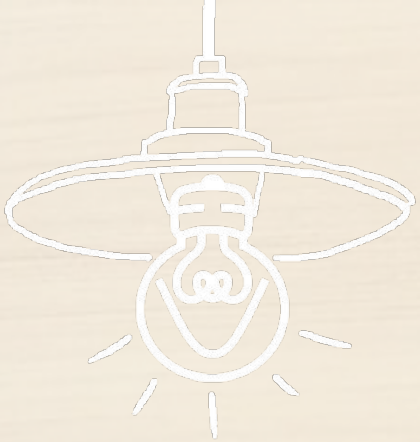


Arduino 實作入門

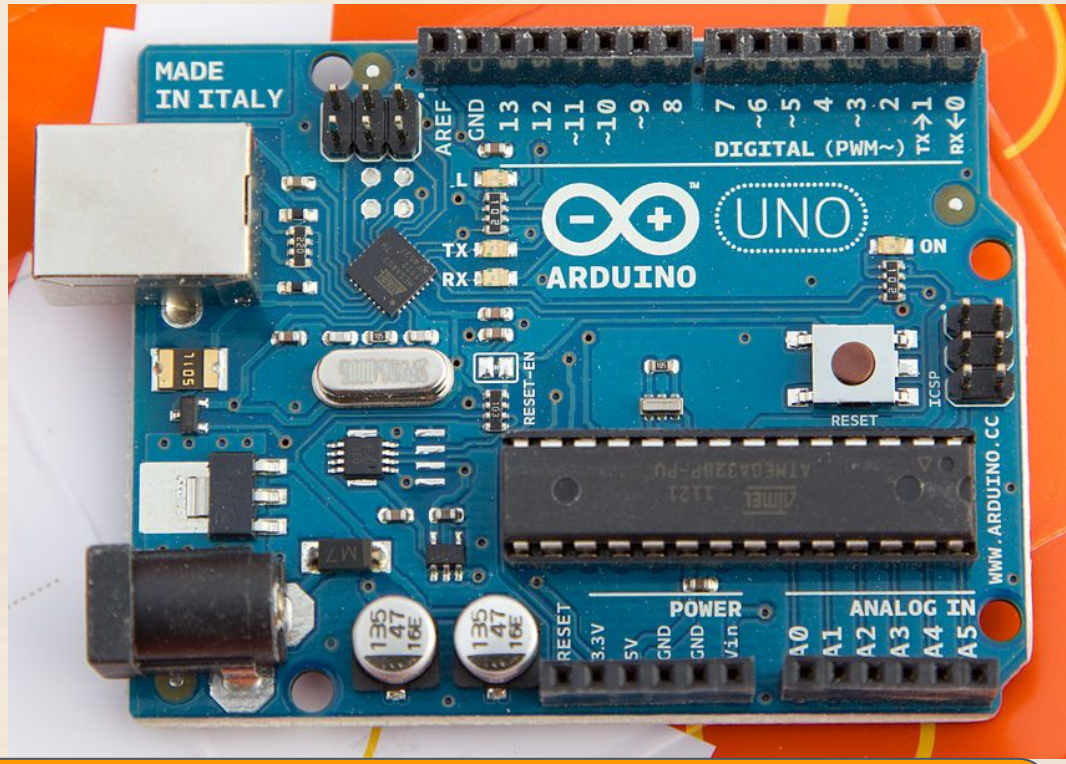
goo.gl/LcksjY

Install Arduino IDE

www.arduino.cc/en/main/software

Arduino

- What
  - Microcontroller
- Why
  - Simple I/O
  - C / Java
  - Fast Prototyping
  - Open Source
- How
  - Parts
  - Circuit
  - Program



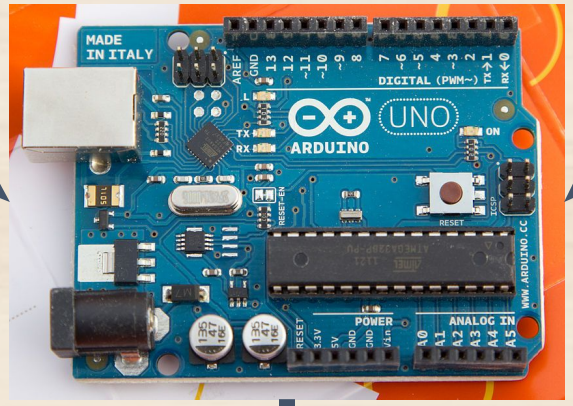
For beginner never study computer science & electrical science, it's a good solution for getting start.

Project Flow

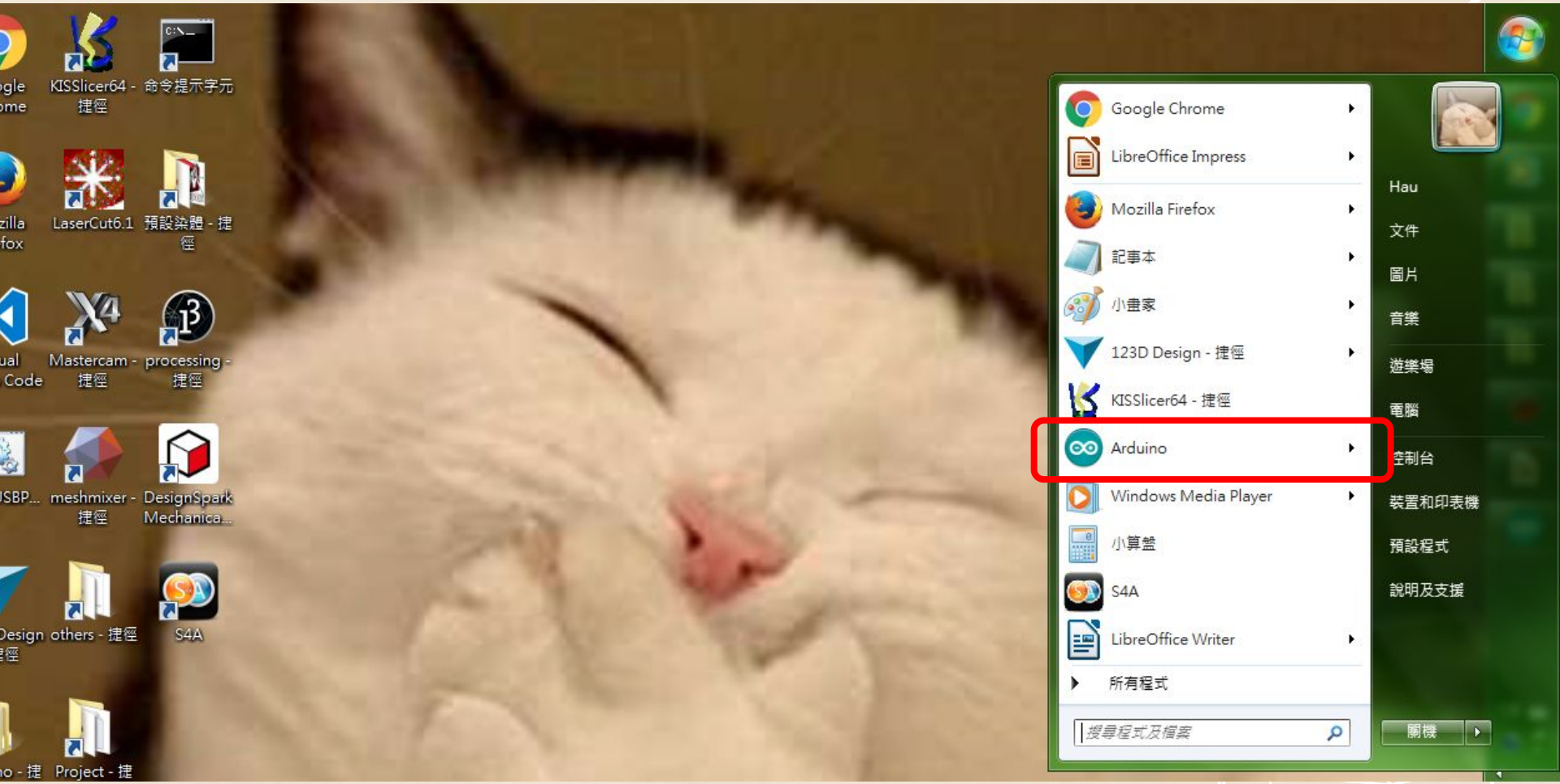
Plan

Parts/Circuit

Code



Outcome


KISSlicer64 - 捷徑
命令提示字元
LaserCut6.1
預設染體 - 捷徑
Mastercam - 捷徑
processing - 捷徑
meshmixer - 捷徑
DesignSpark Mechanica...
others - 捷徑
S4A
Project - 捷
Google Chrome
LibreOffice Impress
Mozilla Firefox
記事本
小畫家
123D Design - 捷徑
KISSlicer64 - 捷徑
Arduino
Windows Media Player
小算盤
S4A
LibreOffice Writer
所有程式
搜尋程式及檔案
Hau
文件
圖片
音樂
遊樂場
電腦
控制台
裝置和印表機
預設程式
說明及支援
關機

sketch_feb23c | Arduino 1.8.1

File Edit Sketch Tools Help

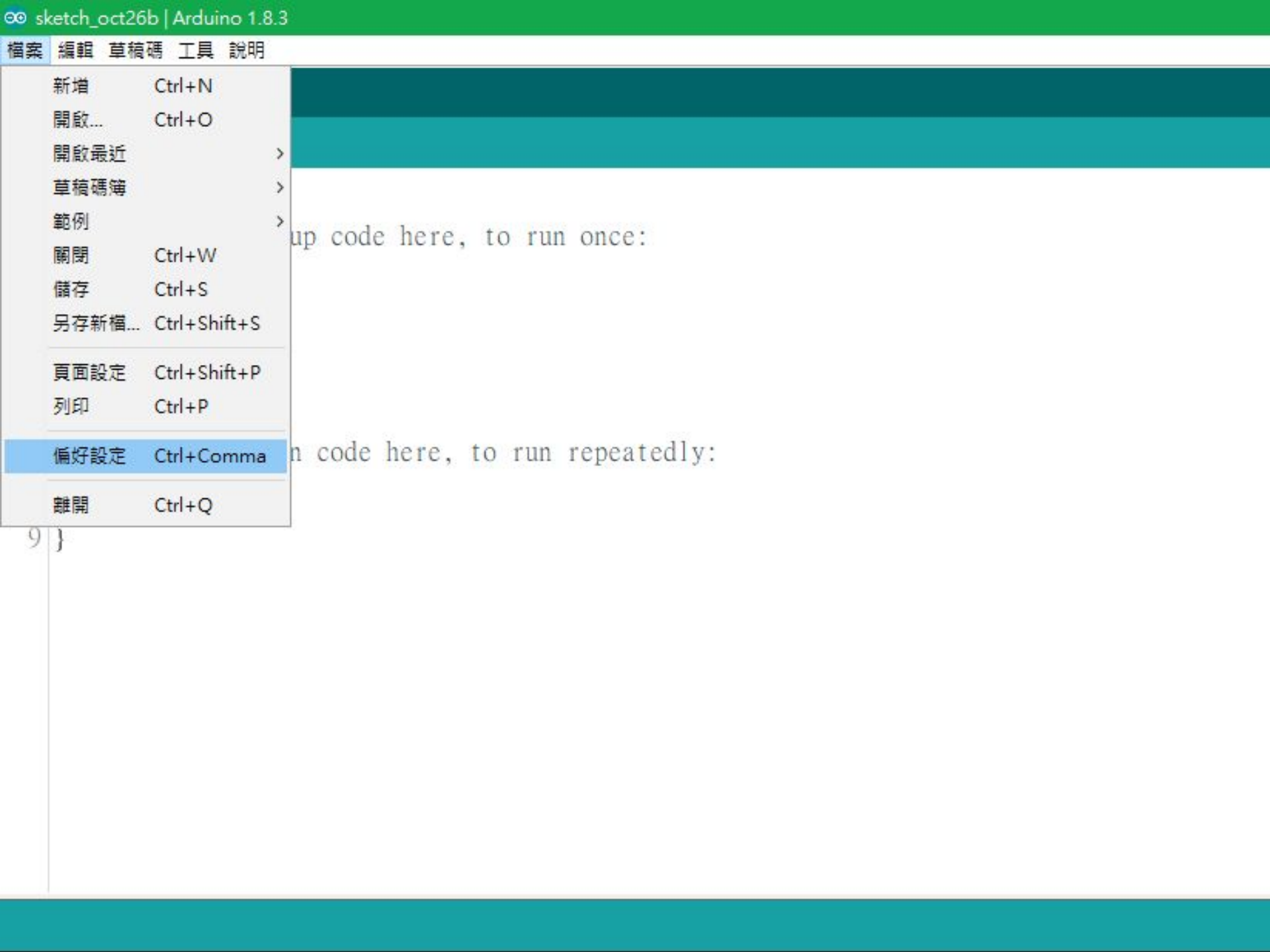
sketch_feb23c

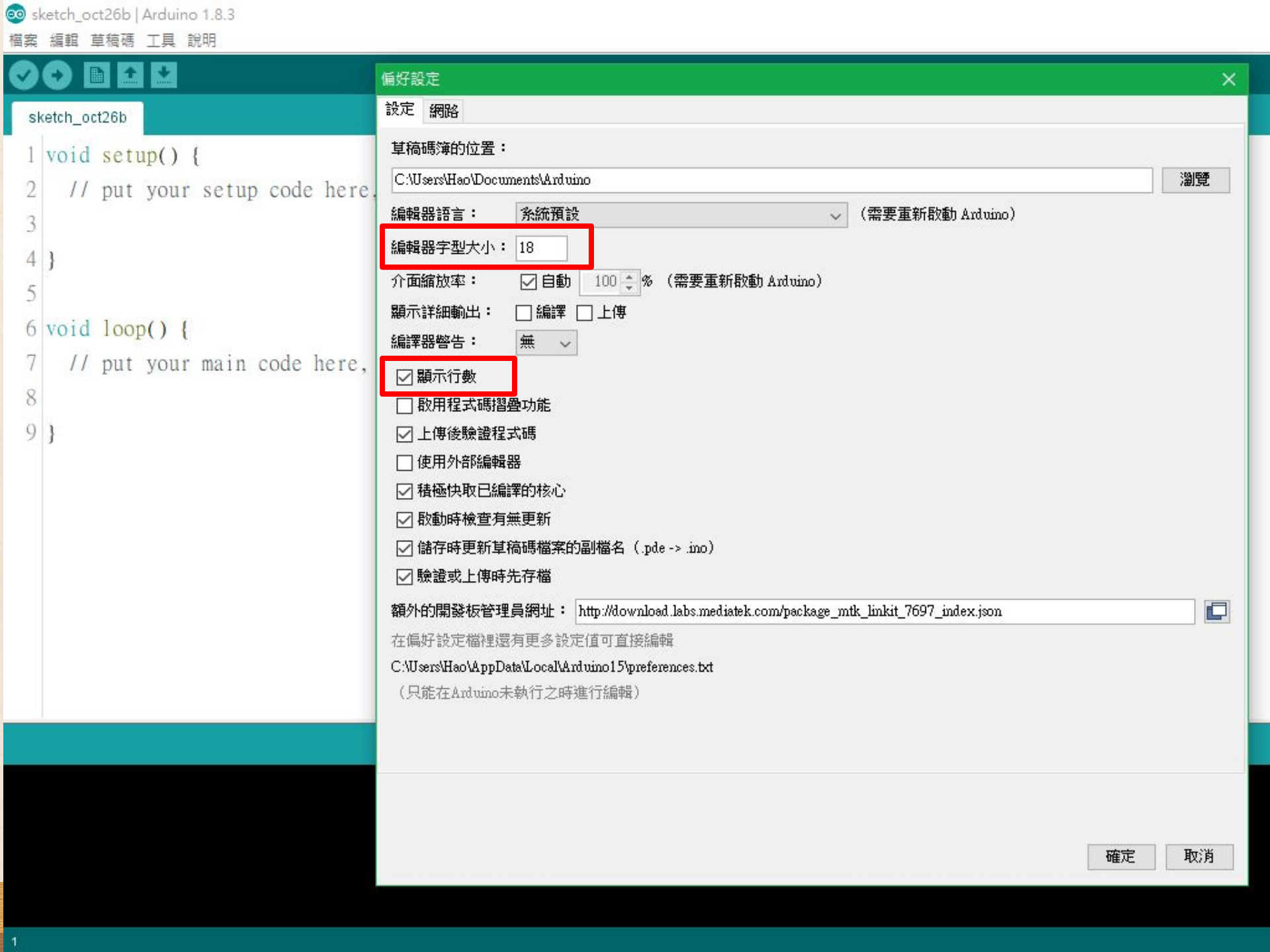
```
void setup() {
  // put your setup code here, to run once:

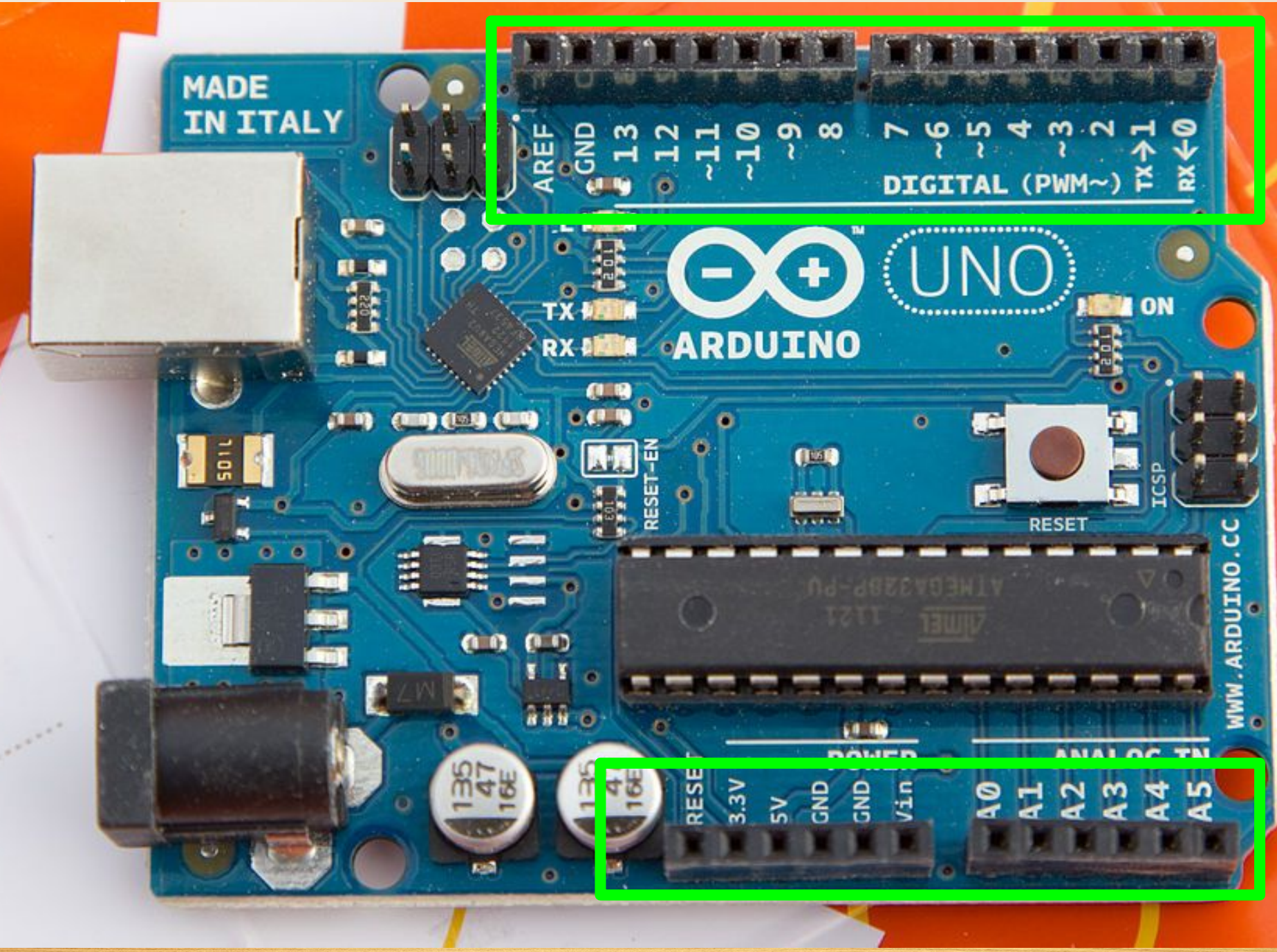
}

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

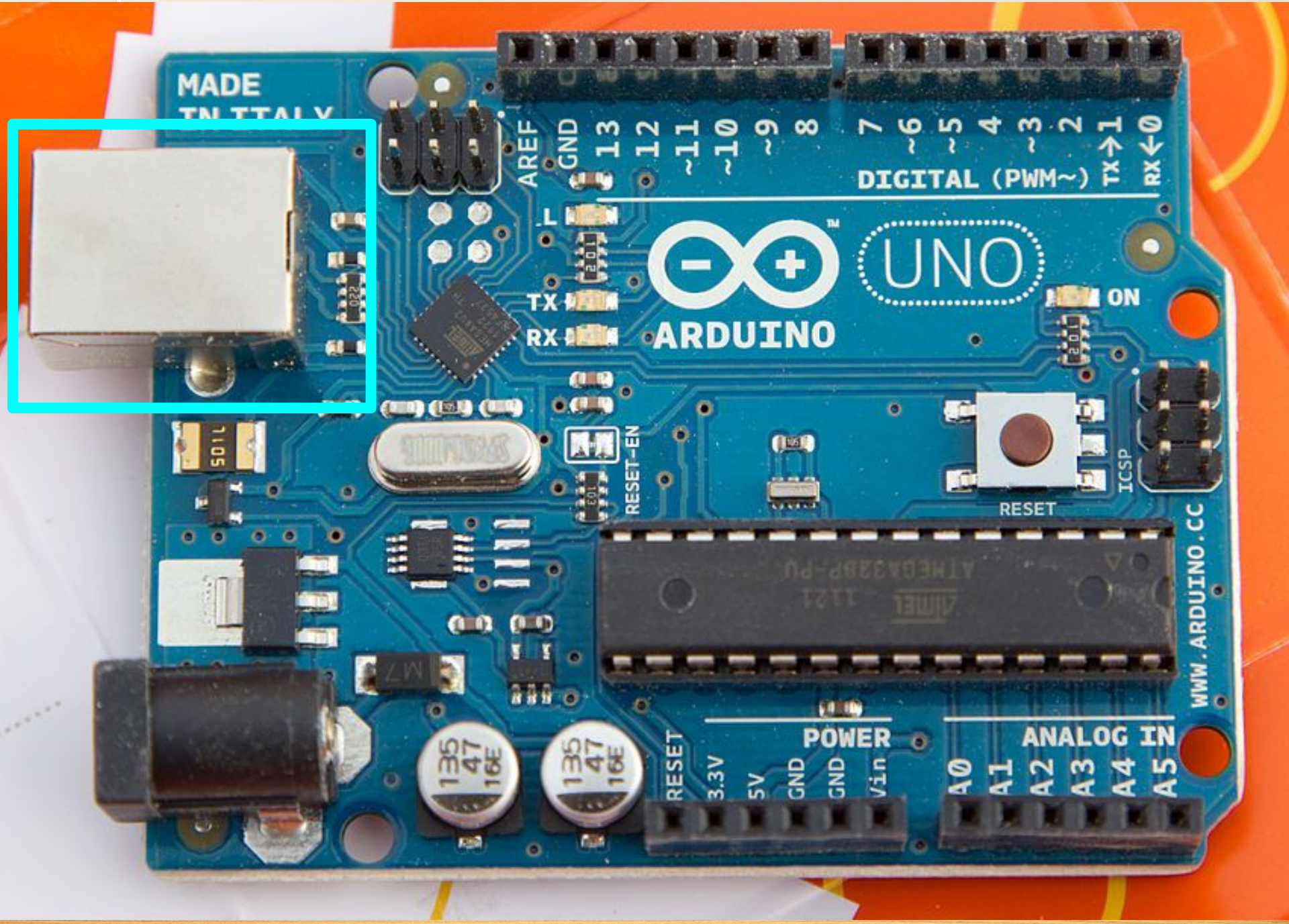
}
```


sketch_oct26b | Arduino 1.8.3
檔案 編輯 草稿碼 工具 說明
新增 Ctrl+N
開啟... Ctrl+O
開啟最近
草稿碼簿
範例
關閉 Ctrl+W
儲存 Ctrl+S
另存新檔... Ctrl+Shift+S
頁面設定 Ctrl+Shift+P
列印 Ctrl+P
偏好設定 Ctrl+Comma
離開 Ctrl+Q
up code here, to run once:
n code here, to run repeatedly:
9 }


sketch_oct26b | Arduino 1.8.3
檔案 編輯 草稿碼 工具 說明
sketch_oct26b
1 void setup() {
2 // put your setup code here,
3
4 }
5
6 void loop() {
7 // put your main code here,
8
9 }
偏好設定
設定
網路
草稿碼簿的位置：
C:\Users\Hao\Documents\Arduino
瀏覽
編輯器語言：
系統預設
（需要重新啟動 Arduino）
編輯器字型大小：
18
介面縮放率：
自動
100
%
（需要重新啟動 Arduino）
顯示詳細輸出：
編譯
上傳
編譯器警告：
無
顯示行數
啟用程式碼摺疊功能
上傳後驗證程式碼
使用外部編輯器
積極快取已編譯的核心
啟動時檢查有無更新
儲存時更新草稿碼檔案的副檔名（.pde -> .ino）
驗證或上傳時先存檔
額外的開發板管理員網址：
http://download.labs.mediatek.com/package_mtk_linkit_7697_index.json
在偏好設定檔裡還有更多設定值可直接編輯
C:\Users\Hao\AppData\Local\Arduino15\preferences.txt
（只能在Arduino未執行之時進行編輯）
確定
取消
1


MADE
IN ITALY
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
UNO
ARDUINO
ON
TX
RX
RESET-EN
RESET
ICSP
WWW.ARDUINO.CC
POWER
ANALOG IN
RESET
3.3V
5V
GND
GND
Vin
A0
A1
A2
A3
A4
A5

Pin Wire


MADE
AREF
GND
13
12
~11
~10
~9
8
7
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~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
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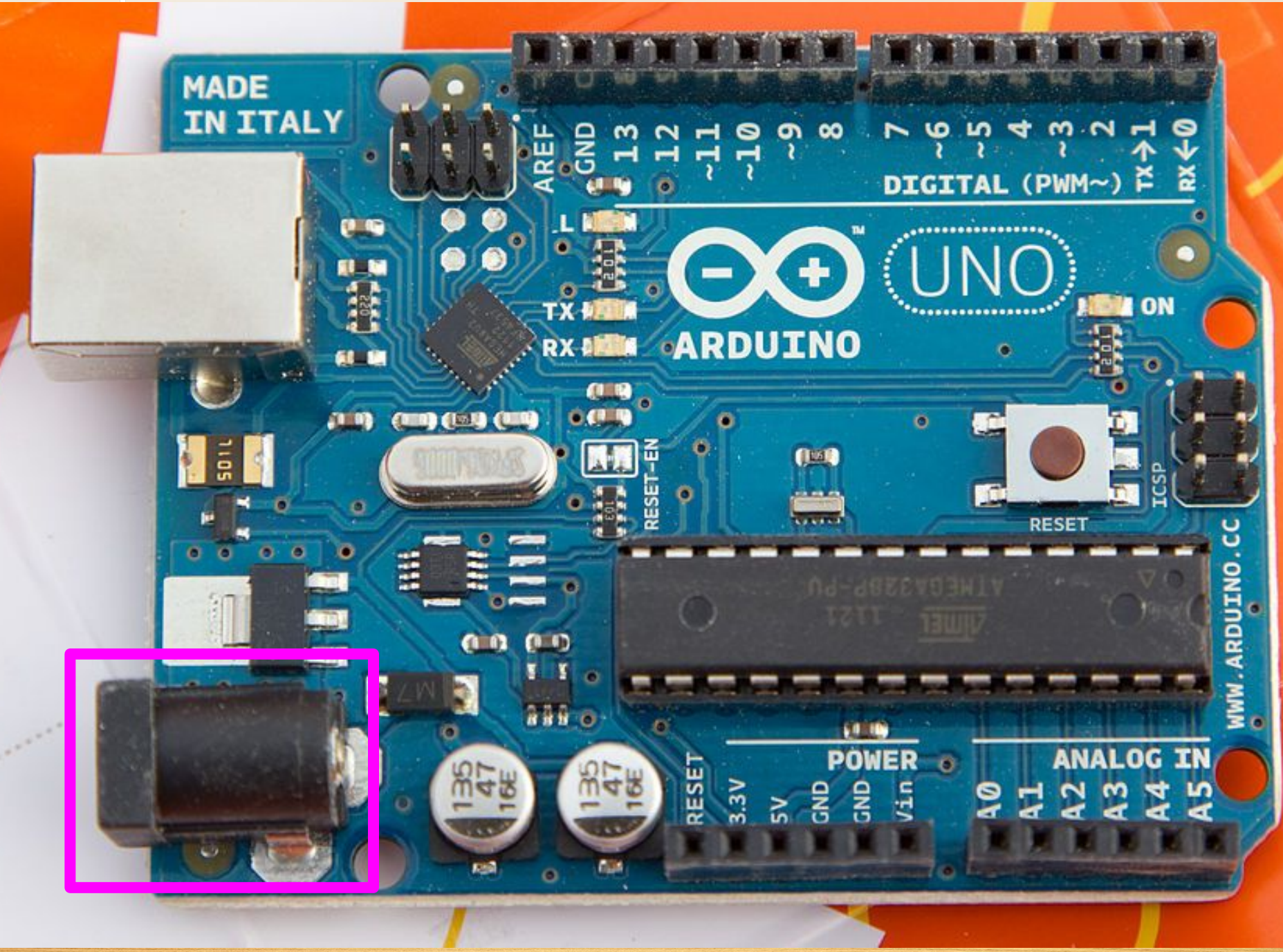
ON
RESET-EN
RESET
ICSP
POWER
ANALOG IN
RESET
3.3V
5V
GND
GND
Vin
A0
A1
A2
A3
A4
A5
WWW.ARDUINO.CC


MADE
IN ITALY
AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
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ARDUINO
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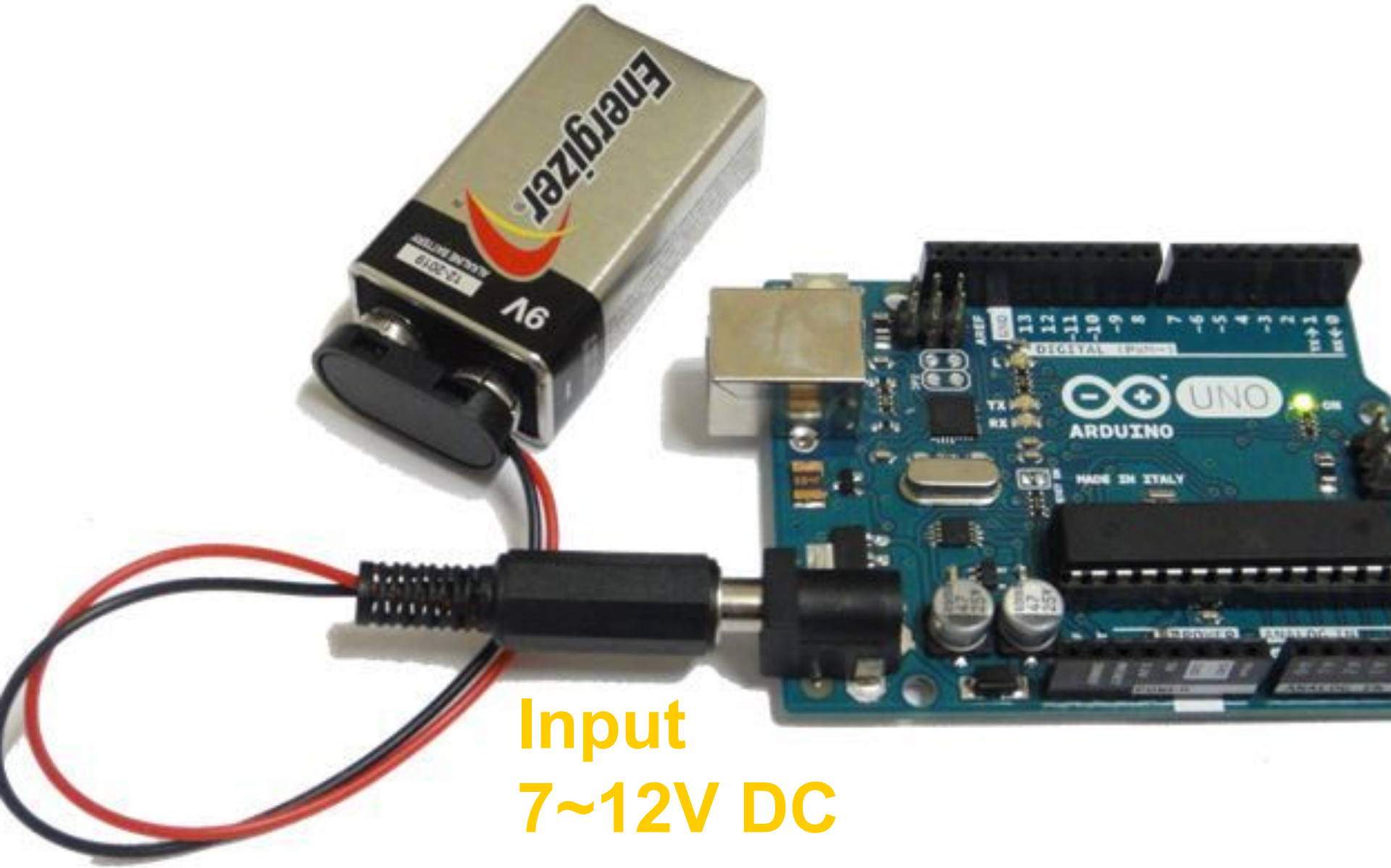
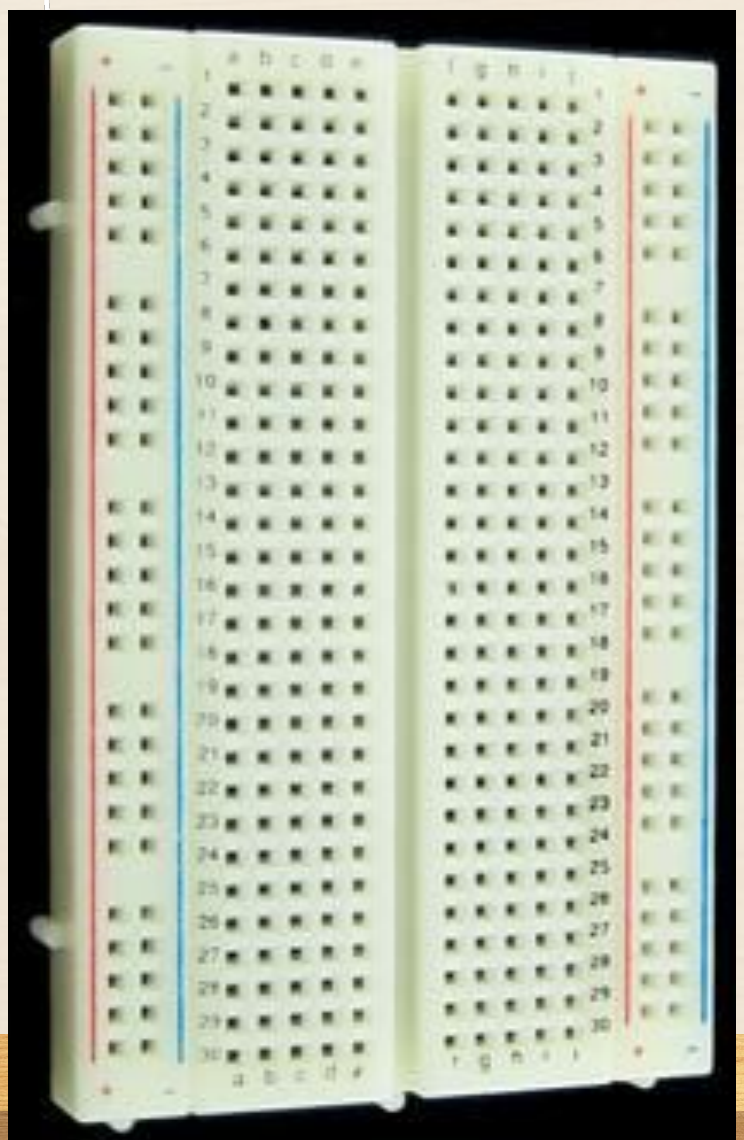
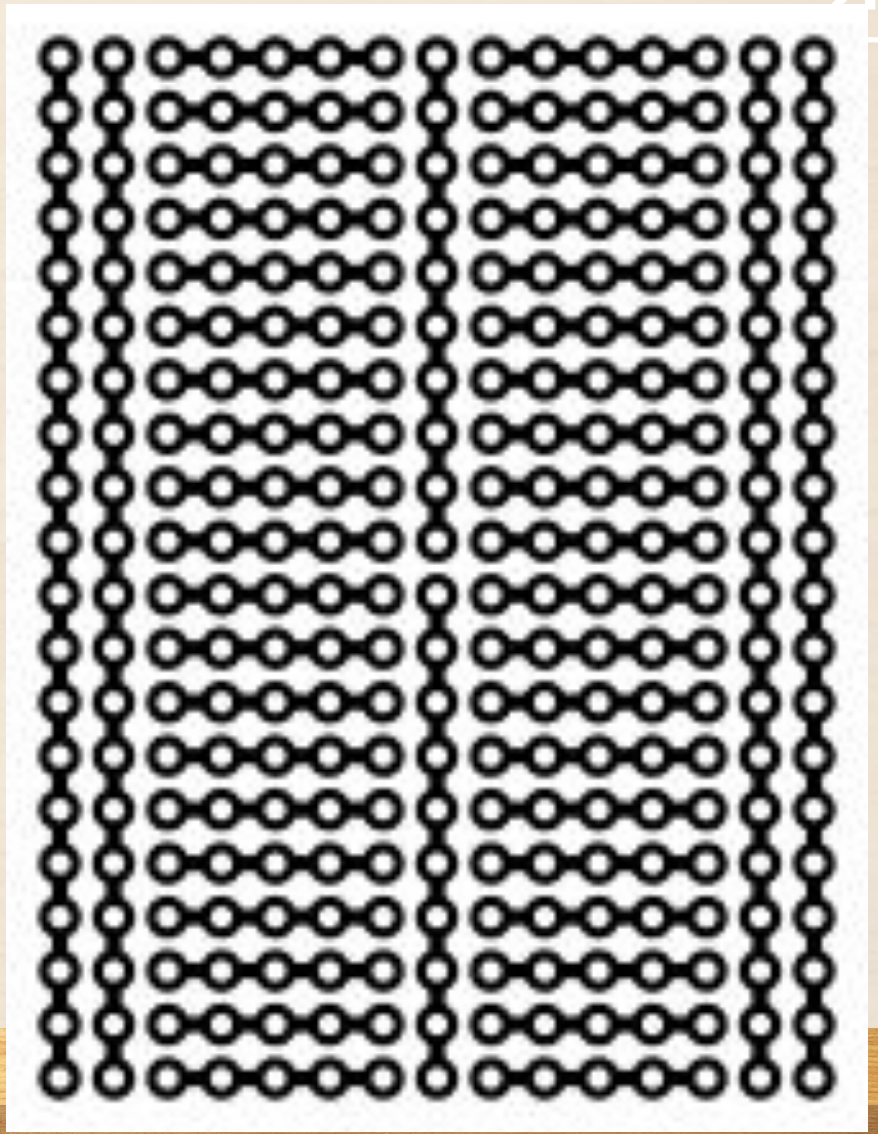
ICSP
POWER
RESET
3.3V
5V
GND
GND
Vin
ANALOG IN
A0
A1
A2
A3
A4
A5
WWW.ARDUINO.CC

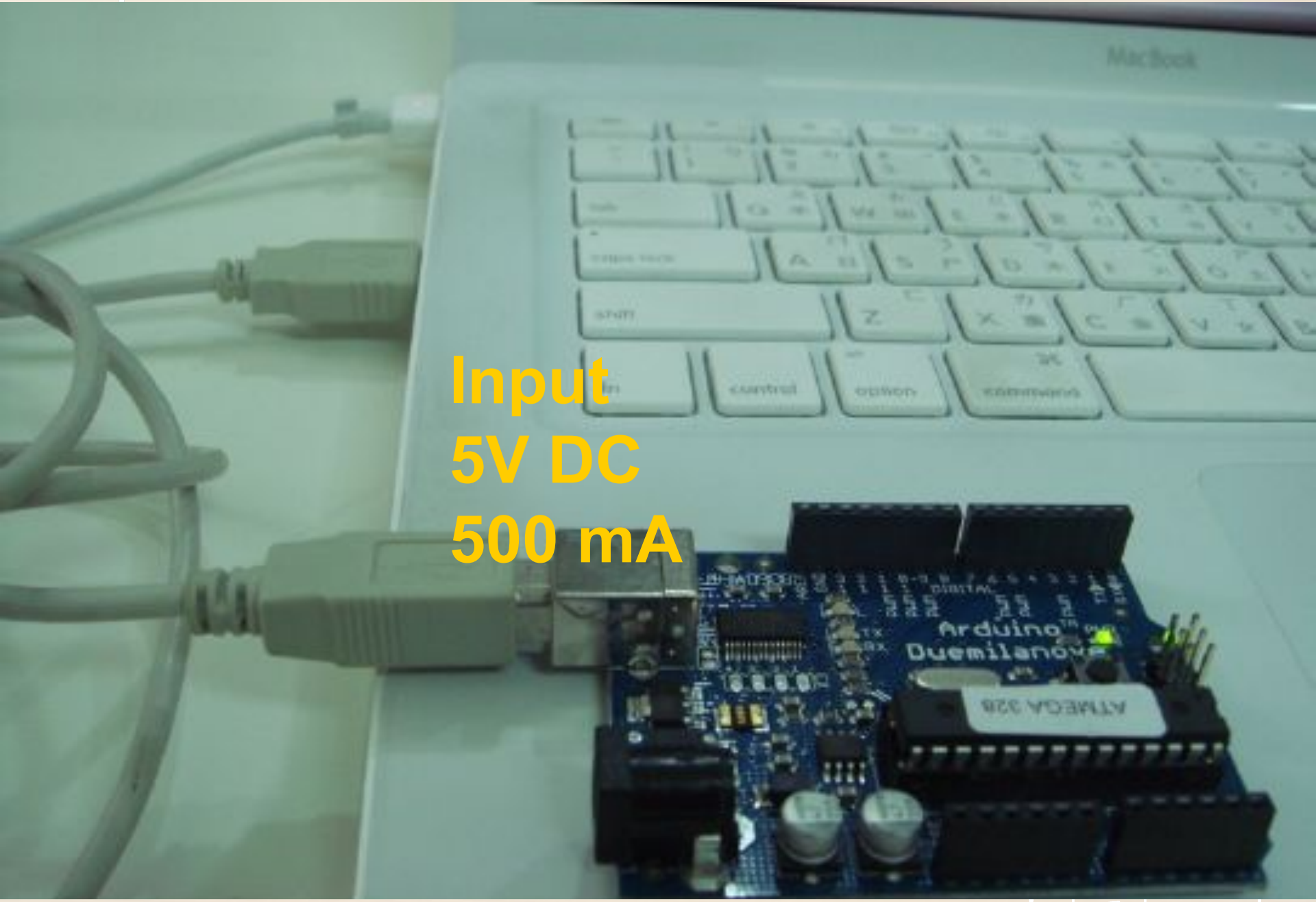


Input
7~12V DC

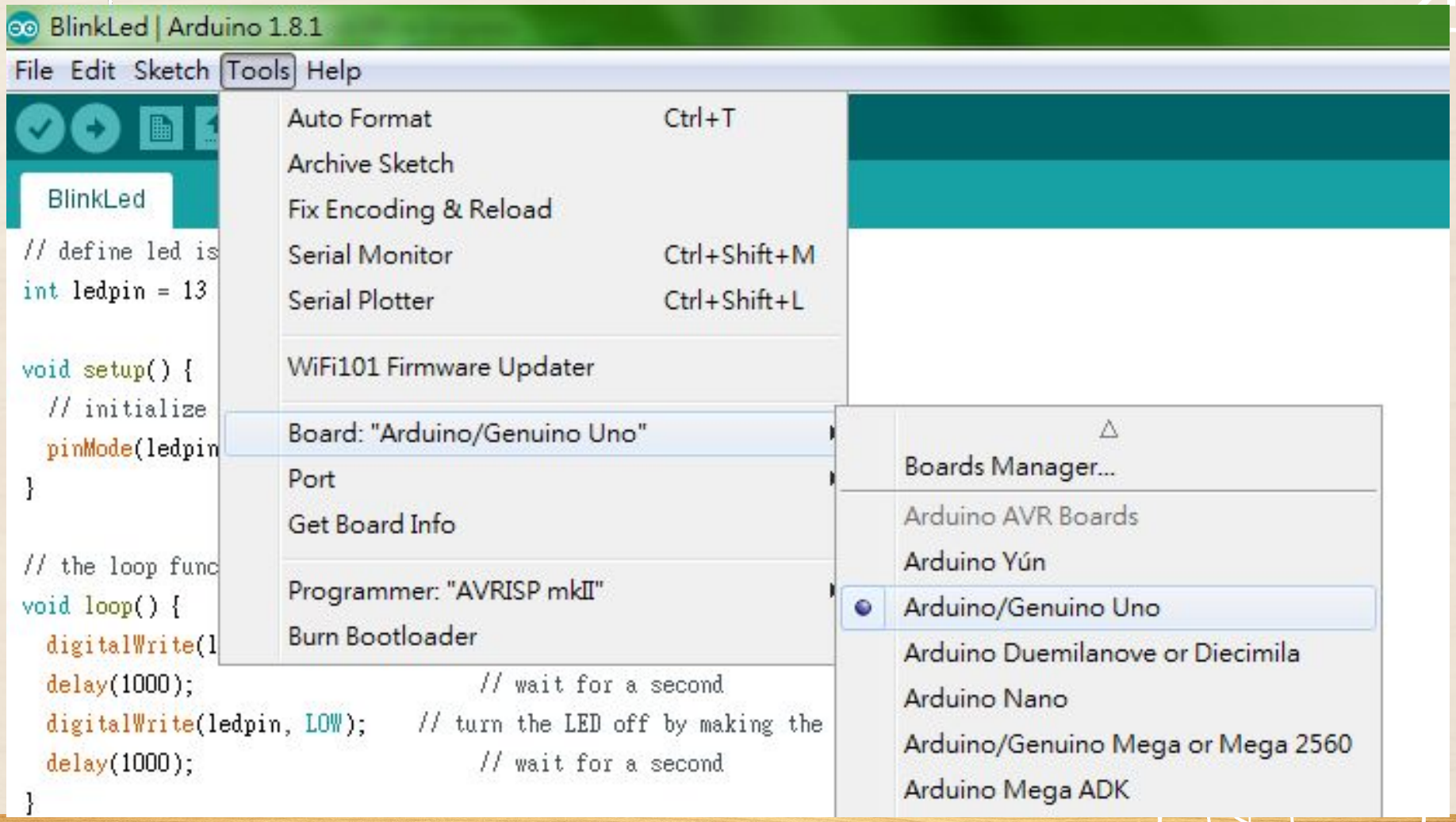
Bread Board



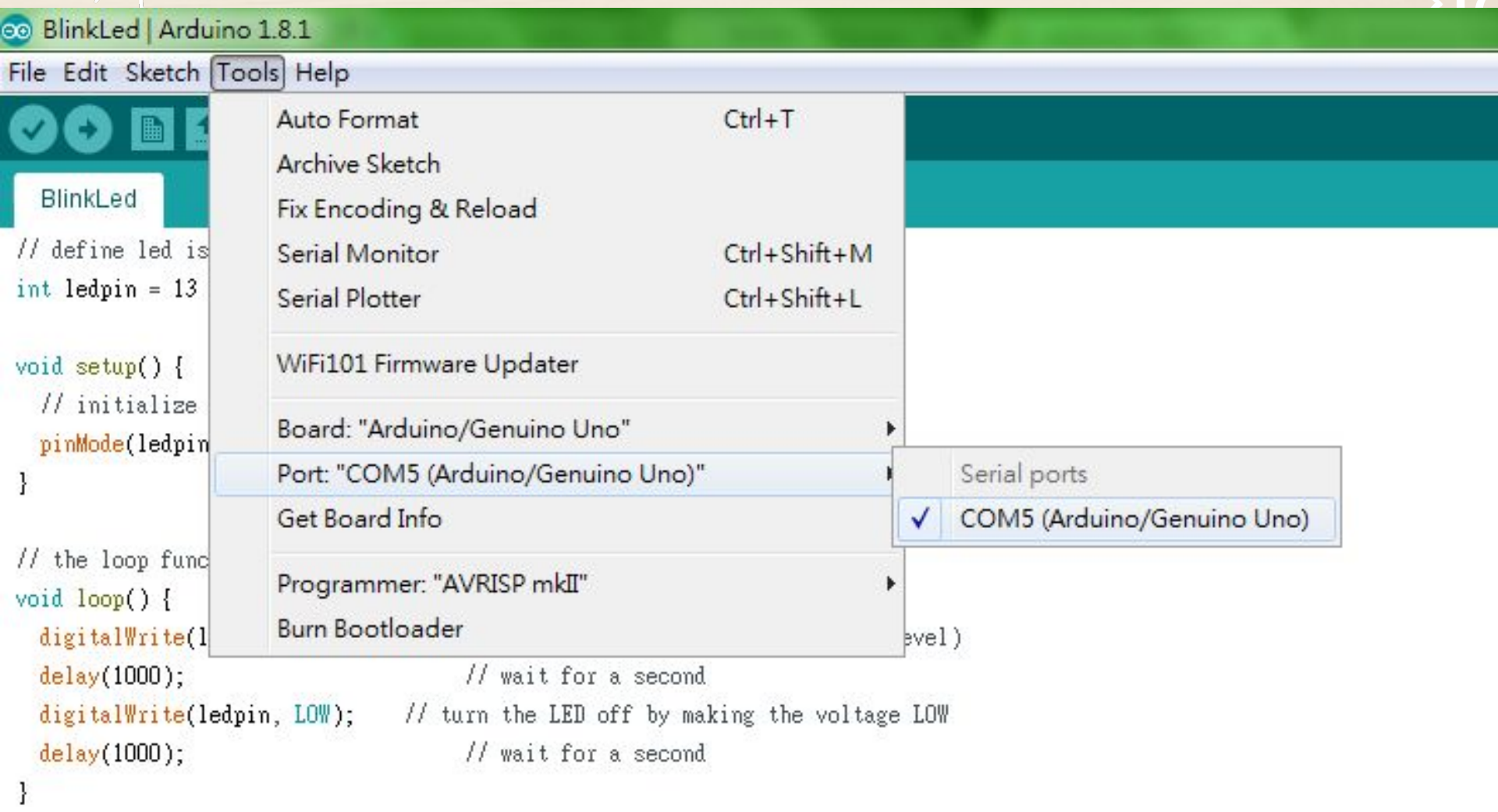



Input
5V DC
500 mA

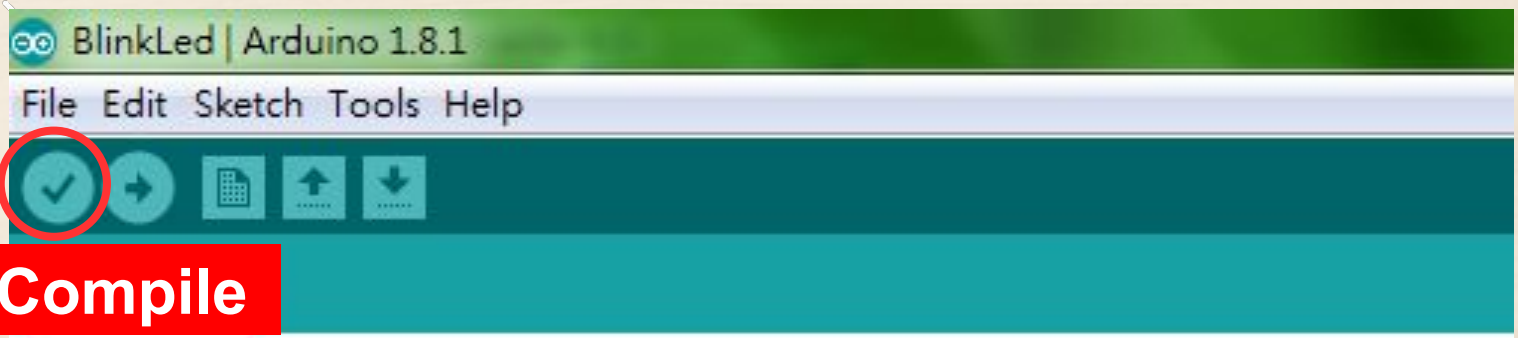
Choose Arduino UNO



Choose Your Port



Compile

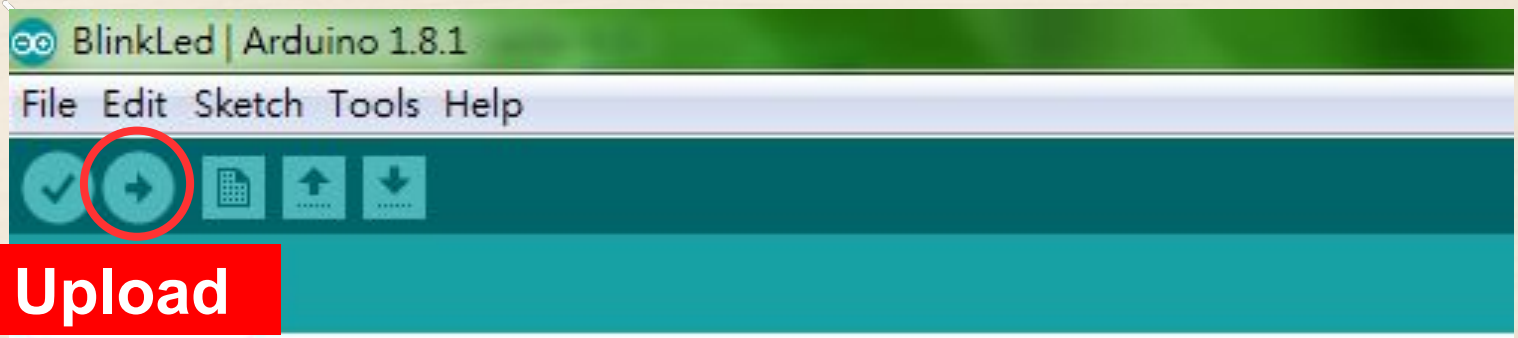



```
// define led is connected to digital pin13
int ledpin = 13

void setup() {
  // initialize digital pin 13 as an output.
  pinMode(ledpin, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(ledpin, HIGH);   // turn the LED on (HIGH is the voltage level)
  delay(1000);                       // wait for a second
  digitalWrite(ledpin, LOW);    // turn the LED off by making the voltage LOW
  delay(1000);                       // wait for a second
}
```

Upload

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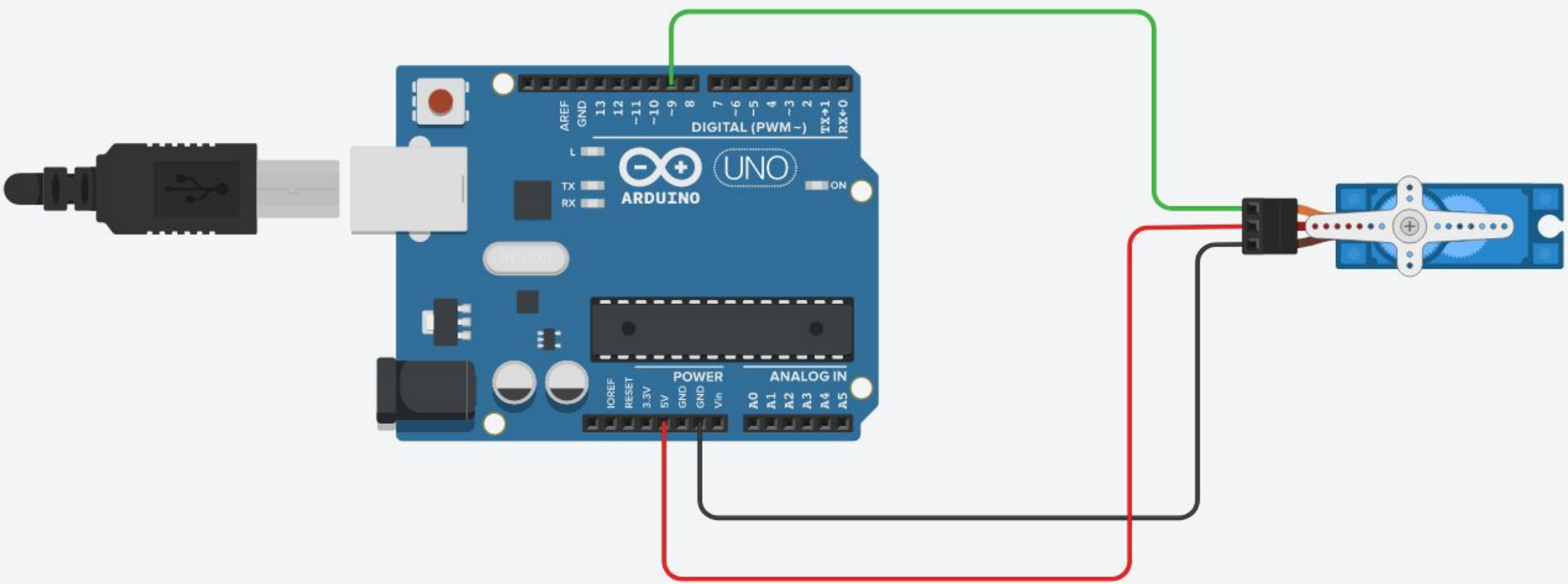
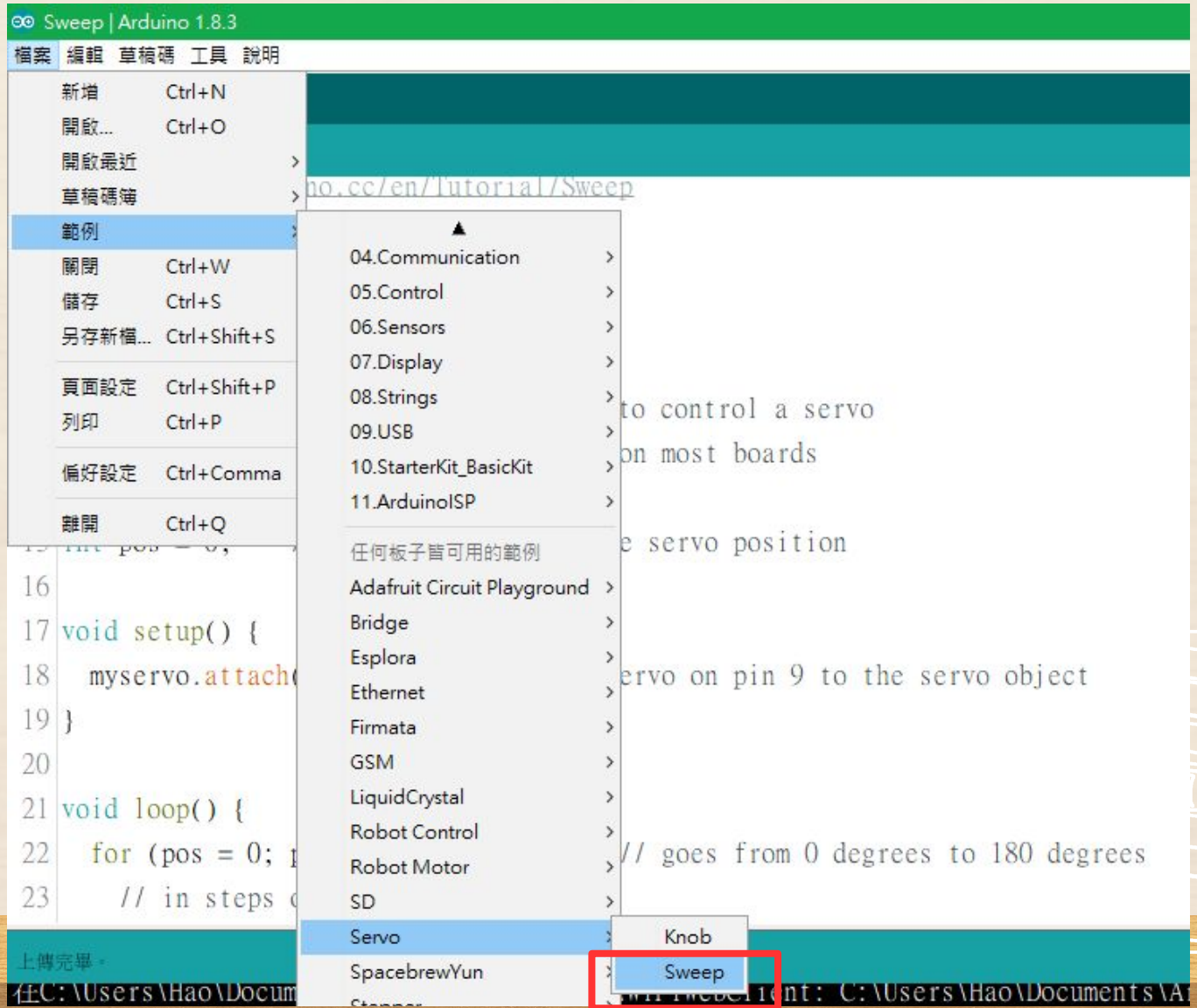
  delay(1000);                       // wait for a second
}
```

Example Servo Motor

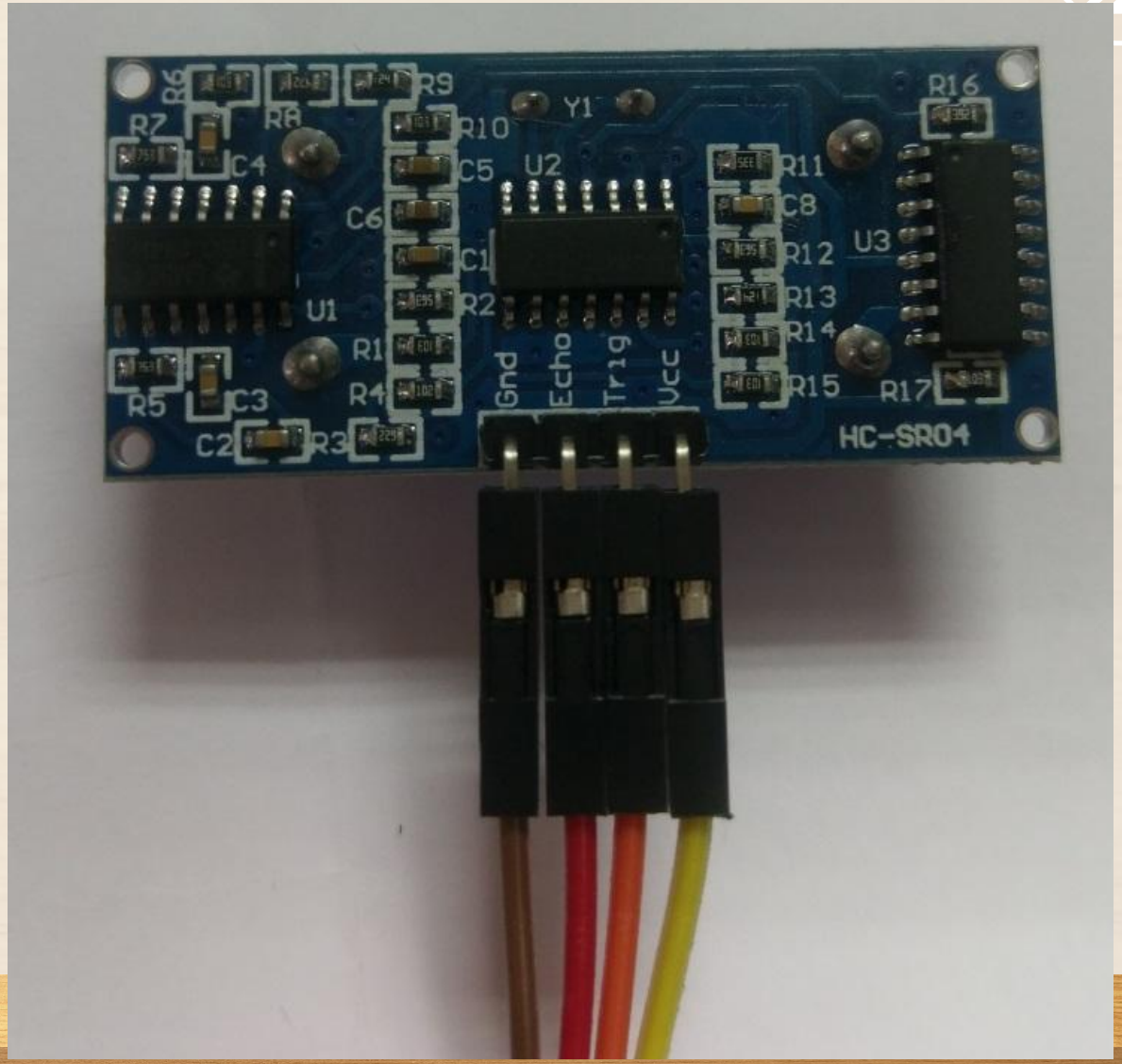


Servo.ino


Sweep | Arduino 1.8.3
檔案 編輯 草稿碼 工具 說明
新增 Ctrl+N
開啟... Ctrl+O
開啟最近
草稿碼簿
範例
關閉 Ctrl+W
儲存 Ctrl+S
另存新檔... Ctrl+Shift+S
頁面設定 Ctrl+Shift+P
列印 Ctrl+P
偏好設定 Ctrl+Comma
離開 Ctrl+Q
04.Communication
05.Control
06.Sensors
07.Display
08.Strings
09.USB
10.StarterKit_BasicKit
11.ArduinoISP
任何板子皆可用的範例
Adafruit Circuit Playground
Bridge
Esplora
Ethernet
Firmata
GSM
LiquidCrystal
Robot Control
Robot Motor
SD
Servo
SpacebrewYun
Knob
Sweep
to control a servo
on most boards
e servo position
ervo on pin 9 to the servo object
// goes from 0 degrees to 180 degrees
16
17 void setup() {
18 myservo.attach(
19 }
20
21 void loop() {
22 for (pos = 0; p
23 // in steps
上傳完畢。

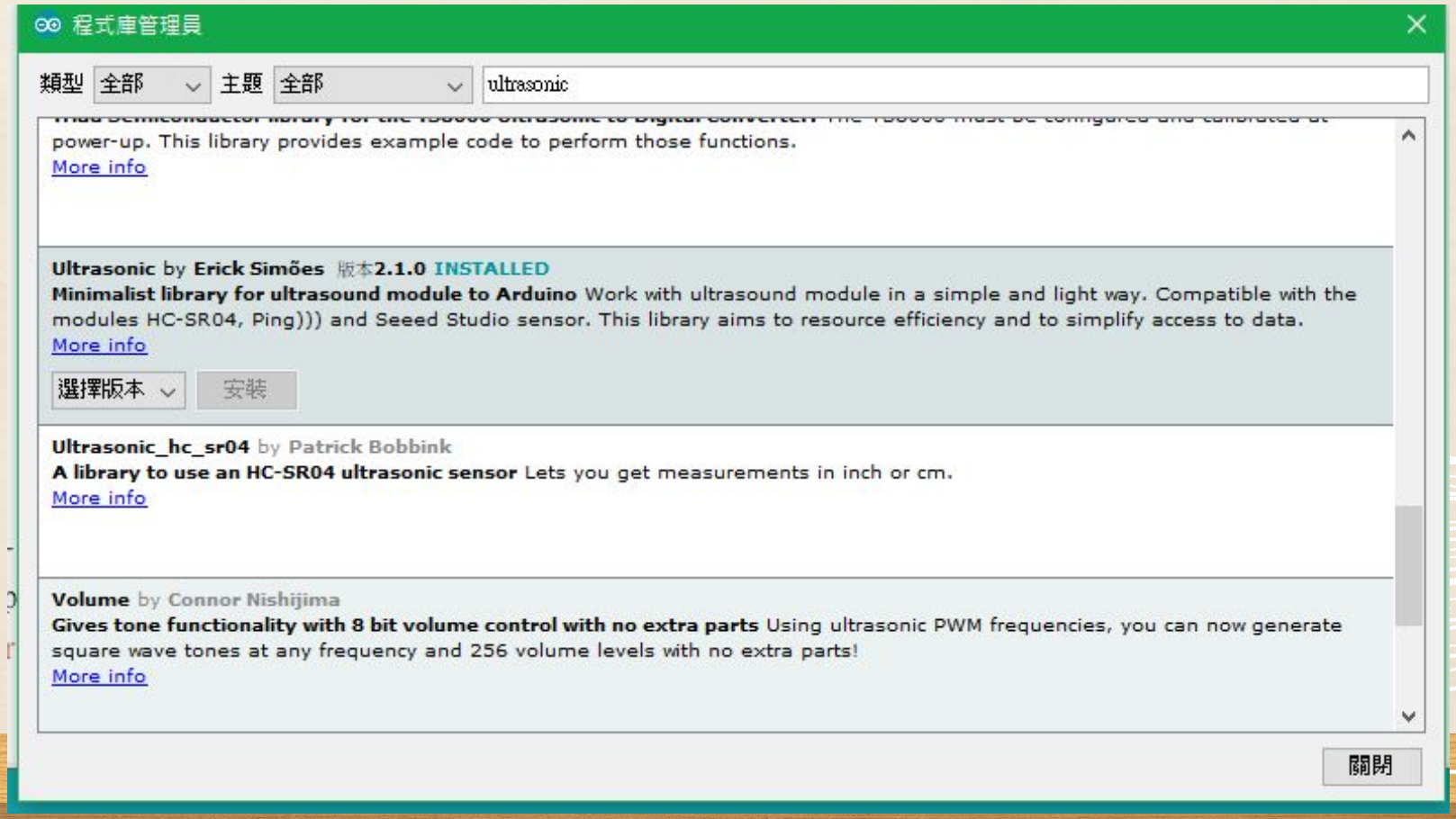
Example Ultrasonic

- VCC →5V
- Trigger→ 12
- Echo→ 13
- GND →GND



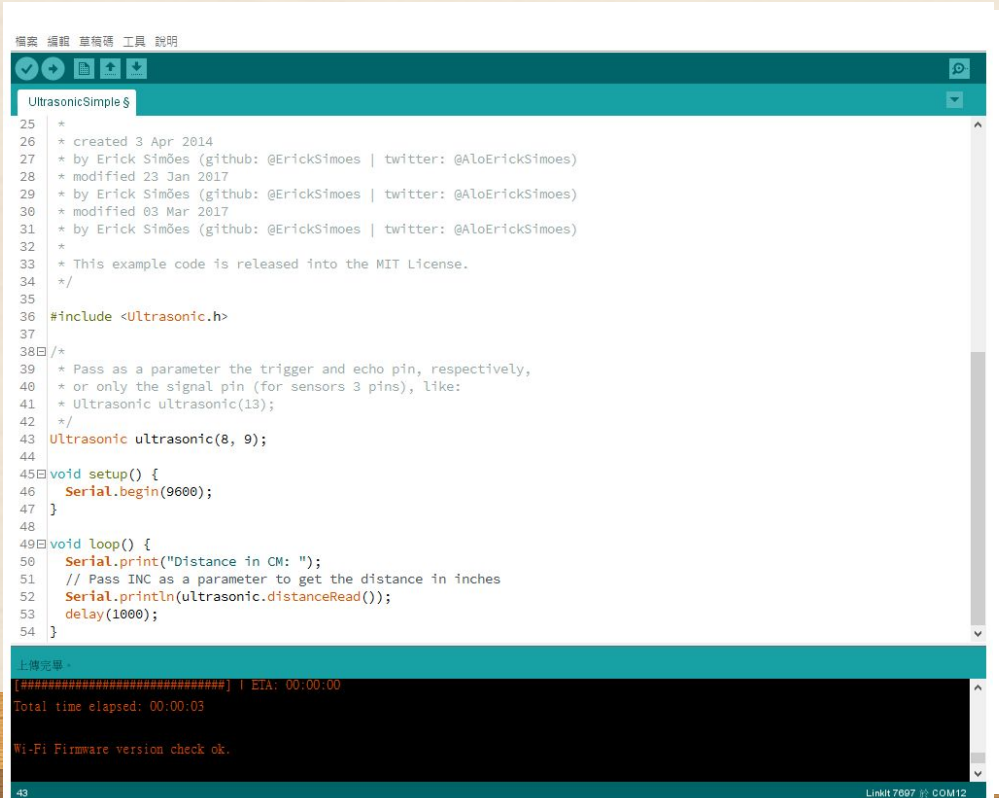
Install Library

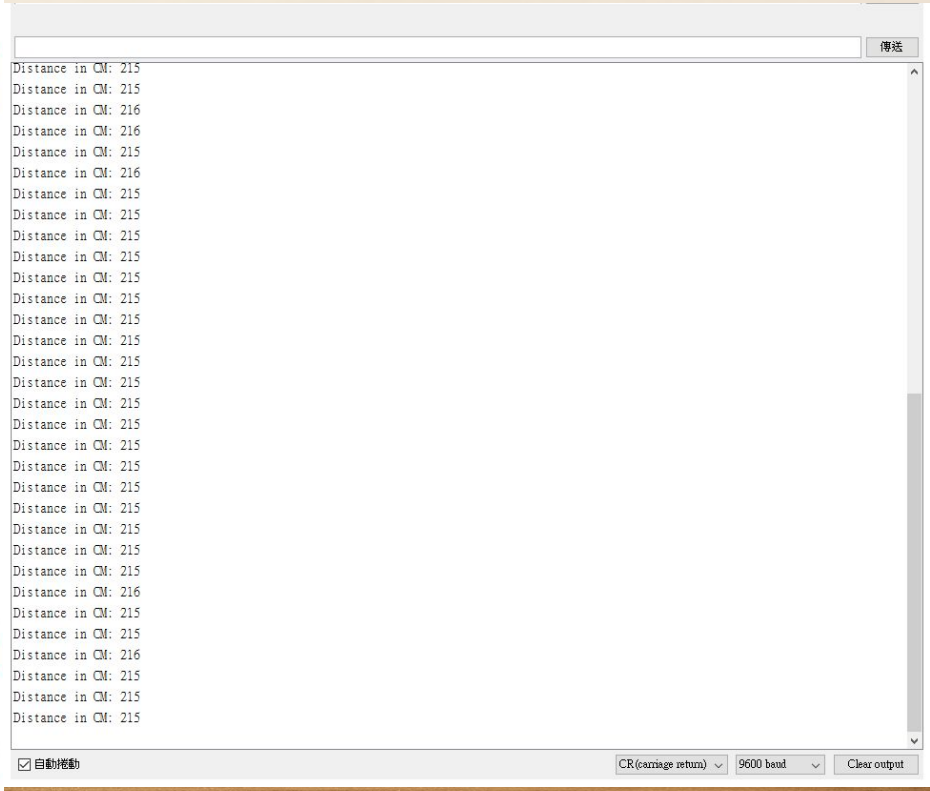
- 草稿碼→匯入程式庫→管理程式庫→搜尋 "Ultrasonic" 並執行安裝



Example

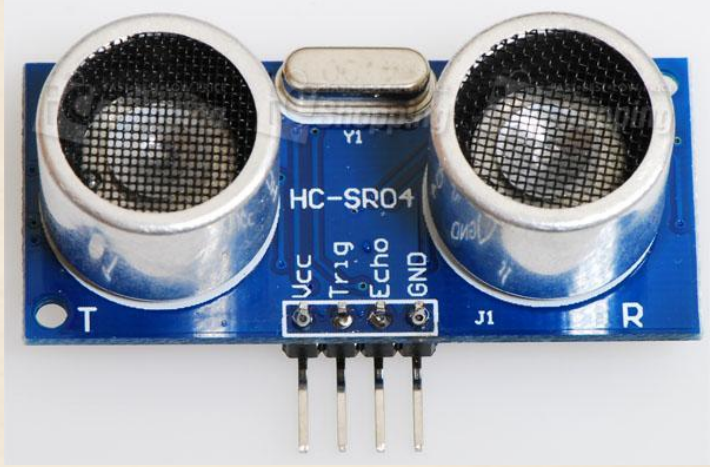
- 開啟檔案→範例→Ultrasonic→ Ultrasonic Simple
- 設定 Trigger Pin 12，Echo Pin 13
- Line #43 Ultrasonic ultrasonic(12, 13);

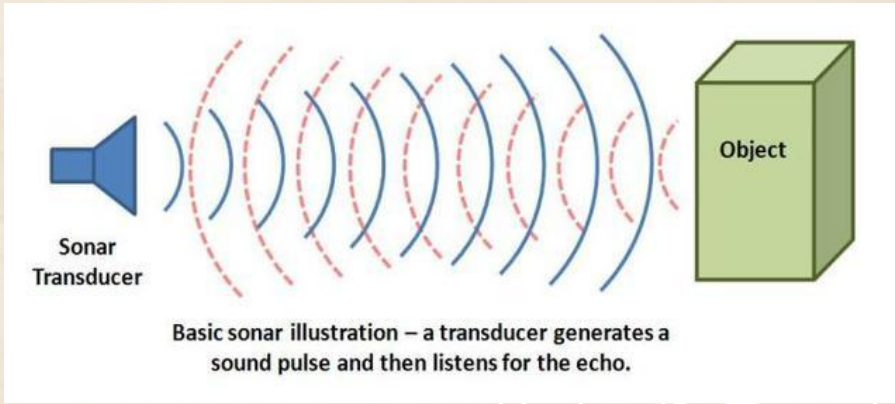


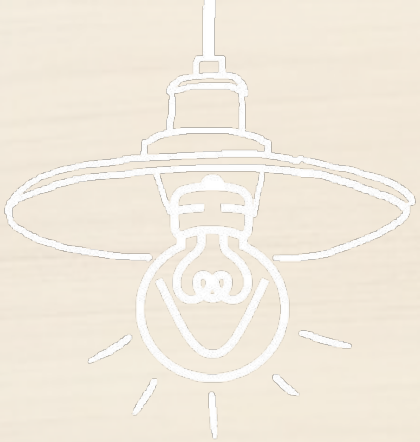


Ultrasonic Sensor

- HC-SR04
- 發送40kHz訊號,
  藉由量測反射訊號判斷距離
- 可探測距離 2~450cm
- Pin definition
  - Vcc: Voltage (5V)
  - Trig: Trigger 觸發
  - Echo: 回聲
  - G: Ground
- 多個模組同時工作可能造成互相干擾







Exercise.
Servo Motor & Ultrasoic Seneor

Ultrasonic Sensor

v = 340m/s

= 34000cm/1000000us

÷ 1/29 cm/us

$\Delta d = v * \Delta t$