Getting started with Raspberry Pi B+ on your Mac

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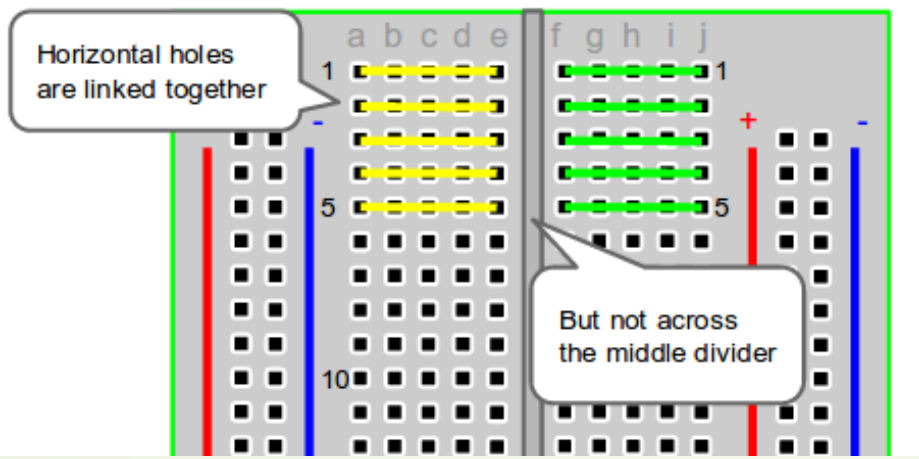
1. Introduction

Presentation is Based on this Starter Kit

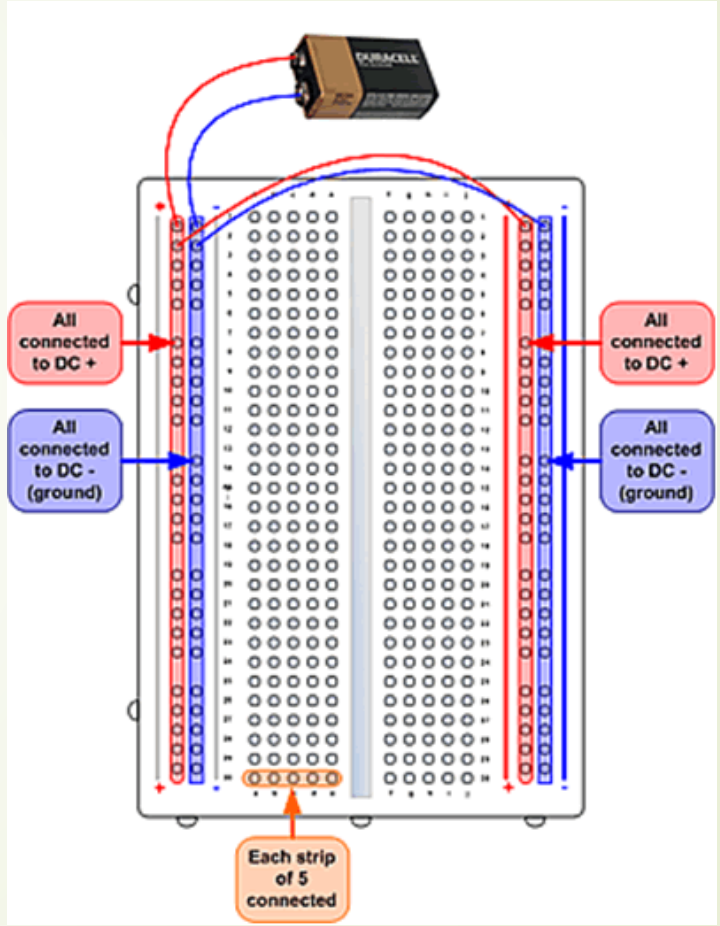
- Raspberry Pi B+ Starter Kit from Adafruit.com
- http://www.adafruit.com/product/2125
- Operating System is pre-installed on the flash memory
- Includes USB to TTL serial device so you don't need a keyboard and monitor
- Includes USB Wi-Fi device to get quickly connected to the internet

How does a Bread Board work?

Depending on which hole you plug into, it will link all the holes either on the vertical or horizontal to the same source as can be seen in the images. All you have to do Is plug into one hole!



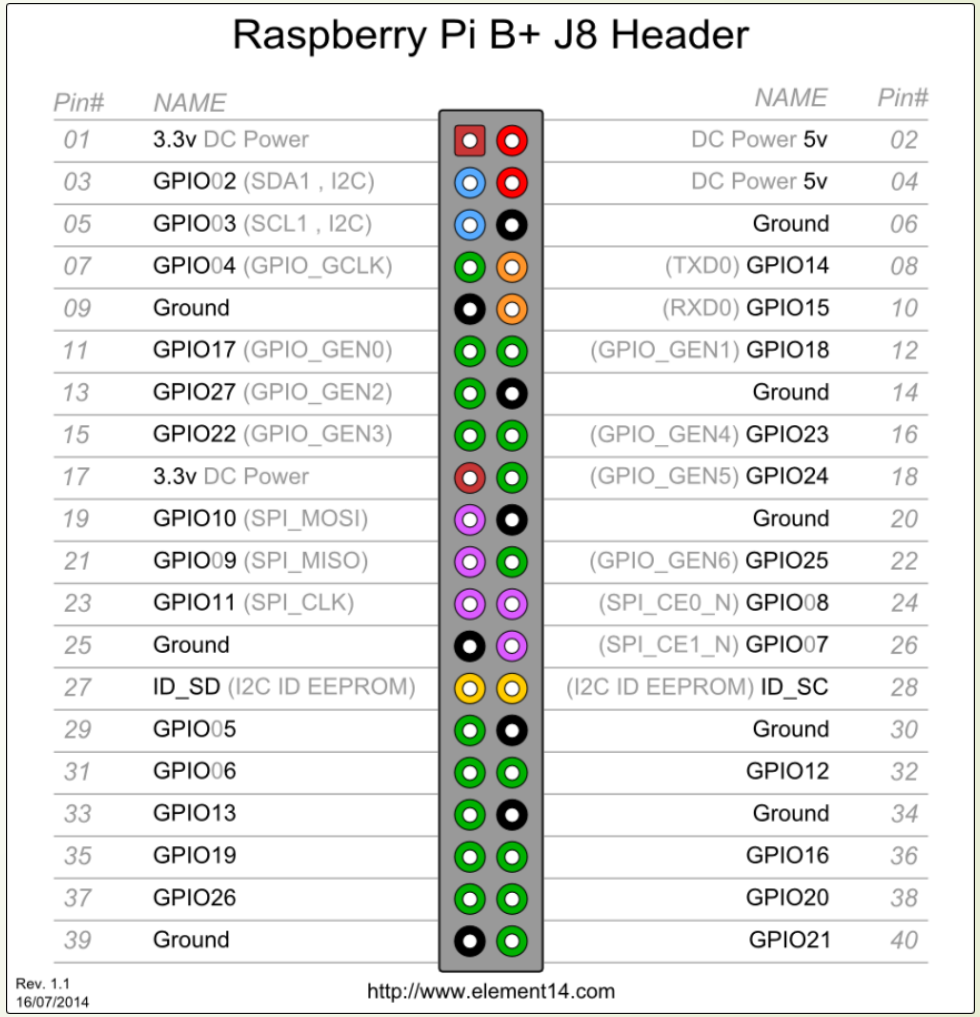
http://computers.tutsplus.com/



http://www.beavisaudio.com/

Pinout of the Raspberry Pi B+ Header

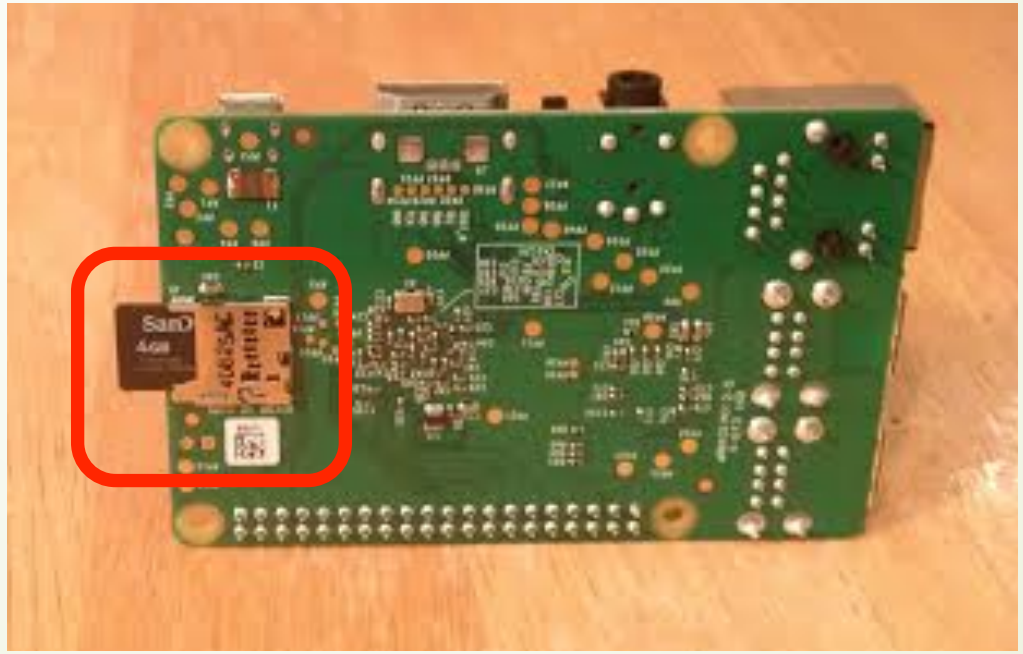
This is the Pinout (location of all the pins and there names) of the Raspberry Pi B+



2. Getting Started

Inserting the Hard Drive (SanDisk 4GB SD card)

- Insert the *4GB SD card for Raspberry Pi preinstalled with Raspbian Wheezy* into the port located on the under side of the Raspberry Pi



Connecting the Serial Device

http://workshop.raspberrypiaustralia.com/usb/ttl/connecting/2014/08/31/01-connecting-to-raspberry-pi-via-usb/

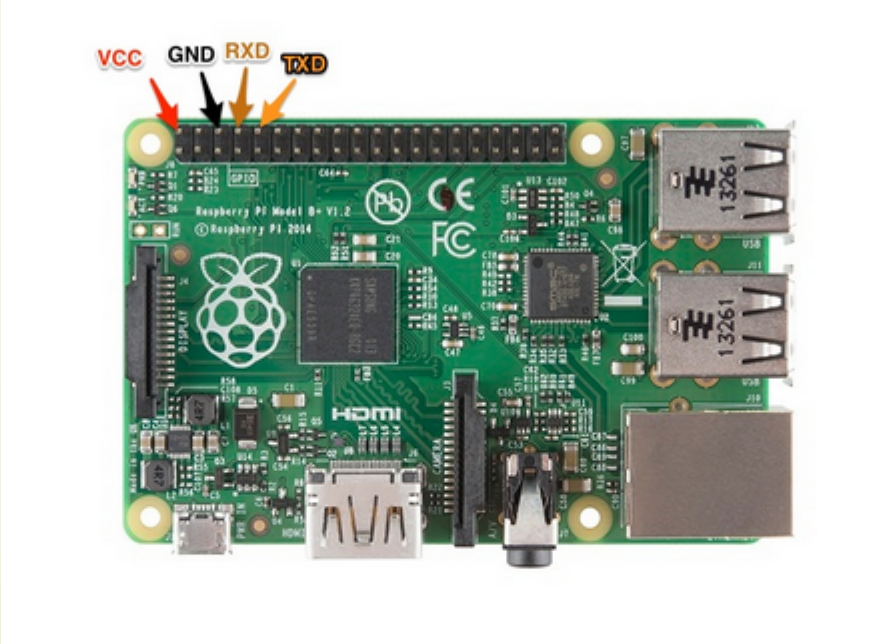
Use the included USB to TTL serial cable to connect the RPi (Raspberry Pi) to the computer.

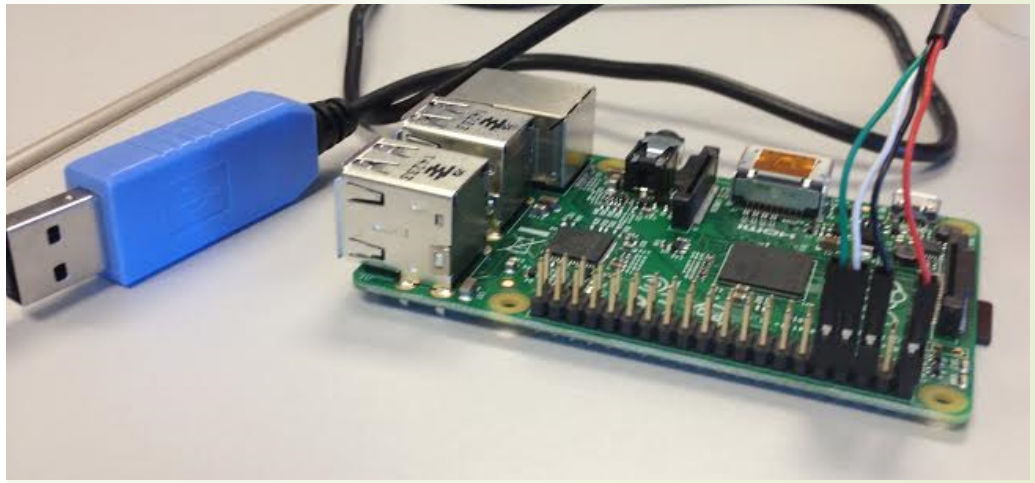
VCC – Red (Pin 02 – DC Power 5V)

GND – Black (Pin 06 – Ground)

RXD – White (Pin 08 – TX)

TXD - Green (Pin 10 – RX)





Wi-Fi Hardware

- Insert the USB Wi-Fi Module to any of the four USB slots on the Raspberry Pi and connect the RPi to the USB port on your computer as shown below:

3. Communicating to Raspberry Pi via Serial Cable

Mac

Bringing Up Login Window

- Open up a terminal window on your Mac computer and type the following command:

  screen /dev/cu.usbserial 115200

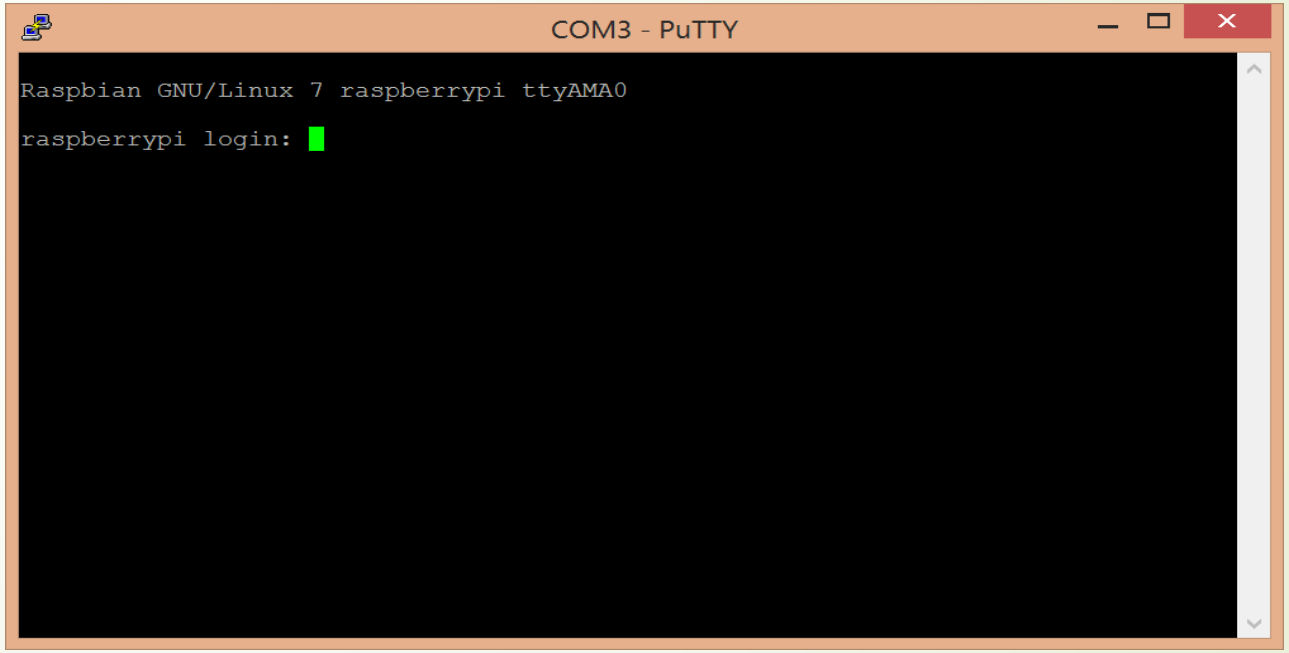
- When you first log in to the Raspberry Pi using this command, it may take some time for the login screen to appear while the system is loading. You may see various system messages displayed on the screen.

Logging Into RPi

Just like for Windows a screen like the one below will pop up and in order to login you must enter the following:

raspberrypi login: **pi**

Password: **raspberry**



After logging in, be sure to update the operating system by running “sudo apt-get update”

Simple Linux Commands

Raspberry Pi uses an operating system called Linux instead of Windows or OS (for macs). Some Important commands to become familiar with are presented on the right.

Once you are logged in to the Raspberry Pi, you can try out various Linux commands to make sure it is working.

Visit the following URL to learn some simple linux commands.

https://www.raspberrypi.org/documentation/linux/usage/commands.md

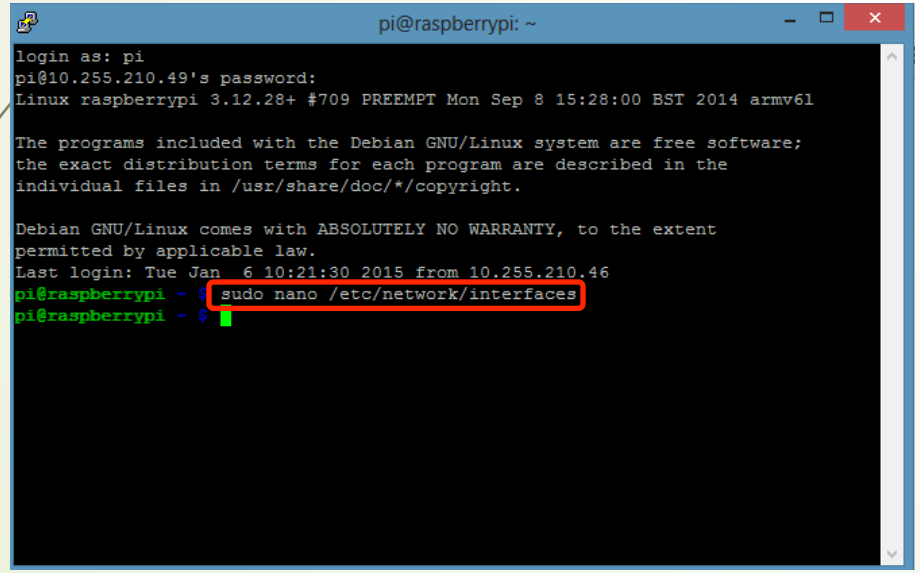
4. Connecting Raspberry Pi To Wi-Fi

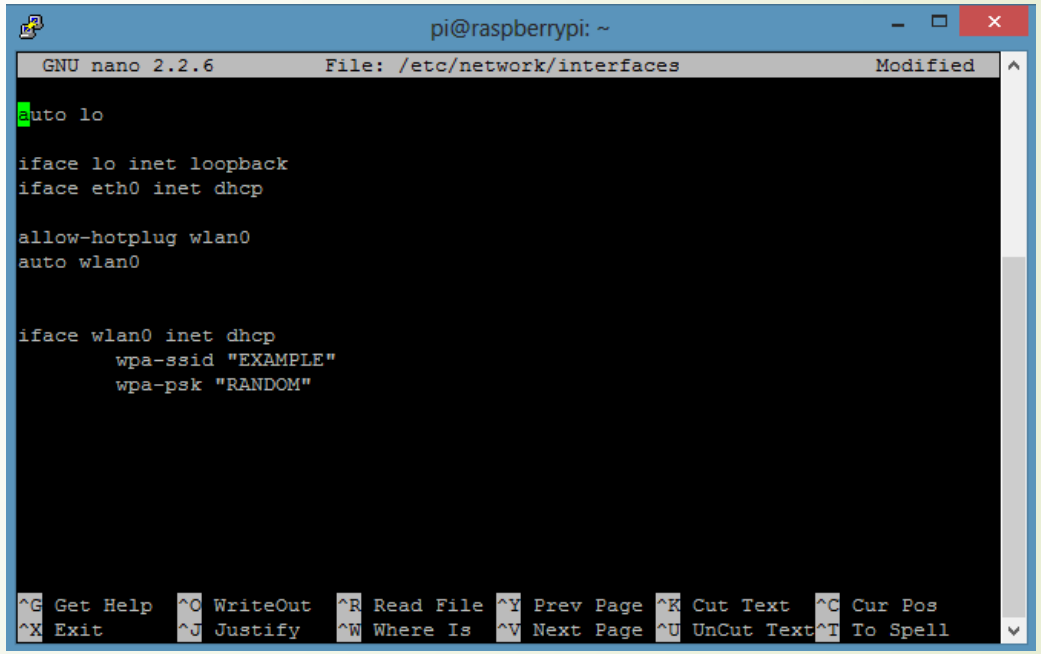
Modifying RPi to Connect to Wi-Fi

- Assuming trying to connect to a network with the following properties:

  Network Name: EXAMPLE Password: RANDOM

- Type the following command and change the file so that it is exactly as seen below:





- Lastly restart the network interface by running the following command:

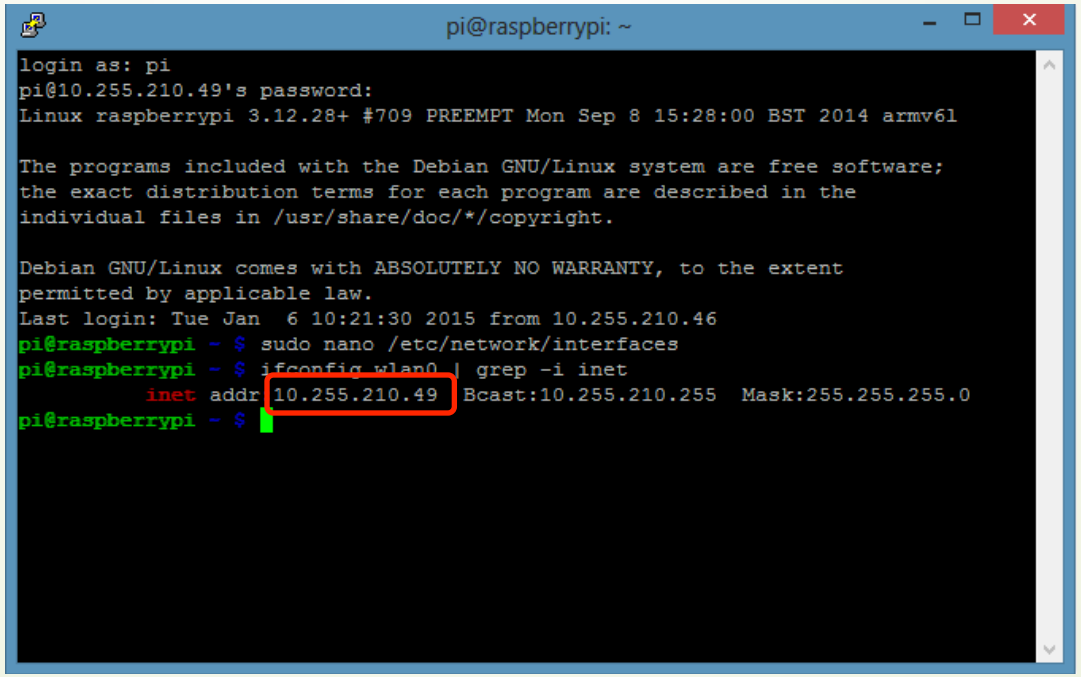
  sudo /etc/init.d/networking restart

Finding RPi's IP Address

- To do this run type the following command into the RPi Terminal:

  ifconfig wlan0 | grep –i inet

- If done correctly, the IP address should be returned:



Enabling SSH and SFTP access

- To enable SSH access the following command must be entered:

  sudo raspi-config

- Select option '8. Advanced Options' and then 'A4 SSH Enable/Disable' remote command line access to your Pi using SSH'
- Lastly select 'Enable' and then 'esc' until your back to the command prompt

Stand Alone Wi-Fi Operation

- In order to begin this step, the Raspberry Pi must be shutdown and disconnected from the computer
- To do this run the following command and wait for the RPi to fully shutdown:

  sudo shutdown –h now

- Insert the USB Wi-Fi Module to any of the four USB slots on the Raspberry Pi and connect the RPi to a power source using the *5V 2A Switching Power Supply w/ 6' MicroUSB Cable* as can be seen below:

Logging Into RPi Through Wi-Fi (Mac)

- Find an outlet and plug the RPi into it
- From the computer, make sure you are connected to the same network as the one entered on the RPi. So from our example before:

  Network Name: EXAMPLE Password: RANDOM

- Enter the following command in a new terminal and login just like before :

  ssh pi@IP-ADDRESS-YOU-FOUND

Update OS and Install libraries

- Update OS: "sudo apt-get update"
- Install the Python Requests Library : "sudo apt-get install python-requests"
- Install the Adafruit BMP180 Libraries:

sudo apt-get install git build-essential python-dev python-smbus

git clone https://github.com/adafruit/Adafruit_Python_BMP.git

cd Adafruit_Python_BMP

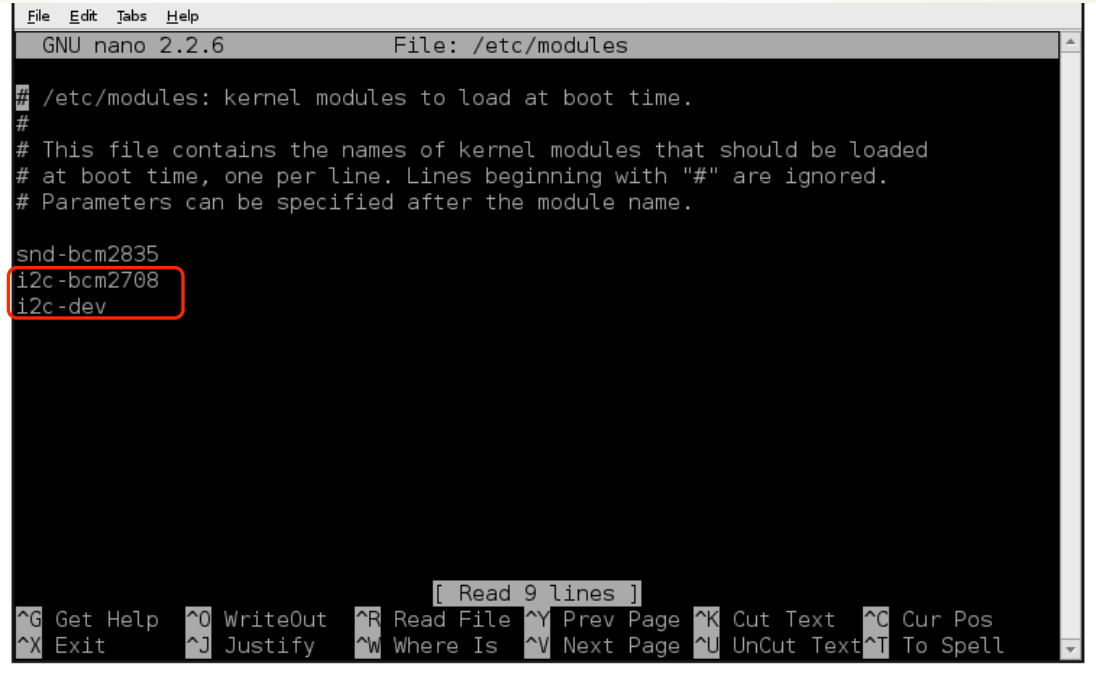
sudo python setup.py install

Configuring Raspberry Pi For I2C

- In order to run this particular sensor it has to be configured for I2C, which is simply a way for chips to talk to one another
- To enable this enter the command:

  sudo nano /etc/modules

- Add the lines: i2c-bcm2708 and i2c-dev to the end of this file as can be seen below



Configuring Raspberry Pi For I2C (cont.)

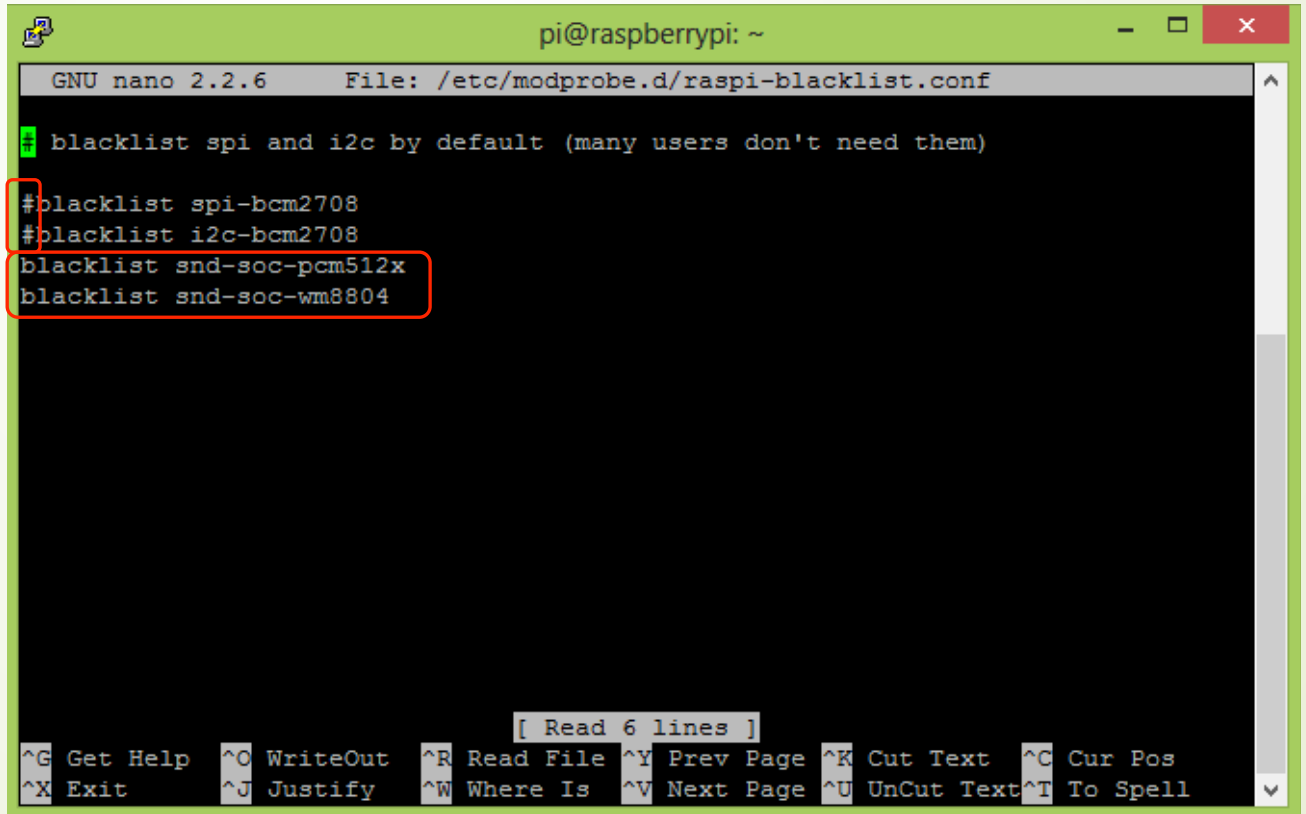
- Next we have to install a couple packages for I2C by typing the following commands:

  sudo apt-get install python-smbus

  sudo apt-get install i2c-tools

- Change the blacklist file on the RPi as seen below (changes are in red) and run the following command to restart the RPi:

  sudo reboot



Configuring Raspberry Pi For I2C (cont.)

- To make sure that you are connected enter the following command and make sure the following is showing:

sudo i2cdetect –y 1