

Mbed Lab 2 Report

Digital Input and Output

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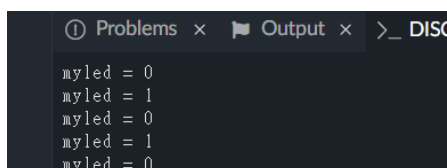
一、Lab Description

1、Seven-segment Display

```
5 int main()
6 {
7     // check that myled object is initialized and connected to a pin
8     if (myled.is_connected()) {
9         printf("myled is initialized and connected!\n\r");
10    }
11
12    // Blink LED
13    while (1) {
14        myled = 1; // set LED1 pin to high
15        printf("myled = %d \n\r", (uint8_t)myled);
16        ThisThread::sleep_for(500ms);
17
18        myled.write(0); // set LED1 pin to low
19        printf("myled = %d \n\r", myled.read());
20        ThisThread::sleep_for(500ms);
21    }
22 }
```

說明：

創建 2_1_Blinky_LED Program，將程式複製上去，執行之後得到以下結果。



```
① Problems x Output x >_ DISC
myled = 0
myled = 1
myled = 0
myled = 1
myled = 0
```

CoolTerm

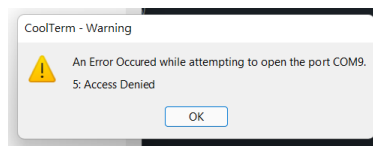
說明：

下載 CoolTerm，Connect 之後會得到以下結果。

要先將 Mbed Sduido 關閉之後才能連上 CoolTerm，否則會顯示Serial Port 被占據的錯誤警告。



```
Untitled_0
File Edit Connection Macros View Remote Window Help
New Open Save Connect Disconnect Clear Data Options View Hex Help
myled is initialized and connected!
myled = 1
myled = 0
myled = 1
myled = 0
myled = 1
myled = 0
myled = 1
myled = 0
myled = 1
myled = 0
myled = 1
myled = 0
```



CoolTerm - Warning

An Error Occured while attempting to open the port COM9.
S: Access Denied

OK

一、Lab Description

1、2_1_Blinky_LED

```
1  #include "mbed.h"
2
3  BusOut display(D6, D7, D9, D10, D11, D5, D4, D8);
4  char table[10] = {0x3F, 0x06, 0x5B, 0x4F, 0x66, 0x6D, 0x7D, 0x07, 0x7F, 0x6F};
5
6  int main(){
7      while(1){
8          for (int i = 0; i<10; i = i+1){
9              display = table[i];
10             ThisThread::sleep_for(1s);
11         }
12     }
```

說明：

創建 2_1_Blinky_LED Program，將程式複製上去執行，使用 BusOut 可以一次宣告多個Pin角位，比起使用 DigitalOut 要來的簡單，避免使用太多行。

Table 裡面的儲存 16 進位的組合，用來控制腳位輸出 0 或是 1，例如：0X3F = 0011 1111 表示 dp、g 這兩個不會亮，所以出現 0，用 for 迴圈進行 table 數字的變換，以 1 秒為間隔，做到 0 變 1 變 2.....。



一、Lab Description

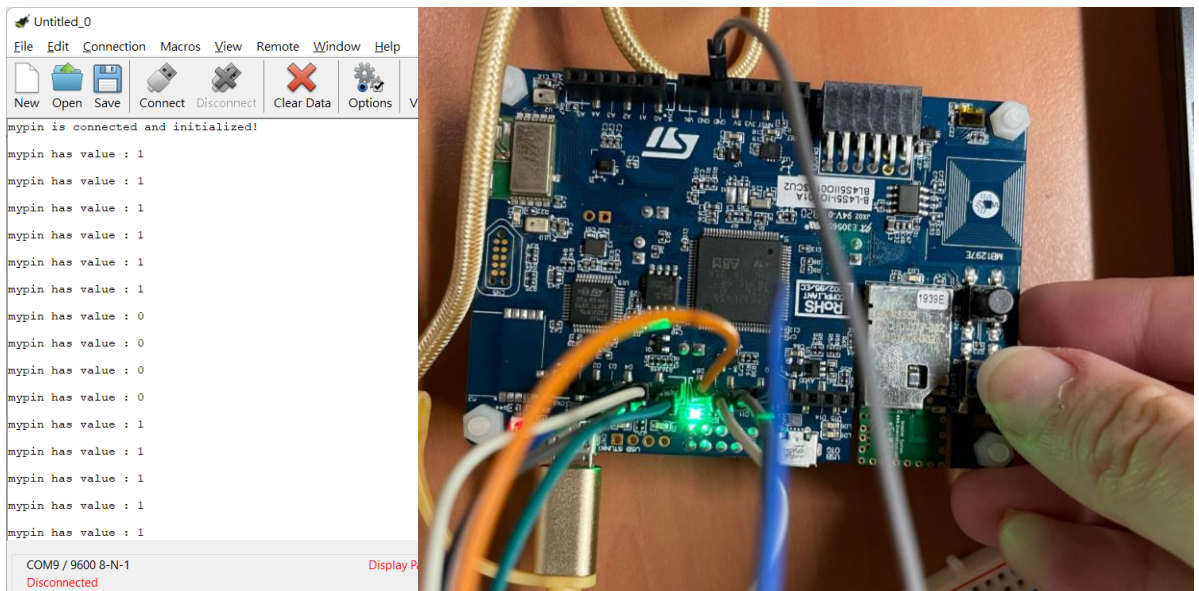
1、2_3_Switch_Button

```
1 #include "mbed.h"
2
3 DigitalIn mypin(BUTTON1);
4 DigitalOut myled(LED1);
5
6 int main()
7 {
8     // check mypin object is initialized and connected to a pin
9     if (mypin.is_connected())
10    {
11        printf("mypin is connected and initialized! \n\r");
12    }
13
14    // Optional: set mode as PullUp/PullDown/PullNone/OpenDrain
15    mypin.mode(PullNone);
16
17    // press the button and see the console / led change
18    while (1)
19    {
20        printf("mypin has value : %d \n\r", mypin.read());
21        myled = mypin; // toggle led based on value of button
22        ThisThread::sleep_for(250ms);
23    }
24 }
```

說明：

DigitalIN 可以讀取 Pin 腳狀態，又因為 Button1 接地，所以當我們按下按鍵時，Button1 接地讀到 0，而不按時讀到 1，利用一開始建立的 myled 在迴圈中每 250ms 讀值並更新一次數字。

```
mypin has value : 1
mypin has value : 1
mypin has value : 1
mypin has value : 0
mypin has value : 0
mypin has value : 0
mypin has value : 0
mypin has value : 0
mypin has value : 0
mypin has value : 1
mypin has value : 1
mypin has value : 1
mypin has value : 1
```

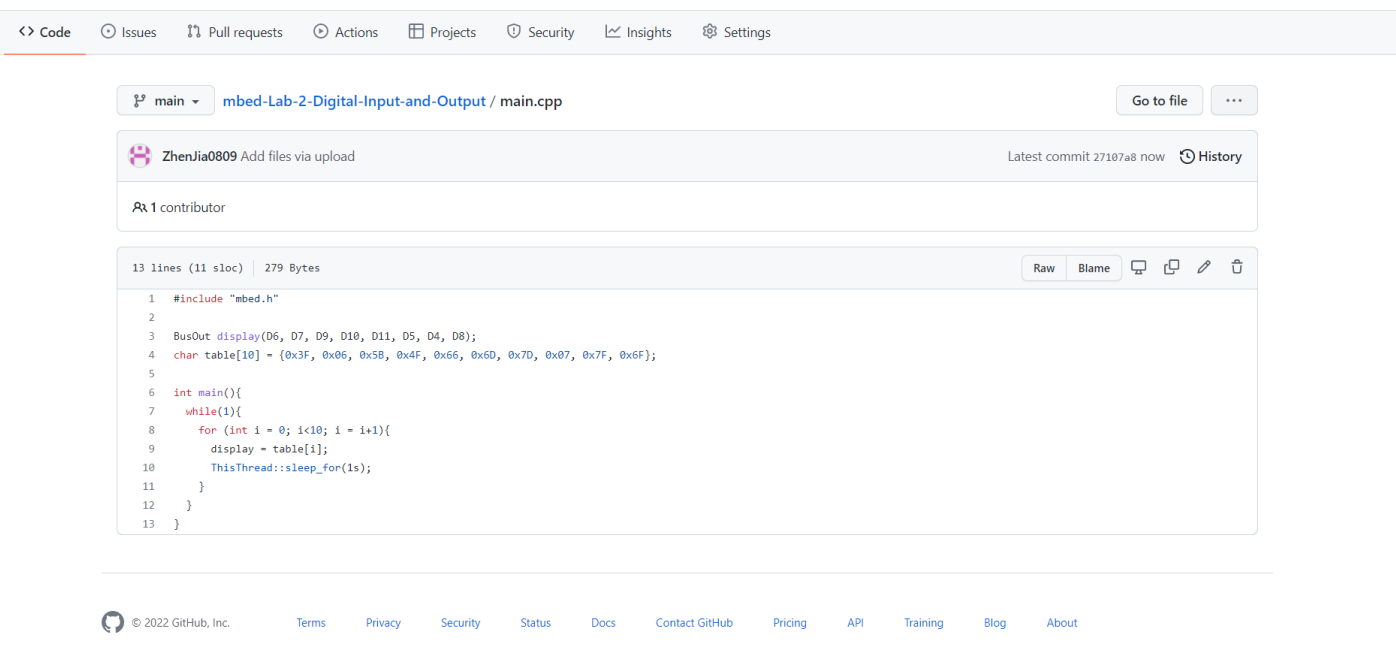


二、Demo and Checkpoints

git remote repository

說明：

將cpp檔上傳至Github。



The screenshot displays a GitHub repository interface for the file `main.cpp` in the `mbed-Lab-2-Digital-Input-and-Output` repository. The file is located on the `main` branch. The repository was last committed by `ZhenJia0809` on `27107a8`. The file contains 13 lines of C++ code, with 11 lines of source code (sloc) and a total size of 279 bytes. The code defines a `display` function and a `main` function that iterates through a `table` of hexadecimal values and prints them to the display, with a 1-second delay between each print.

```
1 #include "mbed.h"
2
3 BusOut display(D6, D7, D9, D10, D11, D5, D4, D8);
4 char table[10] = {0x3F, 0x06, 0x5B, 0x4F, 0x66, 0x6D, 0x7D, 0x07, 0x7F, 0x6F};
5
6 int main(){
7     while(1){
8         for (int i = 0; i<10; i = i+1){
9             display = table[i];
10            ThisThread::sleep_for(1s);
11        }
12    }
13 }
```

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三、遇到的問題

CoolTerm出現Error

後來發現是要先關掉 Mbed Studio 後才能使用CoolTerm讀取訊息，否則序列埠會因為已經被佔據而無法讀取。