

Operating System

UNIVERSITY OF MORATUWA
LAB SESSION 01 – BASIC LINUX COMMADS
BY
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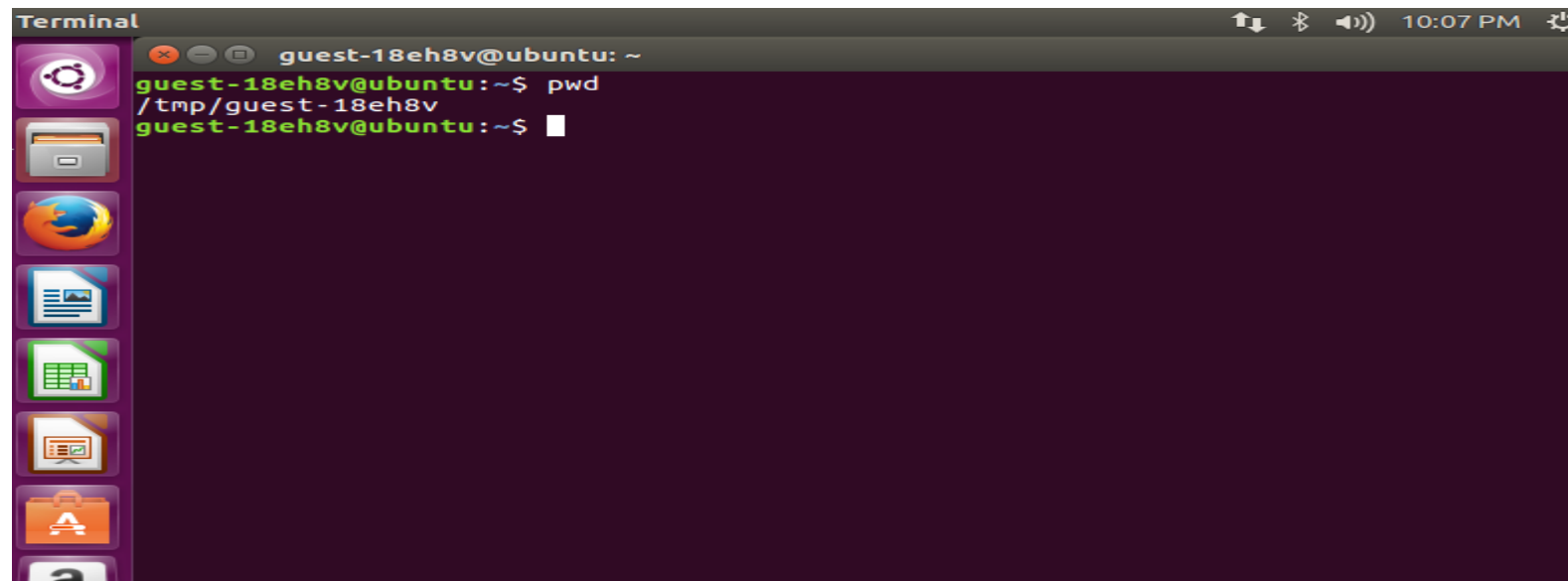
Objectives of lab session

- To study basic unix basic commands
- To learn basic unix shell commands

Basic Linux commands

1. pwd command :

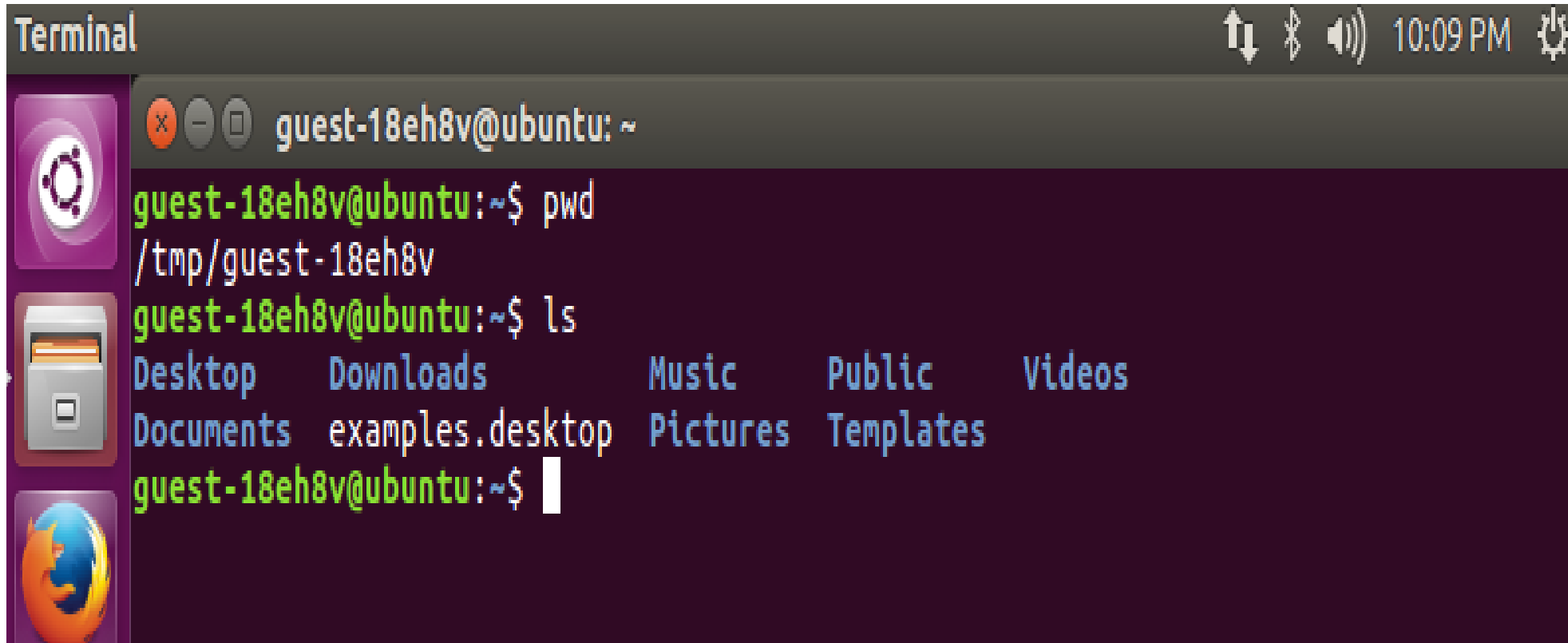
You can see present working directory in your machine. The **pwd** command displays the full pathname of the current directory

A screenshot of a Linux terminal window titled "Terminal". The window has a dark purple background. The prompt is "guest-18eh8v@ubuntu: ~". The user has entered the command "pwd", and the output is "/tmp/guest-18eh8v". The prompt is now "guest-18eh8v@ubuntu: ~\$". On the left side of the terminal window, there is a vertical dock with several application icons: a gear (Settings), a folder (Files), a globe (Web), a document with a magnifying glass (Search), a spreadsheet (LibreOffice Calc), a presentation (LibreOffice Impress), a briefcase (LibreOffice Writer), and a shopping bag (LibreOffice Draw). The top of the terminal window shows system status icons: a network icon, a Bluetooth icon, a volume icon, and the time "10:07 PM".

```
Terminal
guest-18eh8v@ubuntu: ~
guest-18eh8v@ubuntu:~$ pwd
/tmp/guest-18eh8v
guest-18eh8v@ubuntu:~$
```

2. ls command:

Show hidden files with directories of information

A screenshot of a Linux terminal window titled "Terminal". The window has a dark grey title bar with standard window controls (minimize, maximize, close) and system status icons (network, Bluetooth, volume, time 10:09 PM, and settings). The terminal itself has a dark purple background. The prompt is "guest-18eh8v@ubuntu: ~". The user has entered "pwd" and the output is "/tmp/guest-18eh8v". Then, the user has entered "ls" and the output is a list of directories: Desktop, Downloads, Music, Public, Videos, Documents, examples.desktop, Pictures, and Templates. The prompt is now "guest-18eh8v@ubuntu:~\$" with a white cursor.

```
Terminal 10:09 PM
guest-18eh8v@ubuntu: ~
guest-18eh8v@ubuntu:~$ pwd
/tmp/guest-18eh8v
guest-18eh8v@ubuntu:~$ ls
Desktop  Downloads  Music      Public     Videos
Documents  examples.desktop  Pictures  Templates
guest-18eh8v@ubuntu:~$
```

More ls commands

Example: **ls -l**

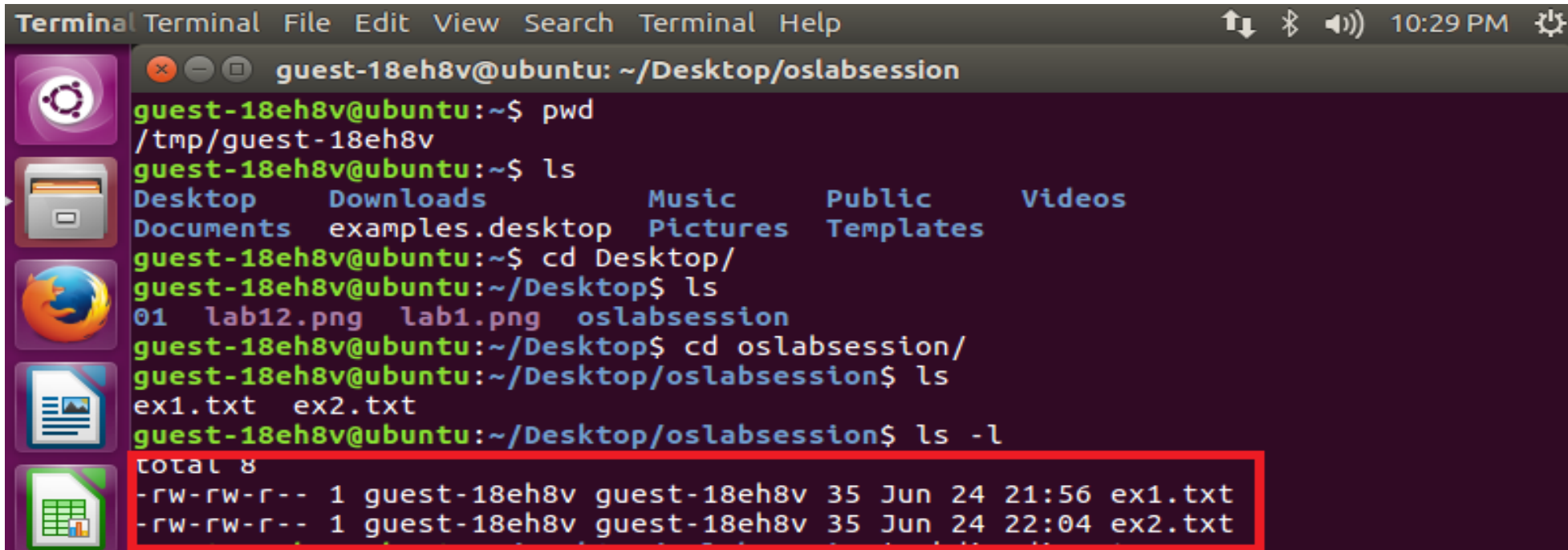
- a Displays all files.
- b Displays nonprinting characters in octal.
- c Displays files by file timestamp.
- C Displays files in a columnar format (default)
- d Displays only directories.
- l Displays the long format listing.
- L Displays the file or directory referenced by a symbolic link.
- m Displays the names as a comma-separated list.
- n Displays the long format listing, with GID and UID numbers.

More ls commands

- o Displays the long format listing, but excludes group name.
- p Displays directories with /
- q Displays all nonprinting characters as ?
- r Displays files in reverse order.
- R Displays subdirectories as well.
- t Displays newest files first. (based on timestamp)
- u Displays files by the file access time.
- x Displays files as rows across the screen.
- 1 Displays each entry on a line.

3. ls -l command

show some extra information

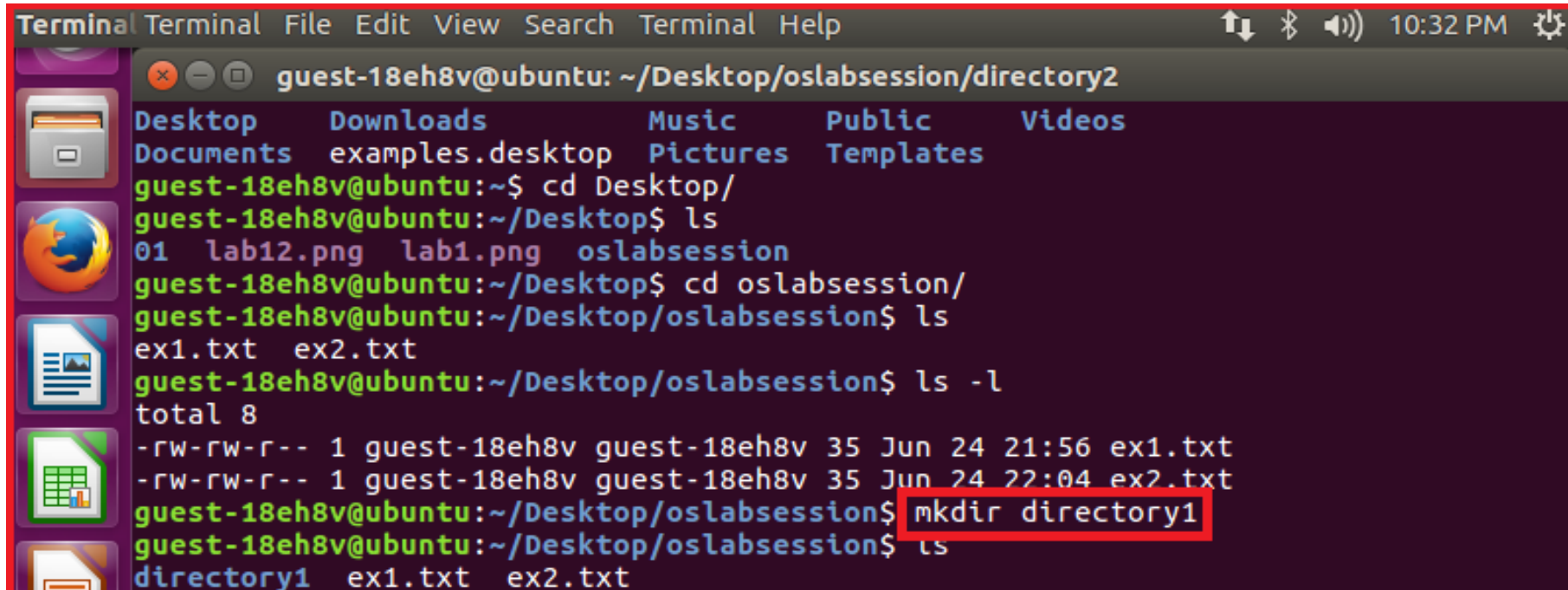


The image shows a terminal window titled "Terminal" with a menu bar (Terminal, File, Edit, View, Search, Terminal, Help) and a status bar (10:29 PM). The terminal is running on a system with the username "guest-18eh8v" and the current directory is "~/Desktop/oslabsession". The user has executed several commands: "pwd" (showing "/tmp/guest-18eh8v"), "ls" (showing a list of directories and files), "cd Desktop/" (changing to the Desktop directory), "ls" (showing files "01", "lab12.png", "lab1.png", and "oslabsession"), "cd oslabsession/" (changing to the oslabsession directory), "ls" (showing files "ex1.txt" and "ex2.txt"), and finally "ls -l" (showing detailed file information). The output of "ls -l" is highlighted with a red box.

```
Terminal Terminal File Edit View Search Terminal Help 10:29 PM
guest-18eh8v@ubuntu: ~/Desktop/oslabsession
guest-18eh8v@ubuntu:~$ pwd
/tmp/guest-18eh8v
guest-18eh8v@ubuntu:~$ ls
Desktop      Downloads    Music        Public       Videos
Documents    examples.desktop  Pictures     Templates
guest-18eh8v@ubuntu:~$ cd Desktop/
guest-18eh8v@ubuntu:~/Desktop$ ls
01  lab12.png  lab1.png  oslabsession
guest-18eh8v@ubuntu:~/Desktop$ cd oslabsession/
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
ex1.txt  ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls -l
total 8
-rw-rw-r-- 1 guest-18eh8v guest-18eh8v 35 Jun 24 21:56 ex1.txt
-rw-rw-r-- 1 guest-18eh8v guest-18eh8v 35 Jun 24 22:04 ex2.txt
```

4. mkdir command:

This command is used for making or creating directories.

A screenshot of a Linux terminal window. The title bar shows 'Terminal' and standard window controls. The terminal text shows a user navigating from their home directory to the Desktop, then to a directory named 'oslabsession'. They list the contents, which include 'ex1.txt' and 'ex2.txt'. Then, they execute the 'mkdir directory1' command, which is highlighted with a red box. Finally, they list the directory contents again, showing 'directory1' has been created.

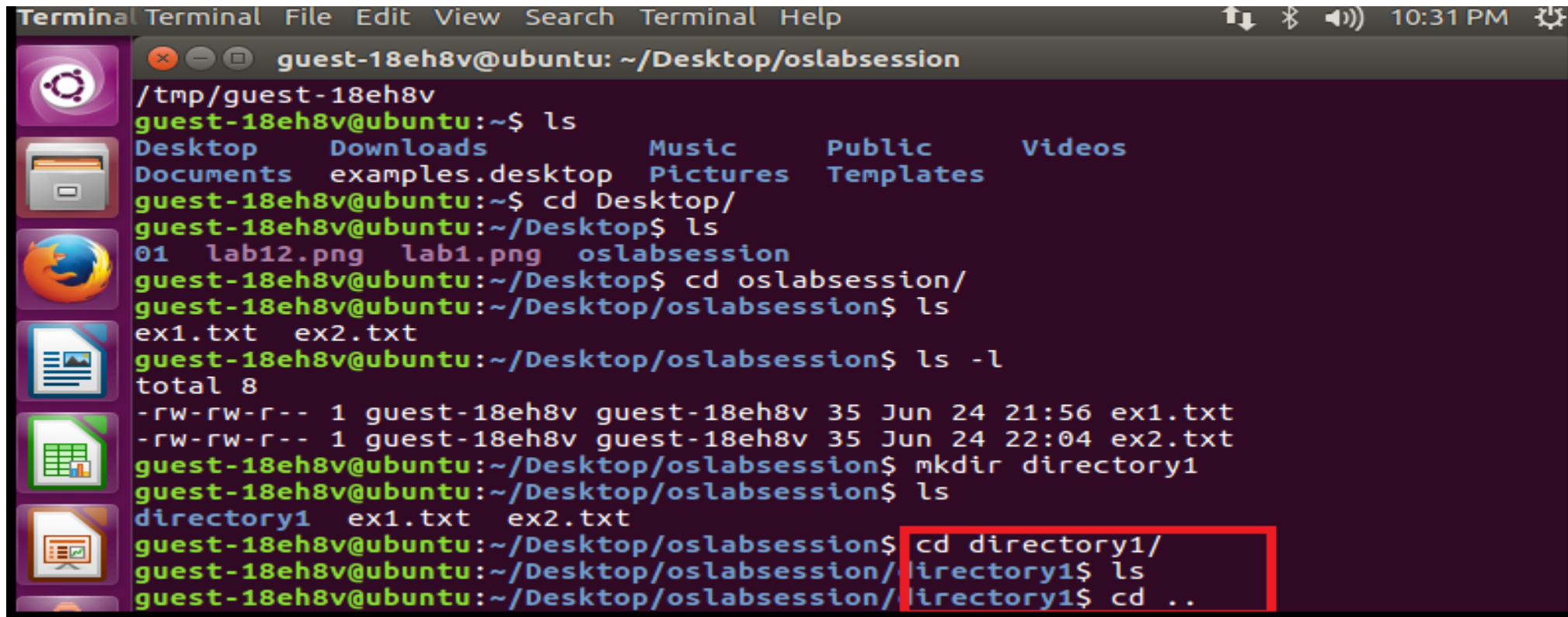
```
Terminal Terminal File Edit View Search Terminal Help 10:32 PM
guest-18eh8v@ubuntu: ~/Desktop/oslabsession/directory2
Desktop Downloads Music Public Videos
Documents examples.desktop Pictures Templates
guest-18eh8v@ubuntu:~$ cd Desktop/
guest-18eh8v@ubuntu:~/Desktop$ ls
01 lab12.png lab1.png oslabsession
guest-18eh8v@ubuntu:~/Desktop$ cd oslabsession/
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
ex1.txt ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls -l
total 8
-rw-rw-r-- 1 guest-18eh8v guest-18eh8v 35 Jun 24 21:56 ex1.txt
-rw-rw-r-- 1 guest-18eh8v guest-18eh8v 35 Jun 24 22:04 ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ mkdir directory1
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
directory1 ex1.txt ex2.txt
```


5. Change directory:

'cd' means 'change directory'.

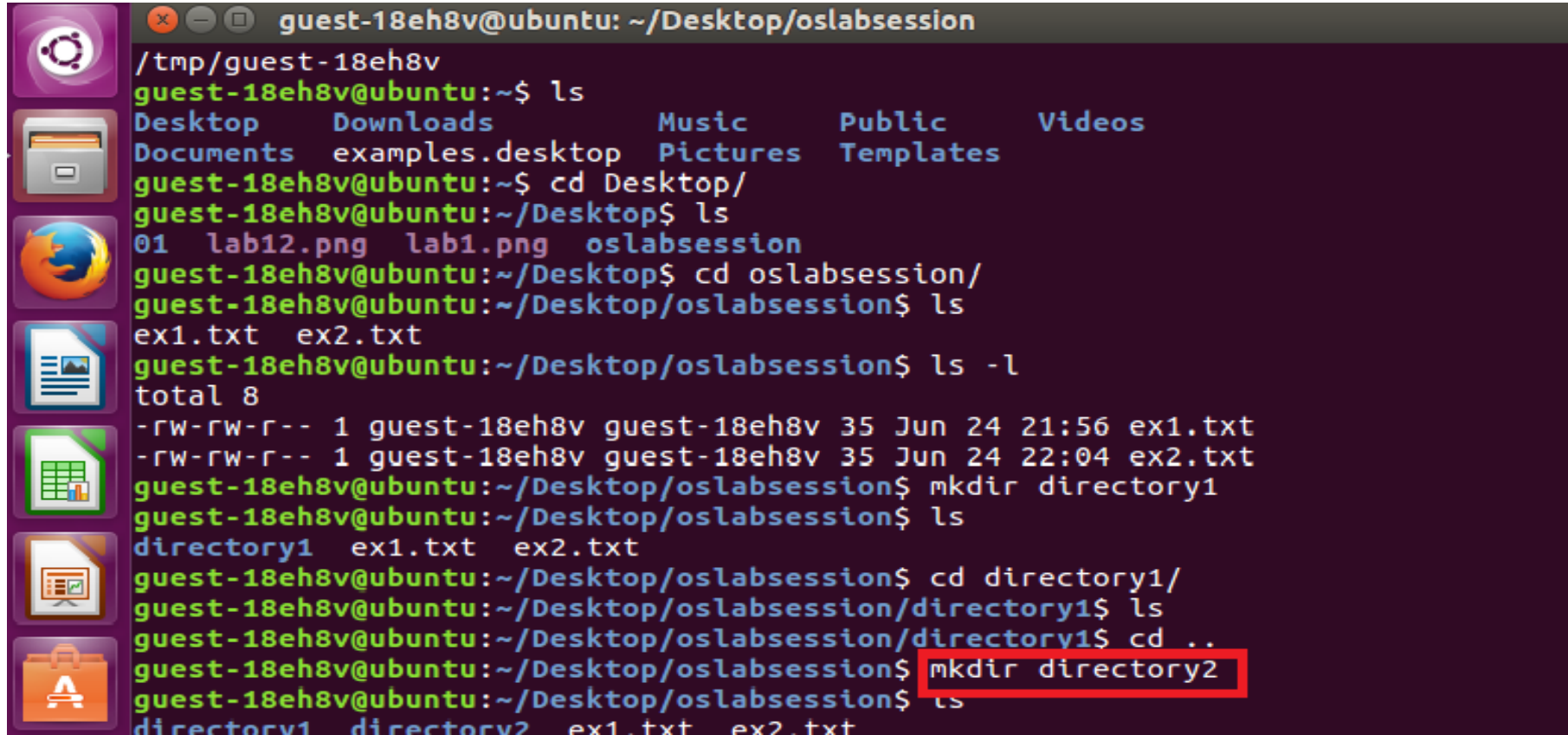
Typing: `cd /[directory name]` will get us into one of the main directories.

Typing `cd ..` will get us out of it. (move to parent directory.)

A terminal window titled 'Terminal' with a menu bar (Terminal, File, Edit, View, Search, Terminal, Help) and a status bar (10:31 PM). The window shows a series of commands and their outputs in a dark theme. The user is navigating through the file system from their home directory to a subdirectory named 'directory1'. The commands include 'ls', 'cd', 'ls -l', 'mkdir', and 'cd ..'. The output shows the contents of each directory, including files like 'ex1.txt', 'ex2.txt', and 'directory1'. The final command 'cd ..' is highlighted with a red box.

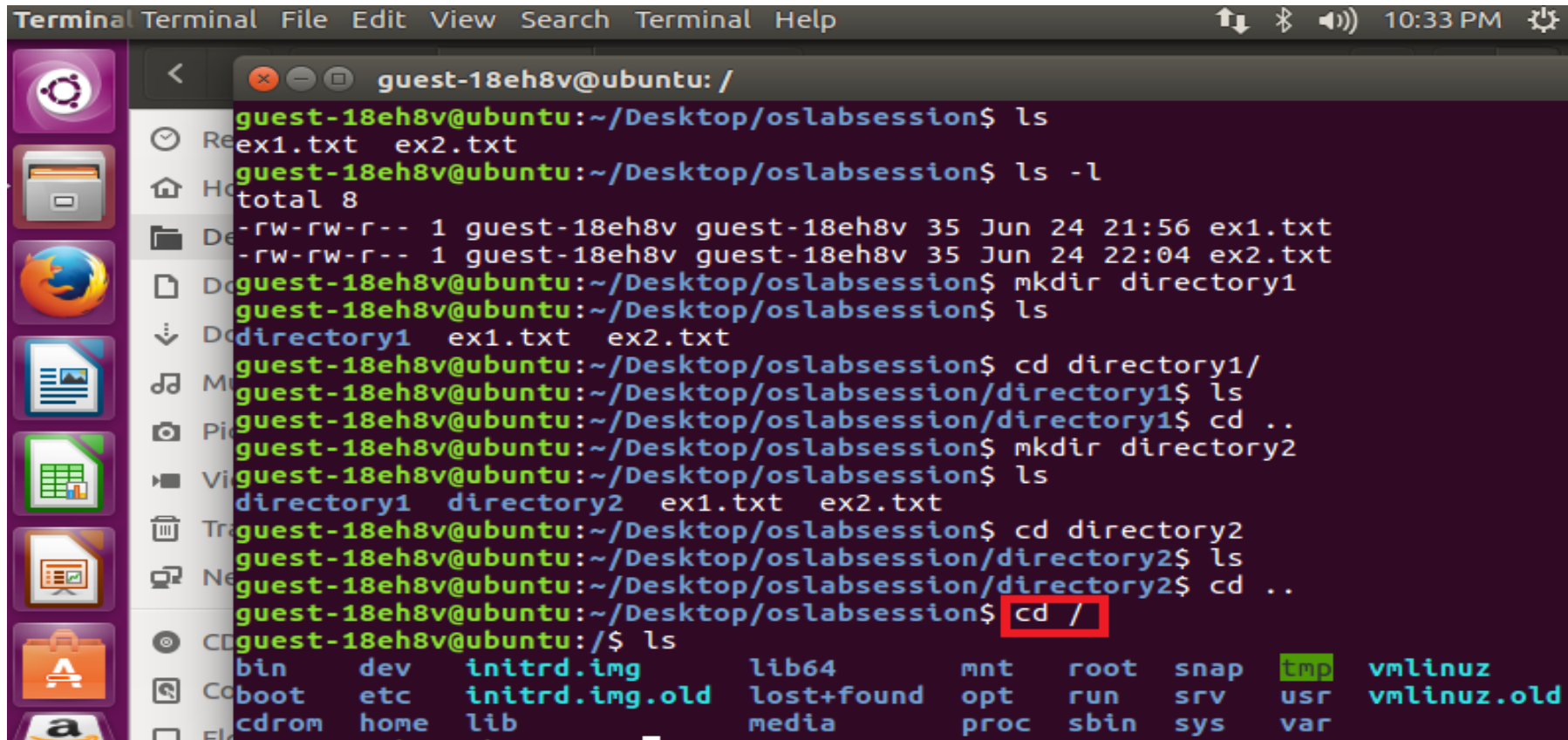
```
Terminal Terminal File Edit View Search Terminal Help 10:31 PM
guest-18eh8v@ubuntu: ~/Desktop/oslabsession
/tmp/guest-18eh8v
guest-18eh8v@ubuntu:~$ ls
Desktop      Downloads      Music      Public      Videos
Documents    examples.desktop  Pictures    Templates
guest-18eh8v@ubuntu:~$ cd Desktop/
guest-18eh8v@ubuntu:~/Desktop$ ls
01 lab12.png lab1.png oslabsession
guest-18eh8v@ubuntu:~/Desktop$ cd oslabsession/
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
ex1.txt ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls -l
total 8
-rw-rw-r-- 1 guest-18eh8v guest-18eh8v 35 Jun 24 21:56 ex1.txt
-rw-rw-r-- 1 guest-18eh8v guest-18eh8v 35 Jun 24 22:04 ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ mkdir directory1
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
directory1 ex1.txt ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ cd directory1/
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cd ..
```

Create another directory name call **directory2**

A terminal window titled 'guest-18eh8v@ubuntu: ~/Desktop/oslabsession' with a Ubuntu logo icon on the left. The terminal shows a series of commands and their outputs. The user navigates from the home directory to the Desktop, then to the 'oslabsession' directory. They list files, create 'directory1', and then create 'directory2'. The 'mkdir directory2' command is highlighted with a red rectangle.

```
guest-18eh8v@ubuntu: ~/Desktop/oslabsession
/tmp/guest-18eh8v
guest-18eh8v@ubuntu:~$ ls
Desktop    Downloads    Music        Public       Videos
Documents  examples.desktop  Pictures    Templates
guest-18eh8v@ubuntu:~$ cd Desktop/
guest-18eh8v@ubuntu:~/Desktop$ ls
01 lab12.png lab1.png oslabsession
guest-18eh8v@ubuntu:~/Desktop$ cd oslabsession/
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
ex1.txt ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls -l
total 8
-rw-rw-r-- 1 guest-18eh8v guest-18eh8v 35 Jun 24 21:56 ex1.txt
-rw-rw-r-- 1 guest-18eh8v guest-18eh8v 35 Jun 24 22:04 ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ mkdir directory1
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
directory1 ex1.txt ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ cd directory1/
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cd ..
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ mkdir directory2
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
directory1 directory2 ex1.txt ex2.txt
```

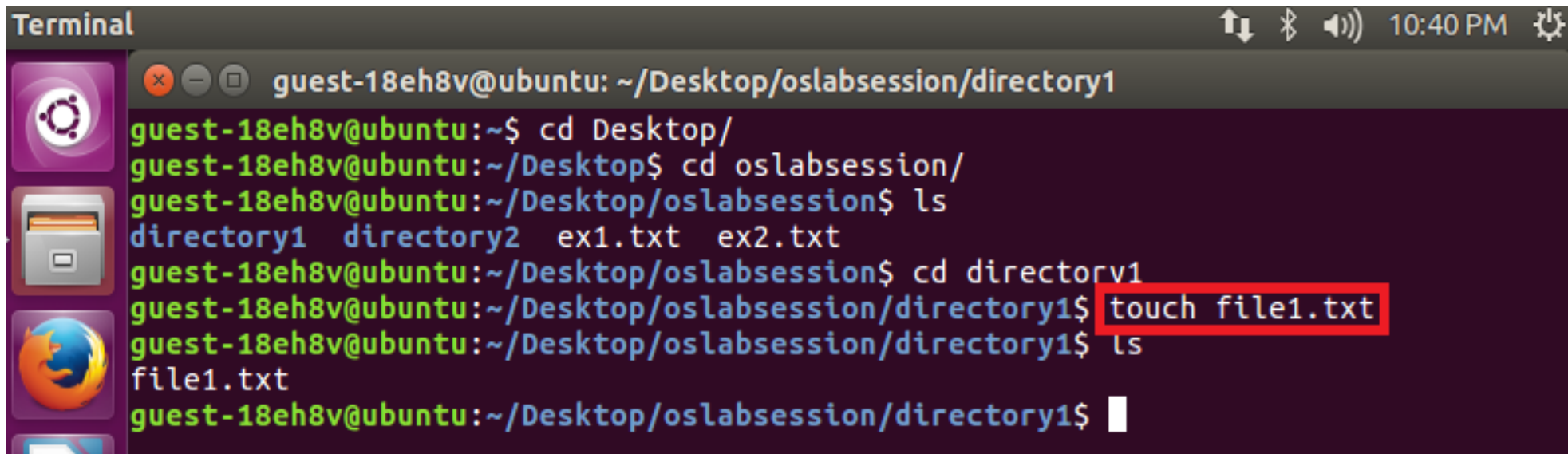
Return back to home



A terminal window titled "Terminal" with a menu bar (Terminal, File, Edit, View, Search, Terminal, Help) and a status bar (10:33 PM). The terminal shows a series of commands and outputs for a user named "guest-18eh8v" on an "ubuntu" machine. The user starts in the directory "~/Desktop/oslabsession". They list files (ex1.txt, ex2.txt), list with long format (-l), create a directory "directory1", list files in "directory1", and then create "directory2". After listing files in "directory2", they enter the command "cd /" to return to the root directory, which is highlighted with a red box. The final output shows the root directory listing.

```
Terminal Terminal File Edit View Search Terminal Help 10:33 PM
guest-18eh8v@ubuntu: /
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
ex1.txt  ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls -l
total 8
-rw-rw-r-- 1 guest-18eh8v guest-18eh8v 35 Jun 24 21:56 ex1.txt
-rw-rw-r-- 1 guest-18eh8v guest-18eh8v 35 Jun 24 22:04 ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ mkdir directory1
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
directory1  ex1.txt  ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ cd directory1/
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cd ..
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ mkdir directory2
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
directory1  directory2  ex1.txt  ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ cd directory2
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory2$ ls
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory2$ cd ..
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ cd /
guest-18eh8v@ubuntu:/$ ls
bin      dev      initrd.img  lib64      mnt      root      snap      tmp      vmlinuz
boot     etc      initrd.img.old  lost+found  opt      run      srv      usr      vmlinuz.old
cdrom    home     lib         media      proc     sbin     sys      var
```

6. touch command: Create a text file

A terminal window titled "Terminal" with a dark background. The window shows a series of commands and their outputs. The user is navigating through directories on a desktop. The command "touch file1.txt" is highlighted with a red box. The terminal output shows the file "file1.txt" being created.

```
Terminal
guest-18eh8v@ubuntu: ~/Desktop/oslabsession/directory1
guest-18eh8v@ubuntu:~$ cd Desktop/
guest-18eh8v@ubuntu:~/Desktop$ cd oslabsession/
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
directory1 directory2 ex1.txt ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ cd directory1
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ touch file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$
```

How to use “vi” editor to create a file and save

Let's make a text file. Type: **vi example1.txt**

We'll see a line of tildes down the left side and the name '**example1.txt**' at the bottom and [new file].

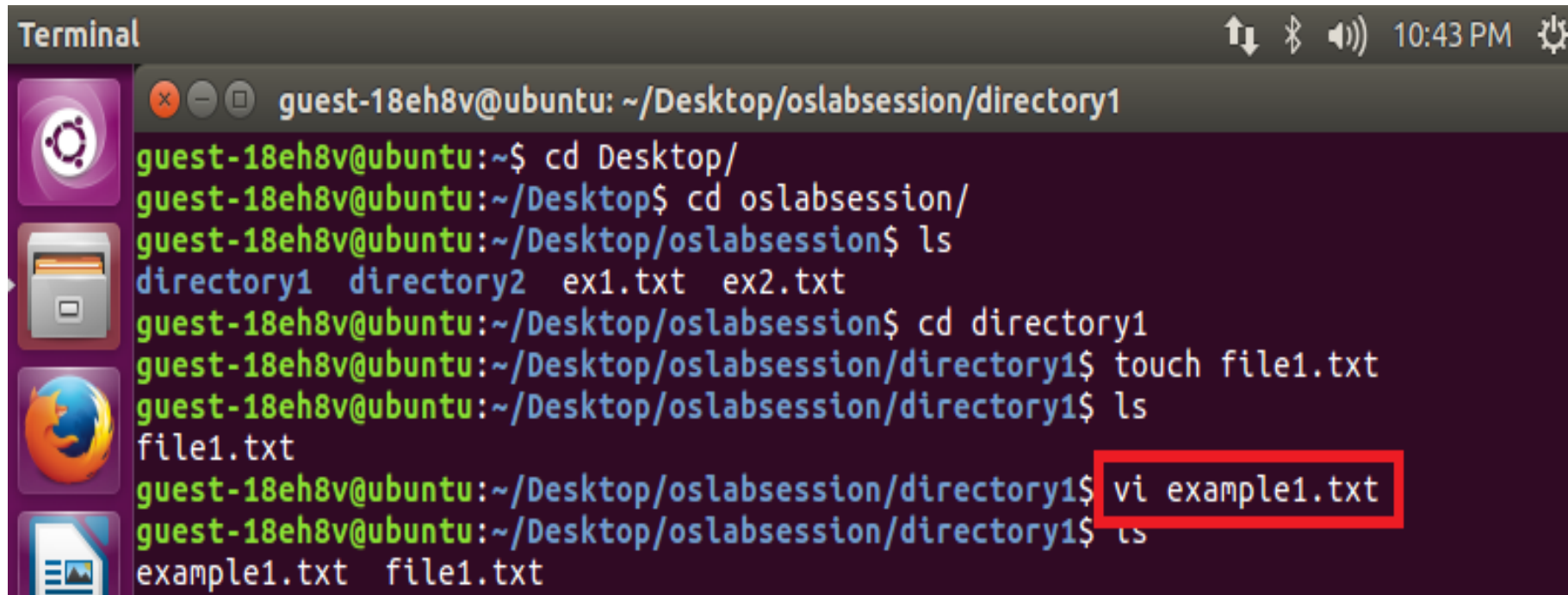
To write something, we have to press ESC and the 'i' key (i for insert). We can always erase our mistakes with the backspace key.

To save this file, we would press ESC then the colon key ':' then 'wq' (write)

To **save the file** and quit vi, you would press ESC, **ESC** the colon key ':' then **wq** (write)

To **quit without saving**, press ESC, ':' then 'q!'. vi may protest if we've written something and we don't want to save it. If we press **ESC ':' 'q!** with an exclamation point, vi will accept it and not save our changes.

Create file in command line editor

A terminal window titled "Terminal" with a dark background. The window shows a series of commands and their outputs. The user is navigating through directories and creating a file. The command "vi example1.txt" is highlighted with a red rectangle.

```
Terminal
guest-18eh8v@ubuntu: ~/Desktop/oslabsession/directory1

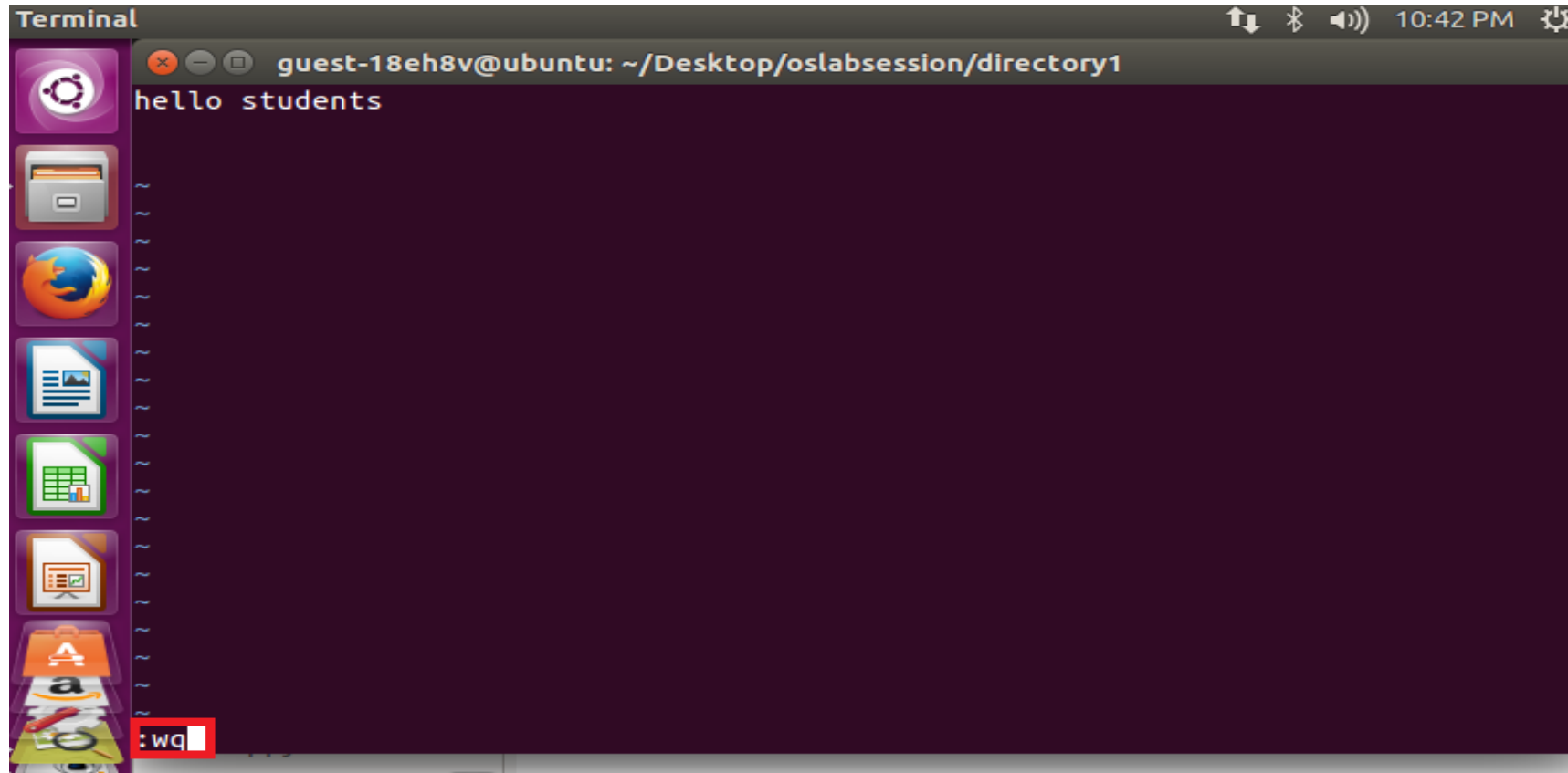
guest-18eh8v@ubuntu:~$ cd Desktop/
guest-18eh8v@ubuntu:~/Desktop$ cd oslabsession/
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
directory1 directory2 ex1.txt ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ cd directory1
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ touch file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ vi example1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
example1.txt file1.txt
```


7. i) **Esc** and **:wq** command:

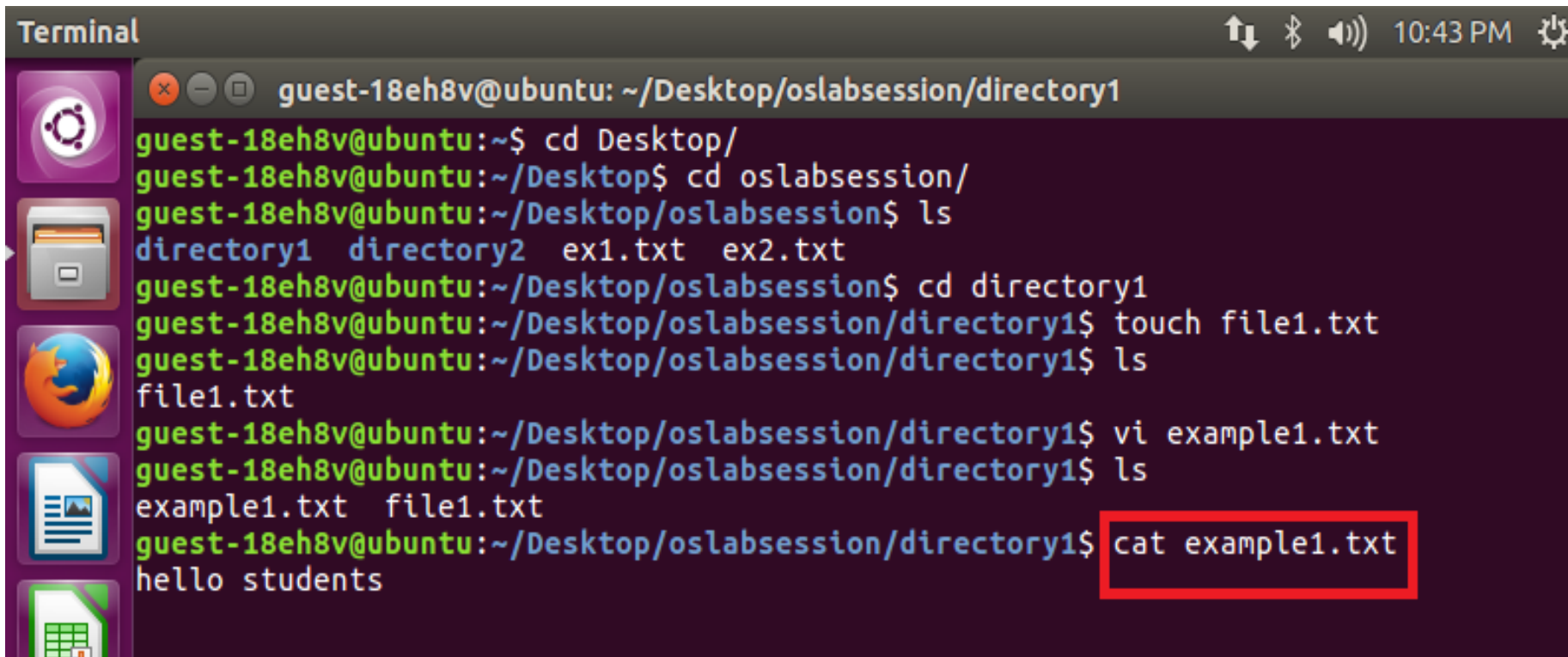
Include file contain(you have to press 'i' to insert data to the file and save file using above command)

ii) **Esc** and **:q!** command:

use to quit the file(you want to cancel the file)



8. cat command: output file in window

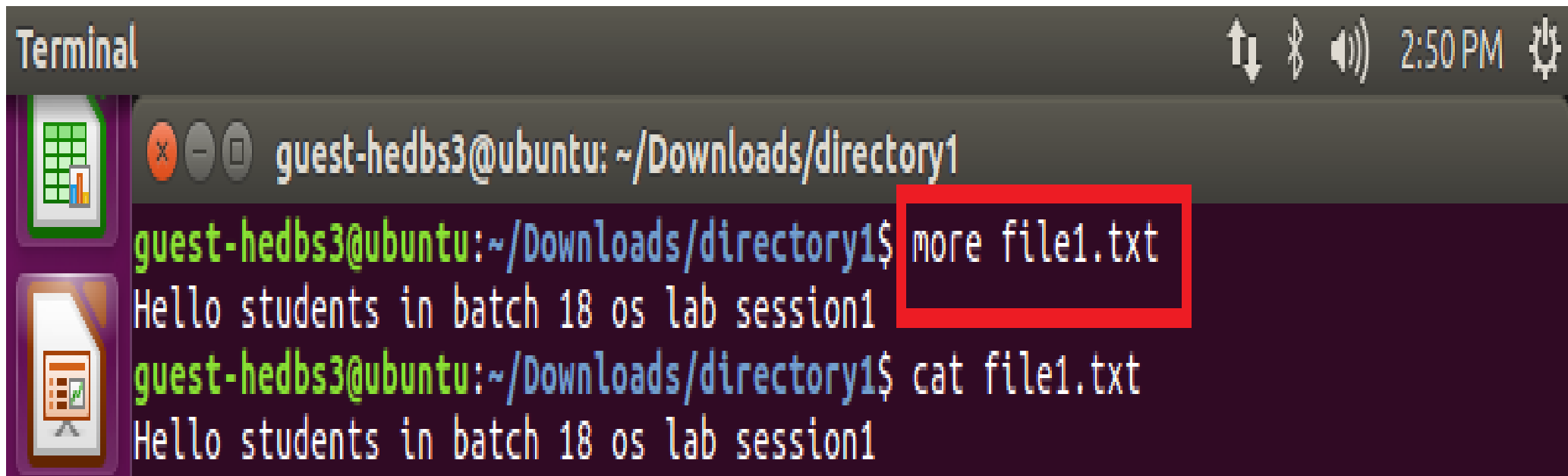


A terminal window titled "Terminal" with a dark background and a light-colored text. The window shows a series of commands and their outputs. The current command being executed is `cat example1.txt`, which is highlighted with a red rectangular box. The output of this command is `hello students`. The terminal window also shows a sidebar with icons for various applications, including a file manager, a web browser, and a terminal.

```
Terminal
guest-18eh8v@ubuntu: ~/Desktop/oslabsession/directory1
guest-18eh8v@ubuntu:~$ cd Desktop/
guest-18eh8v@ubuntu:~/Desktop$ cd oslabsession/
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
directory1 directory2 ex1.txt ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ cd directory1
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ touch file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ vi example1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
example1.txt file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cat example1.txt
hello students
```


more command to output file

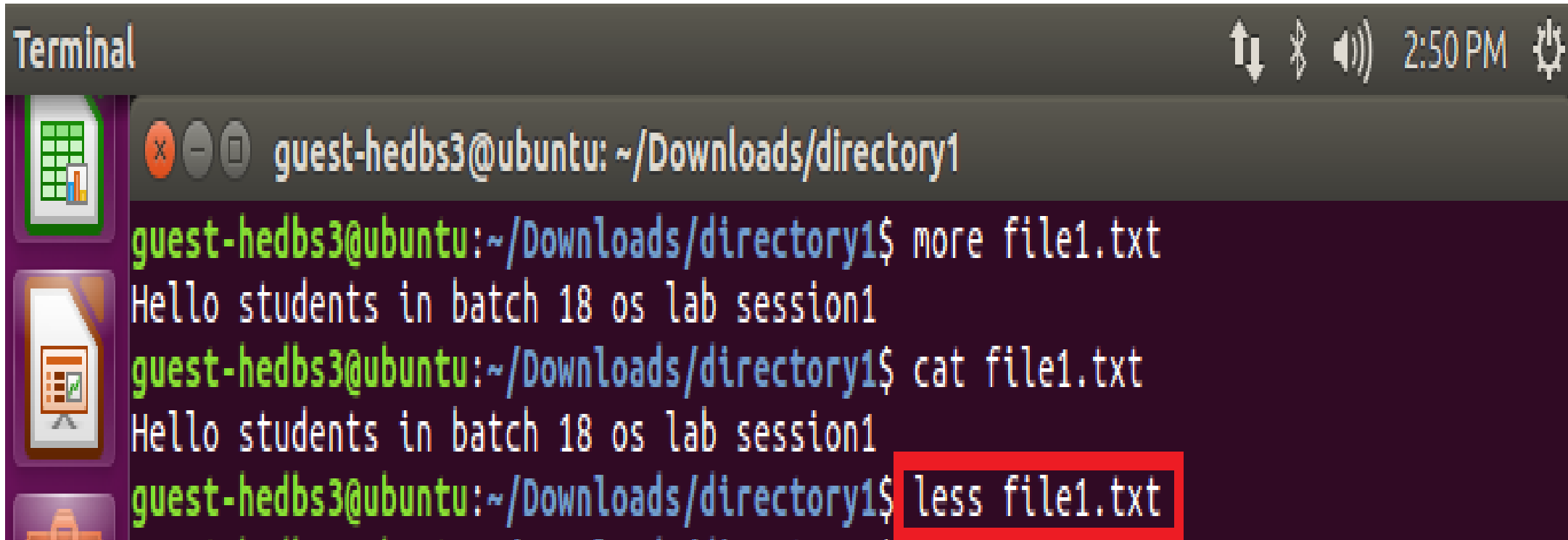
'more' is a command that we can use to read, for example, what's written in a file. We would type 'more file1.txt' to see the file completely.

A screenshot of a Linux terminal window. The title bar at the top says "Terminal" and includes system icons for window management, network, volume, and time (2:50 PM). The terminal shows a user prompt "guest-hedbs3@ubuntu: ~/Downloads/directory1". The user enters the command "more file1.txt", which is highlighted by a red rectangular box. The output of the command is "Hello students in batch 18 os lab session1". Below this, the user enters the command "cat file1.txt", and the same output "Hello students in batch 18 os lab session1" is displayed. On the left side of the terminal window, there are icons for a spreadsheet and a document.

```
Terminal
↑ ↓ 🔌 🔊 2:50 PM ⚙️
guest-hedbs3@ubuntu: ~/Downloads/directory1
guest-hedbs3@ubuntu:~/Downloads/directory1$ more file1.txt
Hello students in batch 18 os lab session1
guest-hedbs3@ubuntu:~/Downloads/directory1$ cat file1.txt
Hello students in batch 18 os lab session1
```

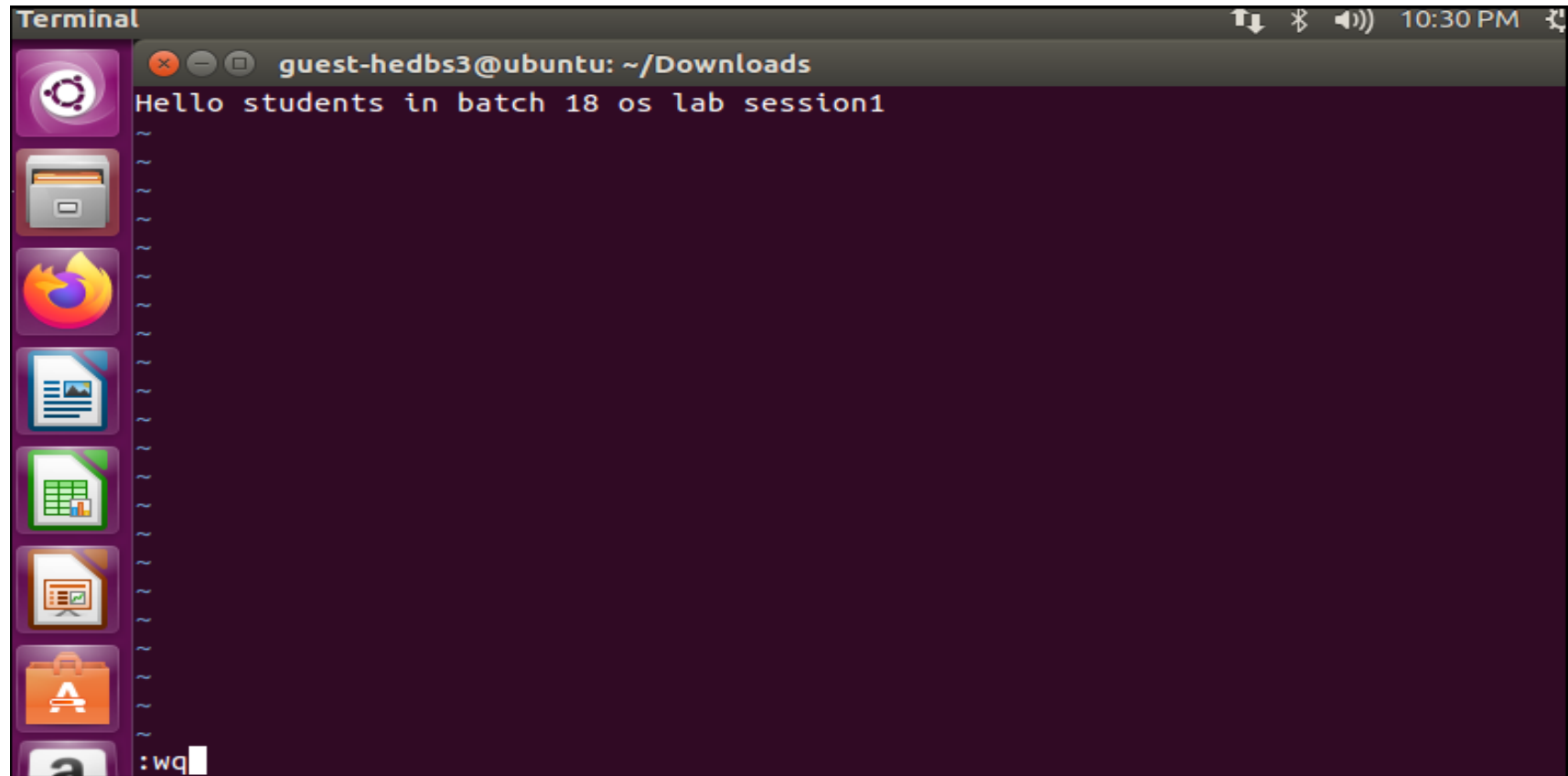
less command to output the file

Then, we can press the 'q' key to stop viewing the file.

A terminal window titled "Terminal" with a dark background. The window shows a user named "guest-hedbs3" at a machine named "ubuntu" in the directory "~/Downloads/directory1". The user has executed three commands: "more file1.txt", "cat file1.txt", and "less file1.txt". The output of the first two commands is "Hello students in batch 18 os lab session1". The third command is currently being executed, and its input "less file1.txt" is highlighted with a red rectangular box. The terminal window includes standard Ubuntu window controls (close, minimize, maximize) and system status icons (network, Bluetooth, volume, time, settings) in the top bar.


```
Terminal
guest-hedbs3@ubuntu: ~/Downloads/directory1
guest-hedbs3@ubuntu:~/Downloads/directory1$ more file1.txt
Hello students in batch 18 os lab session1
guest-hedbs3@ubuntu:~/Downloads/directory1$ cat file1.txt
Hello students in batch 18 os lab session1
guest-hedbs3@ubuntu:~/Downloads/directory1$ less file1.txt
```

You can view file



9.wc command

This command will give us the number of lines, words and letters (characters) in a file and in that order.



```
[1] stopped wc
guest-hedbs3@ubuntu:~/Downloads/directory1$ wc file1.txt
 1  8 43 file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ vi file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ wc file1.txt
 5 19 103 file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ cat file1.txt

Campus will be having M

lecture will be finished soon on
Hello students in batch 18 os lab session1
guest-hedbs3@ubuntu:~/Downloads/directory1$
```

Please attempt below command as well and try to understand

`wc -l <filename>` print the line count

`wc -c <filename>` print the byte count

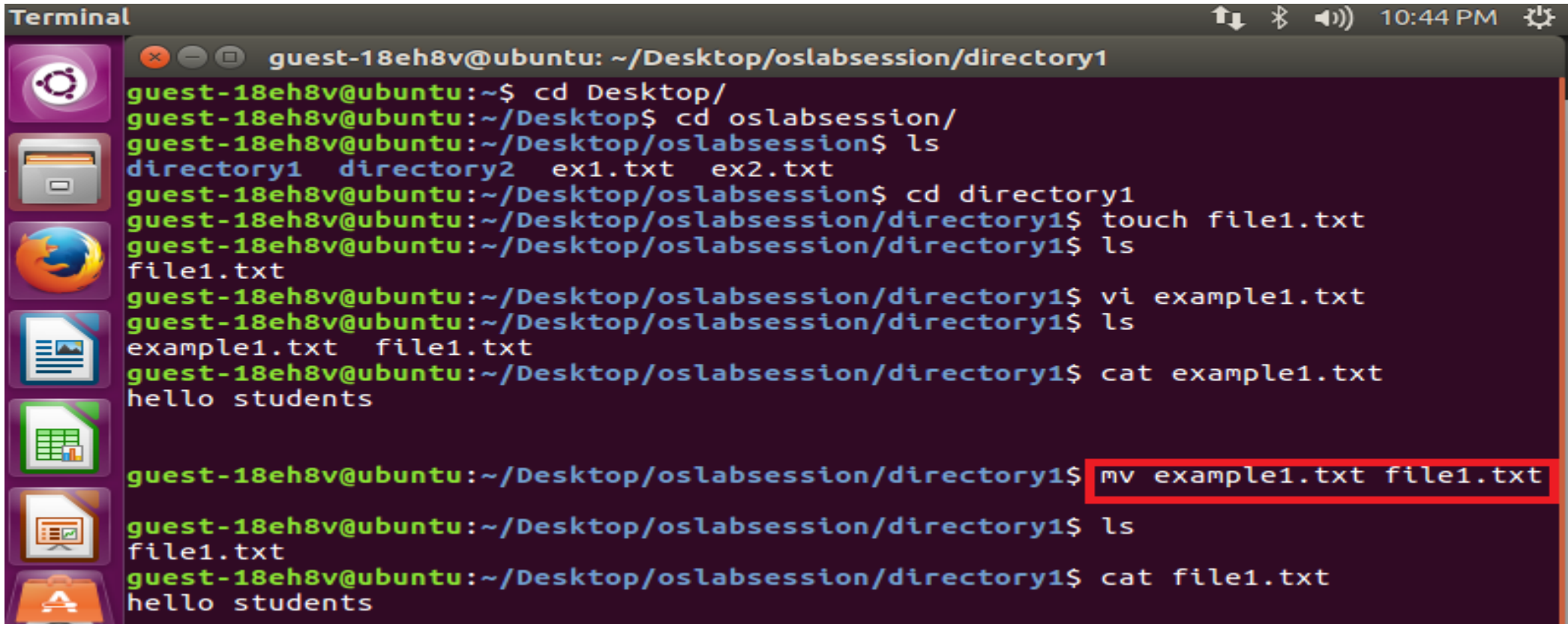
`wc -m <filename>` print the character count

`wc -L <filename>` print the length of longest line

`wc -w <filename>` print the word count

10. mv command

use mv command to send data from example1.txt file to file1.txt

A terminal window titled "Terminal" with a dark background and light text. The window shows a series of commands and their outputs. The user is in a directory named "directory1" under the path "~/Desktop/oslabsession/". The commands executed are: "cd Desktop/", "cd oslabsession/", "ls" (showing "directory1", "directory2", "ex1.txt", "ex2.txt"), "cd directory1", "touch file1.txt", "ls" (showing "file1.txt"), "vi example1.txt", "ls" (showing "example1.txt", "file1.txt"), "cat example1.txt" (outputting "hello students"), "mv example1.txt file1.txt" (highlighted with a red box), "ls" (showing "file1.txt"), and "cat file1.txt" (outputting "hello students"). The terminal window has a sidebar on the left with icons for various applications like a file manager, web browser, and terminal. The top bar shows system icons like network, Bluetooth, and volume, along with the time "10:44 PM".

```
Terminal
guest-18eh8v@ubuntu: ~/Desktop/oslabsession/directory1
guest-18eh8v@ubuntu:~$ cd Desktop/
guest-18eh8v@ubuntu:~/Desktop$ cd oslabsession/
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
directory1  directory2  ex1.txt  ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ cd directory1
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ touch file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ vi example1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
example1.txt  file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cat example1.txt
hello students
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ mv example1.txt file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cat file1.txt
hello students
```

11. cp command

copy file1.txt data to file2.txt file

```
Terminal
guest-18eh8v@ubuntu: ~/Desktop/oslabsession/directory1
file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ vi example1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
example1.txt  file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cat example1.txt
hello students

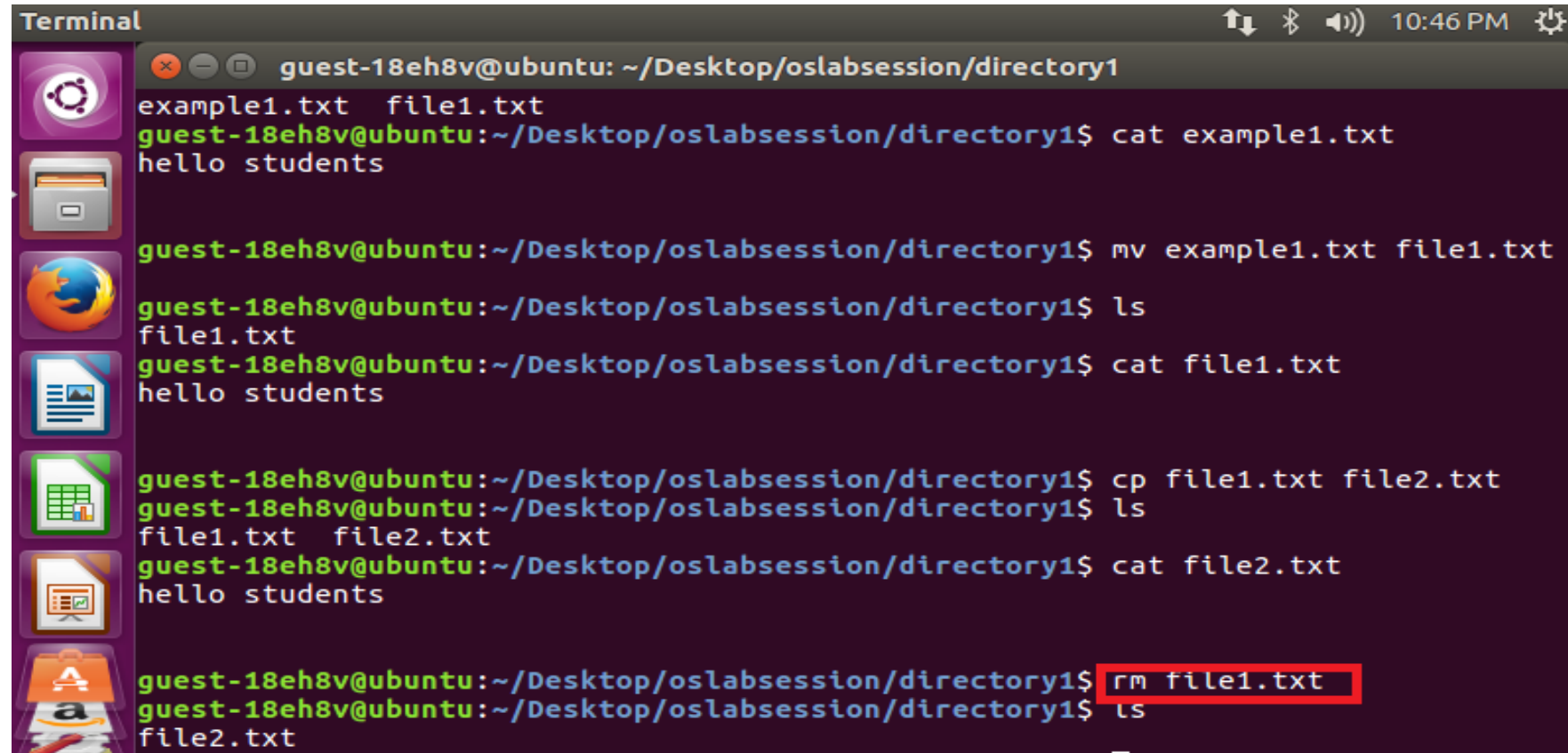
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ mv example1.txt file1.txt

guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cat file1.txt
hello students

guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cp file1.txt file2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
file1.txt  file2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cat file2.txt
hello students
```

12. rm command

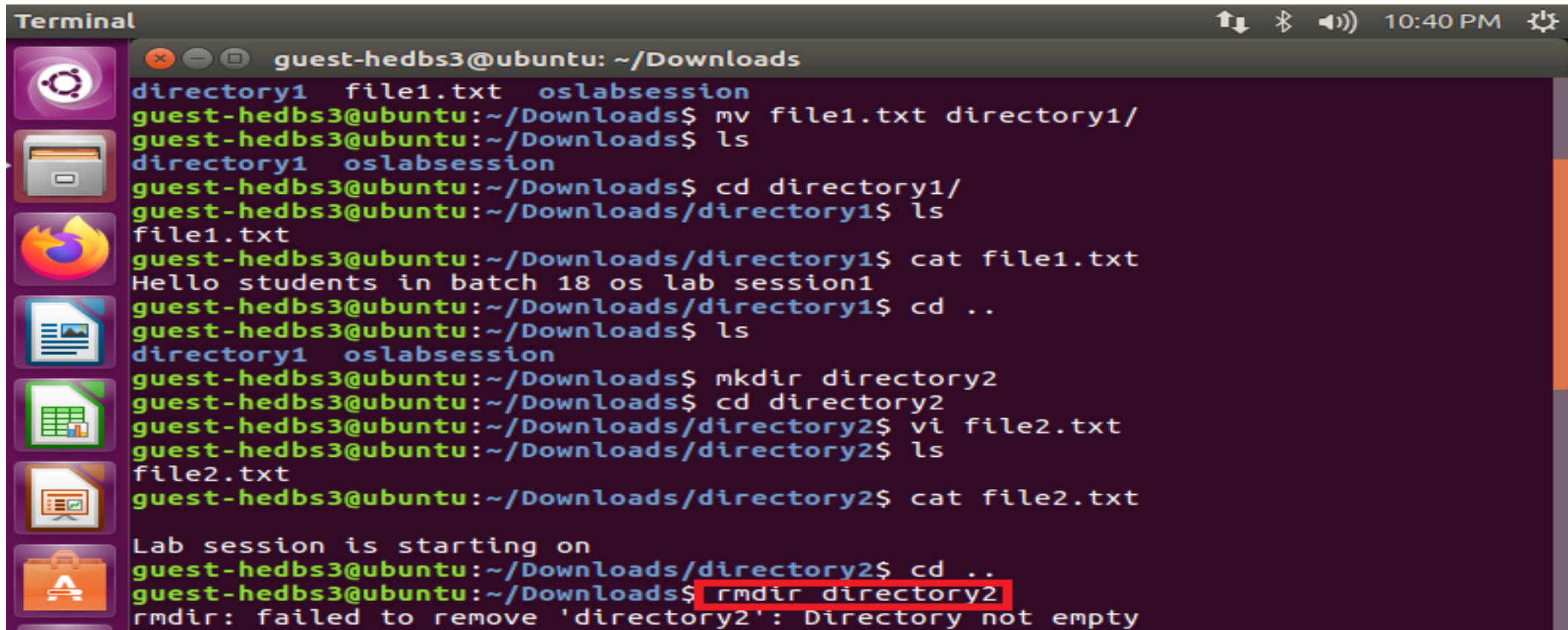
Remove or delete a file1.txt from director1

A terminal window titled "Terminal" with a dark background and light text. The window shows a series of commands and their outputs. The user is in a directory named ~/Desktop/oslabsession/directory1. The commands executed are: 1. cat example1.txt, which outputs "hello students". 2. mv example1.txt file1.txt. 3. ls, which outputs "file1.txt". 4. cat file1.txt, which outputs "hello students". 5. cp file1.txt file2.txt. 6. ls, which outputs "file1.txt file2.txt". 7. cat file2.txt, which outputs "hello students". 8. rm file1.txt, which is highlighted with a red box. 9. ls, which outputs "file2.txt". The terminal window has a sidebar on the left with icons for various applications like a file manager, web browser, and text editor. The top of the window shows system status icons and the time 10:46 PM.

```
Terminal
guest-18eh8v@ubuntu: ~/Desktop/oslabsession/directory1
example1.txt  file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cat example1.txt
hello students
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ mv example1.txt file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cat file1.txt
hello students
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cp file1.txt file2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
file1.txt  file2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cat file2.txt
hello students
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ rm file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
file2.txt
```


13. rmdir command

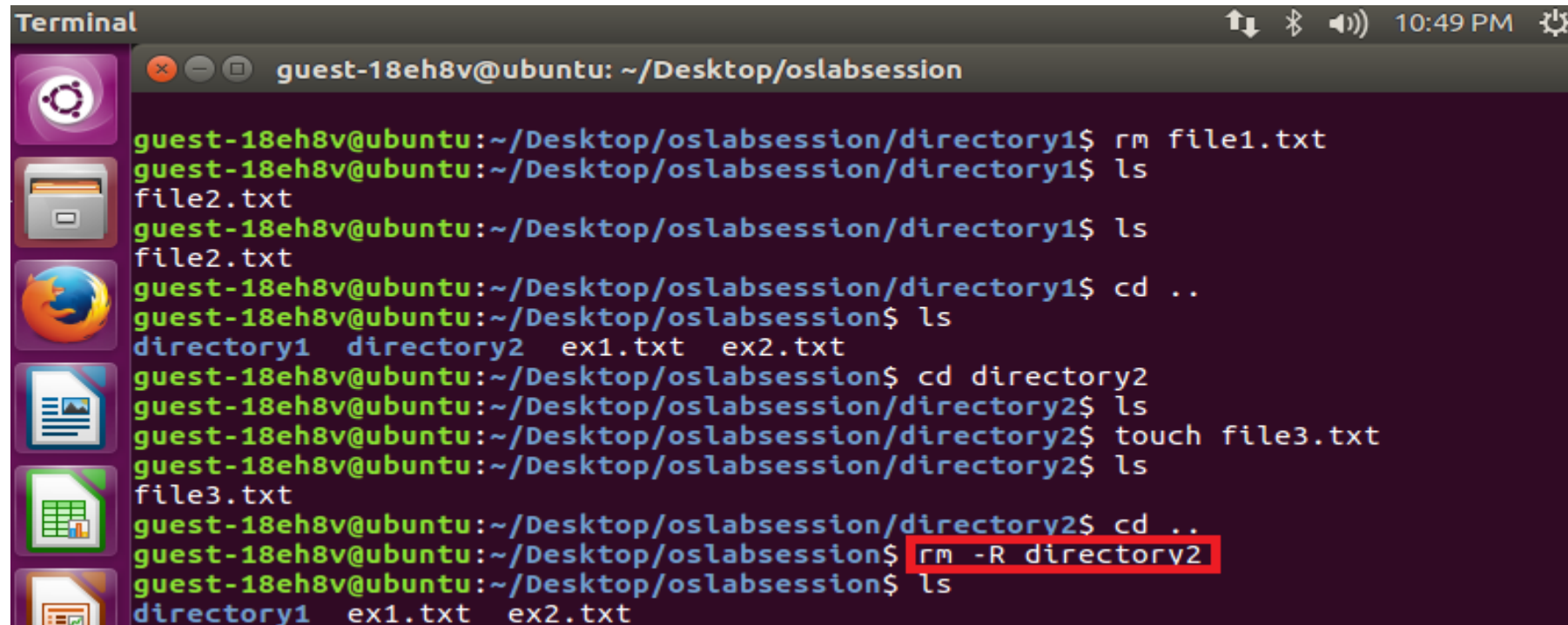
This is the opposite of 'mkdir'- which is used to delete the directories. It should be pointed out that in order to use it, the directory has to be empty.

A terminal window titled "Terminal" with a dark background and light-colored text. The window shows a series of commands and their outputs. The user is in the directory ~/Downloads. They create a directory named 'directory1', move 'file1.txt' to it, and view its contents. Then they create another directory 'directory2', enter it, create 'file2.txt', and view its contents. Finally, they return to the parent directory and attempt to remove 'directory2' using the 'rmdir' command. The command is highlighted with a red box, and the output shows an error: 'rmdir: failed to remove 'directory2': Directory not empty'.

```
Terminal
guest-hedbs3@ubuntu: ~/Downloads
directory1 file1.txt oslabsession
guest-hedbs3@ubuntu:~/Downloads$ mv file1.txt directory1/
guest-hedbs3@ubuntu:~/Downloads$ ls
directory1 oslabsession
guest-hedbs3@ubuntu:~/Downloads$ cd directory1/
guest-hedbs3@ubuntu:~/Downloads/directory1$ ls
file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ cat file1.txt
Hello students in batch 18 os lab session1
guest-hedbs3@ubuntu:~/Downloads/directory1$ cd ..
guest-hedbs3@ubuntu:~/Downloads$ ls
directory1 oslabsession
guest-hedbs3@ubuntu:~/Downloads$ mkdir directory2
guest-hedbs3@ubuntu:~/Downloads$ cd directory2
guest-hedbs3@ubuntu:~/Downloads/directory2$ vi file2.txt
guest-hedbs3@ubuntu:~/Downloads/directory2$ ls
file2.txt
guest-hedbs3@ubuntu:~/Downloads/directory2$ cat file2.txt
Lab session is starting on
guest-hedbs3@ubuntu:~/Downloads/directory2$ cd ..
guest-hedbs3@ubuntu:~/Downloads$ rmdir directory2
rmdir: failed to remove 'directory2': Directory not empty
```

rm -R <directory name> command

Remove directory which can have inside files



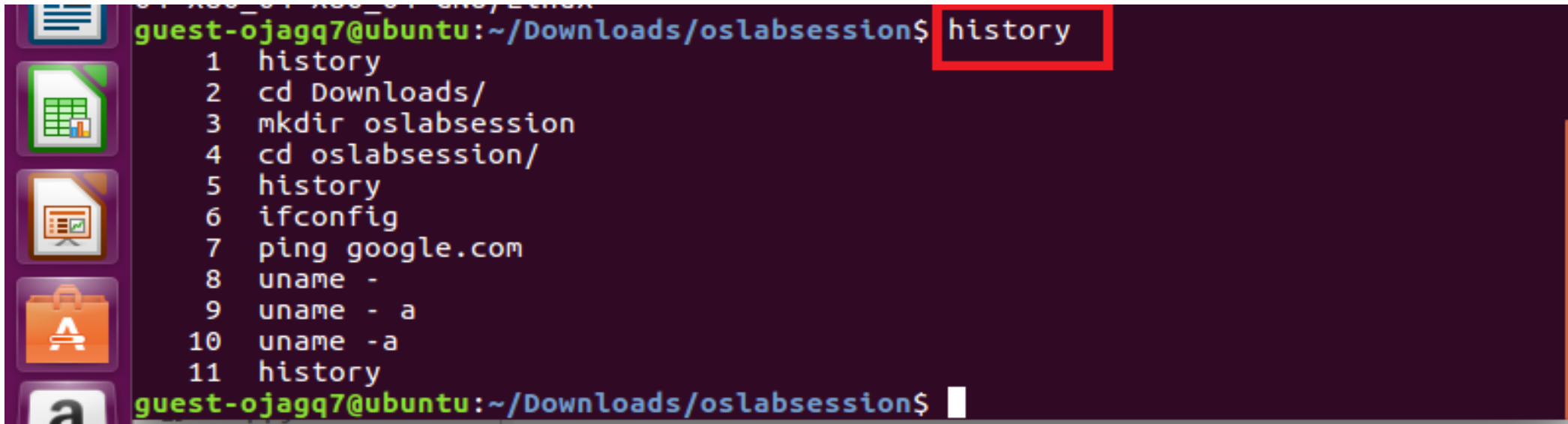
A terminal window titled "Terminal" with a dark background and light text. The window shows a series of commands and their outputs. The user is in a directory named "directory1" and creates a file "file1.txt". They then list the contents, showing "file2.txt". They move to the parent directory and list the contents, showing "directory1", "directory2", "ex1.txt", and "ex2.txt". They then move into "directory2", create a file "file3.txt", and list the contents. Finally, they run the command "rm -R directory2", which is highlighted with a red box. The command is successful, and the directory is removed.

```
Terminal
guest-18eh8v@ubuntu: ~/Desktop/oslabsession

guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ rm file1.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
file2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ ls
file2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory1$ cd ..
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
directory1 directory2 ex1.txt ex2.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ cd directory2
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory2$ ls
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory2$ touch file3.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory2$ ls
file3.txt
guest-18eh8v@ubuntu:~/Desktop/oslabsession/directory2$ cd ..
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ rm -R directory2
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ls
directory1 ex1.txt ex2.txt
```

14. history command

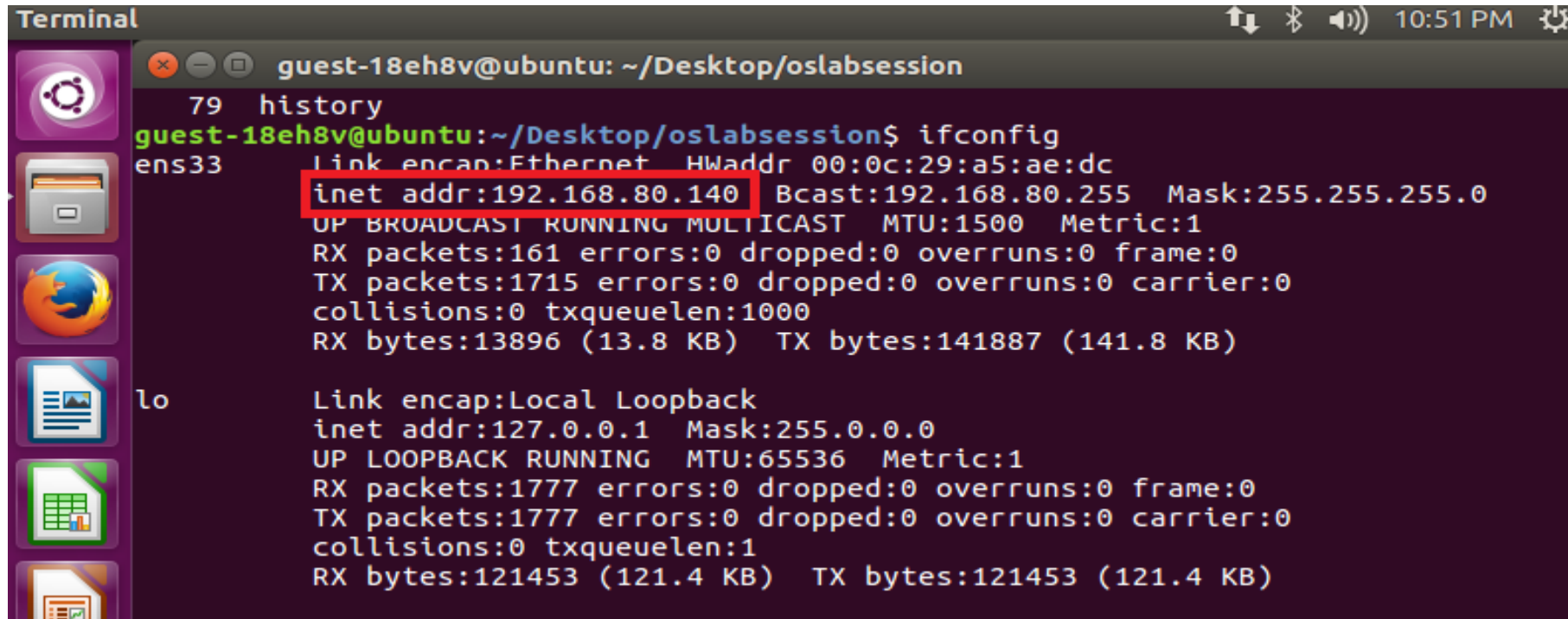
show all commands

A terminal window with a dark purple background and a vertical sidebar on the left containing icons for a file manager, spreadsheet, presentation, shopping bag, and application store. The terminal text shows the user 'guest-ojagq7@ubuntu' in the directory '~/Downloads/oslabsession' typing the 'history' command. The output lists 11 commands: 'history', 'cd Downloads/', 'mkdir oslabsession', 'cd oslabsession/', 'history', 'ifconfig', 'ping google.com', 'uname -', 'uname - a', 'uname -a', and 'history'. The word 'history' at the end of the output is highlighted with a red rectangular box.

```
guest-ojagq7@ubuntu:~/Downloads/oslabsession$ history
1 history
2 cd Downloads/
3 mkdir oslabsession
4 cd oslabsession/
5 history
6 ifconfig
7 ping google.com
8 uname -
9 uname - a
10 uname -a
11 history
guest-ojagq7@ubuntu:~/Downloads/oslabsession$
```

15. ifconfig command

check machine ip address

A terminal window titled "Terminal" with a dark background and light text. The window shows the output of the "ifconfig" command. The first interface, "ens33", is an Ethernet interface with IP address 192.168.80.140, which is highlighted with a red box. The second interface, "lo", is a loopback interface with IP address 127.0.0.1. The terminal window has a sidebar on the left with icons for various applications and a top bar showing system status and time (10:51 PM).

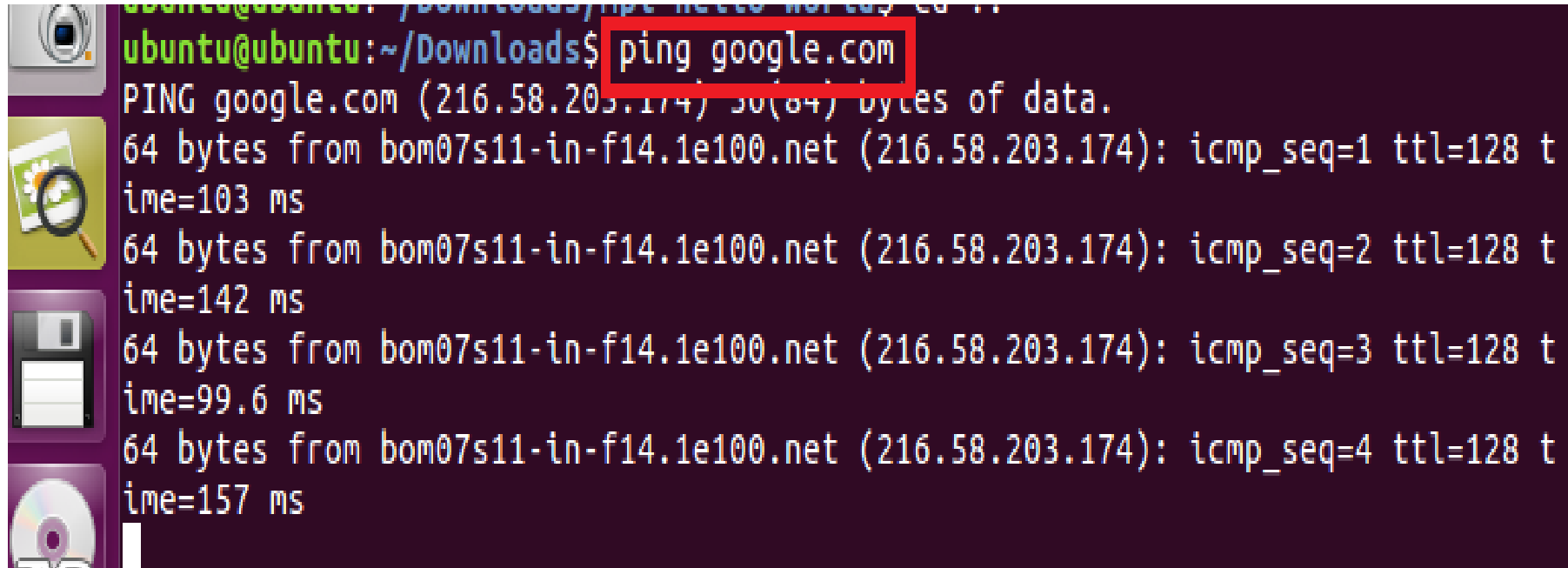
```
Terminal
guest-18eh8v@ubuntu: ~/Desktop/oslabsession

79 history
guest-18eh8v@ubuntu:~/Desktop/oslabsession$ ifconfig
ens33      Link encap:Ethernet  HWaddr 00:0c:29:a5:ae:dc
           inet addr:192.168.80.140  Bcast:192.168.80.255  Mask:255.255.255.0
           UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
           RX packets:161 errors:0 dropped:0 overruns:0 frame:0
           TX packets:1715 errors:0 dropped:0 overruns:0 carrier:0
           collisions:0 txqueuelen:1000
           RX bytes:13896 (13.8 KB)  TX bytes:141887 (141.8 KB)

lo         Link encap:Local Loopback
           inet addr:127.0.0.1  Mask:255.0.0.0
           UP LOOPBACK RUNNING  MTU:65536  Metric:1
           RX packets:1777 errors:0 dropped:0 overruns:0 frame:0
           TX packets:1777 errors:0 dropped:0 overruns:0 carrier:0
           collisions:0 txqueuelen:1
           RX bytes:121453 (121.4 KB)  TX bytes:121453 (121.4 KB)
```

16. ping command

Try out ping to google.com , and to stop browser use Ctrl+c command

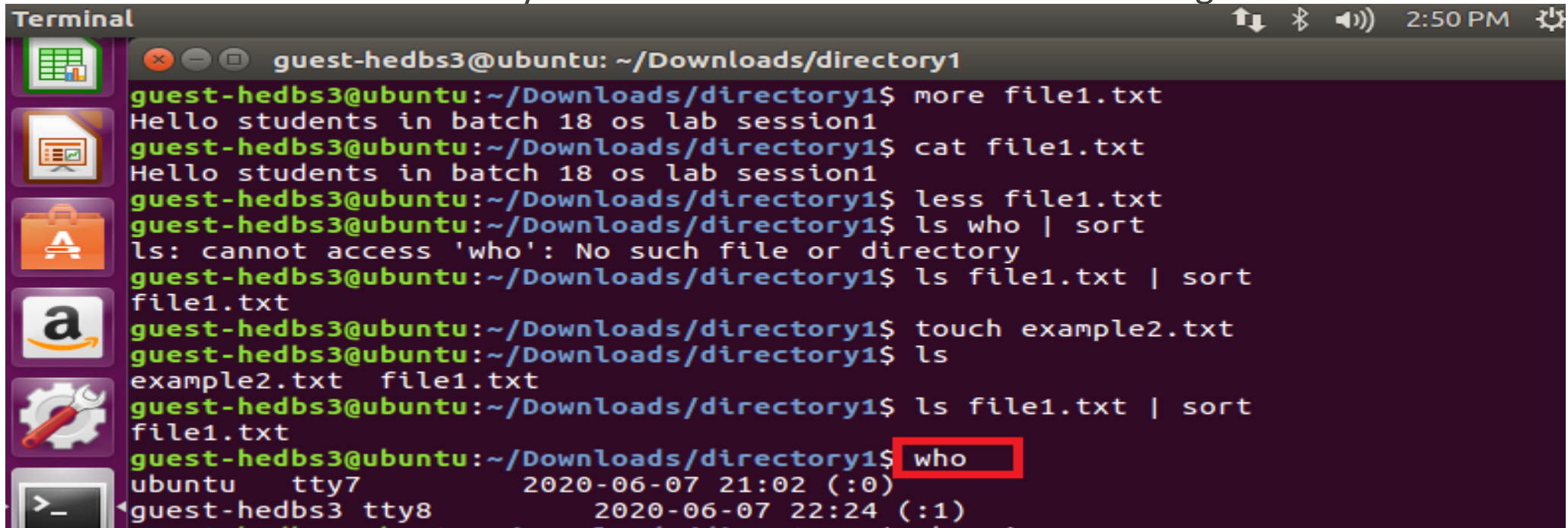
A screenshot of a Linux terminal window with a dark purple background. The prompt is 'ubuntu@ubuntu:~/Downloads\$'. The command 'ping google.com' is entered and highlighted with a red rectangular box. The output shows four successful ping attempts to google.com (IP 216.58.203.174), each returning 64 bytes of data. The response times are 103 ms, 142 ms, 99.6 ms, and 157 ms respectively. The terminal has a sidebar on the left with icons for a network card, a magnifying glass over a document, a floppy disk, and a CD/DVD.

```
ubuntu@ubuntu:~/Downloads$ ping google.com
PING google.com (216.58.203.174) 64(84) bytes of data.
64 bytes from bom07s11-in-f14.1e100.net (216.58.203.174): icmp_seq=1 ttl=128 t
ime=103 ms
64 bytes from bom07s11-in-f14.1e100.net (216.58.203.174): icmp_seq=2 ttl=128 t
ime=142 ms
64 bytes from bom07s11-in-f14.1e100.net (216.58.203.174): icmp_seq=3 ttl=128 t
ime=99.6 ms
64 bytes from bom07s11-in-f14.1e100.net (216.58.203.174): icmp_seq=4 ttl=128 t
ime=157 ms
```

17.Who command

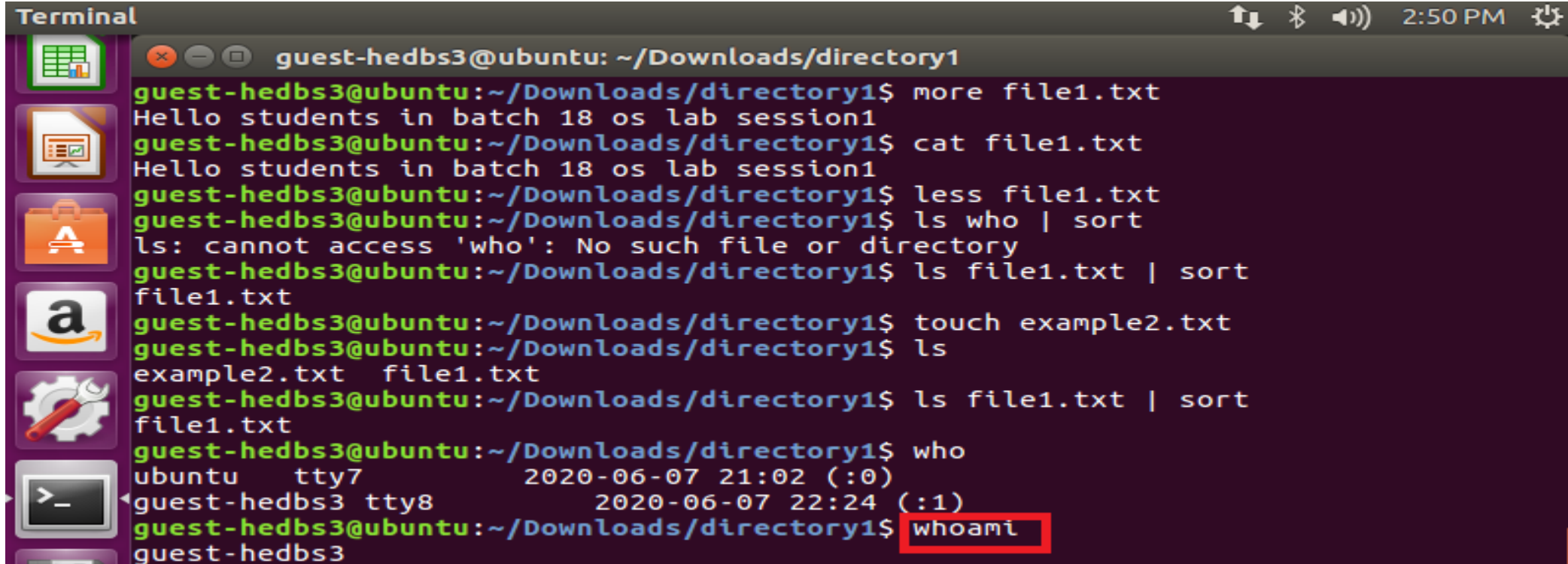
This is used to find out who's working on our system. As we now know, Linux is a multiuser system. Even if we're using one computer at our home, we may be working as more than one person. For example, if we logged in as 'root' but are working as 'guest-hedbs3'. We may see something like this:

This is just Linux's way of saying that 'ubuntu' started working on terminal 2020-06-07 at 21:02 in the afternoon and guest-hedbs3 started working on terminal 2 at 22:24. This is mainly used in networked situations so the system administrator knows who's working.

A terminal window titled 'Terminal' with a dark background and light-colored text. The window shows a series of commands and their outputs. The user is 'guest-hedbs3' on an 'ubuntu' system, located in the directory '~/Downloads/directory1'. The commands executed are: 'more file1.txt' (output: 'Hello students in batch 18 os lab session1'), 'cat file1.txt' (output: 'Hello students in batch 18 os lab session1'), 'less file1.txt', 'ls who | sort' (output: 'ls: cannot access 'who': No such file or directory'), 'ls file1.txt | sort' (output: 'file1.txt'), 'touch example2.txt', 'ls' (output: 'example2.txt file1.txt'), and 'ls file1.txt | sort' (output: 'file1.txt'). The final command, 'who', is highlighted with a red box. Its output shows two active sessions: 'ubuntu tty7 2020-06-07 21:02 (:0)' and 'guest-hedbs3 tty8 2020-06-07 22:24 (:1)'. The terminal window has a standard Ubuntu interface with a sidebar on the left showing application icons and a top bar with system status icons and the time '2:50 PM'.

18.whoami command

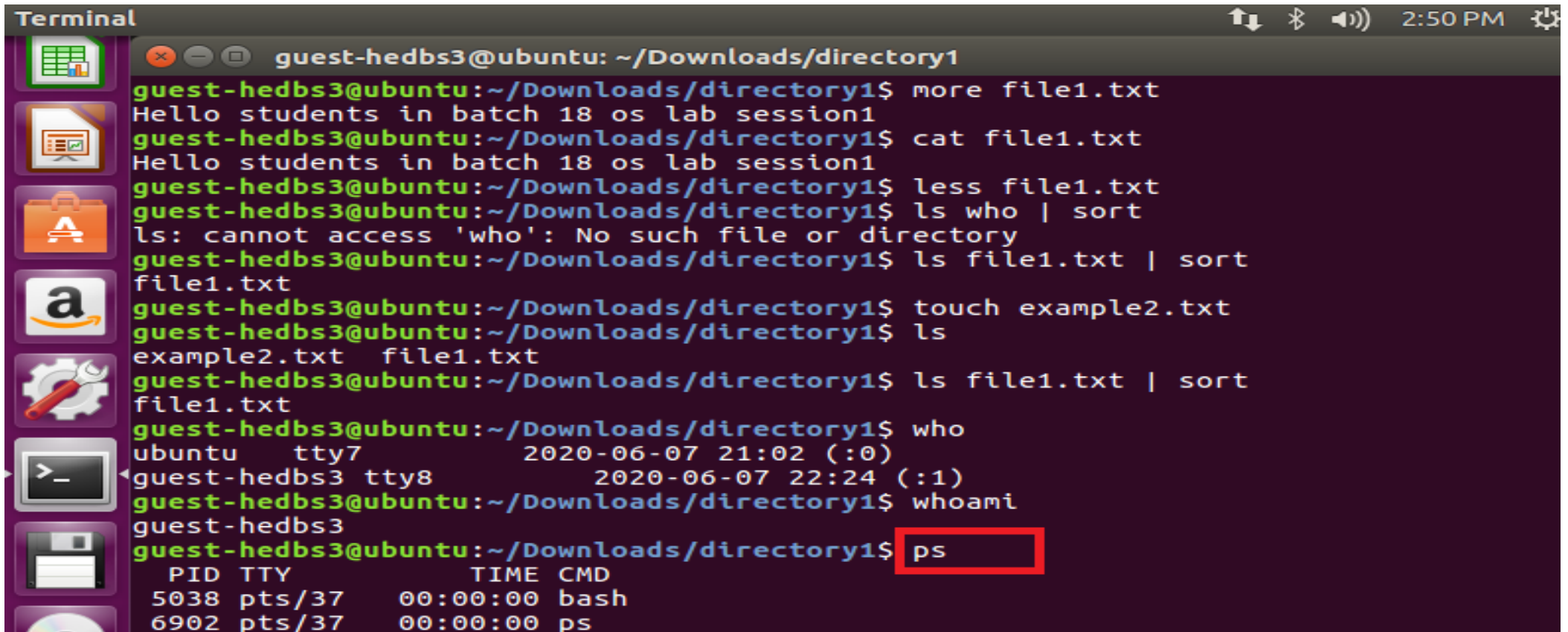
It is a little program that tells us who we are, just in case we didn't know already. Actually it tells us who we are in terms of how Linux understands who you are, that is to say, our user name.



```
Terminal
guest-hedbs3@ubuntu: ~/Downloads/directory1
guest-hedbs3@ubuntu:~/Downloads/directory1$ more file1.txt
Hello students in batch 18 os lab session1
guest-hedbs3@ubuntu:~/Downloads/directory1$ cat file1.txt
Hello students in batch 18 os lab session1
guest-hedbs3@ubuntu:~/Downloads/directory1$ less file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ ls who | sort
ls: cannot access 'who': No such file or directory
guest-hedbs3@ubuntu:~/Downloads/directory1$ ls file1.txt | sort
file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ touch example2.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ ls
example2.txt  file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ ls file1.txt | sort
file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ who
ubuntu      tty7                2020-06-07 21:02 (:0)
guest-hedbs3 tty8                2020-06-07 22:24 (:1)
guest-hedbs3@ubuntu:~/Downloads/directory1$ whoami
guest-hedbs3
```

19.ps command

It gives us a list of the processes running on our system. Just typing ps will give us the processes we're running as a user.

A terminal window titled "Terminal" with a dark background and light text. The window shows a series of commands and their outputs. The current command being entered is "ps", which is highlighted with a red rectangular box. The terminal output shows the results of the "ps" command, listing the PID, TTY, TIME, and CMD for the current user's processes.

```
Terminal
guest-hedbs3@ubuntu: ~/Downloads/directory1
guest-hedbs3@ubuntu:~/Downloads/directory1$ more file1.txt
Hello students in batch 18 os lab session1
guest-hedbs3@ubuntu:~/Downloads/directory1$ cat file1.txt
Hello students in batch 18 os lab session1
guest-hedbs3@ubuntu:~/Downloads/directory1$ less file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ ls who | sort
ls: cannot access 'who': No such file or directory
guest-hedbs3@ubuntu:~/Downloads/directory1$ ls file1.txt | sort
file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ touch example2.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ ls
example2.txt  file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ ls file1.txt | sort
file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ who
ubuntu  tty7          2020-06-07 21:02 (:0)
guest-hedbs3  tty8          2020-06-07 22:24 (:1)
guest-hedbs3@ubuntu:~/Downloads/directory1$ whoami
guest-hedbs3
guest-hedbs3@ubuntu:~/Downloads/directory1$ ps
  PID TTY          TIME CMD
 5038 pts/37      00:00:00 bash
 6902 pts/37      00:00:00 ps
```


20.chmod command

The chmod command changes the access mode of one file or multiple files. The syntax for the chmod command is:

mode:

Who u=user, g=group, o=other, a=all (default)

Opcode

+ means add permission

— means remove permission

= means assign permission and remove the permission of unspecified fields

Permission r=Read, w=write, x=Execute

Examples:

```
chmod ug+rw mydir
```

```
chmod a-w myfile
```

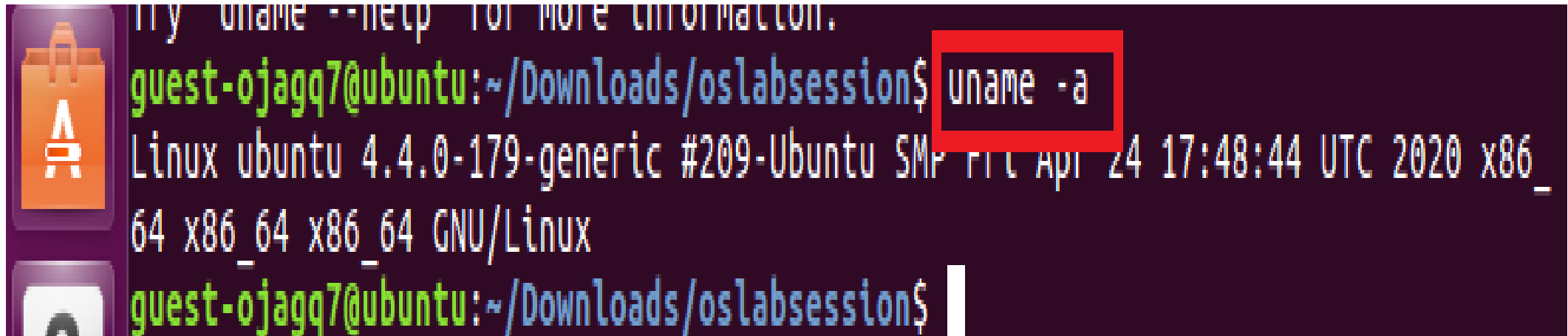
file1.txt has given user and group read and write permission and check with ls -al command

User and group has given read,write and execute permission and check with ls -al command

```
Terminal
guest-hedbs3@ubuntu: ~/Downloads
-rw-rw-r-- 1 guest-hedbs3 guest-hedbs3  0 Jun  8 14:46 example2.txt
-rw-rw-r-- 1 guest-hedbs3 guest-hedbs3 103 Jun  8 15:12 file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ chmod ug+rw file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ ls -al
total 4
drwxrwxr-x 2 guest-hedbs3 guest-hedbs3  80 Jun  8 15:12 .
drwxr-xr-x 4 guest-hedbs3 guest-hedbs3  80 Jun  7 22:37 ..
-rw-rw-r-- 1 guest-hedbs3 guest-hedbs3   0 Jun  8 14:46 example2.txt
-rw-rw-r-- 1 guest-hedbs3 guest-hedbs3 103 Jun  8 15:12 file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ chmod ug+rwx file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ ls -al
total 4
drwxrwxr-x 2 guest-hedbs3 guest-hedbs3  80 Jun  8 15:12 .
drwxr-xr-x 4 guest-hedbs3 guest-hedbs3  80 Jun  7 22:37 ..
-rw-rw-r-- 1 guest-hedbs3 guest-hedbs3   0 Jun  8 14:46 example2.txt
-rwxrwxr-- 1 guest-hedbs3 guest-hedbs3 103 Jun  8 15:12 file1.txt
guest-hedbs3@ubuntu:~/Downloads/directory1$ cd ..
guest-hedbs3@ubuntu:~/Downloads$ ls -al
total 0
drwxr-xr-x  4 guest-hedbs3 guest-hedbs3  80 Jun  7 22:37 .
drwx----- 16 guest-hedbs3 guest-hedbs3 460 Jun  7 22:24 ..
drwxrwxr-x  2 guest-hedbs3 guest-hedbs3  80 Jun  8 15:12 directory1
drwxrwxr-x  2 guest-hedbs3 guest-hedbs3  40 Jun  7 22:28 oslabsession
guest-hedbs3@ubuntu:~/Downloads$
```

21. Uname -a command

summary about the system



A terminal window with a dark purple background. On the left side, there is a vertical dock with two icons: an orange shopping bag icon and a white icon of a computer monitor. The terminal text is as follows:

```
try 'uname --help' for more information.  
guest-ojagq7@ubuntu:~/Downloads/oslabsession$ uname -a  
Linux ubuntu 4.4.0-179-generic #209-Ubuntu SMP Fri Apr 24 17:48:44 UTC 2020 x86_  
64 x86_64 x86_64 GNU/Linux  
guest-ojagq7@ubuntu:~/Downloads/oslabsession$
```

The command `uname -a` is highlighted with a red rectangular box.

End of lab session

Thank you