

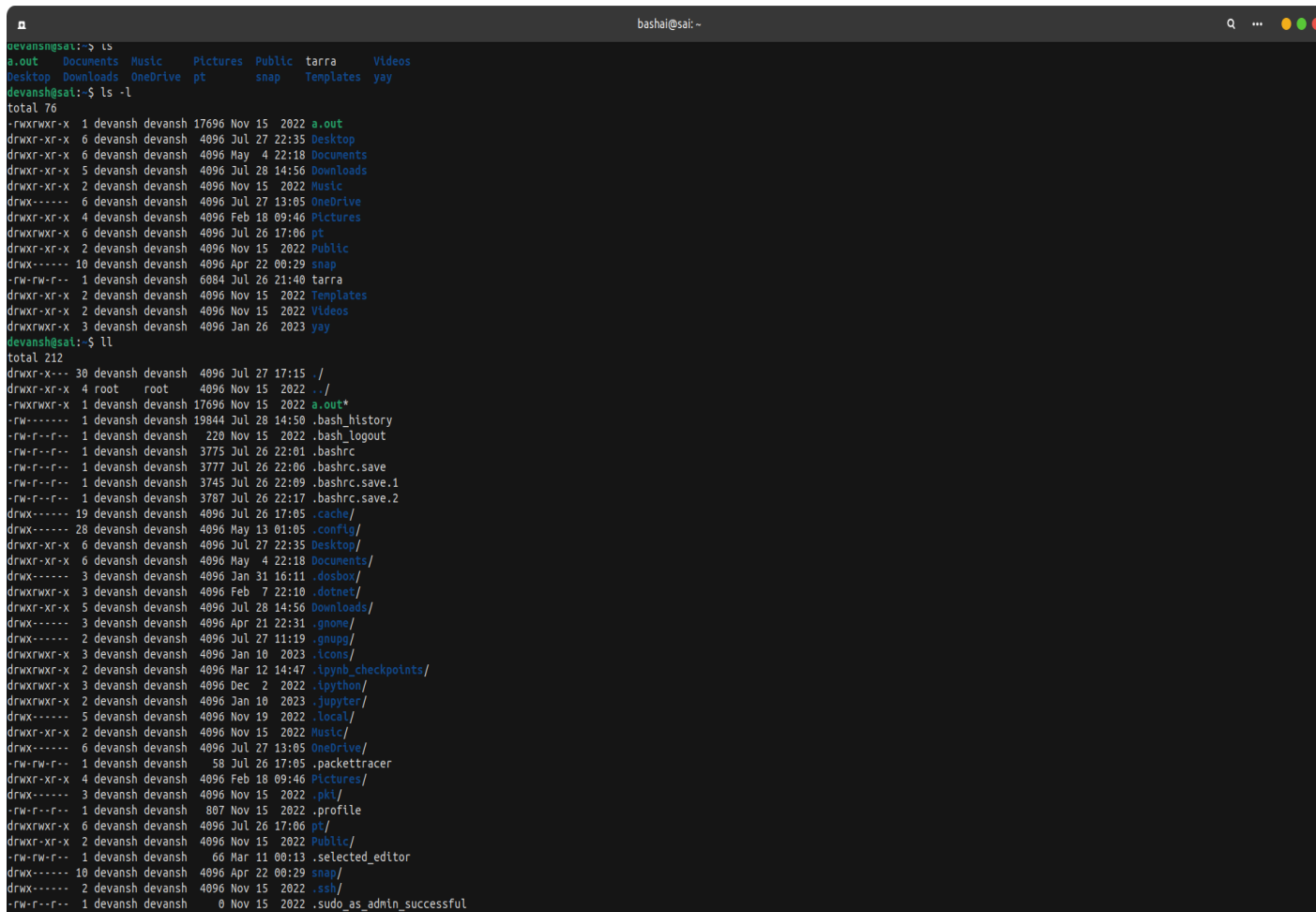
1) ls: -

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The 'ls' command's default output simply lists, one item per line, the names of all the files and directories located in the current working directory. It provides a clear interface.

ls -l or ll:

All Linux distributions do not come with 'll' as the default command, but it is frequently used as an alias for ls -l. To make typing easier and more user-friendly, certain Linux systems, like Ubuntu, designate 'll' as an alias.

A terminal window titled 'bash@devansh: ~' showing the output of 'ls' and 'll' commands. The 'ls' command lists files and directories in the current directory: a.out, Desktop, Downloads, Music, Pictures, Public, tarra, Videos, and yay. The 'll' command (alias for 'ls -l') shows a detailed listing of files and directories, including permissions, owner, group, size, date, and filename. The output is color-coded, with directories in blue and files in green. The terminal window has a dark background and a light-colored text. The title bar shows the window name 'bash@devansh: ~' and standard window controls (minimize, maximize, close).

```
devansh@devansh:~$ ls
a.out  Desktop  Downloads  Music  Pictures  Public  tarra  Videos  yay
devansh@devansh:~$ ll
total 76
-rwxrwxr-x 1 devansh devansh 17696 Nov 15 2022 a.out
drwxr-xr-x 6 devansh devansh 4096 Jul 27 22:35 Desktop
drwxr-xr-x 6 devansh devansh 4096 May 4 22:18 Downloads
drwxr-xr-x 5 devansh devansh 4096 Jul 28 14:56 Downloads
drwxr-xr-x 2 devansh devansh 4096 Nov 15 2022 Music
drwx----- 6 devansh devansh 4096 Jul 27 13:05 OneDrive
drwxr-xr-x 4 devansh devansh 4096 Feb 18 09:46 Pictures
drwxrwxr-x 6 devansh devansh 4096 Jul 26 17:06 pt
drwxr-xr-x 2 devansh devansh 4096 Nov 15 2022 Public
drwx----- 10 devansh devansh 4096 Apr 22 00:29 snap
-rw-rw-r-- 1 devansh devansh 6084 Jul 26 21:40 tarra
drwxr-xr-x 2 devansh devansh 4096 Nov 15 2022 Templates
drwxr-xr-x 2 devansh devansh 4096 Nov 15 2022 Videos
drwxrwxr-x 3 devansh devansh 4096 Jan 26 2023 yay
devansh@devansh:~$ ll
total 212
drwxr-xr-x 30 devansh devansh 4096 Jul 27 17:15 /
drwxr-xr-x 4 root root 4096 Nov 15 2022 ../
-rwxrwxr-x 1 devansh devansh 17696 Nov 15 2022 a.out*
-rw-r----- 1 devansh devansh 19844 Jul 28 14:50 .bash_history
-rw-r--r-- 1 devansh devansh 220 Nov 15 2022 .bash_logout
-rw-r--r-- 1 devansh devansh 3775 Jul 26 22:01 .bashrc
-rw-r--r-- 1 devansh devansh 3777 Jul 26 22:06 .bashrc.save
-rw-r--r-- 1 devansh devansh 3745 Jul 26 22:09 .bashrc.save.1
-rw-r--r-- 1 devansh devansh 3787 Jul 26 22:17 .bashrc.save.2
drwx----- 19 devansh devansh 4096 Jul 26 17:05 .cache/
drwx----- 28 devansh devansh 4096 May 13 01:05 .config/
drwxr-xr-x 6 devansh devansh 4096 Jul 27 22:35 Desktop/
drwxr-xr-x 6 devansh devansh 4096 May 4 22:18 Documents/
drwx----- 3 devansh devansh 4096 Jan 31 16:11 .dosbox/
drwxrwxr-x 3 devansh devansh 4096 Feb 7 22:10 .dotnet/
drwxr-xr-x 5 devansh devansh 4096 Jul 28 14:56 Downloads/
drwx----- 3 devansh devansh 4096 Apr 21 22:31 .gnome/
drwx----- 2 devansh devansh 4096 Jul 27 11:19 .gnupg/
drwxrwxr-x 3 devansh devansh 4096 Jan 10 2023 .icons/
drwxrwxr-x 2 devansh devansh 4096 Mar 12 14:47 .ipynb_checkpoints/
drwxrwxr-x 3 devansh devansh 4096 Dec 2 2022 .ipython/
drwxrwxr-x 2 devansh devansh 4096 Jan 10 2023 .jupyter/
drwx----- 5 devansh devansh 4096 Nov 19 2022 .local/
drwxr-xr-x 2 devansh devansh 4096 Nov 15 2022 Music/
drwx----- 6 devansh devansh 4096 Jul 27 13:05 OneDrive/
-rw-rw-r-- 1 devansh devansh 58 Jul 26 17:05 .packettracer
drwxr-xr-x 4 devansh devansh 4096 Feb 18 09:46 Pictures/
drwx----- 3 devansh devansh 4096 Nov 15 2022 .pki/
-rw-r--r-- 1 devansh devansh 807 Nov 15 2022 .profile
drwxrwxr-x 6 devansh devansh 4096 Jul 26 17:06 pt/
drwxr-xr-x 2 devansh devansh 4096 Nov 15 2022 Public/
-rw-rw-r-- 1 devansh devansh 66 Mar 11 00:13 .selected_editor
drwx----- 10 devansh devansh 4096 Apr 22 00:29 snap/
drwx----- 2 devansh devansh 4096 Nov 15 2022 .ssh/
-rw-r--r-- 1 devansh devansh 0 Nov 15 2022 .sudo_as_admin_successful
```

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2) Reading files in Linux - [cat, more, less]

- **Cat:** - The main purpose of the cat command, which stands for "concatenate" is to show the whole contents of one or more files in the terminal. It produces the contents of the files without halting or paginating.
- **More:** - One screen at a time file content is displayed using the more command. It paginates the output so you can use the keyboard to navigate the file (often using the spacebar to advance to the next page and the 'q' key to exit).
- **Less:** - Less and more are similar in that they both display a file's contents one screen at a time. Less, on the other hand, has more functionality and supports both forward and backward scrolling. This indicates that you can move through the file by going forward and backward.
 - To advance to the next page, use the spacebar.
 - The 'b' key will advance you one page.
 - Line by line scrolling is done with the arrow keys.
 - Enter the search word, then type '/' to start a new search, to find text. To move to the next instance of the search word, press "n."

```
bashai@sai: ~/Desktop/program
devansh@sai:~/Desktop/program$ cat read.c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

int main()
{
    FILE *ptr;
    int num;
    ptr = fopen("/home/devansh/Desktop/program/input.txt","r");

    if(ptr == NULL)
    {
        printf("Error! page not found");
        exit(0);
    }
    num = fgetc(ptr); // for all line characters
    while(num!=EOF)
    {
        printf("%c",num);
        num = fgetc(ptr);
    }
    fclose(ptr);
    return 0;
}
devansh@sai:~/Desktop/program$ more read.c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

int main()
{
    FILE *ptr;
    int num;
    ptr = fopen("/home/devansh/Desktop/program/input.txt","r");

    if(ptr == NULL)
    {
        printf("Error! page not found");
        exit(0);
    }
    num = fgetc(ptr); // for all line characters
    while(num!=EOF)
    {
        printf("%c",num);
        num = fgetc(ptr);
    }
    fclose(ptr);
    return 0;
}
devansh@sai:~/Desktop/program$ less read.c
[1]+  Stopped                  less read.c
devansh@sai:~/Desktop/program$
```

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

int main()
{
    FILE *ptr;
    int num;
    ptr = fopen("/home/devansh/Desktop/program/input.txt","r");

    if(ptr == NULL)
    {
        printf("Error! page not found");
        exit(0);
    }
    num = fgetc(ptr); // for all line characters
    while(num!=EOF)
    {
        printf("%c",num);
        num = fgetc(ptr);
    }
    fclose(ptr);
    return 0;
}
read.c (END)
```

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3) Manipulating files - [cp, mv, rm, mkdir]

- Cp: - To move files and directories between two locations, use the cp command. It copies files just by default; directories are not copied.
- Cp -R: - Recursive directory and content copying is done with the help of the cp -R command. This indicates that in addition to copying the directory itself, all its files and subdirectories will also be copied.
- Mv: - Files and folders can be moved or renamed with the mv command. It will transfer

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The object from the source place to the destination location when used to move a file or directory. The mv command will really rename the file or directory if the destination is in the same directory.

- Rm: - The rm command is used to remove (delete) files and directories. By default, it only works for files. To remove directories and their contents, you need to use the -R (or -r) option, just like with the cp command.

→ Mkdir: - The mkdir command is used to create folders.

```
devansh@sai:~/Desktop/program$ cp alog.cpp algo7.cpp
cp: cannot stat 'alog.cpp': No such file or directory
devansh@sai:~/Desktop/program$ cp algo.cpp algo7.cpp
devansh@sai:~/Desktop/program$ ls
algo7.cpp    append.c      deque.cpp      list.cpp      write.c
algo.cpp     array.cpp     input.txt      output.txt
a.out        cs21b1065_lab1.docx 'Linux Networking Commands1.docx' read.c
```

```
devansh@sai:~/Desktop/program$ cp -R read.c read1.c
devansh@sai:~/Desktop/program$ ls
algo7.cpp    append.c      deque.cpp      list.cpp      read.c
algo.cpp     array.cpp     input.txt      output.txt    write.c
a.out        cs21b1065_lab1.docx 'Linux Networking Commands1.docx' read1.c
devansh@sai:~/Desktop/program$
```

```
devansh@sai:~/Desktop/program$ mv list.cpp list1
devansh@sai:~/Desktop/program$ ls
algo7.cpp    a.out        deque.cpp      'Linux Networking Commands1.docx' output.txt  read.c
algo.cpp     cs21b1065_lab1.docx input.txt      list1        read1.c    write.c
devansh@sai:~/Desktop/program$
```

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```
Try 'rm --help' for more information.
devansh@sai:~/Desktop/program$ rm algo.cpp
devansh@sai:~/Desktop/program$ ls
algo7.cpp    cs21b1065_lab1.docx input.txt      list1        read1.c  write.c
a.out        deque.cpp          'Linux Networking Commands1.docx' output.txt  read.c
devansh@sai:~/Desktop/program$
```

```
a.out        deque.cpp          'Linux Networking Commands1.docx' output.txt  read.c
devansh@sai:~/Desktop/program$ mkdir oslab
devansh@sai:~/Desktop/program$ mkdir
mkdir: missing operand
Try 'mkdir --help' for more information.
devansh@sai:~/Desktop/program$ ls
algo7.cpp    cs21b1065_lab1.docx input.txt      list1        output.txt  read.c
a.out        deque.cpp          'Linux Networking Commands1.docx' oslab        read1.c    write.c
devansh@sai:~/Desktop/program$
```

4) tar, grep, find, ssh, diff, sort, pwd, gzip, ps, free, kill:

-

Tar: - Using the tar command, files and directories can be archived and compressed into a single file, sometimes known as a "tarball." It is a typical technique for transferring several files or making backups.

Grep: - Use the grep command to look for text or pattern within files. It is an effective tool for pattern matching and text processing.

Find: - Using different criteria, such as name, size, or modification time, the locate command can be used to search for files and directories within a directory hierarchy.

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Ssh: - The ssh command is used to connect to remote servers securely using the SSH (Secure Shell) protocol. It allows you to access and manage remote systems from the command line.

Diff: - The diff command is used to compare the lines-by-lines contents of two text files and show the differences.

Sort: - Text file lines can be sorted alphabetically or numerically using the sort of command.

Pwd: - The pwd command is used to print the current working directory, which is the directory you are currently in. [present working directory]

Gzip: - To compress files, use the gzip command. A file is compressed and given a new name ending in ".gz." and the present file will be deleted.

ps: - The ps command can be used to view details about the active processes on the system.

Free: - To view details on the system's memory usage, use the free command.

Kill: - Processes can be killed by giving them signals using the kill command. The most typical signal, SIGTERM (signal 15), kindly requests that a process end. When a process ignores SIGTERM, you can use SIGKILL (signal 9) to end it abruptly.

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```
devansh@sai:~/Desktop/program$ tar cvf file.tar *.txt
input.txt
output.txt
```

```
[51]~ stopped grep --color=auto output.txt
devansh@sai:~/Desktop/program$ grep 51 output.txt
51
10 51 21
51 30 40
51
51
51
51
```

```
devansh@sai:~/Desktop/program$ cd oslab
devansh@sai:~/Desktop/program/oslab$ cd ~
devansh@sai:~$ cd Desktop
devansh@sai:~/Desktop$ find ./program
./program
./program/deque.cpp
./program/algo7.cpp
./program/read1.c
./program/write.c
./program/input.txt
./program/read.c
./program/file.tar
./program/a.out
./program/Linux Networking Commands1.docx
./program/oslab
./program/cs21b1065_lab1.docx
./program/list1
./program/output.txt
devansh@sai:~/Desktop$ find ./program/deque.cpp
./program/deque.cpp
```

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```
devansh@sai:~/Desktop$ ssh devansh@192.168.218.12
The authenticity of host '192.168.218.12 (192.168.218.12)' can't be established.
ED25519 key fingerprint is SHA256:ylIgSQ3bL5pHI0K3QDEa6fCmljLiVNfUgc5uzaqGQW4.
This host key is known by the following other names/addresses:
  ~/.ssh/known_hosts:1: [hashed name]
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.218.12' (ED25519) to the list of known hosts.
devansh@192.168.218.12's password:
Welcome to Ubuntu 22.04.2 LTS (GNU/Linux 5.19.0-41-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

Expanded Security Maintenance for Applications is not enabled.

244 updates can be applied immediately.
157 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable

22 additional security updates can be applied with ESM Apps.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.
```

```
[2]+  Stopped                  gedit input1.txt
devansh@sai:~/Desktop/program$ diff input.txt input1.txt
0a1,2
> EOF
>
53d54
< EOF
devansh@sai:~/Desktop/program$
```

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```
devansh@sai:~/Desktop/program$ gedit name.txt&
[3] 8894
[2] Killed gedit input1.txt
devansh@sai:~/Desktop/program$ sort name.txt
```

```
157 of these updates are standard security updates.
22 additional security updates can be applied with ESM Apps.
244 updates can be applied immediately.
Expanded Security Maintenance for Applications is not enabled.
individual files in /usr/share/doc/*/copyright.
Learn more about enabling ESM Apps service at https://ubuntu.com/esm
the exact distribution terms for each program are described in the
The programs included with the Ubuntu system are free software;
To see these additional updates run: apt list --upgradable
devansh@sai:~/Desktop/program$
```

```
to see these additional updates run: apt list --upgradable
devansh@sai:~/Desktop/program$ pwd
/home/devansh/Desktop/program
[3]- Done gedit name.txt
devansh@sai:~/Desktop/program$
```

```
devansh@sai:~/Desktop/program$ ps
  PID TTY          TIME CMD
  7778 pts/1    00:00:00 bash
  8276 pts/1    00:00:00 less
  9409 pts/1    00:00:00 ps
devansh@sai:~/Desktop/program$
```

```
devansh@sai:~/Desktop/program$ free
              total        used        free      shared  buff/cache   available
Mem:        3796104      1987020      323560       384024      1485524      1135648
Swap:              0              0              0
[2]- Done gedit name.txt
devansh@sai:~/Desktop/program$
```

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```
devansh@sai:~/Desktop/program$ ps
  PID TTY          TIME CMD
  7778 pts/1        00:00:00 bash
  8276 pts/1        00:00:00 less
  9779 pts/1        00:00:00 ps
devansh@sai:~/Desktop/program$ kill 7778
devansh@sai:~/Desktop/program$ ps
  PID TTY          TIME CMD
  7778 pts/1        00:00:00 bash
  8276 pts/1        00:00:00 less
  9805 pts/1        00:00:00 ps
devansh@sai:~/Desktop/program$ kill 7778
devansh@sai:~/Desktop/program$
```

5) chmod (Changing Permissions): -

Chmod: - The chmod command in Linux is used to modify a file or directory's permissions. "Chmod" is an acronym meaning "change mode." Who may read, write, and execute a file or directory is determined by the file permissions. You can alter these permissions to limit who can access your files using the chmod programme.

```

devansh@sai:~/Desktop/program$ ls
algo7.cpp          file.tar          list1             read1.c
a.out             input1.txt       name.txt         read.c
cs21b1065_lab1.docx  input.txt       oslab           write.c
deque.cpp          'Linux Networking Commands1.docx'  output.txt.gz

devansh@sai:~/Desktop/program$ ls -l input1.txt
-rw-rw-r-- 1 devansh devansh 452 Jul 28 15:59 input1.txt

devansh@sai:~/Desktop/program$ chmod u=rw,og=r input1.txt

devansh@sai:~/Desktop/program$ ls -l input1.txt
-rw-r--r-- 1 devansh devansh 452 Jul 28 15:59 input1.txt

devansh@sai:~/Desktop/program$ ll
total 1552
drwxrwxr-x 3 devansh devansh 4096 Jul 28 16:09 ./
drwxr-xr-x 6 devansh devansh 4096 Jul 27 22:35 ../
-rw-rw-r-- 1 devansh devansh 921 Jul 28 15:09 algo7.cpp
-rwxrwxr-x 1 devansh devansh 16208 Jul 27 08:15 a.out*
-rw-rw-r-- 1 devansh devansh 1483901 Jul 26 23:18 cs21b1065_lab1.docx
-rw-rw-r-- 1 devansh devansh 1745 May 12 17:23 deque.cpp
-rw-rw-r-- 1 devansh devansh 10240 Jul 28 15:35 file.tar
-rw-r--r-- 1 devansh devansh 452 Jul 28 15:59 input1.txt
-rw-rw-r-- 1 devansh devansh 451 Jul 26 10:05 input.txt
-rw-rw-r-- 1 devansh devansh 18549 Jul 26 20:05 'Linux Networking Commands1.docx'
-rw-rw-r-- 1 devansh devansh 1097 May 12 17:29 list1
-rw-rw-r-- 1 devansh devansh 528 Jul 28 16:05 name.txt
drwxrwxr-x 2 devansh devansh 4096 Jul 28 15:28 oslab/
-rw-rw-r-- 1 devansh devansh 286 Jul 27 08:15 output.txt.gz
-rw-rw-r-- 1 devansh devansh 365 Jul 28 15:17 read1.c
-rw-rw-r-- 1 devansh devansh 365 Jul 26 10:13 read.c
-rw-rw-r-- 1 devansh devansh 435 Jul 26 10:18 write.c
devansh@sai:~/Desktop/program$

```