

## Lab 1: Configuration and Secure Raspberry Pi

### Lab Overview:

This lab will help us in assembling, configuring, and securing the Raspberry Pi. Raspberry Pi will be used as a computer in this lab.

### Requirements:

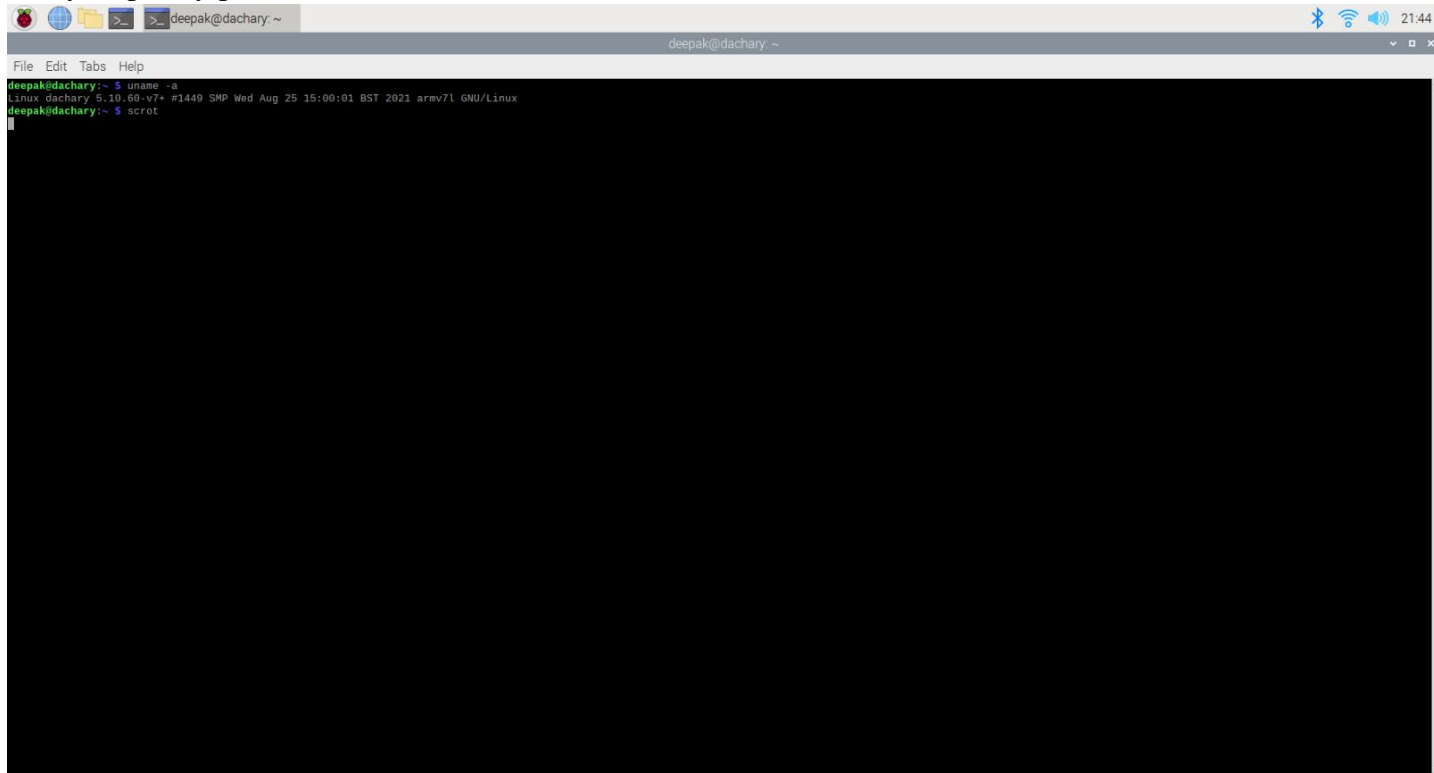
This lab requires raspberry pi 3B+, NOOB installed sd card, HDMI cable, monitor, mouse, and a keyboard.

### Initial Step:

The initial step is to install NOOB or Raspberry OS (Raspbian OS) in the SD card and assemble them as per the instruction in class and the links provided.

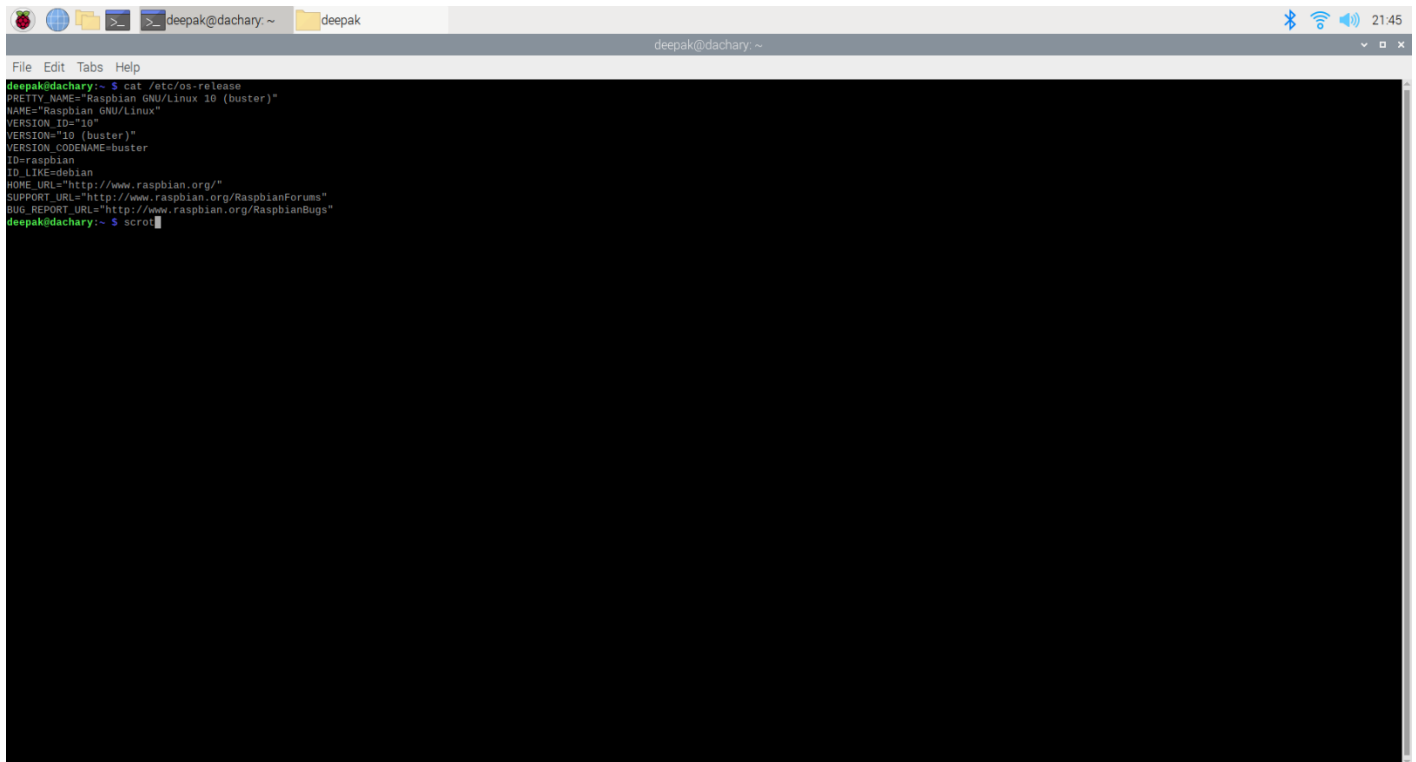
#### a. Version of OS

**i. uname -a:** This command will give version of the OS installed in my raspberry pi. The version of my raspberry pi is 5.10.60-v7+ as shown in the screenshot below.



```
deepak@dachary:~  
File Edit Tabs Help  
deepak@dachary:~$ uname -a  
Linux dachary 5.10.60-v7+ #1449 SMP Wed Aug 25 15:00:01 BST 2021 armv7l GNU/Linux  
deepak@dachary:~$ scrot
```

**ii. cat/etc/os-release:** This command will show the OS release version. The OS release for my raspberry OS is Raspbian GNU/Linux 10 (buster) as shown in the figure below.

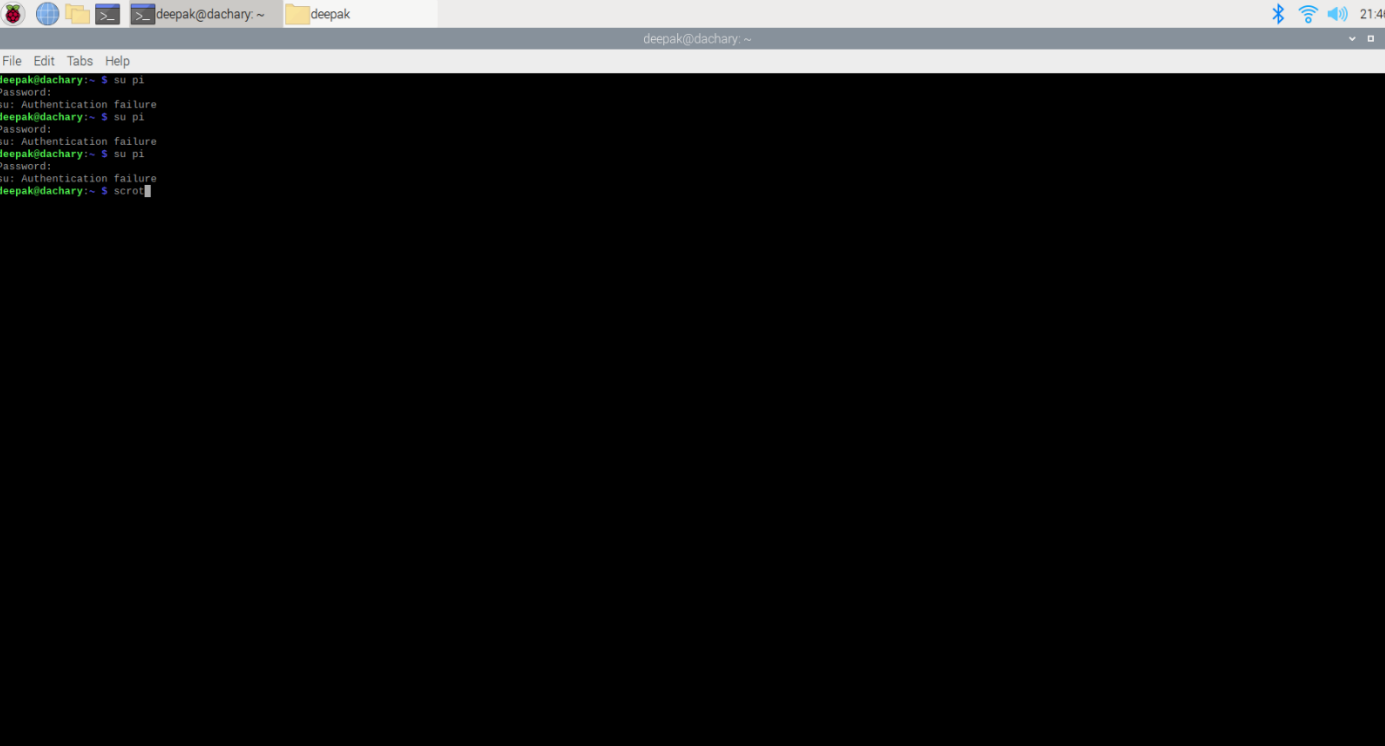
A screenshot of a terminal window on a Raspberry Pi. The window title is 'deepak@dachary: ~'. The terminal shows the command 'cat /etc/os-release' being executed, followed by its output: 'PRETTY\_NAME="Raspbian GNU/Linux 10 (buster)"', 'NAME="Raspbian GNU/Linux"', 'VERSION\_ID="10"', 'VERSION="10 (buster)"', 'VERSION\_CODENAME=buster', 'ID=raspbian', 'ID\_LIKE=debian', 'HOME\_URL="http://www.raspbian.org/"', 'SUPPORT\_URL="http://www.raspbian.org/RaspbianForums"', and 'BUG\_REPORT\_URL="http://www.raspbian.org/RaspbianBugs"'. The prompt 'deepak@dachary:~' is visible at the bottom of the terminal output.

```
deepak@dachary:~ $ cat /etc/os-release
PRETTY_NAME="Raspbian GNU/Linux 10 (buster)"
NAME="Raspbian GNU/Linux"
VERSION_ID="10"
VERSION="10 (buster)"
VERSION_CODENAME=buster
ID=raspbian
ID_LIKE=debian
HOME_URL="http://www.raspbian.org/"
SUPPORT_URL="http://www.raspbian.org/RaspbianForums"
BUG_REPORT_URL="http://www.raspbian.org/RaspbianBugs"
deepak@dachary:~ $
```

## **b. Default UserID security**

As we know that most of the security breaches and attacks in past are result of default password. Thus, we need to make our raspberry pi secure by making the password harder to guess. Passwords like <none>, pi, admin, root, toor, password are some of the commonly used passwords. In the further steps we will change the passwords to something harder not default. The proof changed password is shown in following screenshot.

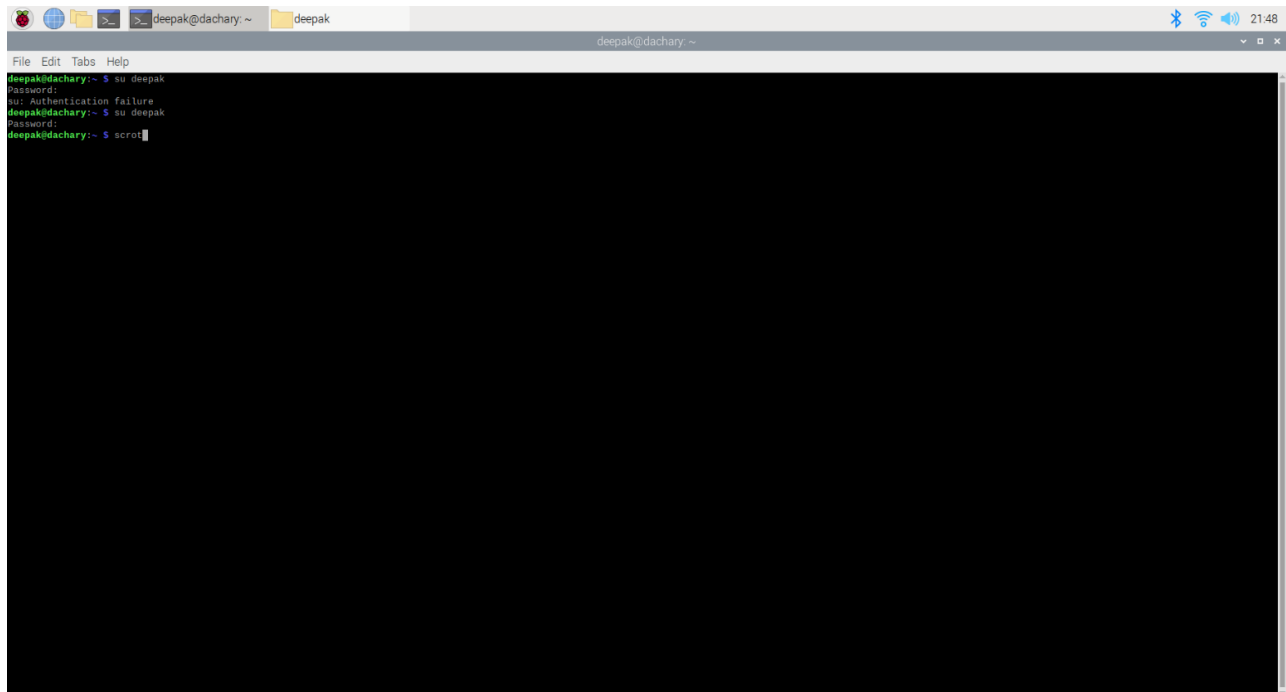
**i. su pi:** This command will ask user to login to user pi.

A screenshot of a Linux terminal window. The window has a title bar with standard Linux window controls (minimize, maximize, close) and a menu bar with 'File', 'Edit', 'Tabs', and 'Help'. The terminal content shows a user named 'deepak' at a host named 'dachary' in their home directory. They attempt to switch to the 'pi' user using 'su pi'. The prompt changes to 'su:' and they are asked for a password. After three failed attempts, the terminal returns to the 'deepak@dachary:~' prompt. The fourth attempt is 'su: Authentication failure', followed by 'deepak@dachary:~ \$ scrot', where the cursor is visible. The terminal background is black, and the text is green. The window's top bar shows the user 'deepak@dachary: ~' and the time '21:46'. System icons for Bluetooth, Wi-Fi, and audio are visible on the right side of the top bar.

**ii. su root:** This command will attempt to log in as user root.

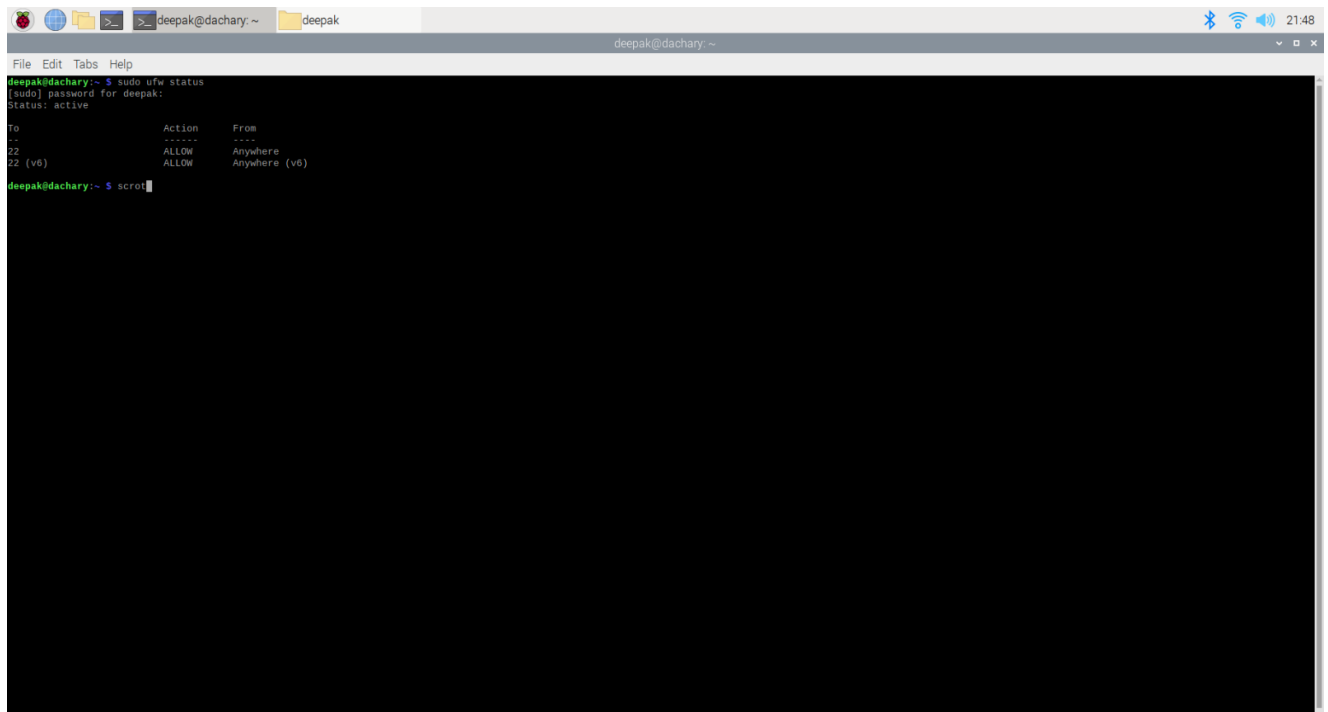
[illegible]

**c. su username:** In this step we will test all the default passwords and finally will use password I created to login to my username as shown in the screenshot below. I successfully logged in to user Deepak by using my secure password.

A terminal window titled 'deepak@dachary: ~' with a menu bar (File, Edit, Tabs, Help) and a status bar (deepak@dachary: ~). The terminal shows the following commands and output:

```
deepak@dachary:~$ su deepak
Password:
su: Authentication failure
deepak@dachary:~$ su deepak
Password:
deepak@dachary:~$ sscrot
```

**d. sudo ufw status:** This command will see all the firewall rule in my raspberry pi. Only port 22 is open as shown in the screenshot below.

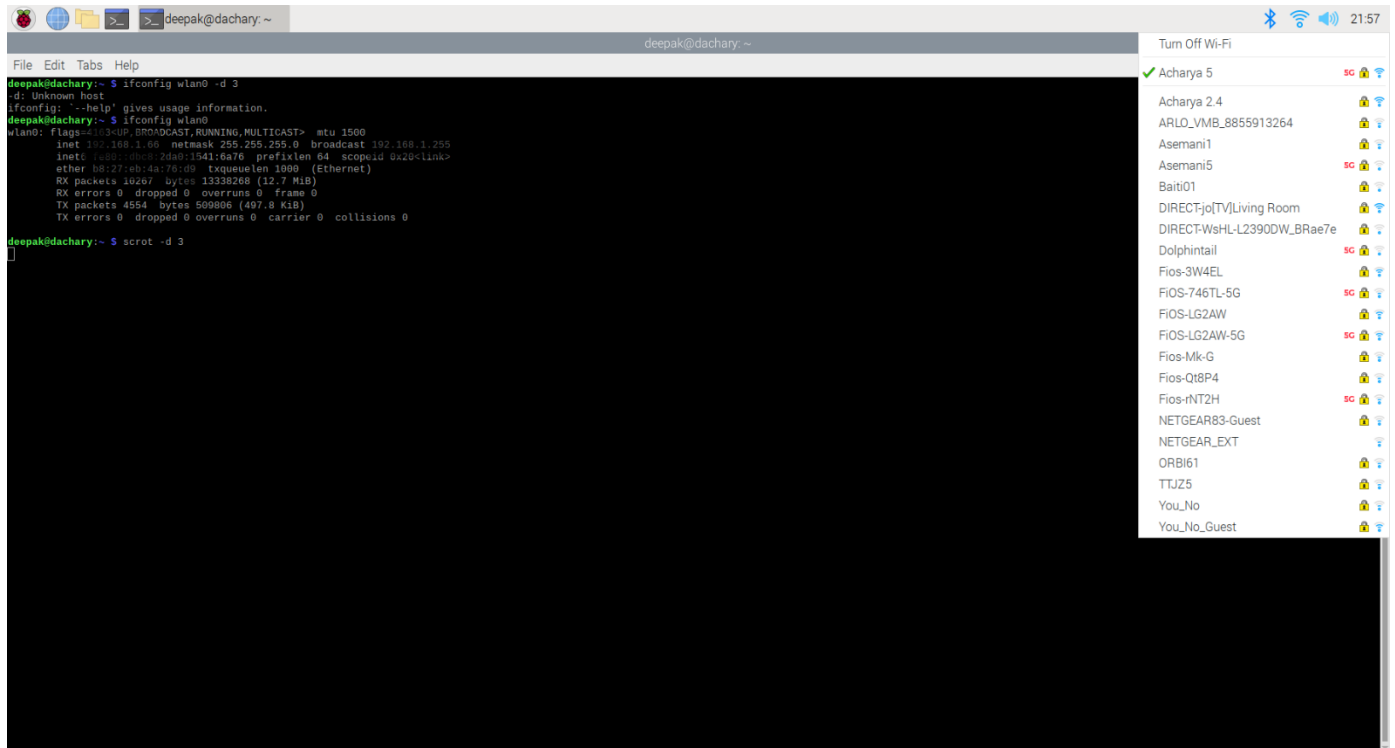
A terminal window titled 'deepak@dachary: ~' with a menu bar (File, Edit, Tabs, Help) and a status bar (deepak@dachary: ~). The terminal shows the following commands and output:

```
deepak@dachary:~$ sudo ufw status
[sudo] password for deepak:
Status: active

To Action From
--
22 ALLOW Anywhere
22 (v6) ALLOW Anywhere (v6)

deepak@dachary:~$ sscrot
```

**e. Connect to WIFI and show IP and MAC address of WIFI interface:** This step shows the connectivity of raspberry pi to my home network. As we can see in the screenshot, my raspberry pi is connected to my home WIFI named “XXXXXXXXXX”. In the screenshot we can also see that the IP address for my network is XXXXXXXXXX and the MAC address is XXXXXXXXXX.



```
deepak@dachary:~$ ifconfig wlan0 -d 3
-d: Unknown host
ifconfig: '--help' gives usage information.
deepak@dachary:~$ ifconfig wlan0
wlan0: flags=4099<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.1.255 netmask 255.255.255.0 broadcast 192.168.1.255
    inet6 fe80::d008:2da0:1541:6a76 prefixlen 64 scopeid 0x20<link>
    ether 88:27:eb:da:76:09 txqueuelen 1000 (Ethernet)
    RX packets 18267 bytes 13338268 (12.7 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 4554 bytes 509806 (497.8 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

deepak@dachary:~$
```

## Conclusion:

In this way, I was able to assemble all the parts of the raspberry pi and configure it by using the secure settings to run my pi. From this lab, I knew how to use a raspberry pi as a computer and knew the security that are to be applied to use it securely. The fact that amazed me in this lab was a small chip and a bootable SD card that can be used as a fully functioning computer.