

[ALC04]Arduino_按鈕實驗

Jason Chin

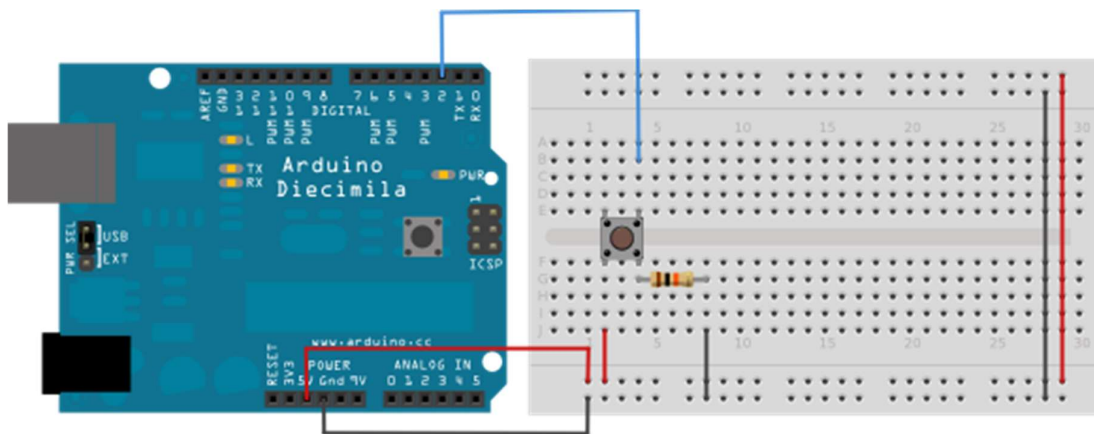
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當我們按鈕或是開關時,是連接電路的兩個端點,這個範例是當我們按下了按鈕,就會讓連接 Pin 13 的內建 LED 亮起來

硬體需求

- Arduino 電路板
- 按鈕開關
- 10K ohm 電阻
- 連接電線
- 麵包板

電路連接

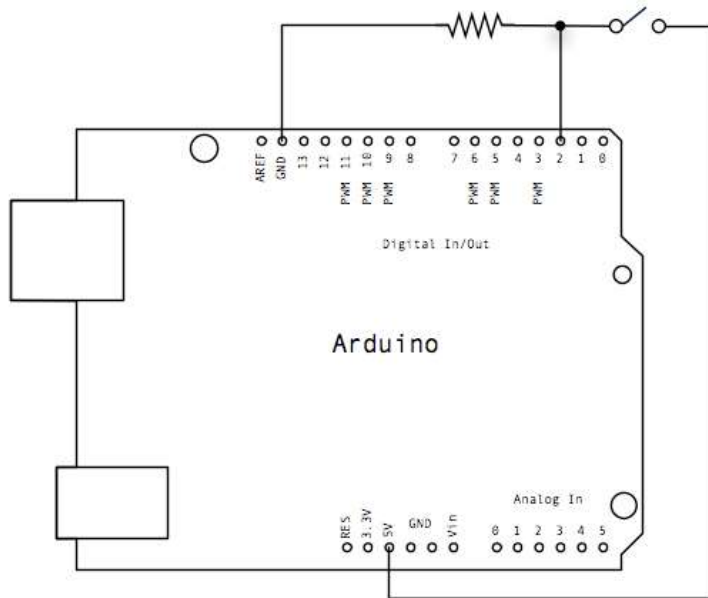


連接到 Arduino 的線一共三條,其紅色線連接到戈人一田卜麵包板的電源,黑色線連到麵包板的地(GND),第三條線如圖的藍色線則連接到 Digital Pin 2,Push Button 如圖示的二支腳,其中一支接 10K Ohms 電阻,連接到地(GND),開關的另一支腳則接到電源端(+5V)

Push 連接電阻的對面那支腳,與電阻那支腳是相通的,所以等於開關連接電阻的腳給它連接到 Digital Pin 2 去,做為開關的輸入端,也就是說當按下開關,+5V 等於輸入到 Pin 2 去,做為"開"的信號,而放開按鈕則是"關"的信號了

為什麼要有那顆 10K Ohms 電阻,其實他稱之為” 提昇電阻”,為避免邏輯電路的邏輯閘,不連接時稱之為浮接 (floating) 現象,造成不是輸入” 0” 也不是輸入 ”1” 這種情形,所以需要提昇電阻,用來確認在” 關” 的時候為 ”0”,即低電位(GND)

電路圖



程式碼

說明: 程式中,用 digitalRead(buttonPin) 讀取 Digital Pin 的信號

在程式中用判斷式,判斷按鈕是否被按下,若被按下則以

digitalWrite(ledPin, HIGH) 先給 LED Pin 輸出為 "1" LED 亮起來

若按鈕沒被按下,則用 digitalWrite(ledPin, LOW) 先給 LED Pin 輸出為 "0" LED 熄滅

以下為原文的程式碼

```
/*  
  Button  
  
  Turns on and off a light emitting diode(LED) connected to digital  
  pin 13, when pressing a pushbutton attached to pin 2.  
  
  The circuit:  
  * LED attached from pin 13 to ground  
  * pushbutton attached to pin 2 from +5V  
  * 10K resistor attached to pin 2 from ground  
  
  * Note: on most Arduinos there is already an LED on the board  
  attached to pin 13.  
  
  created 2005  
  by DojoDave <http://www.0j0.org>  
  modified 30 Aug 2011  
  by Tom Igoe  
  
  This example code is in the public domain.  
  
  http://www.arduino.cc/en/Tutorial/Button  
  */  
  
// constants won't change. They're used here to  
// set pin numbers:
```

```
const int buttonPin = 2;    // the number of the pushbutton pin
const int ledPin = 13;      // the number of the LED pin

// variables will change:
int buttonState = 0;        // variable for reading the pushbutton status

void setup() {
  // initialize the LED pin as an output:
  pinMode(ledPin, OUTPUT);
  // initialize the pushbutton pin as an input:
  pinMode(buttonPin, INPUT);
}

void loop() {
  // read the state of the pushbutton value:
  buttonState = digitalRead(buttonPin);

  // check if the pushbutton is pressed.
  // if it is, the buttonState is HIGH:
  if (buttonState == HIGH) {
    // turn LED on:
    digitalWrite(ledPin, HIGH);
  } else {
    // turn LED off:
    digitalWrite(ledPin, LOW);
  }
}
```

相片

