



National Textile University

Department of Computer Science

Subject: Operating System

Submitted to:

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Submitted by:

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Reg number:

23-NTU-CS-1141

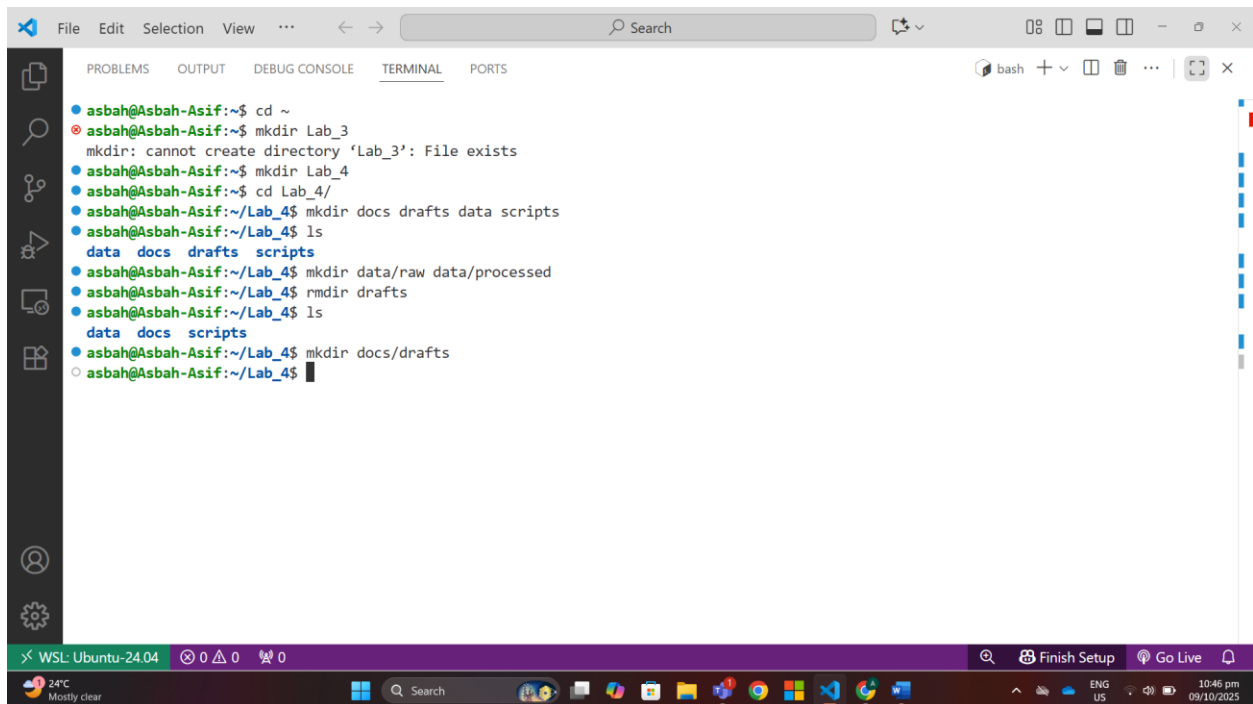
Lab no: 3 Hometask

Lab 03

Part 1: File and Directory Operations

1. Create the following directory structure in your home directory:

Lab_3/ |—— docs/ | |—— drafts/ |—— data/ | |—— raw/ | |—— processed/ |—— scripts/



```
asbah@Asbah-Asif:~$ cd ~
asbah@Asbah-Asif:~$ mkdir Lab_3
mkdir: cannot create directory 'Lab_3': File exists
asbah@Asbah-Asif:~$ mkdir Lab_4
asbah@Asbah-Asif:~$ cd Lab_4/
asbah@Asbah-Asif:~/Lab_4$ mkdir docs drafts data scripts
asbah@Asbah-Asif:~/Lab_4$ ls
data docs drafts scripts
asbah@Asbah-Asif:~/Lab_4$ mkdir data/raw data/processed
asbah@Asbah-Asif:~/Lab_4$ rmdir drafts
asbah@Asbah-Asif:~/Lab_4$ ls
data docs scripts
asbah@Asbah-Asif:~/Lab_4$ mkdir docs/drafts
asbah@Asbah-Asif:~/Lab_4$
```

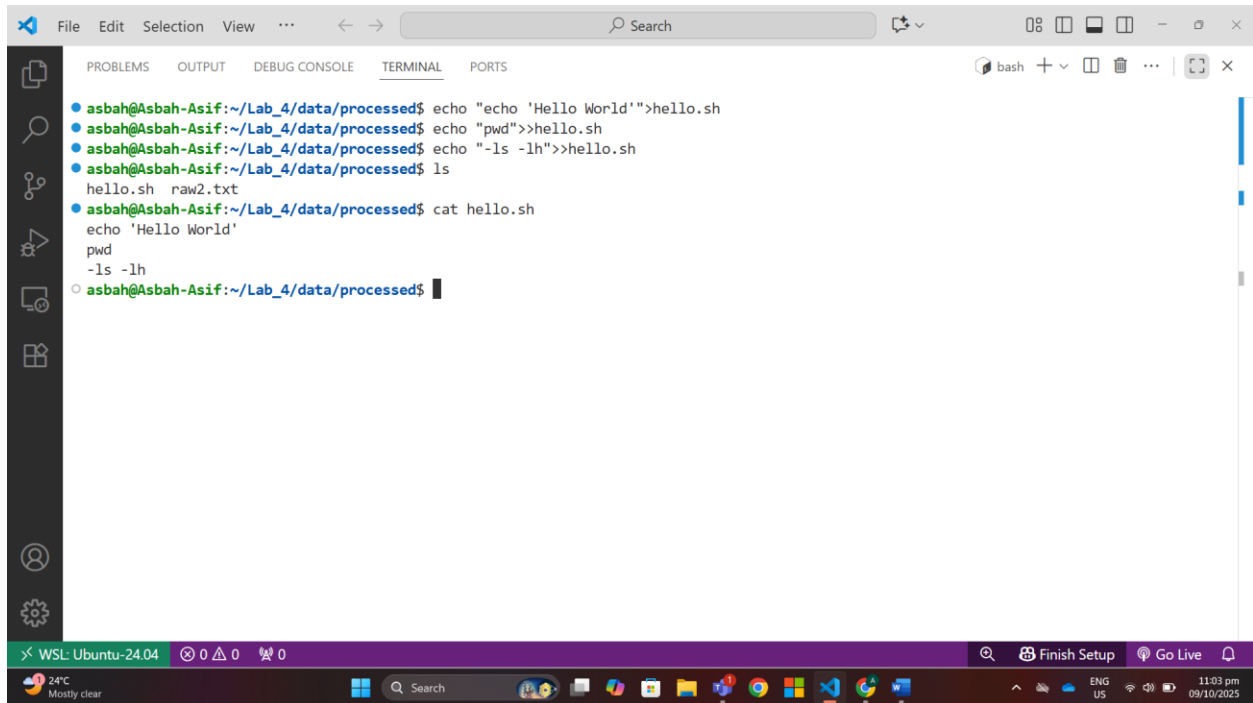
2. Inside docs/: - Create three files: intro.txt, notes.txt, summary.txt. - Add at least two lines of text into each using echo >>. - Copy summary.txt into the drafts/ folder using cp.

```
File Edit Selection View ... Search
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
asbah@Asbah-Asif:~/Lab_4$ mkdir docs/drafts
asbah@Asbah-Asif:~/Lab_4$ cd docs/
asbah@Asbah-Asif:~/Lab_4/docs$ echo "This is intro file." >>intro.txt
asbah@Asbah-Asif:~/Lab_4/docs$ ls
drafts  intro.txt
asbah@Asbah-Asif:~/Lab_4/docs$ echo "this is Notes File." >>notes.txt
asbah@Asbah-Asif:~/Lab_4/docs$ echo "This is Summary File." >>summary.txt
asbah@Asbah-Asif:~/Lab_4/docs$ cp summary.txt ../drafts/
cp: cannot create regular file '../drafts/': Not a directory
asbah@Asbah-Asif:~/Lab_4/docs$ ls -l
total 16
drwxr-xr-x 2 asbah asbah 4096 Oct  9 22:40 drafts
-rw-r--r-- 1 asbah asbah  20 Oct  9 22:49 intro.txt
-rw-r--r-- 1 asbah asbah  20 Oct  9 22:50 notes.txt
-rw-r--r-- 1 asbah asbah  22 Oct  9 22:51 summary.txt
asbah@Asbah-Asif:~/Lab_4/docs$ cp summary.txt drafts/
asbah@Asbah-Asif:~/Lab_4/docs$ cd drafts/
asbah@Asbah-Asif:~/Lab_4/docs/drafts$ ls summary.txt
summary.txt
asbah@Asbah-Asif:~/Lab_4/docs/drafts$ cd ..
asbah@Asbah-Asif:~/Lab_4/docs$ ls
drafts  intro.txt  notes.txt  summary.txt
asbah@Asbah-Asif:~/Lab_4/docs$
asbah@Asbah-Asif:~/Lab_4/docs$
asbah@Asbah-Asif:~/Lab_4/docs$
asbah@Asbah-Asif:~/Lab_4/docs$
asbah@Asbah-Asif:~/Lab_4/docs$
asbah@Asbah-Asif:~/Lab_4/docs$
WSL: Ubuntu-24.04 0 0 0
24°C Mostly clear
Search
Finish Setup Go Live
10:54 pm 09/10/2025
```

3. Inside data/raw/: - Create two files: raw1.txt, raw2.txt. - Append the current date into raw1.txt using the date command. - Move raw2.txt into processed/ using mv source destination.

```
File Edit Selection View ... Search
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
asbah@Asbah-Asif:~/Lab_4/docs$ cd ..
asbah@Asbah-Asif:~/Lab_4$ cd data/
asbah@Asbah-Asif:~/Lab_4/data$ ls
processed  raw
asbah@Asbah-Asif:~/Lab_4/data$ cd raw/
asbah@Asbah-Asif:~/Lab_4/data/raw$ touch raw1.txt raw2.txt
asbah@Asbah-Asif:~/Lab_4/data/raw$ echo $(date) >>raw1.txt
asbah@Asbah-Asif:~/Lab_4/data/raw$ mv raw2.txt ../data/processed
mv: cannot move 'raw2.txt' to '../data/processed': No such file or directory
asbah@Asbah-Asif:~/Lab_4/data/raw$ mv raw2.txt /processed/
mv: cannot move 'raw2.txt' to '/processed/': Not a directory
asbah@Asbah-Asif:~/Lab_4/data/raw$ mv raw2.txt processed/
mv: cannot move 'raw2.txt' to 'processed/': Not a directory
asbah@Asbah-Asif:~/Lab_4/data/raw$ mv raw2.txt /data/processed/
mv: cannot move 'raw2.txt' to '/data/processed/': No such file or directory
asbah@Asbah-Asif:~/Lab_4/data/raw$ mv raw2.txt ../processed/
asbah@Asbah-Asif:~/Lab_4/data/raw$ ls
raw1.txt
asbah@Asbah-Asif:~/Lab_4/data/raw$ cd ..
asbah@Asbah-Asif:~/Lab_4/data$ ls
processed  raw
asbah@Asbah-Asif:~/Lab_4/data$ cd processed/
asbah@Asbah-Asif:~/Lab_4/data/processed$ ls
raw2.txt
asbah@Asbah-Asif:~/Lab_4/data/processed$
WSL: Ubuntu-24.04 0 0 0
Humid Now
Search
Finish Setup Go Live
11:00 pm 09/10/2025
```

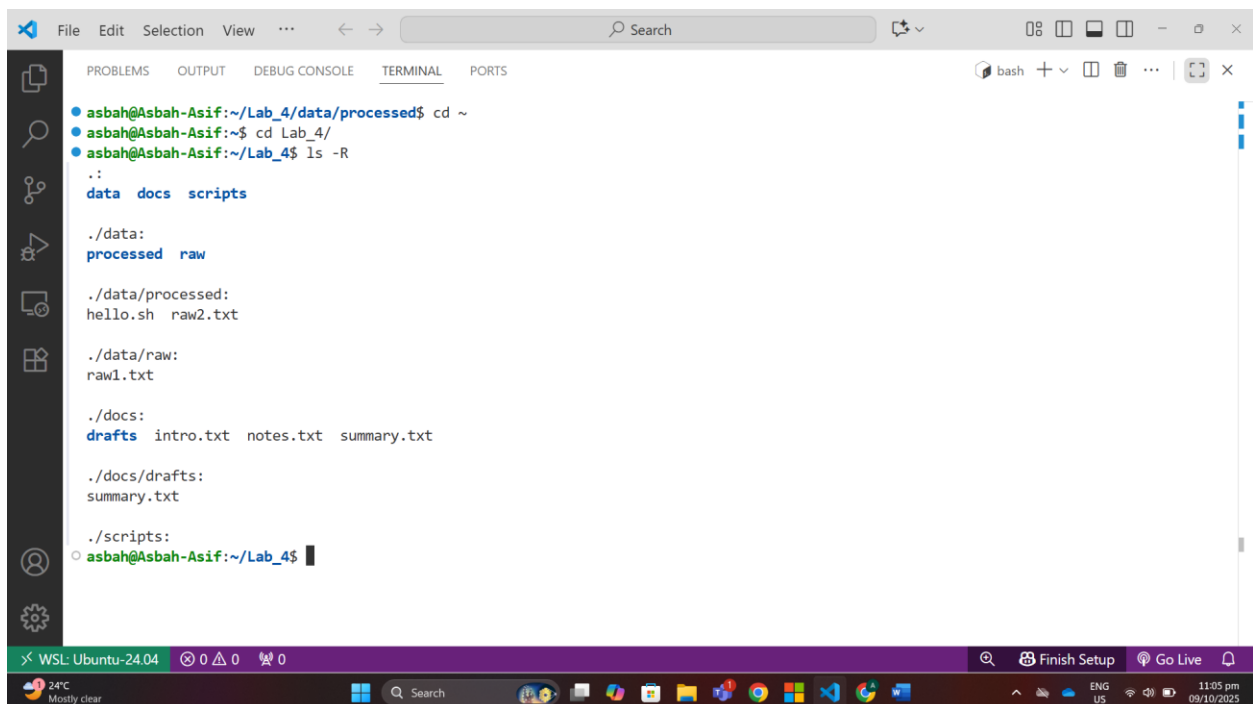
4. Inside scripts/: - Create a script named hello.sh with the following content: bash echo "Hello World" pwd ls -lh - Later, you will make it executable (in Part 3).



```
File Edit Selection View ... Search
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
asbah@Asbah-Asif:~/Lab_4/data/processed$ echo "echo 'Hello World'">hello.sh
asbah@Asbah-Asif:~/Lab_4/data/processed$ echo "pwd">>hello.sh
asbah@Asbah-Asif:~/Lab_4/data/processed$ echo "-ls -lh">>hello.sh
asbah@Asbah-Asif:~/Lab_4/data/processed$ ls
hello.sh  raw2.txt
asbah@Asbah-Asif:~/Lab_4/data/processed$ cat hello.sh
echo 'Hello World'
pwd
-ls -lh
asbah@Asbah-Asif:~/Lab_4/data/processed$
```

WSL: Ubuntu-24.04 24°C Mostly clear 11:03 pm 09/10/2025

5. Display the directory structure recursively:



```
File Edit Selection View ... Search
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
asbah@Asbah-Asif:~/Lab_4/data/processed$ cd ~
asbah@Asbah-Asif:~$ cd Lab_4/
asbah@Asbah-Asif:~/Lab_4$ ls -R
.:
data docs scripts

./data:
processed raw

./data/processed:
hello.sh raw2.txt

./data/raw:
raw1.txt

./docs:
drafts intro.txt notes.txt summary.txt

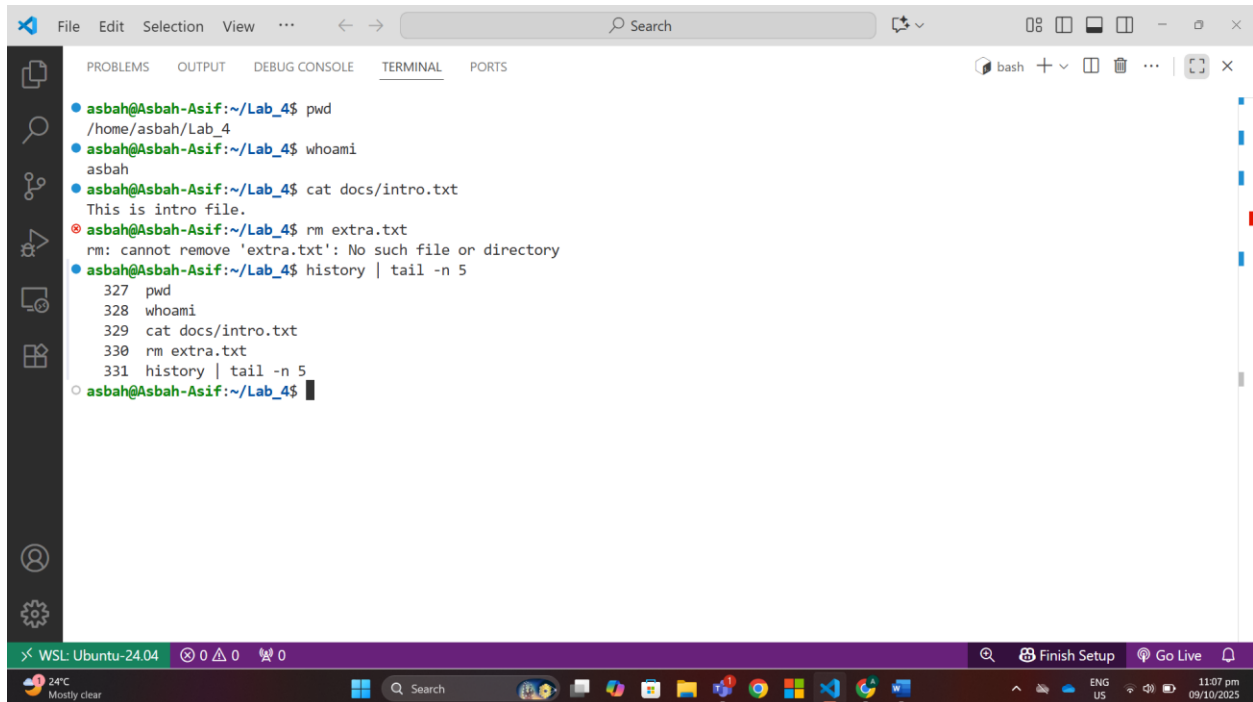
./docs/drafts:
summary.txt

./scripts:
asbah@Asbah-Asif:~/Lab_4$
```

WSL: Ubuntu-24.04 24°C Mostly clear 11:05 pm 09/10/2025

Part 2: Practice with Basic Linux Commands Run the following commands inside Lab_3/ and note their outputs: `pwd` # Show current working directory `whoami` #

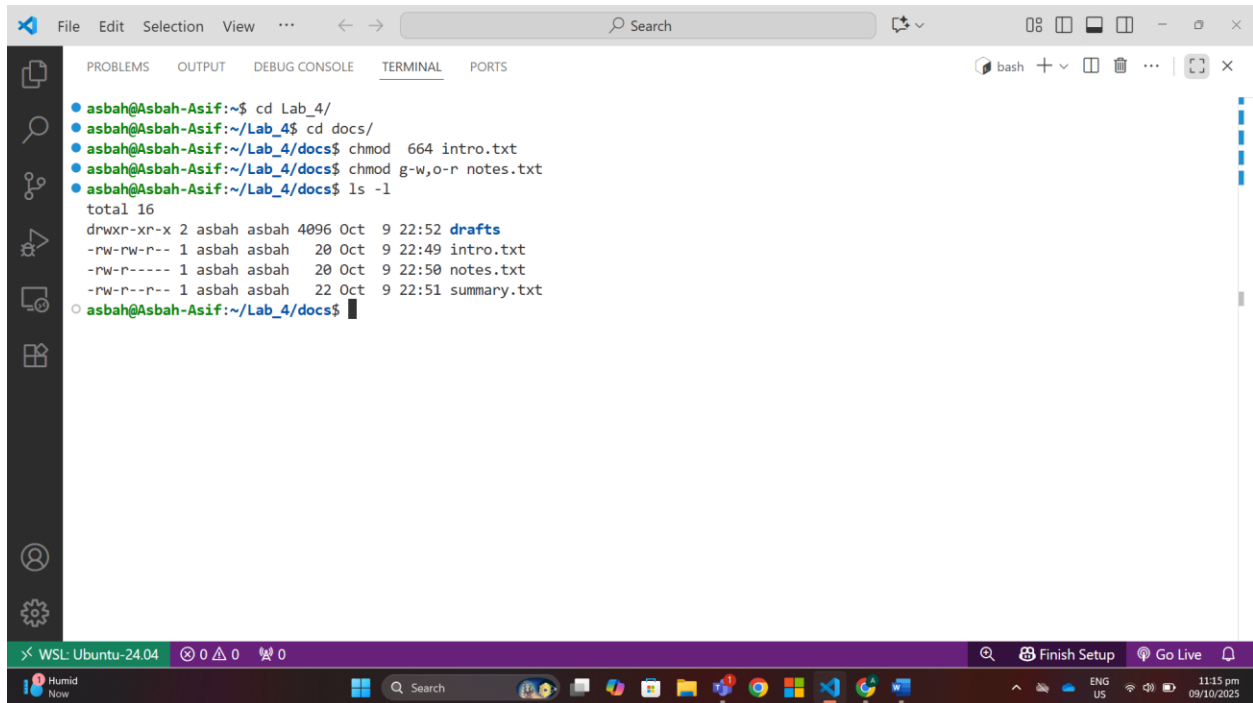
Display the current logged-in user touch extra.txt # Create an empty file cat docs/intro.txt # Display file contents rm extra.txt # Delete a file history | tail -n 5 # Show your last 5 executed commands clear # Clear the terminal



```
asbah@Asbah-Asif:~/Lab_4$ pwd
/home/asbah/Lab_4
asbah@Asbah-Asif:~/Lab_4$ whoami
asbah
asbah@Asbah-Asif:~/Lab_4$ cat docs/intro.txt
This is intro file.
asbah@Asbah-Asif:~/Lab_4$ rm extra.txt
rm: cannot remove 'extra.txt': No such file or directory
asbah@Asbah-Asif:~/Lab_4$ history | tail -n 5
327  pwd
328  whoami
329  cat docs/intro.txt
330  rm extra.txt
331  history | tail -n 5
asbah@Asbah-Asif:~/Lab_4$
```

Part 3: File Permissions and Ownership 1. Change permissions of hello.sh: - Owner → Read, Write & Execute - Group → Read, Write & Execute - Others → No permissions

2. Change permissions of intro.txt using numeric notation: - Owner → Read & Write - Group → Read & Write - Others → Read only 3. Change permissions of notes.txt using symbolic notation: - Remove write permission from group and read from others. 4. Verify all changes:

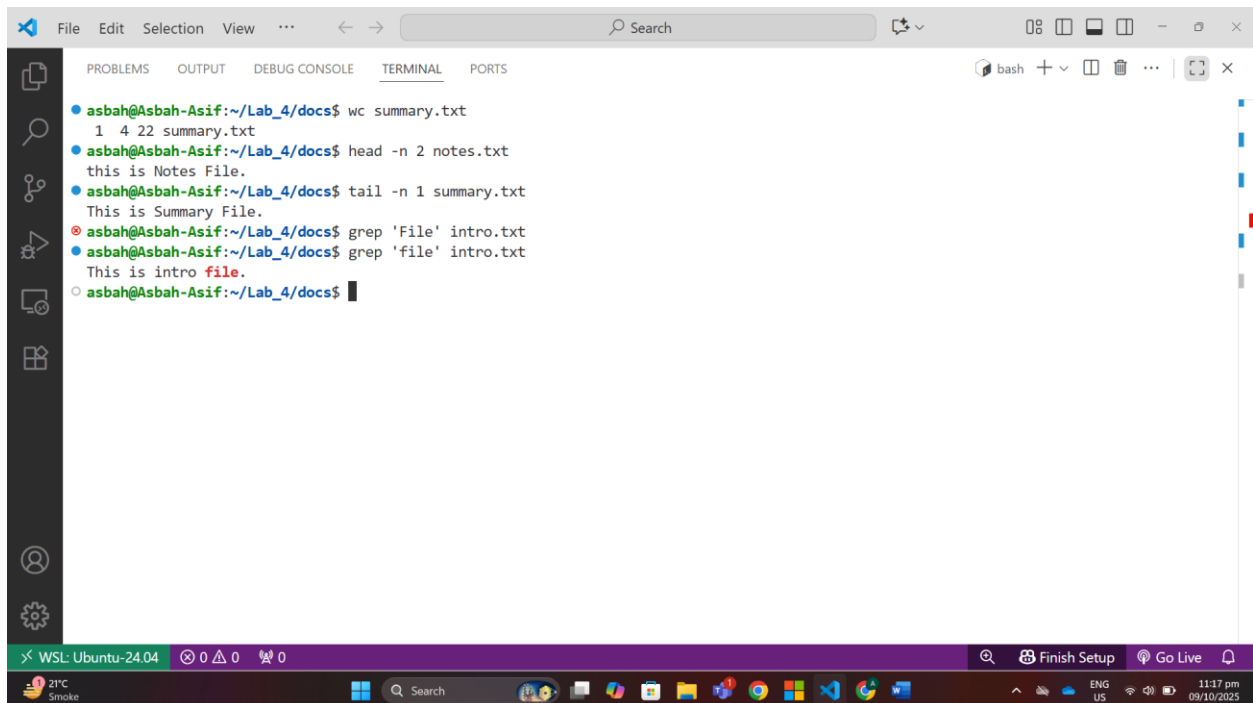


A screenshot of a Visual Studio Code (VS Code) terminal window. The terminal is running a bash shell in a WSL (Windows Subsystem for Linux) environment, specifically Ubuntu-24.04. The user is navigating through directories and performing file operations. The commands and their outputs are as follows:

```
asbah@Asbah-Asif:~$ cd Lab_4/
asbah@Asbah-Asif:~/Lab_4$ cd docs/
asbah@Asbah-Asif:~/Lab_4/docs$ chmod 664 intro.txt
asbah@Asbah-Asif:~/Lab_4/docs$ chmod g-w,o-r notes.txt
asbah@Asbah-Asif:~/Lab_4/docs$ ls -l
total 16
drwxr-xr-x 2 asbah asbah 4096 Oct 9 22:52 drafts
-rw-rw-r-- 1 asbah asbah 20 Oct 9 22:49 intro.txt
-rw-r----- 1 asbah asbah 20 Oct 9 22:50 notes.txt
-rw-rw-r-- 1 asbah asbah 22 Oct 9 22:51 summary.txt
asbah@Asbah-Asif:~/Lab_4/docs$
```

The terminal window is part of a larger application window with a menu bar (File, Edit, Selection, View, ...), a search bar, and tabs for PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL, and PORTS. The status bar at the bottom shows the WSL environment, system status (0 errors, 0 warnings, 0 info), and system time (11:15 pm, 09/10/2025).

Part 4: Reading & Searching Files Inside docs/: `wc summary.txt` # Count lines, words, and characters `head -n 2 notes.txt` # Show first 2 lines `tail -n 1 summary.txt` # Show last line `grep 'keyword' intro.txt` # Search for a keyword



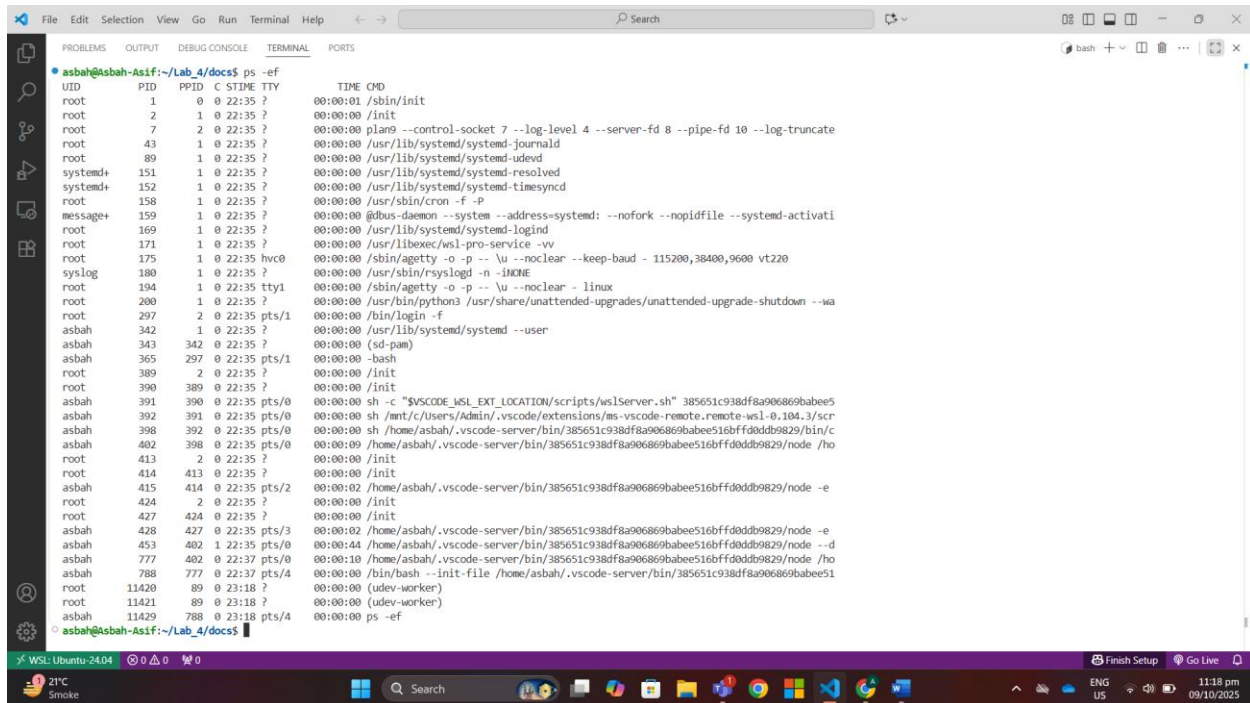
A screenshot of a Visual Studio Code (VS Code) terminal window, continuing from the previous one. The user is performing file operations and searches in the `docs/` directory. The commands and their outputs are as follows:

```
asbah@Asbah-Asif:~/Lab_4/docs$ wc summary.txt
 1  4 22 summary.txt
asbah@Asbah-Asif:~/Lab_4/docs$ head -n 2 notes.txt
this is Notes File.
asbah@Asbah-Asif:~/Lab_4/docs$ tail -n 1 summary.txt
This is Summary File.
asbah@Asbah-Asif:~/Lab_4/docs$ grep 'File' intro.txt
This is intro file.
asbah@Asbah-Asif:~/Lab_4/docs$ grep 'file' intro.txt
This is intro file.
asbah@Asbah-Asif:~/Lab_4/docs$
```

The terminal window shows the same interface as the previous screenshot, with the terminal tab selected. The status bar at the bottom shows the WSL environment, system status, and system time (11:17 pm, 09/10/2025).

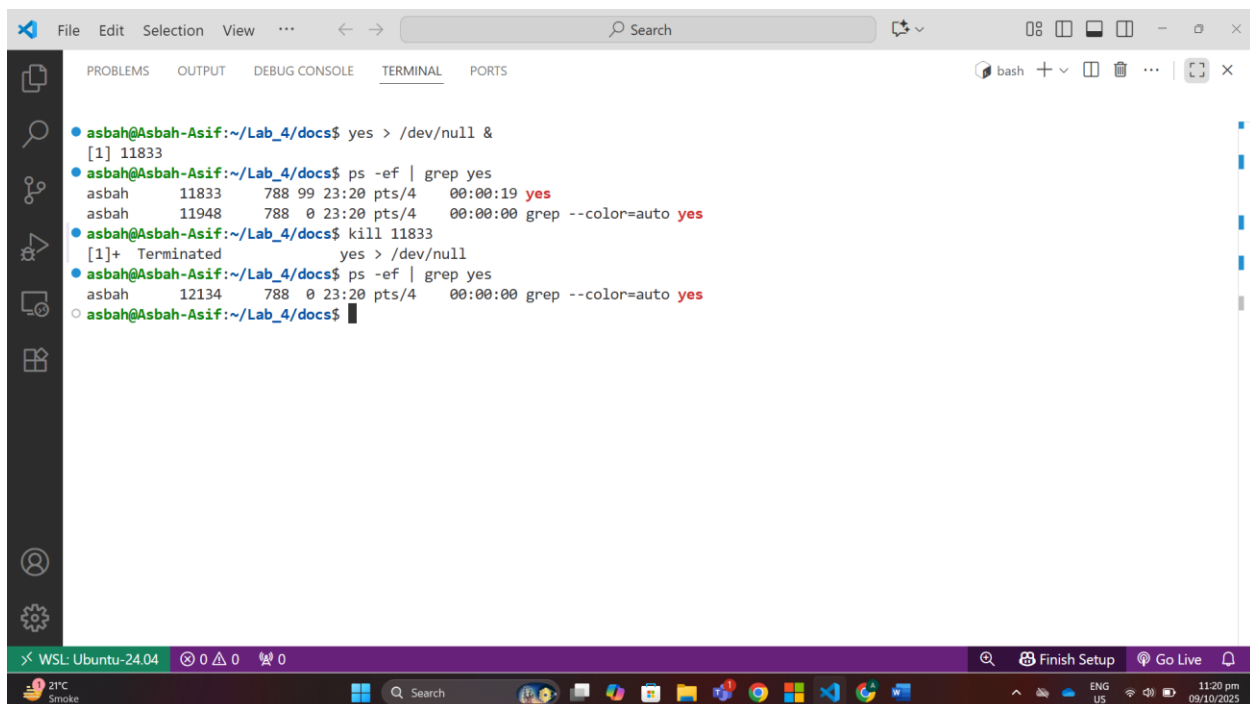
Part 5: Linux Process Commands

1. Exploring Processes



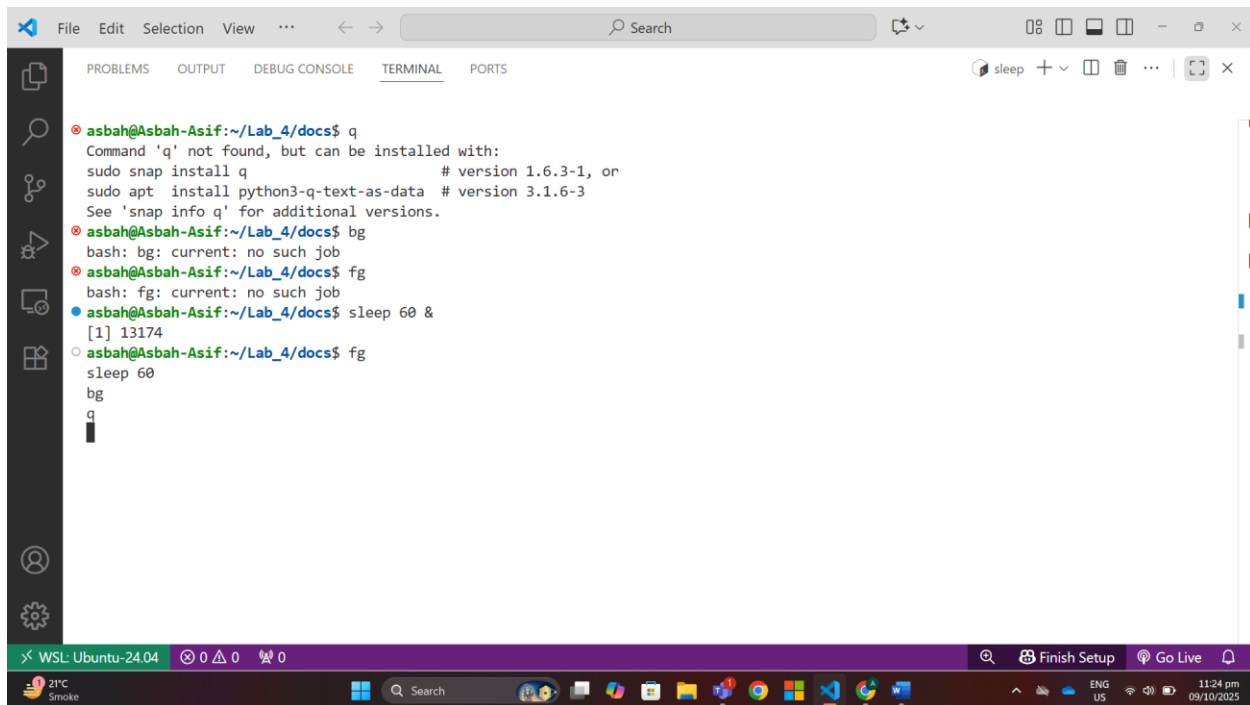
```
asbah@Asbah-Asif:~/Lab_4/docs$ ps -ef
UID          PID    PPID  C STIME TTY          TIME CMD
root           1        0  0 22:35 ?        00:00:01 /sbin/init
root           2        1  0 22:35 ?        00:00:00 /init
root           7        2  0 22:35 ?        00:00:00 plan@ --control-socket 7 --log-level 4 --server-fd 8 --pipe-fd 10 --log-truncate
root          43        1  0 22:35 ?        00:00:00 /usr/lib/systemd/systemd-journald
root          89        1  0 22:35 ?        00:00:00 /usr/lib/systemd/systemd-udev
systemd+     151        1  0 22:35 ?        00:00:00 /usr/lib/systemd/systemd-resolved
systemd+     152        1  0 22:35 ?        00:00:00 /usr/lib/systemd/systemd-timesyncd
root         158        1  0 22:35 ?        00:00:00 /usr/sbin/cron -f -P
message+     159        1  0 22:35 ?        00:00:00 @dbus-daemon --system --address=systemd: --nofork --nopidfile --systemd-activati
root         169        1  0 22:35 ?        00:00:00 /usr/lib/systemd/systemd-logind
root         171        1  0 22:35 ?        00:00:00 /usr/libexec/WSL-pro-service -vv
root         175        1  0 22:35 hv?    00:00:00 /sbin/agetty -o -p -- /u --noclear --keep-baud - 115200,38400,9600 vt220
syslog       180        1  0 22:35 ?        00:00:00 /usr/sbin/rsyslogd -n -iNONE
root         194        1  0 22:35 tty1    00:00:00 /sbin/agetty -o -p -- /u --noclear - linux
root         200        1  0 22:35 ?        00:00:00 /usr/bin/python3 /usr/share/unattended-upgrades/unattended-upgrade-shutdown -wa
root         297        2  0 22:35 pts/1    00:00:00 /bin/login -f
asbah        342        1  0 22:35 ?        00:00:00 /usr/lib/systemd/systemd --user
asbah        343        342  0 22:35 ?        00:00:00 (sd-pam)
asbah        365        2  0 22:35 pts/1    00:00:00 -bash
root         389        2  0 22:35 ?        00:00:00 /init
root         390        389  0 22:35 ?        00:00:00 /init
asbah        391        390  0 22:35 pts/0    00:00:00 sh -c "VS_CODE_WSL_EXT_LOCATION/scripts/wslServer.sh" 385651c938df8a906869babe5
asbah        392        391  0 22:35 pts/0    00:00:00 sh /mnt/c/Users/Admin/.vscode/extensions/ms-vscode-remote.remote-wsl-0.104.3/sr
asbah        398        392  0 22:35 pts/0    00:00:00 sh /home/asbah/.vscode-server/bin/385651c938df8a906869babe516bffd0db9829/bin/c
asbah        402        398  0 22:35 pts/0    00:00:00 /home/asbah/.vscode-server/bin/385651c938df8a906869babe516bffd0db9829/node /ho
root         413        2  0 22:35 ?        00:00:00 /init
root         414        413  0 22:35 ?        00:00:00 /init
asbah        415        414  0 22:35 pts/2    00:00:00 /home/asbah/.vscode-server/bin/385651c938df8a906869babe516bffd0db9829/node -e
root         424        2  0 22:35 ?        00:00:00 /init
root         427        424  0 22:35 ?        00:00:00 /init
asbah        428        427  0 22:35 pts/3    00:00:02 /home/asbah/.vscode-server/bin/385651c938df8a906869babe516bffd0db9829/node -e
asbah        453        402  1 22:35 pts/0    00:00:44 /home/asbah/.vscode-server/bin/385651c938df8a906869babe516bffd0db9829/node -d
asbah        777        402  0 22:37 pts/0    00:00:10 /home/asbah/.vscode-server/bin/385651c938df8a906869babe516bffd0db9829/node /ho
asbah        788        777  0 22:37 pts/4    00:00:00 /bin/bash --init-file /home/asbah/.vscode-server/bin/385651c938df8a906869babe51
root        11420        89  0 23:18 ?        00:00:00 (udev-worker)
root        11421        89  0 23:18 ?        00:00:00 (udev-worker)
asbah        11429        788  0 23:18 pts/4    00:00:00 ps -ef
asbah@Asbah-Asif:~/Lab_4/docs$
```

2. Infinite Process Practice



```
asbah@Asbah-Asif:~/Lab_4/docs$ yes > /dev/null &
[1] 11833
asbah@Asbah-Asif:~/Lab_4/docs$ ps -ef | grep yes
asbah    11833    788  99 23:20 pts/4    00:00:19 yes
asbah    11948    788   0 23:20 pts/4    00:00:00 grep --color=auto yes
asbah@Asbah-Asif:~/Lab_4/docs$ kill 11833
[1]+  Terminated                  yes > /dev/null
asbah@Asbah-Asif:~/Lab_4/docs$ ps -ef | grep yes
asbah    12134    788   0 23:20 pts/4    00:00:00 grep --color=auto yes
asbah@Asbah-Asif:~/Lab_4/docs$
```

3. Foreground & Background Jobs

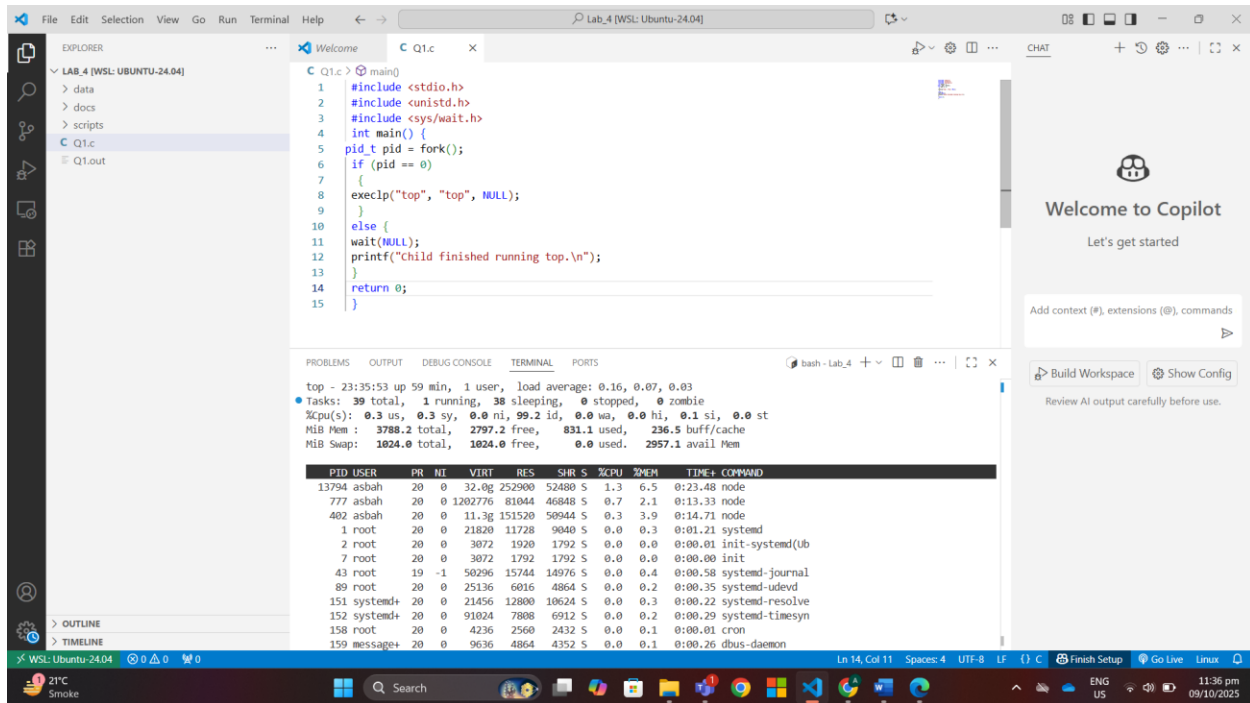


```
asbah@Asbah-Asif:~/Lab_4/docs$ q
Command 'q' not found, but can be installed with:
sudo snap install q # version 1.6.3-1, or
sudo apt install python3-q-text-as-data # version 3.1.6-3
See 'snap info q' for additional versions.
asbah@Asbah-Asif:~/Lab_4/docs$ bg
bash: bg: current: no such job
asbah@Asbah-Asif:~/Lab_4/docs$ fg
bash: fg: current: no such job
asbah@Asbah-Asif:~/Lab_4/docs$ sleep 60 &
[1] 13174
asbah@Asbah-Asif:~/Lab_4/docs$ fg
sleep 60
bg
q
```

Part 6:

C Programs on Processes

Program 1 – Exec with top



Program 2 – Exec with date (to complete)

