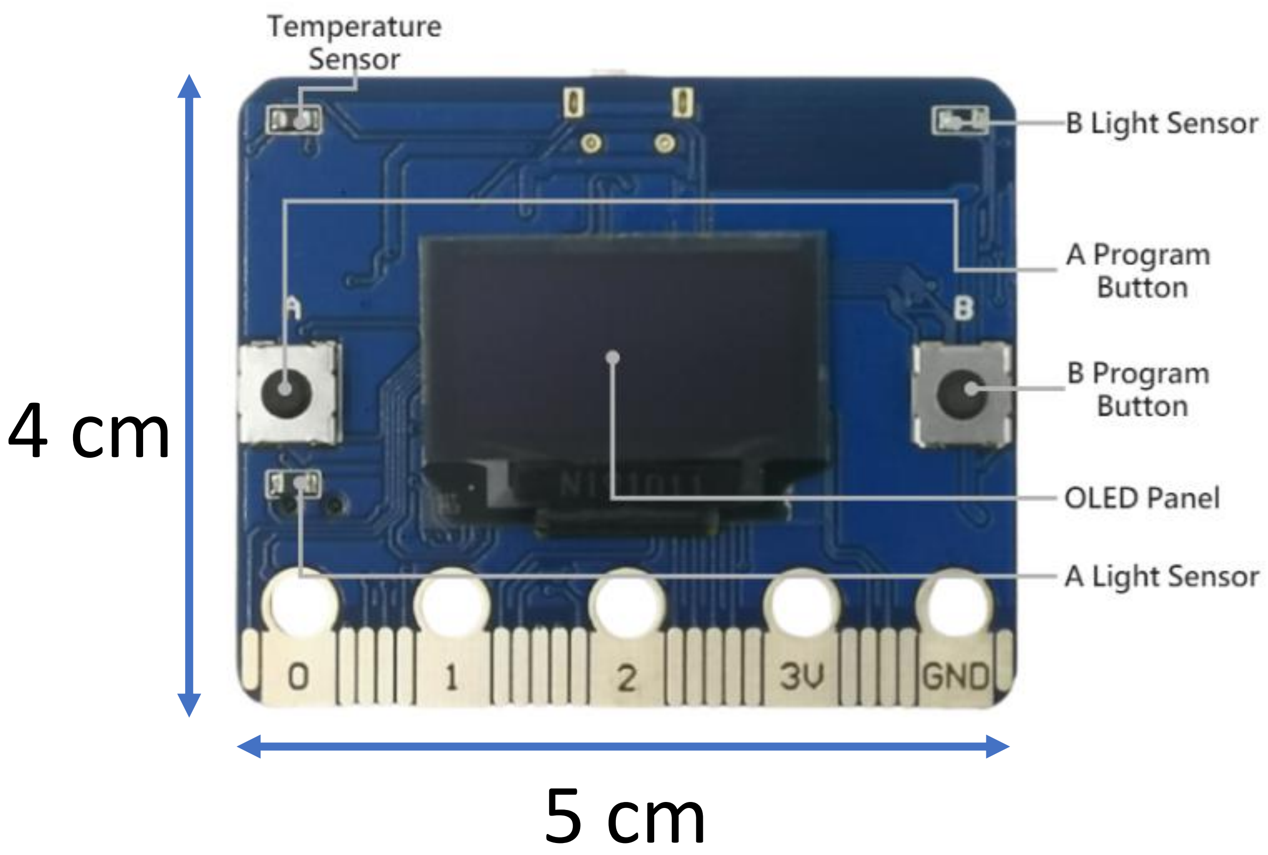
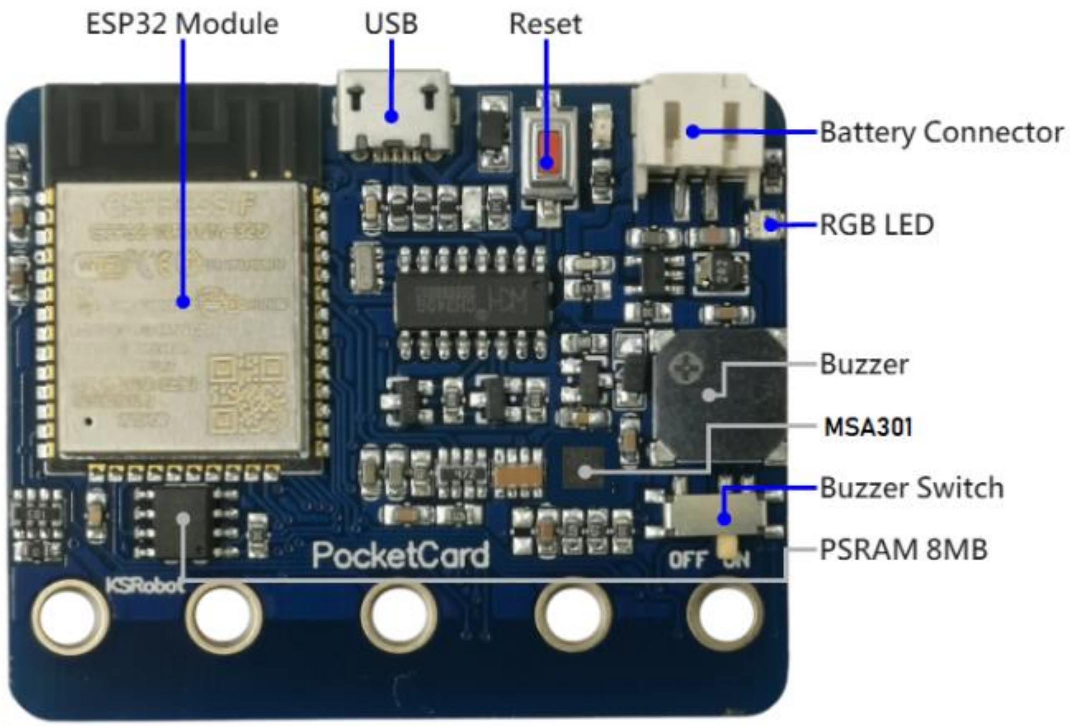
物聯網實務

11_16

廖裕評

KSB061 PocketCard Lite 1.3 in. ESP32 board





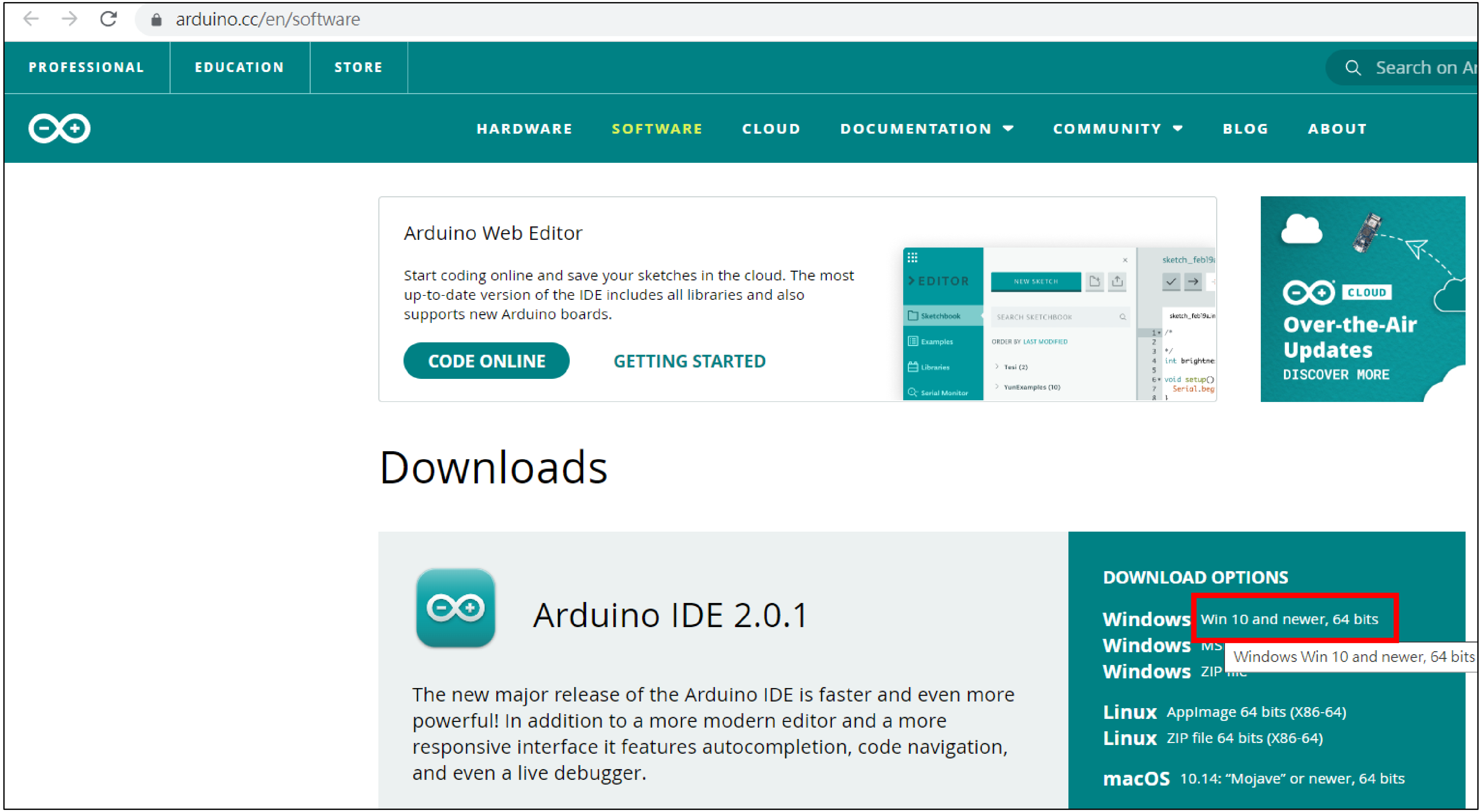
Setting up the environment

- 1. Download Arduino IDE

https://www.arduino.cc/en/Main/Software

- 2. Install the driver for USB to UART device

http://www.wch.cn/download/CH341SER_ZIP.html



Arduino Web Editor

Start coding online and save your sketches in the cloud. The most up-to-date version of the IDE includes all libraries and also supports new Arduino boards.

CODE ONLINE GETTING STARTED

Downloads

Arduino IDE 2.0.1

The new major release of the Arduino IDE is faster and even more powerful! In addition to a more modern editor and a more responsive interface it features autocompletion, code navigation, and even a live debugger.

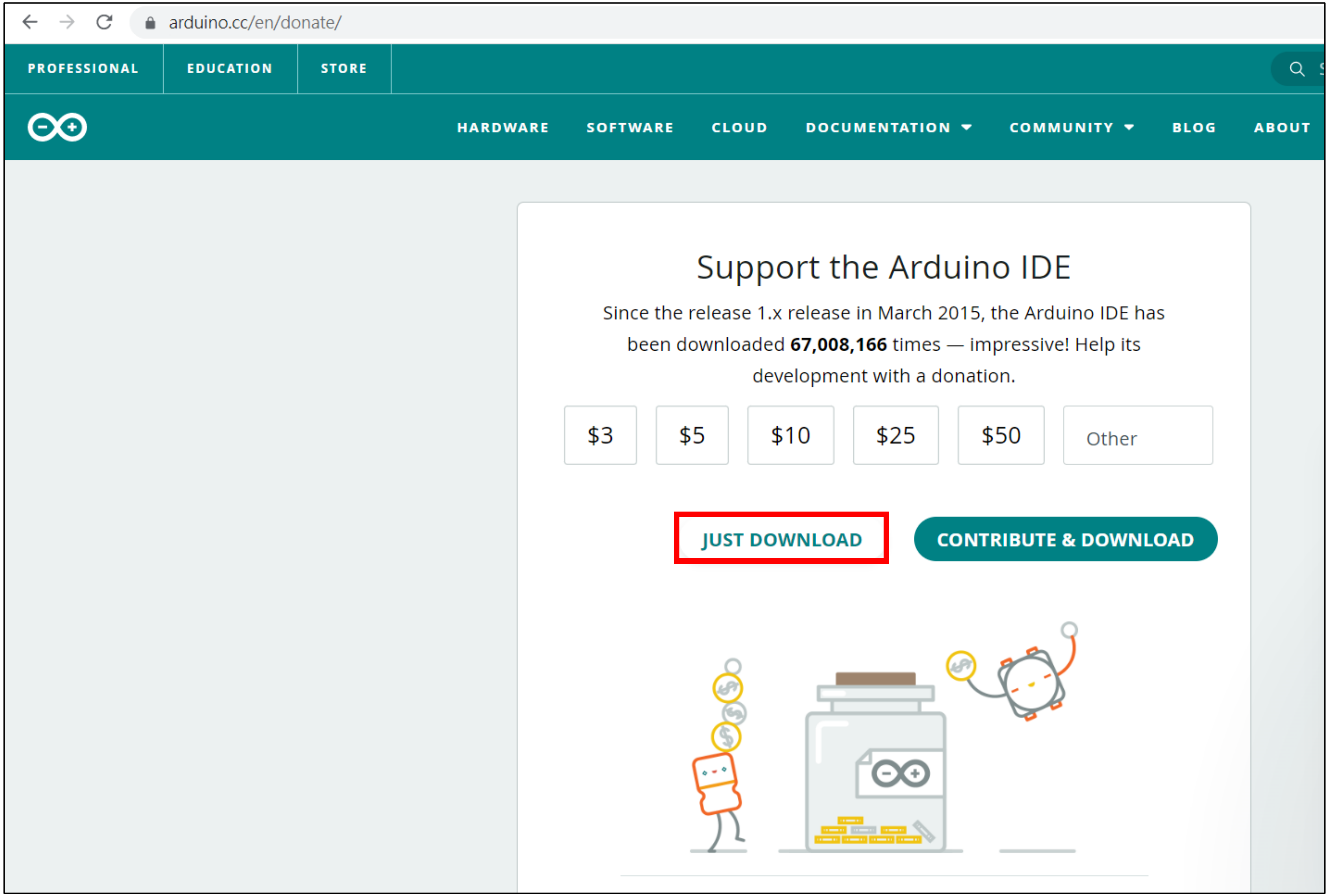
DOWNLOAD OPTIONS

Windows Win 10 and newer, 64 bits
Windows MS
Windows ZIP file

Windows Win 10 and newer, 64 bits

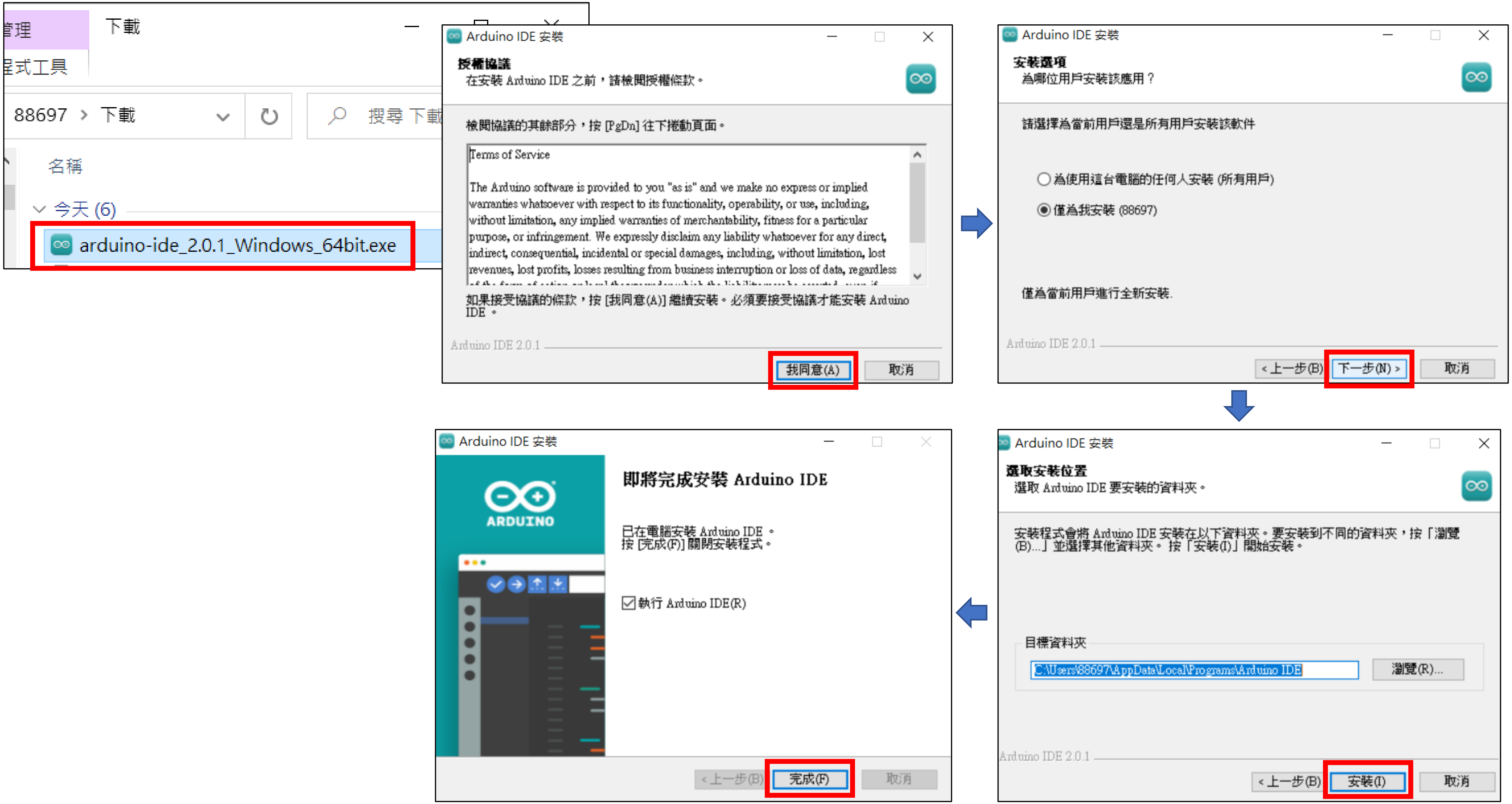
Linux AppImage 64 bits (X86-64)
Linux ZIP file 64 bits (X86-64)

macOS 10.14: "Mojave" or newer, 64 bits



Support the Arduino IDE

Since the release 1.x release in March 2015, the Arduino IDE has been downloaded **67,008,166** times — impressive! Help its development with a donation.



arduino-ide_2.0.1_Windows_64bit.exe

Arduino IDE 安裝

授權協議
在安裝 Arduino IDE 之前，請檢閱授權條款。

檢閱協議的其餘部分，按 [PgDn] 往下捲動頁面。

Terms of Service

The Arduino software is provided to you "as is" and we make no express or implied warranties whatsoever with respect to its functionality, operability, or use, including, without limitation, any implied warranties of merchantability, fitness for a particular purpose, or infringement. We expressly disclaim any liability whatsoever for any direct, indirect, consequential, incidental or special damages, including, without limitation, lost revenues, lost profits, losses resulting from business interruption or loss of data, regardless

如果接受協議的條款，按 [我同意(A)] 繼續安裝。必須要接受協議才能安裝 Arduino IDE。

Arduino IDE 2.0.1

Arduino IDE 安裝

安裝選項
為哪位用戶安裝該應用？

請選擇為當前用戶還是所有用戶安裝該軟件

○ 為使用這台電腦的任何人安裝 (所有用戶)
● 僅為我安裝 (88697)

僅為當前用戶進行全新安裝.

Arduino IDE 2.0.1

Arduino IDE 安裝

選取安裝位置
選取 Arduino IDE 要安裝的資料夾。

安裝程式會將 Arduino IDE 安裝在以下資料夾。要安裝到不同的資料夾，按「瀏覽(B)...」並選擇其他資料夾。 按「安裝(I)」開始安裝。

目標資料夾
C:\Users\88697\AppData\Local\Programs\Arduino IDE

Arduino IDE 2.0.1

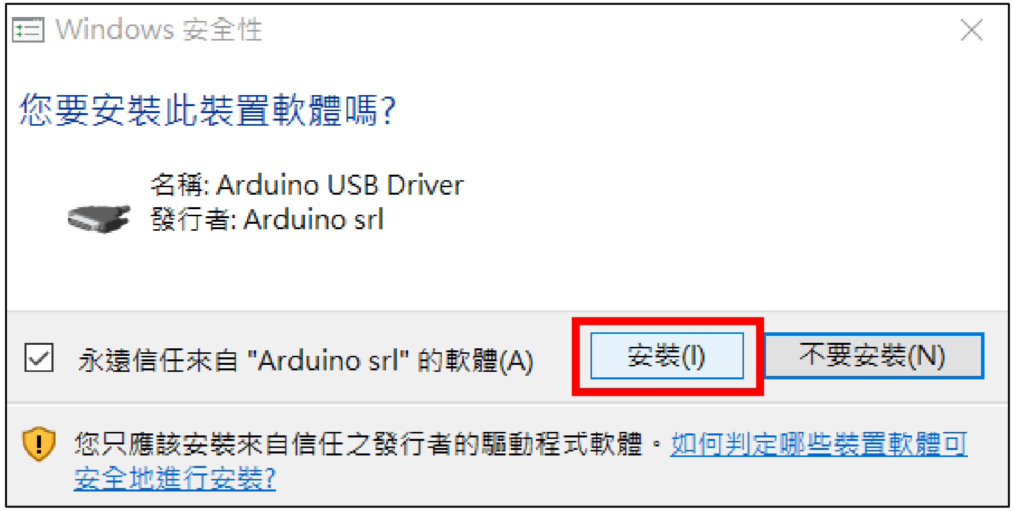
Arduino IDE 安裝

即將完成安裝 Arduino IDE

已在電腦安裝 Arduino IDE。
按 [完成(F)] 關閉安裝程式。

☑ 執行 Arduino IDE(R)

Install Arduino USB Driver



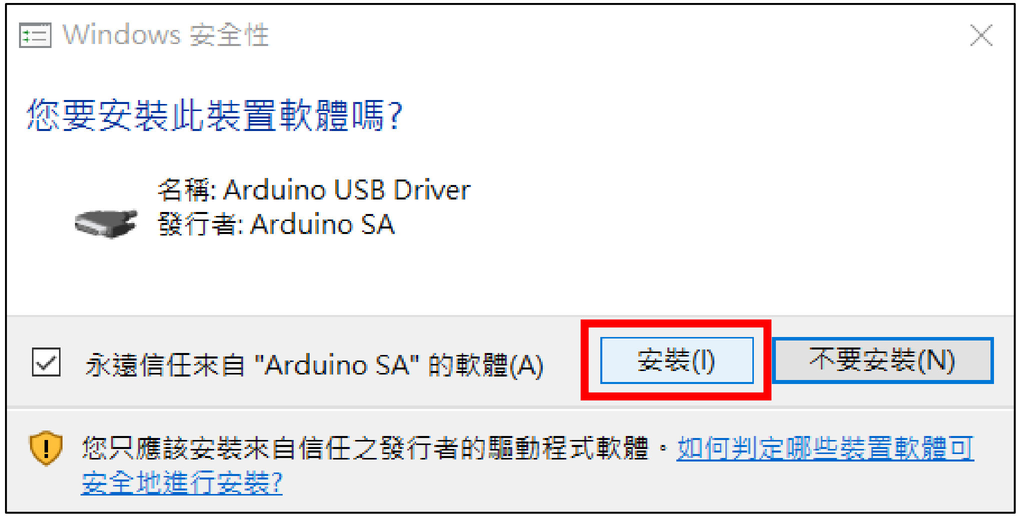
Windows 安全性

您要安裝此裝置軟體嗎?

名稱: Arduino USB Driver
發行者: Arduino srl

☑ 永遠信任來自 "Arduino srl" 的軟體(A)

您只應該安裝來自信任之發行者的驅動程式軟體。如何判定哪些裝置軟體可安全地進行安裝?



Windows 安全性

您要安裝此裝置軟體嗎?

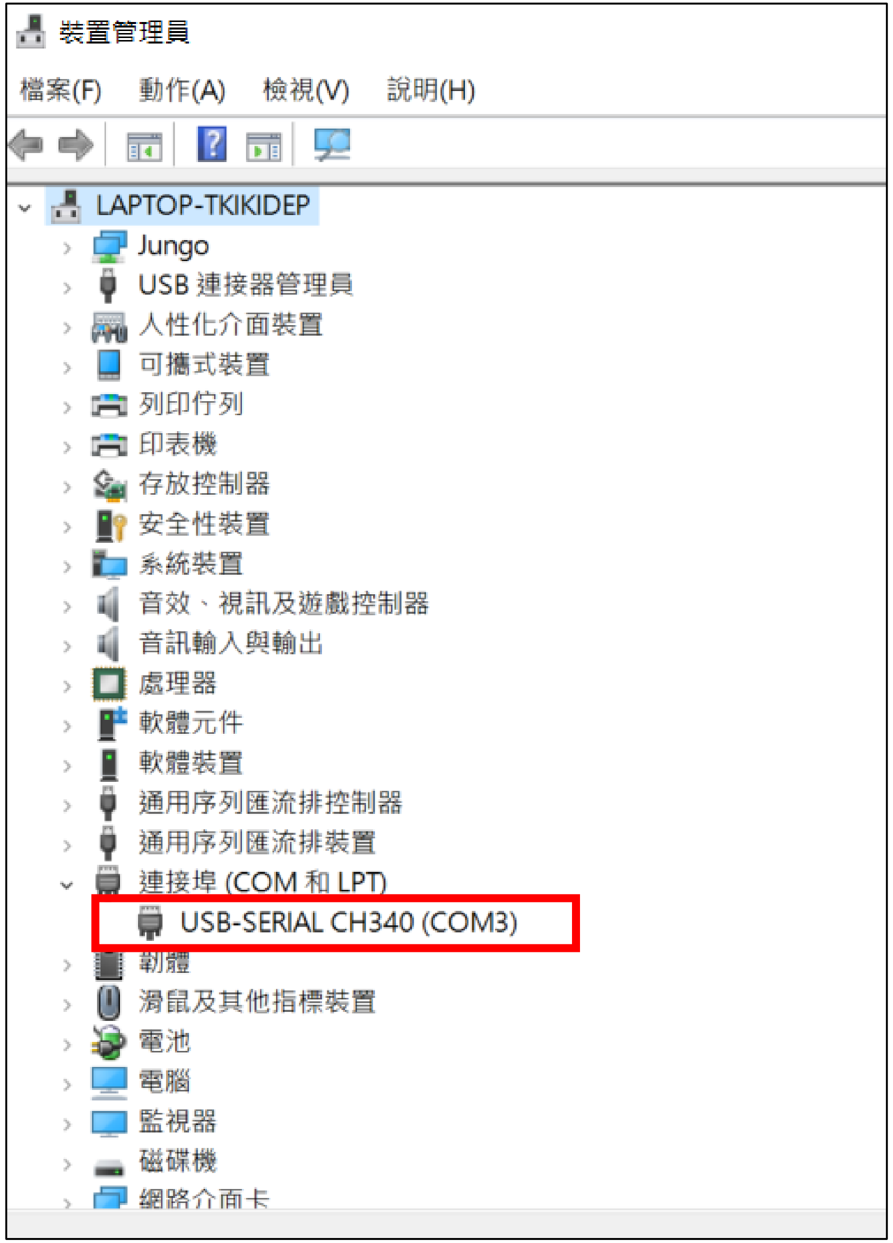
名稱: Arduino USB Driver
發行者: Arduino SA

☑ 永遠信任來自 "Arduino SA" 的軟體(A)

您只應該安裝來自信任之發行者的驅動程式軟體。如何判定哪些裝置軟體可安全地進行安裝?

Connecting

Device Manager

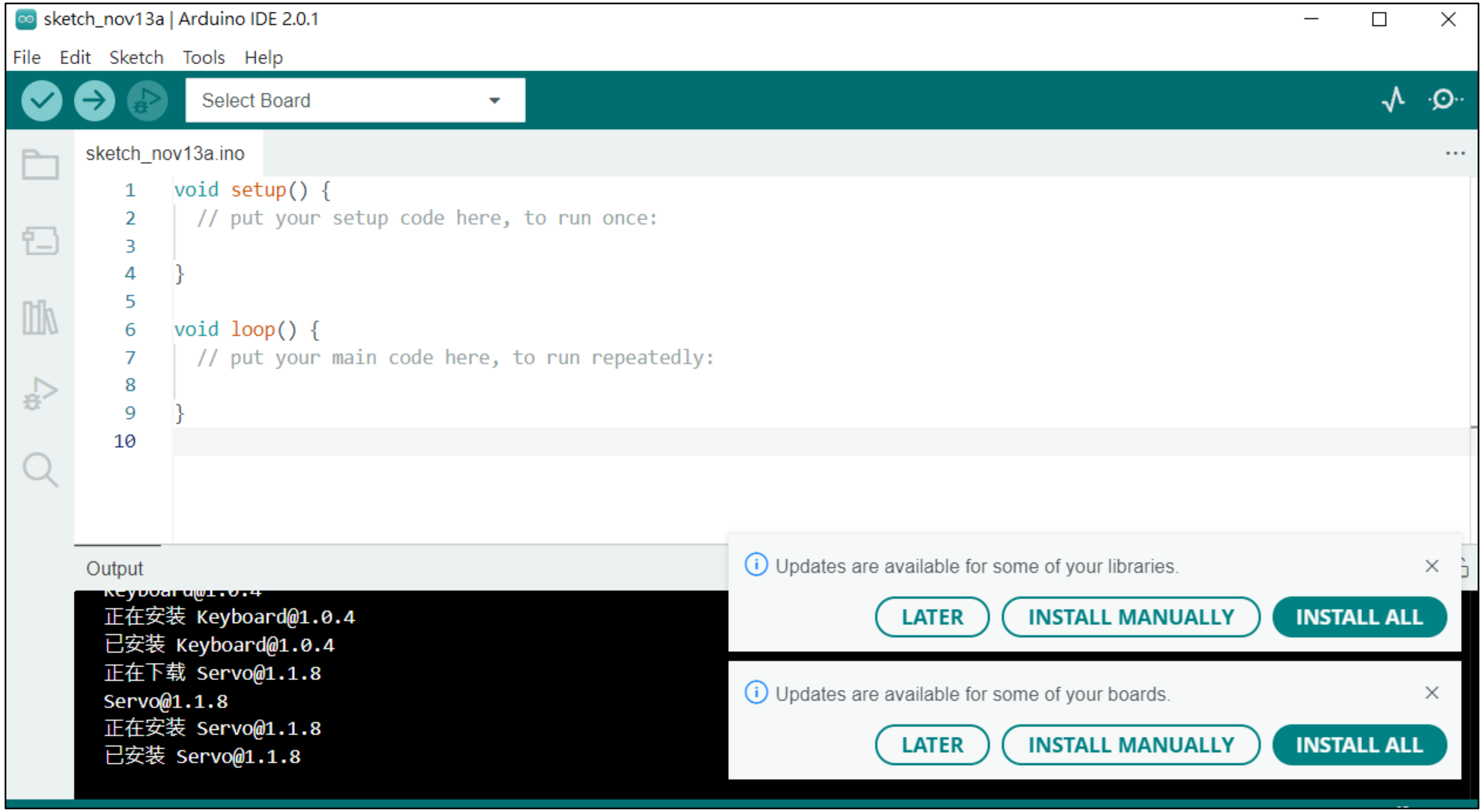


裝置管理員

檔案(F) 動作(A) 檢視(V) 說明(H)

- LAPTOP-TKIKIDEP
  - Jungo
  - USB 連接器管理員
  - 人性化介面裝置
  - 可攜式裝置
  - 列印佇列
  - 印表機
  - 存放控制器
  - 安全性裝置
  - 系統裝置
  - 音效、視訊及遊戲控制器
  - 音訊輸入與輸出
  - 處理器
  - 軟體元件
  - 軟體裝置
  - 通用序列匯流排控制器
  - 通用序列匯流排裝置
  - 連接埠 (COM 和 LPT)
    - USB-SERIAL CH340 (COM3)
  - 韌體
  - 滑鼠及其他指標裝置
  - 電池
  - 電腦
  - 監視器
  - 磁碟機
  - 網路介面卡

Arduino IDE 2.0.1



```
void setup() {
  // put your setup code here, to run once:

}

void loop() {
  // put your main code here, to run repeatedly:

}

```

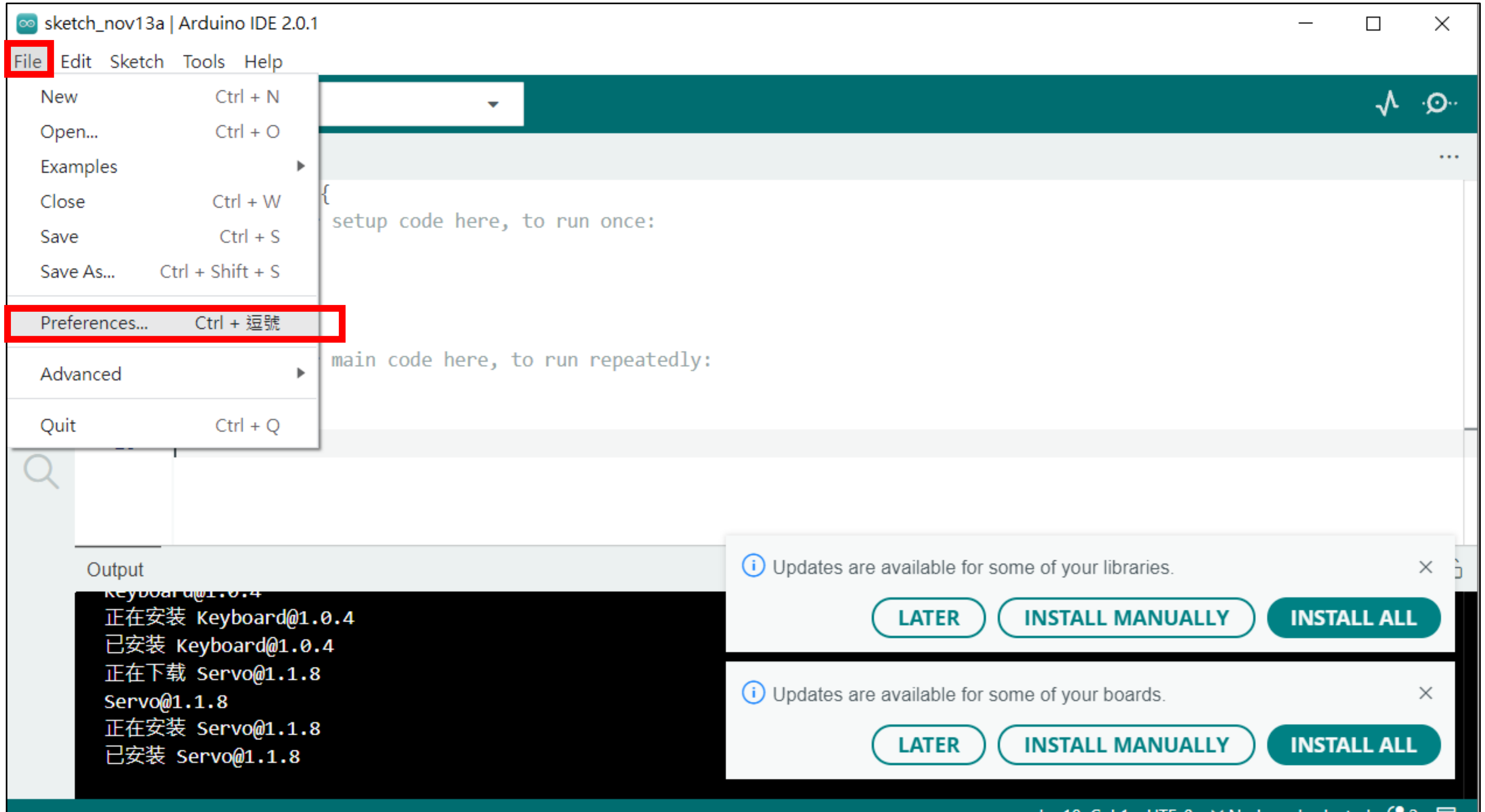
```
Keyboard@1.0.4
正在安装 Keyboard@1.0.4
已安装 Keyboard@1.0.4
正在下载 Servo@1.1.8
Servo@1.1.8
正在安装 Servo@1.1.8
已安装 Servo@1.1.8
```

Updates are available for some of your libraries.

Updates are available for some of your boards.

Installing ESP32 in Arduino IDE

- 「File」>「Preferences」



```
{
 setup code here, to run once:


 main code here, to run repeatedly:
```

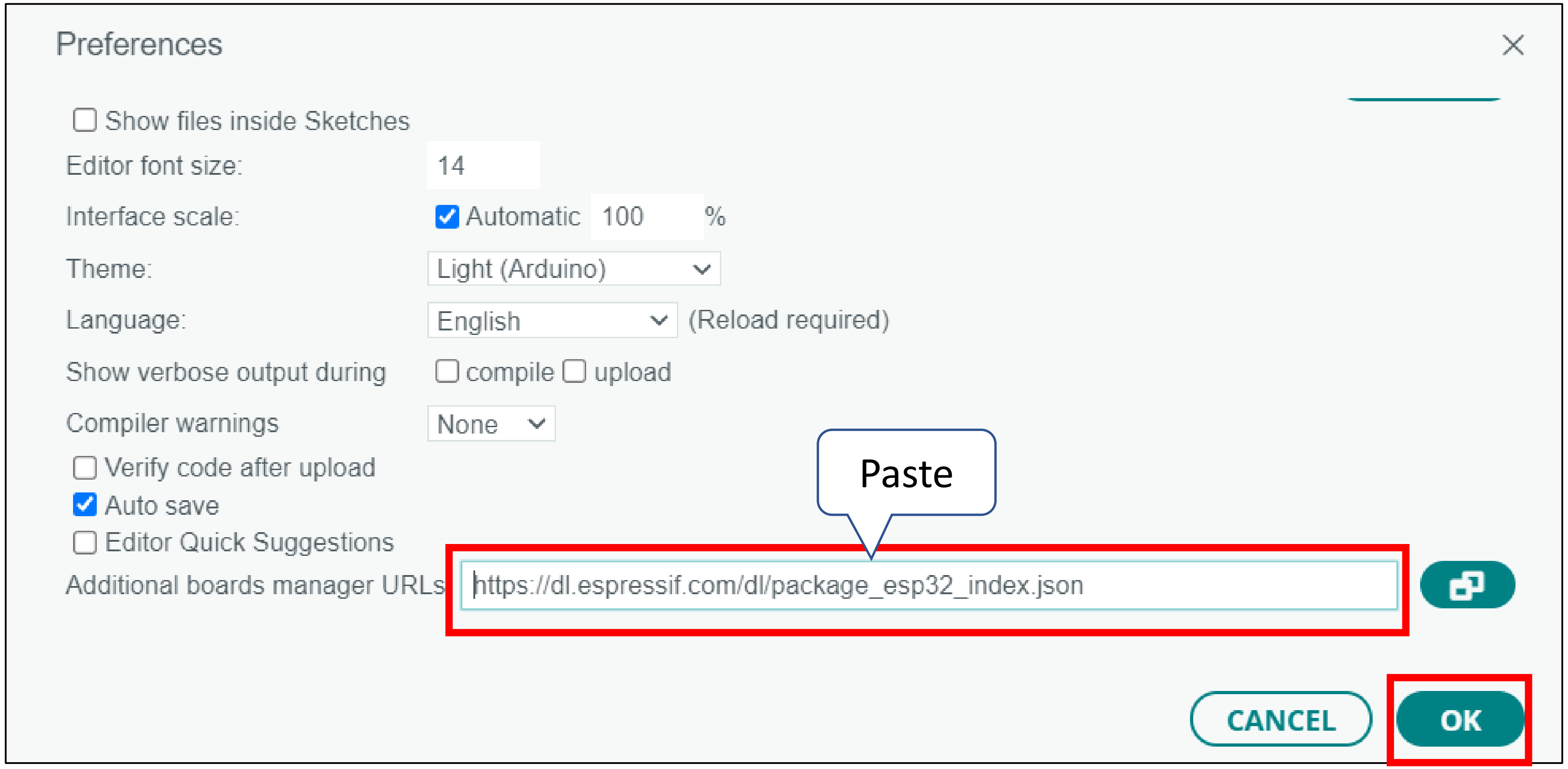
```
正在安装 Keyboard@1.0.4
已安装 Keyboard@1.0.4
正在下载 Servo@1.1.8
Servo@1.1.8
正在安装 Servo@1.1.8
已安装 Servo@1.1.8
```

Updates are available for some of your libraries.

Updates are available for some of your boards.

https://dl.espressif.com/dl/package_esp32_index.json

Copy



Preferences

☐ Show files inside Sketches

Editor font size: 14

Interface scale: ☑ Automatic 100 %

Theme: Light (Arduino)

Language: English (Reload required)

Show verbose output during ☐ compile ☐ upload

Compiler warnings None

☐ Verify code after upload

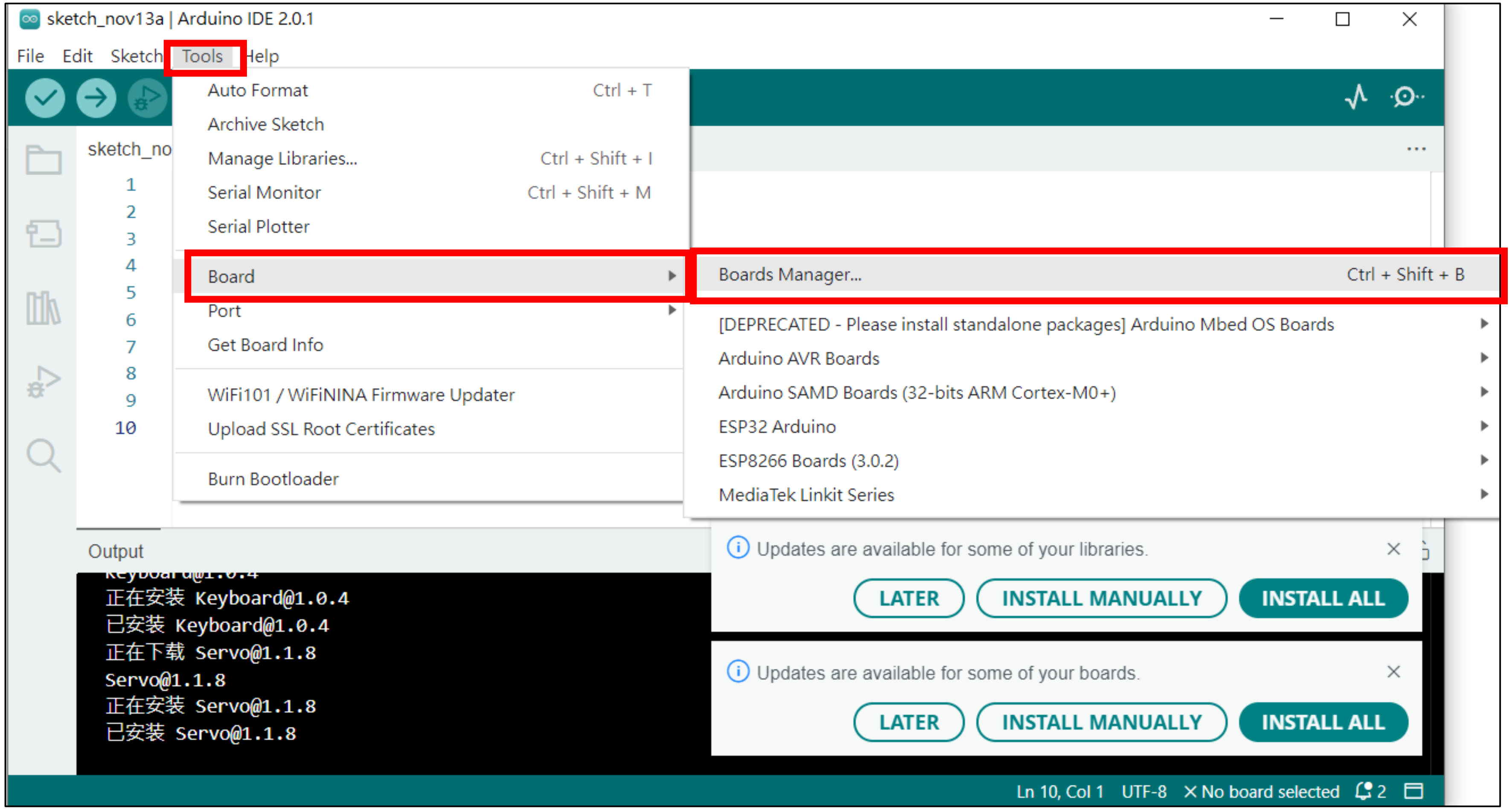
☑ Auto save

☐ Editor Quick Suggestions

Additional boards manager URLs: https://dl.espressif.com/dl/package_esp32_index.json

Paste

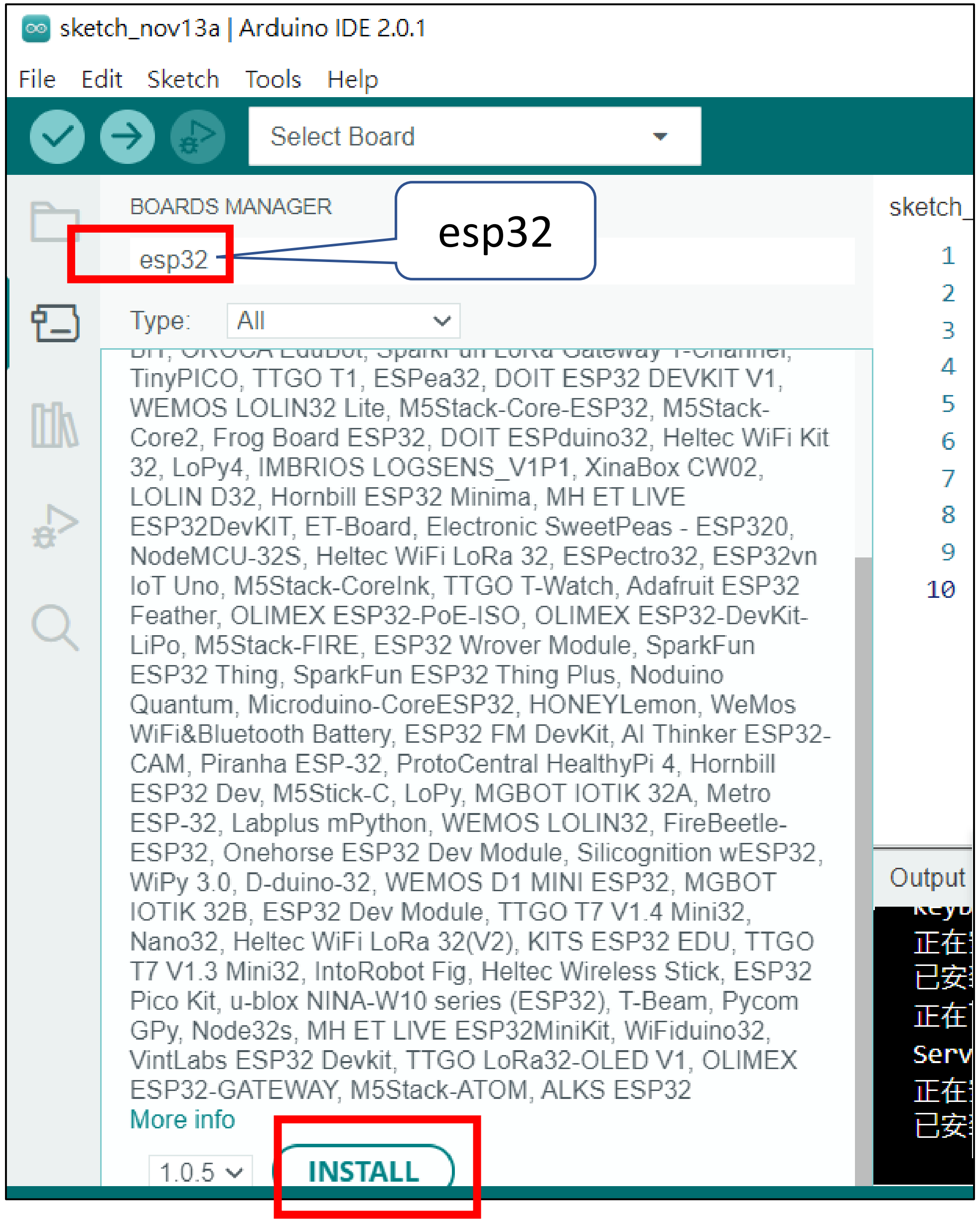
「Tools」 > 「Board」 > 「Board Manager...」


sketch_nov13a | Arduino IDE 2.0.1
File
Edit
Sketch
Tools
Help
sketch_no
1
2
3
4
5
6
7
8
9
10
Auto Format Ctrl + T
Archive Sketch
Manage Libraries... Ctrl + Shift + I
Serial Monitor Ctrl + Shift + M
Serial Plotter
Board
Port
Get Board Info
WiFi101 / WiFiNINA Firmware Updater
Upload SSL Root Certificates
Burn Bootloader
Boards Manager... Ctrl + Shift + B
[DEPRECATED - Please install standalone packages] Arduino Mbed OS Boards
Arduino AVR Boards
Arduino SAMD Boards (32-bits ARM Cortex-M0+)
ESP32 Arduino
ESP8266 Boards (3.0.2)
MediaTek Linkit Series
Output
LATER
INSTALL MANUALLY
INSTALL ALL
LATER
INSTALL MANUALLY
INSTALL ALL
Ln 10, Col 1
UTF-8
No board selected
2

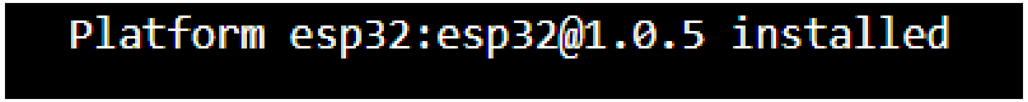
```
Keyboard@1.0.4
正在安装 Keyboard@1.0.4
已安装 Keyboard@1.0.4
正在下载 Servo@1.1.8
Servo@1.1.8
正在安装 Servo@1.1.8
已安装 Servo@1.1.8
```

Updates are available for some of your libraries.

Updates are available for some of your boards.



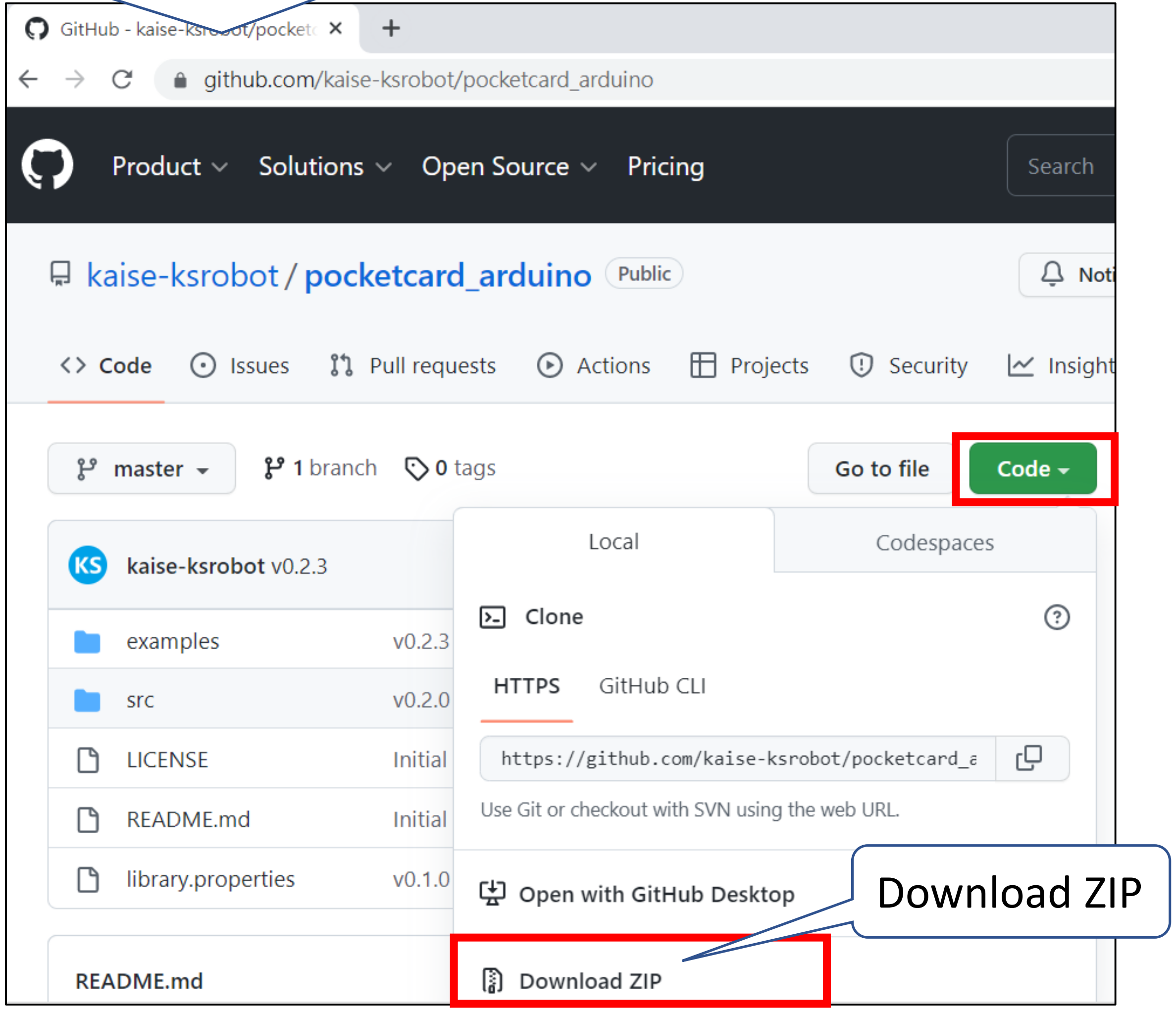
BIT, OROCA EduBot, SparkFun LoRa Gateway 1-Channel, TinyPICO, TTGO T1, ESPea32, DOIT ESP32 DEVKIT V1, WEMOS LOLIN32 Lite, M5Stack-Core-ESP32, M5Stack-Core2, Frog Board ESP32, DOIT ESPduino32, Heltec WiFi Kit 32, LoPy4, IMBRIOS LOGSENS_V1P1, XinaBox CW02, LOLIN D32, Hornbill ESP32 Minima, MH ET LIVE ESP32DevKIT, ET-Board, Electronic SweetPeas - ESP320, NodeMCU-32S, Heltec WiFi LoRa 32, ESPectro32, ESP32vn IoT Uno, M5Stack-CoreInk, TTGO T-Watch, Adafruit ESP32 Feather, OLIMEX ESP32-PoE-ISO, OLIMEX ESP32-DevKit-LiPo, M5Stack-FIRE, ESP32 Wrover Module, SparkFun ESP32 Thing, SparkFun ESP32 Thing Plus, Noduino Quantum, Microduino-CoreESP32, HONEYLemon, WeMos WiFi&Bluetooth Battery, ESP32 FM DevKit, AI Thinker ESP32-CAM, Piranha ESP-32, ProtoCentral HealthyPi 4, Hornbill ESP32 Dev, M5Stick-C, LoPy, MGBOT IOTIK 32A, Metro ESP-32, Labplus mPython, WEMOS LOLIN32, FireBeetle-ESP32, Onehorse ESP32 Dev Module, Silicognition wESP32, WiPy 3.0, D-duino-32, WEMOS D1 MINI ESP32, MGBOT IOTIK 32B, ESP32 Dev Module, TTGO T7 V1.4 Mini32, Nano32, Heltec WiFi LoRa 32(V2), KITS ESP32 EDU, TTGO T7 V1.3 Mini32, IntoRobot Fig, Heltec Wireless Stick, ESP32 Pico Kit, u-blox NINA-W10 series (ESP32), T-Beam, Pycom GPy, Node32s, MH ET LIVE ESP32MiniKit, WiFiduino32, VintLabs ESP32 Devkit, TTGO LoRa32-OLED V1, OLIMEX ESP32-GATEWAY, M5Stack-ATOM, ALKS ESP32



```
Platform esp32:esp32@1.0.5 installed
```

Install Libraries

https://github.com/kaise-ksrobot/pocketcard_arduino

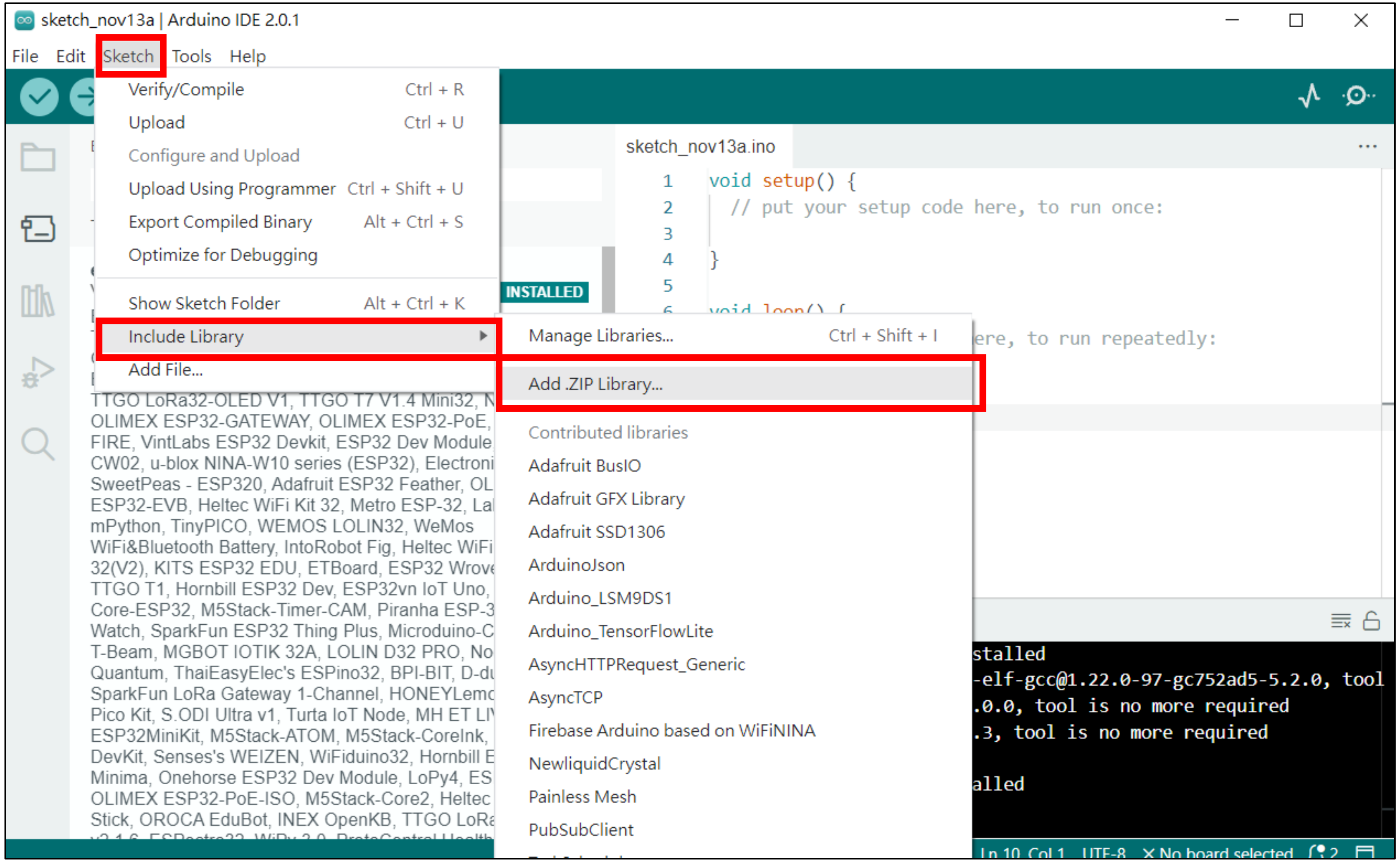


https://github.com/kaise-ksrobot/pocketcard_a

Use Git or checkout with SVN using the web URL.

Download ZIP

Add .ZIP Library

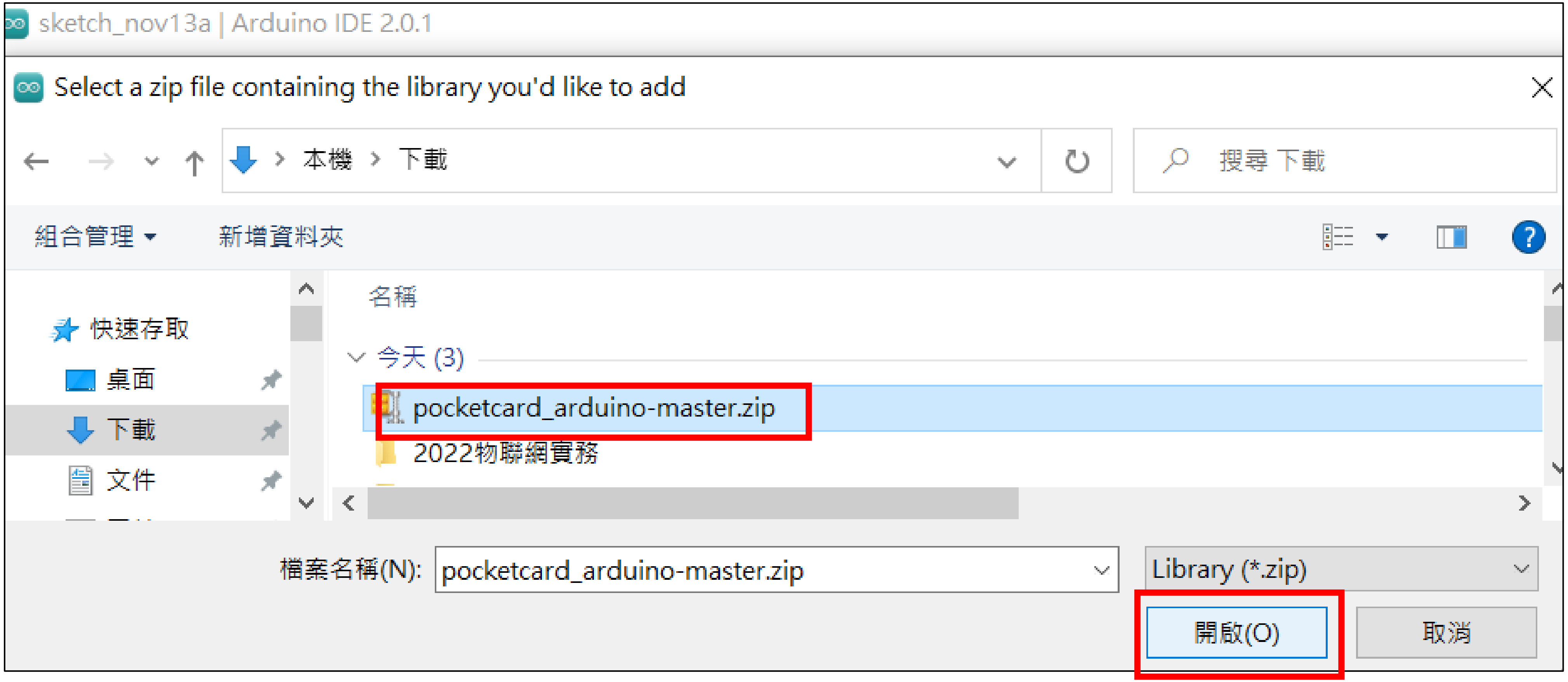


```
void setup() {
  // put your setup code here, to run once:

}

void loop() {
ere, to run repeatedly:
```

TTGO LoRa32-OLED V1, TTGO T7 V1.4 Mini32, N
OLIMEX ESP32-GATEWAY, OLIMEX ESP32-PoE,
FIRE, VintLabs ESP32 Devkit, ESP32 Dev Module
CW02, u-blox NINA-W10 series (ESP32), Electroni
SweetPeas - ESP320, Adafruit ESP32 Feather, OL
ESP32-EVB, Heltec WiFi Kit 32, Metro ESP-32, La
mPython, TinyPICO, WEMOS LOLIN32, WeMos
WiFi&Bluetooth Battery, IntoRobot Fig, Heltec WiFi
32(V2), KITS ESP32 EDU, ETBoard, ESP32 Wrove
TTGO T1, Hornbill ESP32 Dev, ESP32vn IoT Uno,
Core-ESP32, M5Stack-Timer-CAM, Piranha ESP-3
Watch, SparkFun ESP32 Thing Plus, Microduino-C
T-Beam, MGBOT IOTIK 32A, LOLIN D32 PRO, No
Quantum, ThaiEasyElec's ESPino32, BPI-BIT, D-du
SparkFun LoRa Gateway 1-Channel, HONEYLemc
Pico Kit, S.ODI Ultra v1, Turta IoT Node, MH ET LI
ESP32MiniKit, M5Stack-ATOM, M5Stack-CoreInk,
DevKit, Senses's WEIZEN, WiFiduino32, Hornbill E
Minima, Onehorse ESP32 Dev Module, LoPy4, ES
OLIMEX ESP32-PoE-ISO, M5Stack-Core2, Heltec
Stick, OROCA EduBot, INEX OpenKB, TTGO LoRa

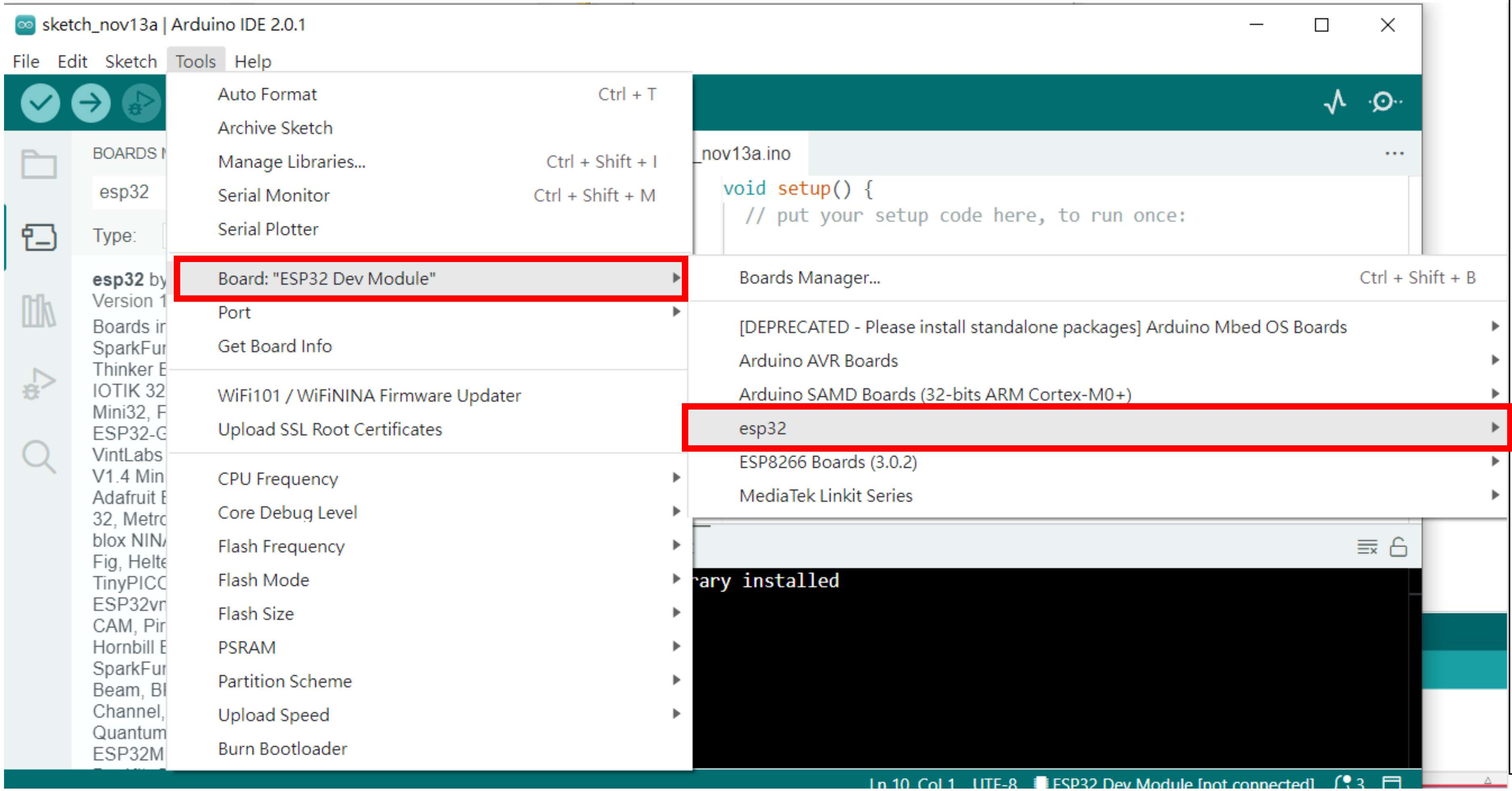
```
stalled
-elf-gcc@1.22.0-97-gc752ad5-5.2.0, tool
.0.0, tool is no more required
.3, tool is no more required

alled
```

pocketcard_arduino-master.zip



檔案名稱(N): pocketcard_arduino-master.zip

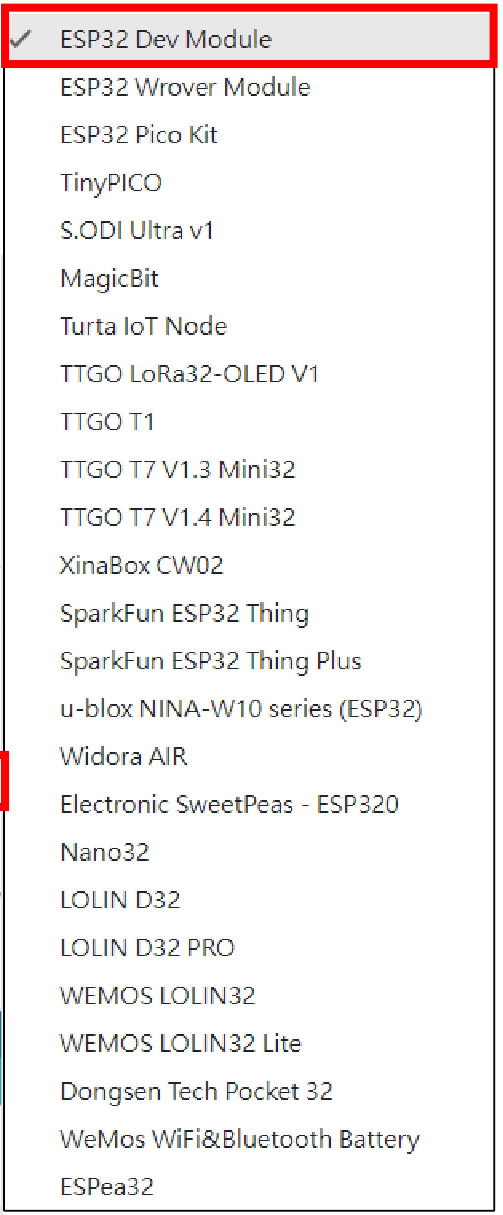
Board: ESP32 Dev Module



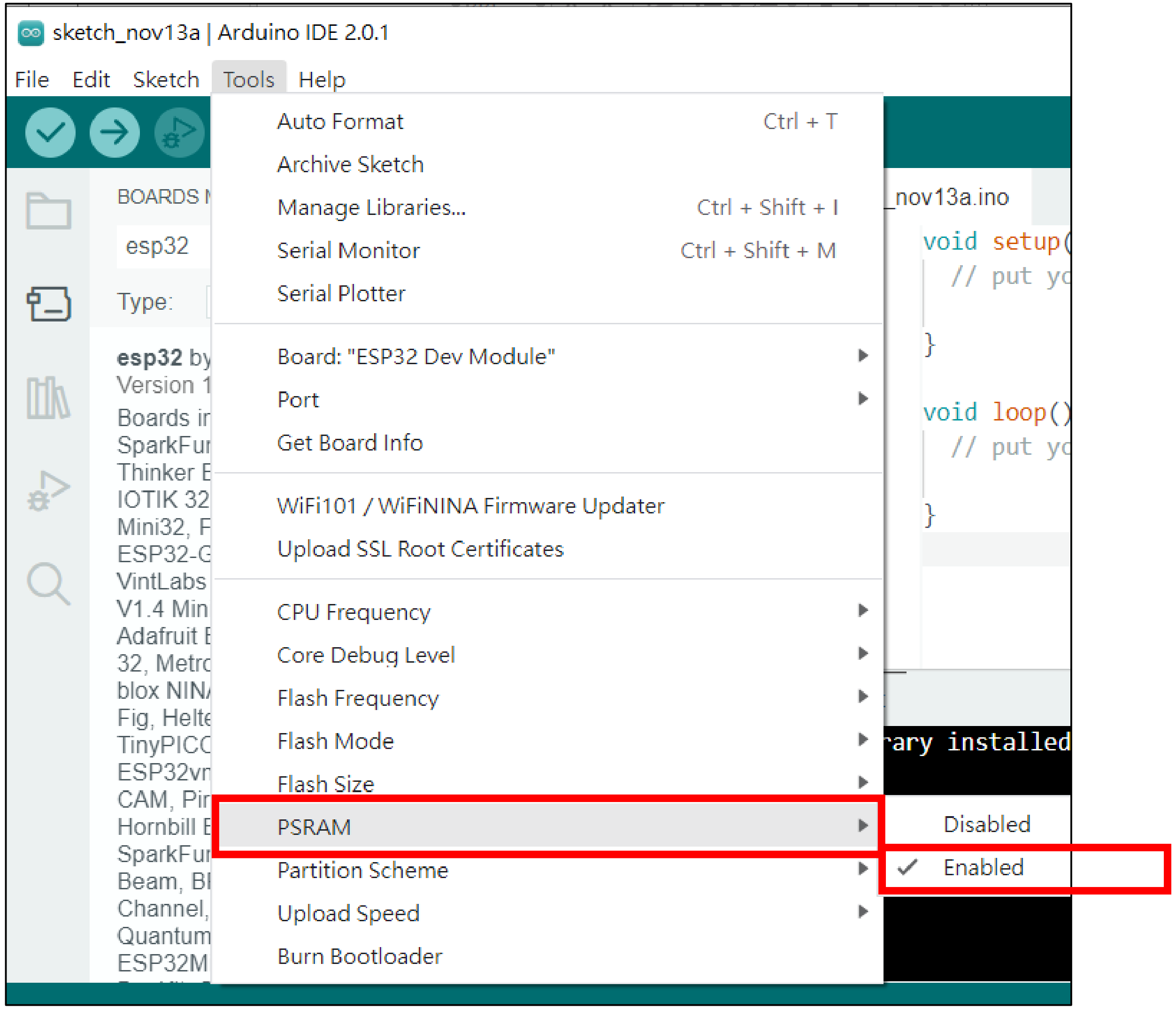
```
void setup() {
  // put your setup code here, to run once:
```

```
rary installed
```

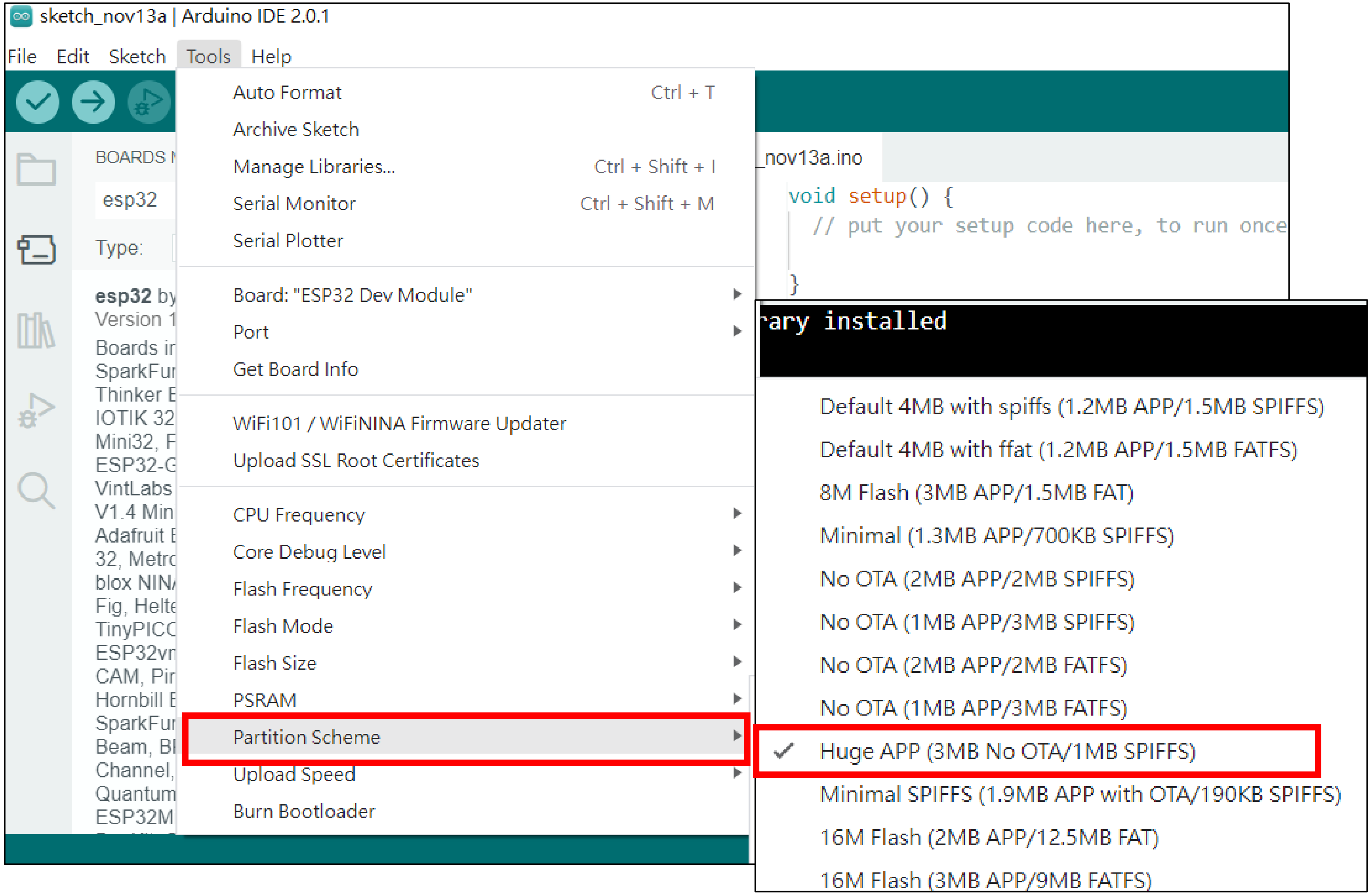
Ln 10, Col 1 UTF-8 ESP32 Dev Module [not connected]



Tools > PSRAM : Enabled



Tools > Partition Scheme : Huge APP



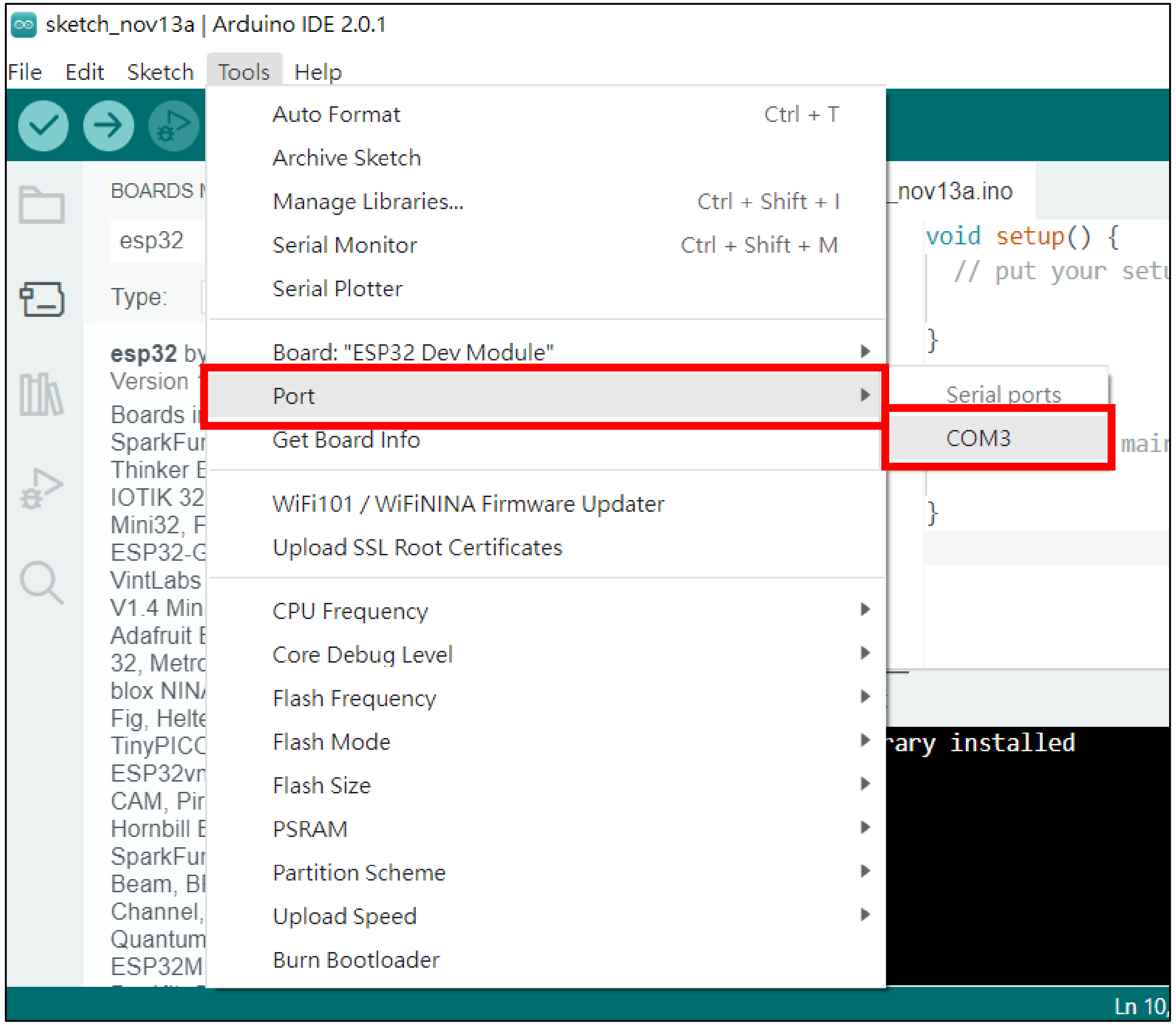
sketch_nov13a | Arduino IDE 2.0.1
File
Edit
Sketch
Tools
Help
BOARDS M
esp32
Type:
esp32 by
Version 1
Boards ir
SparkFur
Thinker E
IOTIK 32
Mini32, F
ESP32-G
VintLabs
V1.4 Min
Adafruit E
32, Metrc
blox NINA
Fig, Helte
TinyPICC
ESP32vn
CAM, Pir
Hornbill E
SparkFur
Beam, BI
Channel,
Quantum
ESP32M
Auto Format Ctrl + T
Archive Sketch
Manage Libraries... Ctrl + Shift + I
Serial Monitor Ctrl + Shift + M
Serial Plotter
Board: "ESP32 Dev Module"
Port
Get Board Info
WiFi101 / WiFiNINA Firmware Updater
Upload SSL Root Certificates
CPU Frequency
Core Debug Level
Flash Frequency
Flash Mode
Flash Size
PSRAM
Partition Scheme
Upload Speed
Burn Bootloader
_nov13a.ino
Default 4MB with spiffs (1.2MB APP/1.5MB SPIFFS)
Default 4MB with ffat (1.2MB APP/1.5MB FATFS)
8M Flash (3MB APP/1.5MB FAT)
Minimal (1.3MB APP/700KB SPIFFS)
No OTA (2MB APP/2MB SPIFFS)
No OTA (1MB APP/3MB SPIFFS)
No OTA (2MB APP/2MB FATFS)
No OTA (1MB APP/3MB FATFS)
Minimal SPIFFS (1.9MB APP with OTA/190KB SPIFFS)
16M Flash (2MB APP/12.5MB FAT)
16M Flash (3MB APP/9MB FATFS)

```
void setup() {
  // put your setup code here, to run once

}
```

```
rary installed
```

✓ Huge APP (3MB No OTA/1MB SPIFFS)

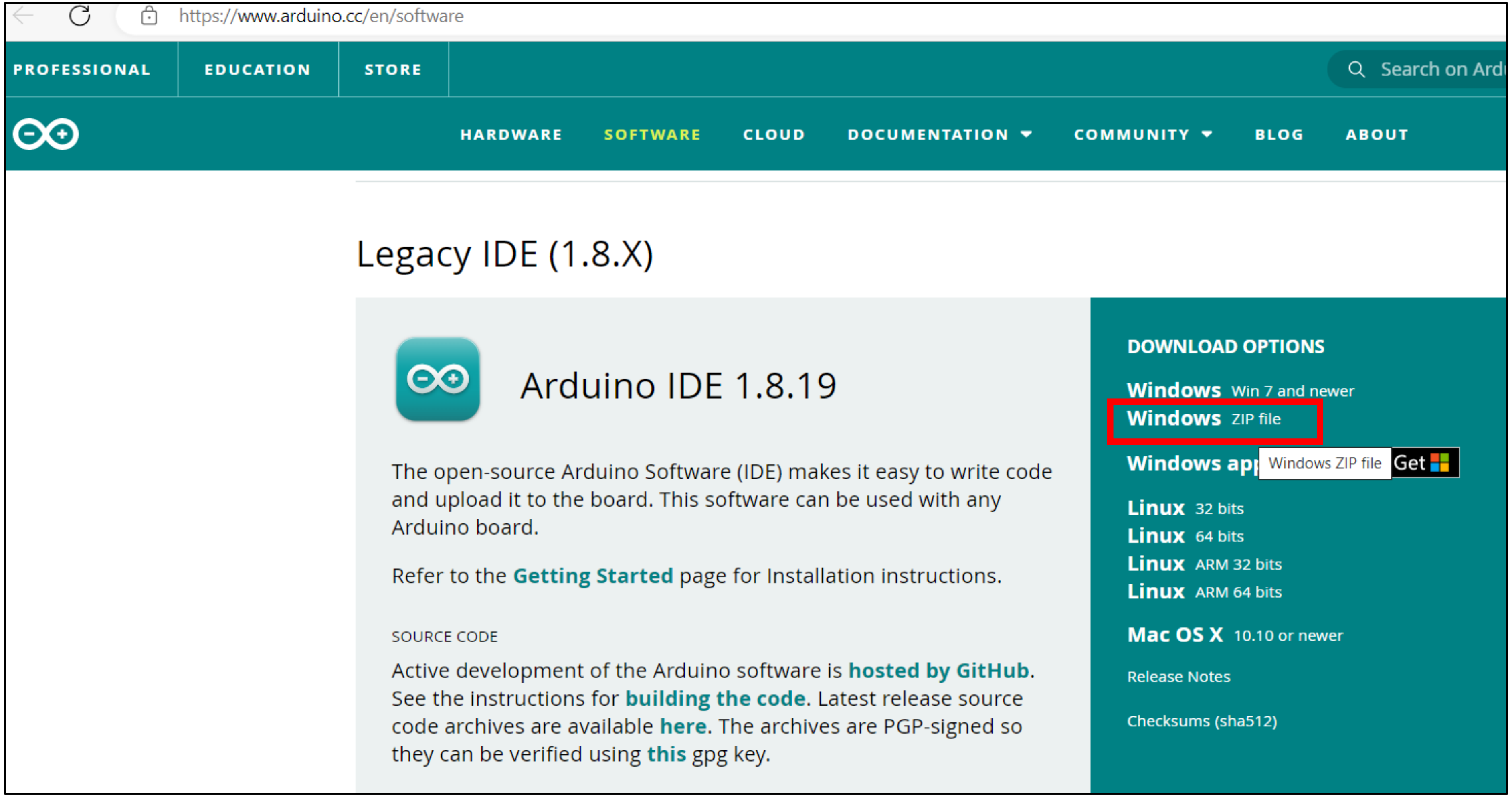
Tools > Port : COM3



```
void setup() {
  // put your setu

}

}
```

```
ary installed
```

Window zip



Legacy IDE (1.8.X)

Arduino IDE 1.8.19

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. This software can be used with any Arduino board.

Refer to the **Getting Started** page for Installation instructions.

SOURCE CODE

Active development of the Arduino software is **hosted by GitHub**. See the instructions for **building the code**. Latest release source code archives are available **here**. The archives are PGP-signed so they can be verified using **this** gpg key.

DOWNLOAD OPTIONS

Windows Win 7 and newer
Windows ZIP file
Windows ap Windows ZIP file Get

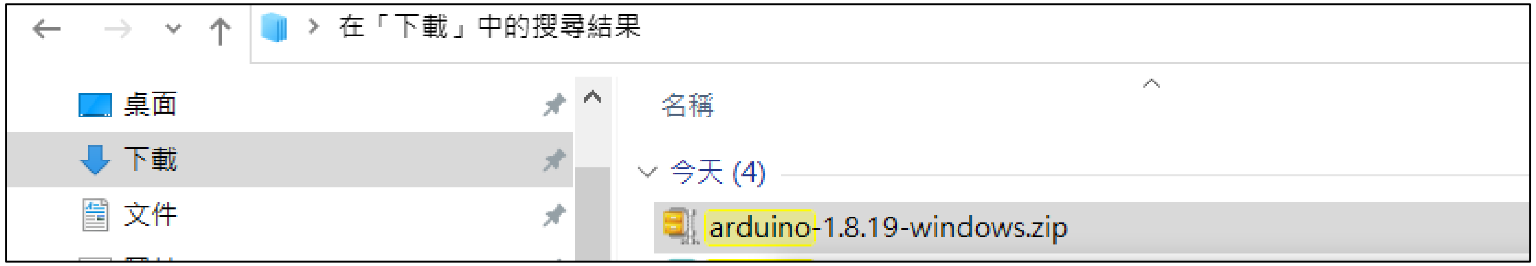
Linux 32 bits
Linux 64 bits
Linux ARM 32 bits
Linux ARM 64 bits

Mac OS X 10.10 or newer

Release Notes

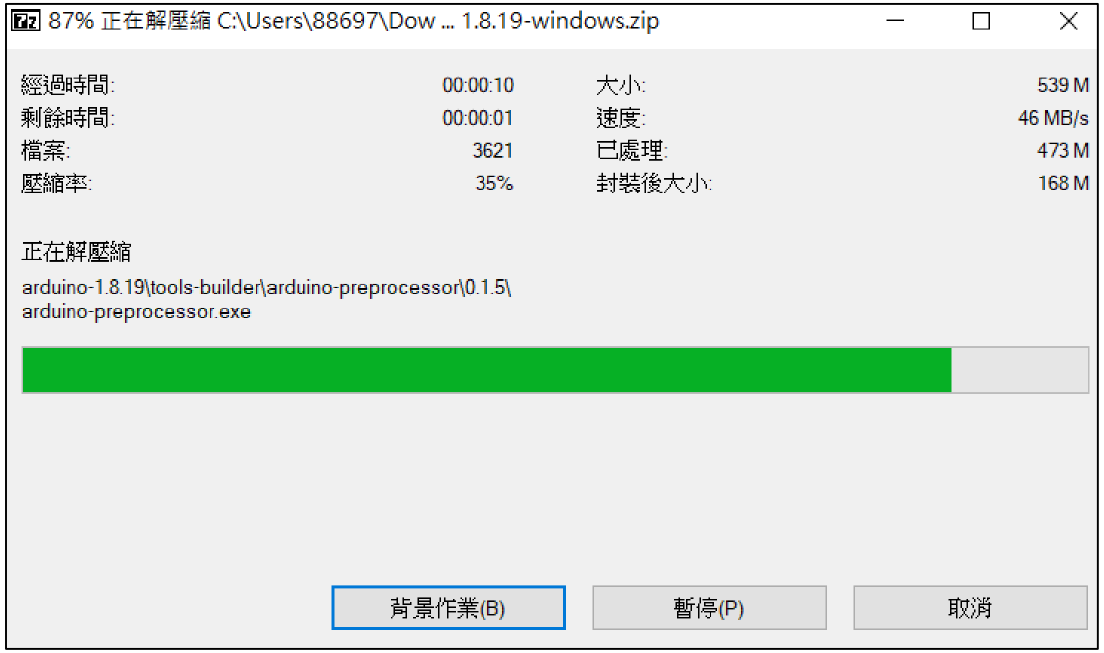
Checksums (sha512)

Unzip



在「下載」中的搜尋結果

arduino-1.8.19-windows.zip

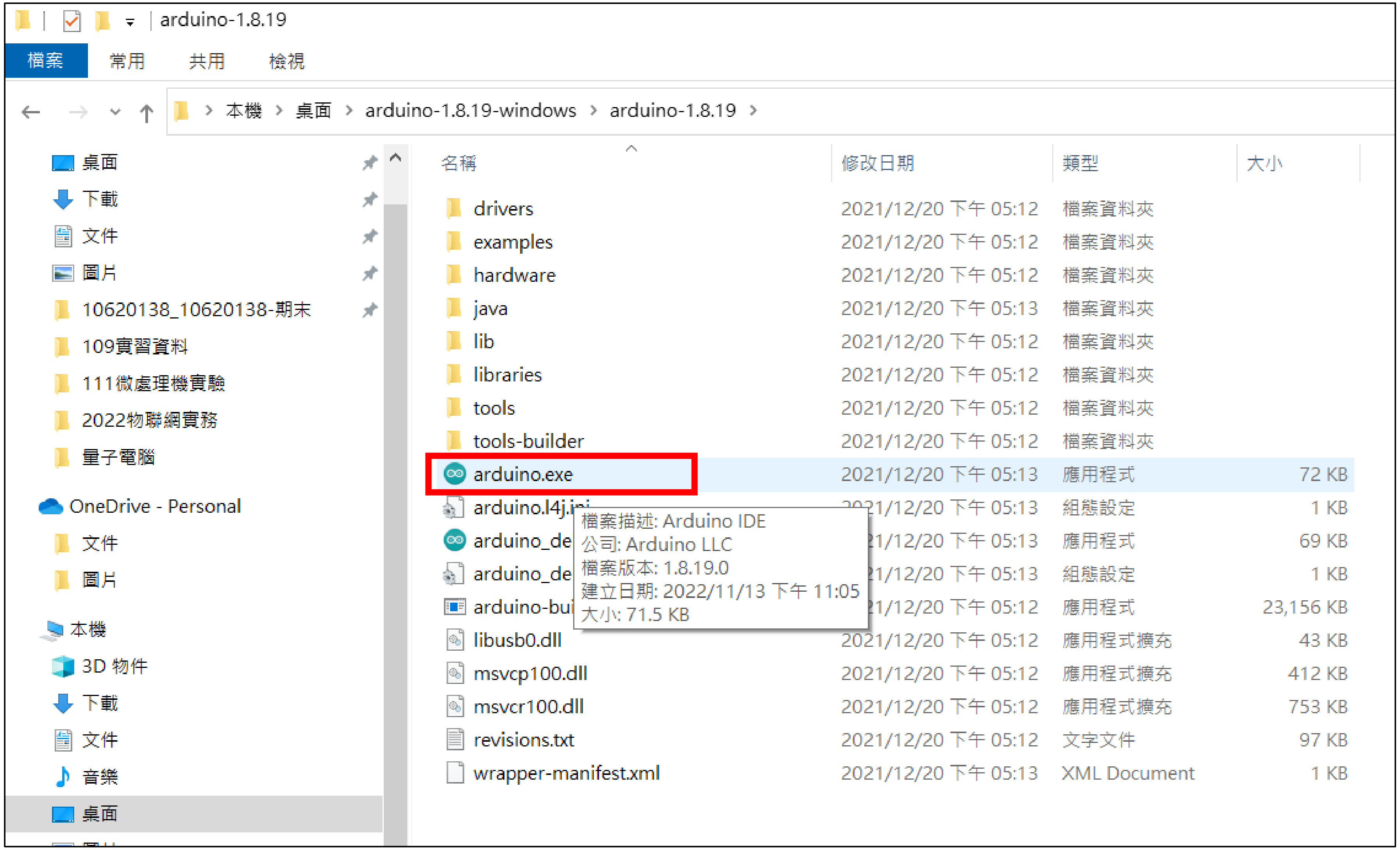


87% 正在解壓縮 C:\Users\88697\Dow ... 1.8.19-windows.zip

經過時間: 00:00:10
剩餘時間: 00:00:01
檔案: 3621
壓縮率: 35%
大小: 539 M
速度: 46 MB/s
已處理: 473 M
封裝後大小: 168 M

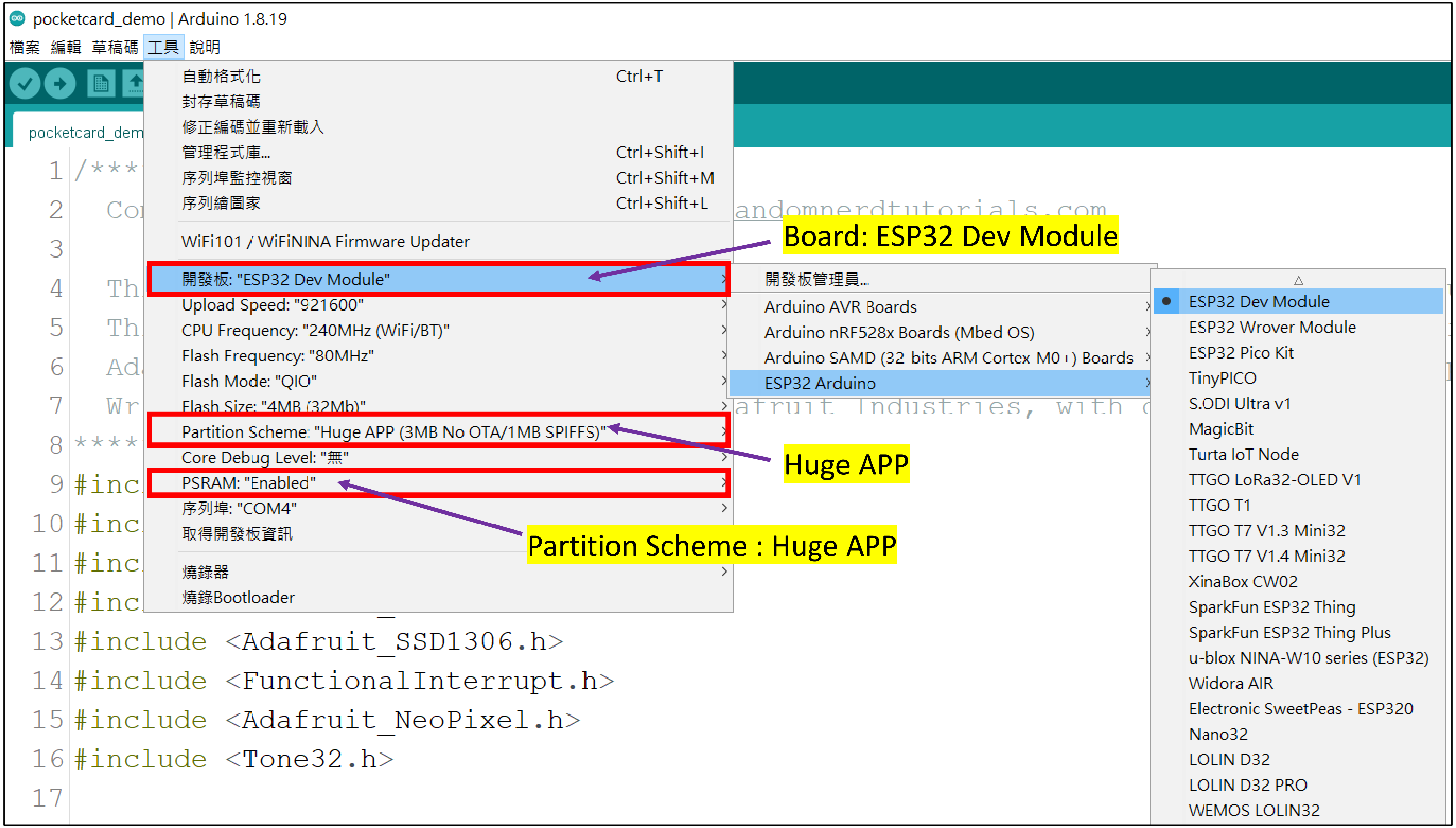
正在解壓縮
arduino-1.8.19\tools-builder\arduino-preprocessor\0.1.5\
arduino-preprocessor.exe

Arduino.exe



名稱	修改日期	類型	大小
drivers	2021/12/20 下午 05:12	檔案資料夾	
examples	2021/12/20 下午 05:12	檔案資料夾	
hardware	2021/12/20 下午 05:12	檔案資料夾	
java	2021/12/20 下午 05:13	檔案資料夾	
lib	2021/12/20 下午 05:12	檔案資料夾	
libraries	2021/12/20 下午 05:12	檔案資料夾	
tools	2021/12/20 下午 05:12	檔案資料夾	
tools-builder	2021/12/20 下午 05:12	檔案資料夾	
arduino.exe	2021/12/20 下午 05:13	應用程式	72 KB
arduino.l4j.ini	2021/12/20 下午 05:13	組態設定	1 KB
arduino_de	1/12/20 下午 05:13	應用程式	69 KB
arduino_de	1/12/20 下午 05:13	組態設定	1 KB
arduino-bui	1/12/20 下午 05:12	應用程式	23,156 KB
libusb0.dll	2021/12/20 下午 05:12	應用程式擴充	43 KB
msvcp100.dll	2021/12/20 下午 05:12	應用程式擴充	412 KB
msvcr100.dll	2021/12/20 下午 05:12	應用程式擴充	753 KB
revisions.txt	2021/12/20 下午 05:12	文字文件	97 KB
wrapper-manifest.xml	2021/12/20 下午 05:13	XML Document	1 KB

檔案描述: Arduino IDE
公司: Arduino LLC
檔案版本: 1.8.19.0
建立日期: 2022/11/13 下午 11:05
大小: 71.5 KB



pocketcard_demo | Arduino 1.8.19

開發板: "ESP32 Dev Module"

Upload Speed: "921600"

CPU Frequency: "240MHz (WiFi/BT)"

Flash Frequency: "80MHz"

Flash Mode: "QIO"

Flash Size: "4MB (32Mb)"

Partition Scheme: "Huge APP (3MB No OTA/1MB SPIFFS)"

Core Debug Level: "無"

PSRAM: "Enabled"

序列埠: "COM4"

● ESP32 Dev Module

Board: ESP32 Dev Module

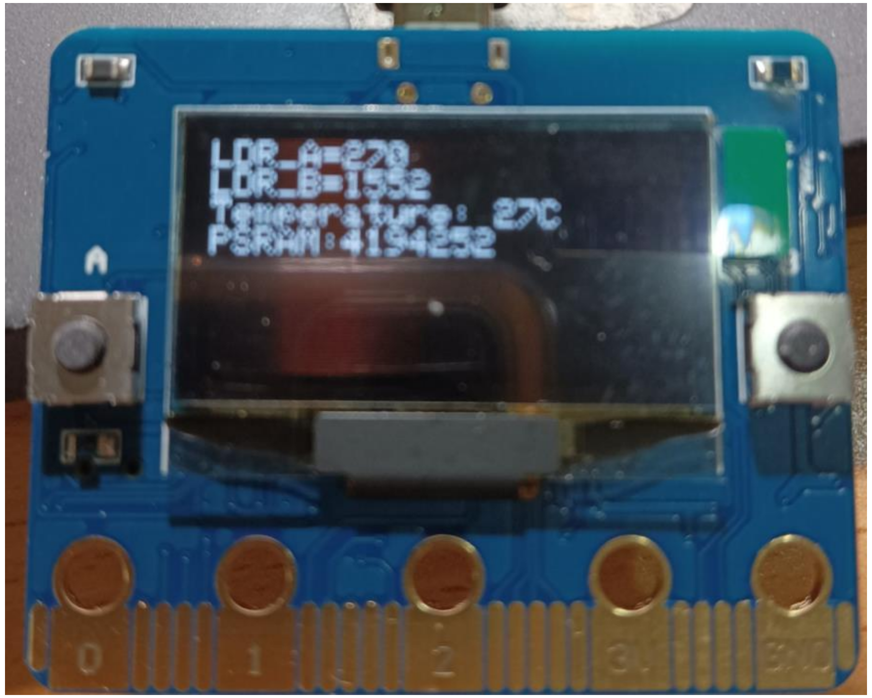
Huge APP

Partition Scheme : Huge APP

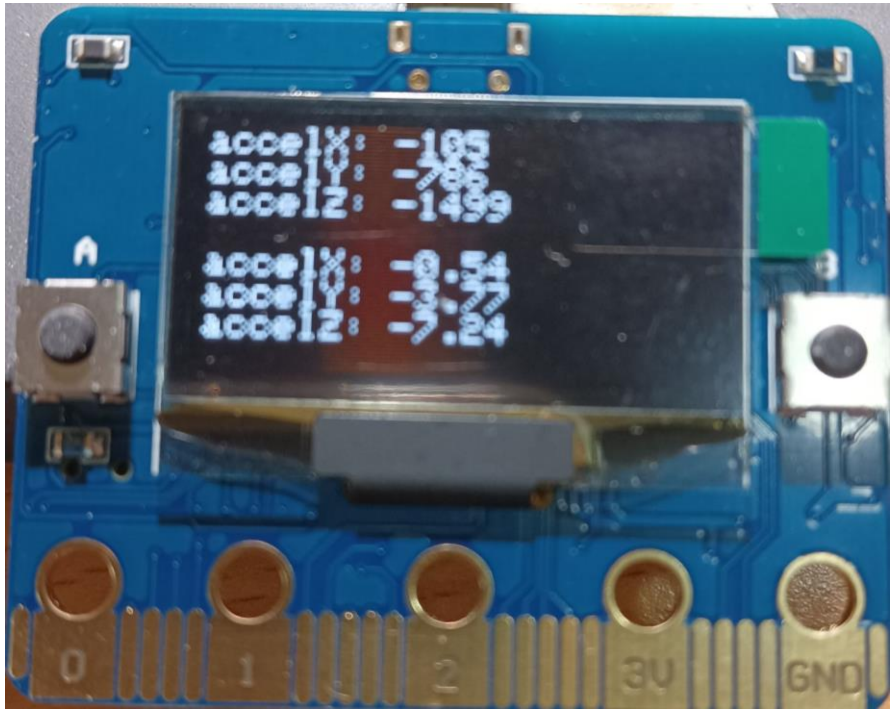
```
/***
  Co                                       andomnerdtutorials.com

  Th
  Th
  Ad
  Wr                                       afruit Industries, with c
****
#inc
#inc
#inc
#inc
#include <Adafruit_SSD1306.h>
#include <FunctionalInterrupt.h>
#include <Adafruit_NeoPixel.h>
#include <Tone32.h>

```

Exercise 9-1

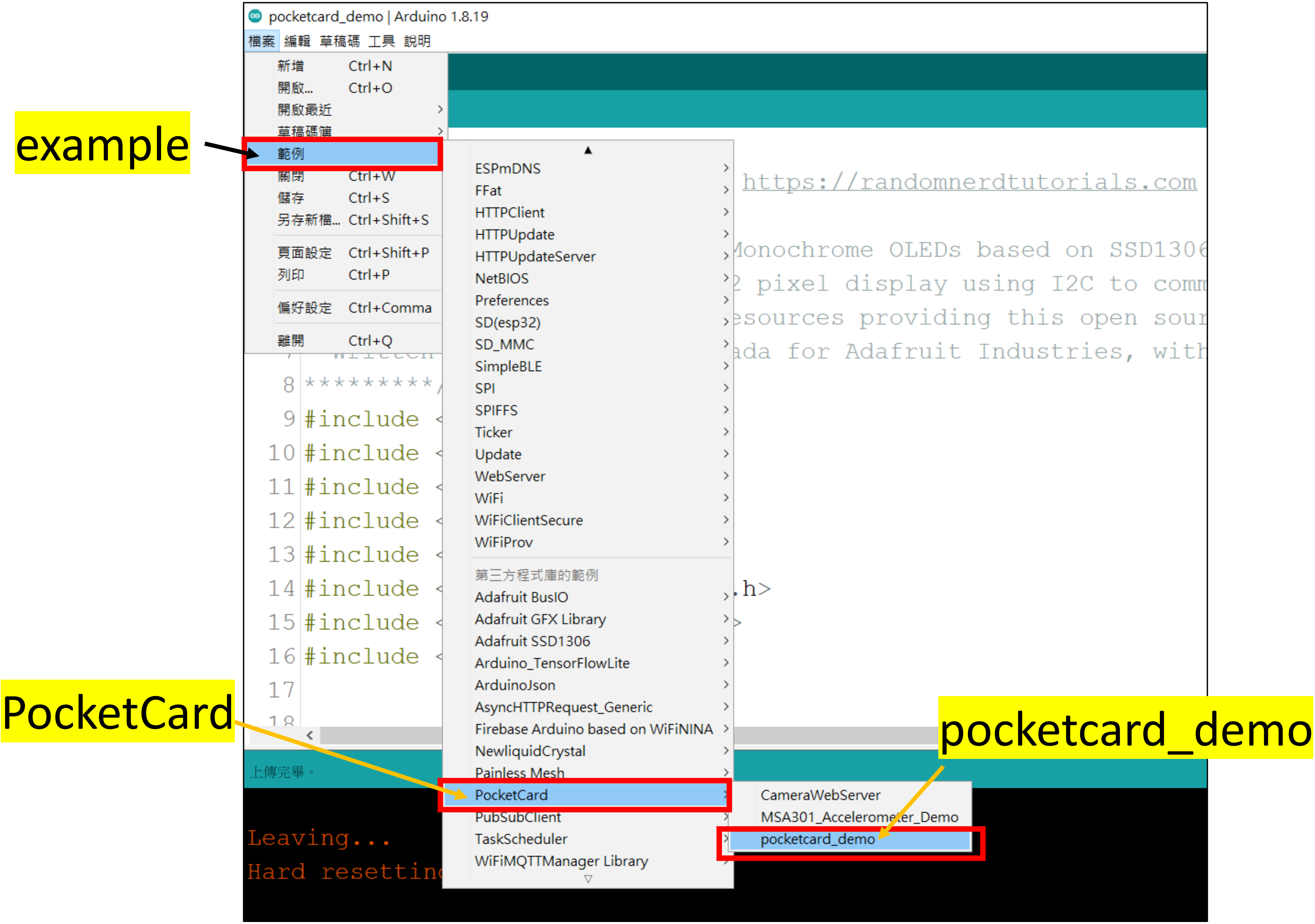
- pocketcard_demo



```
LDR_A=270
LDR_B=1552
Temperature: 27C
PSRAM:4194252
```



```
accelX: -105
accelY: -786
accelZ: -1499

accelX: -0.54
accelY: -3.77
accelZ: -7.24
```



example

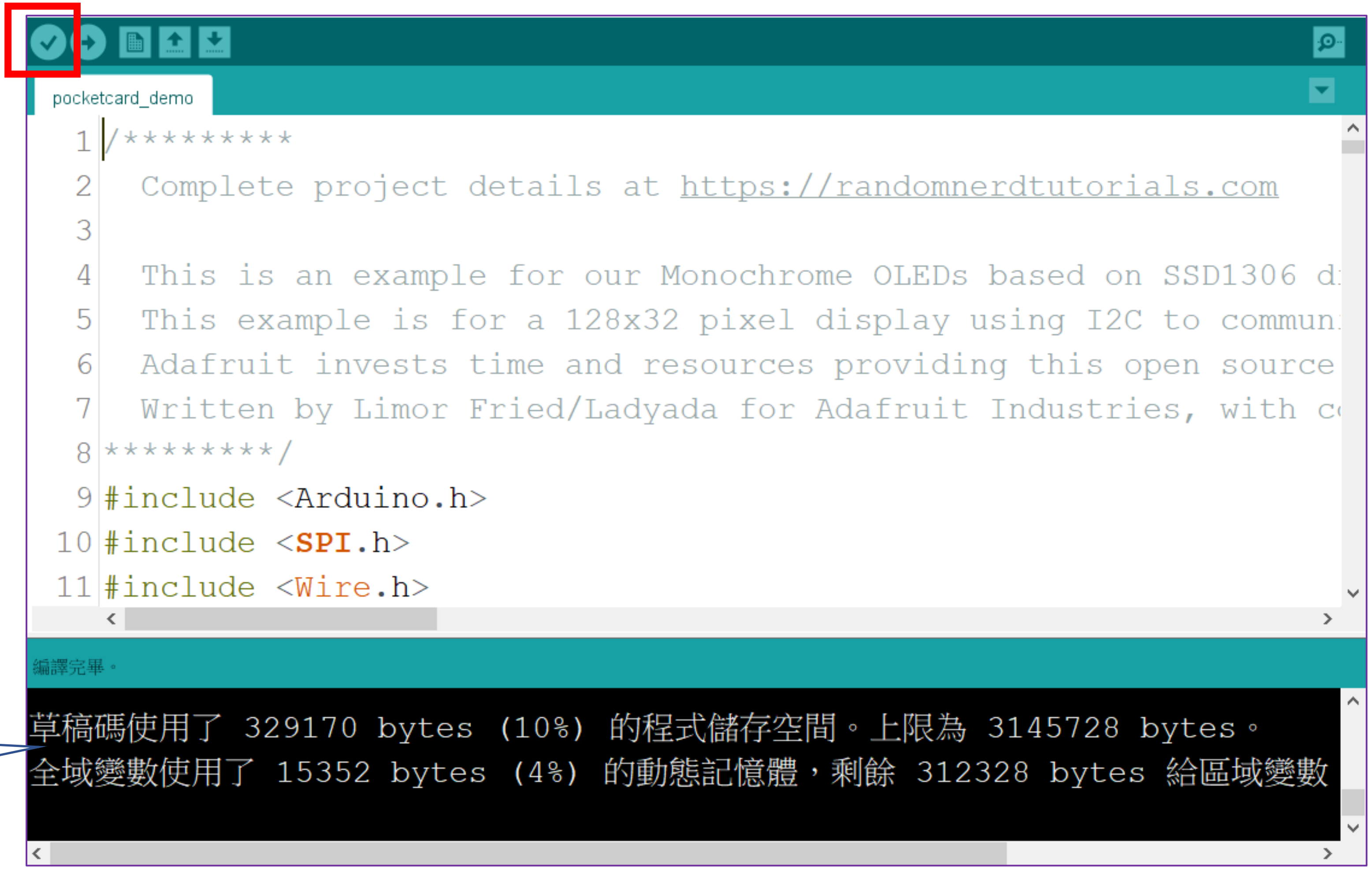
PocketCard

pocketcard_demo

```
https://randomnerdtutorials.com
Monochrome OLEDs based on SSD1306
2 pixel display using I2C to comm
esources providing this open sour
ada for Adafruit Industries, with
 written
*********/
#include <
#include <
#include <
#include <
#include <
#include <                    .h>
#include <                    >
#include <
```

```
Leaving...
Hard resetting
```

Verify



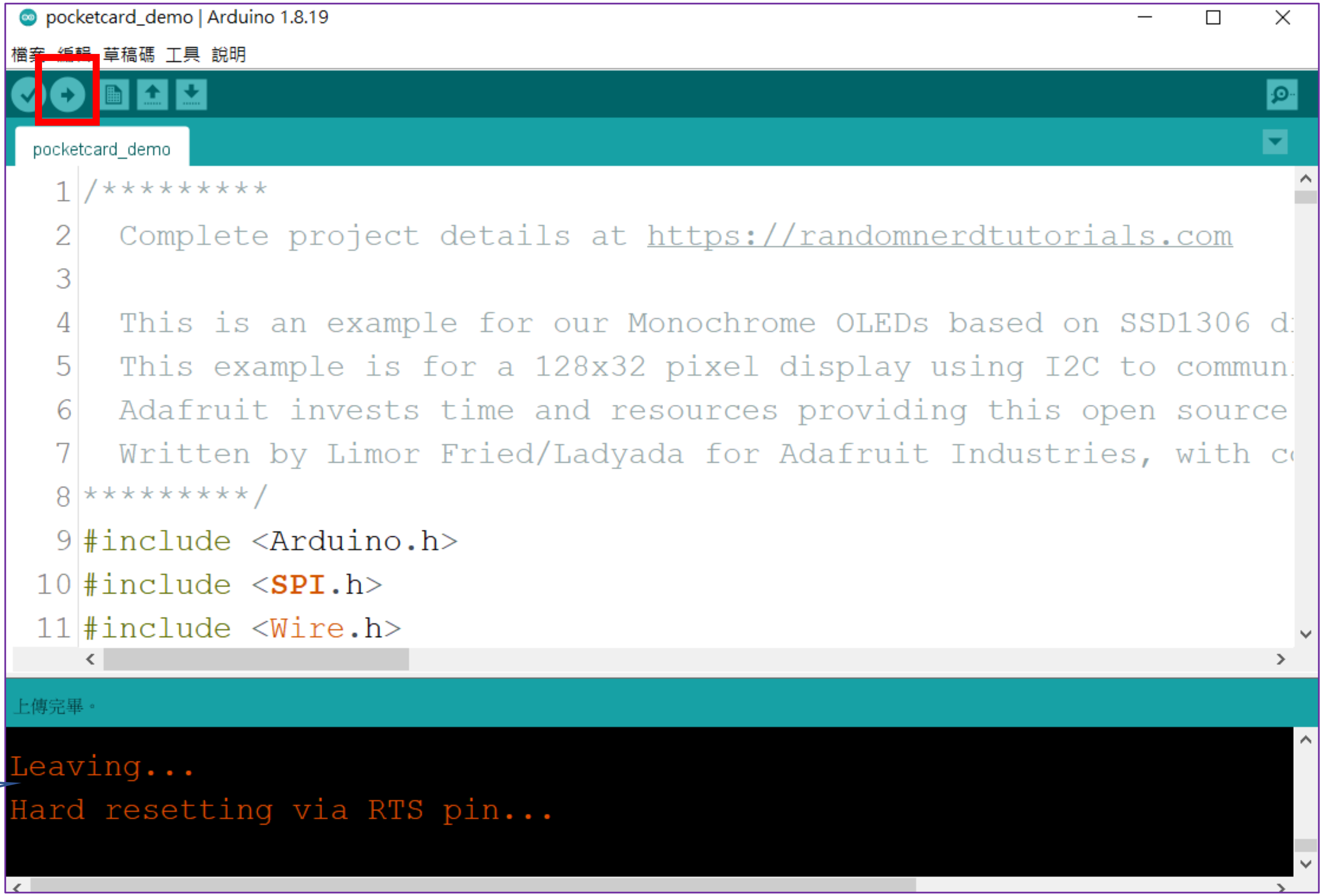
```
/*********
  Complete project details at https://randomnerdtutorials.com

  This is an example for our Monochrome OLEDs based on SSD1306 d
  This example is for a 128x32 pixel display using I2C to commun
  Adafruit invests time and resources providing this open source
  Written by Limor Fried/Ladyada for Adafruit Industries, with c
*********/
#include <Arduino.h>
#include <SPI.h>
#include <Wire.h>
```

編譯完畢。

```
草稿碼使用了 329170 bytes (10%) 的程式儲存空間。上限為 3145728 bytes。
全域變數使用了 15352 bytes (4%) 的動態記憶體，剩餘 312328 bytes 給區域變數
```

no error

Upload



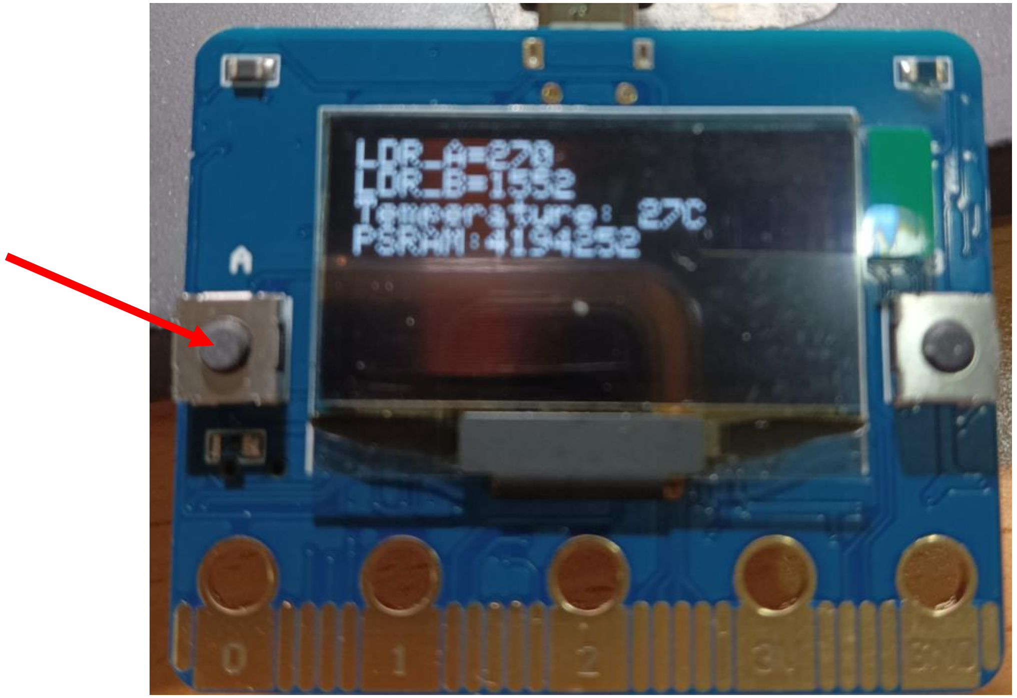
```
/*********
  Complete project details at https://randomnerdtutorials.com

  This is an example for our Monochrome OLEDs based on SSD1306 d
  This example is for a 128x32 pixel display using I2C to commun
  Adafruit invests time and resources providing this open source
  Written by Limor Fried/Ladyada for Adafruit Industries, with c
*********/
#include <Arduino.h>
#include <SPI.h>
#include <Wire.h>
```

上傳完畢。

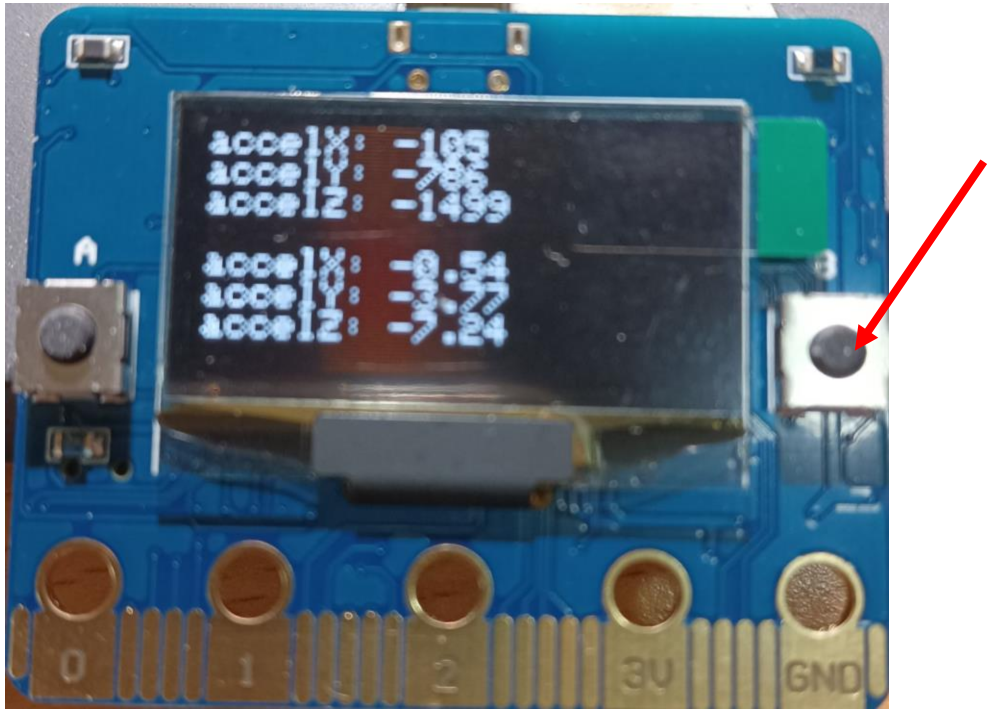
```
Leaving...
Hard resetting via RTS pin...
```

no error

Press button



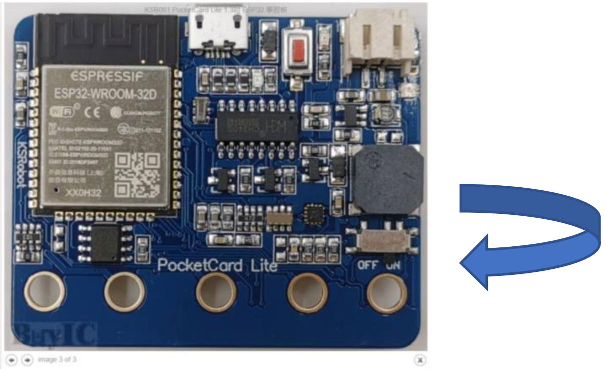
```
LDR_A=270
LDR_B=1552
Temperature: 27C
PSRAM:4194252
```

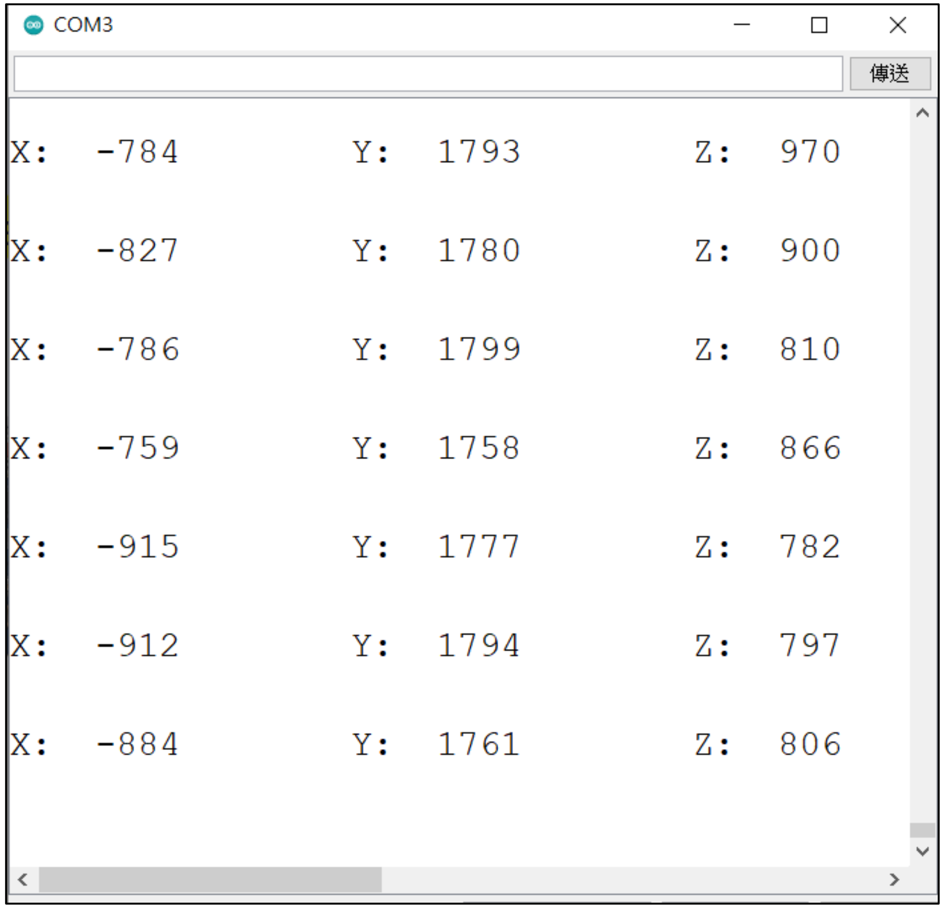


```
accelX: -105
accelY: -786
accelZ: -1499

accelX: -0.54
accelY: -3.77
accelZ: -7.24
```

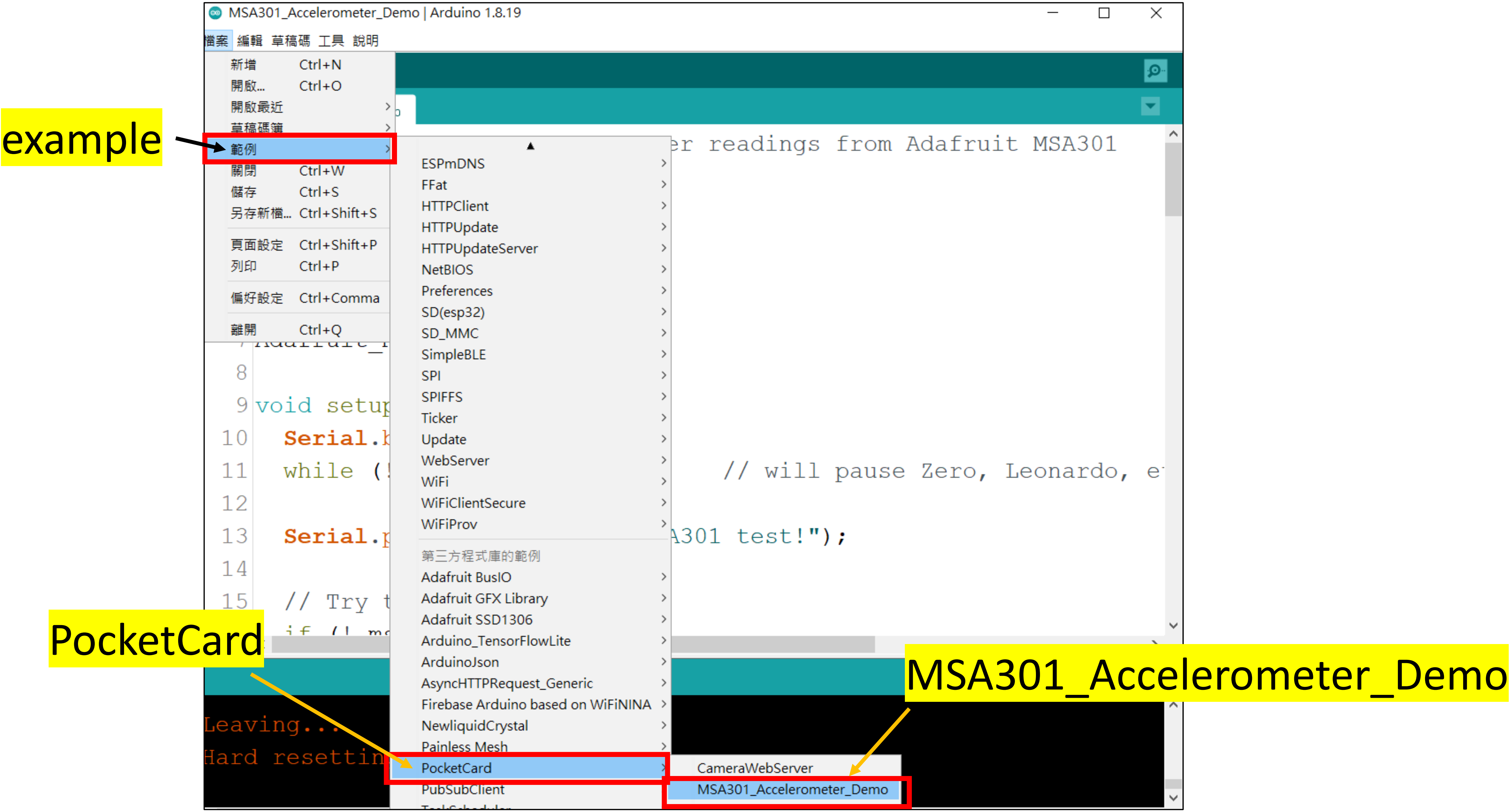
Exercise 9-2

- MSA301_Accelerometer_Demo





```
X:   -784         Y:   1793         Z:   970

X:   -827         Y:   1780         Z:   900

X:   -786         Y:   1799         Z:   810

X:   -759         Y:   1758         Z:   866

X:   -915         Y:   1777         Z:   782

X:   -912         Y:   1794         Z:   797

X:   -884         Y:   1761         Z:   806
```



example

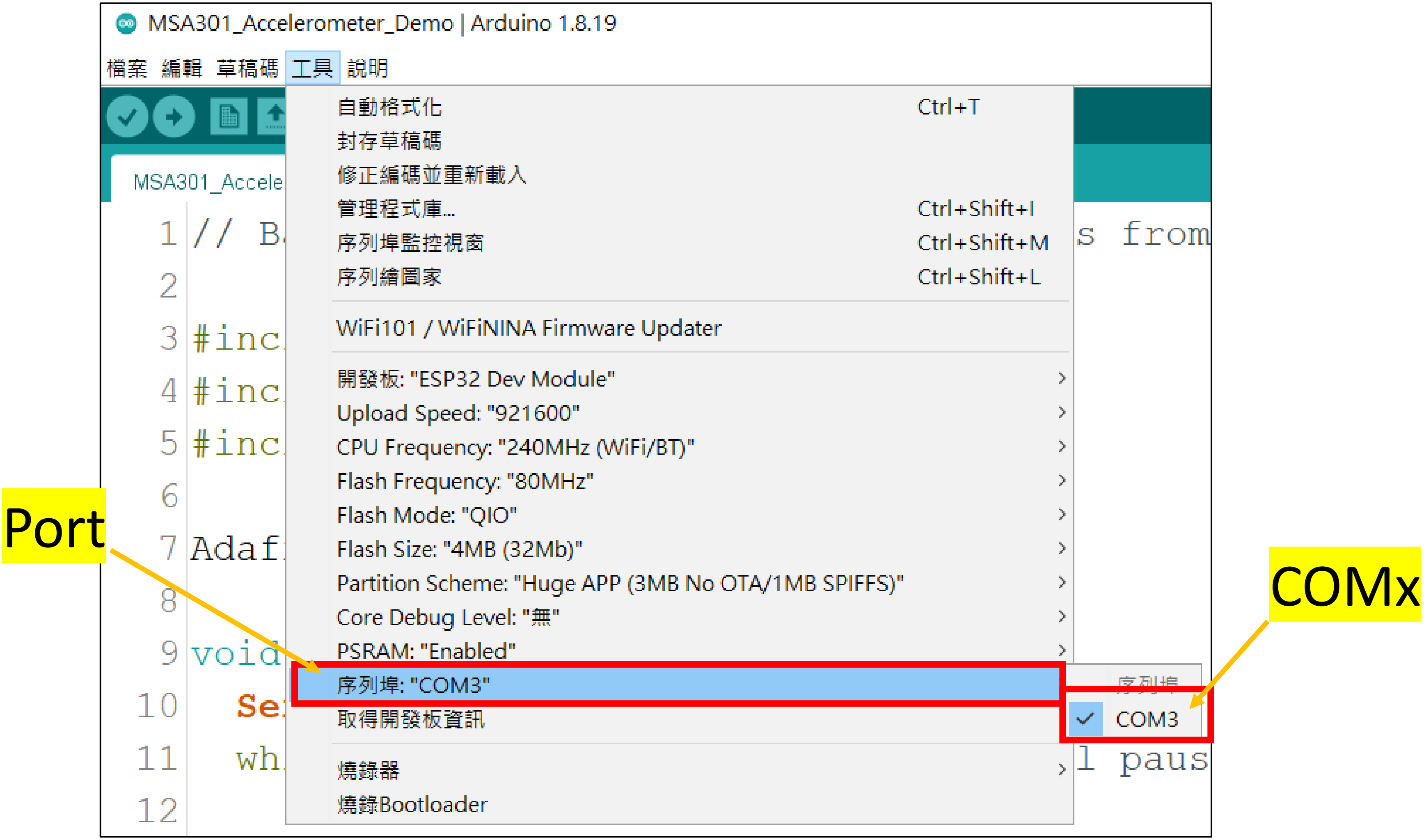
PocketCard

MSA301_Accelerometer_Demo

```
er readings from Adafruit MSA301
void setup
  Serial.b
  while (!                    // will pause Zero, Leonardo, e
  Serial.p                 A301 test!");
  // Try t
```

```
Leaving...
Hard resettin
```

Port : COMx



MSA301_Accelerometer_Demo | Arduino 1.8.19

開發板: "ESP32 Dev Module"
Upload Speed: "921600"
CPU Frequency: "240MHz (WiFi/BT)"
Flash Frequency: "80MHz"
Flash Mode: "QIO"
Flash Size: "4MB (32Mb)"
Partition Scheme: "Huge APP (3MB No OTA/1MB SPIFFS)"
Core Debug Level: "無"
PSRAM: "Enabled"
序列埠: "COM3"

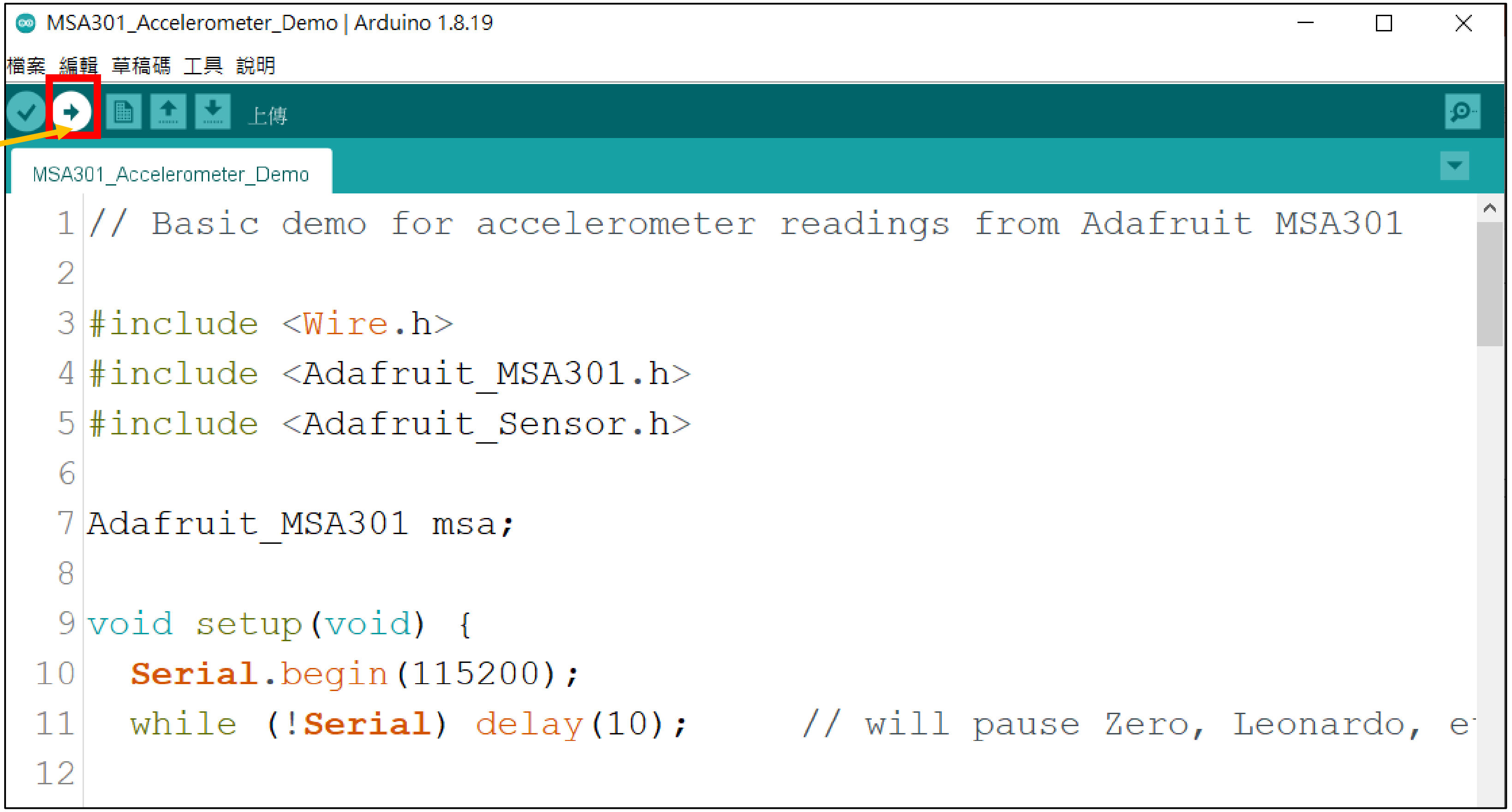
序列埠
✓ COM3

Port

COMx

Upload

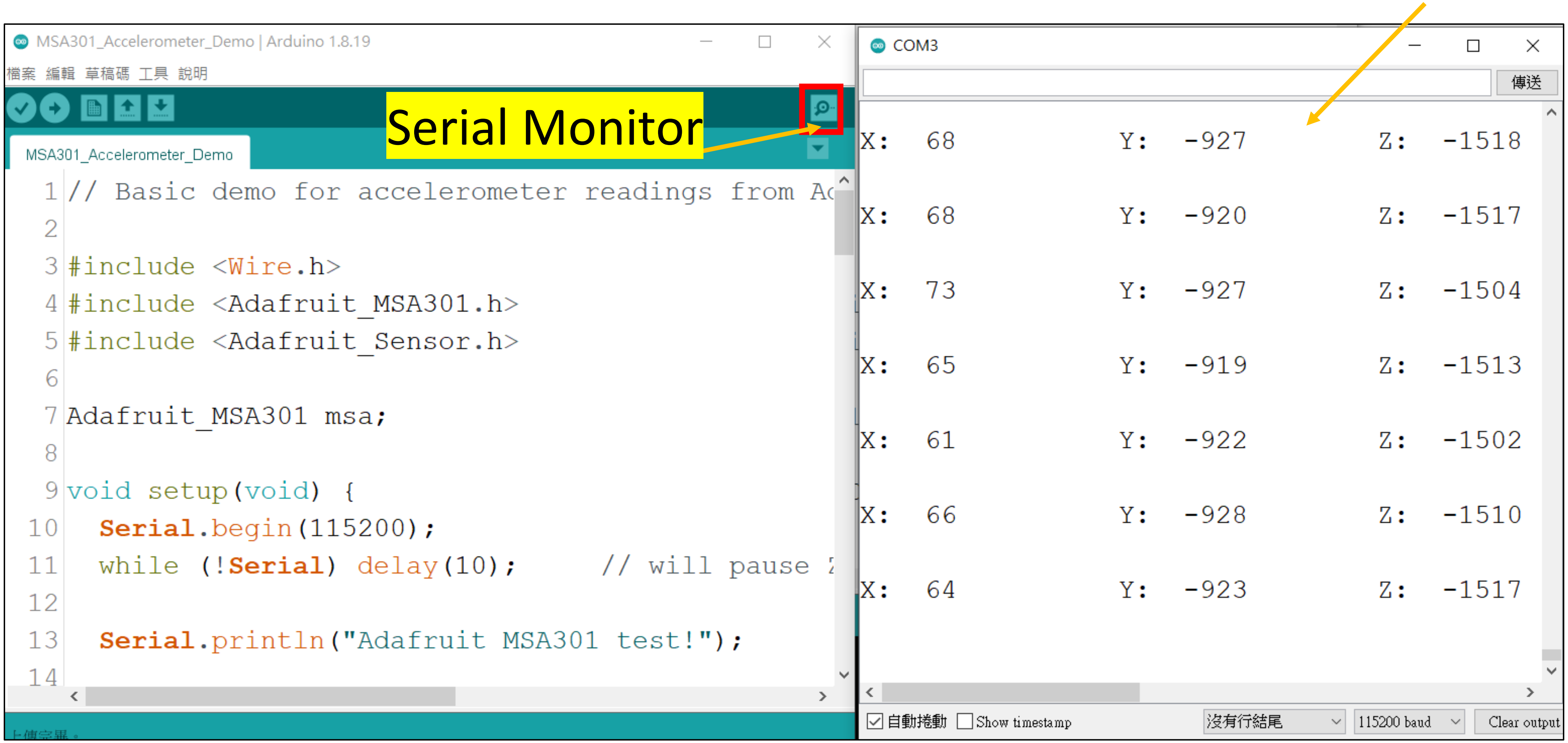
Upload


MSA301_Accelerometer_Demo | Arduino 1.8.19
檔案 編輯 草稿碼 工具 說明
上傳
MSA301_Accelerometer_Demo

```
// Basic demo for accelerometer readings from Adafruit MSA301

#include <Wire.h>
#include <Adafruit_MSA301.h>
#include <Adafruit_Sensor.h>

Adafruit_MSA301 msa;

void setup(void) {
  Serial.begin(115200);
  while (!Serial) delay(10);     // will pause Zero, Leonardo, e

```

Open Serial Monitor

Three axis accelerometer



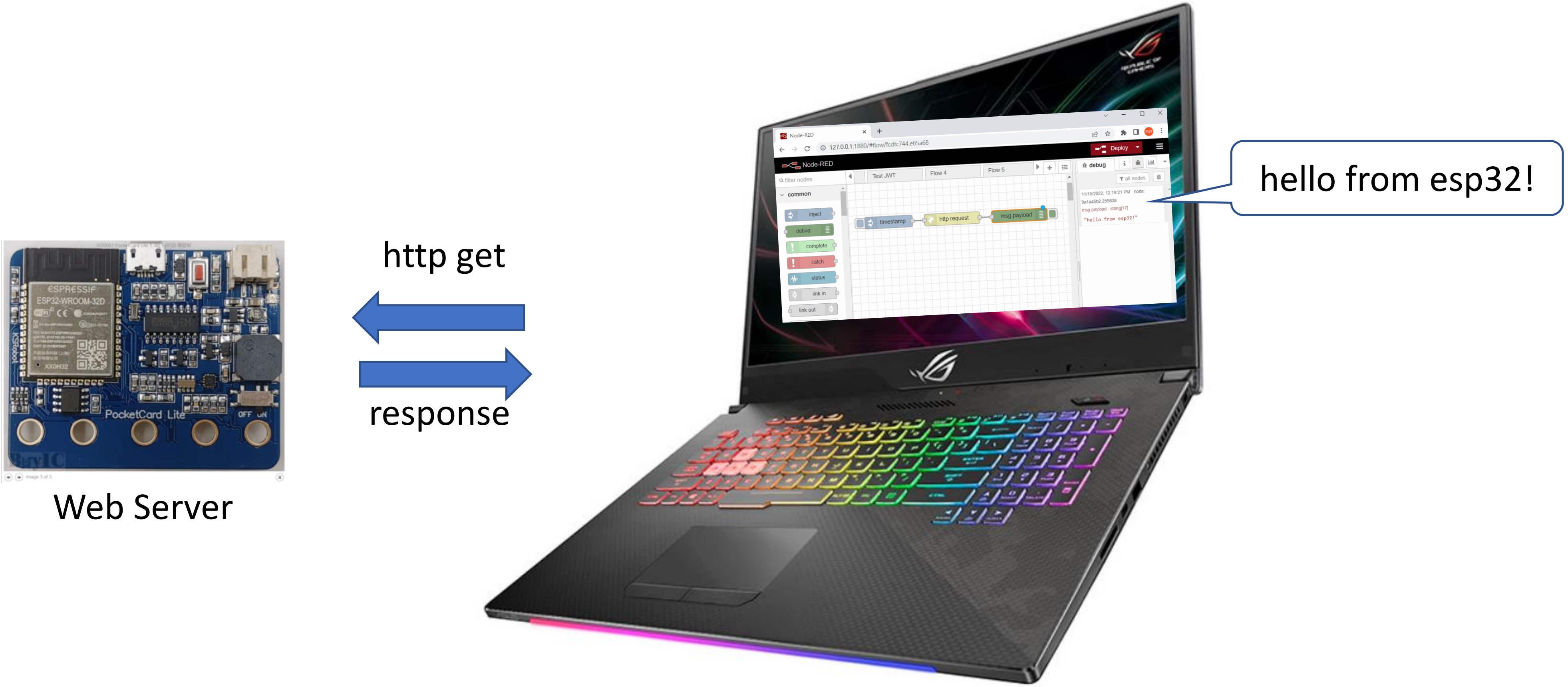
MSA301_Accelerometer_Demo | Arduino 1.8.19
檔案 編輯 草稿碼 工具 說明
MSA301_Accelerometer_Demo
上傳完畢。
COM3
傳送
☑ 自動捲動 □ Show timestamp
沒有行結尾
115200 baud
Clear output

Serial Monitor

```
// Basic demo for accelerometer readings from Ac

#include <Wire.h>
#include <Adafruit_MSA301.h>
#include <Adafruit_Sensor.h>

Adafruit_MSA301 msa;

void setup(void) {
  Serial.begin(115200);
  while (!Serial) delay(10);     // will pause Z

  Serial.println("Adafruit MSA301 test!");

```

```
X:  68       Y:  -927       Z:  -1518

X:  68       Y:  -920       Z:  -1517

X:  73       Y:  -927       Z:  -1504

X:  65       Y:  -919       Z:  -1513

X:  61       Y:  -922       Z:  -1502

X:  66       Y:  -928       Z:  -1510

X:  64       Y:  -923       Z:  -1517
```

Exercise 9-3



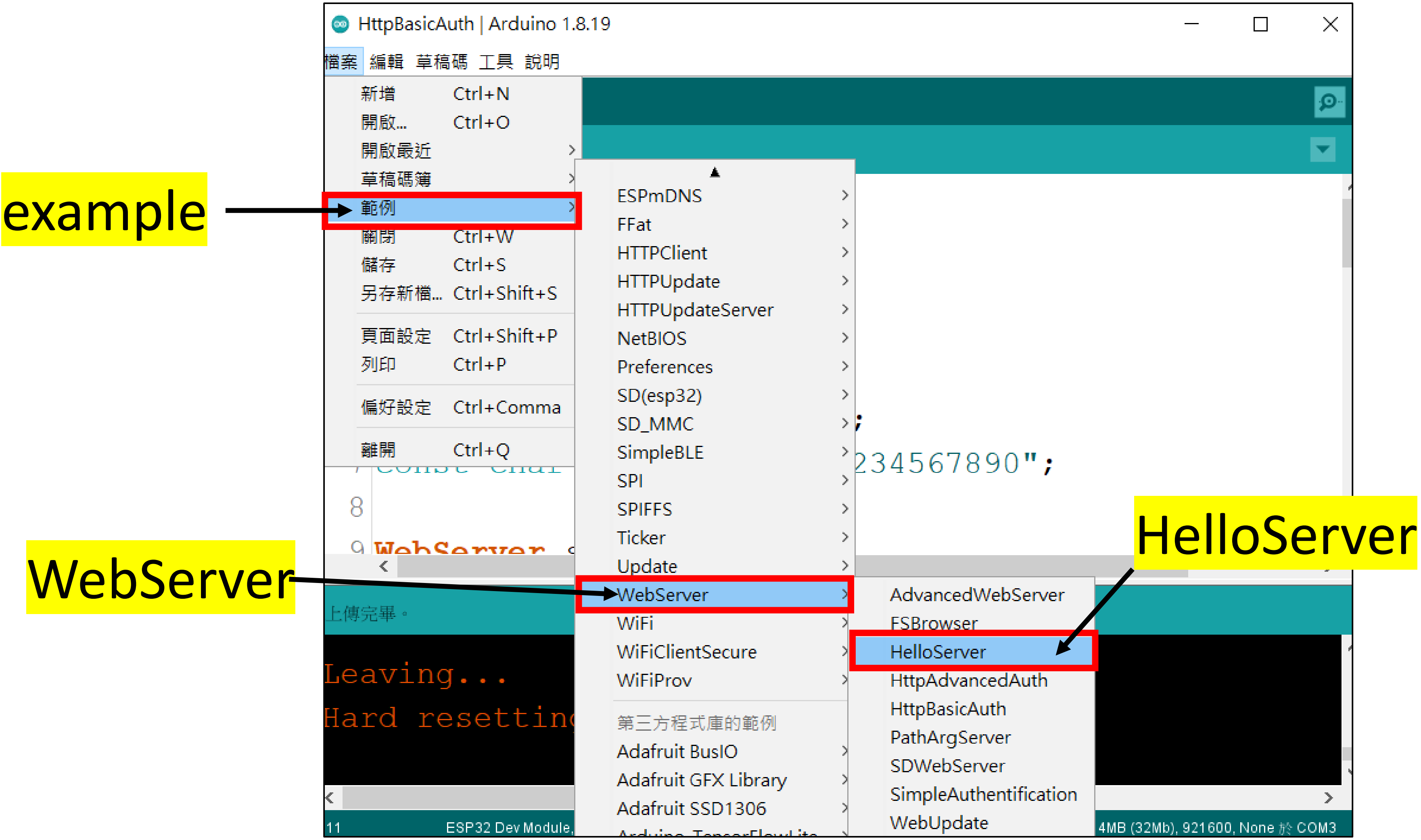
Web Server

http get

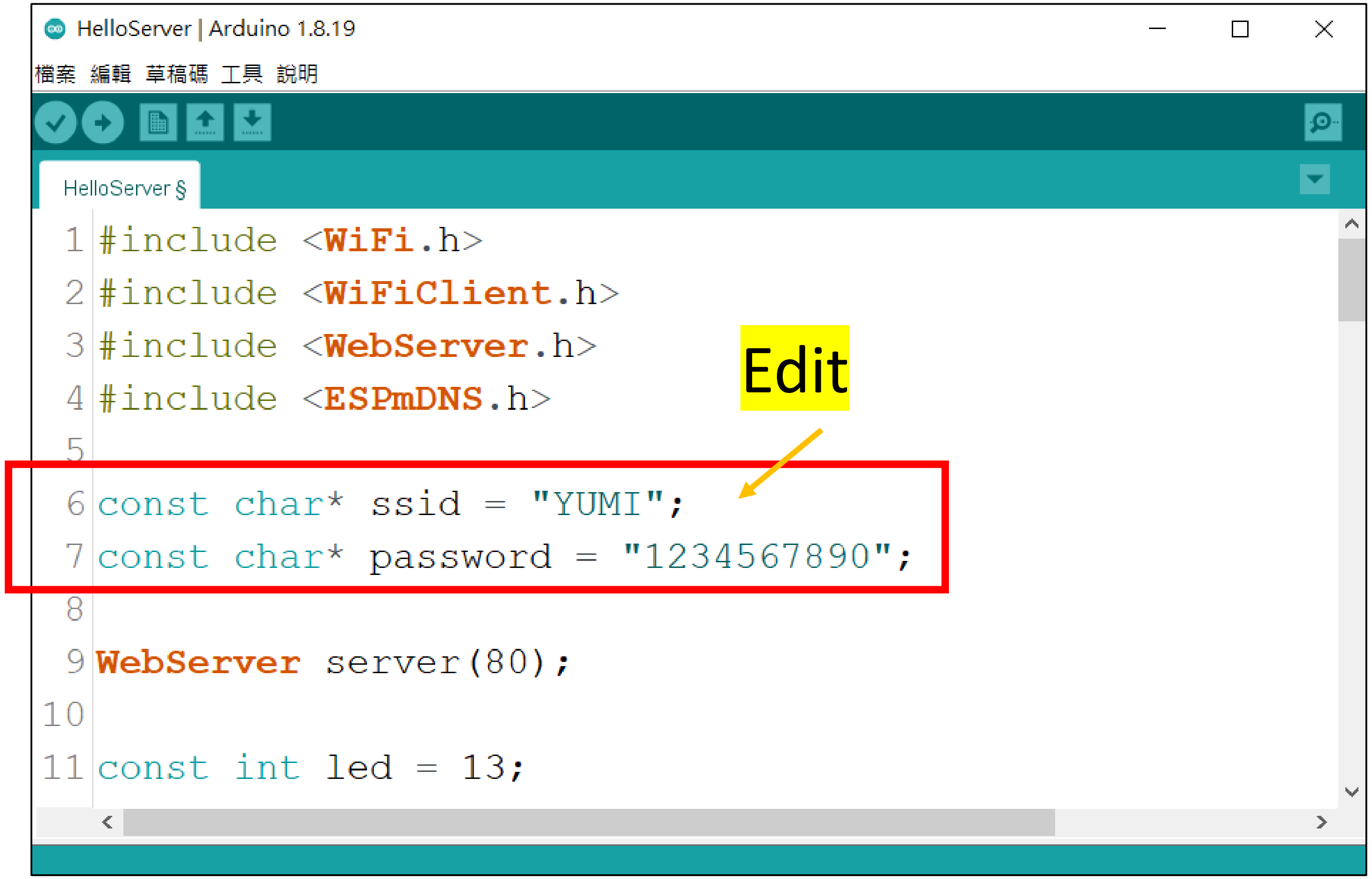
response

hello from esp32!

Example -> WebServer



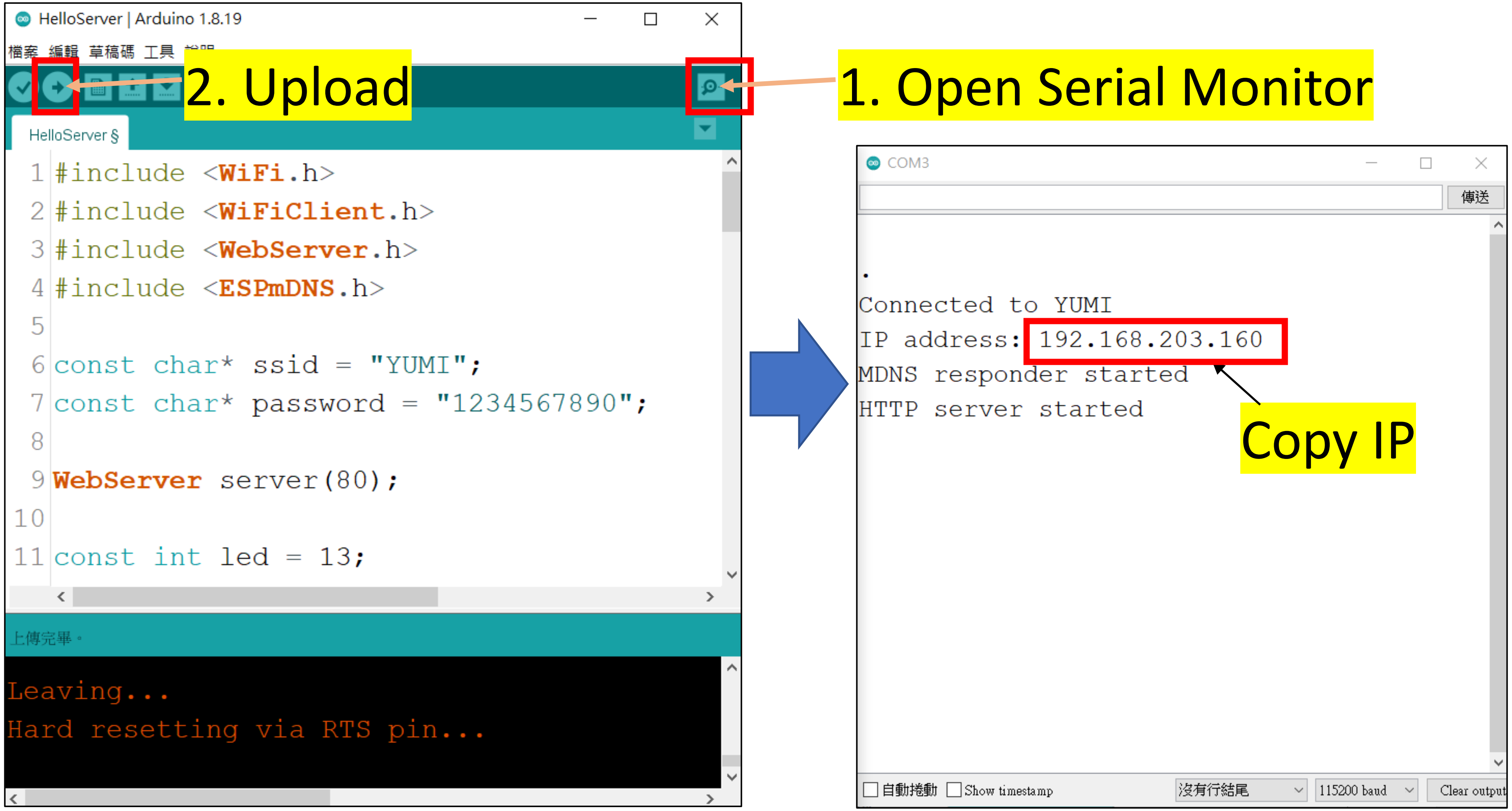
Setting ssid & password



```
#include <WiFi.h>
#include <WiFiClient.h>
#include <WebServer.h>
#include <ESPmDNS.h>

const char* ssid = "YUMI";
const char* password = "1234567890";

WebServer server(80);

const int led = 13;
```

Edit

Upload



HelloServer | Arduino 1.8.19
檔案 編輯 草稿碼 工具 說明
HelloServer §
上傳完畢。
COM3
傳送
□ 自動捲動 □ Show timestamp
沒有行結尾
115200 baud
Clear output

2. Upload

1. Open Serial Monitor

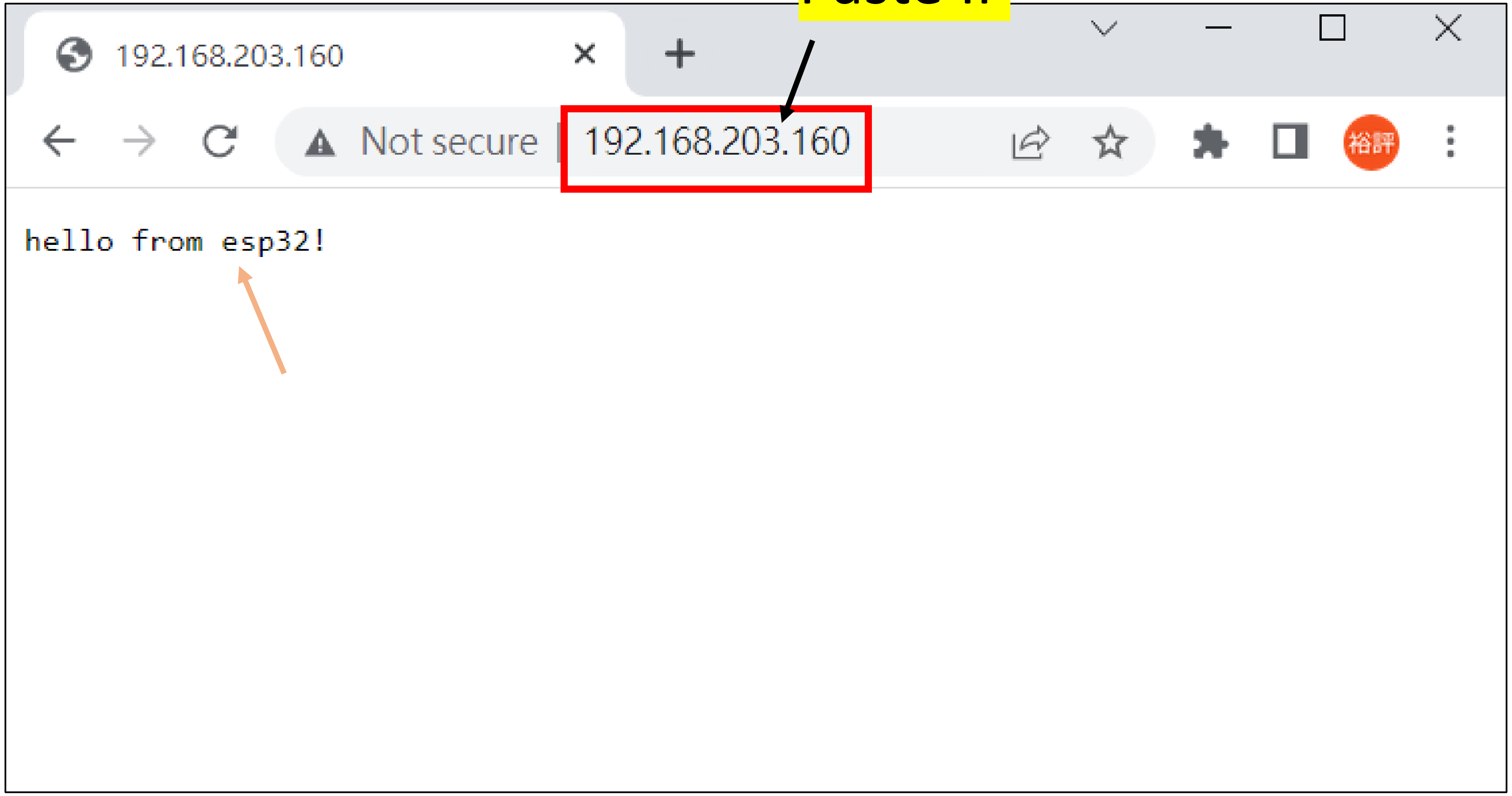
```
#include <WiFi.h>
#include <WiFiClient.h>
#include <WebServer.h>
#include <ESPmDNS.h>

const char* ssid = "YUMI";
const char* password = "1234567890";

WebServer server(80);

const int led = 13;
```

```
Leaving...
Hard resetting via RTS pin...
```

```
.
Connected to YUMI
IP address: 192.168.203.160
MDNS responder started
HTTP server started
```

Copy IP

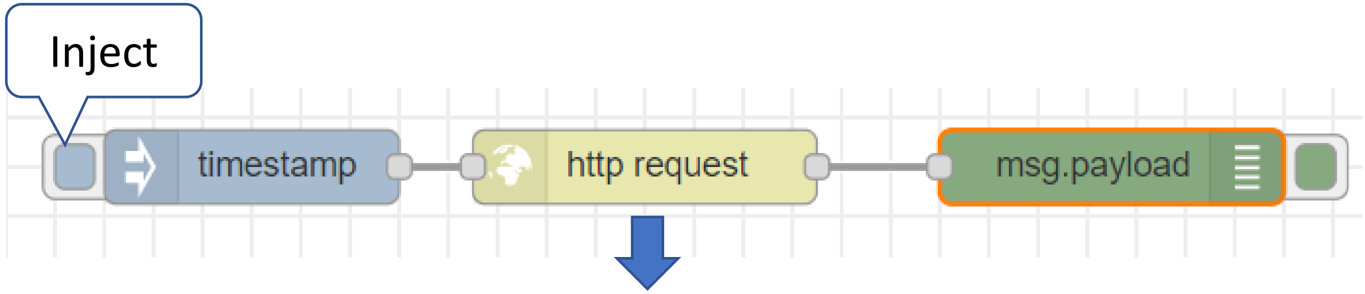
Open Browser

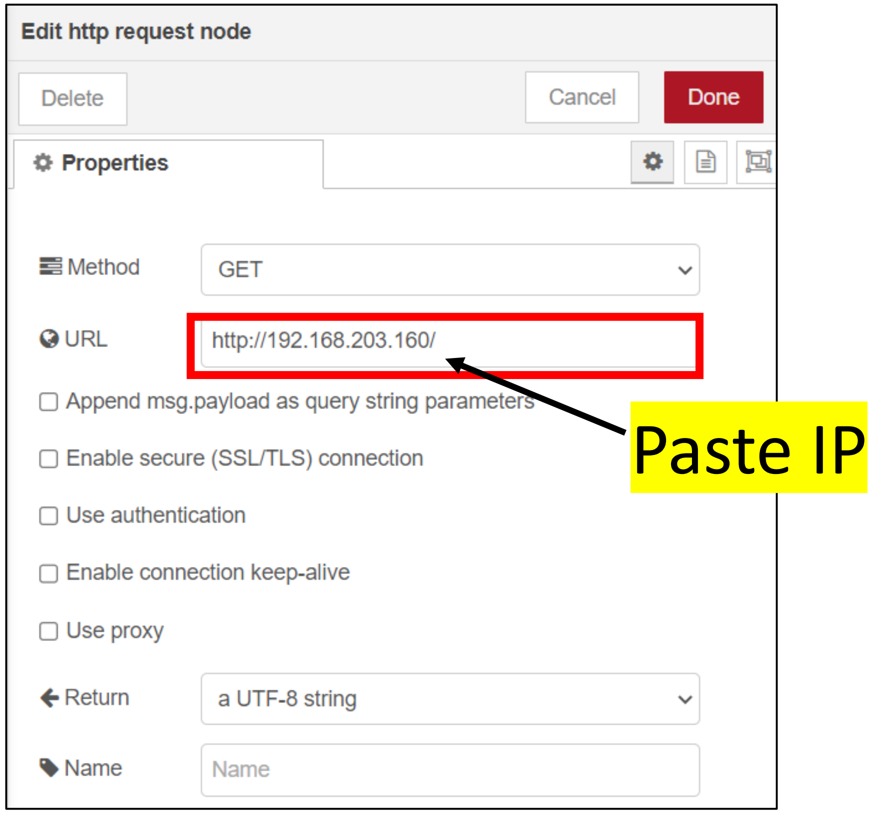


Paste IP

hello from esp32!

Node-Red flow





Method: GET

URL: http://192.168.203.160/

☐ Append msg.payload as query string parameters

☐ Enable secure (SSL/TLS) connection

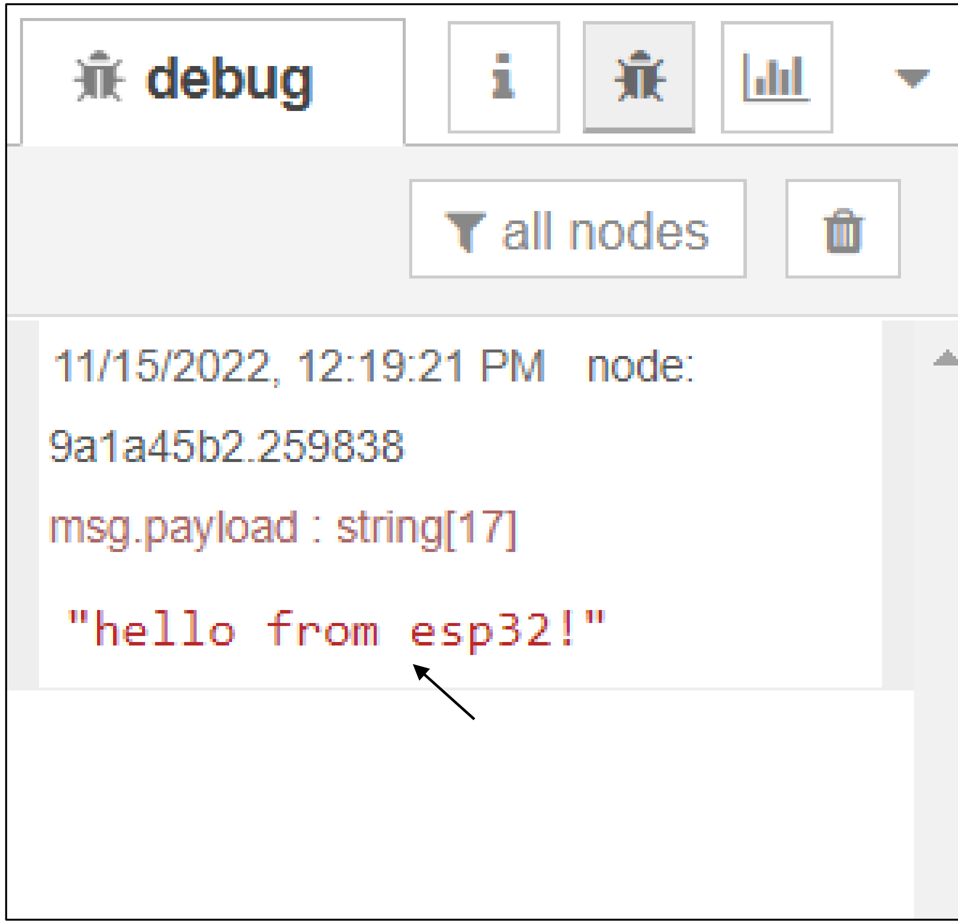
☐ Use authentication

☐ Enable connection keep-alive

☐ Use proxy

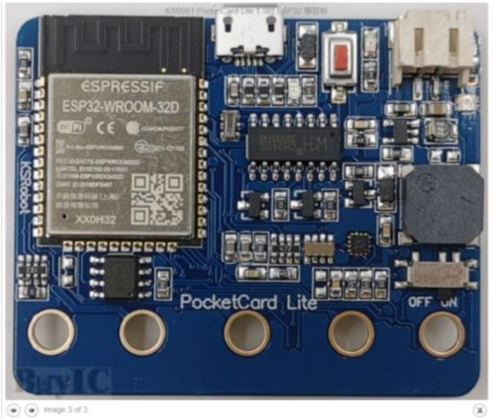
Return: a UTF-8 string

Name: Name



```
11/15/2022, 12:19:21 PM  node:
9a1a45b2.259838
msg.payload : string[17]
 "hello from esp32!"
```

Get data from 192.168.203.160

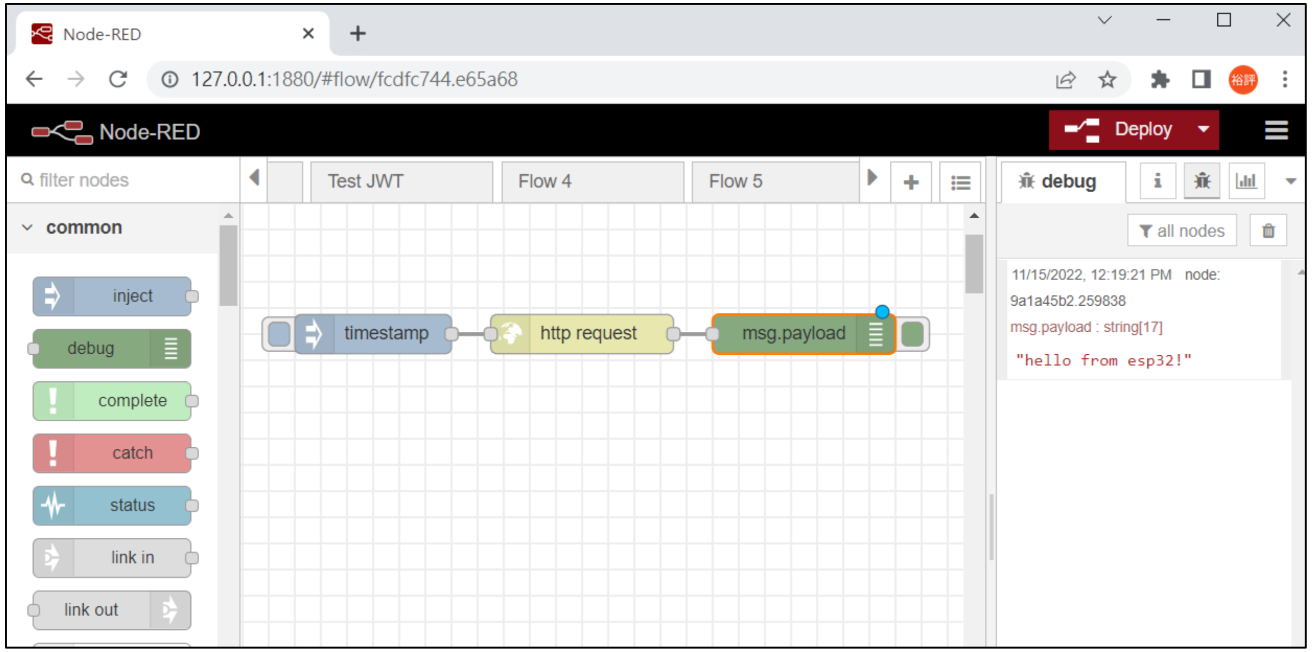


Web Server

IP : 192.168.203.160/

http get

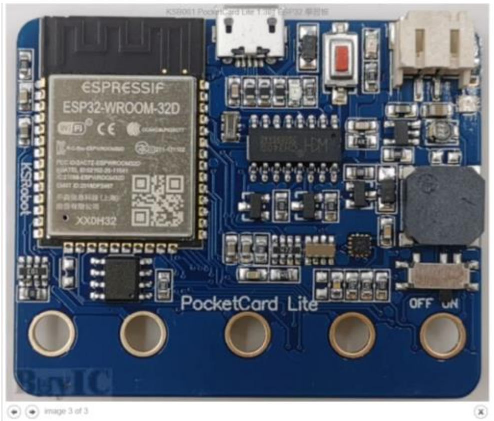
response



```
11/15/2022, 12:19:21 PM   node:
9a1a45b2.259838
msg.payload : string[17]
"hello from esp32!"
```

Exercise 9-4

- Get current temp from the web server.

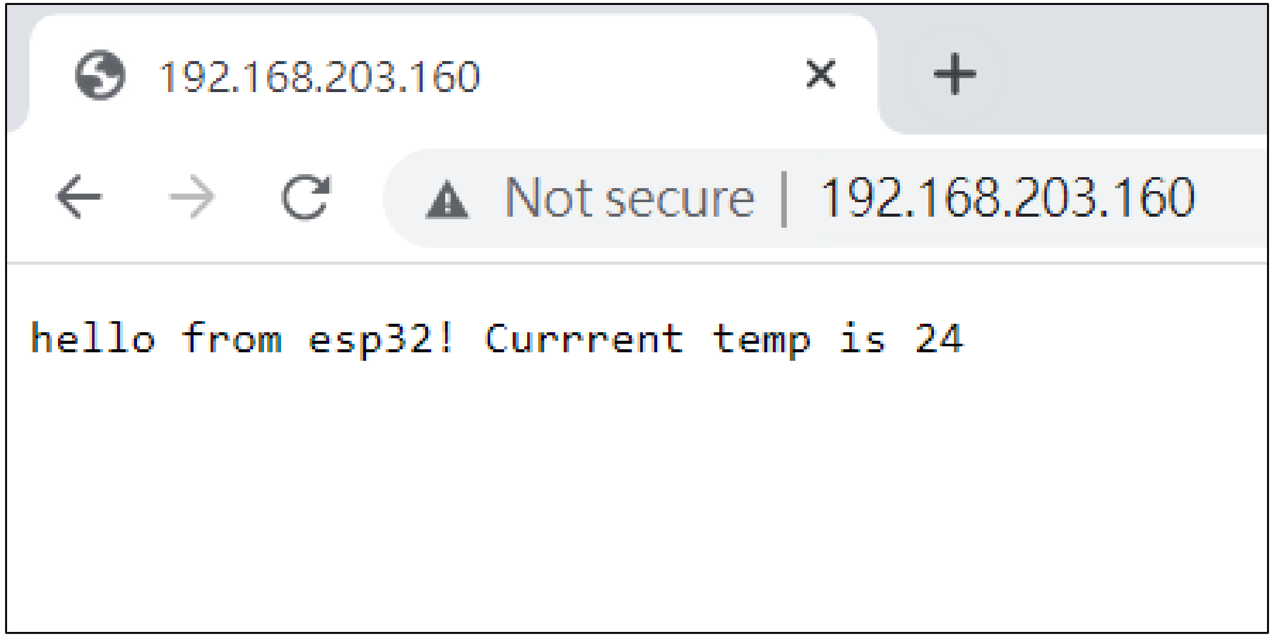


Web Server

IP : 192.168.203.160/

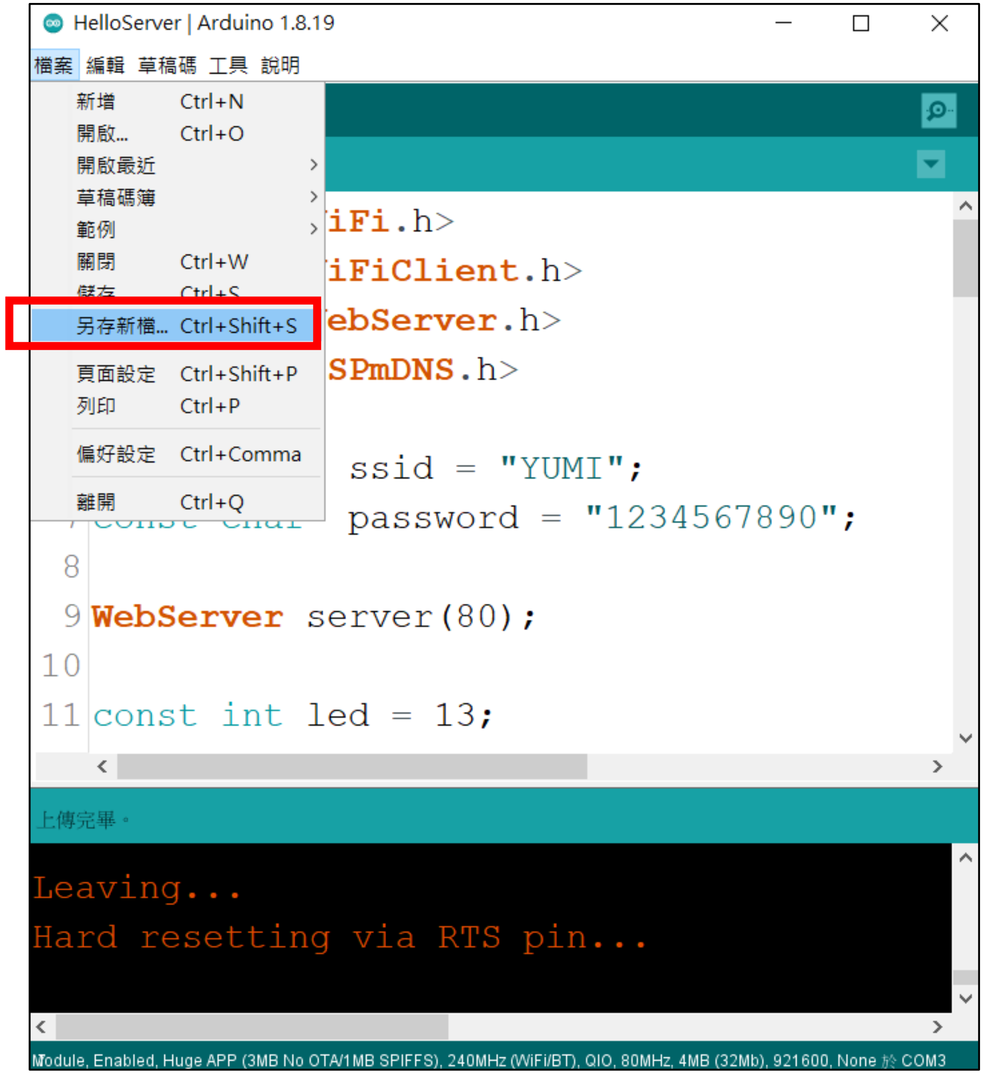
http get

response



```
hello from esp32! Currrent temp is 24
```

Save As

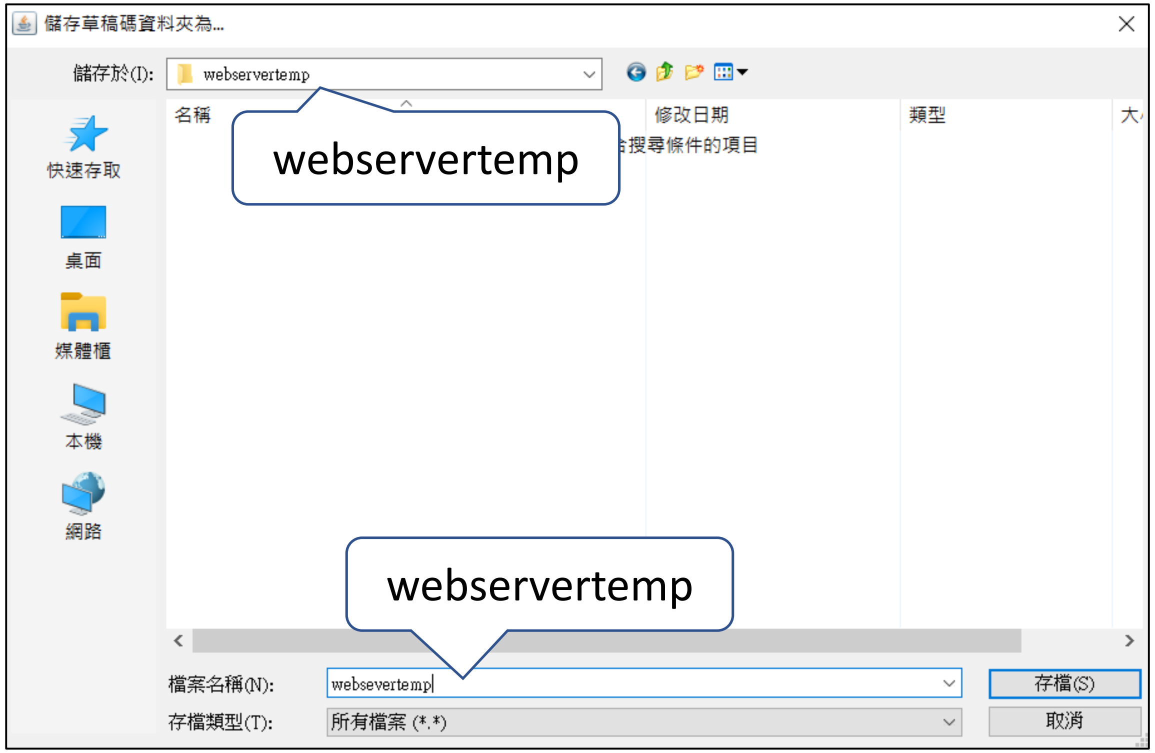


```
iFi.h>
iFiClient.h>
ebServer.h>
SPmDNS.h>

 ssid = "YUMI";
const char  password = "1234567890";

WebServer server(80);

const int led = 13;
```

上傳完畢。

```
Leaving...
Hard resetting via RTS pin...
```

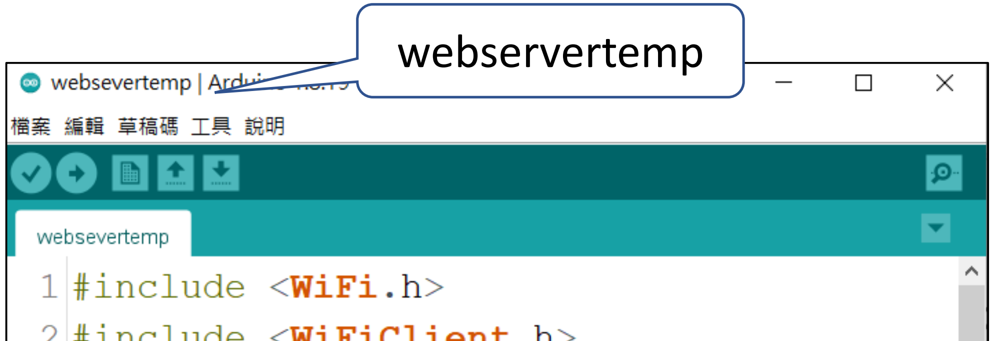
Module, Enabled, Huge APP (3MB No OTA/1MB SPIFFS), 240MHz (WiFi/BT), QIO, 80MHz, 4MB (32Mb), 921600, None 於 COM3



儲存於(I): webservertemp

檔案名稱(N): webservertemp

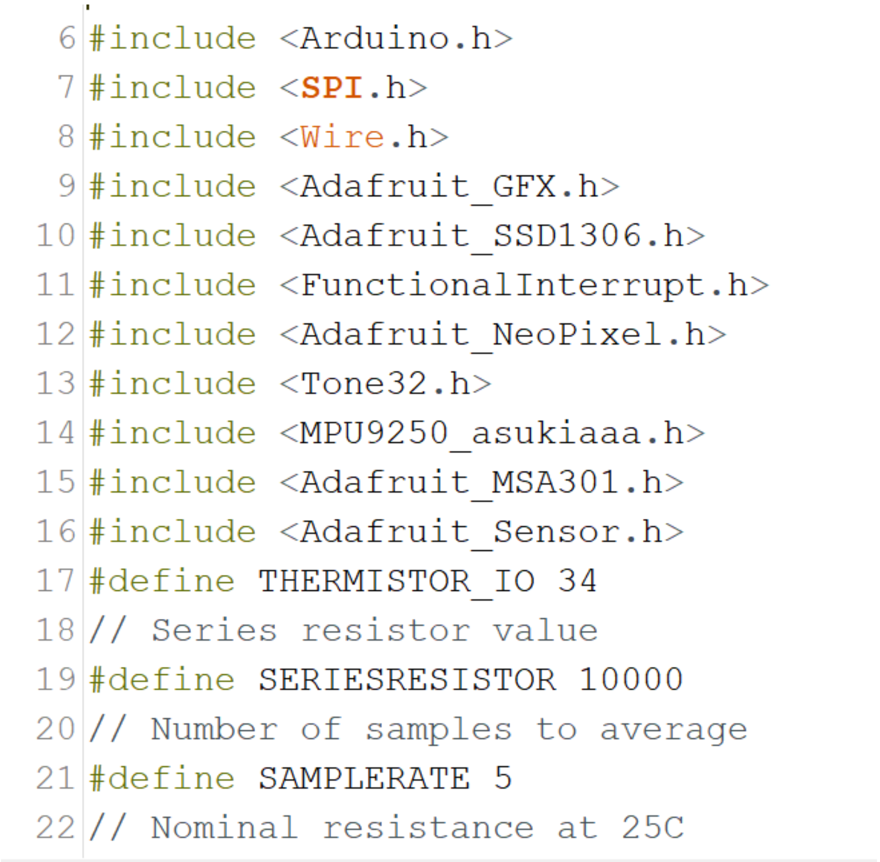
存檔類型(T): 所有檔案 (*.*)



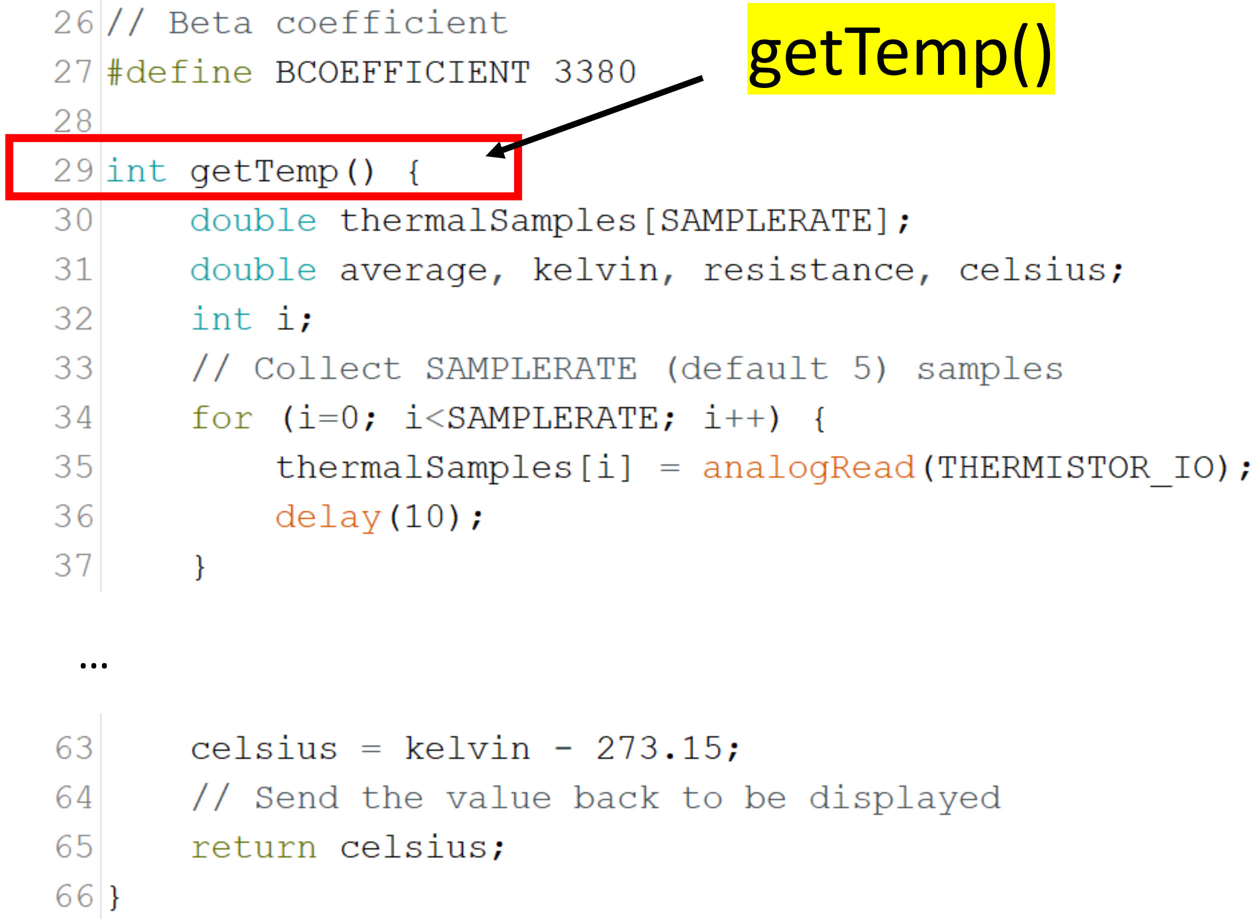
```
#include <WiFi.h>
#include <WiFiClient.h>
```

Processes

- 1. Copy getTemp() function from pocketcard_demo



```
#include <Arduino.h>
#include <SPI.h>
#include <Wire.h>
#include <Adafruit_GFX.h>
#include <Adafruit_SSD1306.h>
#include <FunctionalInterrupt.h>
#include <Adafruit_NeoPixel.h>
#include <Tone32.h>
#include <MPU9250_asukiaaa.h>
#include <Adafruit_MSA301.h>
#include <Adafruit_Sensor.h>
#define THERMISTOR_IO 34
// Series resistor value
#define SERIESRESISTOR 10000
// Number of samples to average
#define SAMPLERATE 5
// Nominal resistance at 25C
```



```
// Beta coefficient
#define BCOEFFICIENT 3380

int getTemp() {
    double thermalSamples[SAMPLERATE];
    double average, kelvin, resistance, celsius;
    int i;
    // Collect SAMPLERATE (default 5) samples
    for (i=0; i<SAMPLERATE; i++) {
        thermalSamples[i] = analogRead(THERMISTOR_IO);
        delay(10);
    }

…

    celsius = kelvin - 273.15;
    // Send the value back to be displayed
    return celsius;
}
```

getTemp()

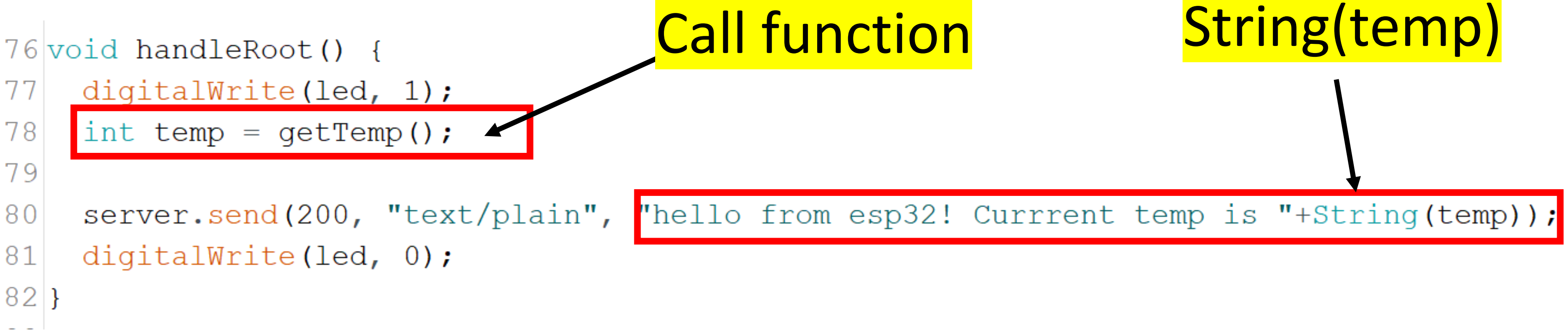
Processes

- 2.Edit handleRoot() function

Converts integer to string

Call function

String(temp)



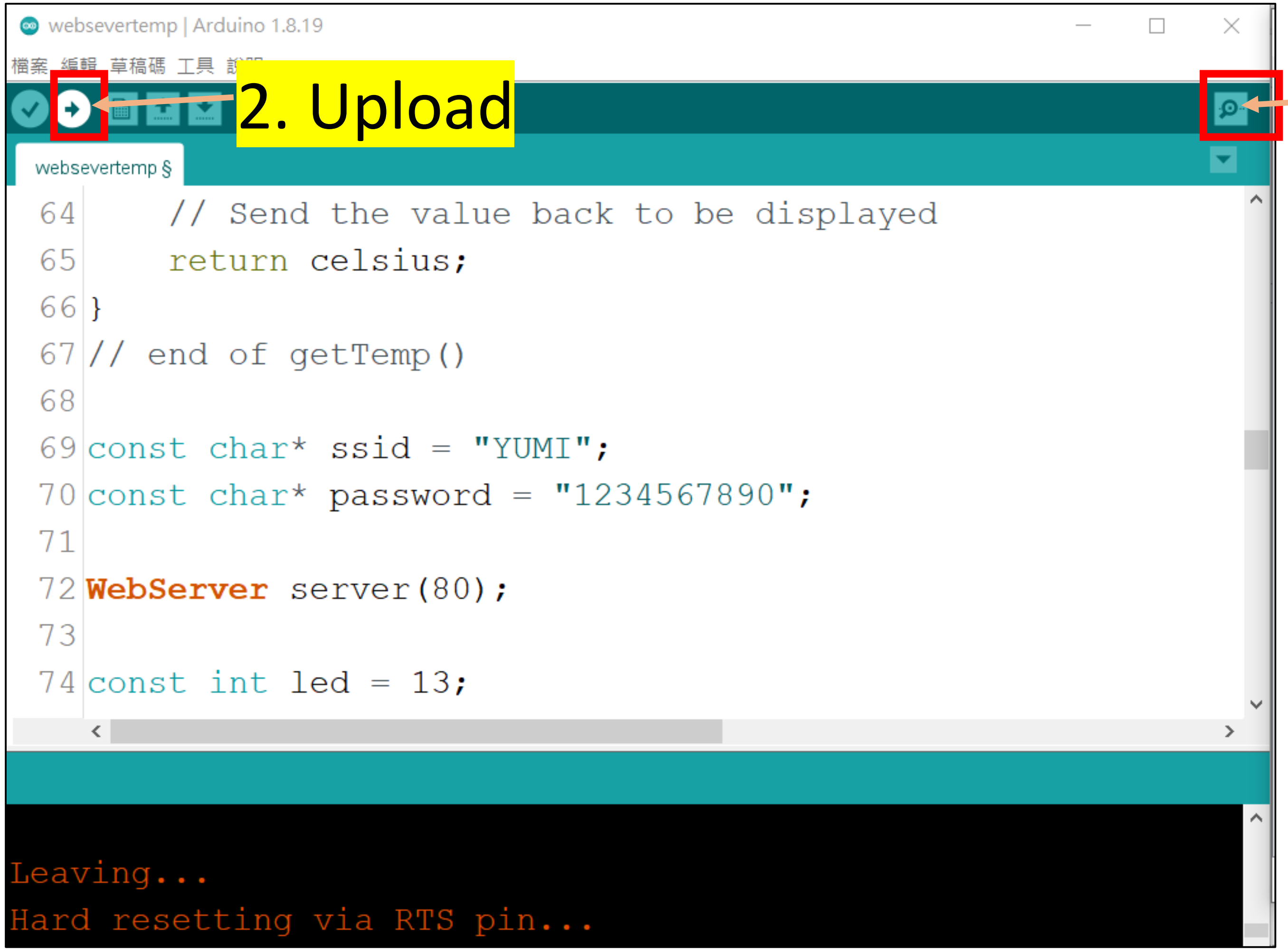
```
void handleRoot() {
  digitalWrite(led, 1);
  int temp = getTemp();

  server.send(200, "text/plain", "hello from esp32! Currrent temp is "+String(temp));
  digitalWrite(led, 0);
}
```

https://circuits4you.com/2018/03/09/how-to-convert-int-to-string-on-arduino/

Example 1: Integer to String Conversion Arduino

```
int a = 1234;
String myStr;
myStr = String(a);   //Converts integer to string
```

Upload

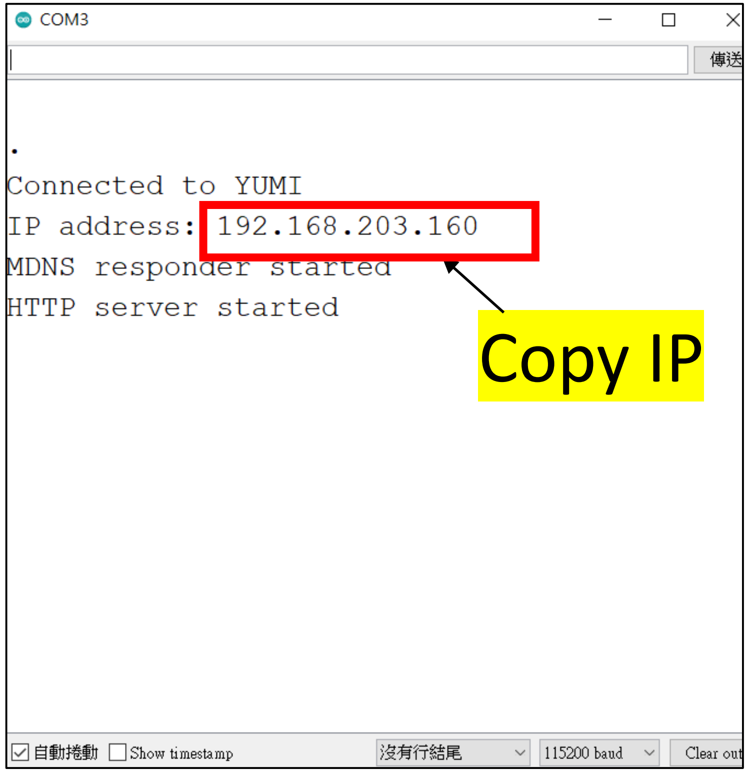


2. Upload

```
    // Send the value back to be displayed
    return celsius;
}
// end of getTemp()

const char* ssid = "YUMI";
const char* password = "1234567890";

WebServer server(80);

const int led = 13;
```

```
Leaving...
Hard resetting via RTS pin...
```

1. Open Serial Monitor

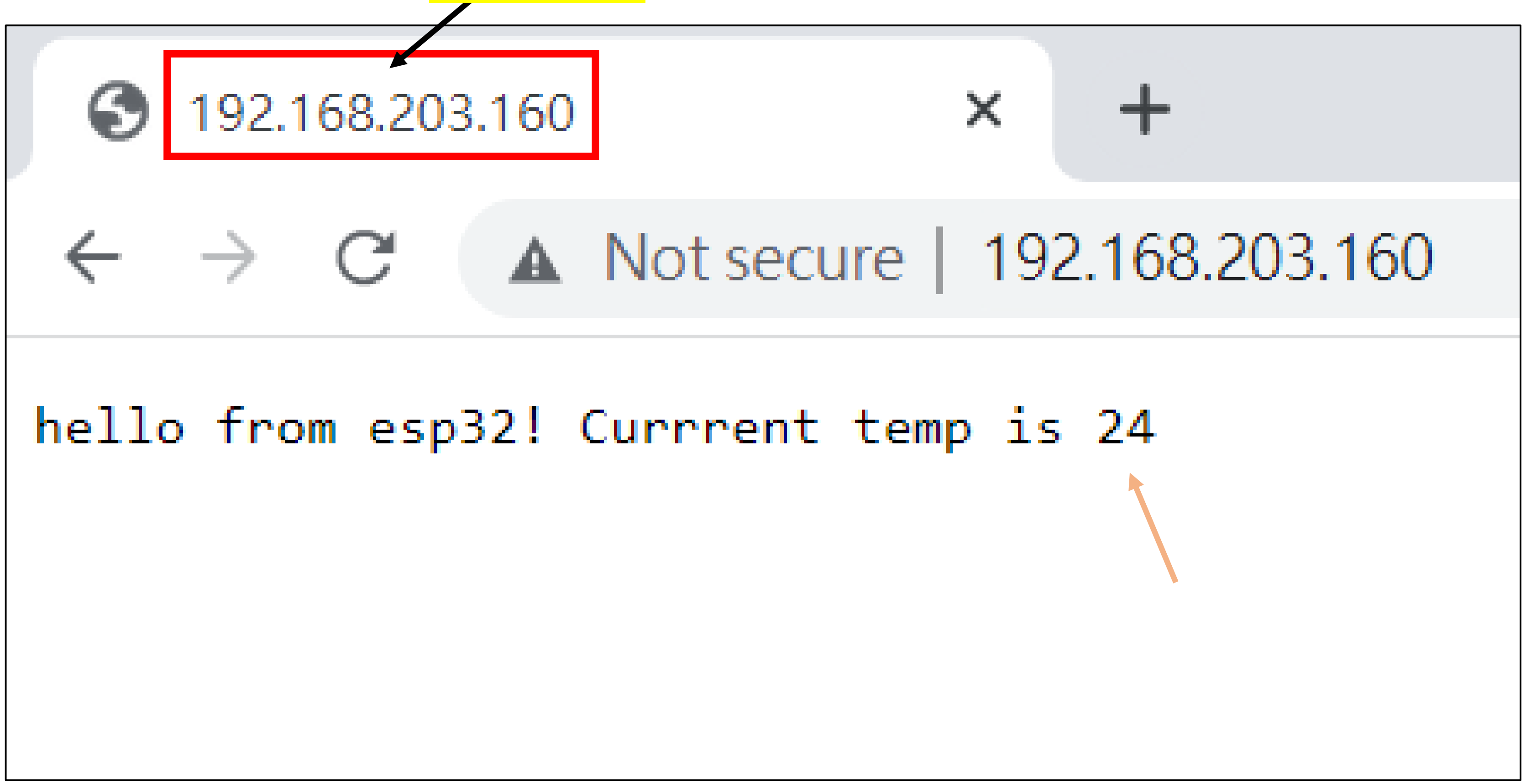


```
.
Connected to YUMI
IP address: 192.168.203.160
MDNS responder started
HTTP server started
```

Copy IP

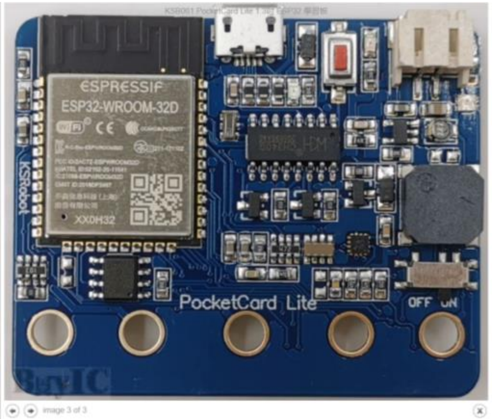
Open Browser

Paste IP



```
hello from esp32! Currrent temp is 24
```

Exercise 9-5

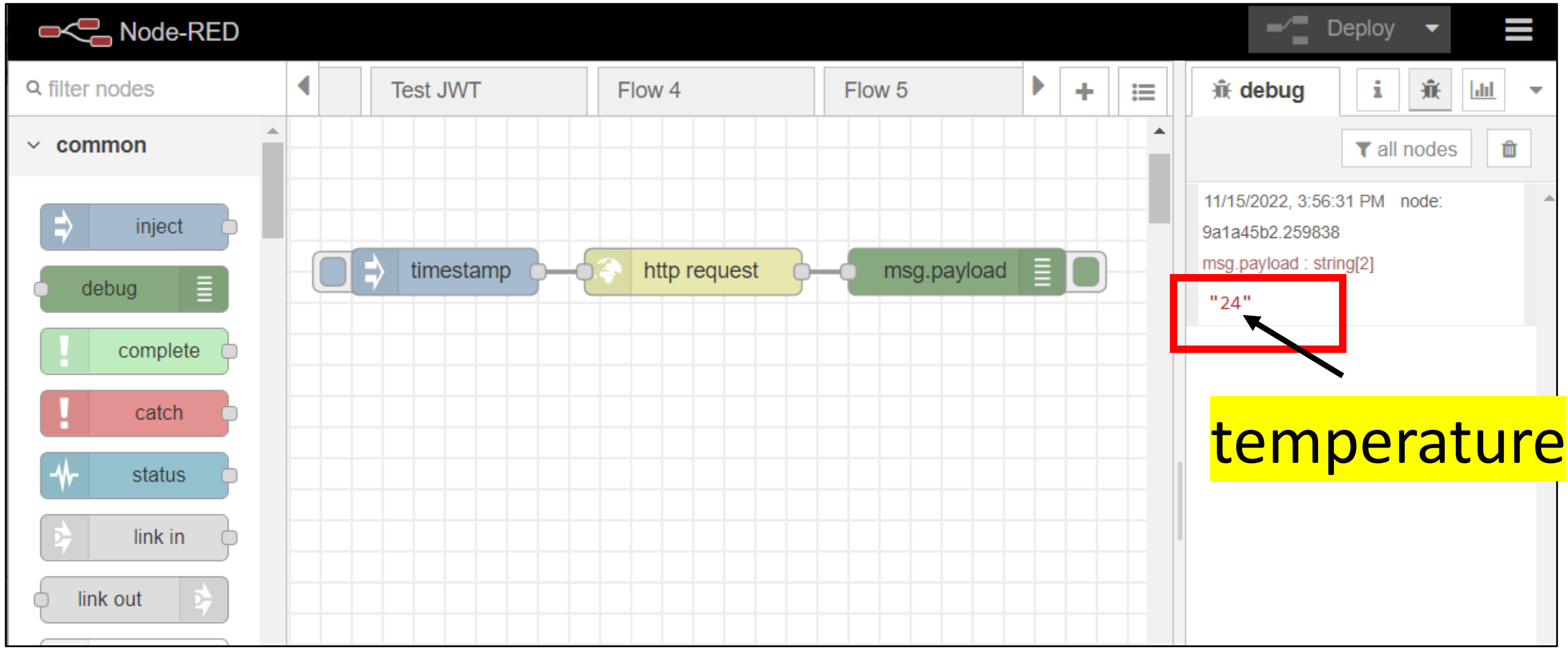


Web Server

IP : 192.168.203.160/

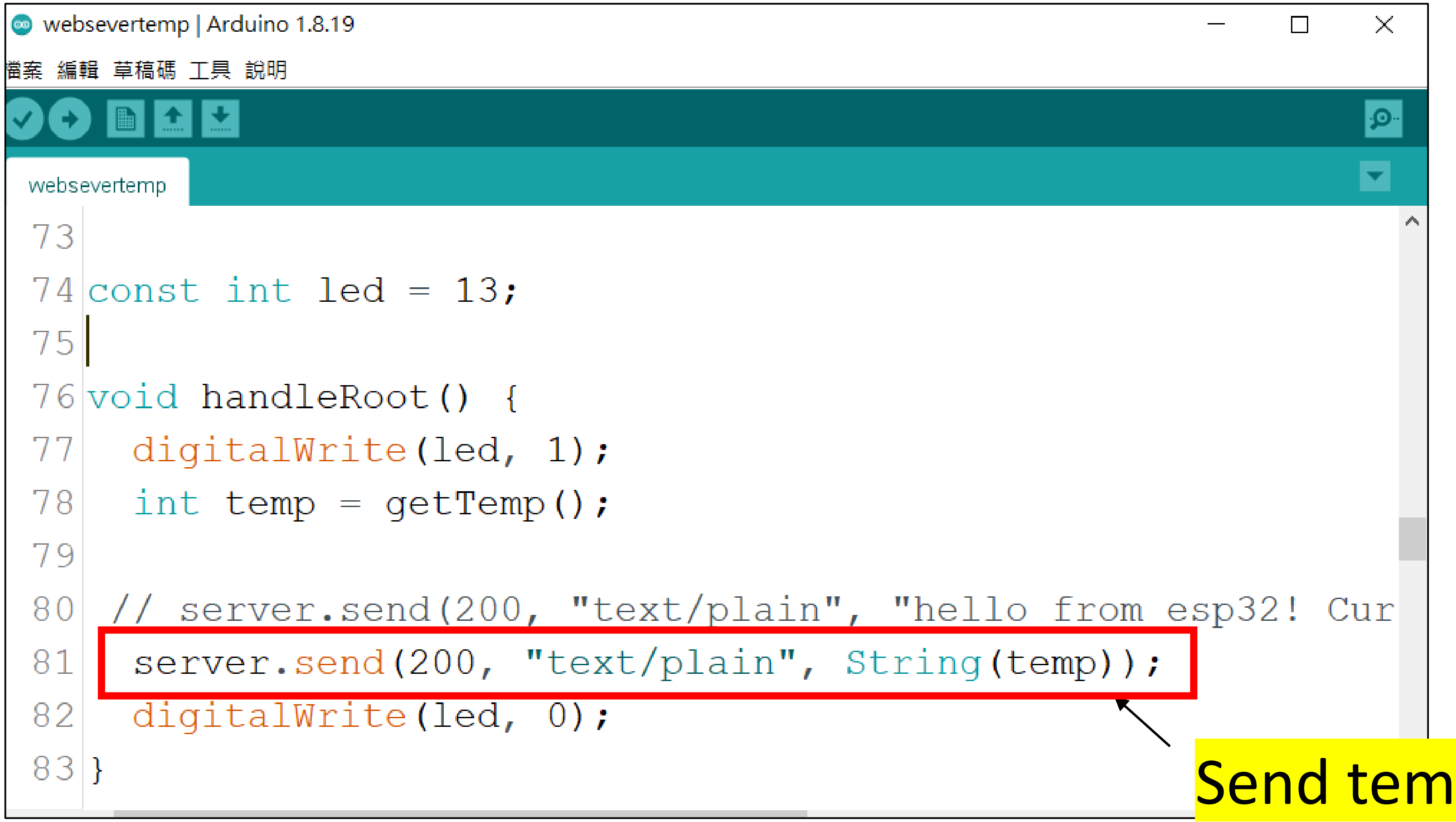
http get

response



```
11/15/2022, 3:56:31 PM   node:
9a1a45b2.259838
msg.payload : string[2]
"24"
```

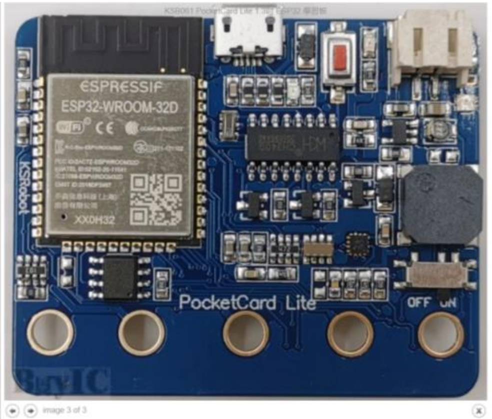
temperature



```

const int led = 13;

void handleRoot() {
  digitalWrite(led, 1);
  int temp = getTemp();

 // server.send(200, "text/plain", "hello from esp32! Cur
  server.send(200, "text/plain", String(temp));
  digitalWrite(led, 0);
}
```

Send temperature

Exercise 9-6

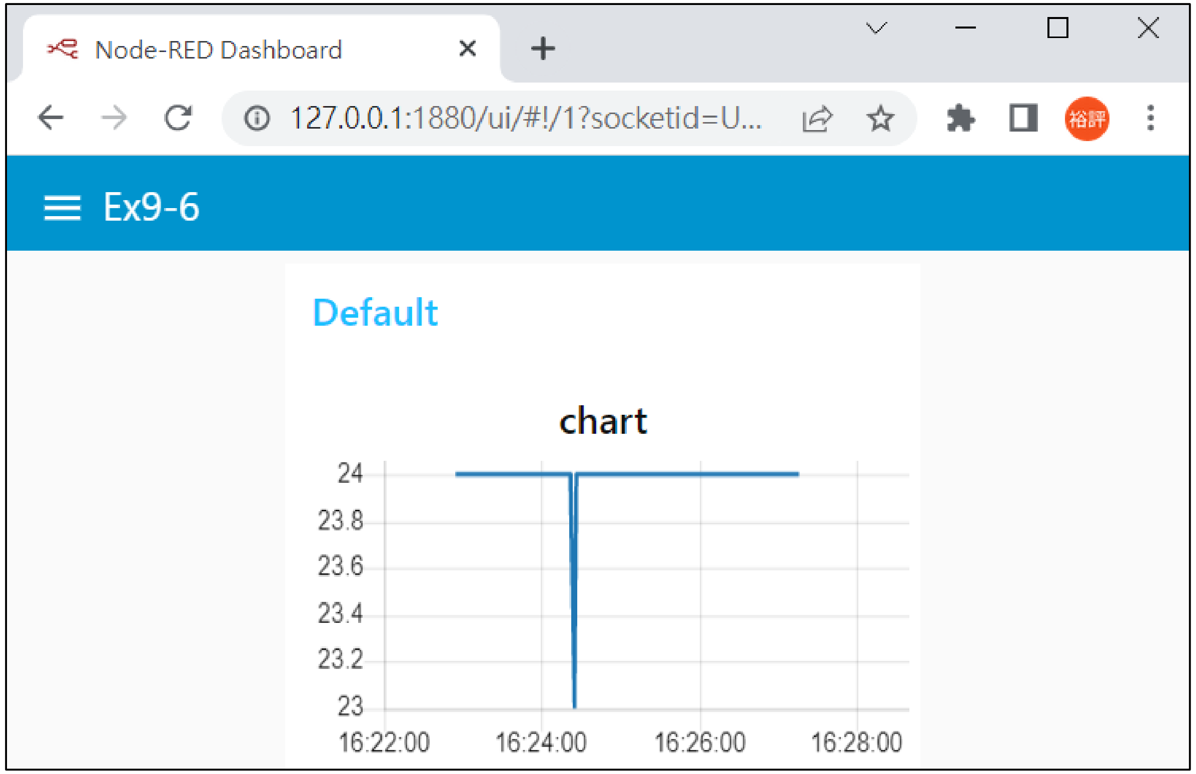


Web Server

IP : 192.168.203.160/

http get

response



Node-RED Dashboard

127.0.0.1:1880/ui/#!/1?socketid=U...

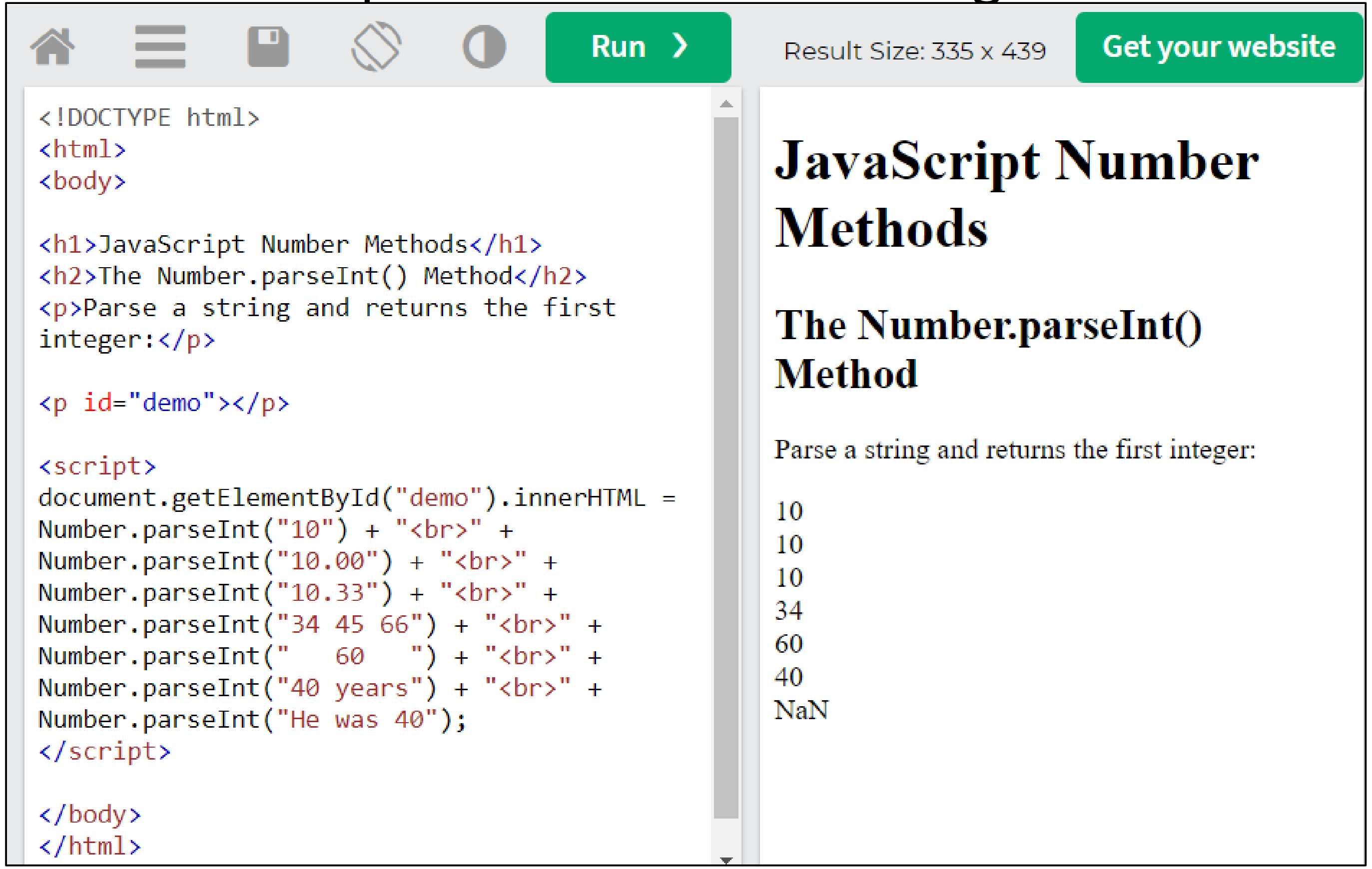
Ex9-6

Default

chart

JavaScript Number.parseInt()

- The Number.parseInt method parses a value as a string and returns the first integer.



```
<!DOCTYPE html>
<html>
<body>

<h1>JavaScript Number Methods</h1>
<h2>The Number.parseInt() Method</h2>
<p>Parse a string and returns the first
integer:</p>

<p id="demo"></p>

<script>
document.getElementById("demo").innerHTML =
Number.parseInt("10") + "<br>" +
Number.parseInt("10.00") + "<br>" +
Number.parseInt("10.33") + "<br>" +
Number.parseInt("34 45 66") + "<br>" +
Number.parseInt("   60   ") + "<br>" +
Number.parseInt("40 years") + "<br>" +
Number.parseInt("He was 40");
</script>

</body>
</html>
```

JavaScript Number Methods

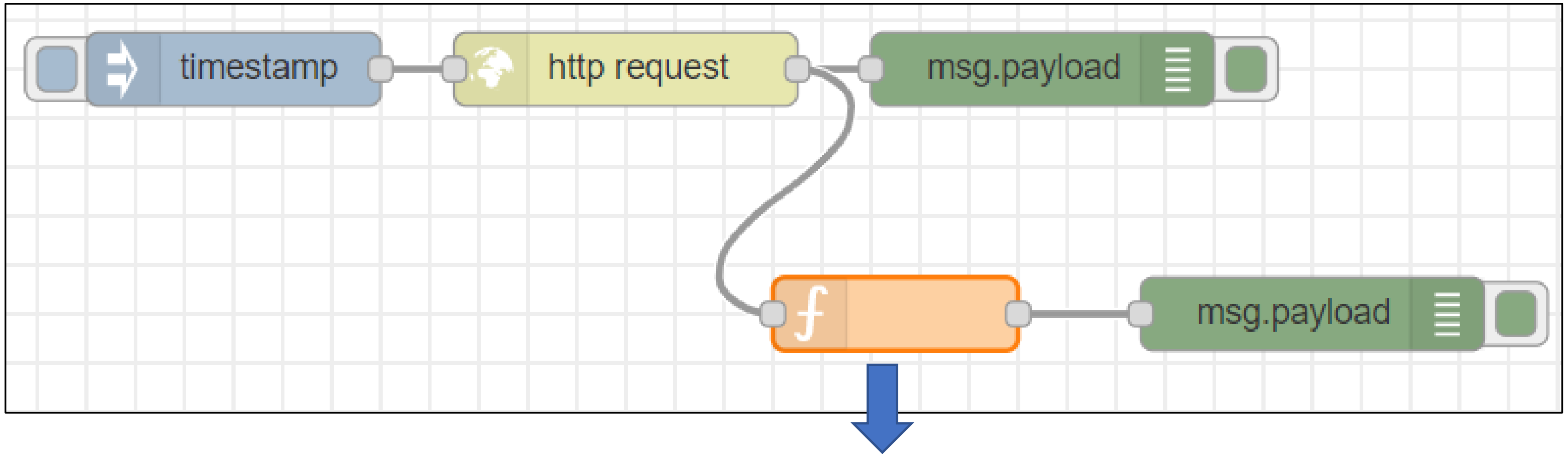
The Number.parseInt() Method

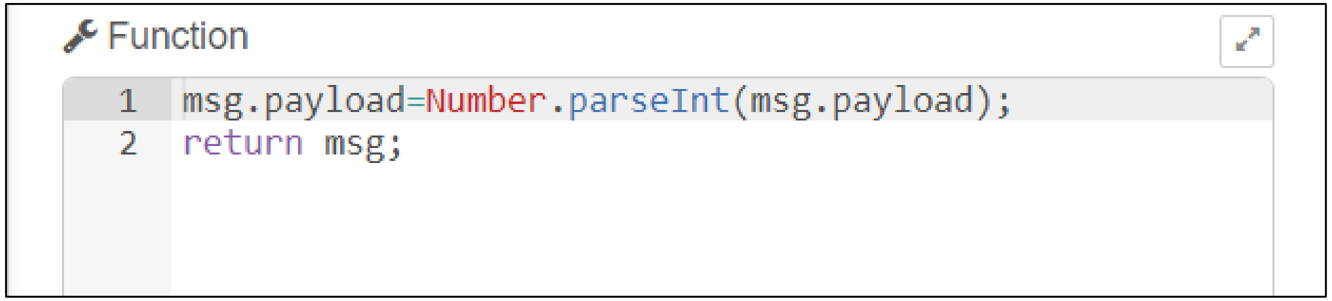
Parse a string and returns the first integer:

```
10
10
10
34
60
40
NaN
```

https://www.w3schools.com/jsref/jsref_number_parseint.asp

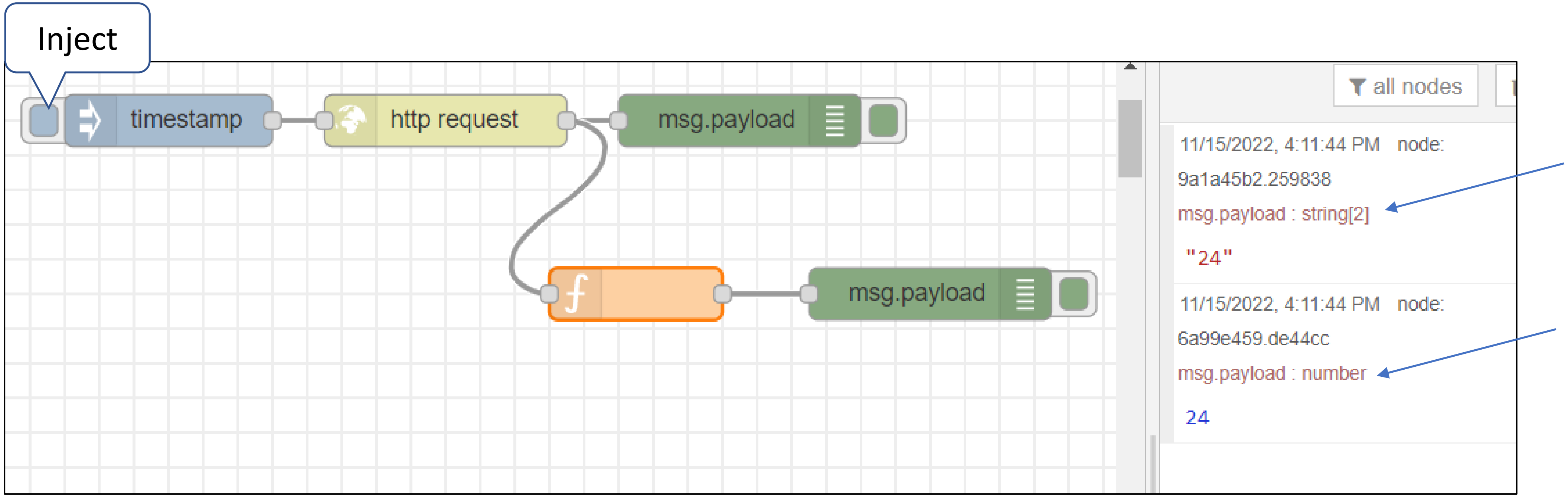
String to interger





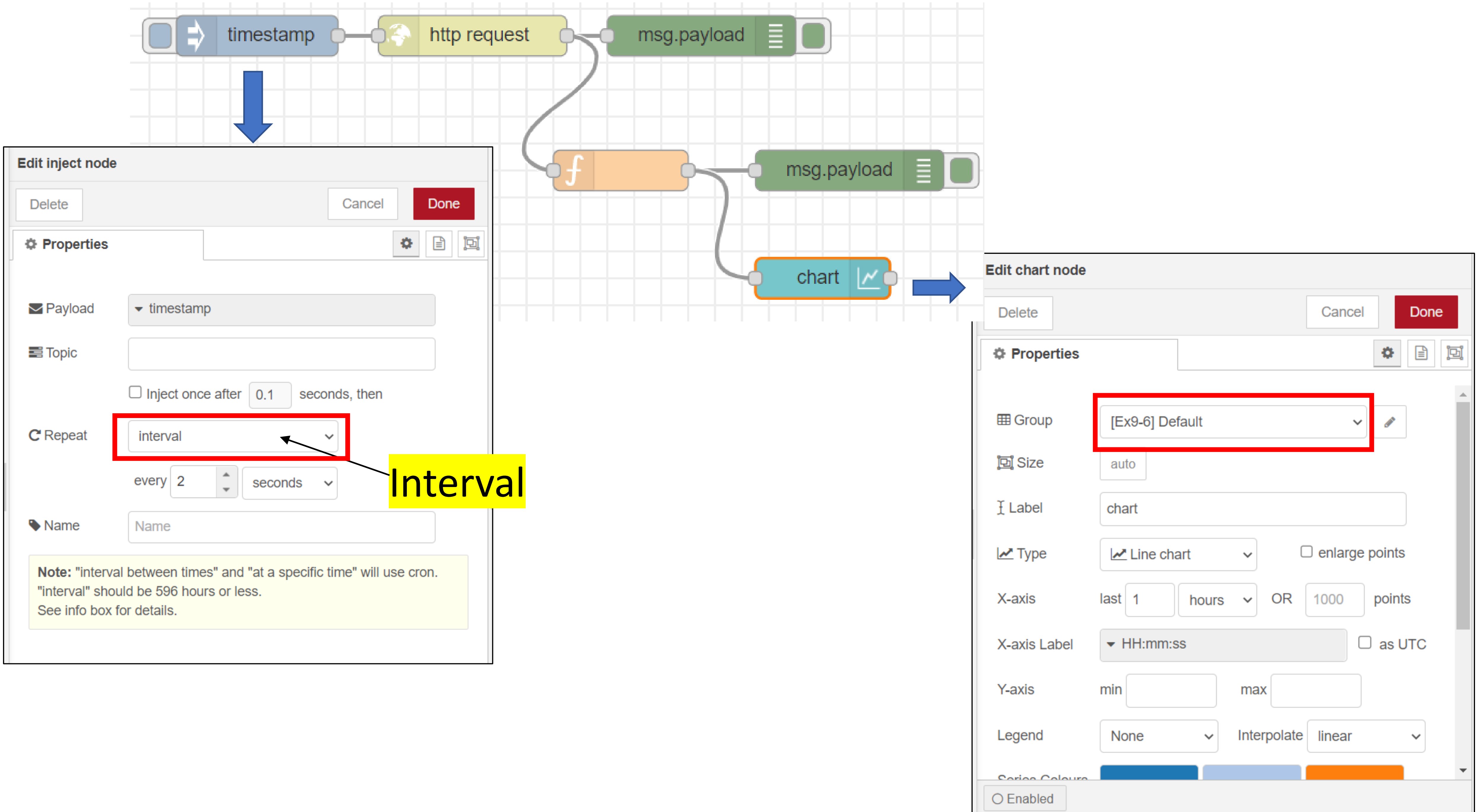
```
msg.payload=Number.parseInt(msg.payload);
return msg;
```

Check the debug window



11/15/2022, 4:11:44 PM node: 9a1a45b2.259838
msg.payload : string[2]
"24"

11/15/2022, 4:11:44 PM node: 6a99e459.de44cc
msg.payload : number
24



Edit inject node

Delete | Cancel | Done

Properties

Payload: timestamp

Topic:

☐ Inject once after 0.1 seconds, then

Repeat: interval

every 2 seconds

Name: Name

Note: "interval between times" and "at a specific time" will use cron.
"interval" should be 596 hours or less.
See info box for details.

Edit chart node

Delete | Cancel | Done

Properties

Group: [Ex9-6] Default

Size: auto

Label: chart

Type: Line chart ☐ enlarge points

X-axis: last 1 hours OR 1000 points

X-axis Label: HH:mm:ss ☐ as UTC

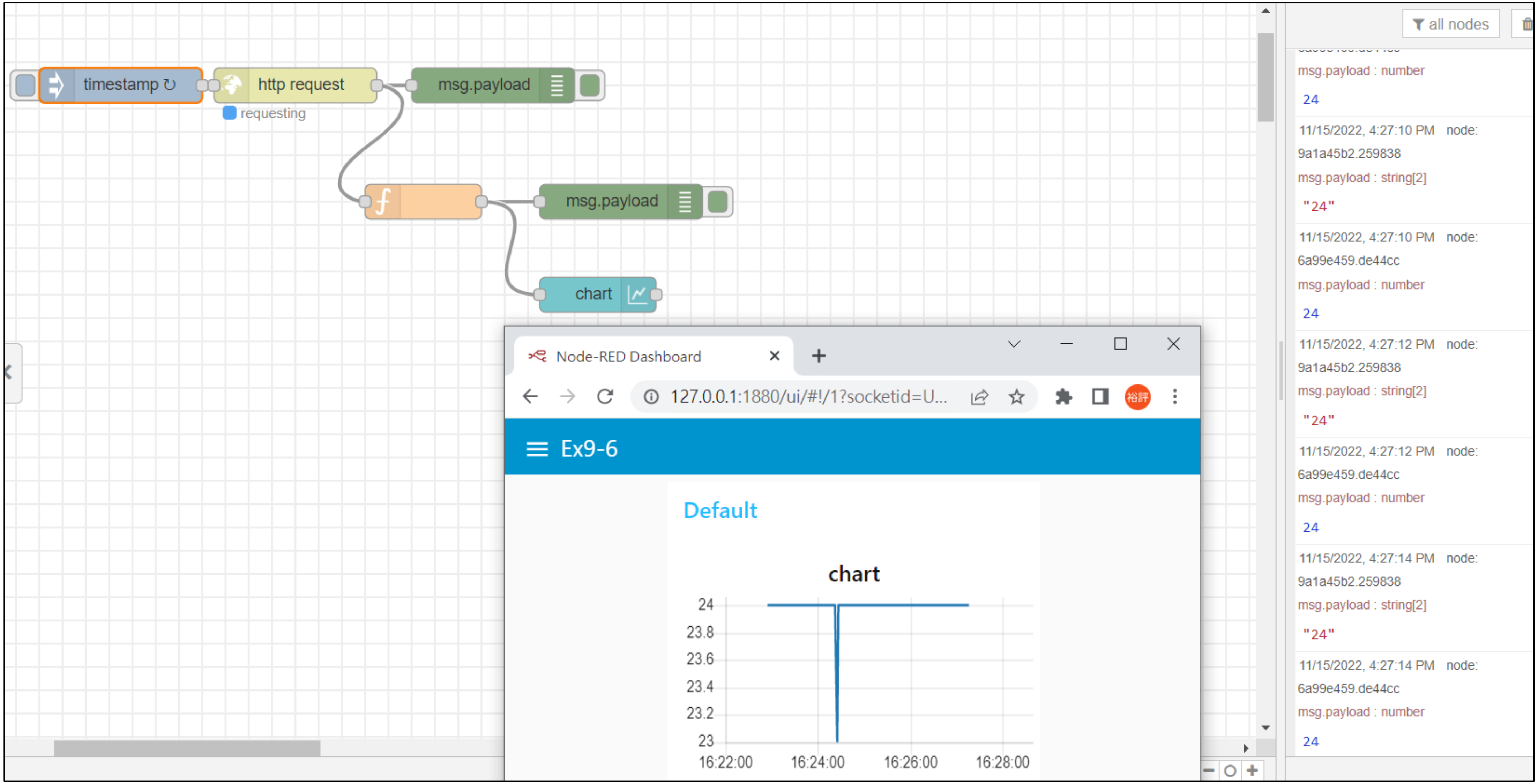
Y-axis: min max

Legend: None Interpolate linear

Series Colours

○ Enabled

Node-RED Dashboard



```
msg.payload : number
24
11/15/2022, 4:27:10 PM   node:
9a1a45b2.259838
msg.payload : string[2]
"24"
11/15/2022, 4:27:10 PM   node:
6a99e459.de44cc
msg.payload : number
24
11/15/2022, 4:27:12 PM   node:
9a1a45b2.259838
msg.payload : string[2]
"24"
11/15/2022, 4:27:12 PM   node:
6a99e459.de44cc
msg.payload : number
24
11/15/2022, 4:27:14 PM   node:
9a1a45b2.259838
msg.payload : string[2]
"24"
11/15/2022, 4:27:14 PM   node:
6a99e459.de44cc
msg.payload : number
24
```

Exercise 9-7

- Show another sensor values from the esp32 board on the Node-RED dashboard.