Getting Started with the Raspberry Pi

Introduction

Raspberry Pi is developped by a British charitable organization named Raspberry Pi foundation. It is a card computer designed for students' programming,and the size only like a credit card, the system based on Linux(Debian).

Many things we can do using Raspberry Pi,listen to music,see films,handle official bussiness.These are just the most common function. We can use it to control our equipment or collect sensors' data, so we can use it make our own intelligent household, may be this is the most attractive.

The most basic condition should be provided before you start your project with Raspberry Pi, a mouse,a keyboard,a network cable,a SD card and a displayer,etc…

Starting your travel of Raspberry Pi

For the first time, it is essential for you to build development environment.To achieve this, you should take the following measures.

1,Download the image of operation system.

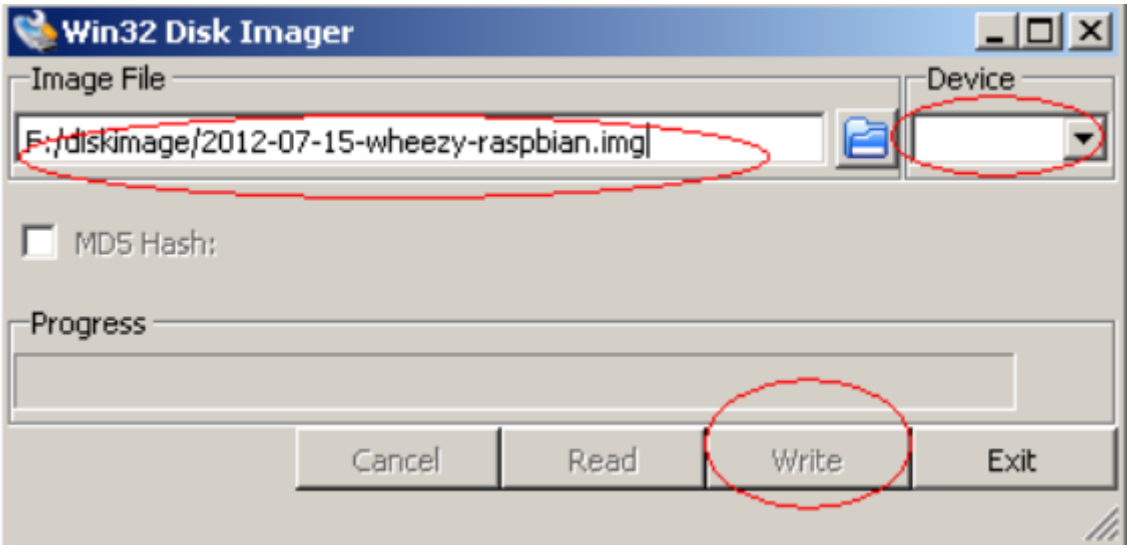
http://www.raspberrypi.org/downloads

we recommend Raspbian for you if you are a starter.

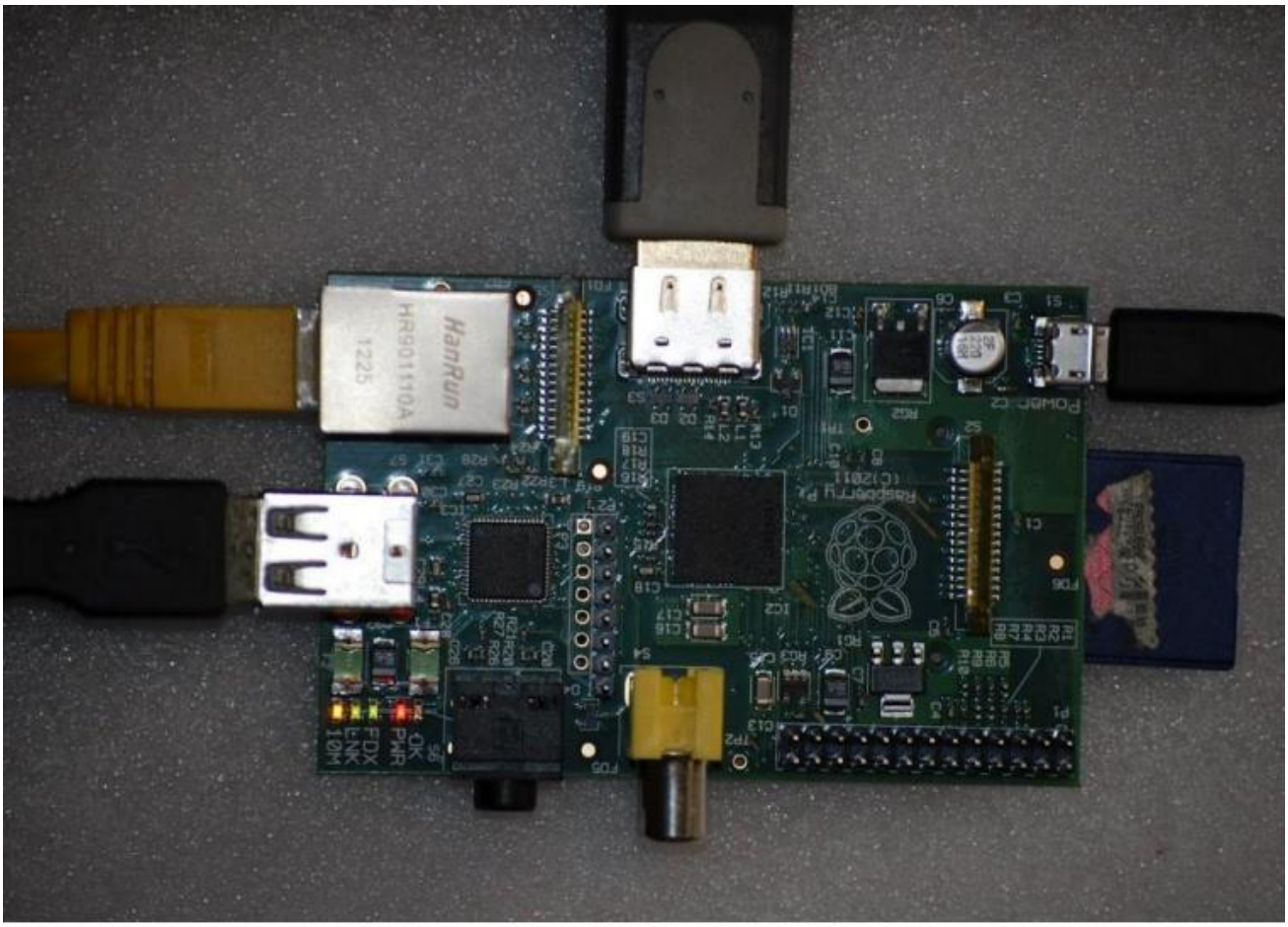
2,Download Win32DiskImager if you are a windows user.

3,Unzip the OS(2014-01-07-wheezy-raspbian.zip).

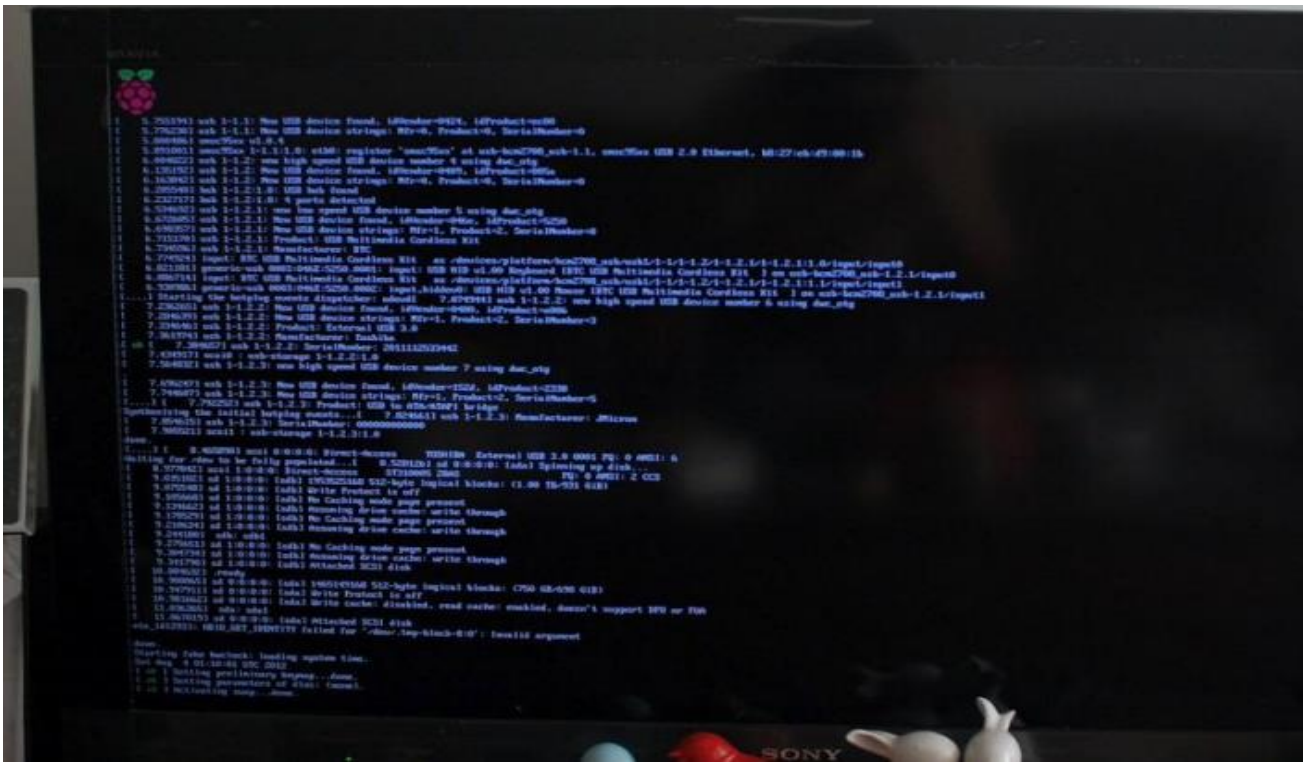
4,Run Win32DiskImager,select 2014-01-07-wheezy-raspbian.img and appropriate drive(be careful). Click Write.



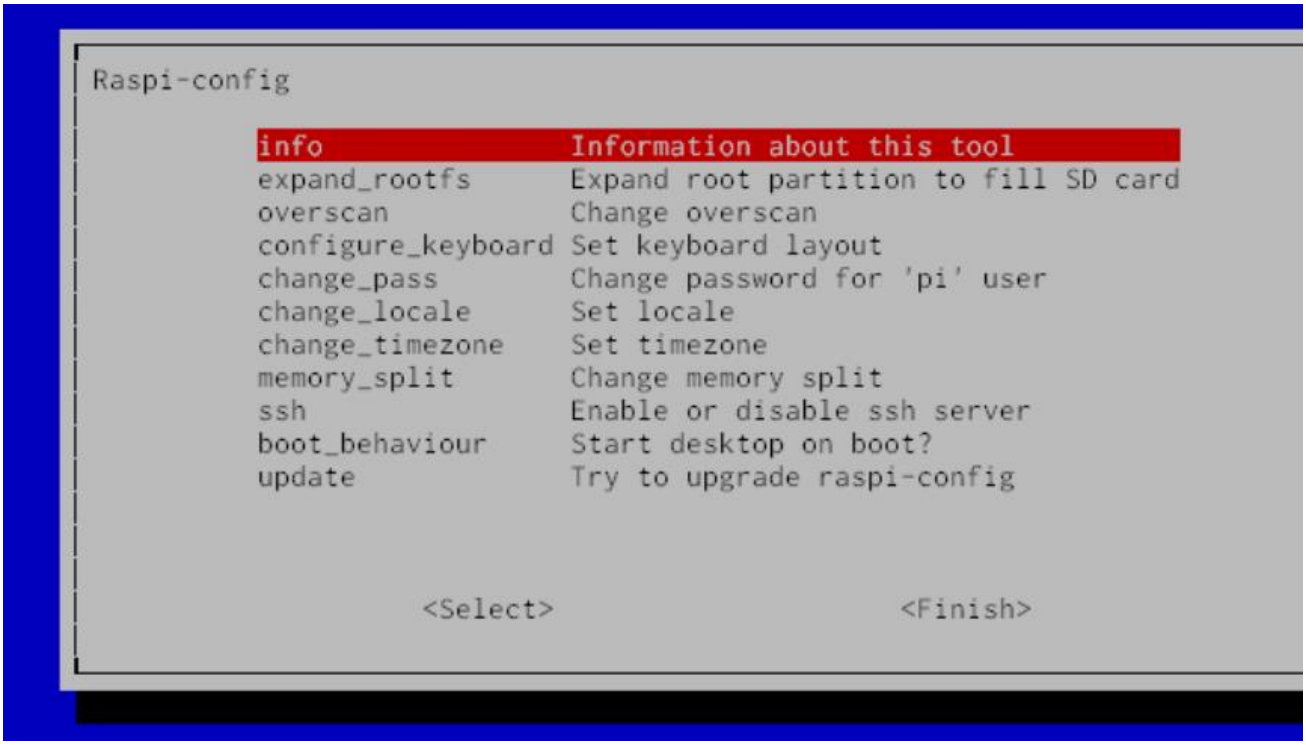
5,After finished writing, plug SD card to Raspberry Pi and connect mouse, keyboard, network cable,HDMI.



6,Power on Raspberry Pi(The green led flash indicate that SD card is available). Next, you will see the startup picture if your connection is right.



7,Waiting for a while, you will see a configuration UI if you use Raspberry Pi for the first time, and the configuration UI will be activated in future by the command of raspi-config.



▪ expand_rootfs – expand root partition to the whole SD card. Because we need enough space to install applications.

▪ overscoverscan – expand or narrow display area of the screen. Make the picture full of the screen.

▪ configure_keyboard – This is very import. If you do not setup it, your keyboard maybe can not work normally.

Setup your network

sudo nano /etc/network/interfaces

auto lo

iface lo inet loopback

iface eth0 inet dhcp

auto wlan0

allow-hotplug wlan0

iface wlan0 inet dhcp

wpa-ssid "your wifi name"

wpa-psk "your wifi password

Setup static IP

sudo nano /etc/network/interfaces

auto lo

iface lo inet loopback

iface eth0 inet dhcp

allow-hotplug wlan0

iface wlan0 inet manual

wpa-roam /etc/wpa_supplicant/wpa_supplicant.conf

iface default inet static

address 192.168.1.2

netmask 255.255.255.0

gateway 192.168.1.1

dns-nameservers your DNS-server IP

Test network

ping www.google.com

Install vim

sudo apt-get install vim

Install RPi.GPIO(Python)

Install python-dev

```
sudo aptitude install python-dev
```

Install RPi.GPIO

```
wget http://raspberry-gpio-python.googlecode.com/files/RPi.GPIO-0.5.3a.tar.gz
tar xvzf RPi.GPIO-0.5.3a.tar.gz
cd RPi.GPIO-0.5.3a
sudo python setup.py install
```

`new a led.py`

```
1.  #!/usr/bin/env python
2.  # -*- coding: utf-8 -*-
3.  import RPi.GPIO as GPIO
```

```
4.  import time
5.
6.  GPIO.setmode(GPIO.BOARD)
7.  # need to set up every channel which are using as an input or an output
8.  GPIO.setup(11, GPIO.OUT)
9.
10. while True:
11.     GPIO.output(11, GPIO.HIGH)
12.     time.sleep(1)
13.     GPIO.output(11, GPIO.LOW)
14.     time.sleep(1)
```

Run:

sudo python led.py

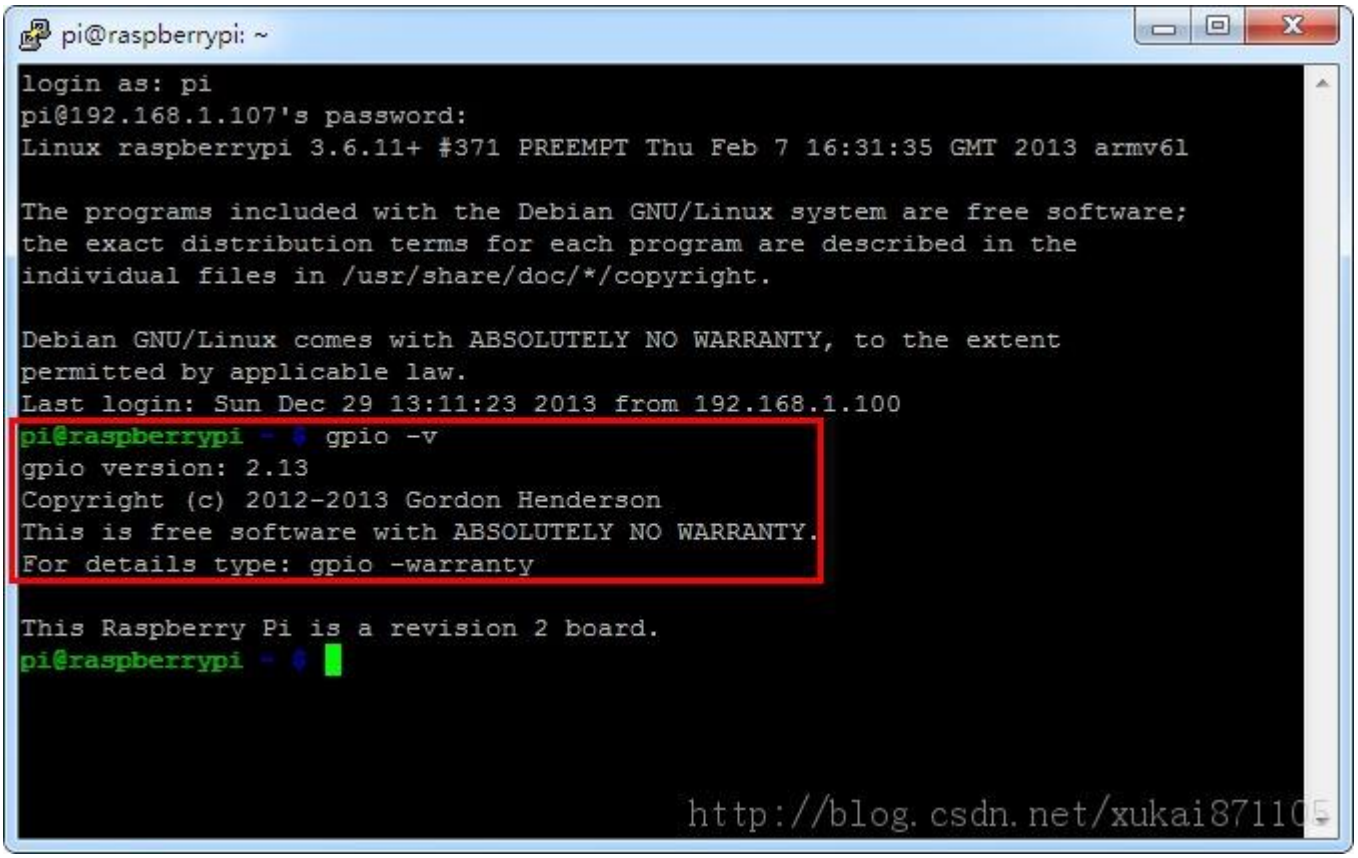
Install wiringPi(Rpi GPIO C Library)

sudo apt-get update
sudo apt-get upgrade
apt-get install git-core
git clone git://git.drogon.net/wiringPi
cd wiringPi
git pull origin
cd wiringPi
./build

Test wiringPi whether or not is installed successfully.

gpio -v

gpio readall



New a blink.c

```
1.  #include <wiringPi.h>
2.  main ()
3.  {
4.    wiringPiSetup () ;
5.    pinMode (0, OUTPUT) ;
6.    for (;;)
7.    {
8.      digitalWrite (0, HIGH) ; delay (500) ;
9.      digitalWrite (0,  LOW) ; delay (500) ;
10.   }
11. }
```

gcc -Wall -o blink blink.c –lwiringPi

Run:

sudo ./blink

Install BCM2835 C Library

Download from internet

```
wget http://www.airspayce.com/mikem/bcm2835/bcm2835-1.35.tar.gz
tar xvzf bcm2835-1.35.tar.gz
cd bcm2835-1.35
./configure
make
sudo make check
sudo make install
```

new a blink.c

```c
#include <bcm2835.h>

// Blinks on RPi Plug P1 pin 11 (which is GPIO pin 17)
#define PIN RPI_GPIO_P1_11

int main(int argc, char **argv)
{
  if (!bcm2835_init())
  return 1;

  // Set the pin to be an output
  bcm2835_gpio_fsel(PIN, BCM2835_GPIO_FSEL_OUTP);

  // Blink
  while (1)
  {
    bcm2835_gpio_write(PIN, HIGH);
    bcm2835_delay(100);

    bcm2835_gpio_write(PIN, LOW);
    bcm2835_delay(100);
  }
  bcm2835_close();
  return 0;
}
```

gcc -o blink blink.c -lbcm2835

sudo ./blink

Install FTP server and client

FTP is used to download files from other computer that it is configured as FTP server.

Vsftpd make your Raspberry Pi into FTP server.

sudo apt-get install ftp

sudo apt-get install vsftpd

The directory of your ftp server is /home/pi, it means that what files placed in /home/pi can be download by others.