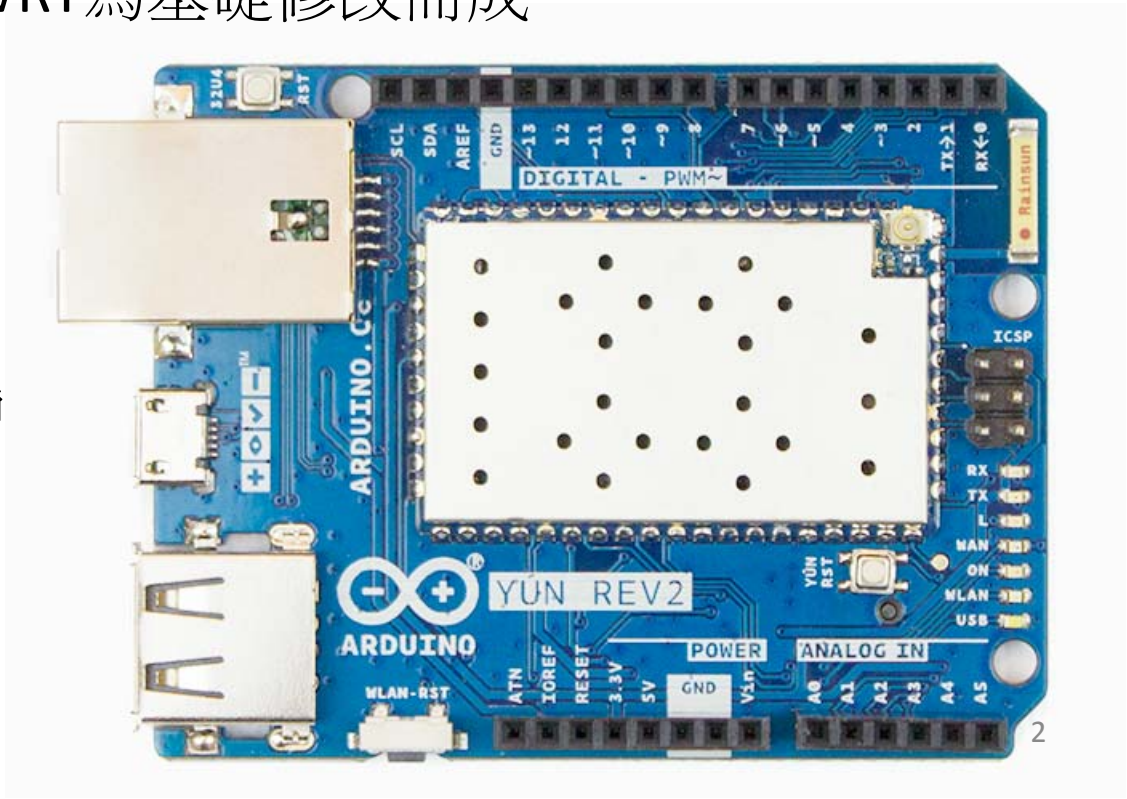
How ArduinoYun Rev. 2 Connect to IoTtalk?

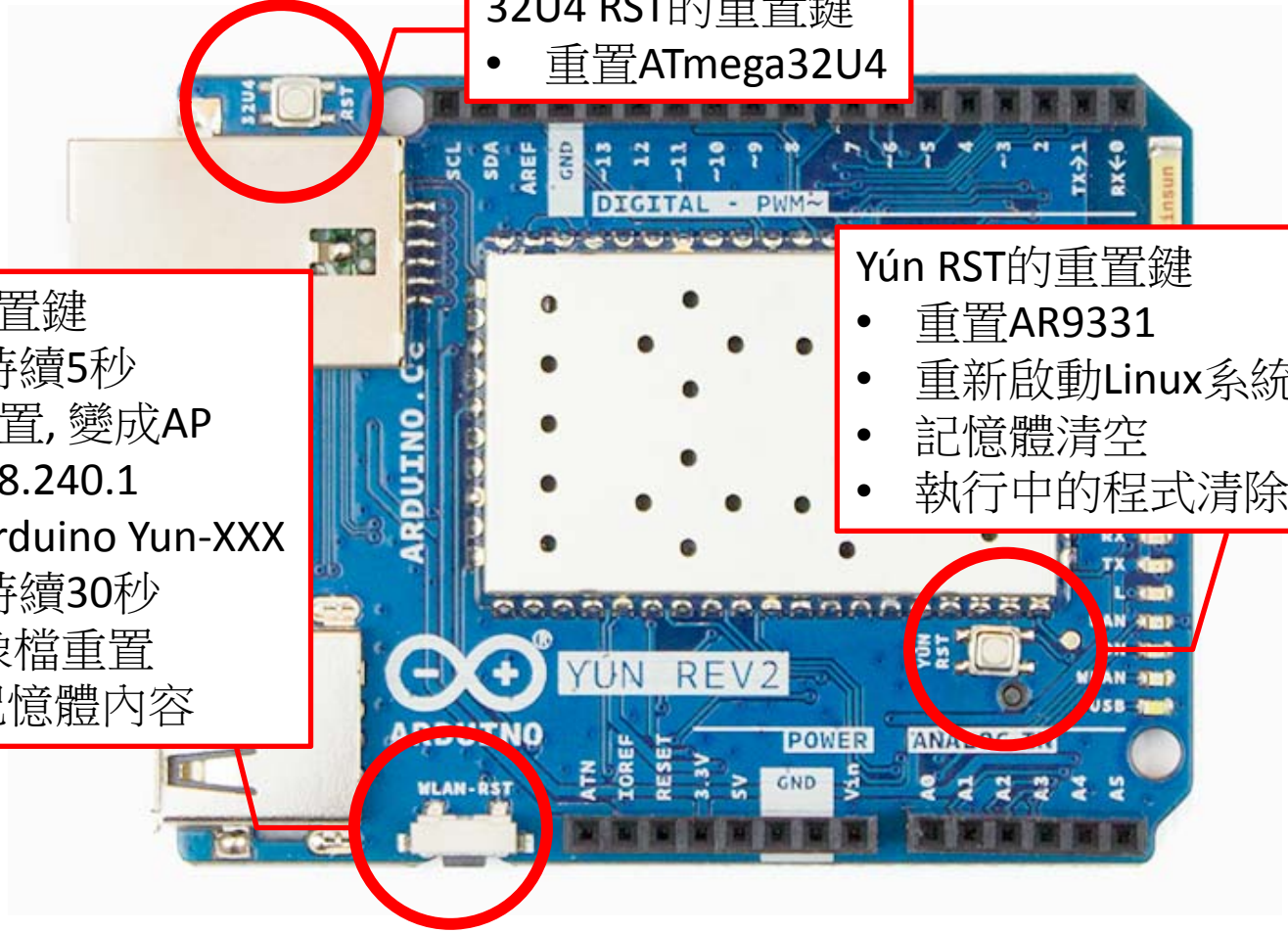
Dr. Yun-Wei Lin
NCTU

Arduino Yún Rev. 2

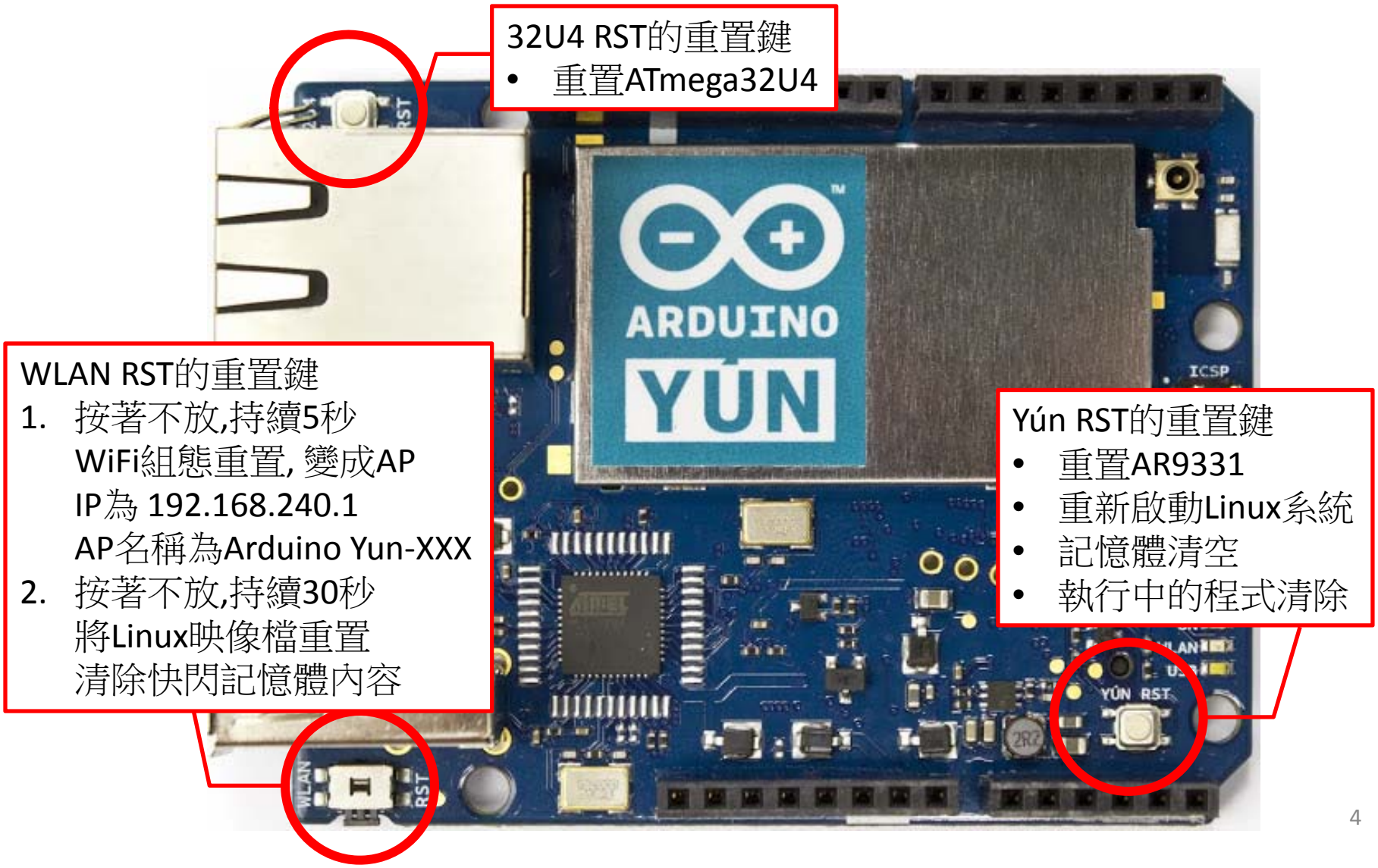
- 與其他Arduino板子不同之處
  - ATmega32U4 (MCU), 運行Arduino環境
  - Atheros AR9331 (SoC), 運行Linux環境 (Linino)
    - Linino以OpenWRT為基礎修改而成
  - Ethernet
  - WiFi
  - USB A埠
  - micro SD卡插槽



Arduino Yún Rev. 2上的三顆按鈕



Arduino Yún上的三顆按鈕

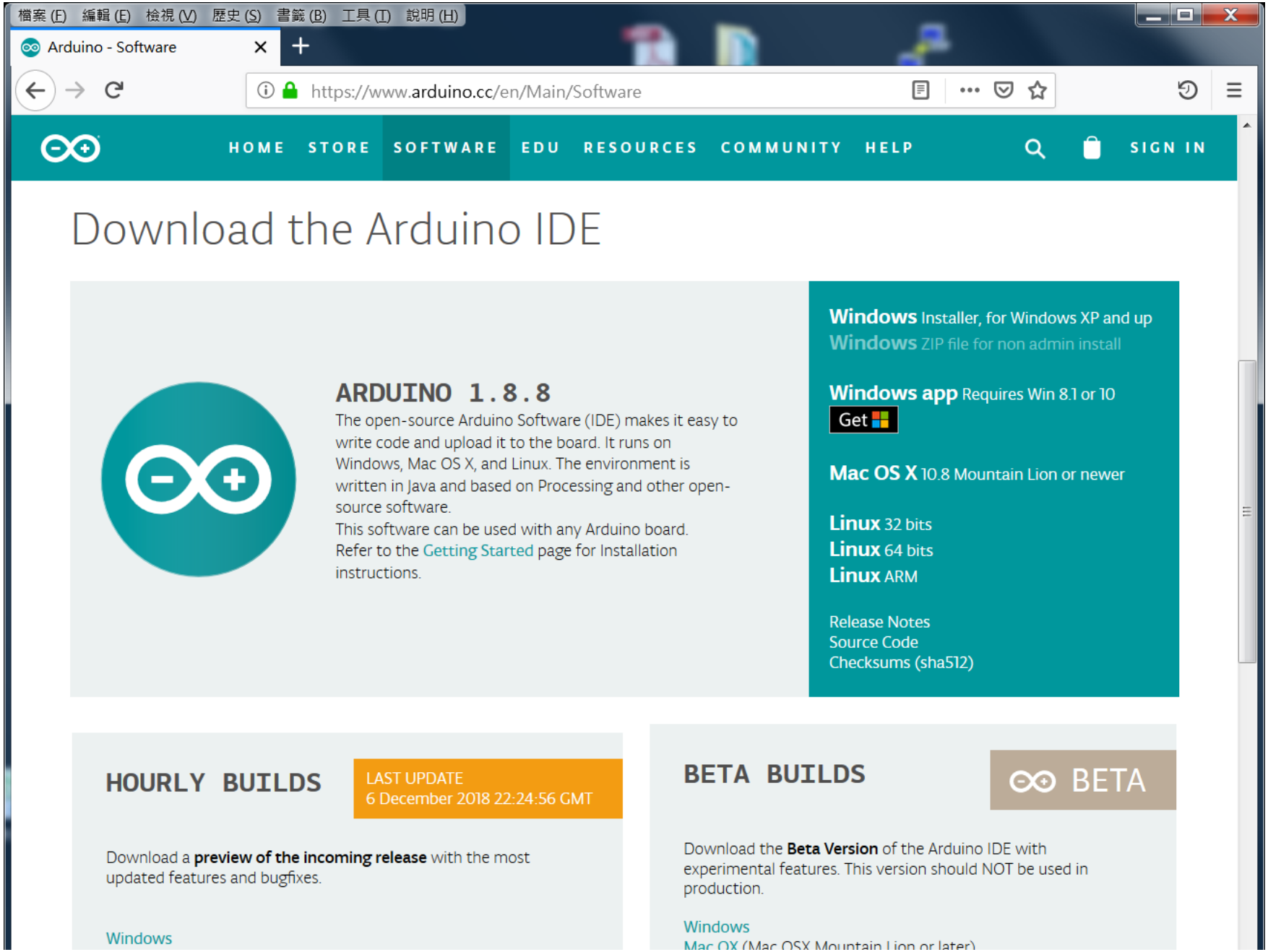


電壓, 電流, 與電阻

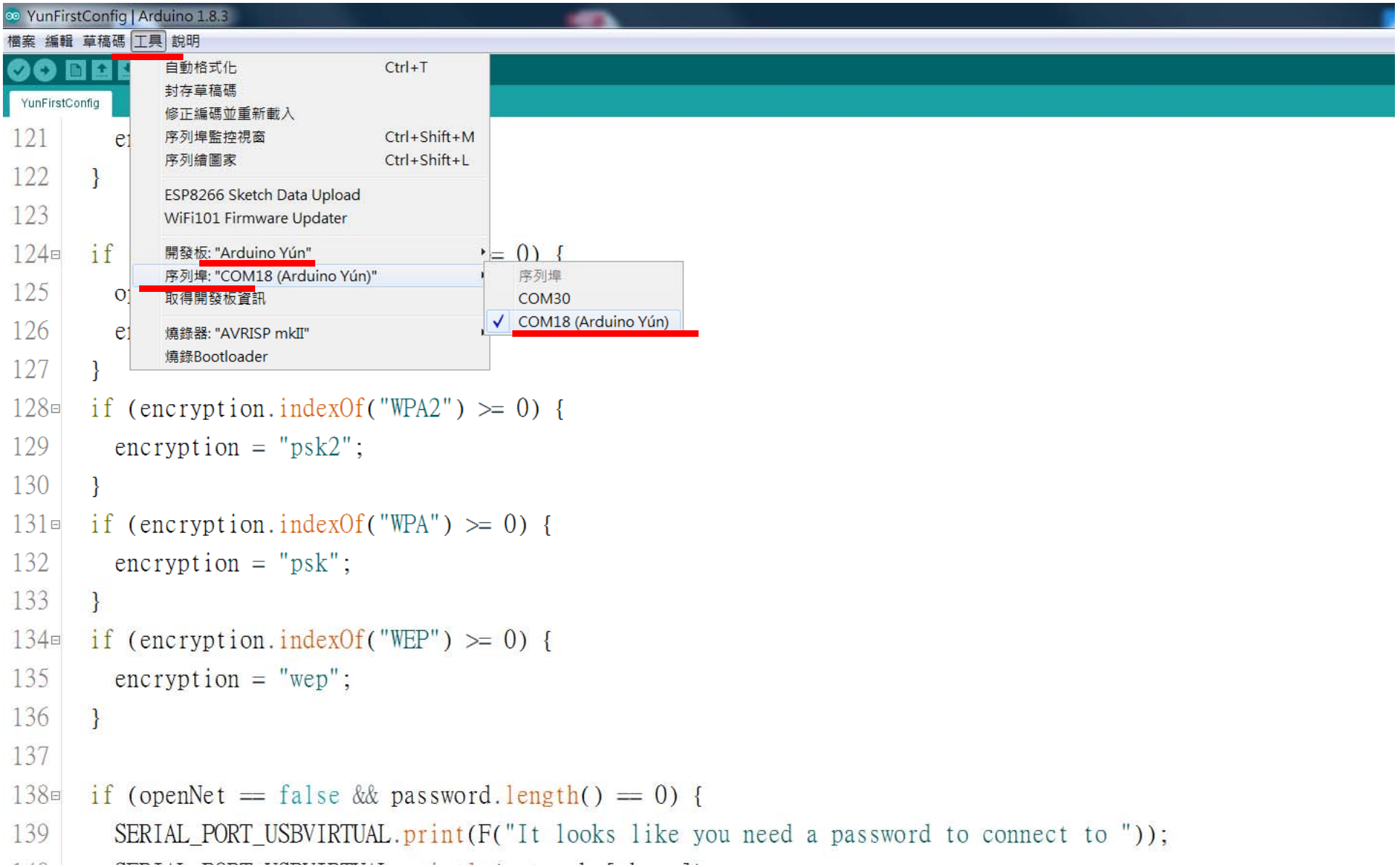
- Arduino Yún針腳輸出5v, 40ma
- 紅光LED工作電壓約為2.2v, 20ma
- 所以要確保LED壽命較長，需要降壓2v~3v
- 根據V=I * R
  - 2v=20ma * R, R=100歐姆

設定ArduinoYun連到Wi-Fi AP

0. 下載Arduino IDE

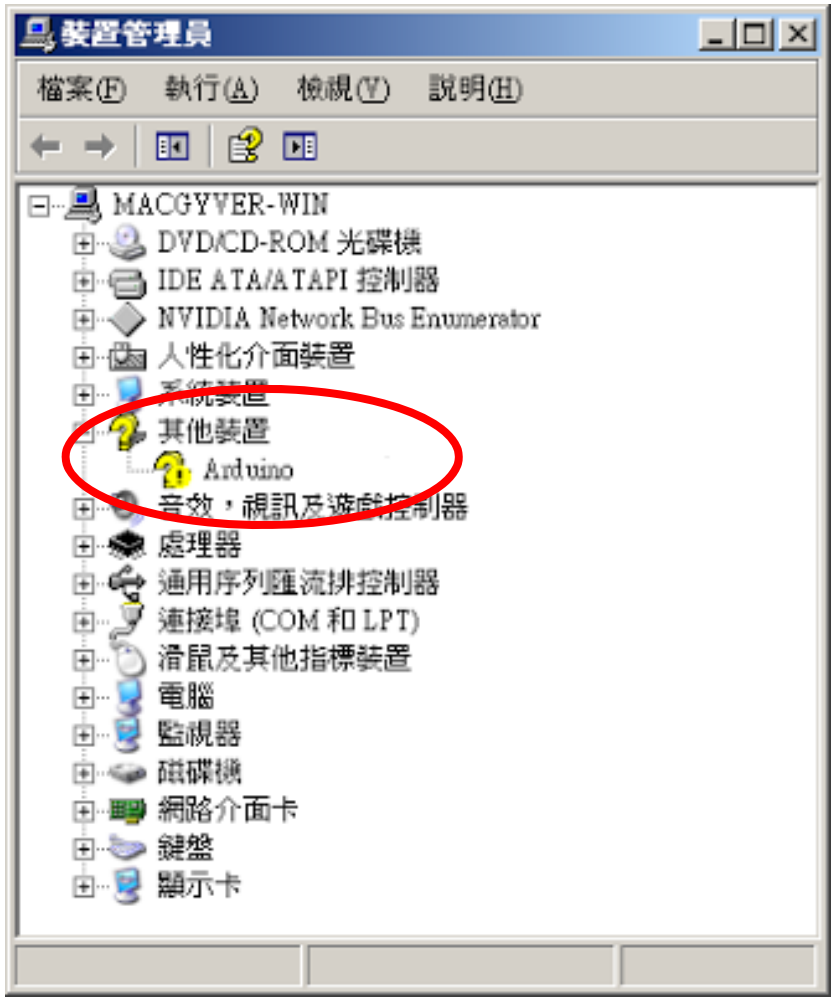


1. 將micro usb線串起ArduinoYun與PC
2. 在IDE上選則對應的COM port



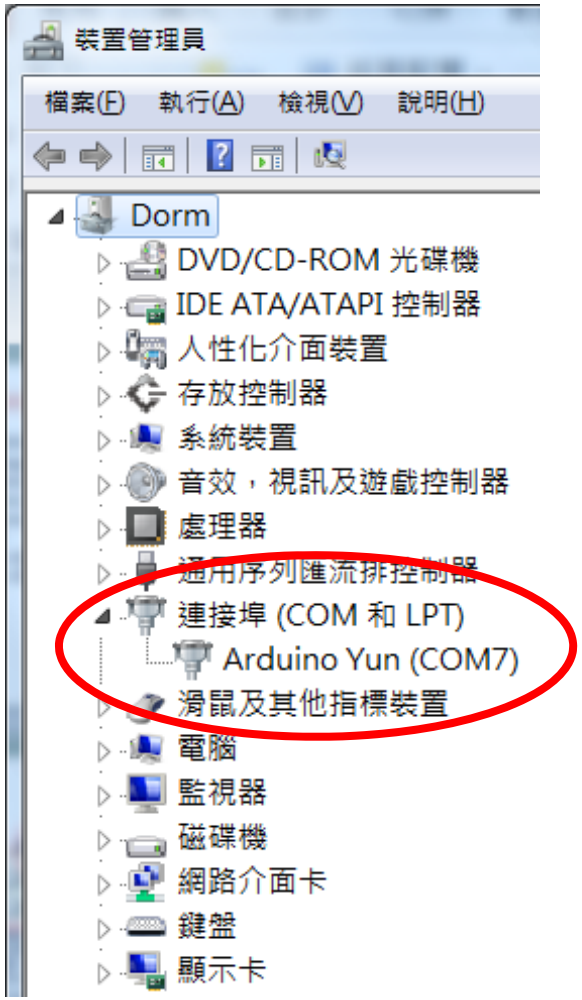
Arduino Yún 與電腦連結之驅動安裝

1. 接上Arduino Yun
2. 進入裝置管理員
3. 找到其他裝置中的Arduino
4. 於其上點右鍵選擇更新驅動程式
5. 將驅動程式目錄選擇到Arduino IDE目錄下即可找到驅動程式進行安裝

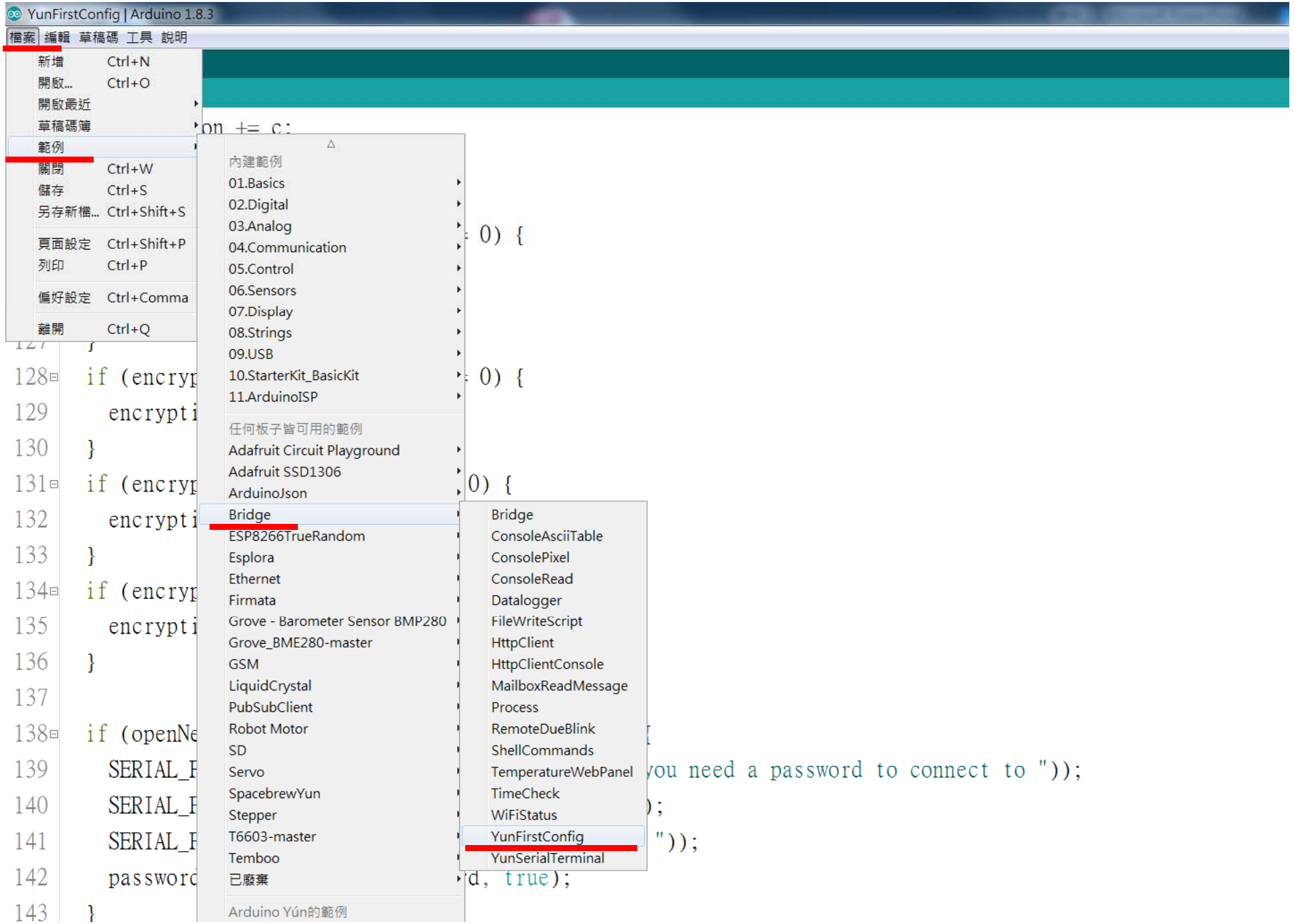


Arduino Yún與電腦連結成功

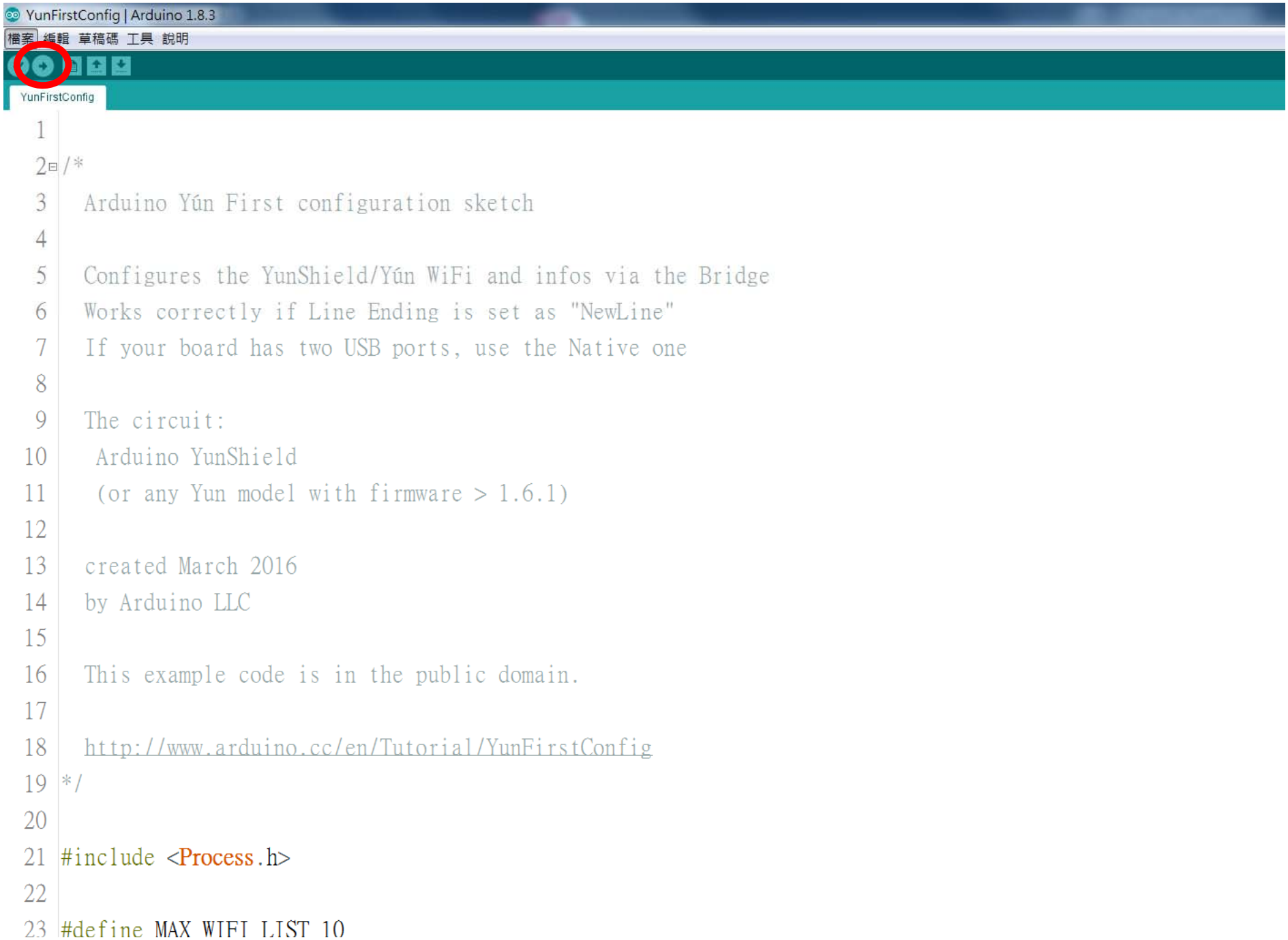
- 驅動程式若是安裝成功
  可在連接阜內看到
  Arduino Yun (COMX)
  X=1,2,3,…



3. 選擇範例程式YunFirstConfig

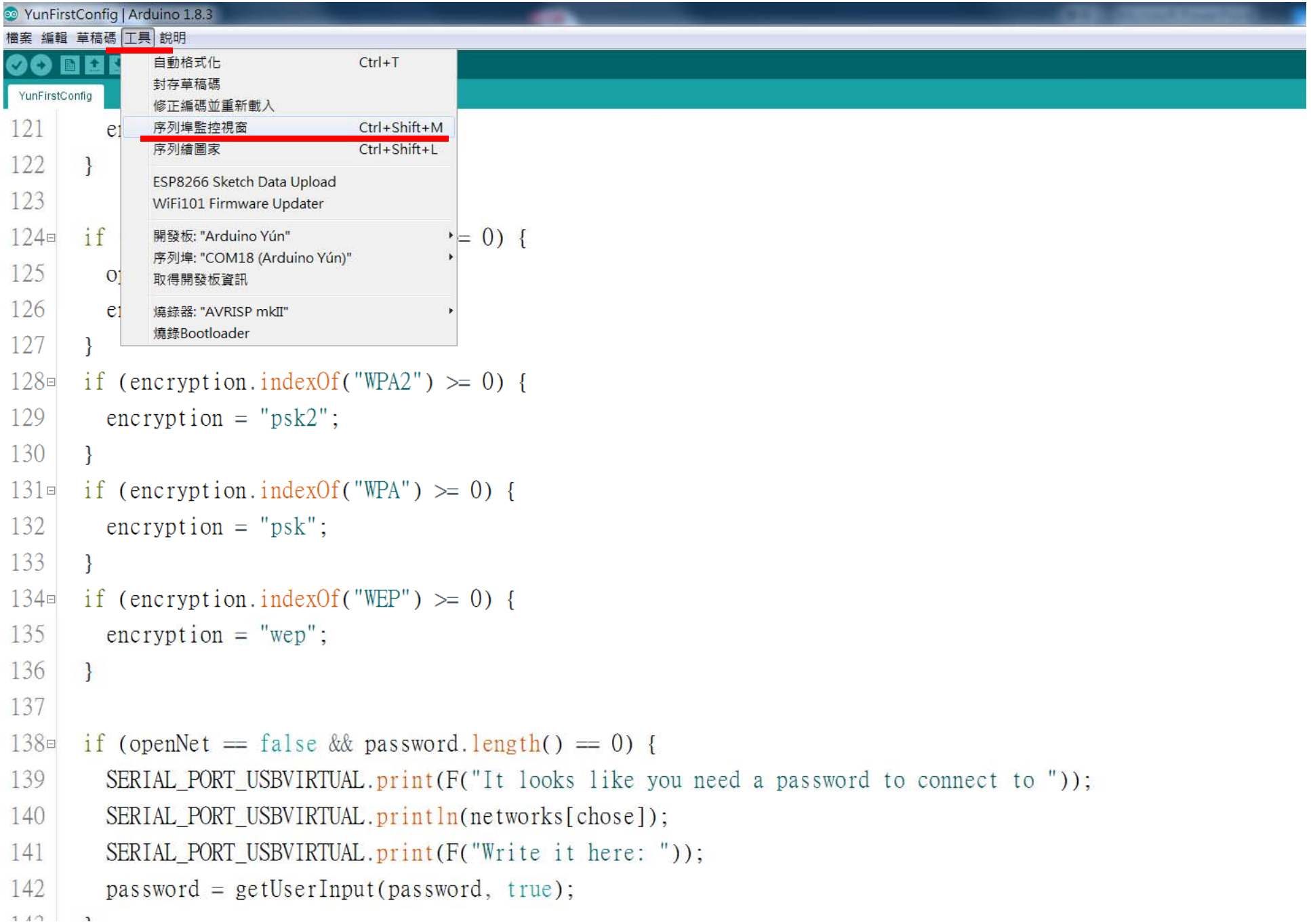


3.1. 上傳例程式YunFirstConfig到ArduinoYun板子上

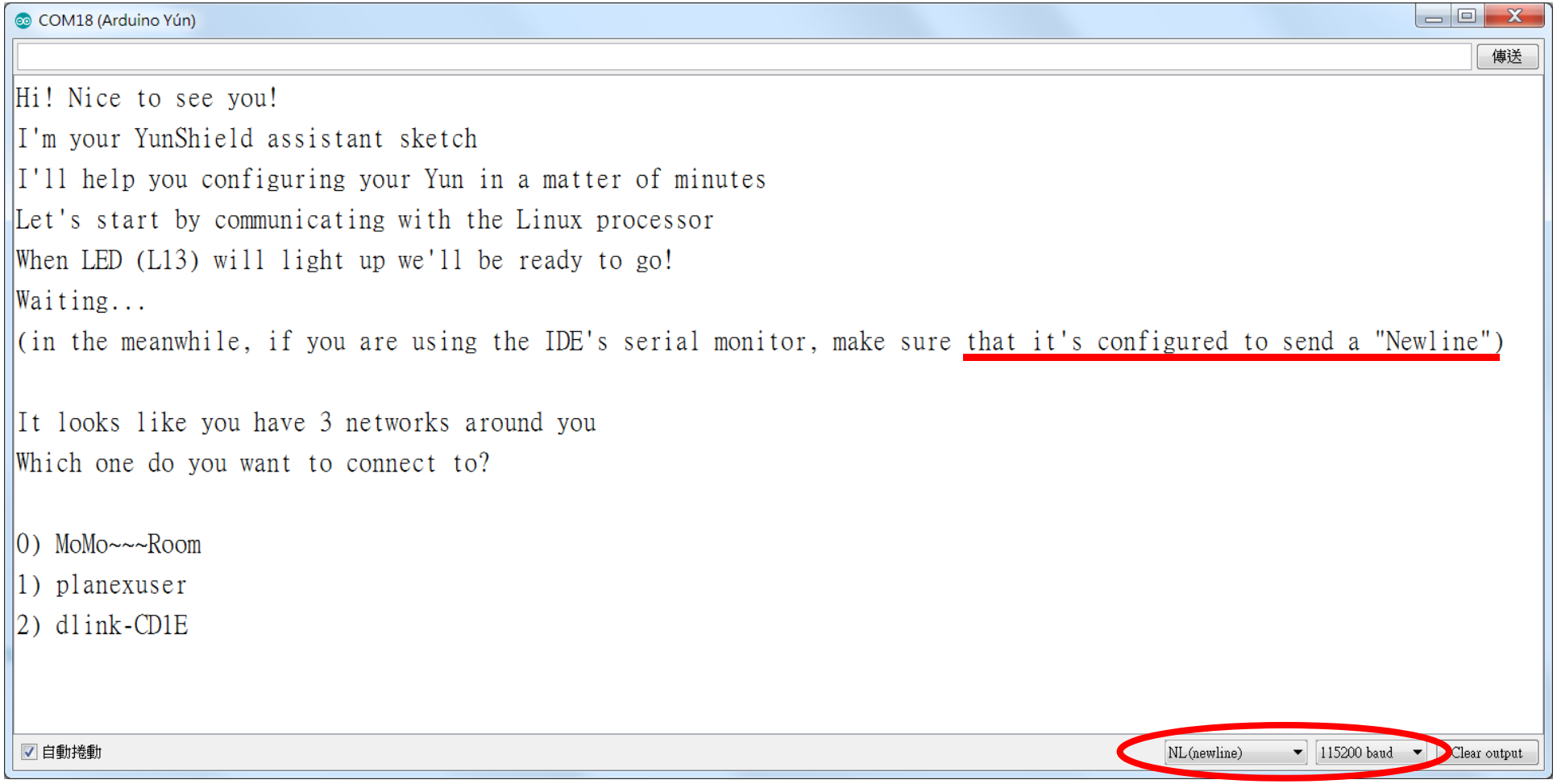



```
1
2  /*
3    Arduino Yún First configuration sketch
4
5    Configures the YunShield/Yún WiFi and infos via the Bridge
6    Works correctly if Line Ending is set as "NewLine"
7    If your board has two USB ports, use the Native one
8
9    The circuit:
10    Arduino YunShield
11    (or any Yun model with firmware > 1.6.1)
12
13   created March 2016
14   by Arduino LLC
15
16   This example code is in the public domain.
17
18   http://www.arduino.cc/en/Tutorial/YunFirstConfig
19 */
20
21 #include <Process.h>
22
23 #define MAX_WIFI_LIST 10
```

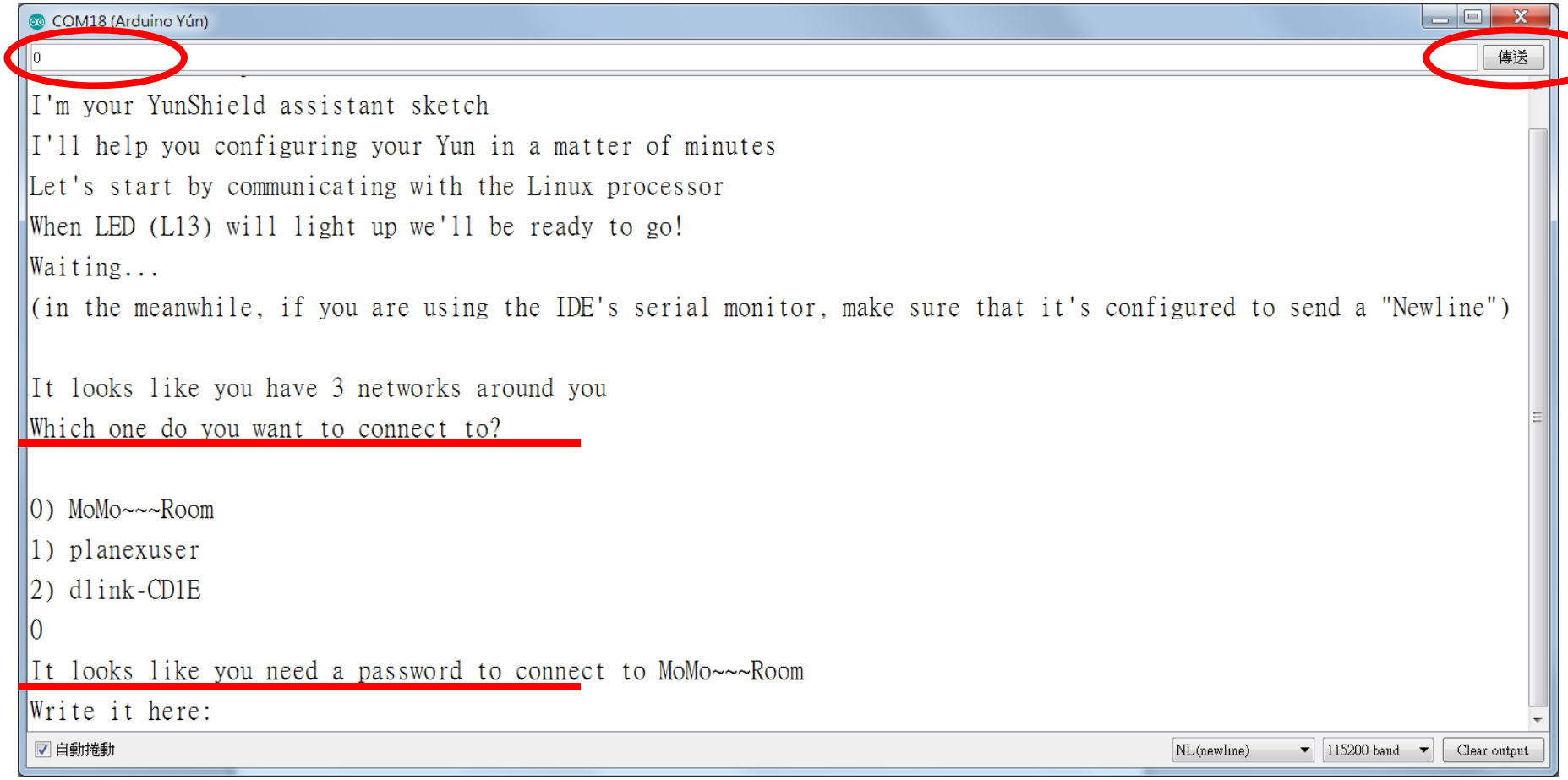
4. 斷電重開，選擇序列阜監控視窗



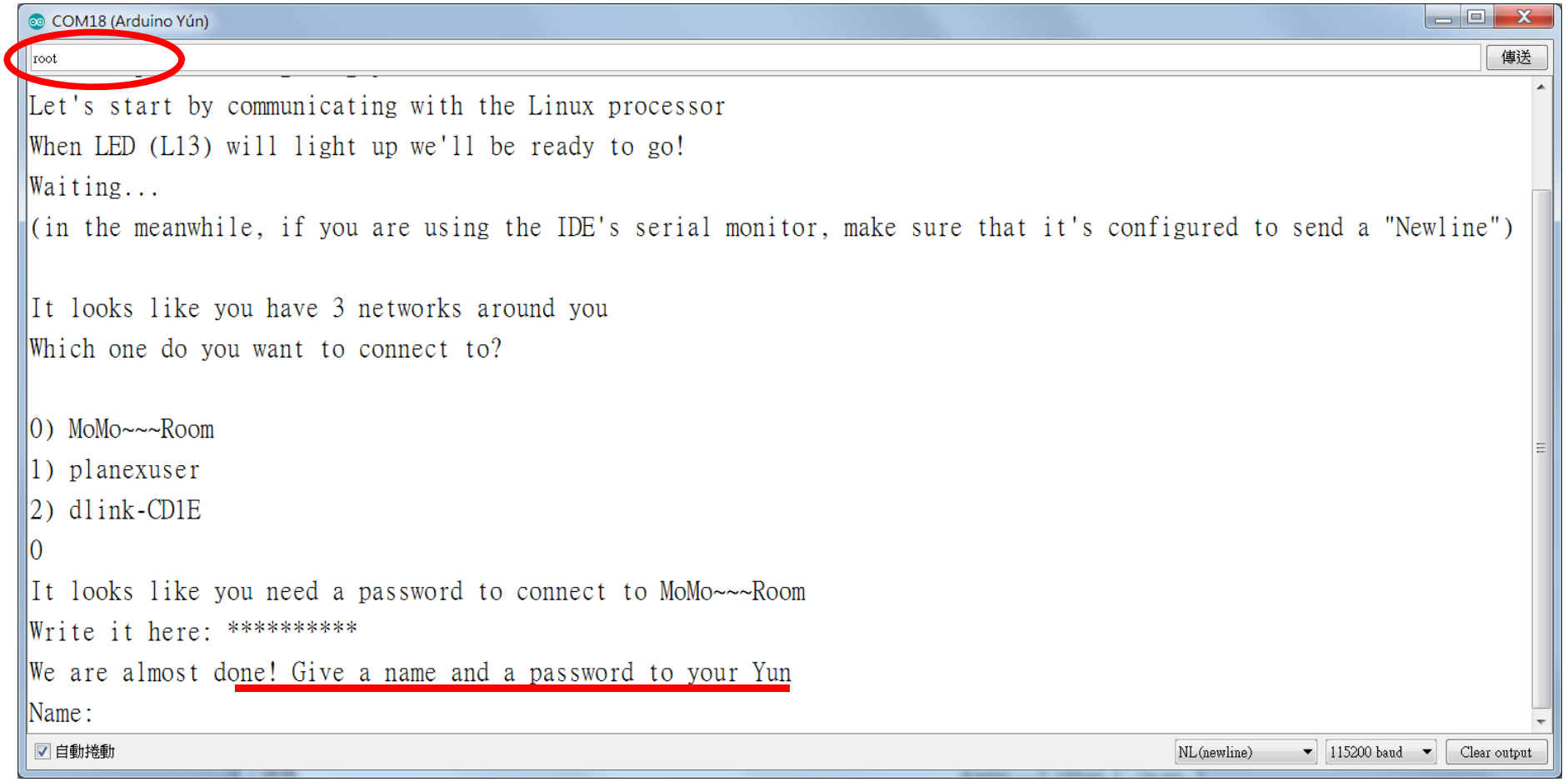
5. 序列阜監控視窗的通訊模式要選 **NL(newline), 115200 baud**



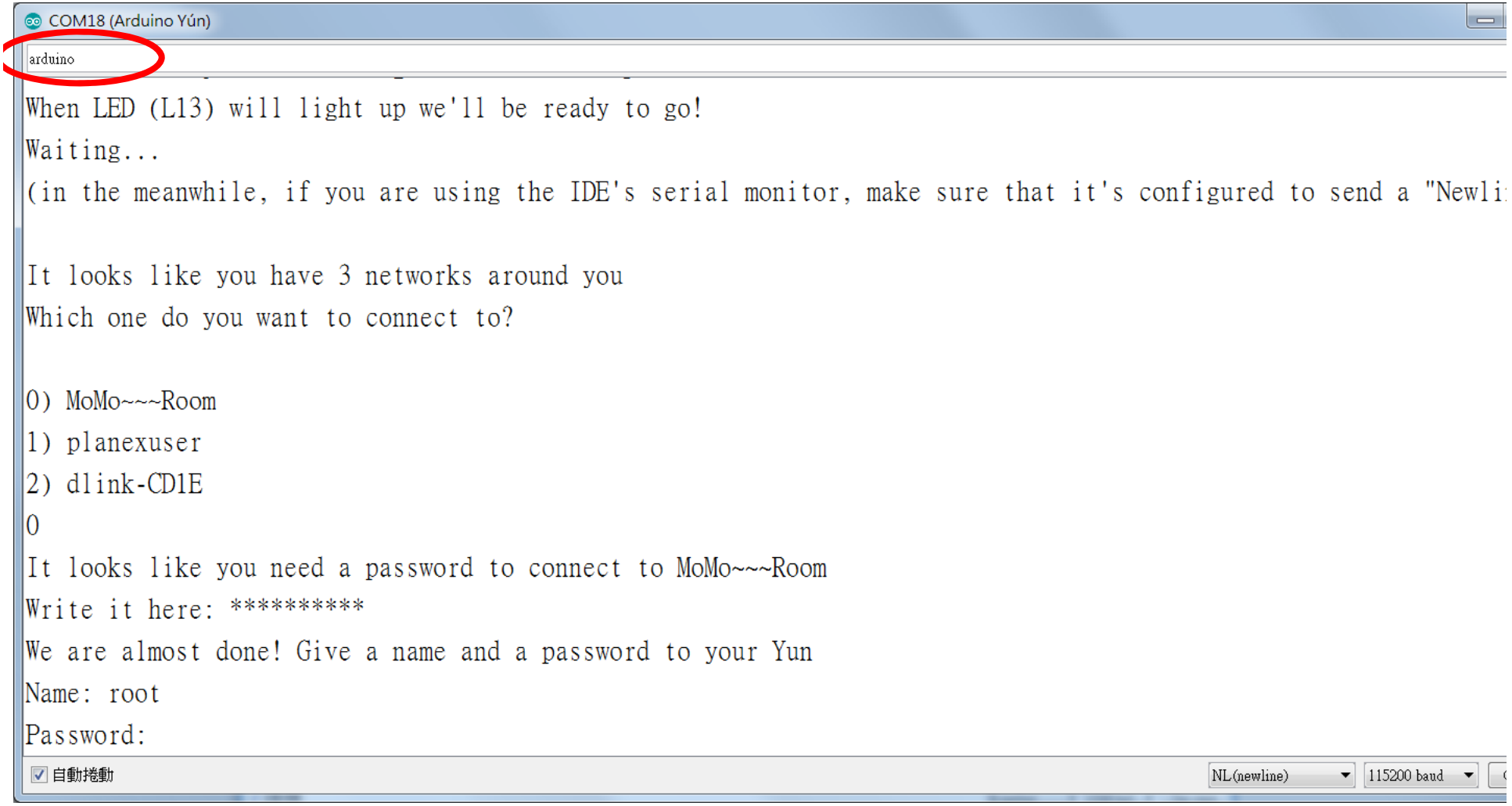
6. 於上方輸入框中依序輸入問題的答案，按下右邊的傳送鈕傳送
選擇正確 WiFi AP後，接著輸入密碼。



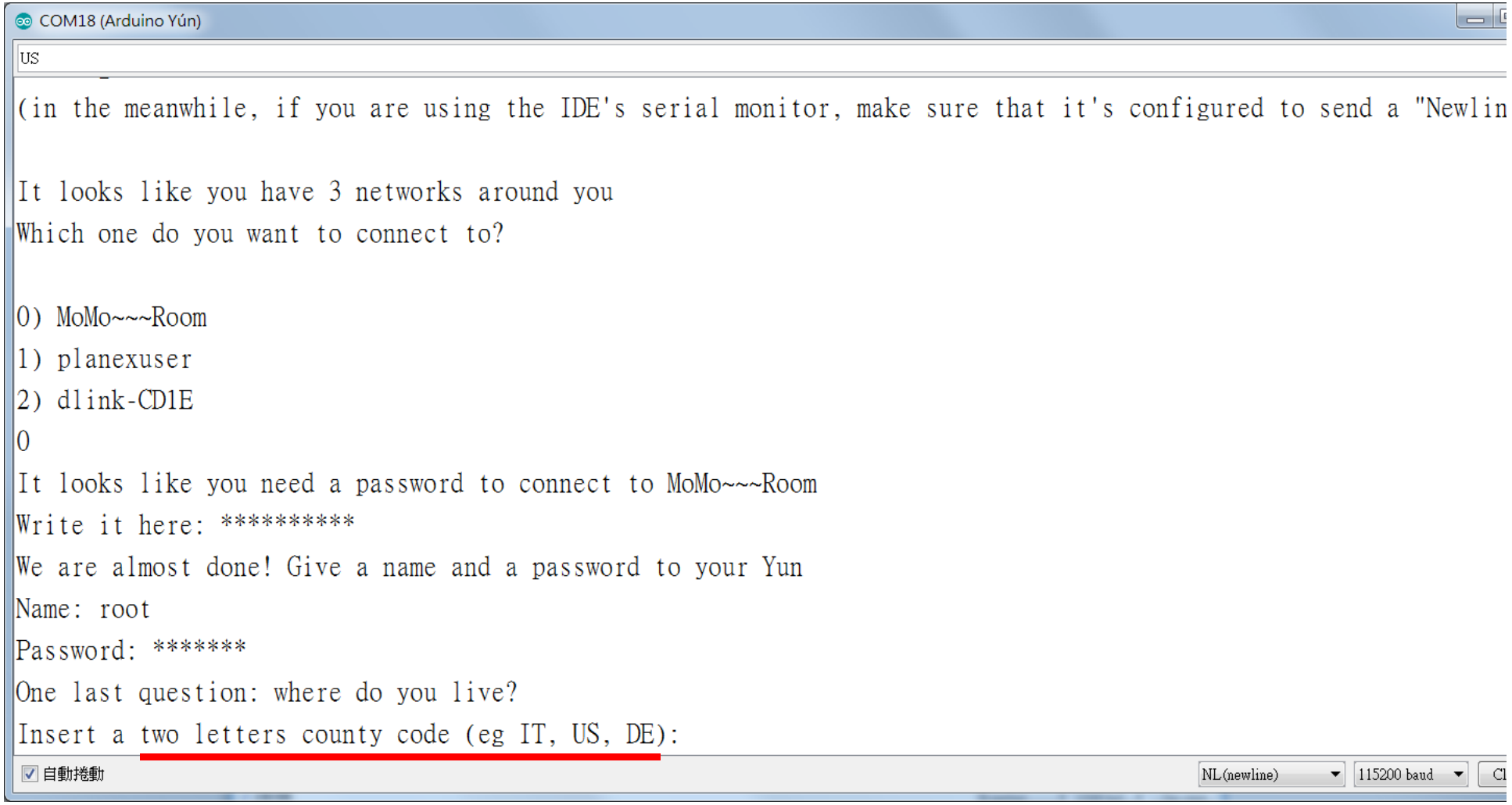
7. 設定登入帳號，請輸入 root



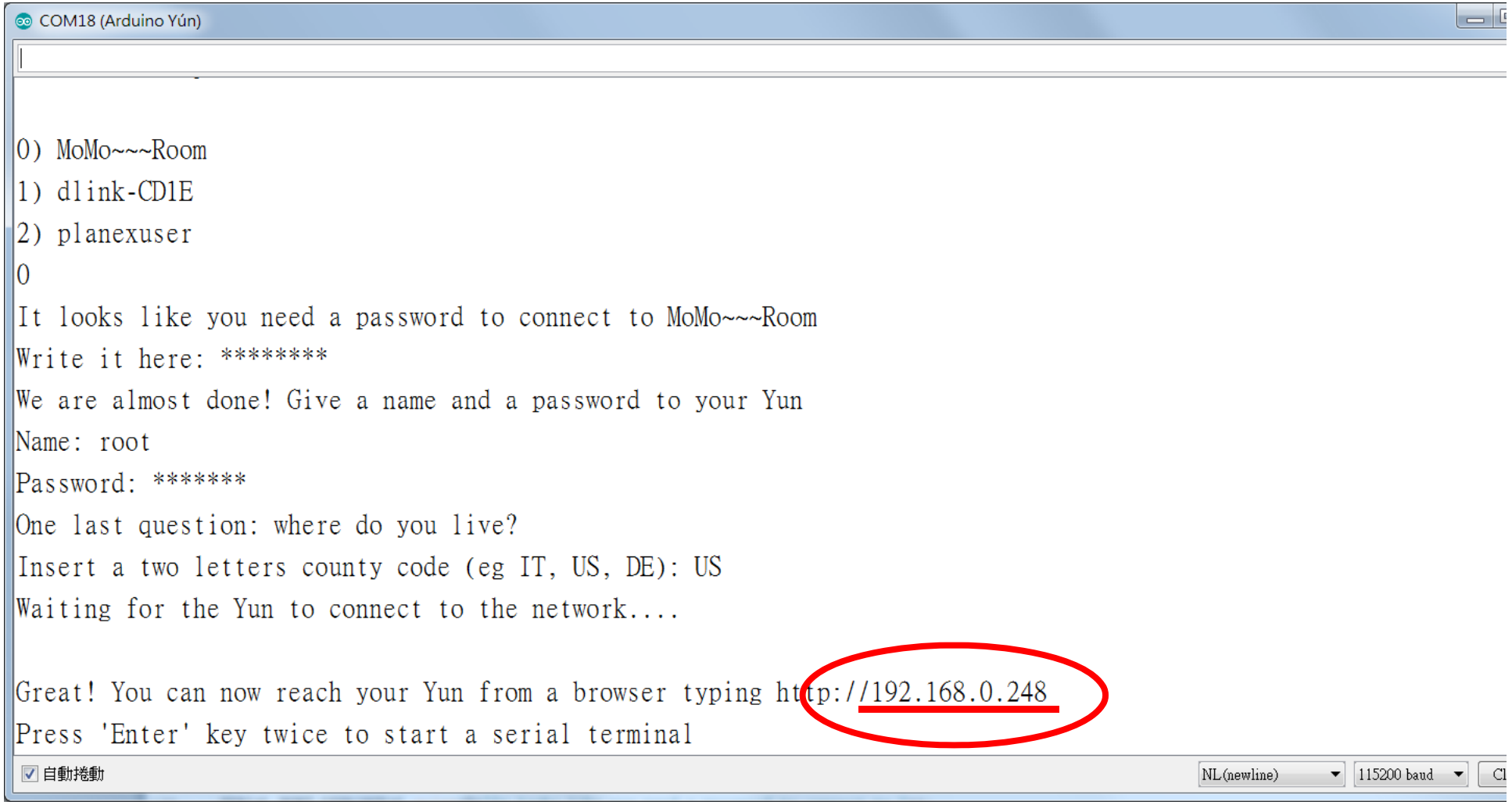
8. 設定登入密碼，請輸入 arduino



9. 國碼輸入TW


COM18 (Arduino Yún)
US
(in the meanwhile, if you are using the IDE's serial monitor, make sure that it's configured to send a "Newlin
It looks like you have 3 networks around you
Which one do you want to connect to?
0) MoMo~~~Room
1) planexuser
2) dlink-CD1E
0
It looks like you need a password to connect to MoMo~~~Room
Write it here: **********
We are almost done! Give a name and a password to your Yun
Name: root
Password: *******
One last question: where do you live?
Insert a two letters county code (eg IT, US, DE):
自動捲動
NL(newline)
115200 baud

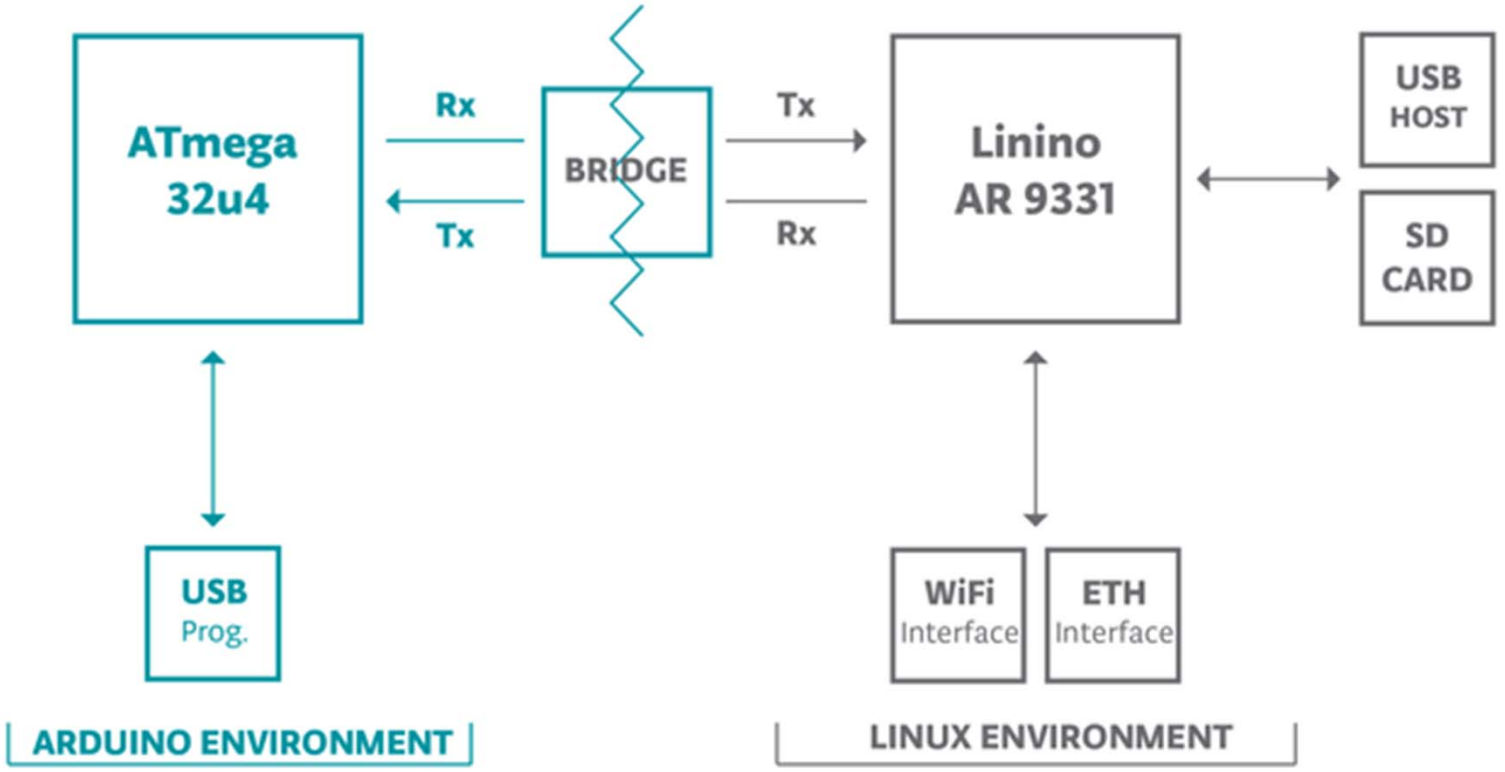
10. 記住畫面所顯示的板子IP



ArduinoYun連接IoTtalk

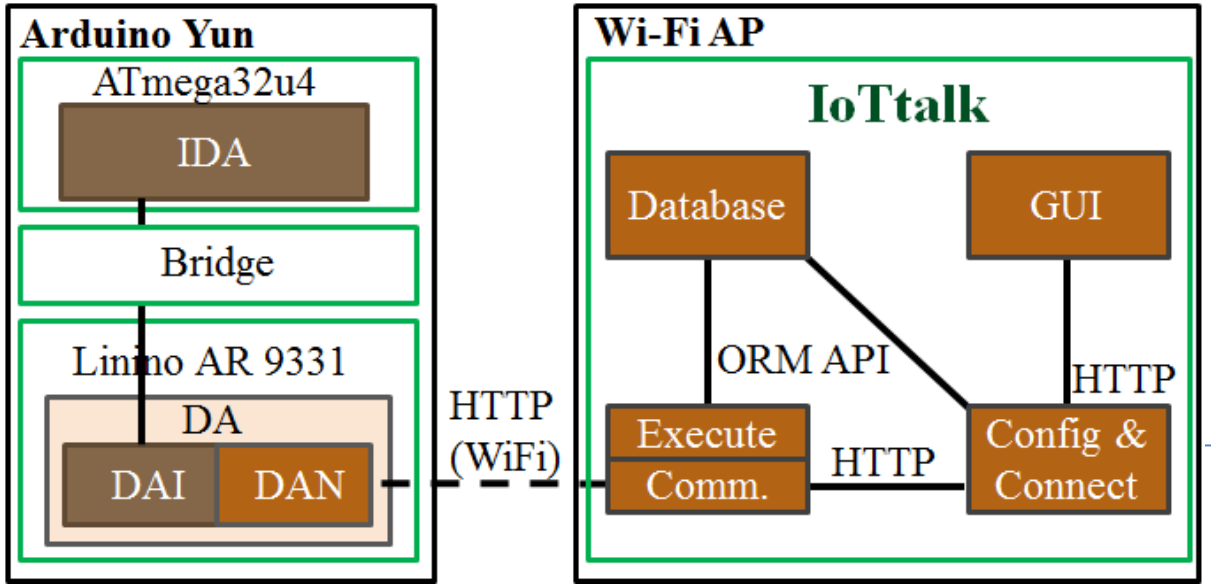
如何讓Arduino Yún 連結IoTtalk?

- Arduino Yún提供bridge架構，讓Linux環境與Arduino環境之間可以溝通
- Bridge架構



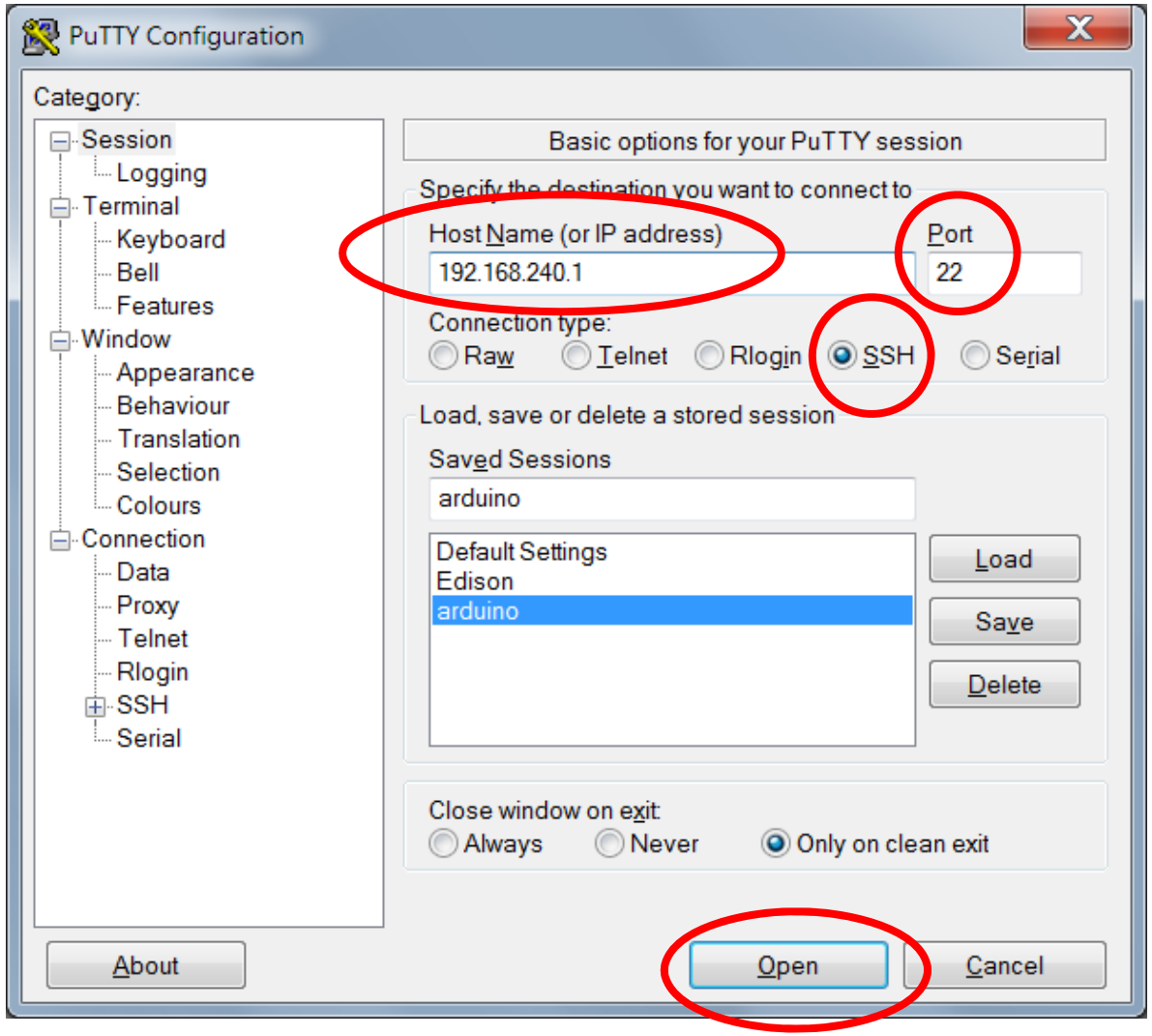
如何讓Arduino Yún 連結IoTtalk?

- 需在Arduino Yún板子中，載好與IoTtalk通訊的DAI.py, DAN.py, csmapi.py程式
- DAI: 負責與Arduino程式(IDA) 通訊
  - 使用者仍須修改custom.py來達成與IDA的通訊
- IDA: Arduino環境跑的程式
- DAN:負責跟IoTtalk通訊的程式

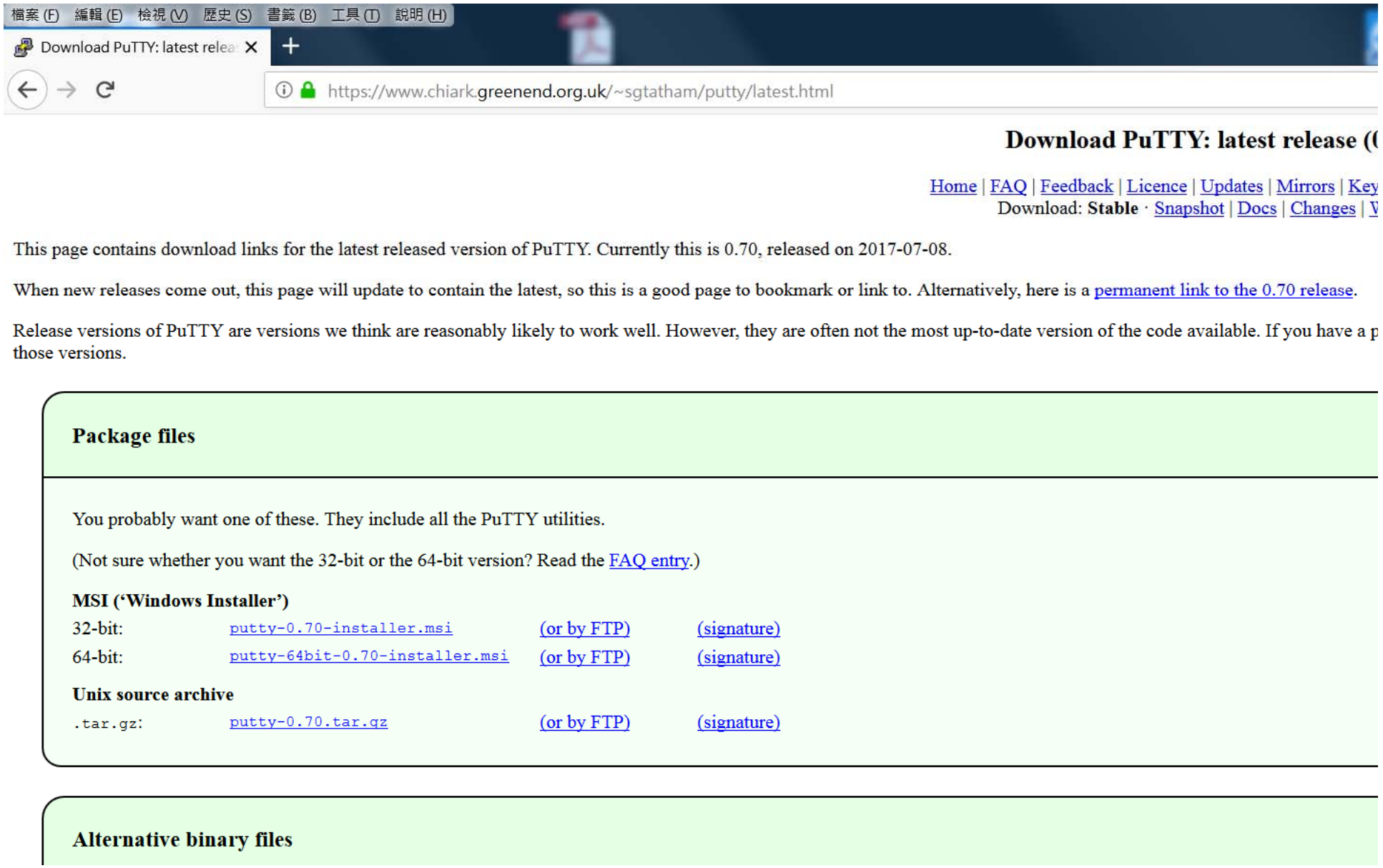


- DAI:
  device application to IoT device
- IDA:
  IoT device to device application
- DAN:
  device application to network

使用PuTTy連接Arduino Yún



Google putty and download.



登入Arduino Yún 上的Linino

- 帳號：root
- 密碼：arduino

設置python執行環境，安裝requests

請參考 https://github.com/IoTtalk/Arduino-da

opkg update

opkg install python-pip

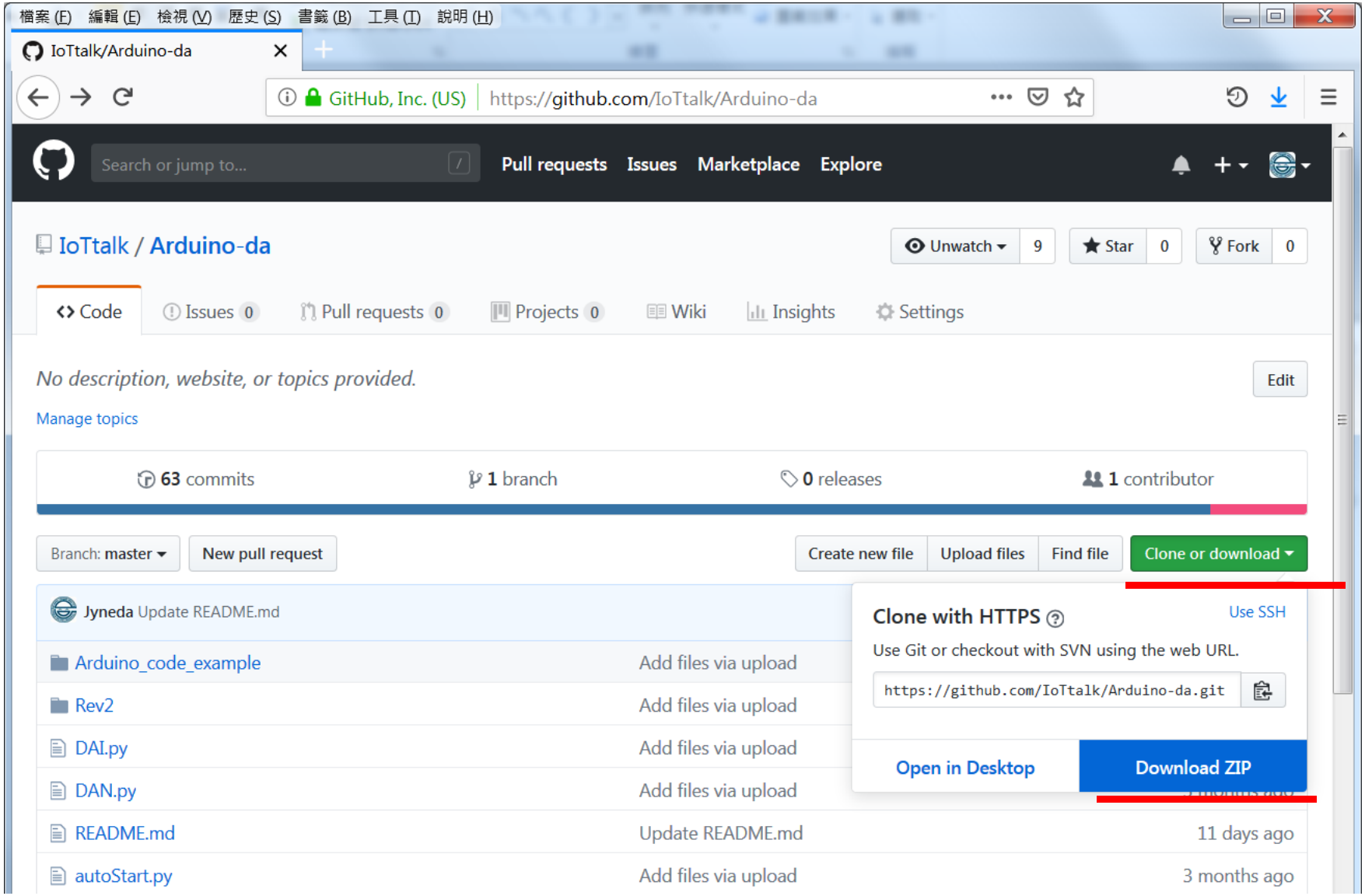
pip install requests (斷電重開機後執行，不然一定會發生記憶體不足 Memory error)

opkg update opkg install openssh-sftp-server

註：上述順序不可改。 如果裝requests時一直發生memory error記憶體不足，
可試著手動依序安裝 idna, urllib3, chardet, certifi, requests 一旦遭遇記憶體
不足就斷電重開機後執行後再繼續裝， 如果怎樣都裝不起來，只能Factory
reset後再試試看。

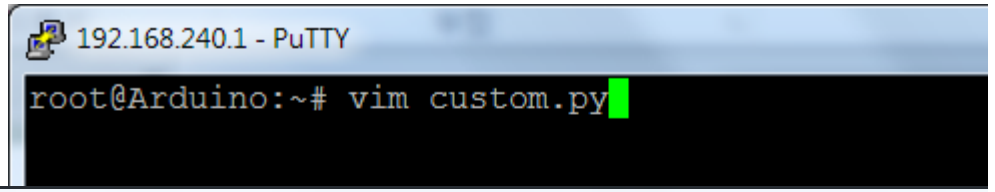
下載ArduinoYun Rev. 2連接 IoTtalk的程式，並用FTP軟體上傳到ArduinoYun Linux端
https://github.com/IoTtalk/ArduTalk-for-ArduinoYun/tree/master/Rev2

Arduino端要燒入的程式範例
https://github.com/IoTtalk/ArduTalk-for-ArduinoYun/tree/master/sketch_apr17a



設定Device Feature, Model, 與Arduino傳遞資訊的變數

- 指令：vim custom.py



192.168.240.1 - PuTTY

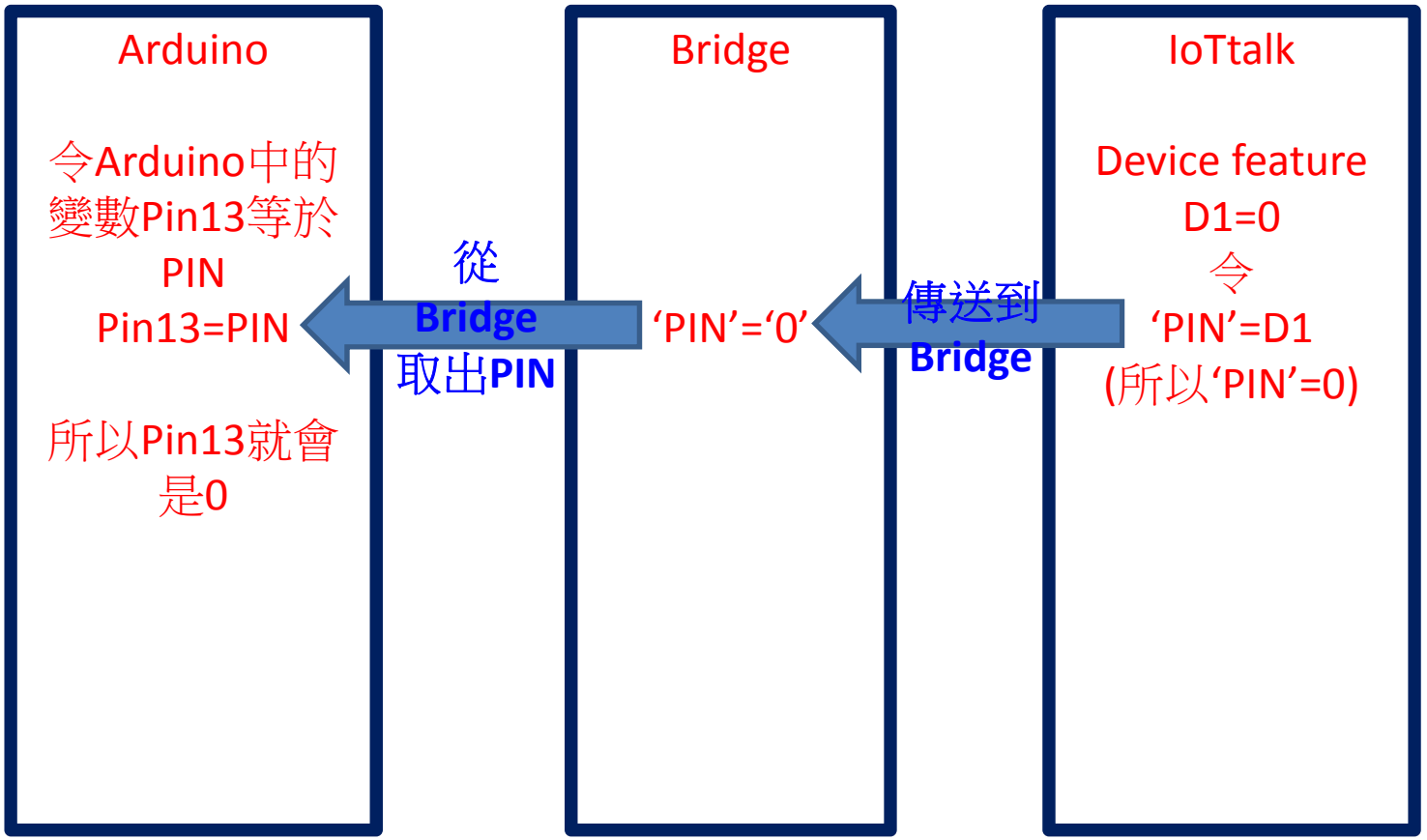
```
import DAN

def update_profile():
    DAN.profile['dm_name']='Arduino'
    DAN.profile['d_name']='Arduino Yun'
    DAN.profile['df_list']=['Pin', 'Camera_angle']

def assign():
    return [
        ('Pin', 0, 'PIN'),
        ('Camera_angle', 1, 'Reg_done'),
    ]
```

想要傳送的 Device feature

Device feature的維度

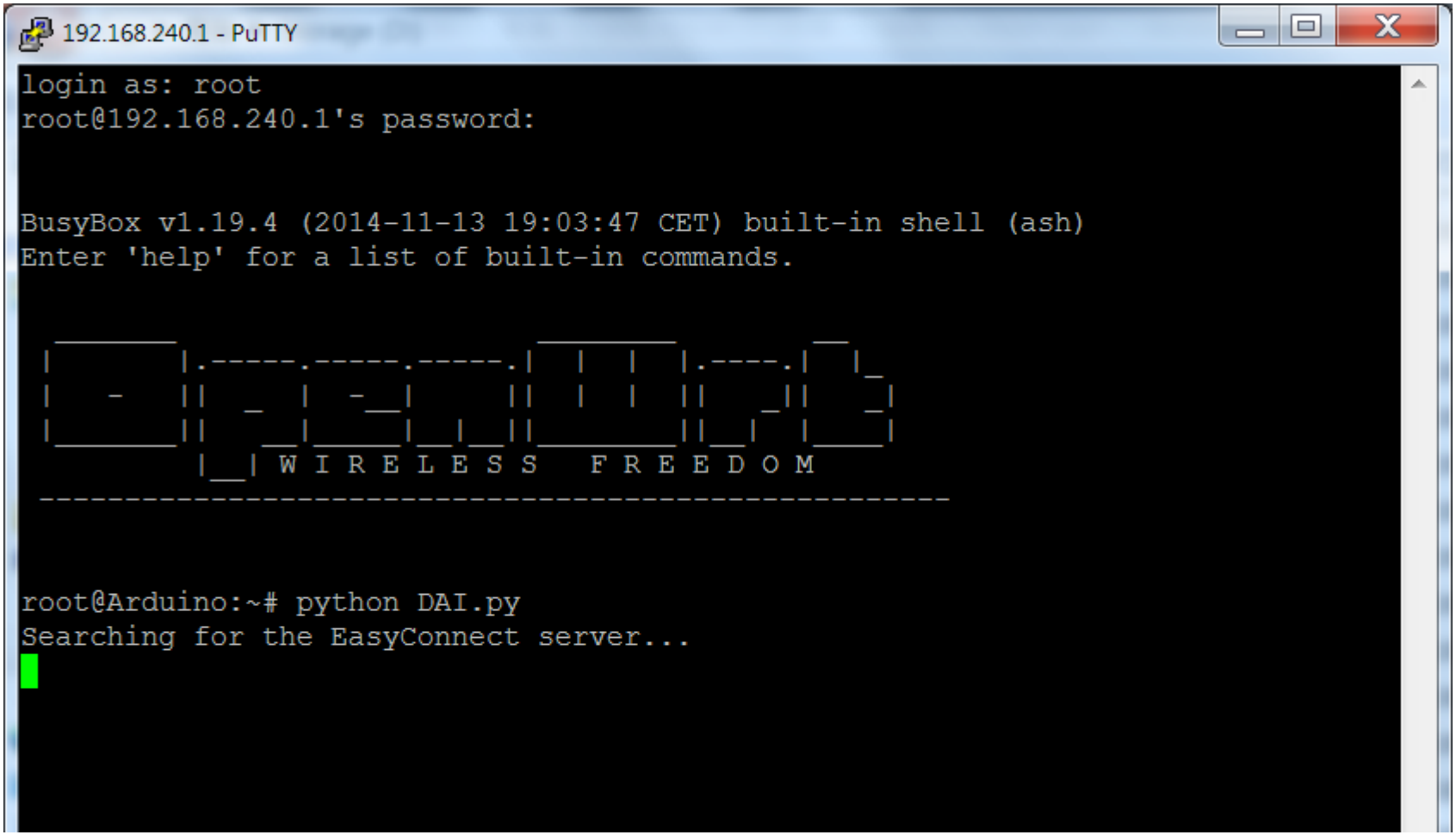
與Arduino中透過bridge傳遞的共通變數名稱，意即此變數在Arduino中也要一模一樣。IoTtalkt將device feature傳進此放在bridge中的變數(假設是PIN)在Arduino端就可在bridge中，從變數PIN取出數值

透過Bridge傳遞Output Device Feature數值到Arduino



執行DAI.py連結IoTtalk

- 指令：python DAI.py



設定Arduino Yún通電後自動連結IoTtalk

執行 python autoStart.py

autoStart.py會在 /etc/rc.local 加入一行

(sleep 0;python -u /root/DAI.py)&

避免下列行為，以免燒掉Arduino

1. 將任一個 I/O Pins 與 GND 連接形成短路
2. 將 I/O Pins 相互連接
3. 將過大的電壓導引到 I/O Pins 上
4. 外部電流反接
5. 電源由 5V 針腳導入,且外部電源電壓大於 5V
6. 電源由 3.3V 針腳導入,且外部電源電壓大於 3.3V
7. 連接 Vin 與 GND
8. 提供超過 13V 到 Reset Pin 上
9. 超過微控制器所能負載之電流量(200ma)