, 1.03, 0.90
Tasks: 227 total, 1 running, 226 sleeping, 0 stopped, 0 zombie
%Cpu(s):  9.6 us,  4.4 sy,  0.0 ni, 83.1 id,  2.9 wa,  0.0 hi,  0.0 s
MiB Mem :  3475.4 total,  147.6 free,  2340.0 used,  987.9 buff
MiB Swap:    0.0 total,    0.0 free,    0.0 used.  301.4 avai

  PID USER      PR  NI   VIRT   RES   SHR S  %CPU  %MEM
1588 rakibur   20   0 4613696 195232 50920 S   8.6   5.5
2204 rakibur   20   0  12.3g 503488 98068 S   6.6  14.1
9625 rakibur   20   0  563612 50284 37072 S   4.0   1.4
2281 rakibur   20   0  436232 38448 11384 S   3.3   1.1
3902 rakibur   20   0 2531900 142664 40576 S   1.7   4.0
```

33. ps — List running processes

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ ps
  PID TTY          TIME CMD
  9643 pts/0        00:00:00 bash
 10245 pts/0        00:00:00 ps
rakibur@rakibur-IdeaPad-3-15IGL05:~$
```

### Install programs

34. apt — Install and manage packages in Ubuntu

```
rakibur@rakibur-IdeaPad-3-15IGL05:~$ sudo apt
[sudo] password for rakibur:
apt 2.4.6 (amd64)
Usage: apt [options] command

apt is a commandline package manager and provides commands for
searching and managing as well as querying information about packages


rakibur@rakibur-IdeaPad-3-15IGL05:~$ sudo apt install curl
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  libcurl4

1 upgraded, 1 newly installed, 0 to remove and 38 not upgraded.
Need to get 484 kB of archives.
After this operation, 453 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

35. tar — Use tar to work with tarballs (or files compressed in a tarball archive)

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt  foodmenu.txt  iphone.mp3  newfile.txt
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ tar -cvf programs.tar /home/rakibur/rakib
tar: Removing leading '/' from member names
/home/rakibur/rakib/
tar: /home/rakibur/rakib/programs.tar: file is the archive; not dumped
/home/rakibur/rakib/file.txt
/home/rakibur/rakib/foodmenu.txt
/home/rakibur/rakib/newfile.txt
/home/rakibur/rakib/iphone.mp3
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ ls
file.txt  foodmenu.txt  iphone.mp3  newfile.txt  programs.tar
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ tar -xvf programs.tar
home/rakibur/rakib/
home/rakibur/rakib/file.txt
home/rakibur/rakib/foodmenu.txt
home/rakibur/rakib/newfile.txt
home/rakibur/rakib/iphone.mp3
```

### Unix Shell Commands

36. history – Show history of previous commands

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ history
 1  pwd
 2  ls
 3  ls -a

449  zip file.txt
450  clear
451  history
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$
```

### Unix users commands

37. whoami – Show system username

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ whoami
rakibur
```

38. id – Print user identity

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ id
uid=1000(rakibur) gid=1000(rakibur) groups=1000(rakibur),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),122(lpadmin),134(lxd),135(sambashare)
```

39. groups – Show which groups user belongs to

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ groups
rakibur adm cdrom sudo dip plugdev lpadmin lxd sambashare
```

40. who – Find out who is logged into the system

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ who
rakibur  tty2          2022-09-05 12:31 (tty2)
```

41. last – Show history of logins into the system

```
rakibur@rakibur-IdeaPad-3-15IGL05:~/rakib$ last
rakibur  tty2          tty2          Mon Sep  5 12:31    still logged in
```