Remote Login using Wi-Fi Dongle

Note: You need to first install the operating system image provided by e-Yantra (Raspbian_e-Yantra). Please refer to the tutorial "Installing Operating System Images on the Raspberry Pi". Only after installing this image, you will be able to Remotely Login to your Raspberry Pi.

Hardware Required:

1. Raspberry Pi
2. Wi-Fi Dongle
3. USB Camera
4. Power Bank
5. **Windows** Laptop/Computer that **can connect to Wi-Fi networks**

Software Required:

1. MobaXterm

This document is divided into **3 sections:**

1. Steps for Remote Login
2. Changing the SSID
3. Testing Python and OpenCV

1. Steps for Remote Login:

1.1. Installing MobaXterm:
- Go to the following link:
  http://mobaxterm.mobatek.net/download-home-edition.html
- Download MobaXterm Home Edition v9.4 (Portable Edition)
- Unzip the downloaded zip file to any location of your choice.

1.2. Connect the **USB Camera** and **Wi-Fi Dongle** to the Raspberry Pi in **any** of the two USB slots (out of the 4 available USB slots) as shown in Figure 1.

1.3. Switch on the Raspberry Pi by connecting it to the **Power Bank** provided in your Robotic Kit as shown in Figure 1.
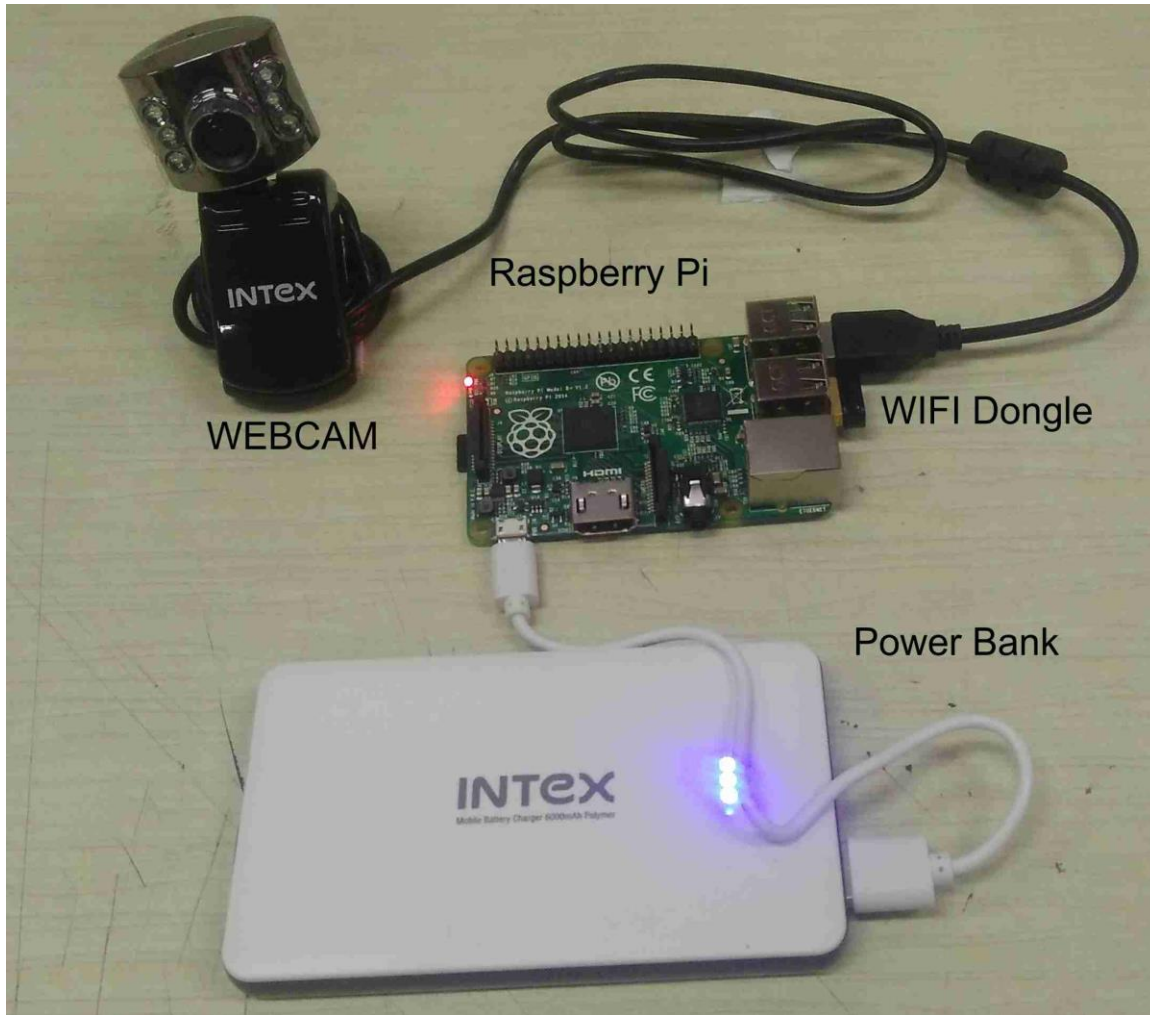
Figure 1: Connecting the Wi-Fi Dongle and USB Camera, and Powering Up the Raspberry Pi

Note: Please wait for a minute or two after switching on the Power Bank as the Raspberry Pi takes some time to boot. If it has booted correctly a Blue Colored LED (present on the Wi-Fi dongle) will start blinking.

1.4. In our Raspbian_e-Yantra image, we have pre-configured the Raspberry Pi to create an **access point** with **SSID "RPi"** in order to be able to remotely login into the RPi. Search for available Wi-Fi devices. You should be able to see a Wi-Fi network called **"RPi"**as shown in Figure 2**.** Connect to this network. The password is: **firebird.**

Figure 2: Connecting to Wi-Fi Network "RPi"

1.5. Go to the folder where you extracted the MobaXterm zip file. Launch MobaXterm_Personal_8.2.exe.You may get a **Security Warning** as shown in Figure 3. Click on "Run".
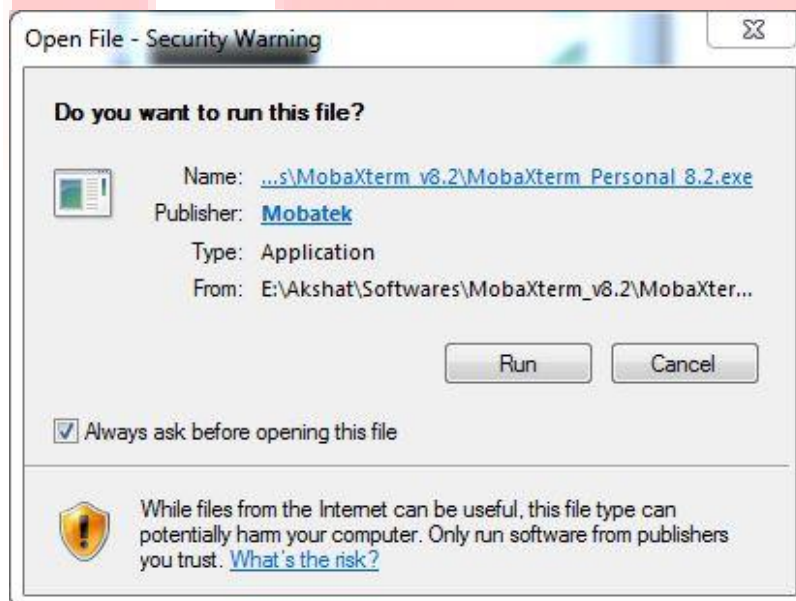

Figure 3: MobaXterm Security Warning

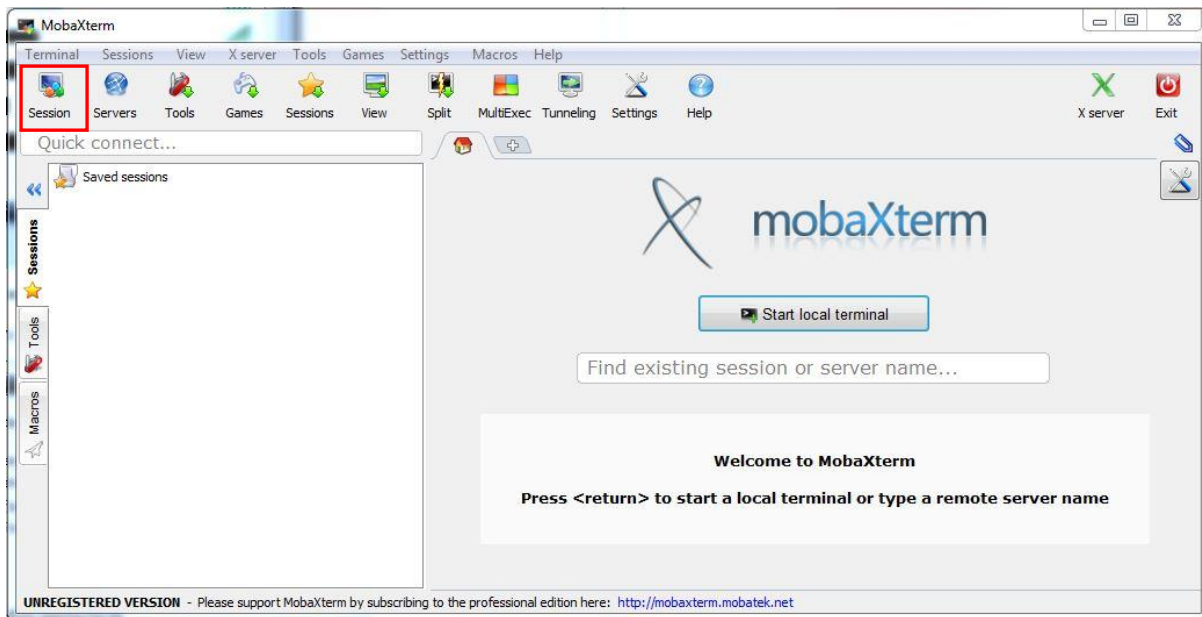The **MobaXterm** window will open as shown in Figure 4.

Figure 4: MobaXterm Window

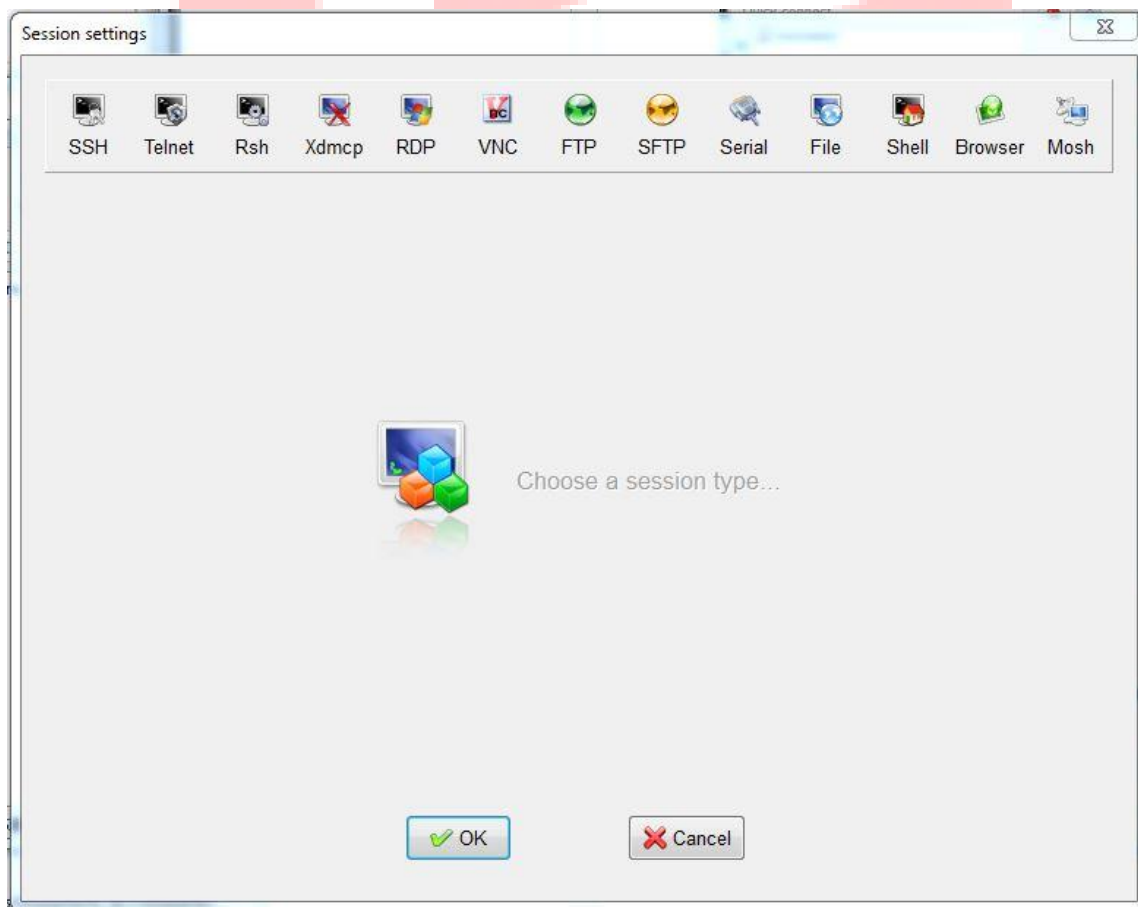**1.6.** Click on **Session** as shown in Figure 4**.** A **Session Settings** window will open as shown in Figure 5.

Figure 5: Session Settings Window

1.7. Click on the **SSH** tab.

1.8. Enter **192.168.10.1** in the **Remote Host** box.

1.9. Click on the **Advanced SSH Settings** tab.

1.10. Change the **Remote Environment** to **LXDE Desktop**by clicking on the drop down menu**.**

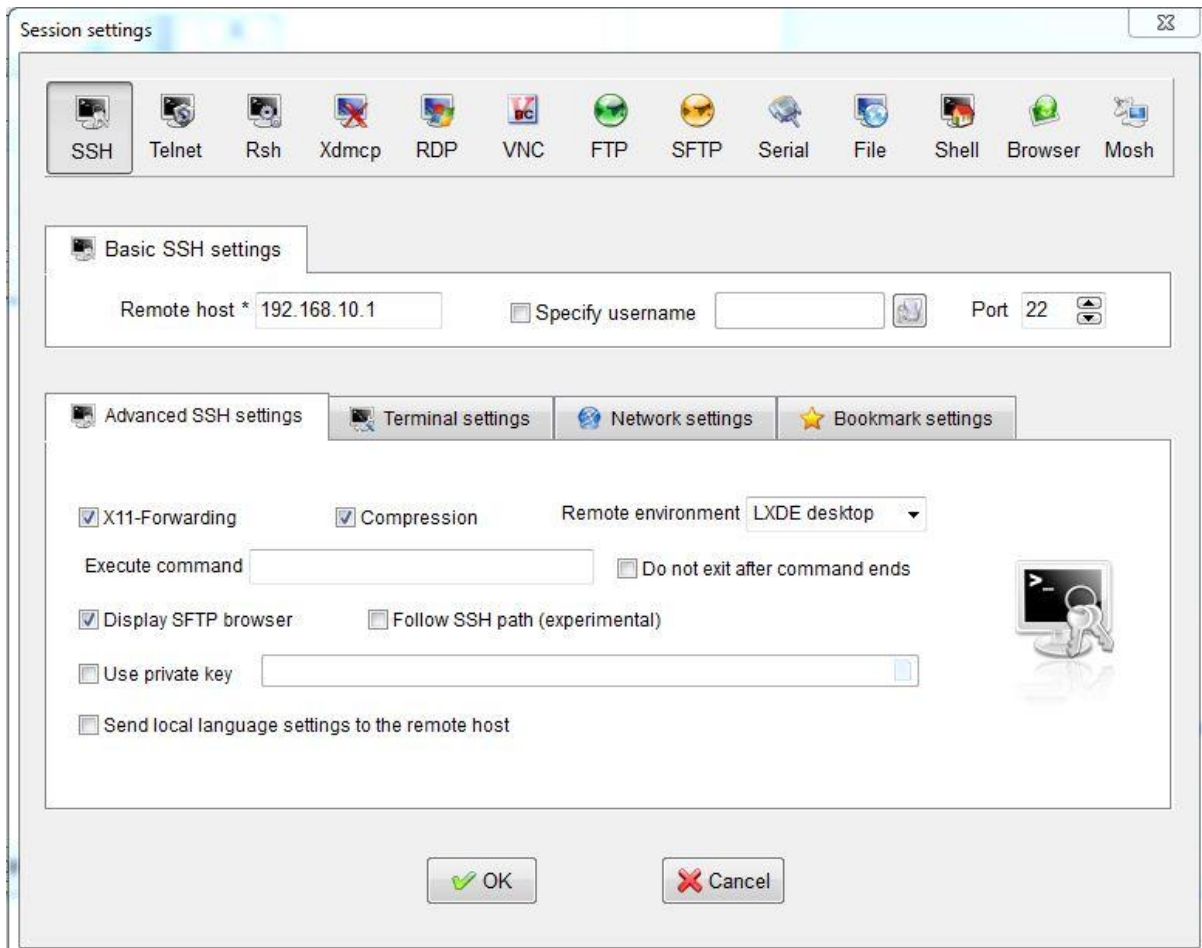**We have now successfully configured the Session Settings.**

Figure 6: Session Settings Configured

1.11. Click on **OK.**An additional **"MobaXterm X server:1.0.0"** window will open along with our Session Window as shown in Figure 7.
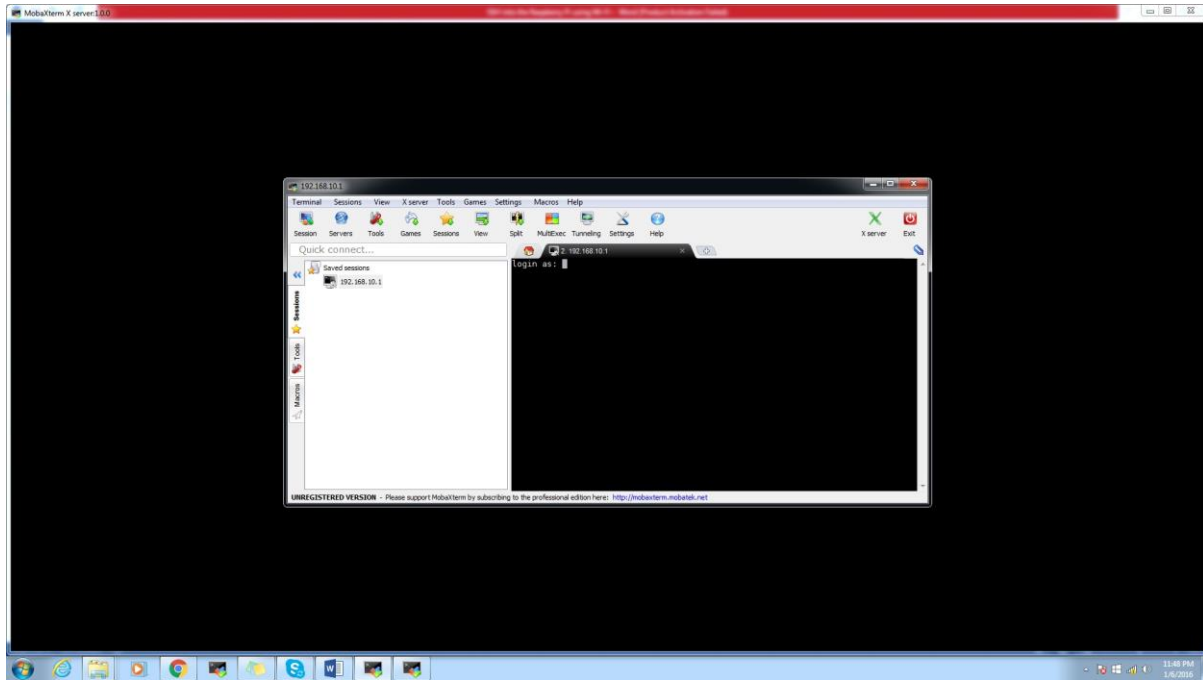
Figure 7: Session Window + MobaXterm X server:1.0.0 Window

1.12. Go to the session window and login as the "**root**" user using the password: "**firebird**" as shown in Figure 8.
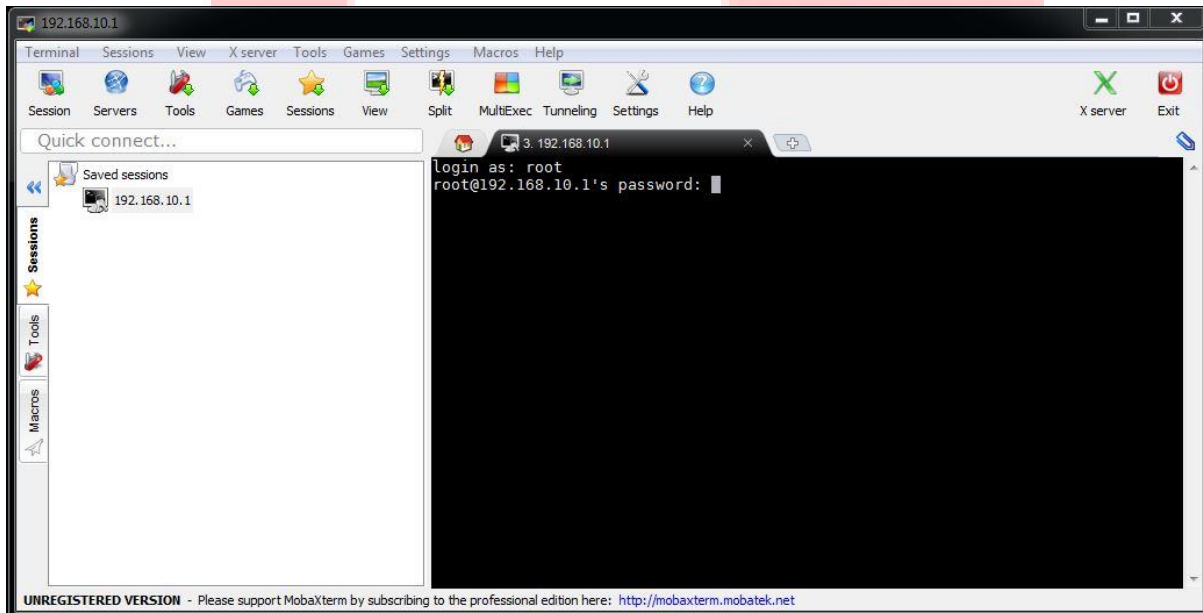

Figure 8: Logging in as the "root" User

Note: While entering the password you will not be able to see any character you type on the screen. Do not worry-- your password is getting entered and there is nothing wrong with your keyboard. This is done for security reasons.

Congratulations! You have successfully logged in to your Raspberry Pi. A screen as shown in Figure 9 should appear if all the steps have been followed correctly.
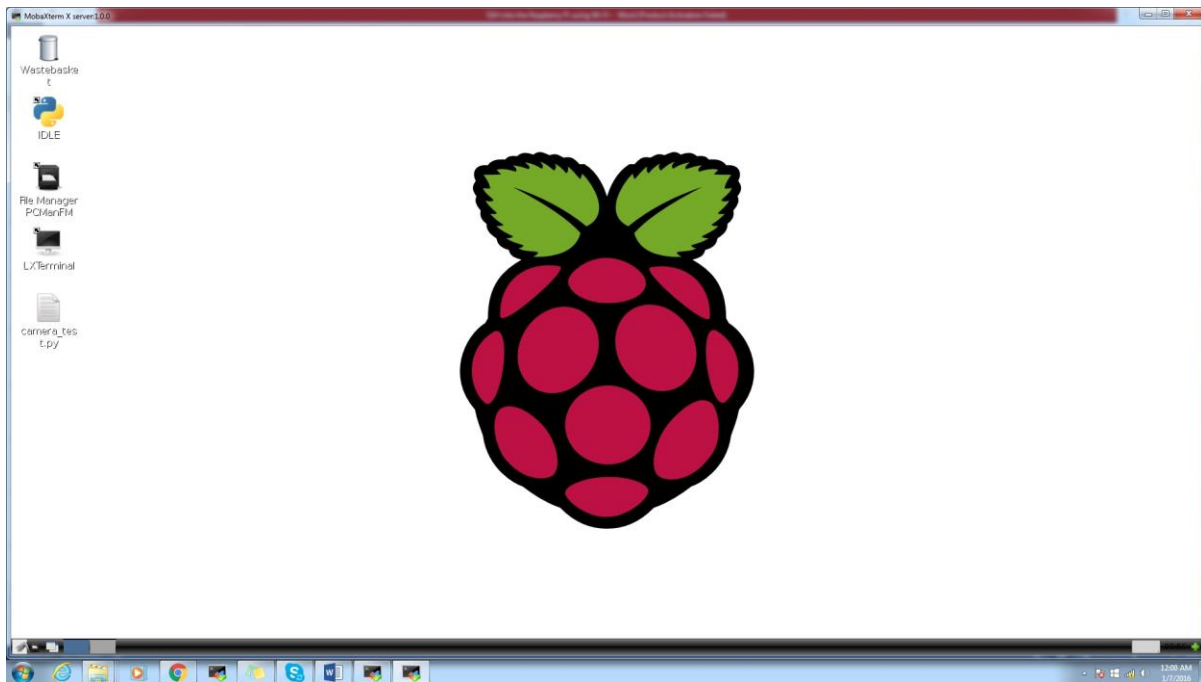

Figure 9: Raspberry Pi Home Screen

2. <u>Changing the SSID:</u>

You need to change the SSID of the access point created on the Raspberry Pi as all the teams by default have a **common** SSID "RPi".
This will create problems if you have some other Raspberry Pi nearby who is creating an access point with the same SSID.

We will follow a standard naming protocol: SSID = RPi-<team ID>
For example,
team ID 1 will change their SSID to **RPi-1**
team ID 12 will change their SSID to **RPi-12**
team ID 123 will change their SSID to **RPi-123**
team ID 1234 will change their SSID to **RPi-1234**

Steps to change the SSID:
   2.1.   Double-click on File Manager PCManFM as shown in Figure 10.

Figure 10: File Manager PCManFM

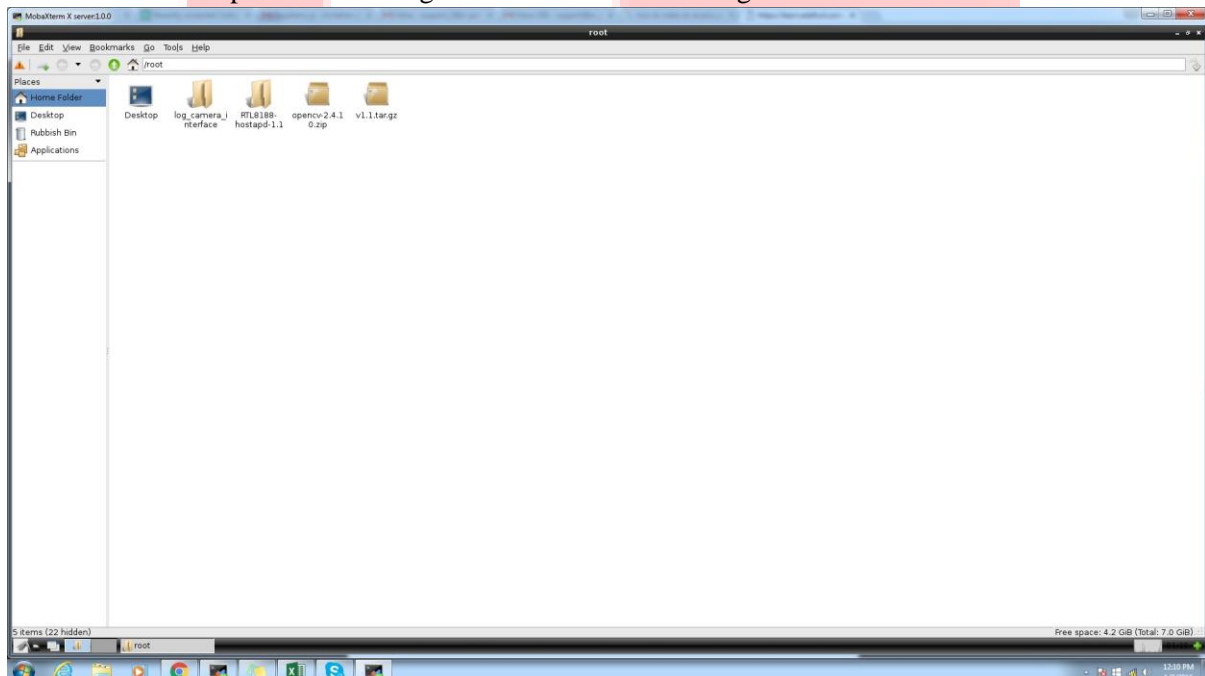   **2.2.**   This will open a File Manager window as shown in Figure 11.

Figure 11: File Manager Window

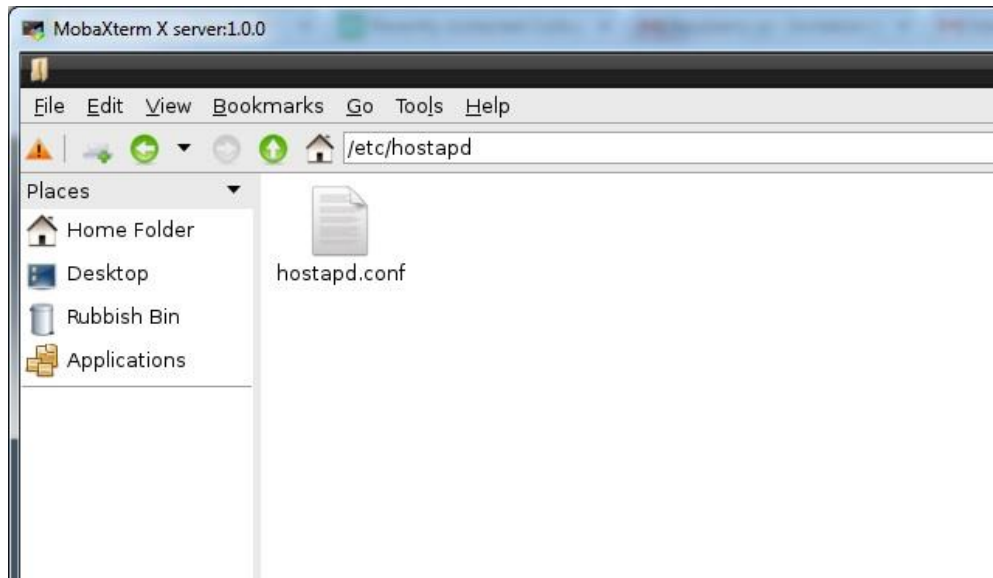**2.3.** Go to the following location: **/etc/hostapd**as shown in Figure 12.

Figure 12: Location /etc/hostapd

2.4. Double-click on the file**hostapd.conf.** It will open a text editor as shown in Figure 13.
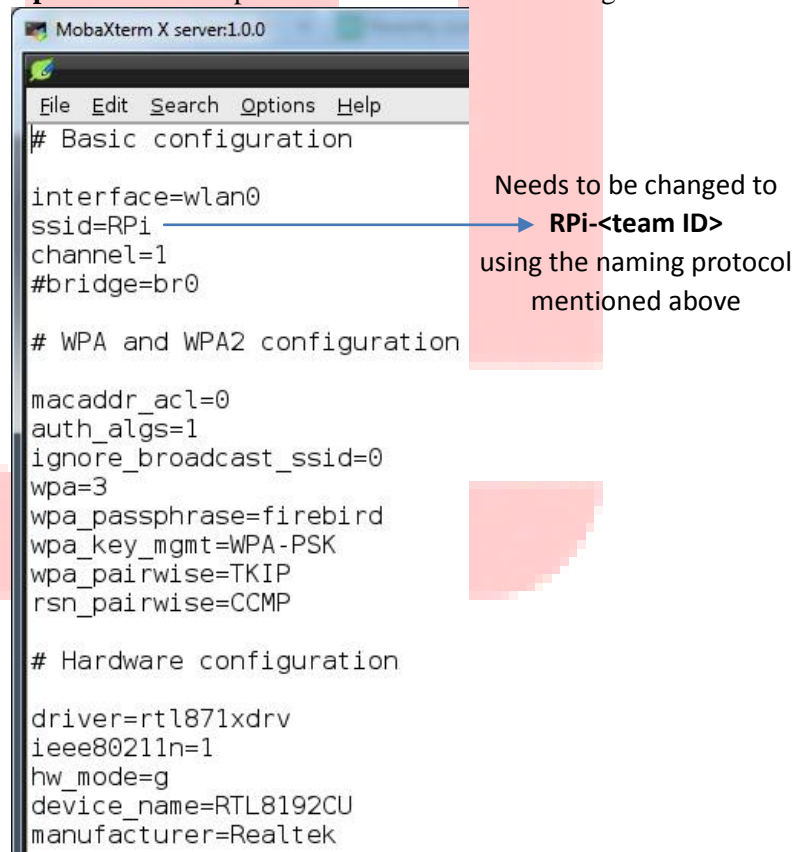

Figure 13: hostapd.conf

2.5. Change **ssid = RPi** to **ssid = RPi-<team ID>** using the naming protocol mentioned above. Click on **File** and click on **Save.**

NOTE:
- **DO NOT Change any other line in this file.** It may lead to problems with access point creation.
- **DO NOT save the file with a different name.**

2.6. Now you need to reboot the RPi. Go to the RPi Home Screen as shown in Figure 9 and double-click on LXTerminal as shown in Figure 14.
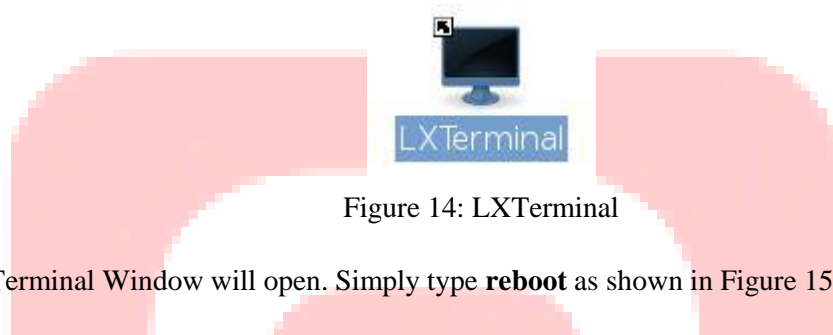

Figure 14: LXTerminal

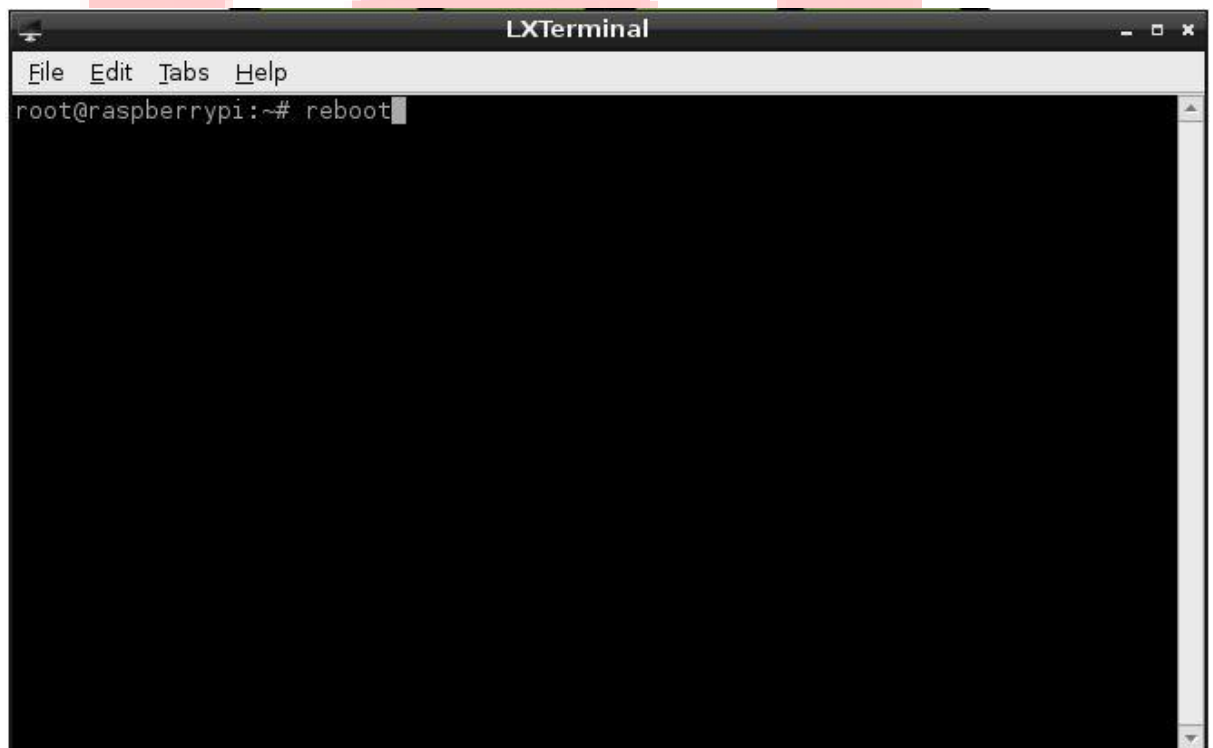**2.7.** ALXTerminal Window will open. Simply type **reboot** as shown in Figure 15.

Figure 15: LXTerminal Window

2.8. You should get a reboot message as shown in Figure 16.

Figure 16: Reboot Message on LXTerminal

2.9. You may now re-login to the RPi using the steps mentioned in Section 1. The only change now will be that instead of connecting to the network "RPi", you will now connect to "RPi-<team ID>". For example, team ID 1234 will see RPi-1234 as shown in Figure 17.

Figure 17: Changed SSID

3. <u>Testing Python and OpenCV</u>

A code snippet **"camera_test.py"** for testing Python and OpenCV is available on the **root user Home Screen.**

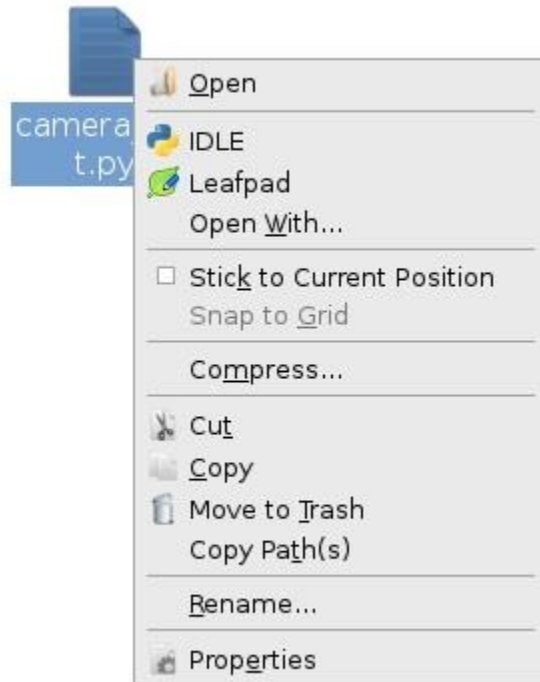Right-click on camera_test.py to get a Context Menu as shown in Figure 18.

Figure 18: Context Menu

Click on IDLE. It will open the code snippet in IDLE. You need to simply run this code.

Note: Please do not make any changes to the code.

If everything is installed correctly you should get your camera feed on your screen. An example output is shown in Figure 19.
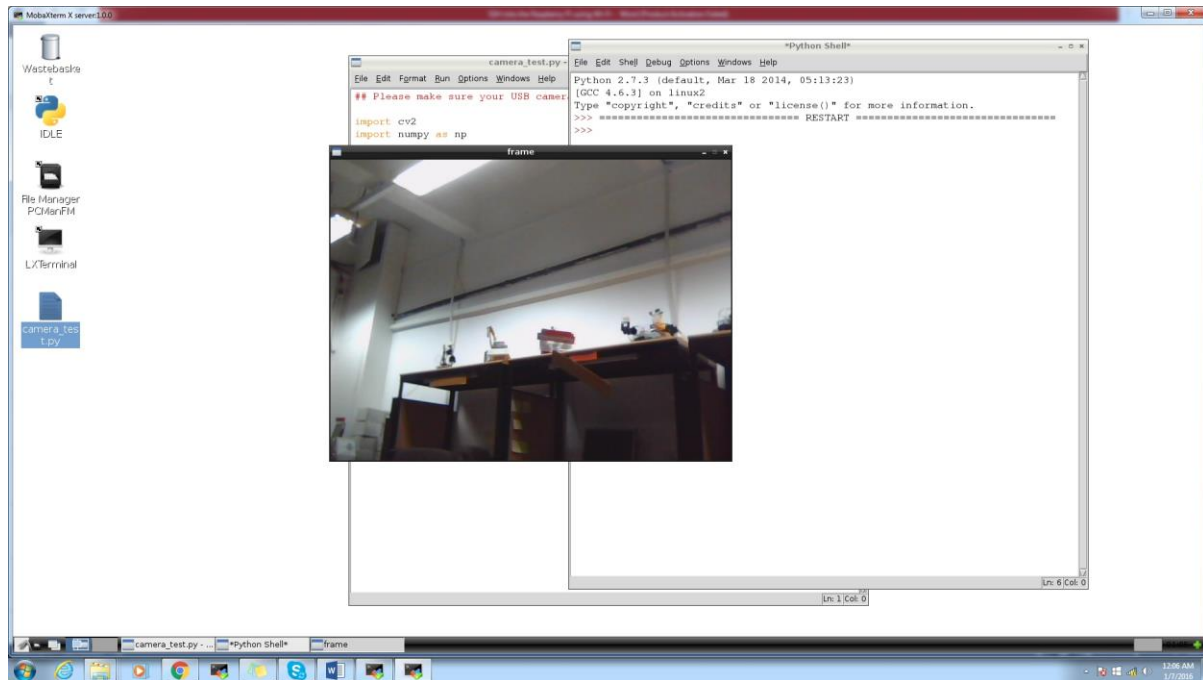
Figure 19: Correct Output

If you get an error as shown in Figure 20, please make sure your camera is connected properly to the Raspberry Pi.
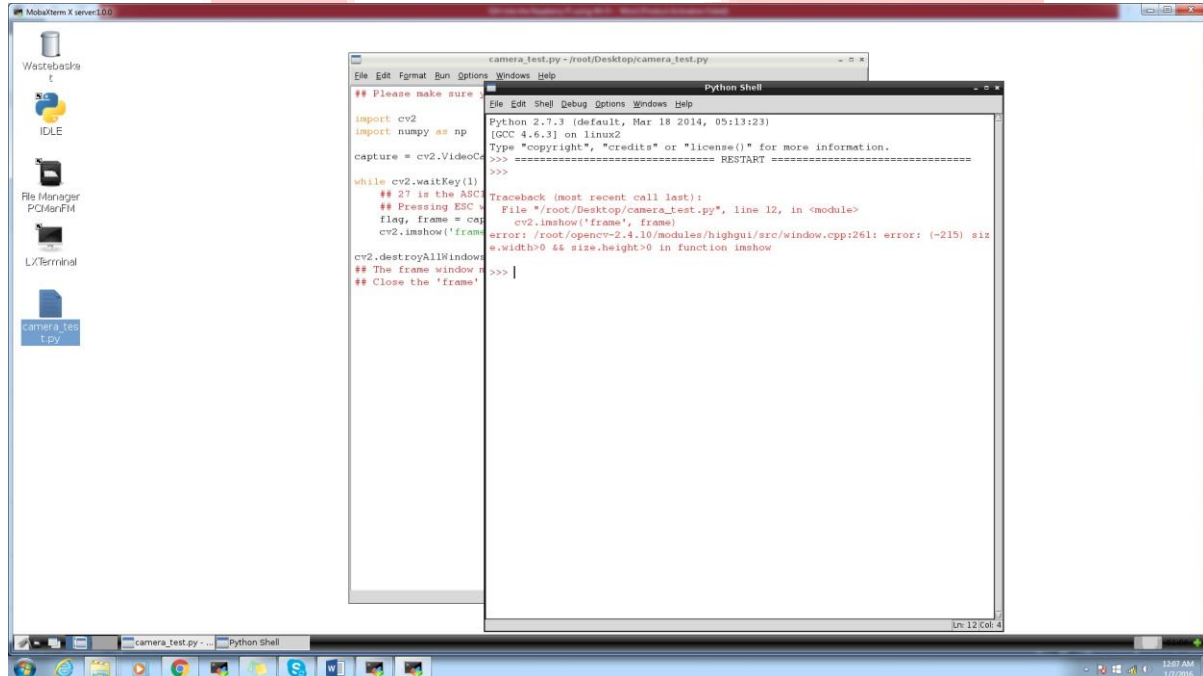

Figure 20: Incorrect Output

… END …