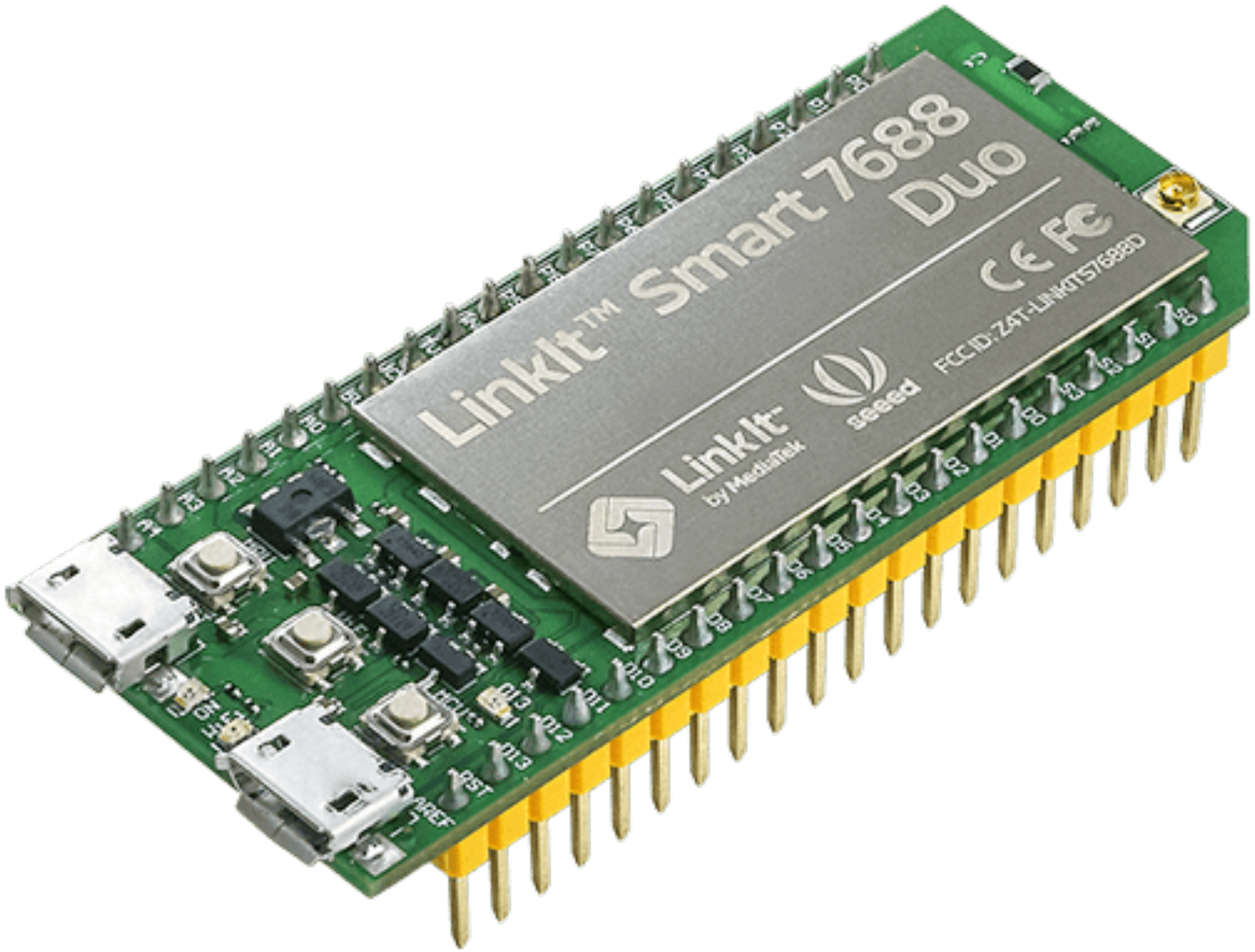
Week 4

Howard Ke

https://goo.gl/eXaR9G

投影片檔案

linkit 7688


Smart 7688
Duo
LinkIt™
LinkIt
by MediaTek
seeed
FCC ID:Z4T-LINKIT7688D

安裝環境

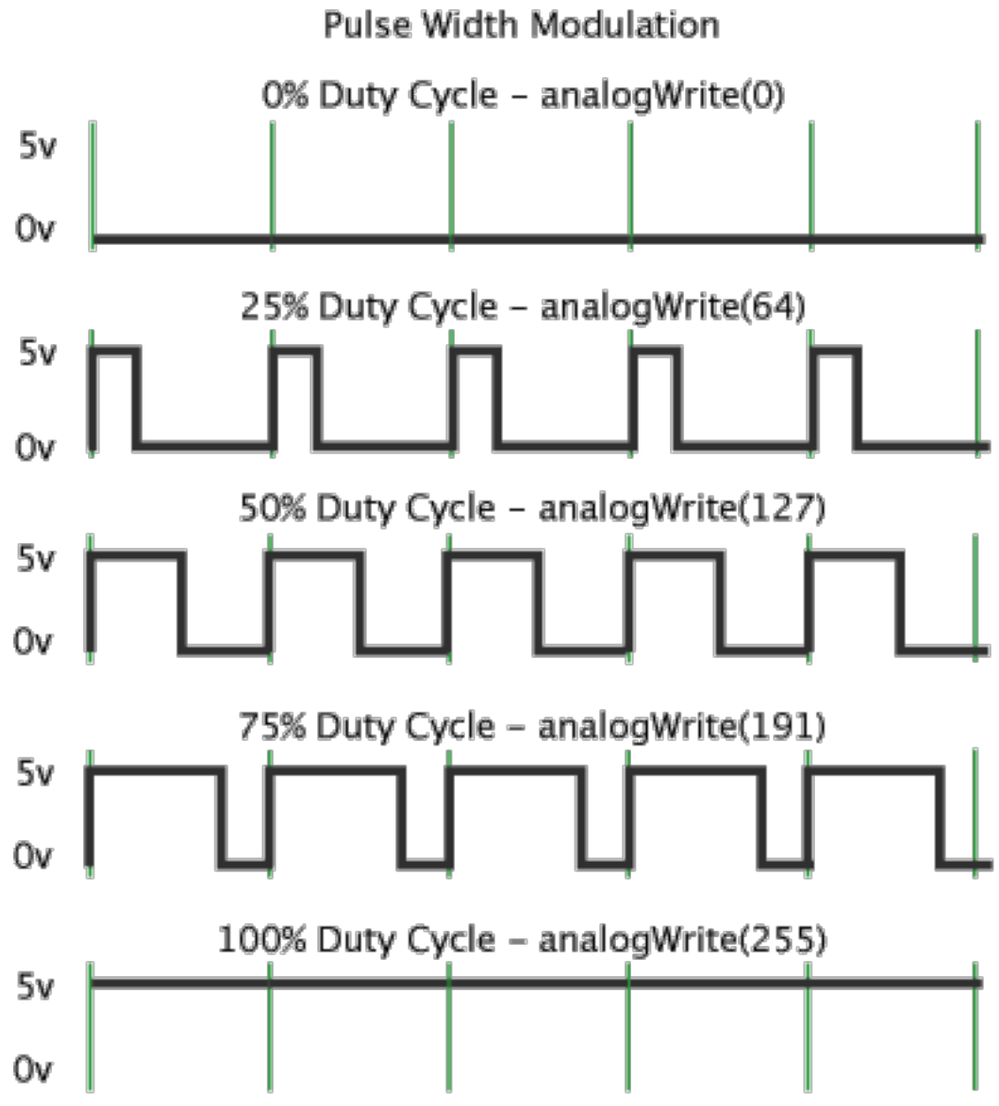
- 把以下網址加入board manager:
  - http://download.labs.mediatek.com/package_mtk_linkit_smart_7688_index.json
- 教學：https://goo.gl/9LLvgV

PWM

我要怎麼控制亮度？

PWM (Pulse Width Modulation)

- 用數位輸出模擬類比輸出
- 迅速的開關，用通電的時間比例控制輸出能量
- Arduino - analogWrite



PWM (Pulse Width Modulation)

- 腳位
  - 旁邊有 ~ 符號
  - Arduino UNO: 3, 5, 6, 9, 10, 11
- analogWrite(pin, value)
  - 輸入範圍 0(全暗) ~ 255(全亮)
  - Duty cycle: <input>/256*100%

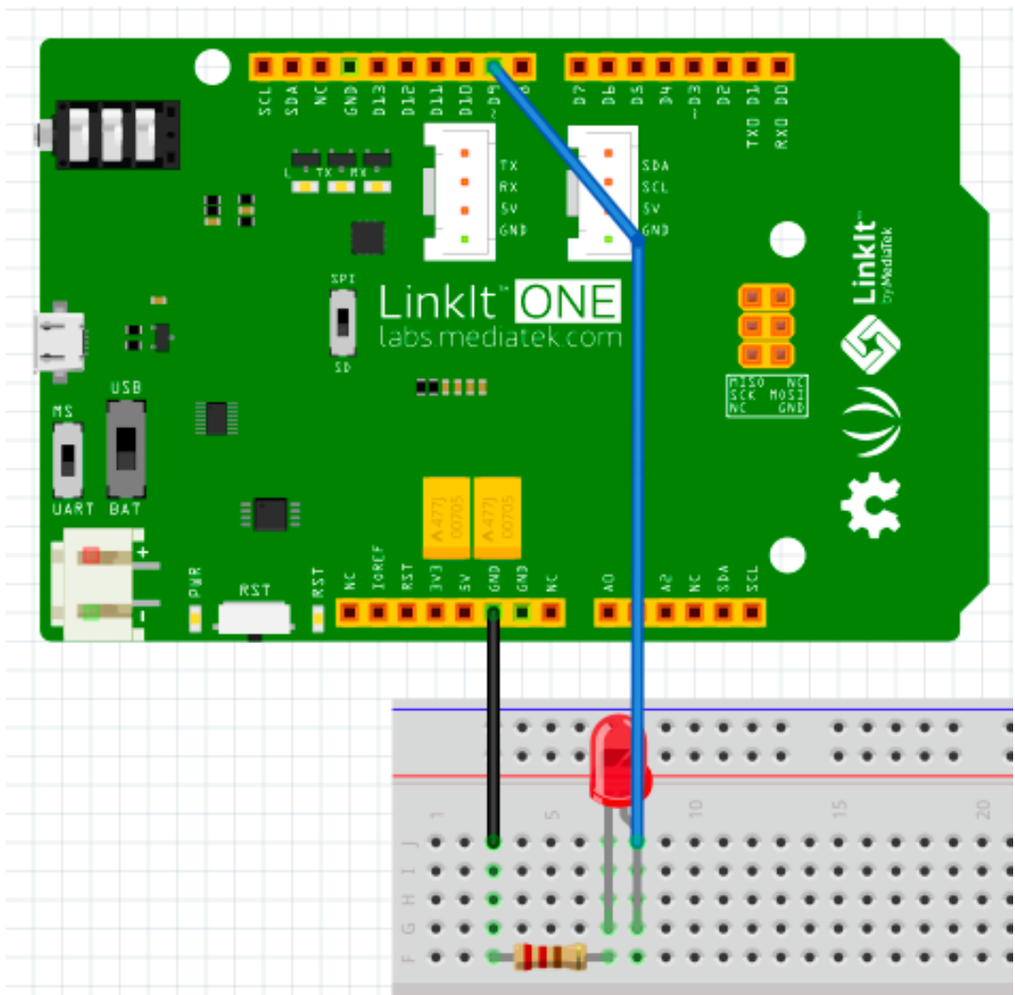
PWM

```
int led_pin = 9;

void setup() {
  pinMode(led_pin, OUTPUT);
}

void loop() {
  analogWrite(led_pin, 64);
  delay(1000);
  analogWrite(led_pin, 255);
  delay(1000);
}
```

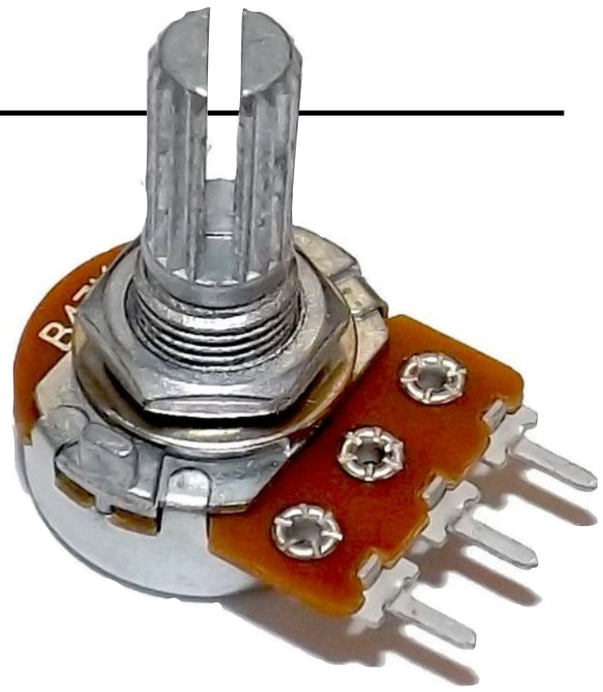
Lab 01

Goal: 呼吸燈

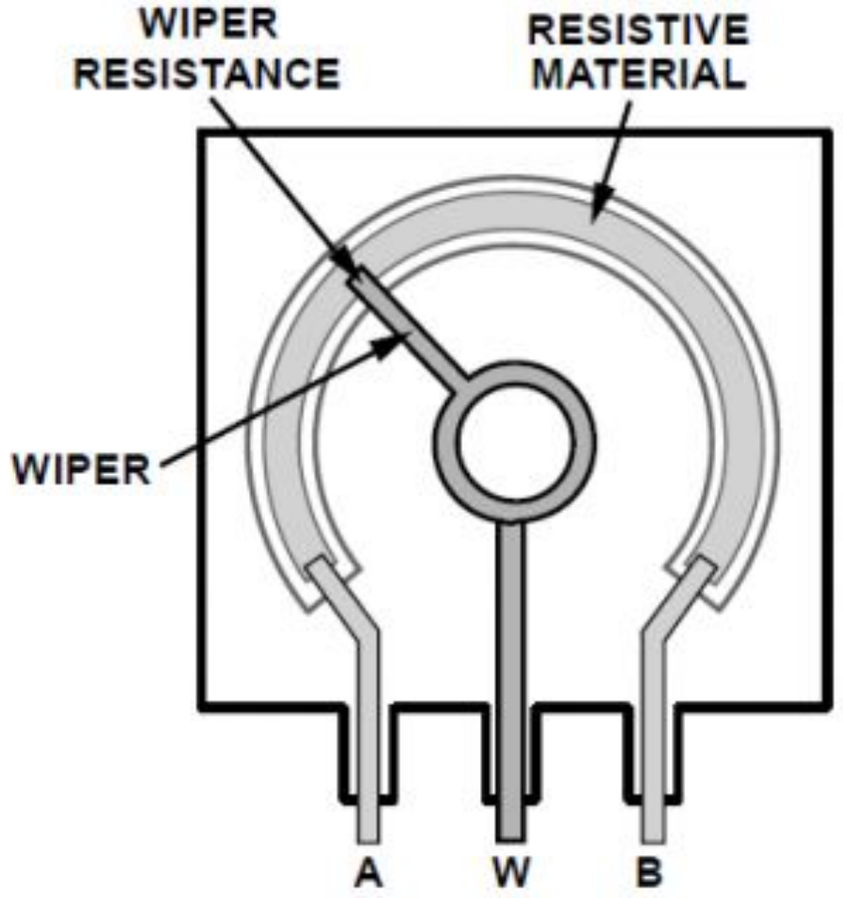
1. 讓LED從暗漸漸變亮



可變電阻



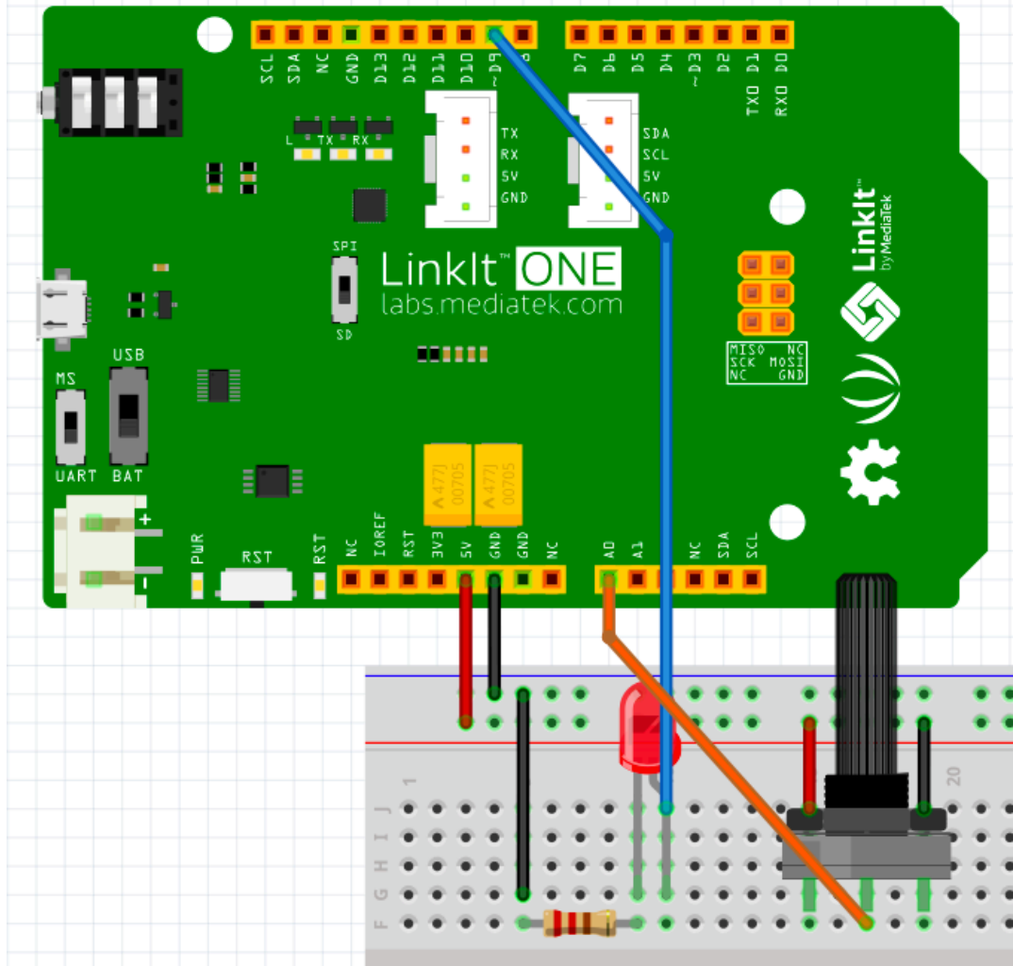
- 兩個固定接點+一個滑動接點
- 透過改變滑動端和固定端間距離改變電阻值
- 用途：
  - 音量控制
  - 位置、距離傳感器



Lab 02

Goal: 可變電阻控制LED

1. 用Arduino讀取可變電阻電壓
2. 輸出對應的PWM訊號控制LED燈亮度
3. bonus: 反向



Lab 02 - code

```
int led_pin = 9;
void setup() {
  pinMode(led_pin, OUTPUT);
}
```

```
void loop() {
  int sensorValue = analogRead(A0);

  analogWrite(led_pin, sensorValue);
  delay(150);

}
```

digitalRead

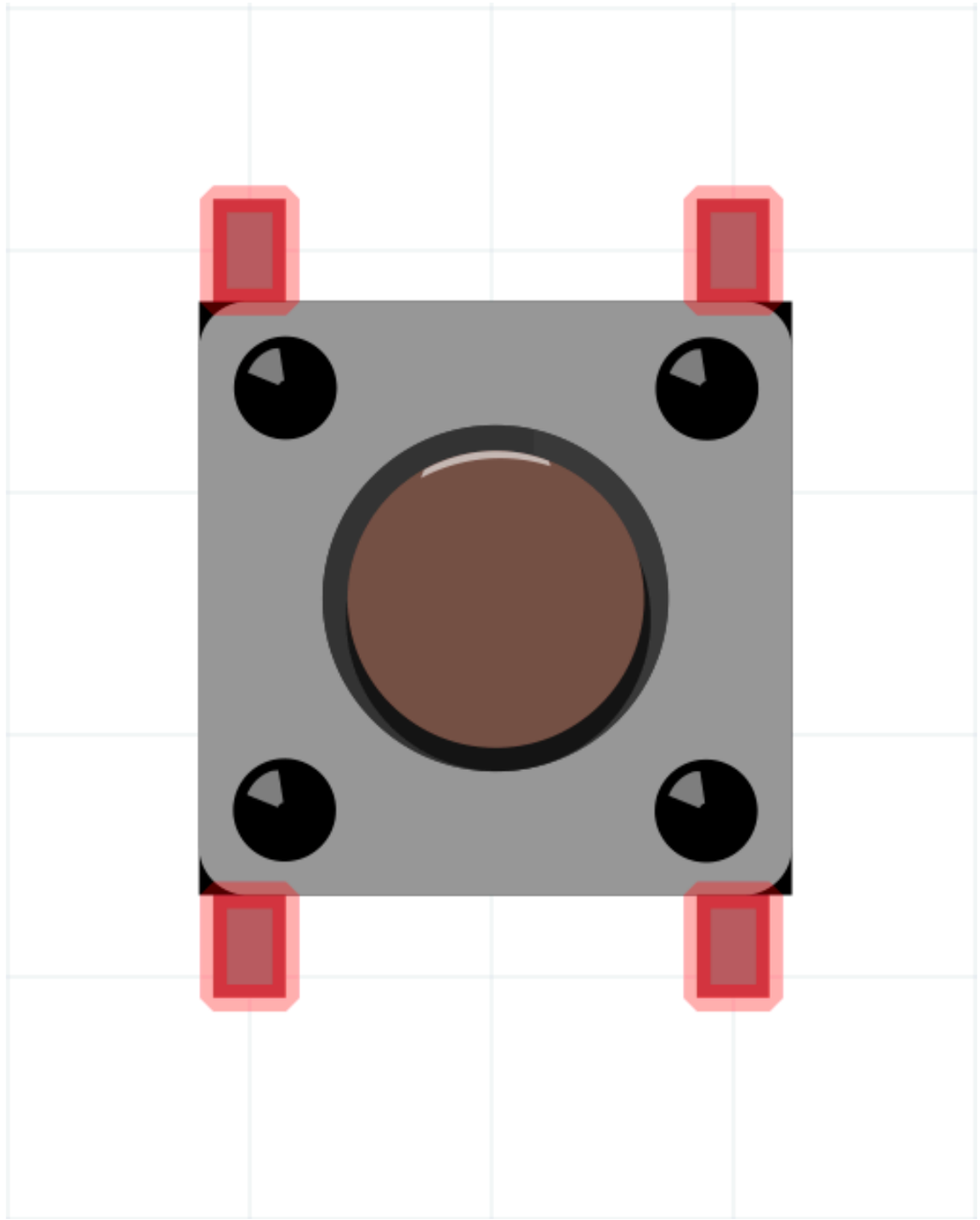
有analogWrite

有digitalWrite

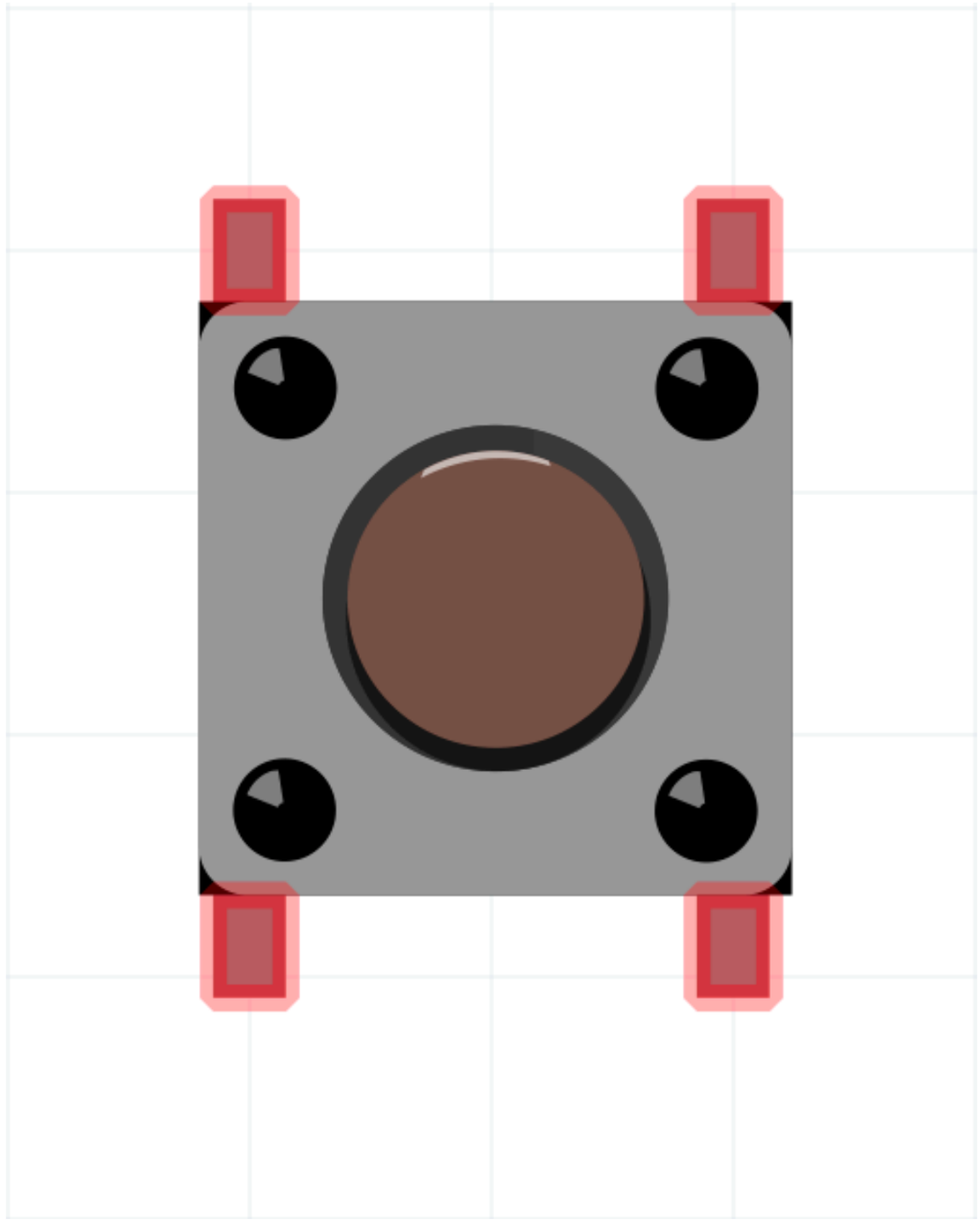
有analogRead

那有沒有digitalWrite？

digitalRead



digitalRead



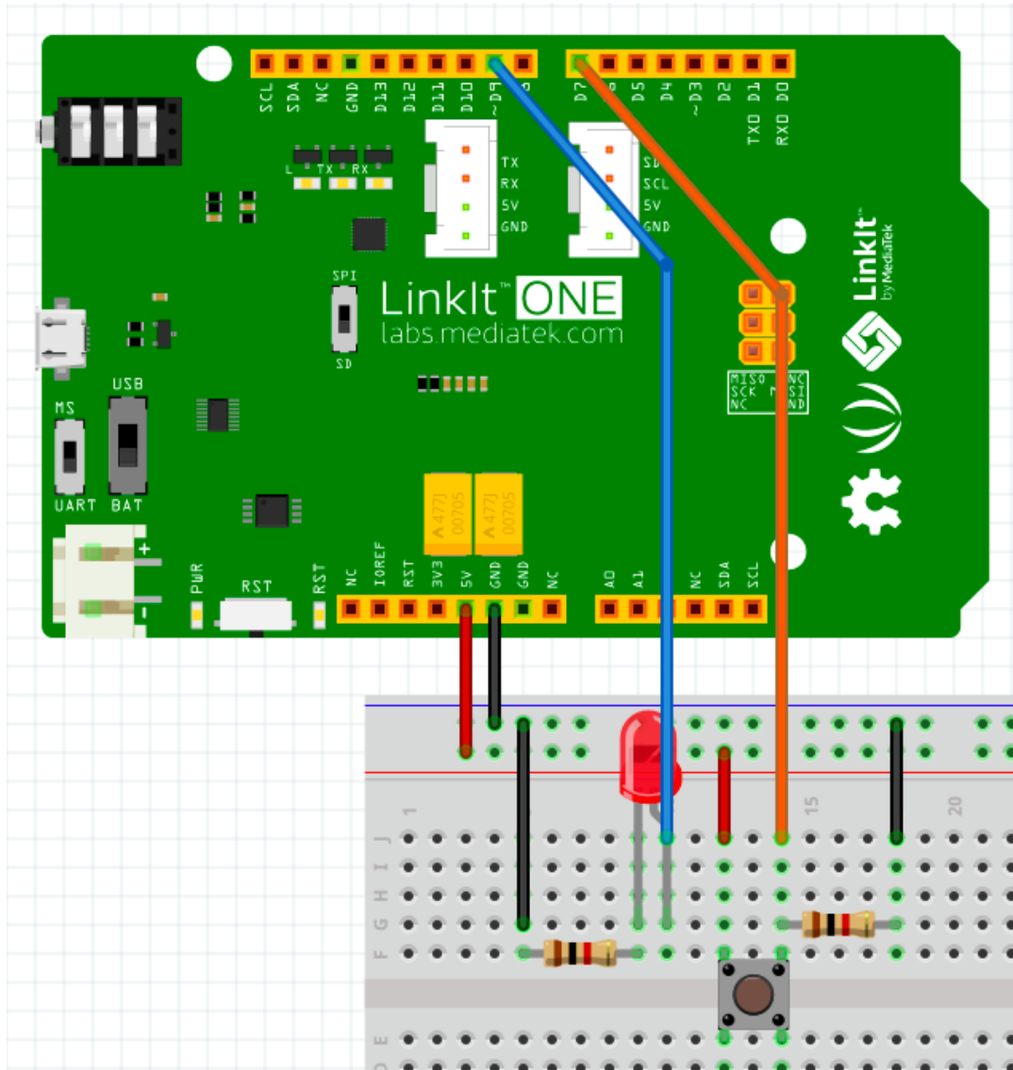
digitalRead

```
int led_pin = 9;
int button_pin = 7;

void setup() {
  pinMode(led_pin, OUTPUT);
  pinMode(button_pin, INPUT);
}

void loop() {
  int value = digitalRead(button_pin);
  digitalWrite(led_pin, value);
  delay(10);
}
```

Lab 03

Goal: 按鈕控制LED

1. bonus: sticky LED
   (按下切換狀態)



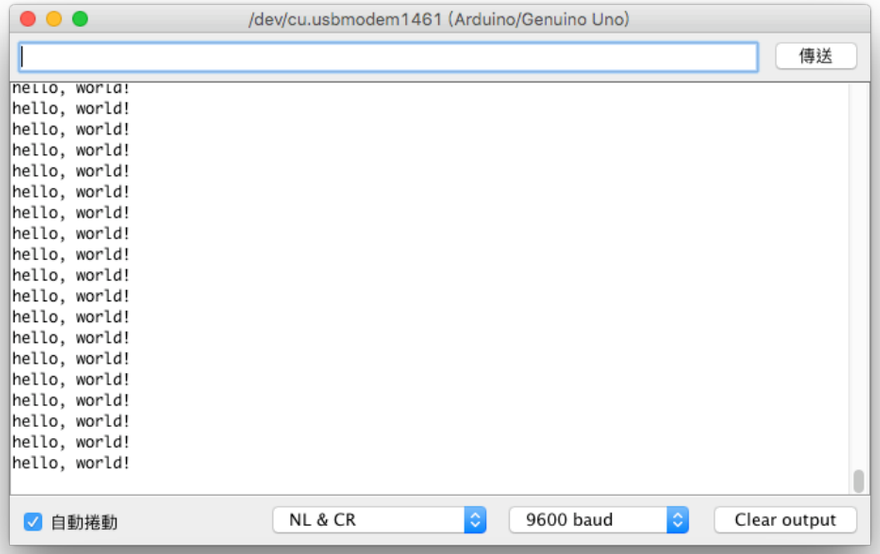
Serial Monitor

要怎麼看到值？

Serial Monitor

Arduino 透過 USB 作串列傳輸，與電腦互傳資料

可以透過 Arduino IDE 的 Serial Monitor 進行操作

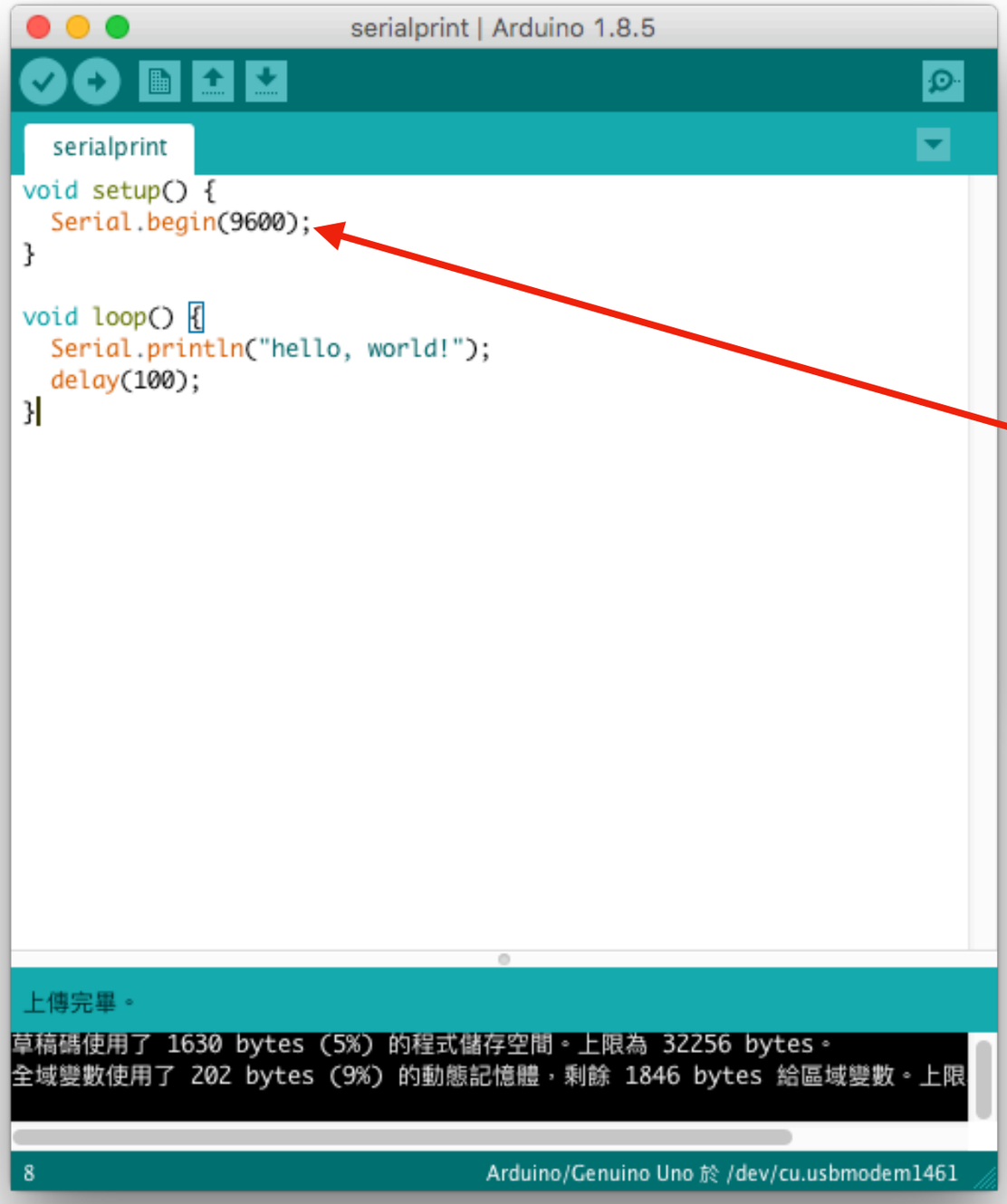


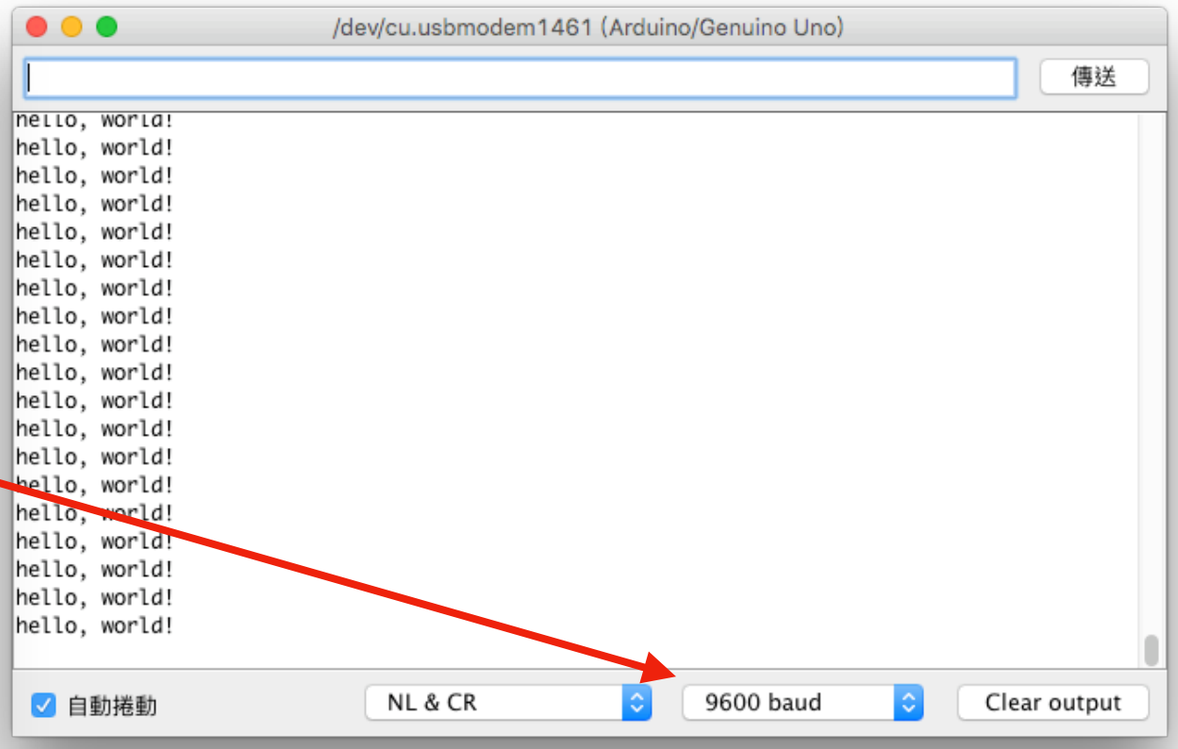
Serial Monitor

```
void setup() {
  Serial.begin(9600);
}
```

```
void loop() {
  Serial.println("Hello, world ");
  delay(1000);
}
```

Serial Monitor



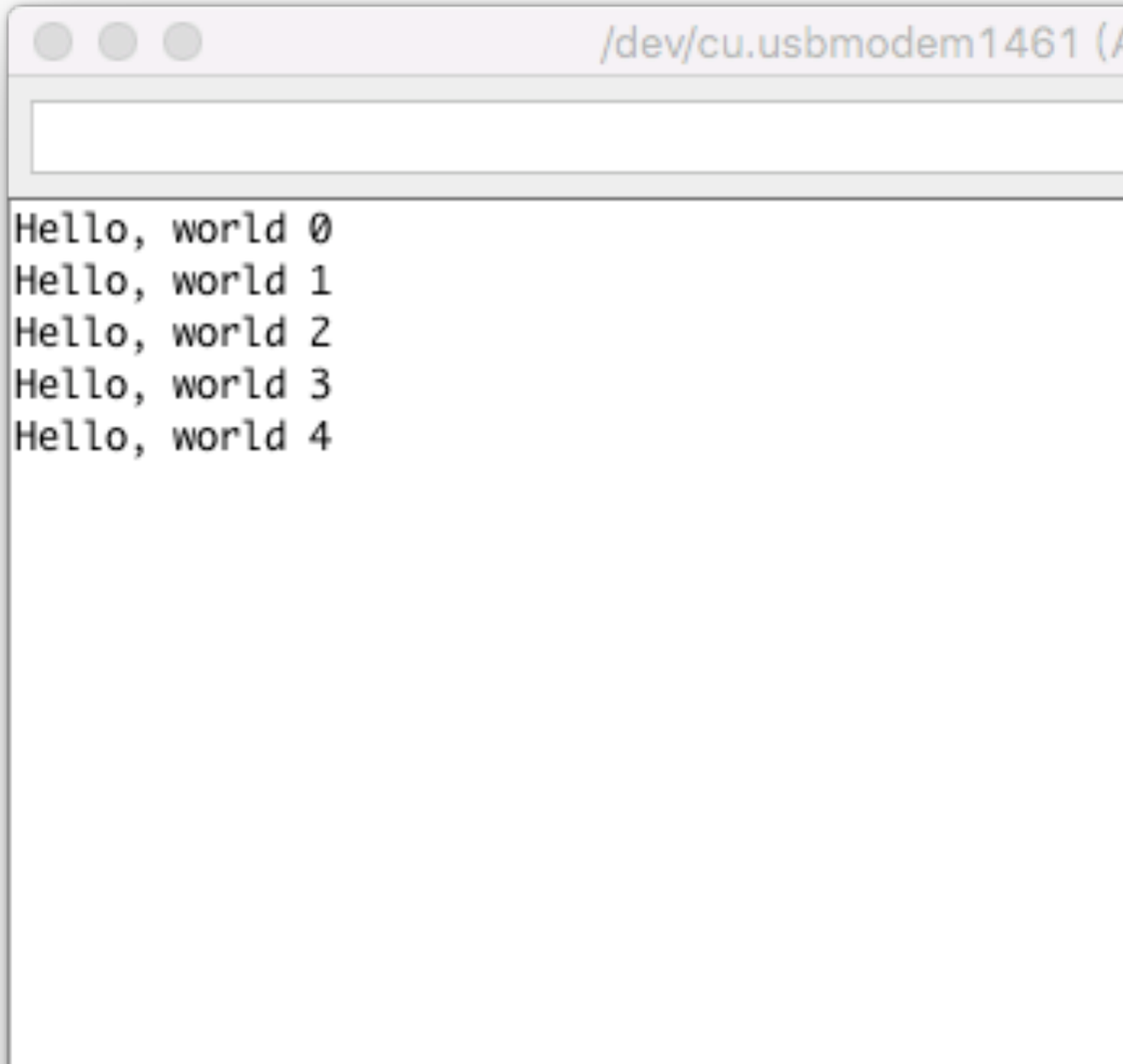


baud rate 要一樣

Serial.print / Serial.println

Serial.print 不換行

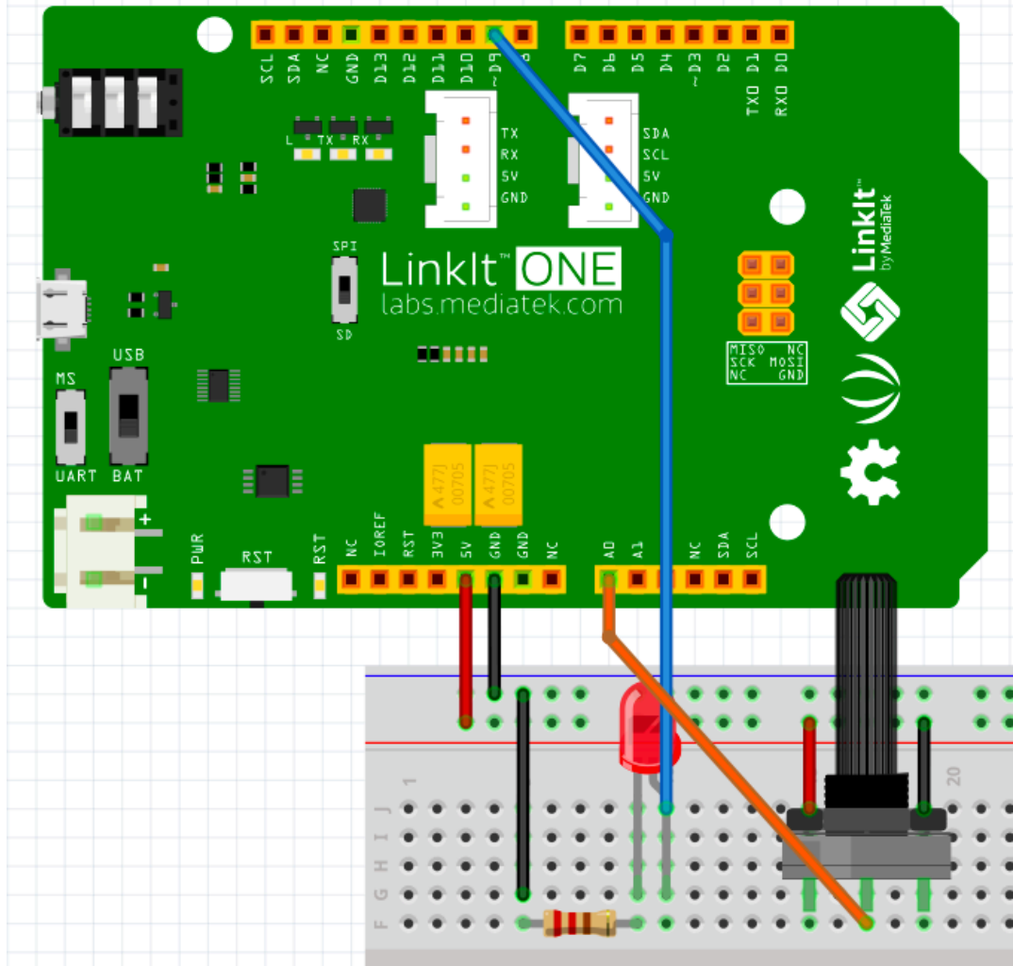
Serial.println 會換行



Lab 04

Goal: 可變電阻控制LED

跟lab02一樣，但要在 Serial Monitor 顯示讀到的值



function

我覺得你們的 code 很亂。

function

```
void setup() {
  Serial.begin(9600);
}

void loop() {
  sayHello();
  delay(1000);
}

void sayHello () {
  Serial.println("Hello, world ");
}
```

bonus lab

Goal: 用可變電阻與 function 控制七段顯示器