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17 JULY TASK

LSP (LINUX SYSTEM PROGRAMMING)

COMMAND	DESCRIPTION
ls	List the content of present working directory
cd	Change directory
mkdir	Make a directory
rmdir	Remove a directory
touch	Create a file
pwd	Present working directory
cp	copy
mv	Move and rename
rm	Remove file or directory
Ls -a	Show hidden file
ls-la	Show all the info of file and directory permission
ls-fa	Show all the file including hidden

```
rps@rps-virtual-machine:~$ ls /
bin   cdrom  etc   lib    lib64   lost+found  mnt  proc  run   snap  swapfile  tmp  var
boot  dev    home  lib32  libx32  media       opt  root  sbin  srv   sys       usr
rps@rps-virtual-machine:~$ ls
Desktop    Downloads  Music     Public  sks   Templates  Videos  wipro_project
Documents  lsp        Pictures  skk     snap  test       wipro
rps@rps-virtual-machine:~$ cd
rps@rps-virtual-machine:~$ cp skk lsp
rps@rps-virtual-machine:~$ ls
Desktop    Downloads  Music     Public  sks   Templates  Videos  wipro_project
Documents  lsp        Pictures  skk     snap  test       wipro
rps@rps-virtual-machine:~$ mv skk sks
rps@rps-virtual-machine:~$ ls
Desktop    Downloads  Music     Public  snap       test    wipro
Documents  lsp        Pictures  sks     Templates  Videos  wipro_project
rps@rps-virtual-machine:~$ mkdir test1
rps@rps-virtual-machine:~$ rmdir test1
rps@rps-virtual-machine:~$ history >history.txt
rps@rps-virtual-machine:~$ cat history.txt
    1  sudo apt update
    2  sudo nano /etc/resolv.conf
    3  sudo apt update
    4  sudo apt upgrade
```

```
rps@rps-virtual-machine:~$ more history.txt
    1  sudo apt update
    2  sudo nano /etc/resolv.conf
    3  sudo apt update
    4  sudo apt upgrade
    5  sudo apt install gcc++
    6  sudo apt install gcc
    7  sudo apt install build-essentials
    8  sudo apt install build-essential
    9  sudo apt install gdb
   10  init 0
   11  gcc --version
   12  cd "/home/rps/Desktop/C Demo/" && gcc first.c -o first && "/home/rps/Desktop/C Demo/"first
   13  sudo su
   14  tar xvfz node_exporter-1.7.0.linux-amd64.tar.gz
   15  cd node_exporter-1.7.0.linux-amd64/
   16  sudo mv node_exporter /usr/local/bin/
```

```
rps@rps-virtual-machine:~$ ls-a
ls-a: command not found
rps@rps-virtual-machine:~$ ls -a
.              .cache     Downloads    .local     .profile  .sudo_as_admin_successful  .vscode
..             .config    .gitconfig   lsp        Public    Templates                  wipro
.bash_history  Desktop    .gnupg       Music      sks       test                       wipro_project
.bash_logout   Documents  history.txt  Pictures   snap      Videos
.bashrc        .dotnet    .lesshst     .pki       .ssh      .viminfo
rps@rps-virtual-machine:~$ ls -la
total 128
drwxr-x--- 24 rps  rps  4096 Jul 17 09:58 .
drwxr-xr-x  3 root root 4096 Mar 16  2023 ..
-rw-------  1 rps  rps  1345 Jun 24 12:41 .bash_history
-rw-r--r--  1 rps  rps   220 Mar 16  2023 .bash_logout
-rw-r--r--  1 rps  rps  3771 Mar 16  2023 .bashrc
drwx------ 15 rps  rps  4096 Jun 26 21:43 .cache
drwx------ 16 rps  rps  4096 Jul  1 21:07 .config
drwxr-xr-x  3 rps  rps  4096 Mar 10 09:58 Desktop
```

```
rps@rps-virtual-machine:~$ ls -fa
Desktop        .pki       Videos      .bashrc       test      .gitconfig      wipro_project
.viminfo       lsp        .profile    history.txt   Public    sks             Downloads
.bash_logout   Pictures   .lesshst    snap          Music     .ssh            .sudo_as_admin_successful
.local         .cache     Documents   wipro         .vscode   .bash_history
Templates      ..         .gnupg      .             .config   .dotnet
rps@rps-virtual-machine:~$ mkdir linux
rps@rps-virtual-machine:~$ ls
Desktop    Downloads    linux  Music     Public  snap       test    wipro
Documents  history.txt  lsp    Pictures  sks     Templates  Videos  wipro_project
rps@rps-virtual-machine:~$
```

Relative path: a relative path is a path to a file or directory that is relative to the current directory.

It specifies the location of the file or directory in relation to the current directory. Relative paths do not start with the root directory and are usually shorter than absolute paths.

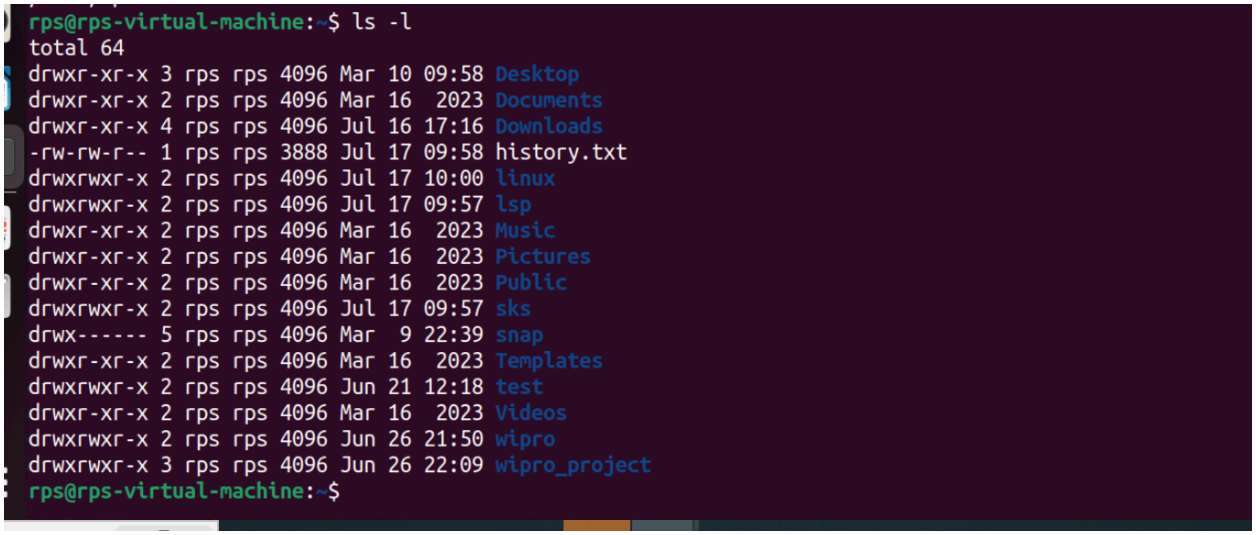
ABSOLUTE PATH: An absolute path is the location of a file or directory specified from the root directory. It represents the complete path from the start of the filesystem from the root directory.

Q.Exercise: Navigate to your home directory (cd ~), then explore subdirectories like Documents (cd Documents). Use pwd (print working directory) to confirm your location. Try going back a directory with cd ...
pwd (print working directory): Shows your current directory path.

Q.Exercise: After navigating using cd, use pwd to verify the path.
ls (list): Lists files and directories in the current directory.

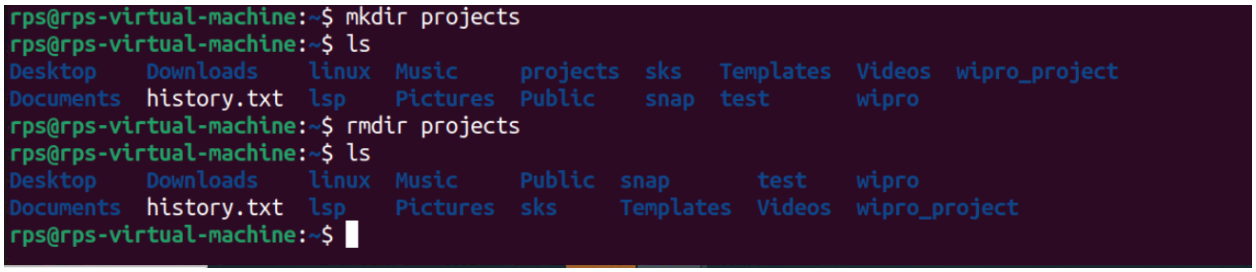
```
rps@rps-virtual-machine:~$ ls
Desktop    Downloads    linux  Music     Public  snap       test    wipro
Documents  history.txt  lsp    Pictures  sks     Templates  Videos  wipro_project
rps@rps-virtual-machine:~$ cd
rps@rps-virtual-machine:~$ cd Documents/
rps@rps-virtual-machine:~/Documents$ pwd
/home/rps/Documents
rps@rps-virtual-machine:~/Documents$ cd ..
rps@rps-virtual-machine:~$ pwd
/home/rps
rps@rps-virtual-machine:~$
```

Q. Exercise: Use ls in your home directory and note the listed items. Try ls -l (long format) for detailed information like permissions, owner, and size.
File and Directory Management:



Q. mkdir (make directory): Creates a new directory.

Exercise: Create a new directory called "Projects" (mkdir Projects). Use ls to confirm its existence.
rmdir (remove directory): Deletes an empty directory.



Q.Exercise: Make a directory named "temp" (mkdir temp). Delete it after verifying its existence with ls (rmdir temp).
touch (create file): Creates an empty file.

```
rps@rps-virtual-machine:~$ ls
Desktop    Downloads    linux  Music     Public  snap       test    wipro
Documents  history.txt  lsp    Pictures  sks     Templates  Videos  wipro_project
rps@rps-virtual-machine:~$ rmdir temp
rmdir: failed to remove 'temp': No such file or directory
rps@rps-virtual-machine:~$ mkdir temp
rps@rps-virtual-machine:~$ ls
Desktop    Downloads    linux  Music     Public  snap  Templates  Videos  wipro_project
Documents  history.txt  lsp    Pictures  sks     temp  test       wipro
rps@rps-virtual-machine:~$ rm temp
rm: cannot remove 'temp': Is a directory
rps@rps-virtual-machine:~$ rmdir temp
rps@rps-virtual-machine:~$ touch temp
rps@rps-virtual-machine:~$ ls
Desktop    Downloads    linux  Music     Public  snap  Templates  Videos  wipro_project
Documents  history.txt  lsp    Pictures  sks     temp  test       wipro
rps@rps-virtual-machine:~$
```

Q. Exercise: Create a file called "test.txt" (touch test.txt). Use ls to see it listed.

cp (copy): Copies a file or directory to another location.

```
rps@rps-virtual-machine:~$ ls
Desktop    Downloads    linux  Music     Public  snap  Templates  Videos  wipro_project
Documents  history.txt  lsp    Pictures  sks     temp  test       wipro
rps@rps-virtual-machine:~$ touch test.txt
rps@rps-virtual-machine:~$ ls
Desktop    Downloads    linux  Music     Public  snap  Templates  test.txt  wipro
Documents  history.txt  lsp    Pictures  sks     temp  test       Videos    wipro_project
rps@rps-virtual-machine:~$ cp test.txt sks
rps@rps-virtual-machine:~$ ls
Desktop    Downloads    linux  Music     Public  snap  Templates  test.txt  wipro
Documents  history.txt  lsp    Pictures  sks     temp  test       Videos    wipro_project
rps@rps-virtual-machine:~$ cd sks/
rps@rps-virtual-machine:~/sks$ ls
skk  test.txt
rps@rps-virtual-machine:~/sks$
```

Q.Exercise: Copy "test.txt" to your Documents directory (cp test.txt Documents). Verify the copy with ls Documents.

mv (move/rename): Moves or renames a file or directory.

Exercise: Rename "test.txt" to "data.txt" (mv test.txt data.txt). Use ls to confirm the change. You can also move files to a different directory (e.g., mv data.txt Documents).

rm (remove): Deletes files or directories (use with caution!).

```
rps@rps-virtual-machine:~$ cp test.txt Documents/
rps@rps-virtual-machine:~$ ls
Desktop    Downloads    linux  Music     Public  snap  Templates  test.txt  wipro
Documents  history.txt  lsp    Pictures  sks     temp  test       Videos    wipro_project
rps@rps-virtual-machine:~$ cd Documents/
rps@rps-virtual-machine:~/Documents$ ls
test.txt
rps@rps-virtual-machine:~/Documents$ mn test.txt rename.txt
Command 'mn' not found, but can be installed with:
sudo apt install mininet
rps@rps-virtual-machine:~/Documents$ mv test.txt rename.txt
rps@rps-virtual-machine:~/Documents$ ls
rename.txt
rps@rps-virtual-machine:~/Documents$
```

Q.Exercise: Important: Only use this after creating a test file (e.g., touch temp.txt). Delete "temp.txt" with rm temp.txt. Never use rm -rf without understanding the risks!

```
rps@rps-virtual-machine:~/Documents$ touch t.txt
rps@rps-virtual-machine:~/Documents$ ls
rename.txt  t.txt
rps@rps-virtual-machine:~/Documents$ rm t.txt
rps@rps-virtual-machine:~/Documents$ ls
rename.txt
rps@rps-virtual-machine:~/Documents$
```

Q.Exercise: Create a text file named "message.txt" with some content (e.g., using a text editor). Then, use cat message.txt to view its contents.

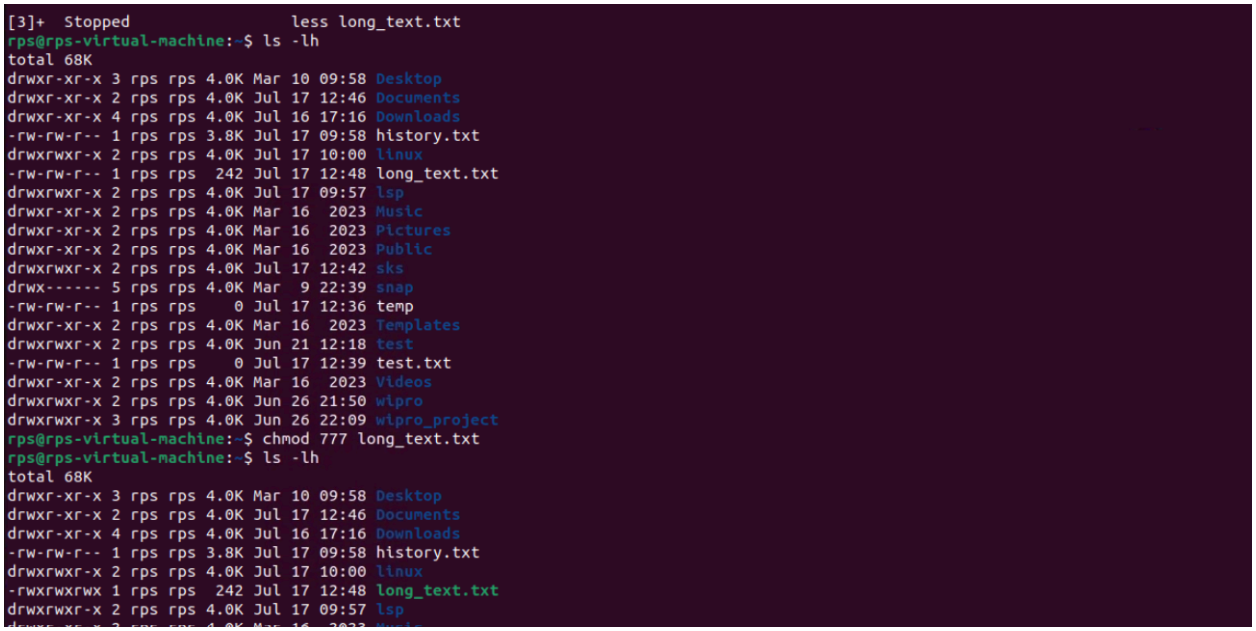
more (pager): Displays a file's contents one screen at a time (useful for long files).

```
rps@rps-virtual-machine:~$ vi message.txt
rps@rps-virtual-machine:~$ cat message.txt
b118user05
er
f
v
f
ghy
h
yu
j8
ik
j7u
yh3g4rf
45y
67
hiug45656
iu789
iy7gf56
```

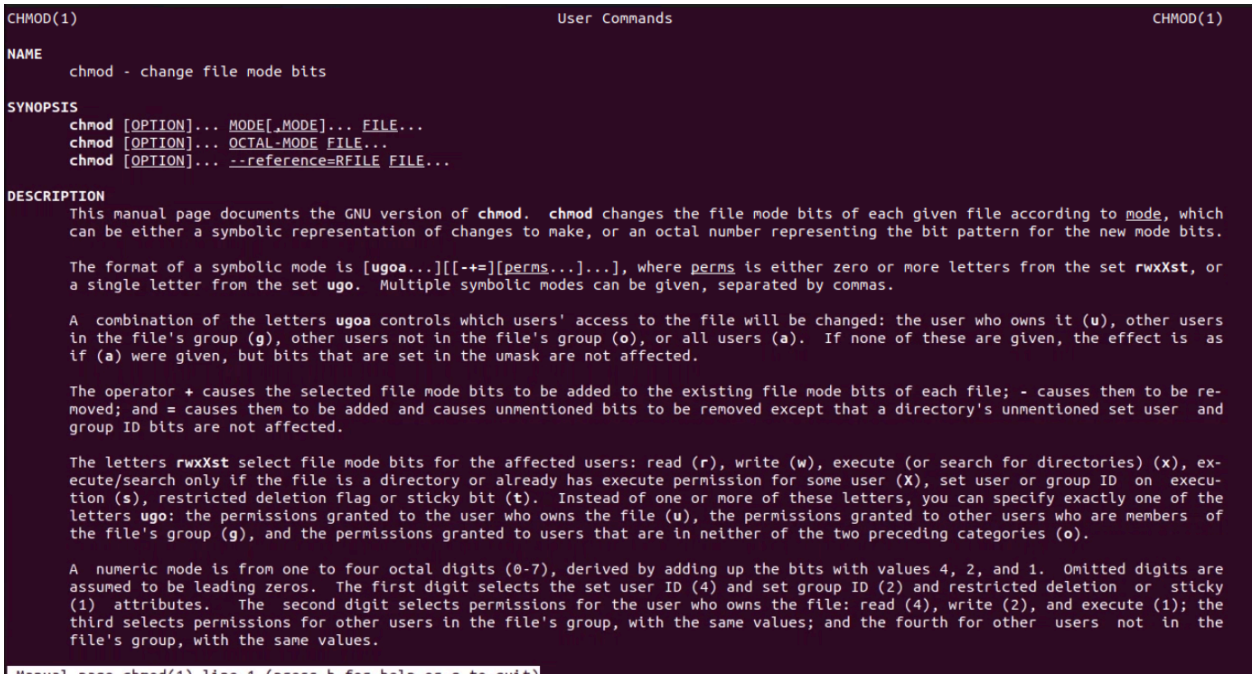
Q. Exercise: Create a larger text file (e.g., "long_text.txt") and use more long_text.txt to navigate through its content page by page.
less (pager): Similar to more, but allows you to move backward in the file.

```
78u
678o787
jg67
i
87u6
o09o8uhjy6uo9ij
7hu7u
8u7y
7u78i
7u76
/bin/bash: line 1: wq: command not found
rps@rps-virtual-machine:~$ more long_text.txt
b118user05
er
f
v
f
ghy
h
yu
j8
ik
j7u
yh3g4rf
45y
67
```

Q.Exercise: Use less with "long_text.txt" to try moving backward using the Up arrow key.
chmod (change mode): Modifies file permissions (owner, group, others) for read, write, and execute access.



Q. Exercise: This requires understanding permissions. Refer to the man chmod page for details. Proceed with caution when modifying permissions.
Getting Help and Information:



```
CHMOD(1)                                  User Commands                                  CHMOD(1)

NAME
       chmod - change file mode bits

SYNOPSIS
       chmod [OPTION]... MODE[,MODE]... FILE...
       chmod [OPTION]... OCTAL-MODE FILE...
       chmod [OPTION]... --reference=RFILE FILE...

DESCRIPTION
       This manual page documents the GNU version of chmod.  chmod changes the file mode bits of each given file according to mode, which
       can be either a symbolic representation of changes to make, or an octal number representing the bit pattern for the new mode bits.

       The format of a symbolic mode is [ugoa...][[-+=][perms...]...], where perms is either zero or more letters from the set rwxXst, or
       a single letter from the set ugo.  Multiple symbolic modes can be given, separated by commas.

       A  combination of the letters ugoa controls which users' access to the file will be changed: the user who owns it (u), other users
       in the file's group (g), other users not in the file's group (o), or all users (a).  If none of these are given, the effect is  as
       if (a) were given, but bits that are set in the umask are not affected.

       The operator + causes the selected file mode bits to be added to the existing file mode bits of each file; - causes them to be re-
       moved; and = causes them to be added and causes unmentioned bits to be removed except that a directory's unmentioned set user  and
       group ID bits are not affected.

       The letters rwxXst select file mode bits for the affected users: read (r), write (w), execute (or search for directories) (x), ex-
       ecute/search only if the file is a directory or already has execute permission for some user (X), set user or group ID  on  execu-
       tion (s), restricted deletion flag or sticky bit (t).  Instead of one or more of these letters, you can specify exactly one of the
       letters ugo: the permissions granted to the user who owns the file (u), the permissions granted to other users who are members  of
       the file's group (g), and the permissions granted to users that are in neither of the two preceding categories (o).

       A  numeric mode is from one to four octal digits (0-7), derived by adding up the bits with values 4, 2, and 1.  Omitted digits are
       assumed to be leading zeros.  The first digit selects the set user ID (4) and set group ID (2) and restricted deletion  or  sticky
       (1)  attributes.   The  second digit selects permissions for the user who owns the file: read (4), write (2), and execute (1); the
       third selects permissions for other users in the file's group, with the same values; and the fourth for other  users  not  in  the
       file's group, with the same values.
```

Q. Exercise: Use man ls or man cd to learn more about these commands.

info (information): Another source of documentation for some commands, often more user-friendly than man.

```
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 entries ending with ~

       -c     with -lt: sort by, and show, ctime (time of last modification of file status information); with -l: show ctime and sort  by
              name; otherwise: sort by ctime, newest first

       -C     list entries by columns
```

We can change File permission using chmod(change mode)

There are three type of permission

1. Read(R)
2. Write(w)
3. Execute (X)