

# ECE 1175 – Embedded Systems Design

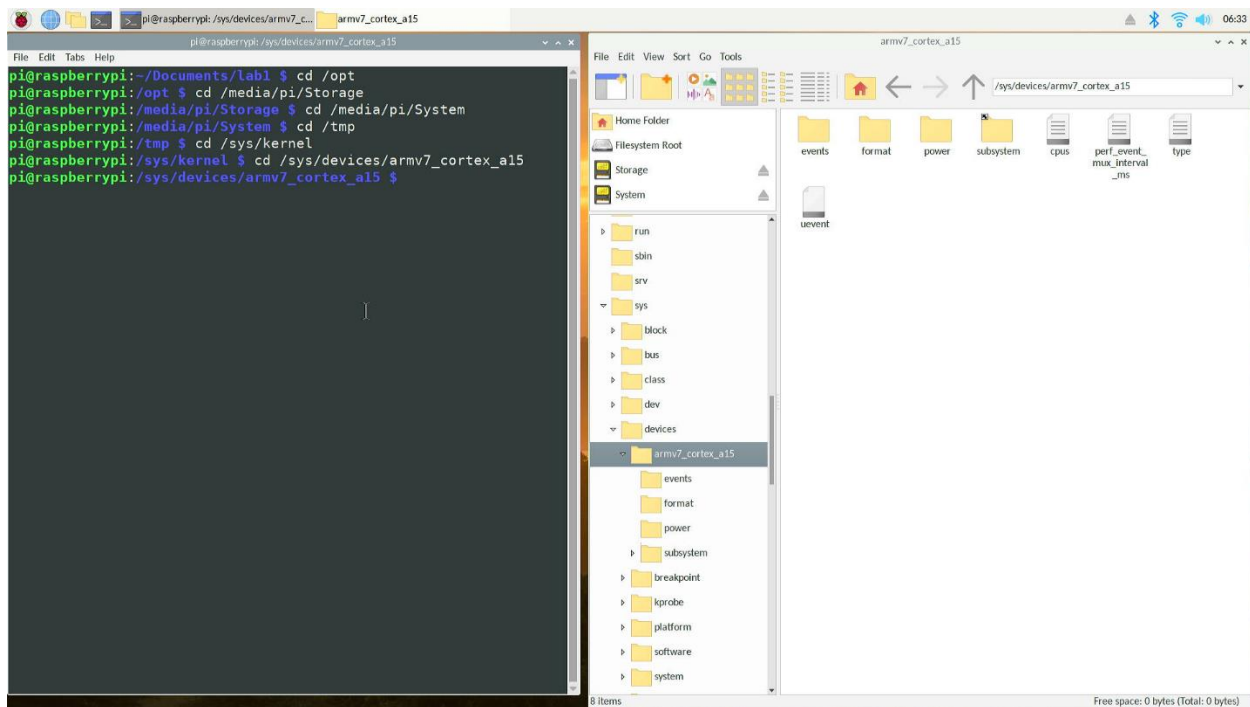
Yinhao Qian

## Lab 1 Report

Section 1 (40%): Take the screenshot of every subtask and then send them as a lab report to the TA.

Note: when you type command line in the terminal, please do not include “<>” these two signs.

1. Please use cd command to navigate file system through terminal. Please at least list seven directories and briefly explain what is to store in each directory



/opt – stores the add-on applications packages.

/media/pi/Storage – stores accessible files as media in device-specific folder

/media/pi/System – store system-related files in device-specific folder

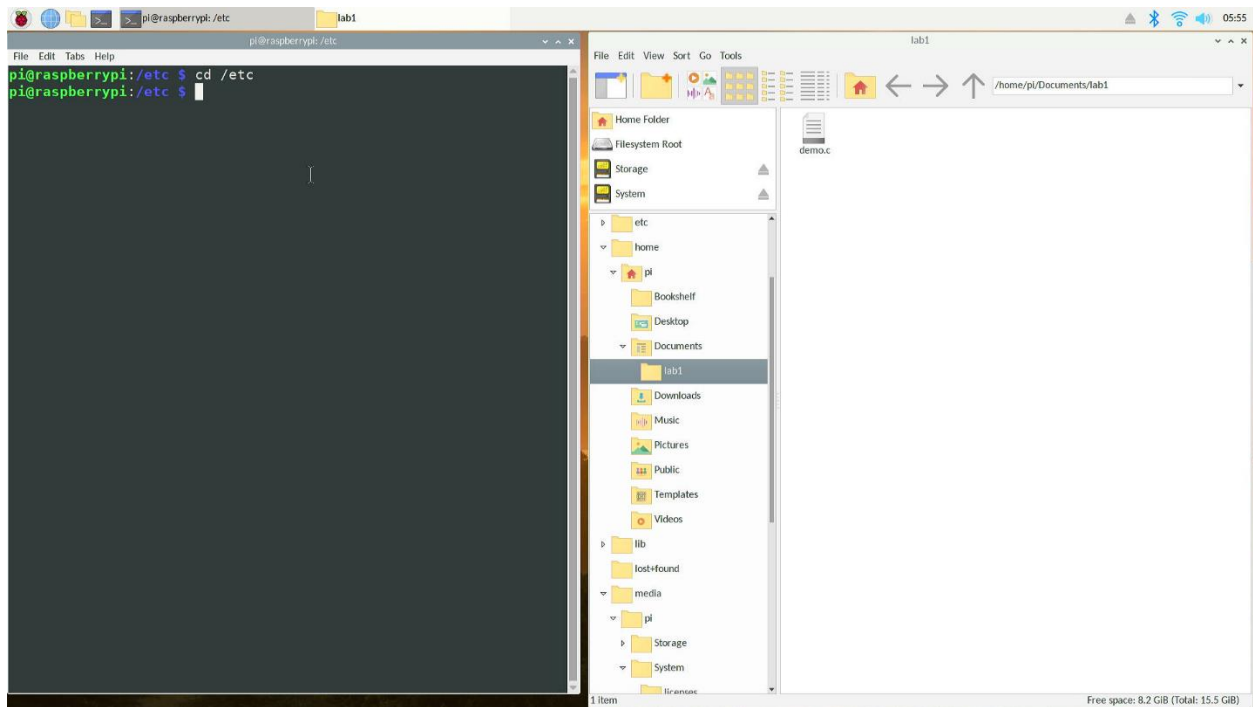
/tmp – stores general temporary files

/sys/kernel – stores core kernel files of the system.

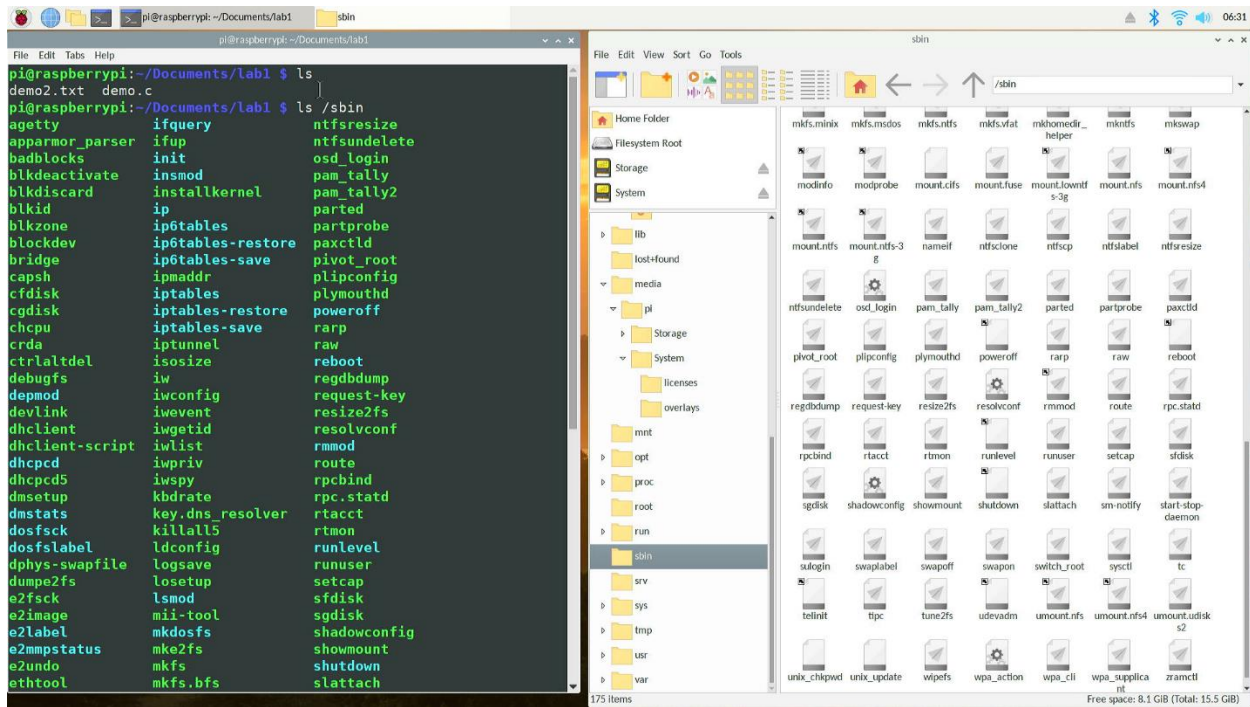
/sys/devices – stores general devices information related to this model.

/etc – stores configuration files

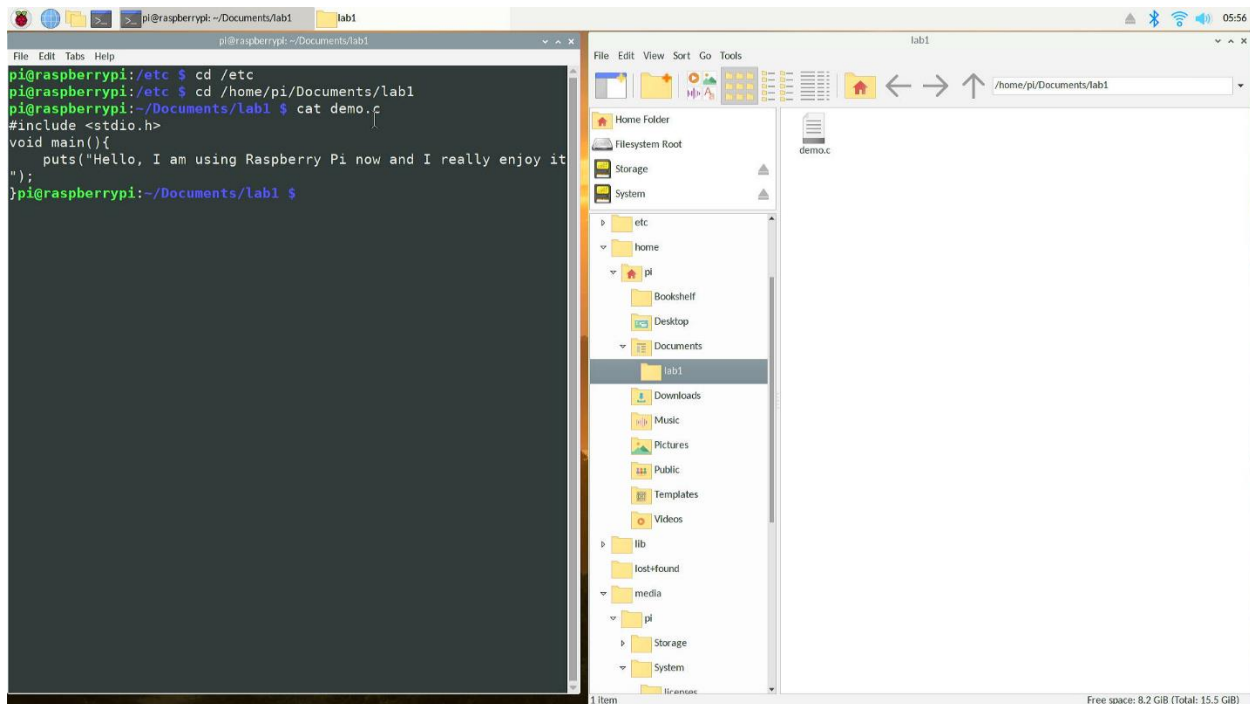
2. a)For instance: /etc: system management and configuration file



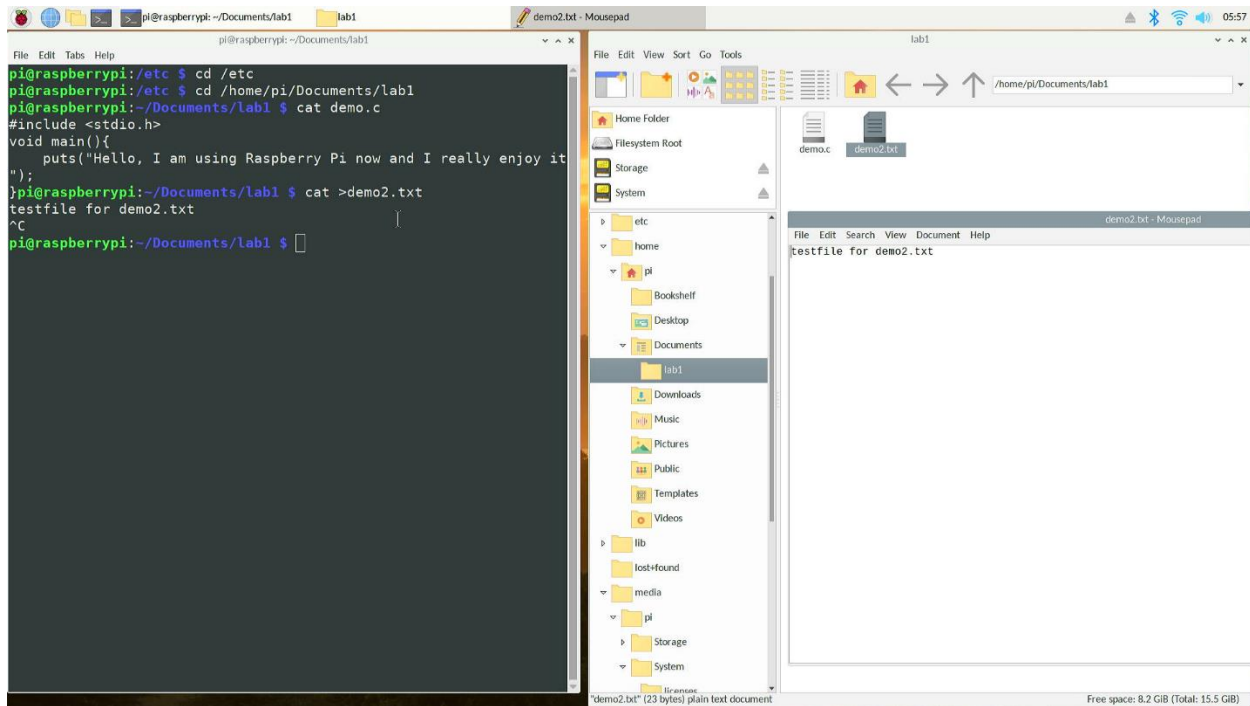
3. Please get familiar with ls command to see files under current directory while navigating file system



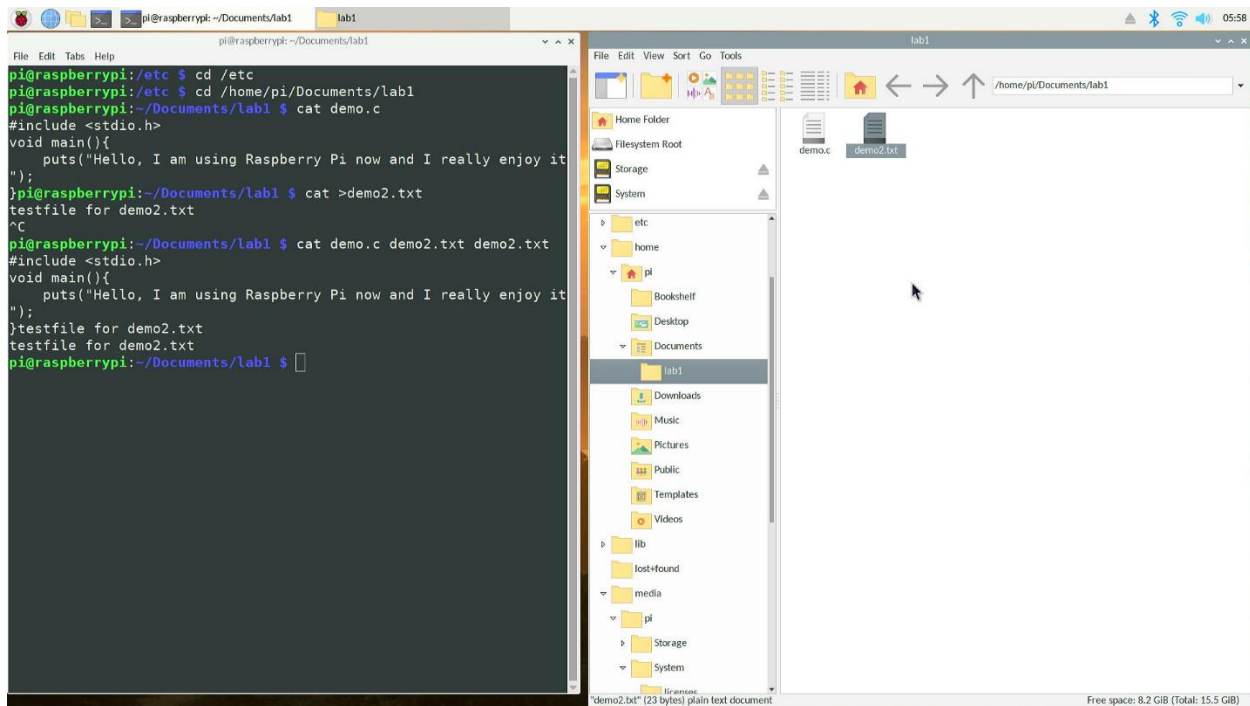
4. Please try to use cat command in way of creating new file, showing file and merging two files.
5. a) `cat <filename>`



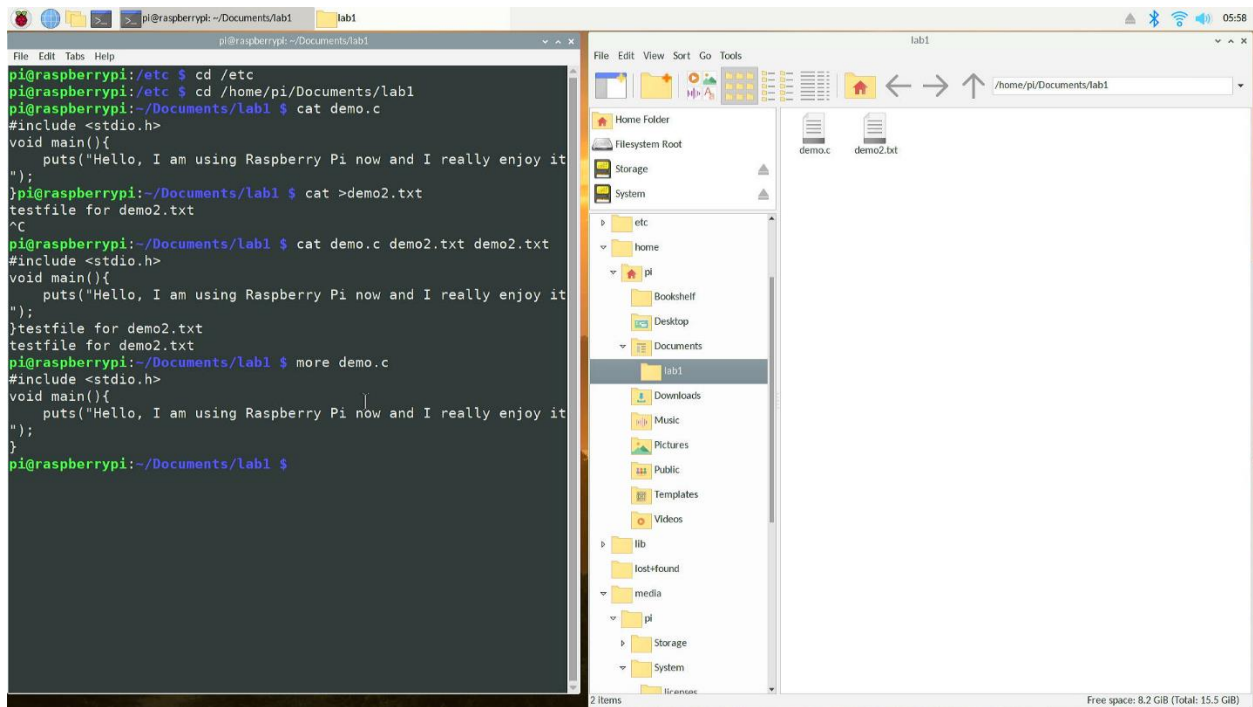
6. b)cat > <filename>



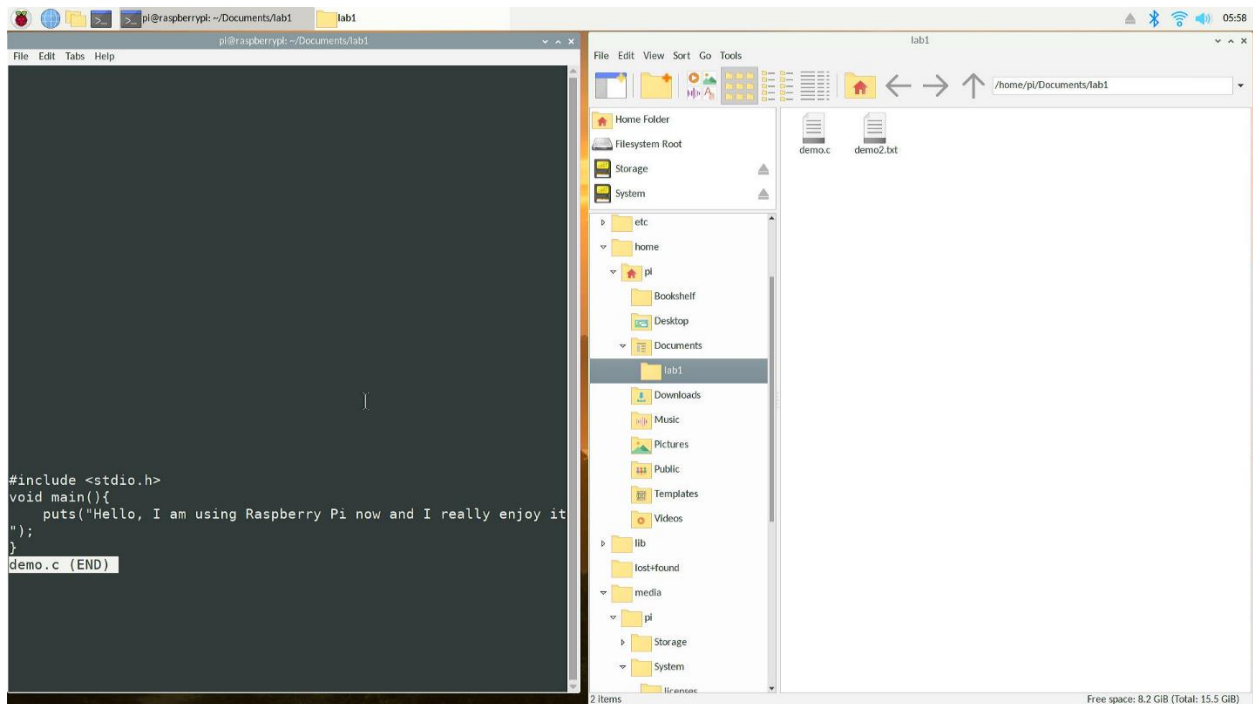
7. c)cat <filename 1> <filename2> <merged filename>



8. Please try command more, less
9. a)more <filename>



10. b)less <filename>





The screenshot displays a Raspberry Pi desktop environment. On the left, a terminal window titled 'pi@raspberrypi:~/Documents/lab1' shows the following commands and output:

```

pi@raspberrypi:~/Documents/lab1
pi@raspberrypi:~/Documents/lab1
pi@raspberrypi:~/Documents/lab1 $ cd /etc
pi@raspberrypi:~/Documents/lab1 $ cd /home/pi/Documents/lab1
pi@raspberrypi:~/Documents/lab1 $ cat demo.c
#include <stdio.h>
void main(){
    puts("Hello, I am using Raspberry Pi now and I really enjoy it
");
}
pi@raspberrypi:~/Documents/lab1 $ cat >demo2.txt
testfile for demo2.txt
^C
pi@raspberrypi:~/Documents/lab1 $ cat demo.c demo2.txt demo2.txt
#include <stdio.h>
void main(){
    puts("Hello, I am using Raspberry Pi now and I really enjoy it
");
}
testfile for demo2.txt
testfile for demo2.txt
pi@raspberrypi:~/Documents/lab1 $ more demo.c
#include <stdio.h>
void main(){
    puts("Hello, I am using Raspberry Pi now and I really enjoy it
");
}
pi@raspberrypi:~/Documents/lab1 $ less demo.c
[2]+  Stopped                  less demo.c
pi@raspberrypi:~/Documents/lab1 $ apt-get update
Reading package lists... Done
E: Could not open lock file /var/lib/apt/lists/lock - open (13: Per
mission denied)
E: Unable to lock directory /var/lib/apt/lists/
W: Problem unlinking the file /var/cache/apt/pkgcache.bin - Remove
Caches (13: Permission denied)
W: Problem unlinking the file /var/cache/apt/srcpkgcache.bin - Rem
oveCaches (13: Permission denied)
pi@raspberrypi:~/Documents/lab1 $
  
```

On the right, a file manager window titled 'lab1' shows the file system structure. The left sidebar lists the following folders: etc, home, pi, Bookshelf, Desktop, Documents, lab1 (selected), Downloads, Music, Pictures, Public, Templates, Videos, lib, lost-found, media, pi, Storage, System, and for someone. The main pane displays the contents of the 'lab1' folder, showing two files: 'demo.c' and 'demo2.txt'.

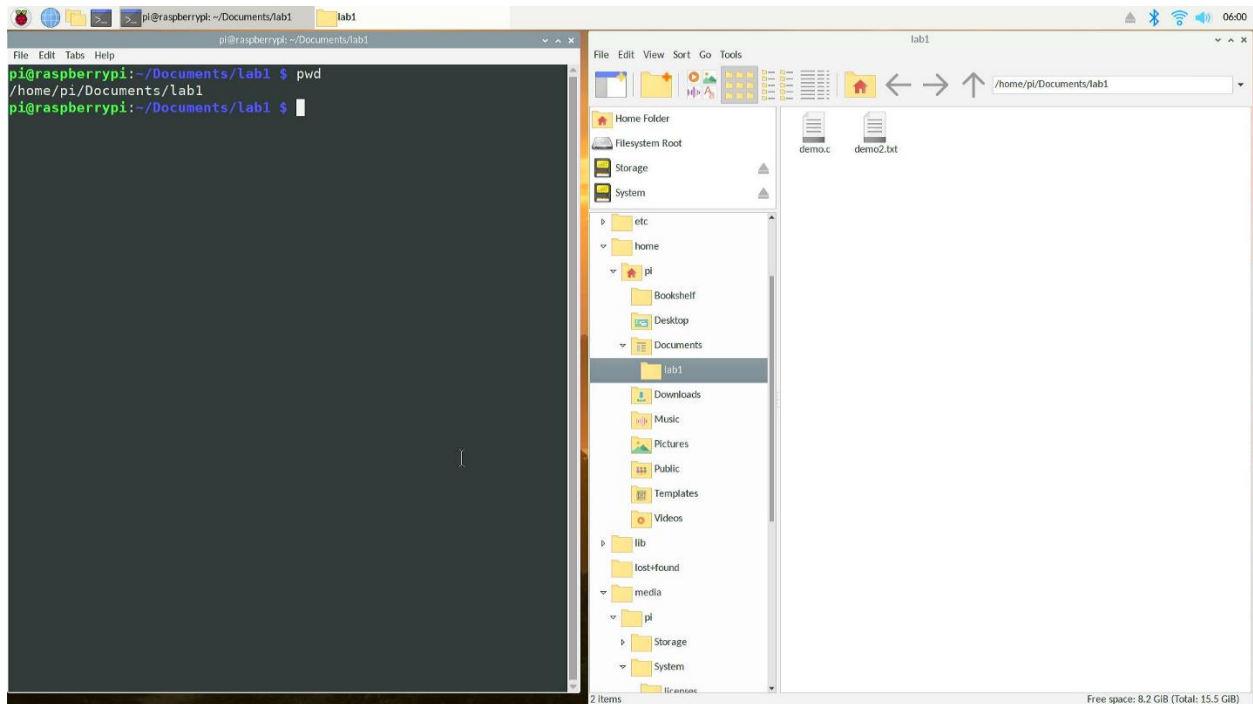
The desktop background is a light blue gradient. The top status bar shows the time as 05:58 and various system icons (Wi-Fi, Bluetooth, network).

“apt-get update” will only list things that are available to be upgraded, but no upgrading will be performed. “apt-get upgrade” will attempt to upgrade all packages to the latest version.

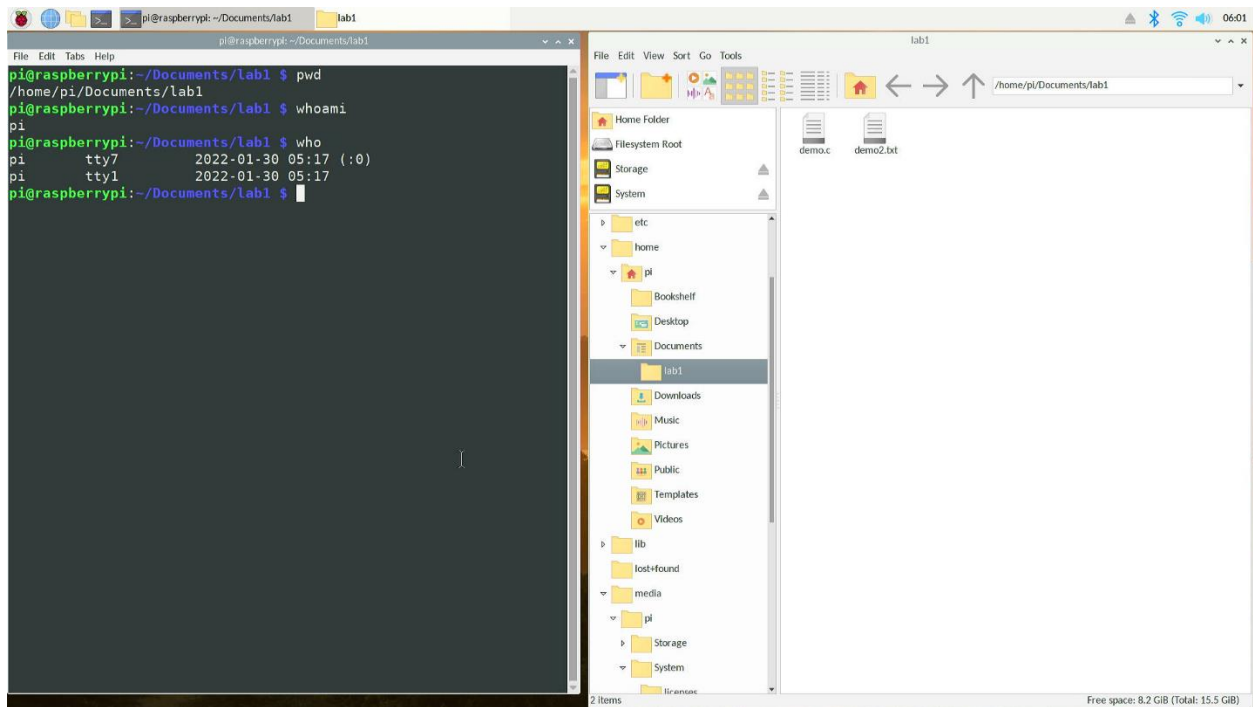
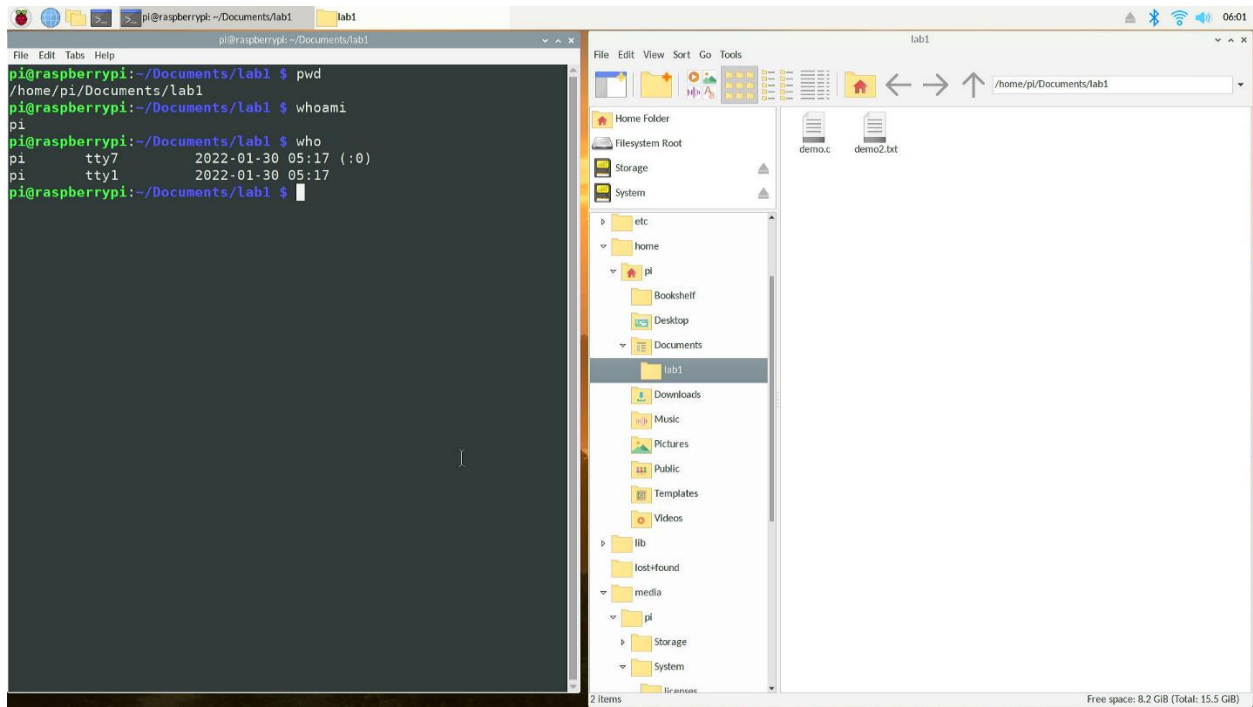
12. Please use `apt-get install <software name>` command to install a text editor (nano or vim) if there is no built-in text editor.

There are already many text editors installed, so I decided not to install any new editors.

13. Please try `pwd` command to see the path to your current directory.



14. Please try `whoami`/`who` command to see your current user of login

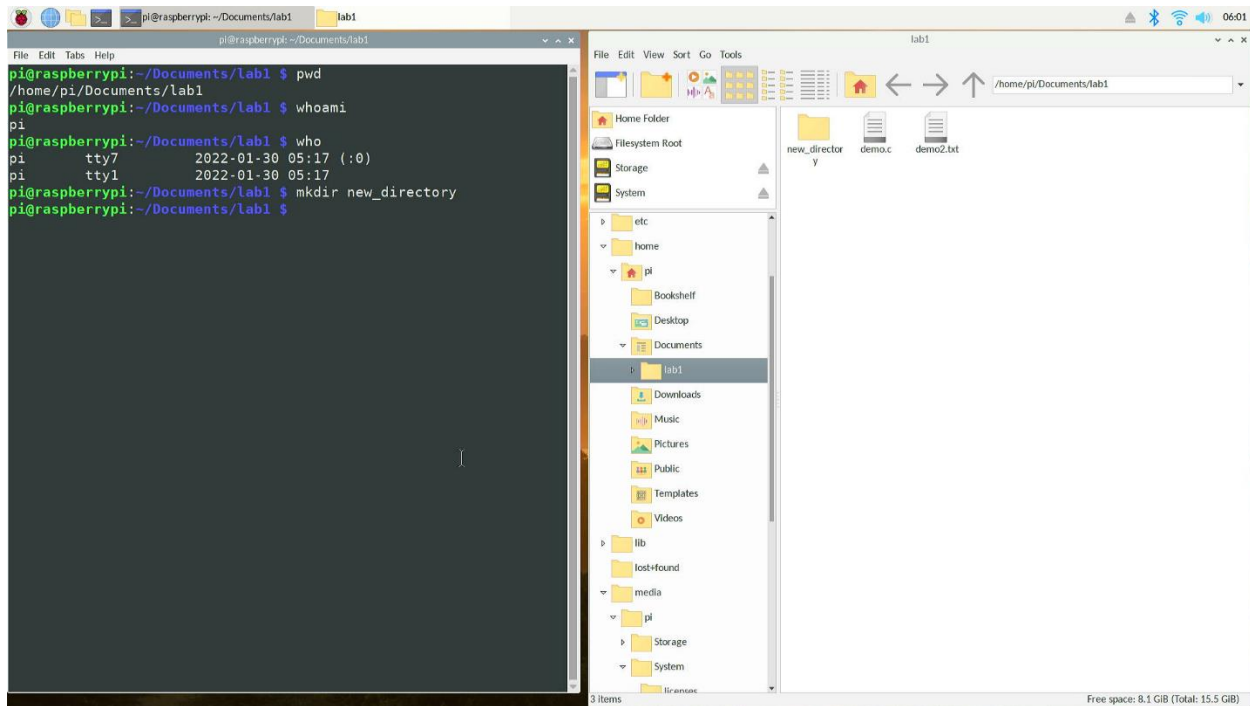


15. Please try `mkdir`, `rmdir`, `cp` `rm` for making new directory, remove directory, copying file or directory, removing file or directory and understand when to use each command.

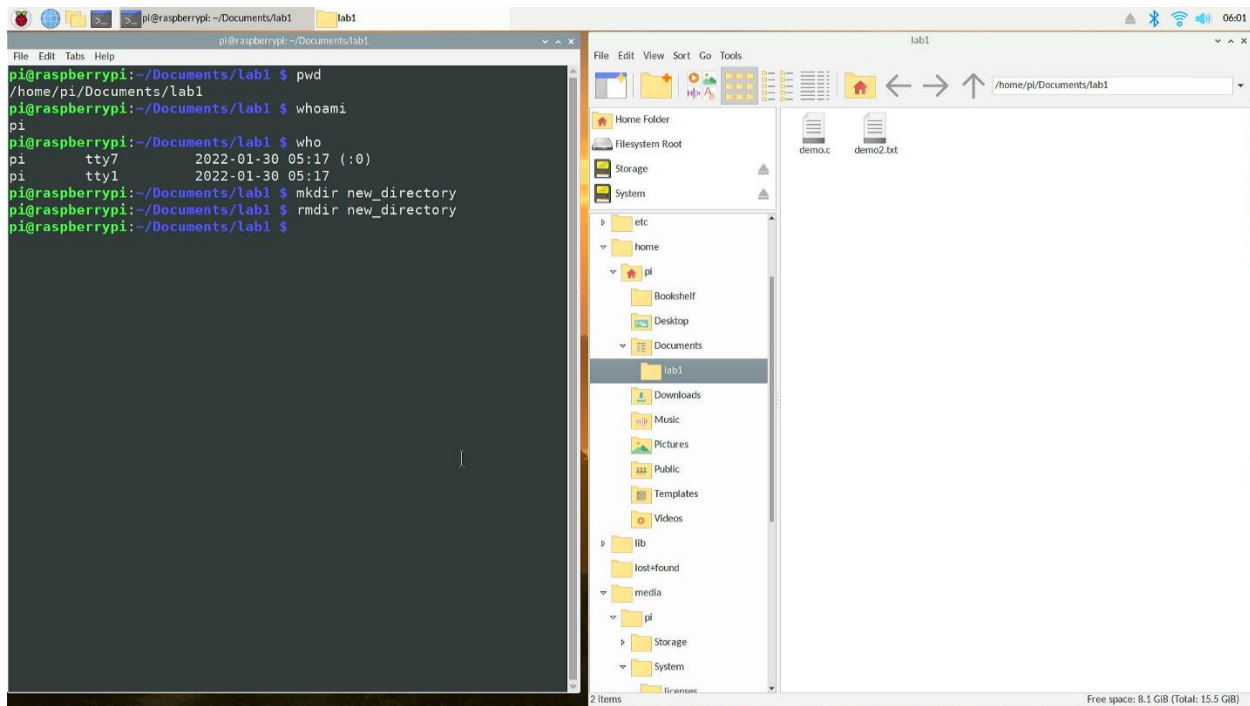
16. a) `mkdir <directory name>`



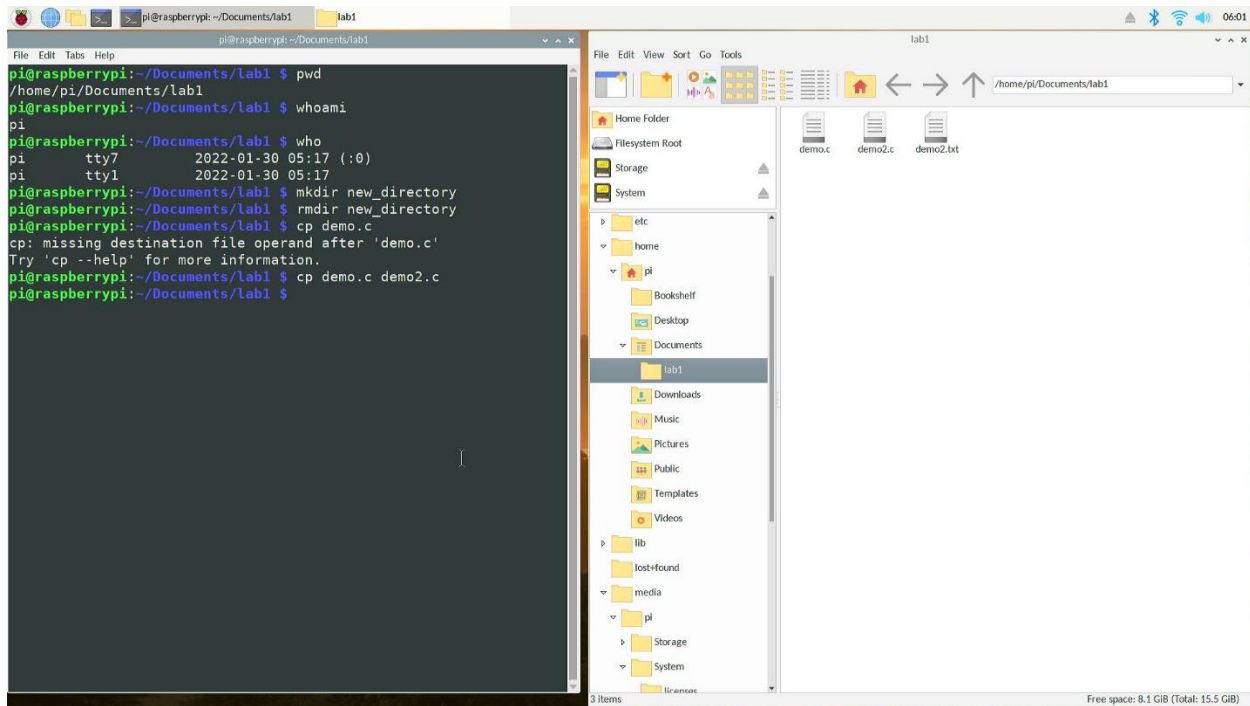
17.



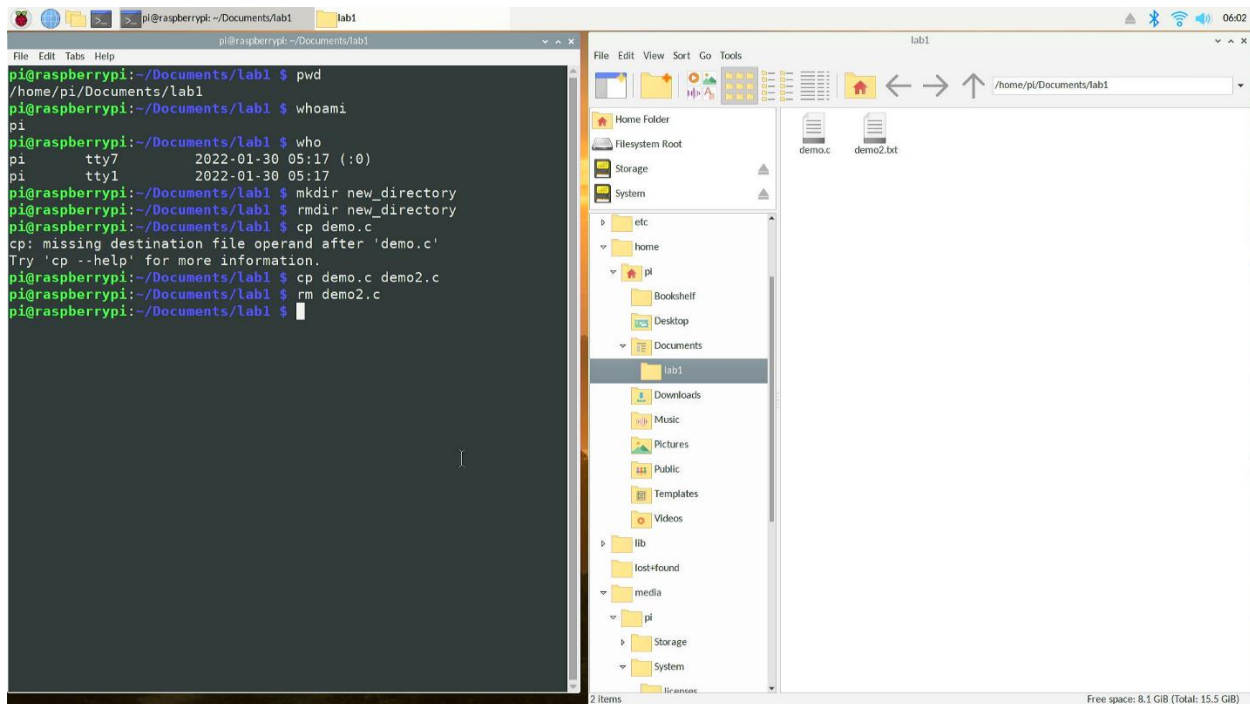
18. b) `rmdir <directory name>`



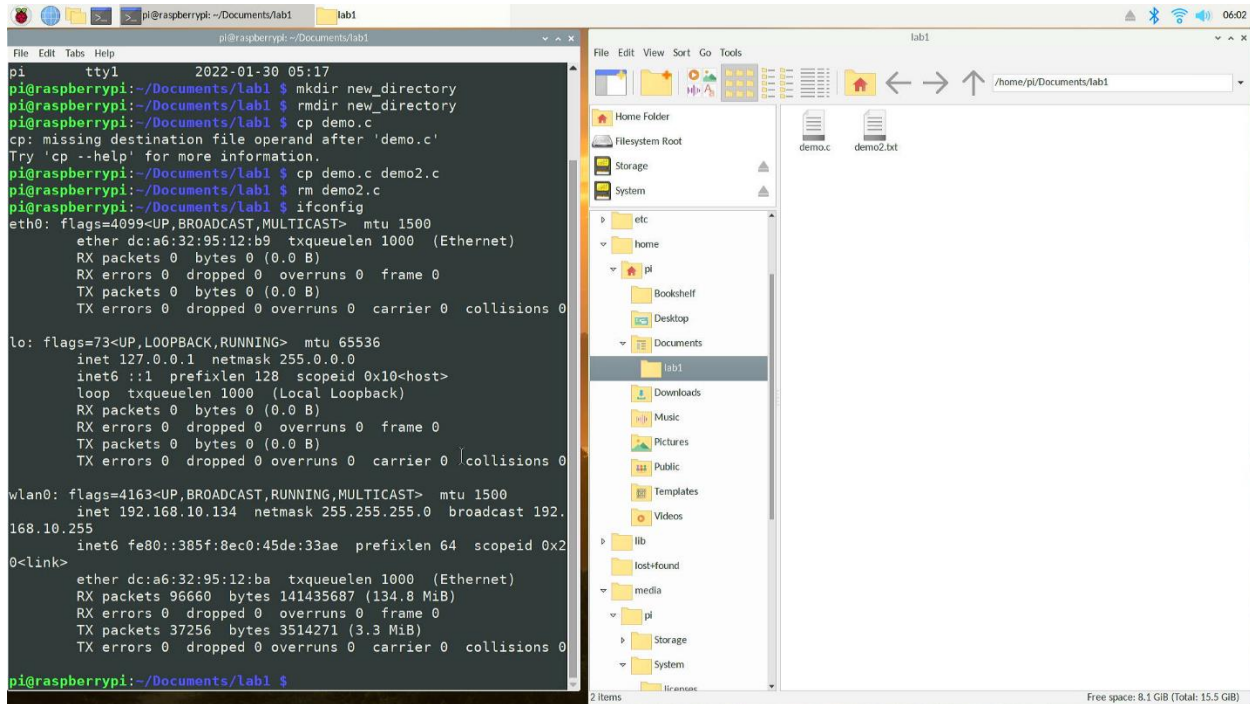
19. c)cp <filename1> <filename2>



20. d)rm <filename>



## 21. Please use ifconfig to see your IP Address



The screenshot shows a Raspberry Pi desktop environment. On the left, a terminal window displays the output of the `ifconfig` command. On the right, a file manager window shows the directory structure of the `/home/pi/Documents/lab1` folder.

```
pi@raspberrypi:~/Documents/lab1
pi$ ttyl
2022-01-30 05:17
pi@raspberrypi:~/Documents/lab1 $ mkdir new_directory
pi@raspberrypi:~/Documents/lab1 $ rmdir new_directory
pi@raspberrypi:~/Documents/lab1 $ cp demo.c
cp: missing destination file operand after 'demo.c'
Try 'cp --help' for more information.
pi@raspberrypi:~/Documents/lab1 $ cp demo.c demo2.c
pi@raspberrypi:~/Documents/lab1 $ rm demo2.c
pi@raspberrypi:~/Documents/lab1 $ ifconfig
eth0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    ether dc:a6:32:95:12:b9 txqueuelen 1000 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

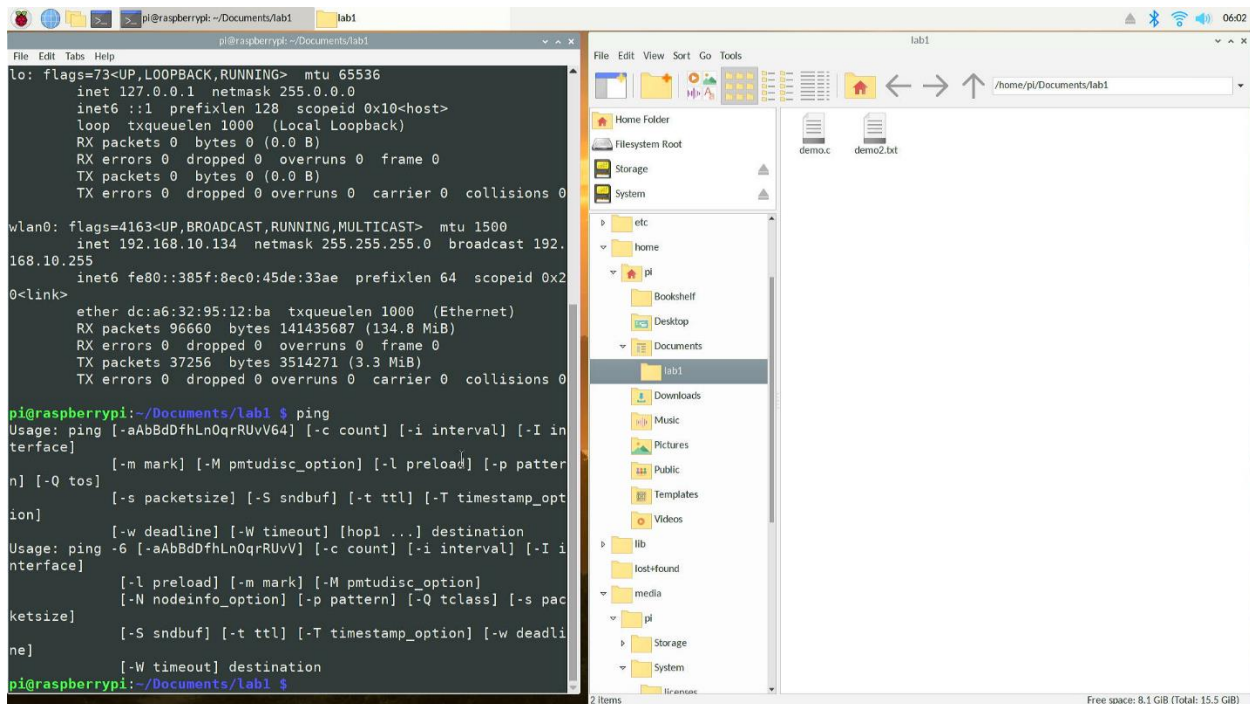
wlan0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.10.134 netmask 255.255.255.0 broadcast 192.168.10.255
    inet6 fe80::385f:8ec0:45de:33ae prefixlen 64 scopeid 0x2
    0<link>
    ether dc:a6:32:95:12:ba txqueuelen 1000 (Ethernet)
    RX packets 96660 bytes 141435687 (134.8 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 37256 bytes 3514271 (3.3 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

pi@raspberrypi:~/Documents/lab1 $
```

The file manager window shows the following directory structure:

- Home Folder
- Filesystem Root
- Storage
- System
- etc
- home
  - pi
    - Bookshelf
    - Desktop
    - Documents
      - lab1
      - Downloads
      - Music
      - Pictures
      - Public
      - Templates
      - Videos
    - lib
    - lost-found
    - media
      - pi
        - Storage
    - System
    - Templates

## 22. Please try ping command to test your network

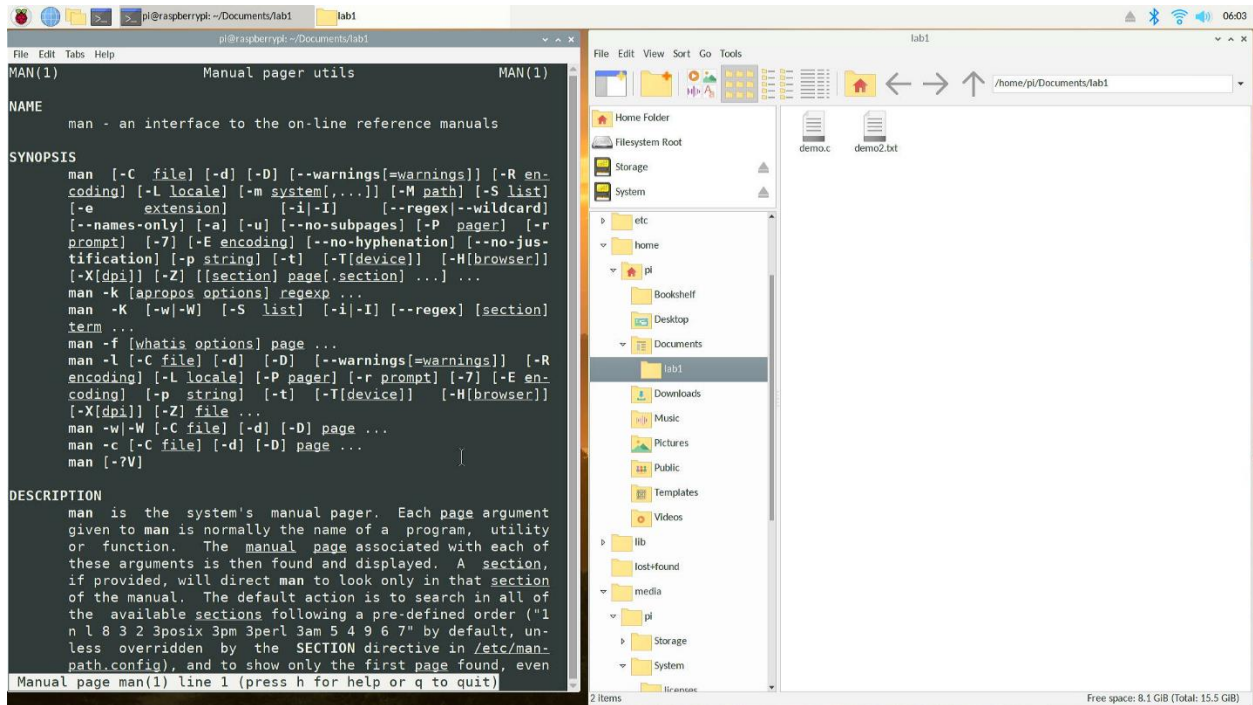


The screenshot shows the same Raspberry Pi desktop environment as the previous one. The terminal window now displays the output of the `ping` command. The file manager window remains open, showing the same directory structure.

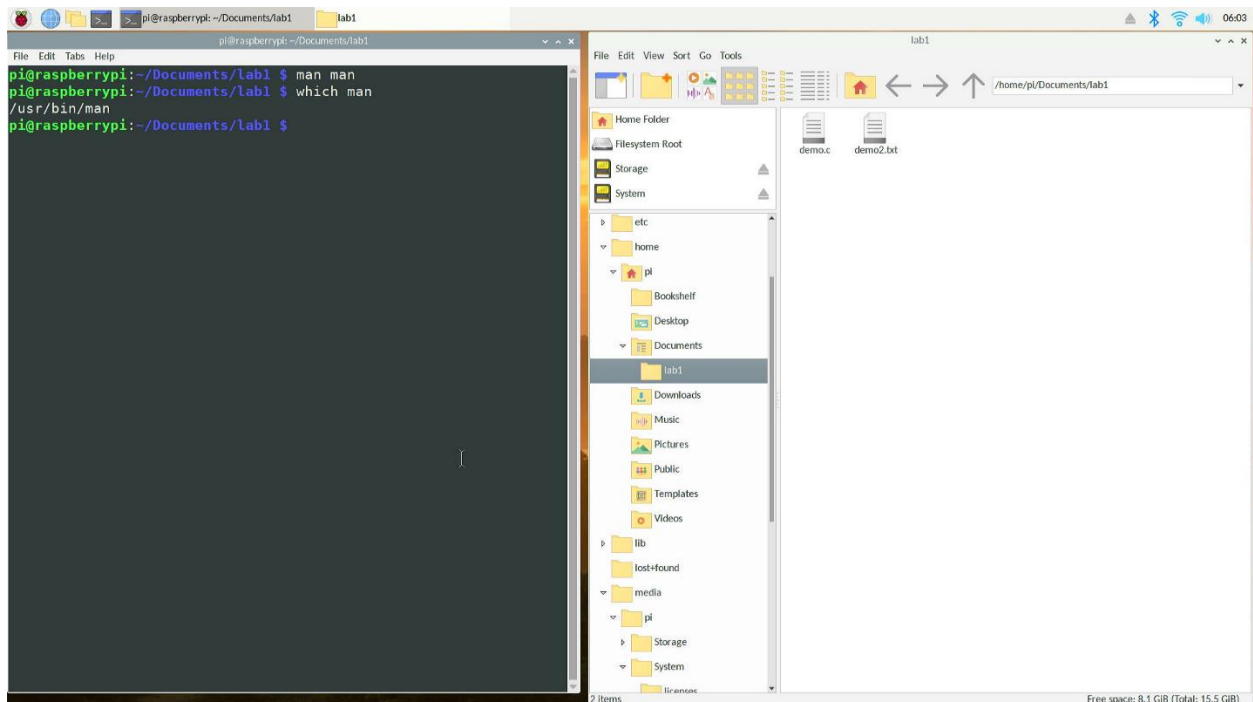
```
pi@raspberrypi:~/Documents/lab1
pi$ ping
Usage: ping [-aAbBdDfHlNqRrUvV64] [-c count] [-i interval] [-I interface]
        [-m mark] [-M pmtudisc_option] [-l preload] [-p pattern] [-Q tos]
        [-s packetsize] [-S sndbuf] [-t ttl] [-T timestamp_option]
        [-w deadline] [-W timeout] [hop1 ...] destination
Usage: ping -6 [-aAbBdDfHlNqRrUvV] [-c count] [-i interval] [-I interface]
        [-l preload] [-m mark] [-M pmtudisc_option]
        [-N nodeinfo_option] [-p pattern] [-Q tclass] [-s packetsize]
        [-S sndbuf] [-t ttl] [-T timestamp_option] [-w deadline]
        [-W timeout] destination
pi@raspberrypi:~/Documents/lab1 $
```

The file manager window shows the same directory structure as in the previous screenshot.

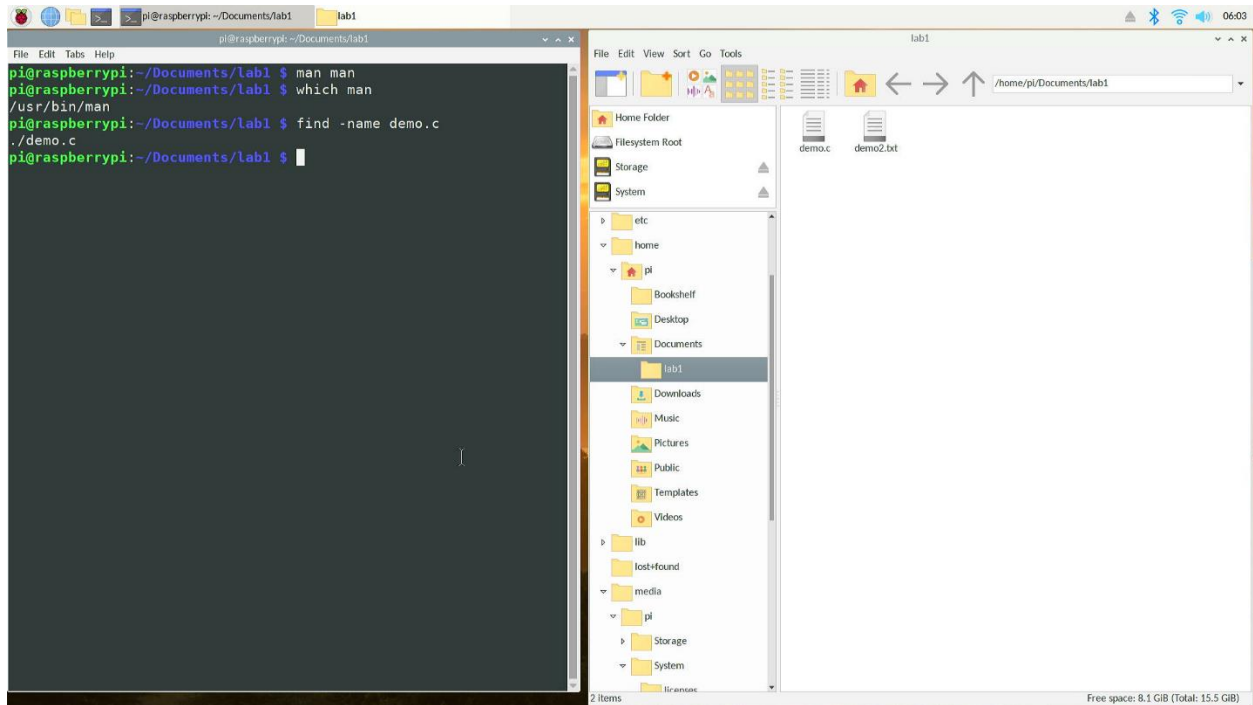
23. Please use `man <command name>` if you don't know how to use command, or `<command name> --help`.



24. Please try which `<command name>` to see if command exist.



25. Please try find <path> -name <filename> to find your file. (put “/” in the <path> meaning to find your file through whole file system)



Section 2 (60%): Demo to the TA on or before the due dates

**Video Demo Link:** <https://youtu.be/sN2ozpEk19s>

1. Please try to get one screenshot for your Raspberry Pi desktop.

(Hint: you may need to install scrot package)

2. Please try to display “Hello, I am using Raspberry Pi now and I really enjoy it” to terminal. You can use shell script, java, c, python or other language at your preference.
3. Please try to change resolution of your desktop in Raspberry Pi.

(Hint: try sudo raspi-config command to change resolution)

4. Please try to play sound through Raspberry Pi



(Hint: please try omxplayer command)

5. Please try to change the wallpaper of Raspberry Pi Desktop