S.B. JAIN INSTITUTE OF TECHNOLOGY MANAGEMENT & RESEARCH, NAGPUR

Practical 2
Prelab

Aim: To understand and demonstrate the use of basic commands in different operating systems (Windows, Linux, and UNIX) for managing files, directories, permissions, and user interactions through a terminal or command-line interface.

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Semester / Year: 4th/2nd

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Date of Performance:

Date of Submission:

✞ Objectives:

1. To learn and practice fundamental command-line operations for file and directory management.
2. To explore and utilize user and permission management commands effectively.
3. To enhance system administration skills by working with commands across different operating systems.

✞ Requirements:

Hardware Requirements:

- **Processor**: Multi-core CPU, Intel Core i3 (3.0 GHz) or higher
- **RAM**: Minimum 4 GB (8 GB recommended for optimal performance)
- **Storage**: 100 GB HDD or SSD (Solid State Drive) for faster access
- **Network Interface**: Ethernet or Wi-Fi adapter for connectivity

Software Requirements:

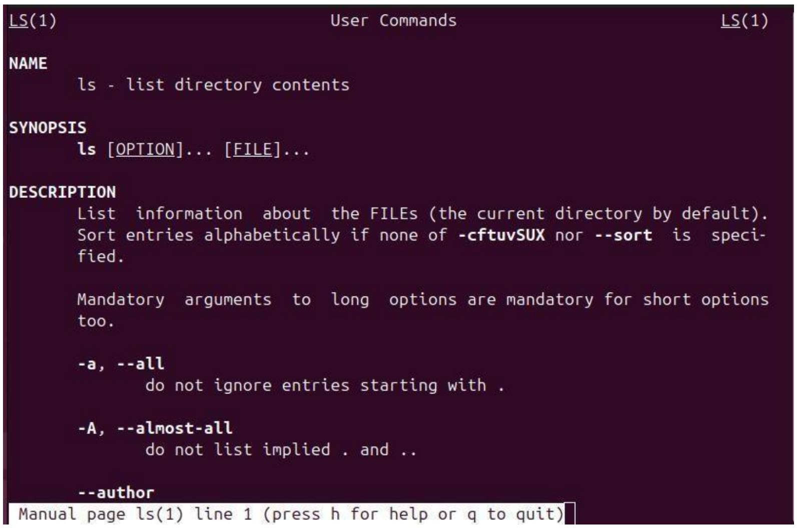
- **Operating System**: Windows 10/11, Linux (Ubuntu 20.04/CentOS 8), UNIX-based OS
- **Command-line Interface**: PowerShell or Command Prompt (Windows), Terminal (Linux/UNIX)
- **Text Editor**: Nano, Vim, or Visual Studio Code for file editing
- **Administrative Privileges**: Superuser (Linux/UNIX) or Administrator (Windows) access

✞ Theory:

In system administration, command-line interfaces (CLI) are essential tools for managing and interacting with operating systems like Windows, Linux, and UNIX. Commands allow users to perform various tasks such as navigating directories, managing files, controlling permissions, and monitoring system performance. Each operating system provides a set of built-in commands, such as ‘man’, ‘ls’, ‘cd’, ‘mkdir’, and ‘chmod’, to facilitate efficient system management. Understanding these commands and their syntax is crucial for automating tasks, enhancing security, and ensuring optimal system functionality. This practical aims to develop foundational skills in executing and applying

1.Display User Manual of a Command

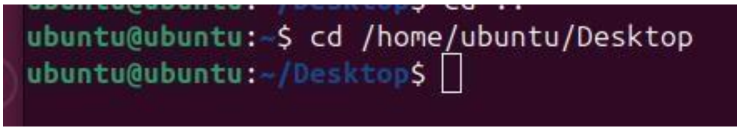
Functionality: Shows the manual page with details about a command’s usage, options, and arguments. Syntax: man <command>



```
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  speci‐
       fied.

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

2.Change Current Working Directory.

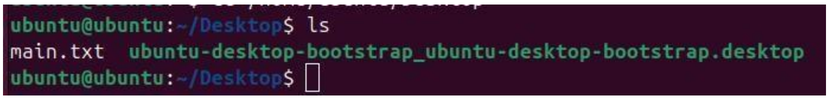
Functionality: Changes the terminal’s current working directory. Syntax: cd <directorypath>



```
ubuntu@ubuntu:~$ cd /home/ubuntu/Desktop
ubuntu@ubuntu:~/Desktop$ 
```

3.List Contents of the Current Directory.

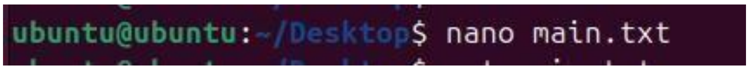
Functionality: Lists all files and directories in the current location. Syntax: ls



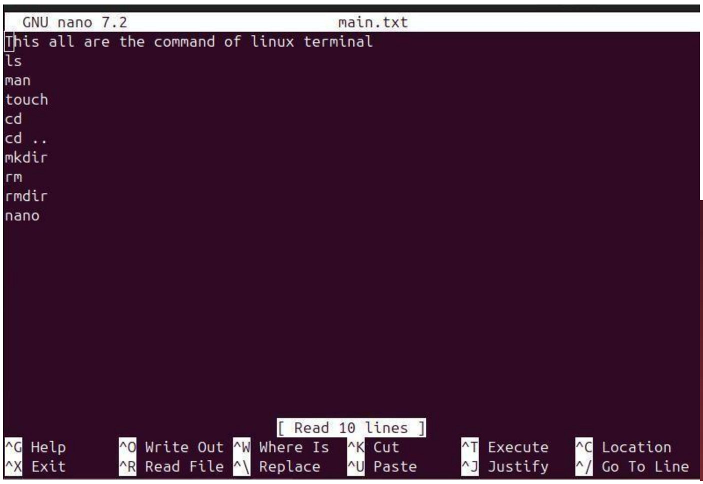
```
ubuntu@ubuntu:~/Desktop$ ls
main.txt  ubuntu-desktop-bootstrap_ubuntu-desktop-bootstrap.desktop
ubuntu@ubuntu:~/Desktop$ 
```

4.Read/Modify/Concatenate Text Files.

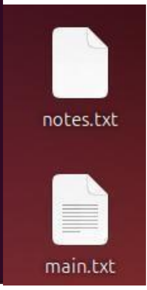
Functionality: Displays or manipulates file content.
Syntax:
Read: cat <filename>
Modify: ‘nano <filename>
Concatenate: cat <file1> <file2> > <outputfile>

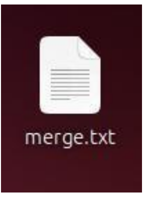


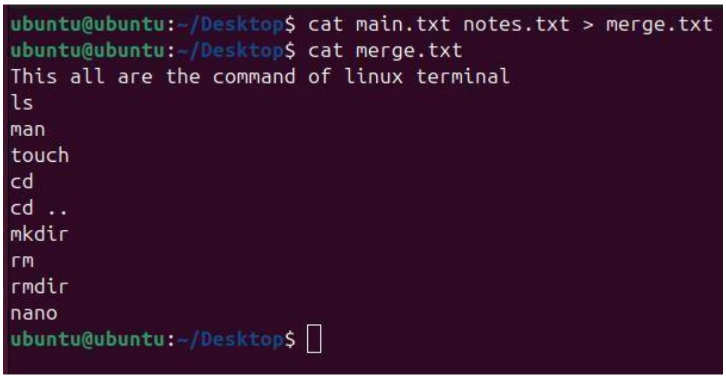
```
ubuntu@ubuntu:~/Desktop$ nano main.txt
```



```
  GNU nano 7.2                        main.txt
This all are the command of linux terminal
ls
man
touch
cd
cd ..
mkdir
rm
rmdir
nano

                              [ Read 10 lines ]
^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^/ Go To Line
```



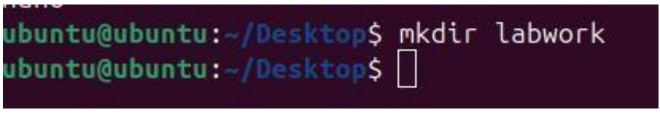




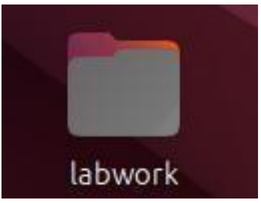
```
ubuntu@ubuntu:~/Desktop$ cat main.txt notes.txt > merge.txt
ubuntu@ubuntu:~/Desktop$ cat merge.txt
This all are the command of linux terminal
ls
man
touch
cd
cd ..
mkdir
rm
rmdir
nano
ubuntu@ubuntu:~/Desktop$ 
```

5.**Create a New Directory**.

Functionality: Creates a new directory at the specified path.
Syntax: mkdir <directory-name

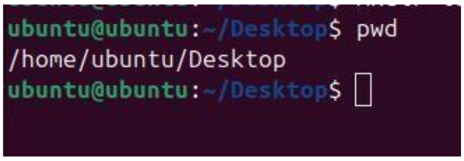


```
ubuntu@ubuntu:~/Desktop$ mkdir labwork
ubuntu@ubuntu:~/Desktop$ 
```



6.**Display Current Working Directory.**

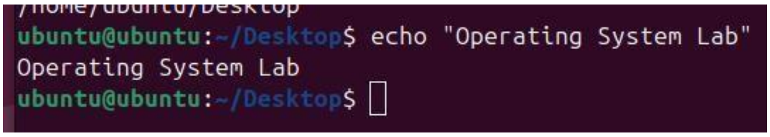
Functionality: Prints the current directory path.
Syntax: pwd



```
ubuntu@ubuntu:~/Desktop$ pwd
/home/ubuntu/Desktop
ubuntu@ubuntu:~/Desktop$ 
```

7.**Write Arguments to Standard Output.**

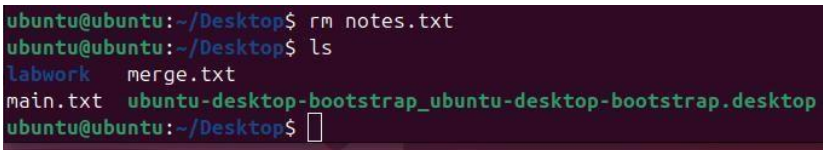
Functionality: Prints the provided string or variables.
Syntax: echo <arguments>



```
/home/ubuntu/Desktop
ubuntu@ubuntu:~/Desktop$ echo "Operating System Lab"
Operating System Lab
ubuntu@ubuntu:~/Desktop$ 
```

8.Remove a File.

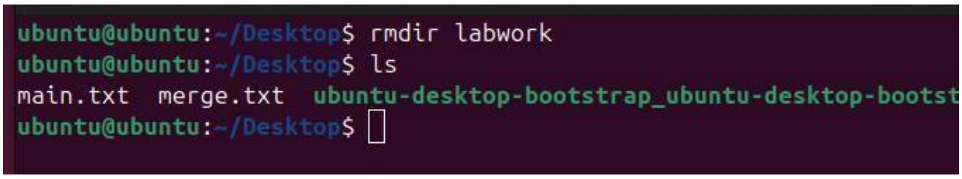
Functionality: Deletes a specified file.
Syntax: rm <filename>



```
ubuntu@ubuntu:~/Desktop$ rm notes.txt
ubuntu@ubuntu:~/Desktop$ ls
labwork   merge.txt
main.txt  ubuntu-desktop-bootstrap_ubuntu-desktop-bootstrap.desktop
ubuntu@ubuntu:~/Desktop$ 
```

9.Delete a Directory.

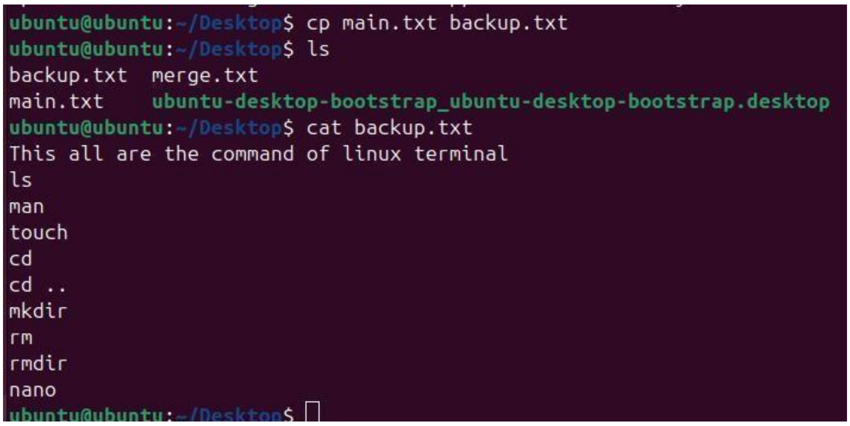
Functionality: Removes an empty directory.
Syntax: rmdir <directory-name>



```
ubuntu@ubuntu:~/Desktop$ rmdir labwork
ubuntu@ubuntu:~/Desktop$ ls
main.txt  merge.txt  ubuntu-desktop-bootstrap_ubuntu-desktop-bootst
ubuntu@ubuntu:~/Desktop$ 
```

10.Copy a File or Directory.

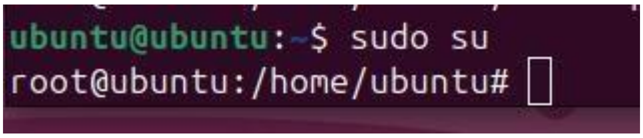
Functionality: Copies a file or directory to a destination.
Syntax: cp <source> <destination>



```
ubuntu@ubuntu:~/Desktop$ cp main.txt backup.txt
ubuntu@ubuntu:~/Desktop$ ls
backup.txt  merge.txt
main.txt    ubuntu-desktop-bootstrap_ubuntu-desktop-bootstrap.desktop
ubuntu@ubuntu:~/Desktop$ cat backup.txt
This all are the command of linux terminal
ls
man
touch
cd
cd ..
mkdir
rm
rmdir
nano
ubuntu@ubuntu:~/Desktop$ 
```

10.Switch to Root User.

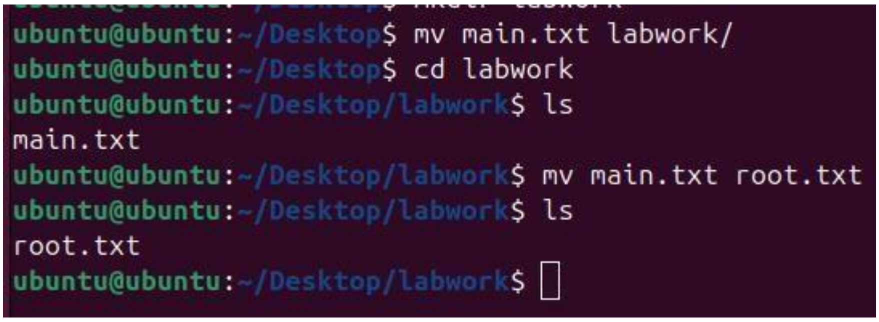
Functionality: Gains root privileges temporarily.
Syntax: sudo su



```
ubuntu@ubuntu:~$ sudo su
root@ubuntu:/home/ubuntu# 
```

11.**Move Files or Directories.**

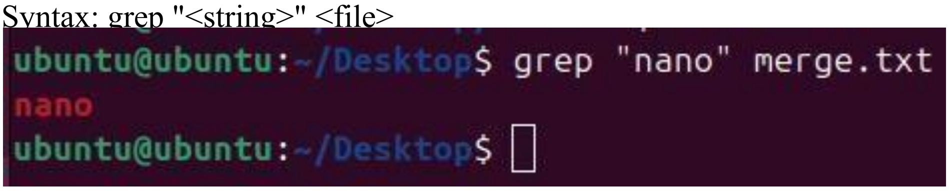
Functionality: Moves or renames files and directories.
-Syntax: mv <source> <destination>



```
ubuntu@ubuntu:~/Desktop$ mv main.txt labwork/
ubuntu@ubuntu:~/Desktop$ cd labwork
ubuntu@ubuntu:~/Desktop/labwork$ ls
main.txt
ubuntu@ubuntu:~/Desktop/labwork$ mv main.txt root.txt
ubuntu@ubuntu:~/Desktop/labwork$ ls
root.txt
ubuntu@ubuntu:~/Desktop/labwork$ 
```

12.Search for a String in a File.

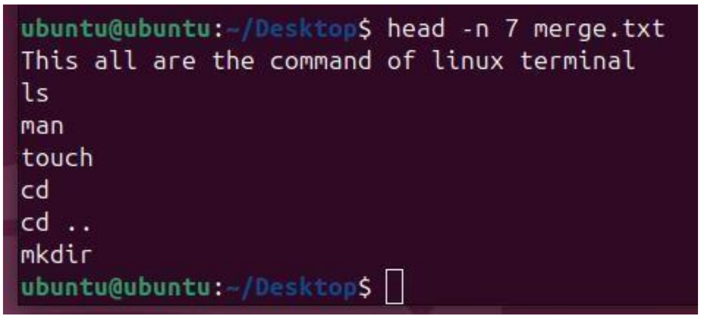
Functionality: Searches for a specific word or pattern in a file.
Syntax: grep "<string>" <file>



```
ubuntu@ubuntu:~/Desktop$ grep "nano" merge.txt
nano
ubuntu@ubuntu:~/Desktop$ 
```

13.Print Top N Lines of a File.

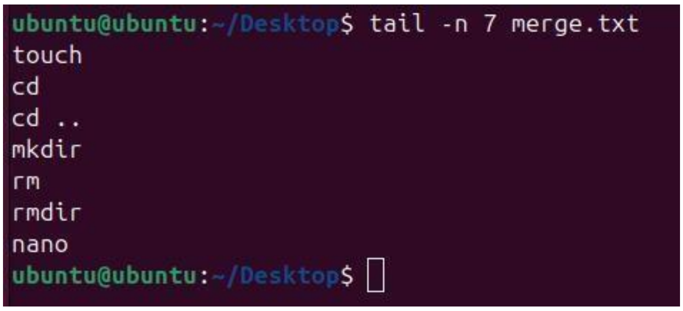
Functionality: Displays the first N lines of a file.
Syntax: head -n <N> <file>



```
ubuntu@ubuntu:~/Desktop$ head -n 7 merge.txt
This all are the command of linux terminal
ls
man
touch
cd
cd ..
mkdir
ubuntu@ubuntu:~/Desktop$ 
```

14.**Print Last N Lines of a File.**

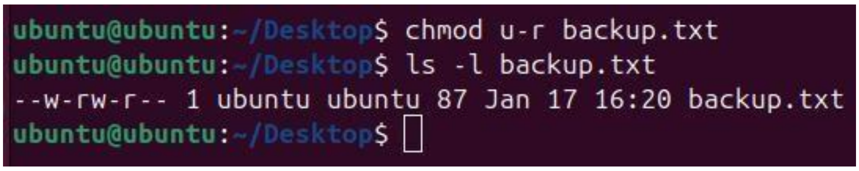
Functionality: Displays the last N lines of a file.
Syntax: tail -n <N> <file>



```
ubuntu@ubuntu:~/Desktop$ tail -n 7 merge.txt
touch
cd
cd ..
mkdir
rm
rmdir
nano
ubuntu@ubuntu:~/Desktop$ 
```

15.**Remove Read Permission from Owner.**

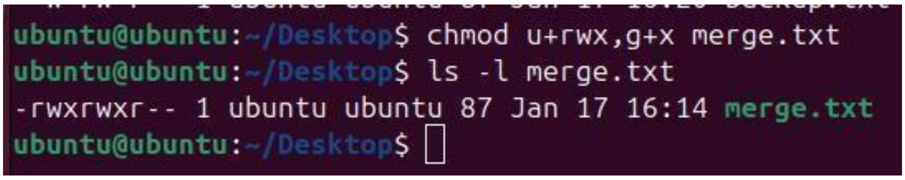
Functionality: Revokes the owner's read permission for a file.Syntax: chmod u-r <filename>



```
ubuntu@ubuntu:~/Desktop$ chmod u-r backup.txt
ubuntu@ubuntu:~/Desktop$ ls -l backup.txt
--w-rw-r-- 1 ubuntu ubuntu 87 Jan 17 16:20 backup.txt
ubuntu@ubuntu:~/Desktop$ 
```

16.**Change Specific Permissions.**

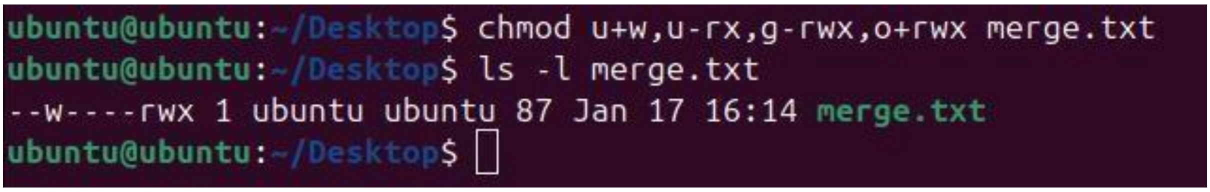
Functionality: Sets or removes specific file permissions.
-Syntax: chmod u+r,w-x,g+w <filename>



```
ubuntu@ubuntu:~/Desktop$ chmod u+rwx,g+x merge.txt
ubuntu@ubuntu:~/Desktop$ ls -l merge.txt
-rwxrwxr-- 1 ubuntu ubuntu 87 Jan 17 16:14 merge.txt
ubuntu@ubuntu:~/Desktop$ 
```

17.Add Write Permission to Owner, None to Others.

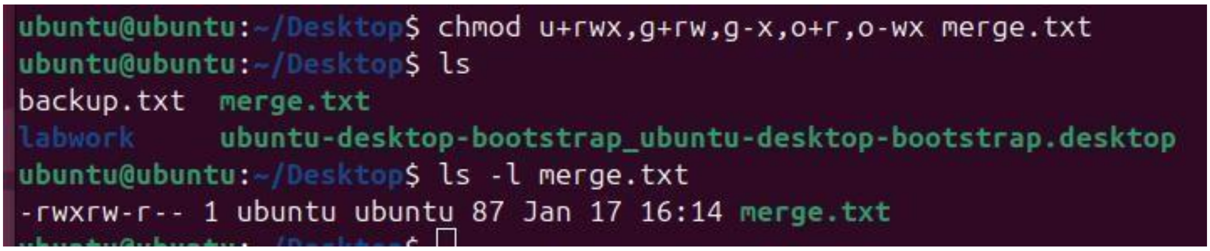
-Functionality: Allows write access for the owner only.
Syntax: chmod u+w,o-rwx <filename>



```
ubuntu@ubuntu:~/Desktop$ chmod u+w,u-rx,g-rwx,o+rwx merge.txt
ubuntu@ubuntu:~/Desktop$ ls -l merge.txt
--w----rwx 1 ubuntu ubuntu 87 Jan 17 16:14 merge.txt
ubuntu@ubuntu:~/Desktop$ 
```

18.Assign Permissions to Users.

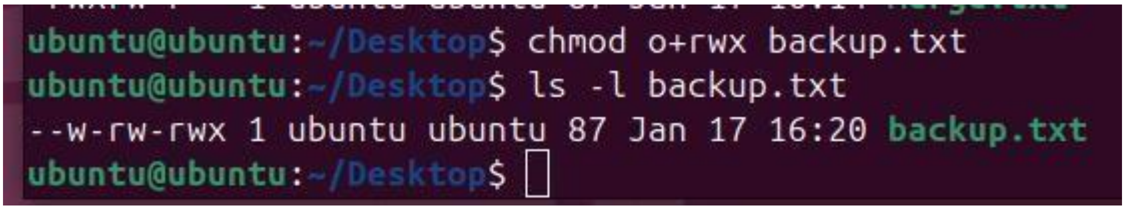
Functionality: Modifies file access for users, groups, and others.
Syntax: chmod u+rwx,g+rx,o+r <filename>



```
ubuntu@ubuntu:~/Desktop$ chmod u+rwx,g+rw,g-x,o+r,o-wx merge.txt
ubuntu@ubuntu:~/Desktop$ ls
backup.txt  merge.txt
labwork     ubuntu-desktop-bootstrap_ubuntu-desktop-bootstrap.desktop
ubuntu@ubuntu:~/Desktop$ ls -l merge.txt
-rwxrw-r-- 1 ubuntu ubuntu 87 Jan 17 16:14 merge.txt
```

19.Assign R/W/X to Others.

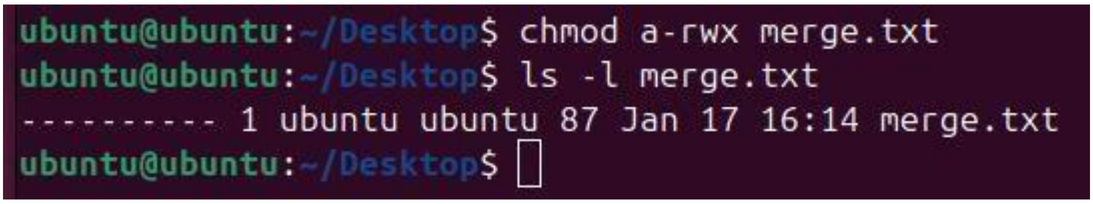
Functionality: Gives read, write, and execute permissions to others.
Syntax: chmod o+rwx <filename>



```
ubuntu@ubuntu:~/Desktop$ chmod o+rwx backup.txt
ubuntu@ubuntu:~/Desktop$ ls -l backup.txt
--w-rw-rwx 1 ubuntu ubuntu 87 Jan 17 16:20 backup.txt
ubuntu@ubuntu:~/Desktop$ 
```

20.Remove All Permissions from All Users.

Functionality: Clears all permissions on a file.
Syntax: ‘chmod a-rwx <filename>



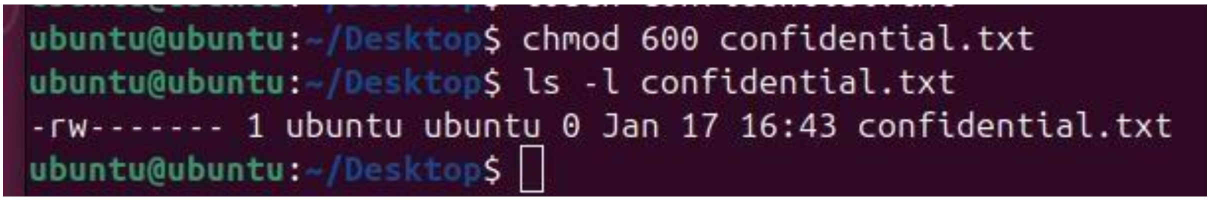
```
ubuntu@ubuntu:~/Desktop$ chmod a-rwx merge.txt
ubuntu@ubuntu:~/Desktop$ ls -l merge.txt
---------- 1 ubuntu ubuntu 87 Jan 17 16:14 merge.txt
ubuntu@ubuntu:~/Desktop$ 
```

21.Remove Read Permission Using Absolute Mode.

Functionality: Uses numeric mode to restrict read access.
Syntax: chmod 700 <filename>

22.Set R/W for Owner, None for Group/Other.

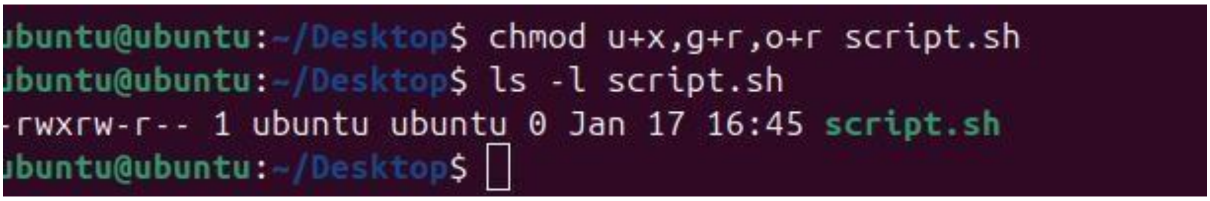
Functionality: Assigns permissions in numeric mode.
Syntax: chmod 600 <filename>



```
ubuntu@ubuntu:~/Desktop$ chmod 600 confidential.txt
ubuntu@ubuntu:~/Desktop$ ls -l confidential.txt
-rw------- 1 ubuntu ubuntu 0 Jan 17 16:43 confidential.txt
ubuntu@ubuntu:~/Desktop$ 
```

23.Add Execute for Owner, Read for Group/Others.

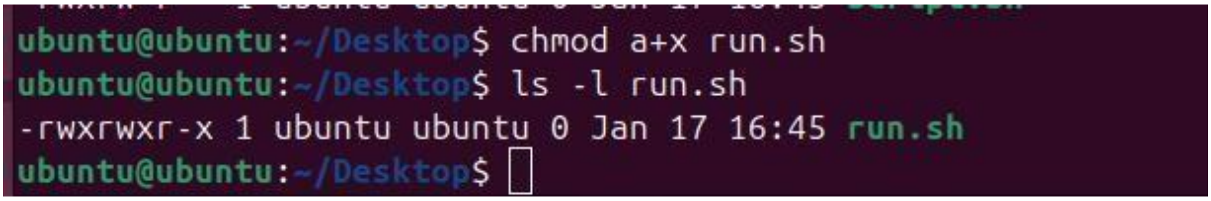
Functionality: Adds execution and read access.
Syntax: chmod u+x,g+r,o+r <filename>



```
ubuntu@ubuntu:~/Desktop$ chmod u+x,g+r,o+r script.sh
ubuntu@ubuntu:~/Desktop$ ls -l script.sh
-rwxrw-r-- 1 ubuntu ubuntu 0 Jan 17 16:45 script.sh
ubuntu@ubuntu:~/Desktop$ 
```

24.**Add Execute Permission to All Users.**

Functionality: Enables execution by everyone.
Syntax: chmod a+x <filename>



```
ubuntu@ubuntu:~/Desktop$ chmod a+x run.sh
ubuntu@ubuntu:~/Desktop$ ls -l run.sh
-rwxrwxr-x 1 ubuntu ubuntu 0 Jan 17 16:45 run.sh
ubuntu@ubuntu:~/Desktop$ 
```

References:

https://ubuntu.com/tutorials/command-line-for-beginners#1-overview
https://www.geeksforgeeks.org/25-basic-ubuntu-commands/

Date:____/____/2026

Signature

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