

National Textile University

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Submitted To:

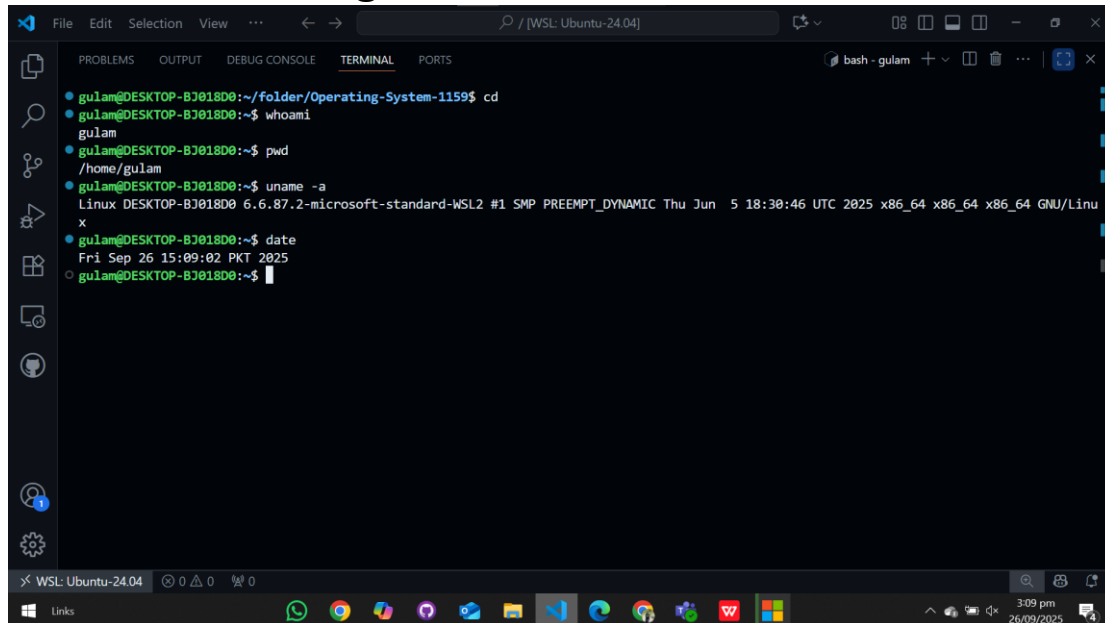
Sir Nasir Ali

Lab No:

2

LAB : 02

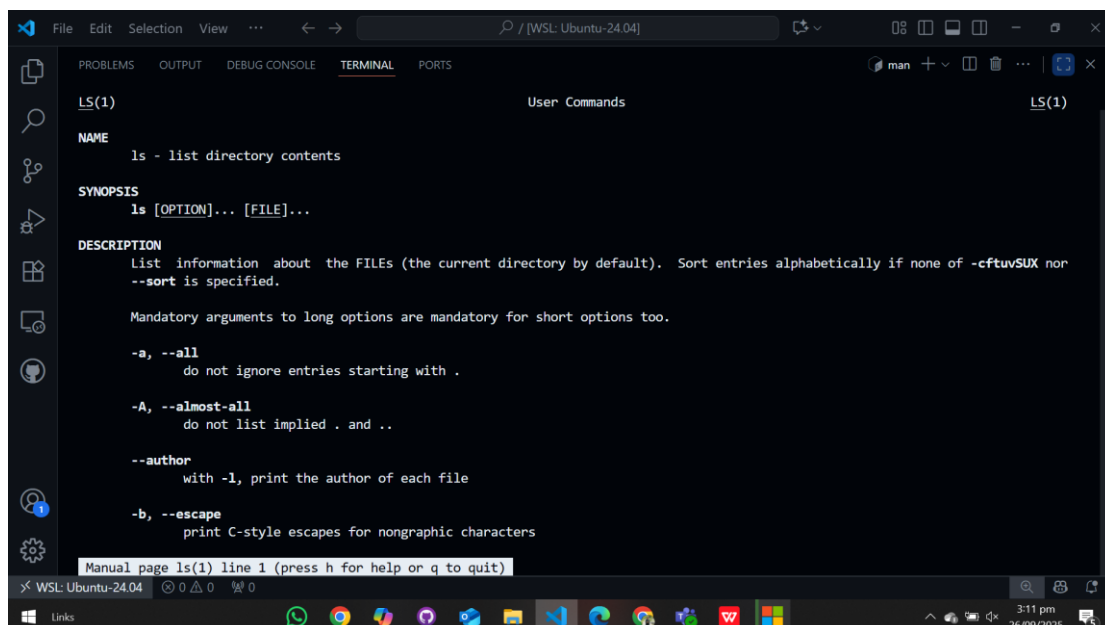
1.1 Understanding the Linux Environment:



```
gulam@DESKTOP-BJ018D0:~/folder/Operating-System-1159$ cd
gulam@DESKTOP-BJ018D0:~$ whoami
gulam
gulam@DESKTOP-BJ018D0:~$ pwd
/home/gulam
gulam@DESKTOP-BJ018D0:~$ uname -a
Linux DESKTOP-BJ018D0 6.6.87.2-microsoft-standard-WSL2 #1 SMP PREEMPT_DYNAMIC Thu Jun  5 18:30:46 UTC 2025 x86_64 x86_64 x86_64 GNU/Linux
gulam@DESKTOP-BJ018D0:~$ date
Fri Sep 26 15:09:02 PKT 2025
gulam@DESKTOP-BJ018D0:~$
```

1.2 Getting Help in Linux

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 .

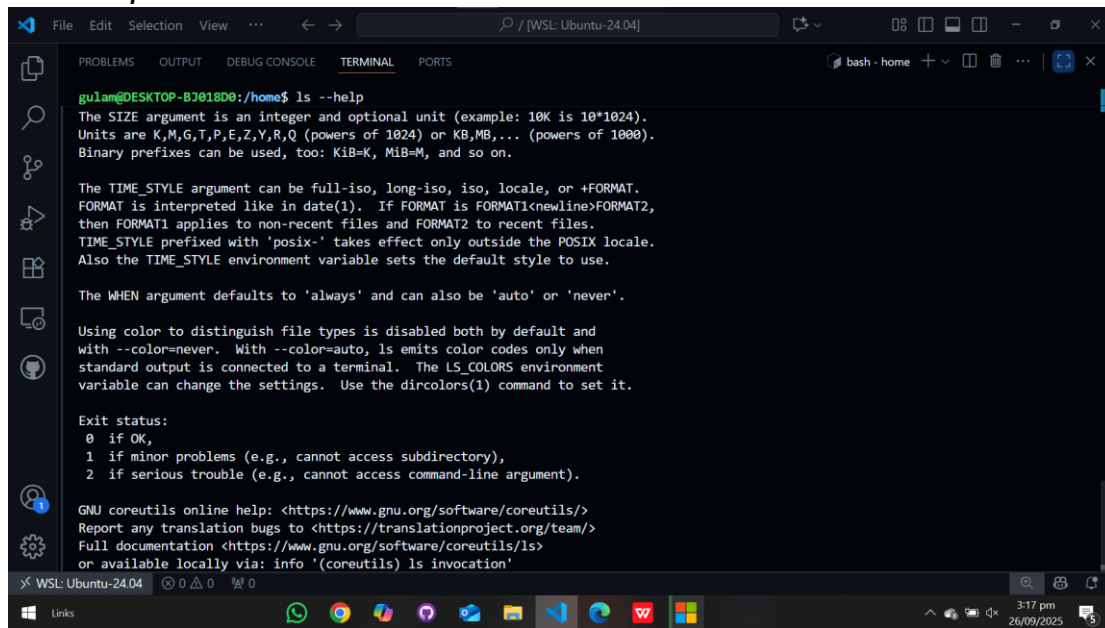
-A, --almost-all
do not list implied . and ..

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

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

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

Ls --help



```
gulam@DESKTOP-B3018D0:/home$ ls --help

The SIZE argument is an integer and optional unit (example: 10K is 10*1024).
Units are K,M,G,T,P,E,Z,Y,R,Q (powers of 1024) or KB,MB,... (powers of 1000).
Binary prefixes can be used, too: KiB=M, MiB=M, and so on.

The TIME_STYLE argument can be full-iso, long-iso, iso, locale, or +FORMAT.
FORMAT is interpreted like in date(1). If FORMAT is FORMAT1<newline>FORMAT2,
then FORMAT1 applies to non-recent files and FORMAT2 to recent files.
TIME_STYLE prefixed with 'posix-' takes effect only outside the POSIX locale.
Also the TIME_STYLE environment variable sets the default style to use.

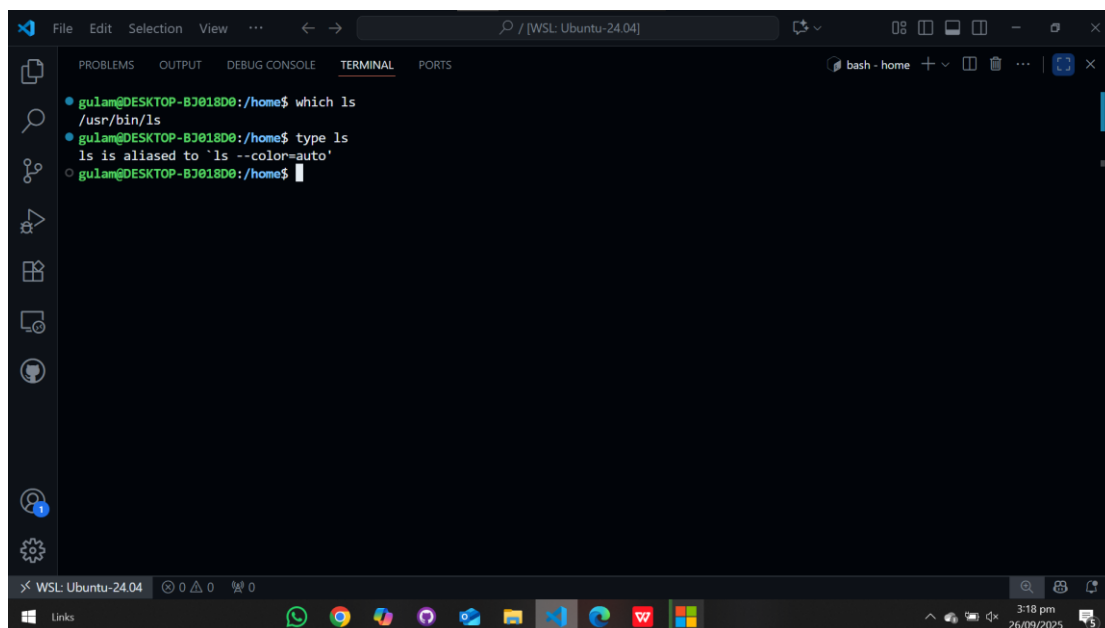
The WHEN argument defaults to 'always' and can also be 'auto' or 'never'.

Using color to distinguish file types is disabled both by default and
with --color=never. With --color=auto, ls emits color codes only when
standard output is connected to a terminal. The LS_COLORS environment
variable can change the settings. Use the dircolors(1) command to set it.

Exit status:
 0 if OK,
 1 if minor problems (e.g., cannot access subdirectory),
 2 if serious trouble (e.g., cannot access command-line argument).

GNU coreutils online help: <https://www.gnu.org/software/coreutils/>
Report any translation bugs to <https://translationproject.org/team/>
Full documentation <https://www.gnu.org/software/coreutils/ls>
or available locally via: info '(coreutils) ls invocation'
```

Which Is Type Is



```
gulam@DESKTOP-B3018D0:/home$ which ls
/usr/bin/ls
gulam@DESKTOP-B3018D0:/home$ type ls
ls is aliased to `ls --color=auto'
gulam@DESKTOP-B3018D0:/home$
```

2.1 Understanding Linux Directory Structure

Ls/

```
File Edit Selection View ... [WSL: Ubuntu-24.04] bash - home + - - - x
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
gulam@DESKTOP-B3018D0:/home$ ls /
bin boot etc init lib.usr-is-merged lost+found mnt proc run sbin.usr-is-merged srv sys var
bin.usr-is-merged dev home lib lib64 media opt root sbin snap sys usr
gulam@DESKTOP-B3018D0:/home$
```

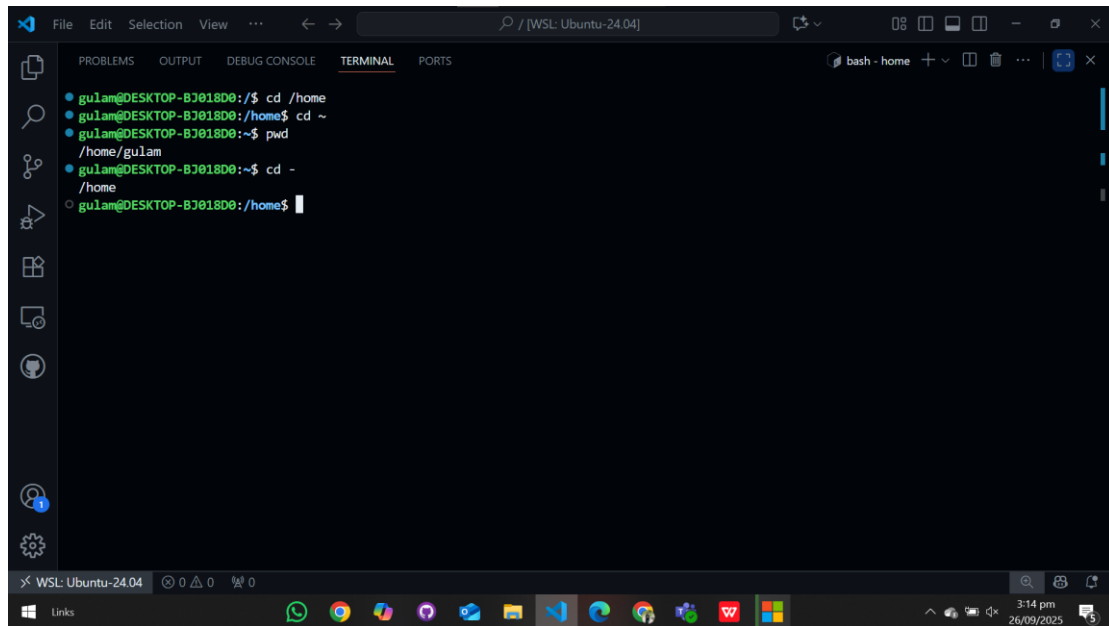
Ls - la

```
File Edit Selection View ... [WSL: Ubuntu-24.04] bash + - - - x
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
gulam@DESKTOP-B3018D0:~$ whoami
gulam
gulam@DESKTOP-B3018D0:~$ pwd
/home/gulam
gulam@DESKTOP-B3018D0:~$ uname -a ...
gulam@DESKTOP-B3018D0:/$ ls -la
total 2756
drwxr-xr-x 22 root root 4096 Sep 26 14:10 .
drwxr-xr-x 22 root root 4096 Sep 26 14:10 ..
lrwxrwxrwx 1 root root 7 Apr 22 2024 bin -> usr/bin
drwxr-xr-x 2 root root 4096 Feb 26 2024 bin.usr-is-merged
drwxr-xr-x 2 root root 4096 Apr 22 2024 boot
drwxr-xr-x 15 root root 3840 Sep 26 14:10 dev
drwxr-xr-x 88 root root 4096 Sep 26 14:11 etc
drwxr-xr-x 3 root root 4096 Sep 18 23:08 home
-rwxrwxrwx 1 root root 2735264 Aug 7 00:54 init
lrwxrwxrwx 1 root root 7 Apr 22 2024 lib -> usr/lib
drwxr-xr-x 2 root root 4096 Apr 8 2024 lib.usr-is-merged
lrwxrwxrwx 1 root root 9 Apr 22 2024 lib64 -> usr/lib64
drwx----- 2 root root 16384 Sep 18 23:03 lost+found
drwxr-xr-x 2 root root 4096 Aug 5 21:55 media
drwxr-xr-x 7 root root 4096 Sep 18 23:03 mnt
drwxr-xr-x 2 root root 4096 Aug 5 21:55 opt
dr-xr-xr-x 205 root root 0 Sep 26 14:10 proc
drwx----- 3 root root 4096 Aug 5 21:57 root
drwxr-xr-x 19 root root 560 Sep 26 14:10 run
lrwxrwxrwx 1 root root 8 Apr 22 2024 sbin -> usr/sbin
```

Ls /home

Cd ~

Cd -



The image shows a screenshot of a Visual Studio Code editor window with a terminal pane open. The terminal is running a bash shell in a WSL (Windows Subsystem for Linux) environment, specifically Ubuntu-24.04. The terminal output shows a series of commands and their results:

```
gulam@DESKTOP-BJ018D0:/$ cd /home
gulam@DESKTOP-BJ018D0:/home$ cd ~
gulam@DESKTOP-BJ018D0:~$ pwd
/home/gulam
gulam@DESKTOP-BJ018D0:~$ cd -
/home
gulam@DESKTOP-BJ018D0:/home$
```

The terminal window has a dark theme. The top bar shows the file explorer, search, and other standard VS Code icons. The bottom status bar indicates the current directory is /home and the shell is bash.

2.2 Basic Navigation Commands

Pwd

Ls

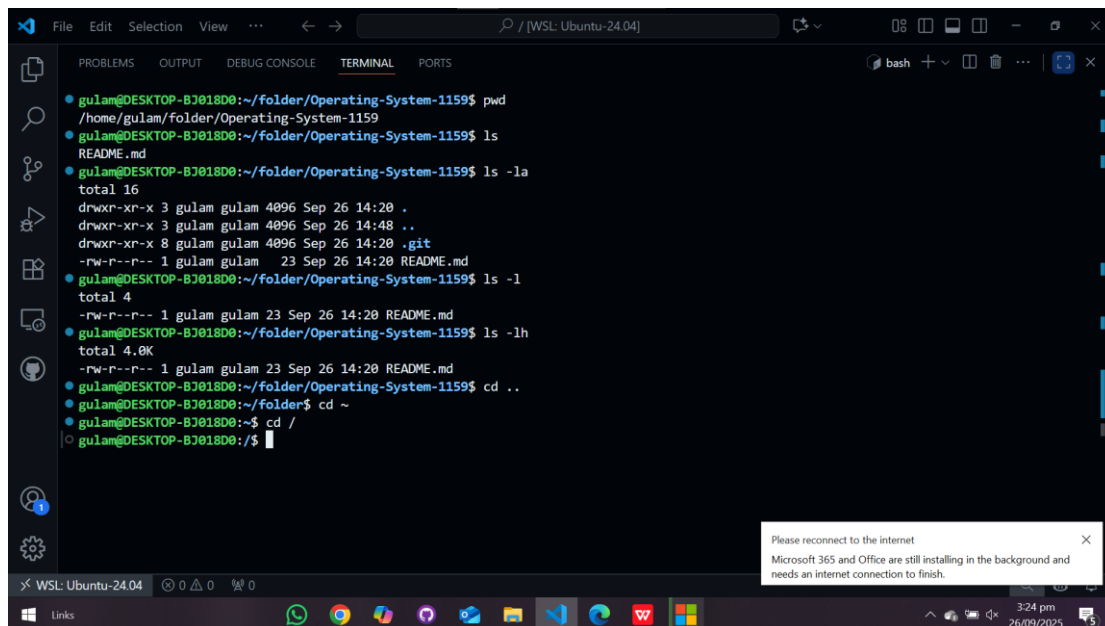
Ls -l

Ls -la

Ls -lh

Cd ..

Cd ~



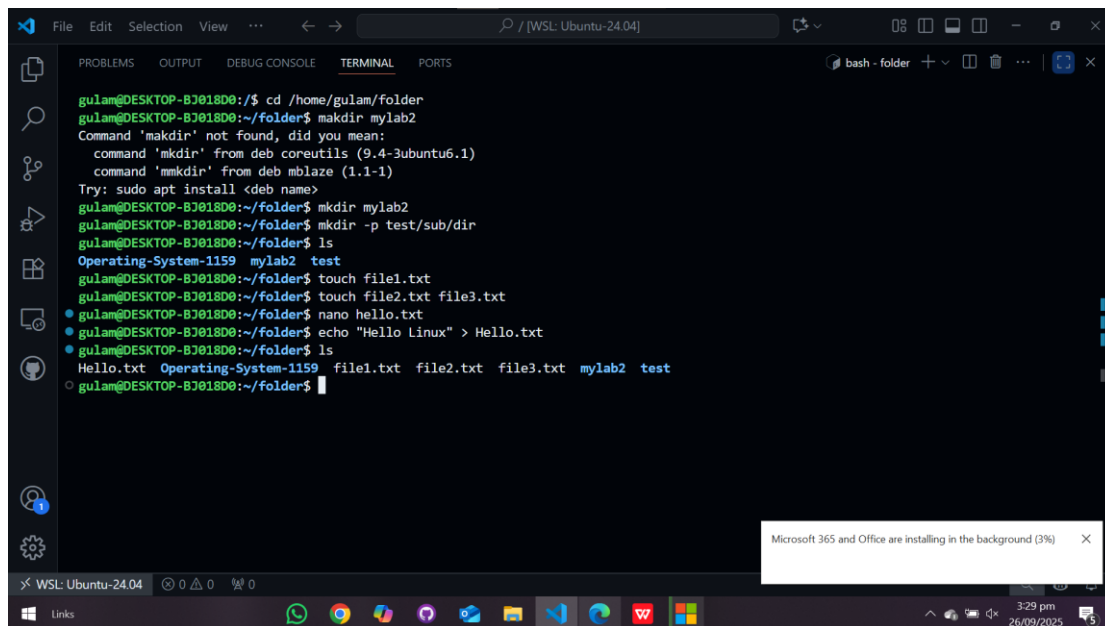
```
gulam@DESKTOP-B7018D0:~/folder/Operating-System-1159$ pwd
/home/gulam/folder/Operating-System-1159
gulam@DESKTOP-B7018D0:~/folder/Operating-System-1159$ ls
README.md
gulam@DESKTOP-B7018D0:~/folder/Operating-System-1159$ ls -la
total 16
drwxr-xr-x 3 gulam gulam 4096 Sep 26 14:20 .
drwxr-xr-x 3 gulam gulam 4096 Sep 26 14:48 ..
drwxr-xr-x 8 gulam gulam 4096 Sep 26 14:20 .git
-rw-r--r-- 1 gulam gulam 23 Sep 26 14:20 README.md
gulam@DESKTOP-B7018D0:~/folder/Operating-System-1159$ ls -l
total 4
-rw-r--r-- 1 gulam gulam 23 Sep 26 14:20 README.md
gulam@DESKTOP-B7018D0:~/folder/Operating-System-1159$ ls -lh
total 4.0K
-rw-r--r-- 1 gulam gulam 23 Sep 26 14:20 README.md
gulam@DESKTOP-B7018D0:~/folder/Operating-System-1159$ cd ..
gulam@DESKTOP-B7018D0:~/folder$ cd ~
gulam@DESKTOP-B7018D0:~$ cd /
gulam@DESKTOP-B7018D0:/$
```

Please reconnect to the internet
Microsoft 365 and Office are still installing in the background and needs an internet connection to finish.

Part 3: File and Directory Options

3.1 Creating and Managing File Directories

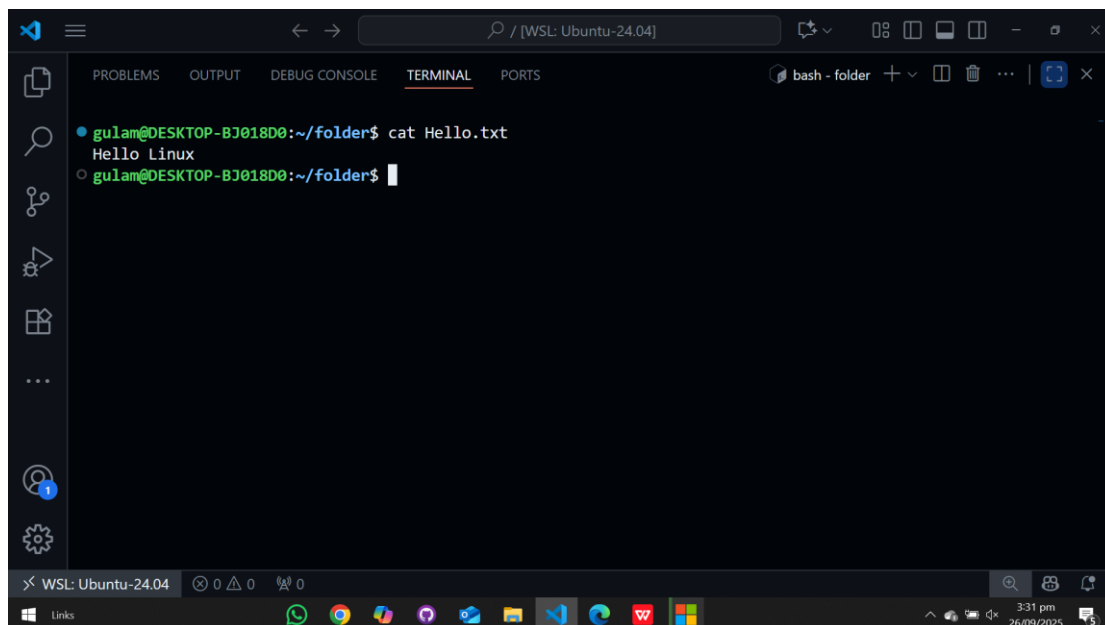
Commands to Demonstrate:



```
gulam@DESKTOP-BJ018D0:/$ cd /home/gulam/folder
gulam@DESKTOP-BJ018D0:~/folder$ mkdir mylab2
Command 'mkdir' not found, did you mean:
  command 'mkmdir' from deb coreutils (9.4-3ubuntu6.1)
  command 'mmkdir' from deb mblaze (1.1-1)
Try: sudo apt install <deb name>
gulam@DESKTOP-BJ018D0:~/folder$ mkdir mylab2
gulam@DESKTOP-BJ018D0:~/folder$ mkdir -p test/sub/dir
gulam@DESKTOP-BJ018D0:~/folder$ ls
Operating-System-1159  mylab2  test
gulam@DESKTOP-BJ018D0:~/folder$ touch file1.txt
gulam@DESKTOP-BJ018D0:~/folder$ touch file2.txt file3.txt
gulam@DESKTOP-BJ018D0:~/folder$ nano hello.txt
gulam@DESKTOP-BJ018D0:~/folder$ echo "Hello Linux" > Hello.txt
gulam@DESKTOP-BJ018D0:~/folder$ ls
Hello.txt  Operating-System-1159  file1.txt  file2.txt  file3.txt  mylab2  test
gulam@DESKTOP-BJ018D0:~/folder$
```

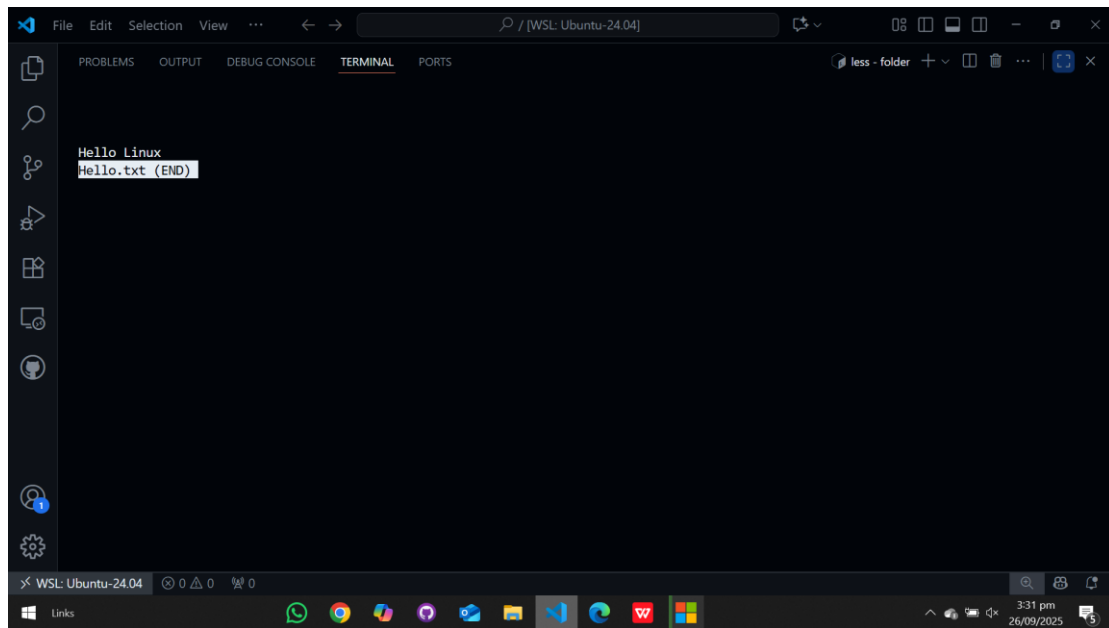
File Viewing Commands:

Cat Hello.txt

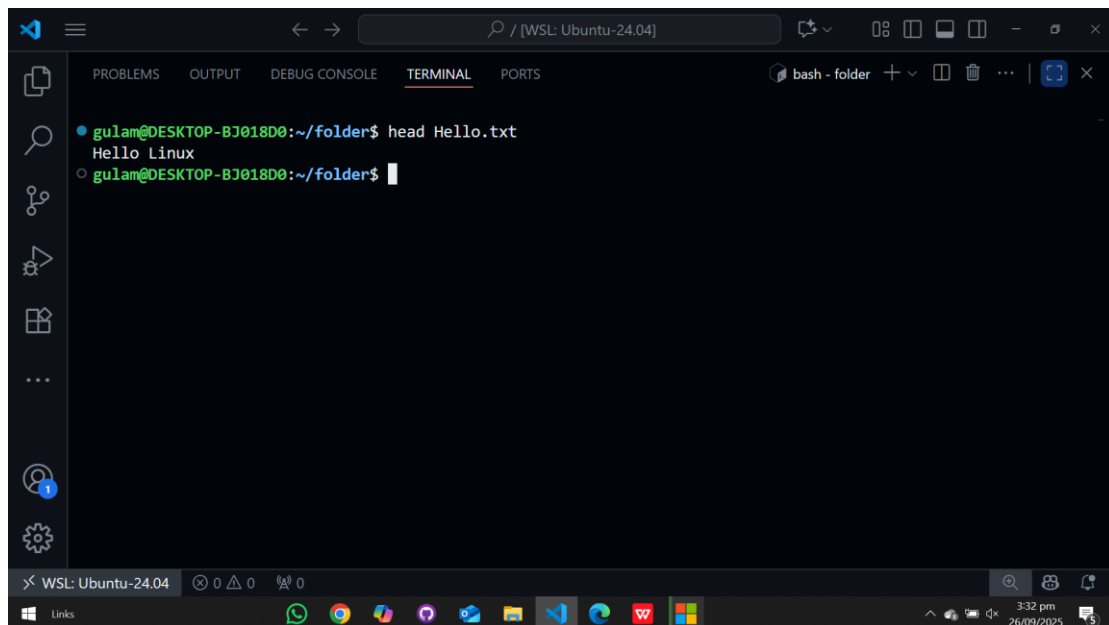


```
gulam@DESKTOP-BJ018D0:~/folder$ cat Hello.txt
Hello Linux
gulam@DESKTOP-BJ018D0:~/folder$
```

Less Hello.txt

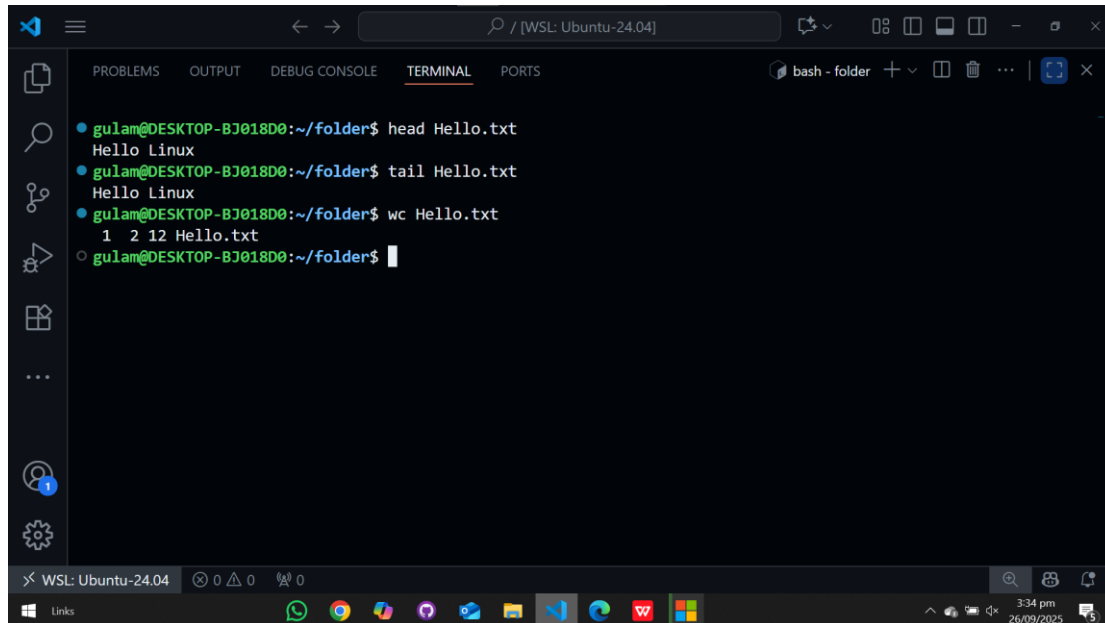


Head Hello.txt



Tail Hello.txt

Wc Hello.txt



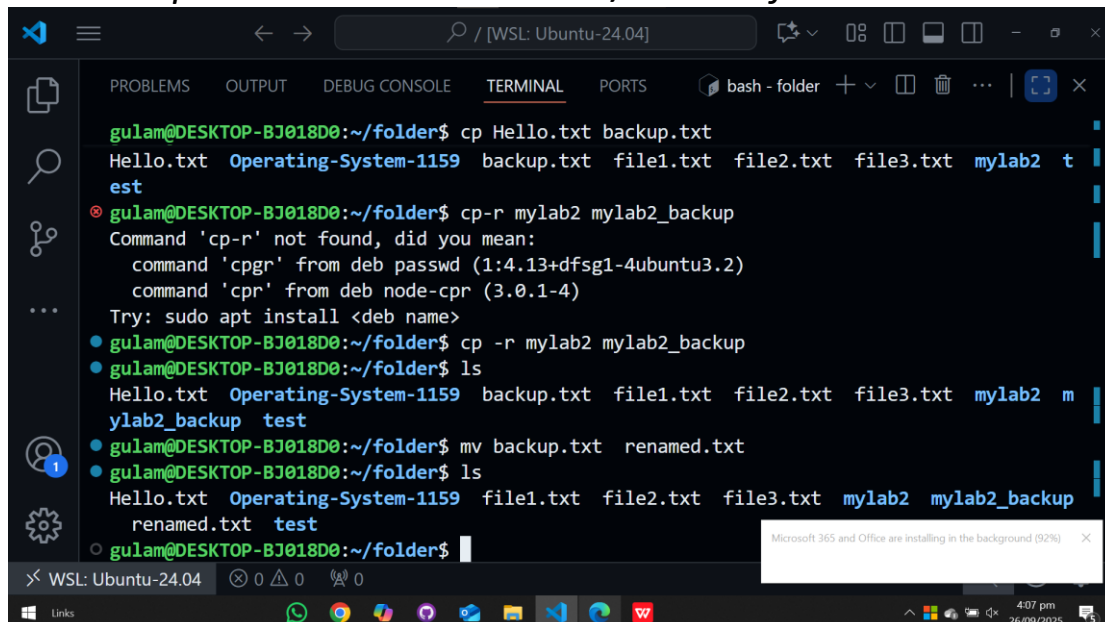
```
gulam@DESKTOP-BJ018D0:~/folder$ head Hello.txt
Hello Linux
gulam@DESKTOP-BJ018D0:~/folder$ tail Hello.txt
Hello Linux
gulam@DESKTOP-BJ018D0:~/folder$ wc Hello.txt
 1  2 12 Hello.txt
gulam@DESKTOP-BJ018D0:~/folder$
```

3.2 Copying Moving & Deleting

cp hello.txt backup.txt # Copy file

cp-r mylab2 mylab2_backup # Copy directory recursively

mv backup.txt renamed.txt # Move/rename file

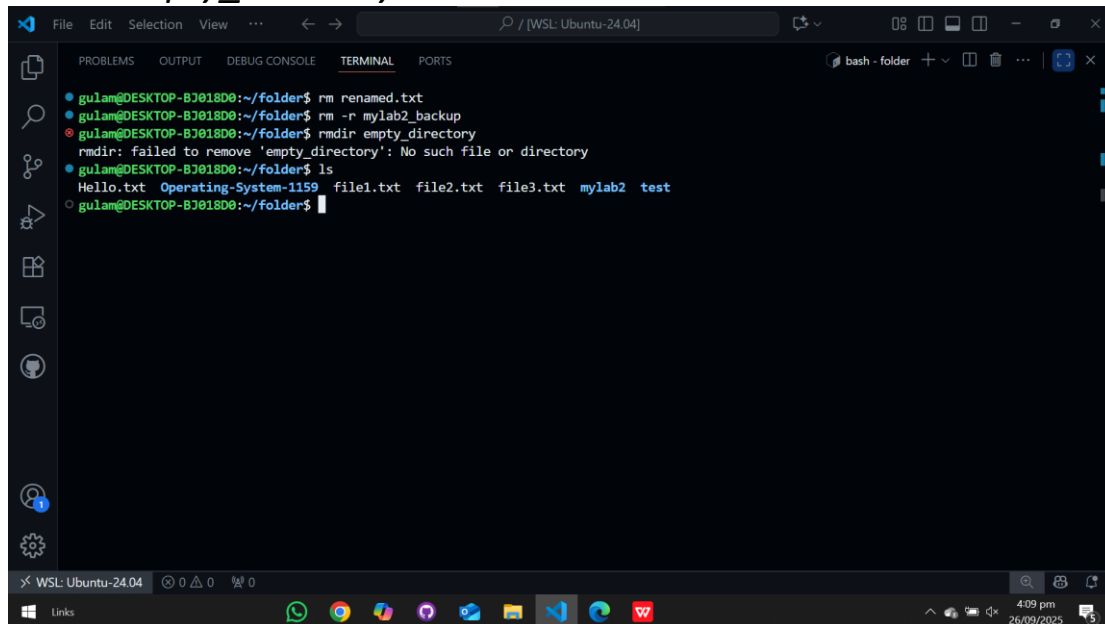


```
gulam@DESKTOP-BJ018D0:~/folder$ cp Hello.txt backup.txt
Hello.txt Operating-System-1159 backup.txt file1.txt file2.txt file3.txt mylab2 test
gulam@DESKTOP-BJ018D0:~/folder$ cp-r mylab2 mylab2_backup
Command 'cp-r' not found, did you mean:
  command 'cpgr' from deb passwd (1:4.13+dfsg1-4ubuntu3.2)
  command 'cpr' from deb node-cpr (3.0.1-4)
Try: sudo apt install <deb name>
gulam@DESKTOP-BJ018D0:~/folder$ cp -r mylab2 mylab2_backup
gulam@DESKTOP-BJ018D0:~/folder$ ls
Hello.txt Operating-System-1159 backup.txt file1.txt file2.txt file3.txt mylab2 mylab2_backup test
gulam@DESKTOP-BJ018D0:~/folder$ mv backup.txt renamed.txt
gulam@DESKTOP-BJ018D0:~/folder$ ls
Hello.txt Operating-System-1159 file1.txt file2.txt file3.txt mylab2 mylab2_backup renamed.txt test
gulam@DESKTOP-BJ018D0:~/folder$
```

rm renamed.txt

rm-r mylab2_backup # Remove directory

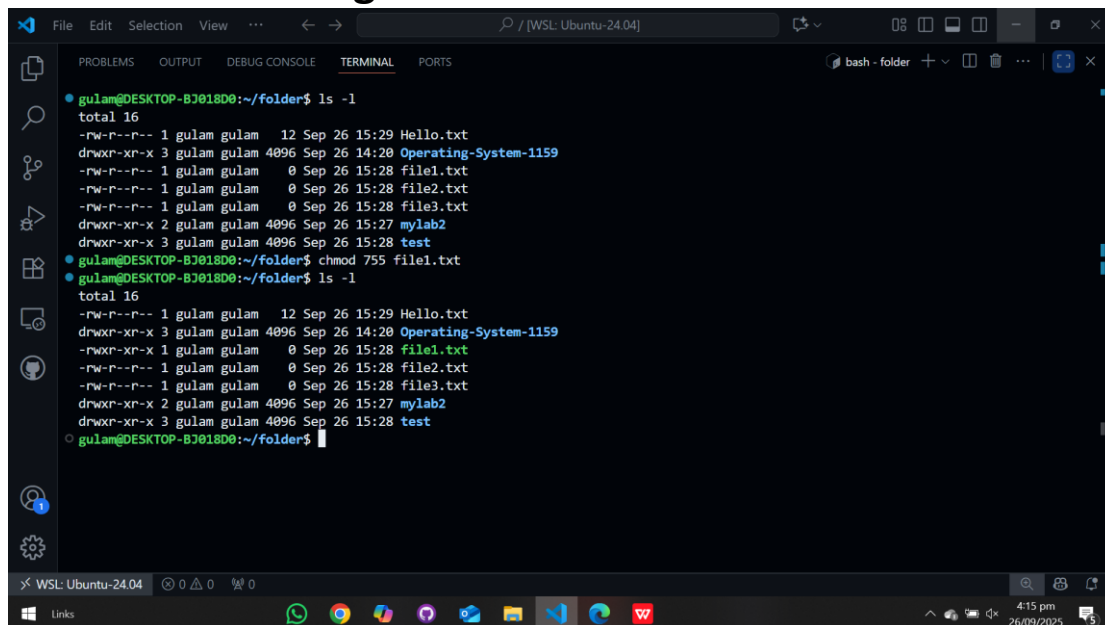
rmdir empty_directory



```
File Edit Selection View ... [WSL: Ubuntu-24.04] bash - folder + - x
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
gulam@DESKTOP-B3018D0:~/folder$ rm renamed.txt
gulam@DESKTOP-B3018D0:~/folder$ rm -r mylab2_backup
gulam@DESKTOP-B3018D0:~/folder$ rmdir empty_directory
rmdir: failed to remove 'empty_directory': No such file or directory
gulam@DESKTOP-B3018D0:~/folder$ ls
Hello.txt Operating-System-1159 file1.txt file2.txt file3.txt mylab2 test
gulam@DESKTOP-B3018D0:~/folder$
```

Part 4: File Permission and Ownership:

4.1 Understanding File Permission



```
File Edit Selection View ... [WSL: Ubuntu-24.04] bash - folder + - x
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
gulam@DESKTOP-B3018D0:~/folder$ ls -l
total 16
-rw-r--r-- 1 gulam gulam 12 Sep 26 15:29 Hello.txt
drwxr-xr-x 3 gulam gulam 4096 Sep 26 14:20 Operating-System-1159
-rw-r--r-- 1 gulam gulam 0 Sep 26 15:28 file1.txt
-rw-r--r-- 1 gulam gulam 0 Sep 26 15:28 file2.txt
-rw-r--r-- 1 gulam gulam 0 Sep 26 15:28 file3.txt
drwxr-xr-x 2 gulam gulam 4096 Sep 26 15:27 mylab2
drwxr-xr-x 3 gulam gulam 4096 Sep 26 15:28 test
gulam@DESKTOP-B3018D0:~/folder$ chmod 755 file1.txt
gulam@DESKTOP-B3018D0:~/folder$ ls -l
total 16
-rw-r--r-- 1 gulam gulam 12 Sep 26 15:29 Hello.txt
drwxr-xr-x 3 gulam gulam 4096 Sep 26 14:20 Operating-System-1159
-rwxr-xr-x 1 gulam gulam 0 Sep 26 15:28 file1.txt
-rw-r--r-- 1 gulam gulam 0 Sep 26 15:28 file2.txt
-rw-r--r-- 1 gulam gulam 0 Sep 26 15:28 file3.txt
drwxr-xr-x 2 gulam gulam 4096 Sep 26 15:27 mylab2
drwxr-xr-x 3 gulam gulam 4096 Sep 26 15:28 test
gulam@DESKTOP-B3018D0:~/folder$
```