

Mbed Lab 1 Report

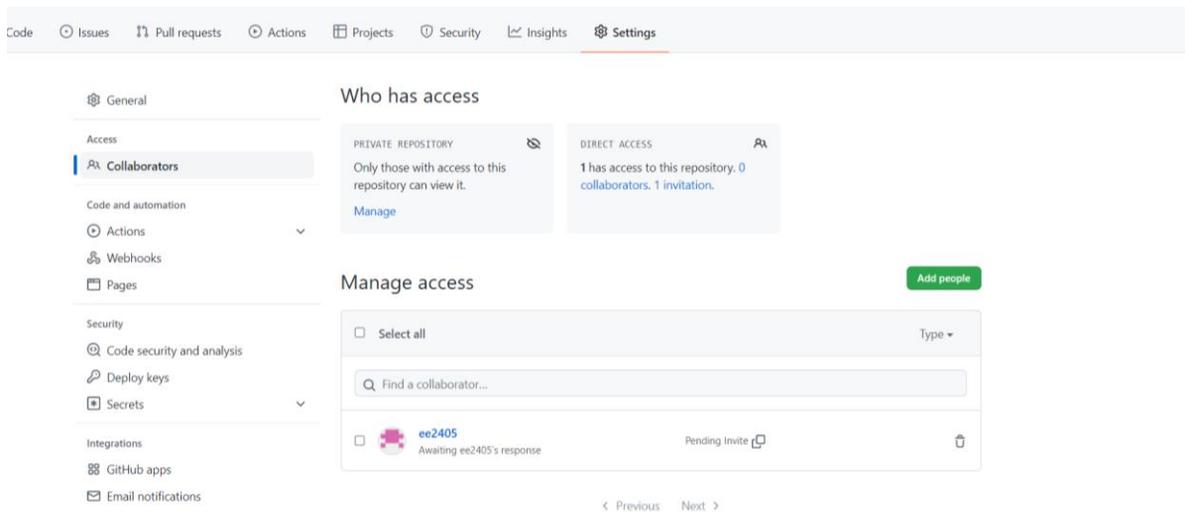
Mbed Introduction

109033130 唐振家

一、環境建置

1、Set Github

辦Github帳號，並設定Collaborators加入ee2405。



2、Set VScode

MSYS2 Download :載好MSYS2並測試成功

```
tomkitty512@LAPTOP-N7DHN3UH MINGW64 ~
$ g++ --version
g++.exe (Rev10, Built by MSYS2 project) 11.2.0
Copyright (C) 2021 Free Software Foundation, Inc.
This is free software; see the source for copying conditions. There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.

tomkitty512@LAPTOP-N7DHN3UH MINGW64 ~
GNU gdb (GDB) 11.2
Copyright (C) 2022 Free Software Foundation, Inc.
License GPLv3+: GNU GPL version 3 or later <http://gnu.org/licenses/gpl.html>
This is free software; you are free to change and redistribute it.
There is NO WARRANTY, to the extent permitted by law.

tomkitty512@LAPTOP-N7DHN3UH MINGW64 ~
$ gcc --version
gcc.exe (Rev10, Built by MSYS2 project) 11.2.0
Copyright (C) 2021 Free Software Foundation, Inc.
This is free software; see the source for copying conditions. There is NO
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.
```

Compile C++ :設定好Vscode編譯環境

一、環境建置

成功在 Vscode 中 Publish 到 github



Success!

Authorization was successful. You will be redirected back to Visual Studio Code

Didn't work?

If you aren't redirected, you can add the token manually.

Your authorization token:

```
vscode://vscode.github-authentication/did-authenticate?windowid=18&code=b8286edeb689f3c1655e&state=c8d49d57-e833-4b42-8cb2-4e7e7d105d09
```

1. Copy the token.
2. Switch back to VS code.
3. Click **Signing in to github.com...** in the status bar.
4. Paste the token and hit **enter**.

The screenshot shows the GitHub profile page for user ZhenJia0809. The profile picture is a circular avatar with a purple and white checkerboard pattern. The user's name is ZhenJia0809, and there is an 'Edit profile' button below it. The 'Repositories' tab is active, showing two private repositories: 'ee2405' (updated 5 minutes ago) and 'mbed-os-test-program_Demo' (updated 2 days ago). The page includes a search bar, navigation links for Pull requests, Issues, Marketplace, and Explore, and a footer with copyright information for GitHub, Inc. and various links like Terms, Privacy, Security, Status, Docs, Contact GitHub, Pricing, API, Training, Blog, and About.

一、環境建置

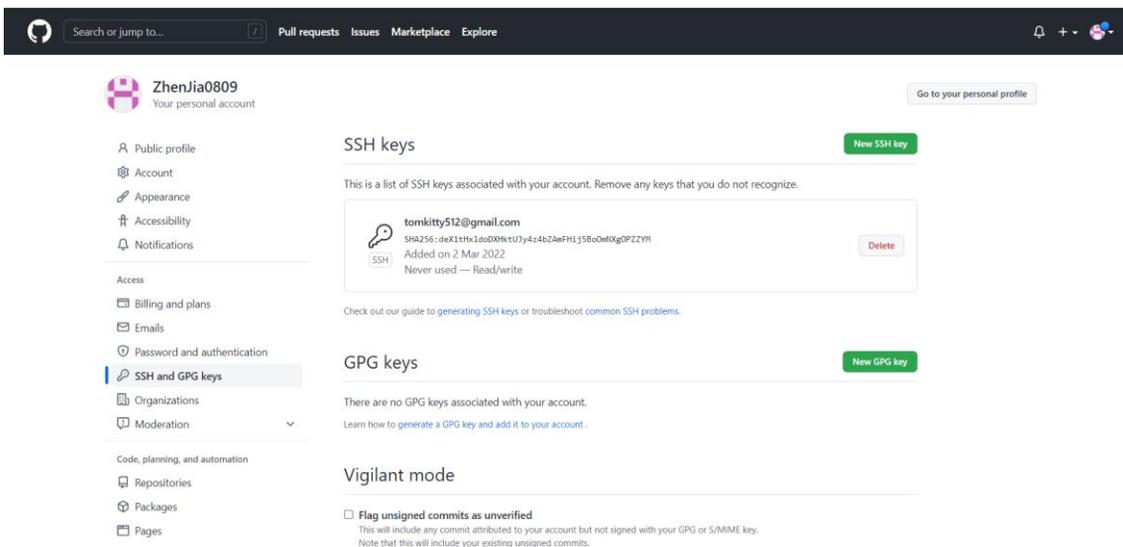
3、Git Bash

```
tomkitty512@LAPTOP-N7DHN3UH MINGW64 ~
$ git --version
git version 2.35.1.windows.2

tomkitty512@LAPTOP-N7DHN3UH MINGW64 ~
$ git config --global user.name "ZhenJia"

tomkitty512@LAPTOP-N7DHN3UH MINGW64 ~
$ git config --global user.email "tomkitty512@gmail.com"
```

4、設定SSH



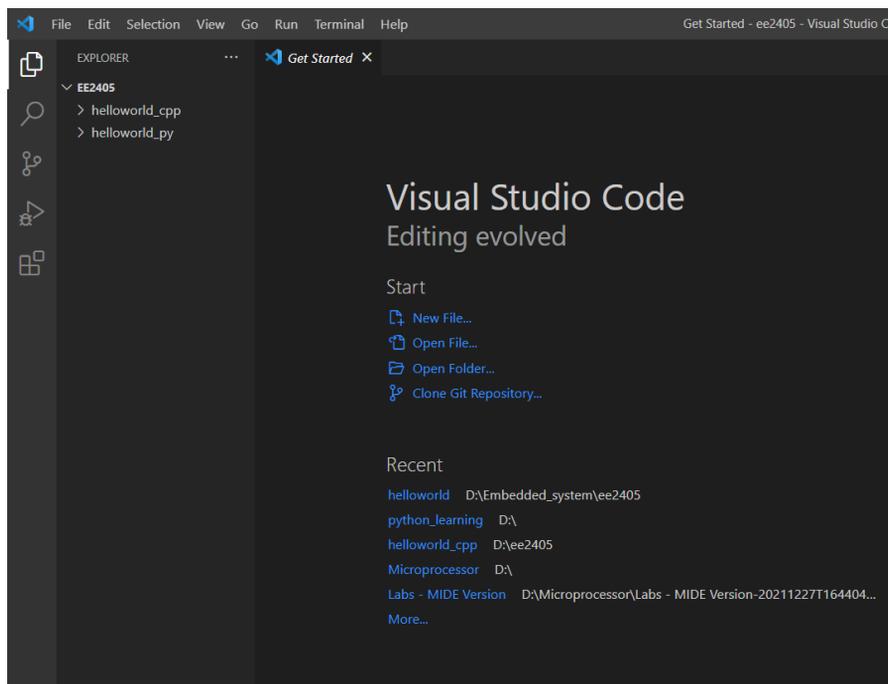
一、環境建置

5、建Workspace

在D槽新建helloworld_cpp、helloworld_py資料夾

```
C:\>D:
D:\>cd Embedded_system
D:\Embedded_system>mkdir ee2405
D:\Embedded_system>cd ee2405
D:\Embedded_system\ee2405>mkdir helloworld_cpp
D:\Embedded_system\ee2405>code .
D:\Embedded_system\ee2405>mkdir helloworld_py
D:\Embedded_system\ee2405>code .
D:\Embedded_system\ee2405>_
```

VScode開啟畫面



二、Create and Compile a mbed program

1、mbed-os-example-blinky

```
1  /* mbed Microcontroller Library
2   * Copyright (c) 2019 ARM Limited
3   * SPDX-License-Identifier: Apache-2.0
4   */
5
6  #include "mbed.h"
7
8
9  // Blinking rate in milliseconds
10 #define BLINKING_RATE    500ms
11
12
13 int main()
14 {
15     // Initialise the digital pin LED1 as an output
16     DigitalOut led(LED1);
17
18     while (true) {
19         led = !led;
20         ThisThread::sleep_for(BLINKING_RATE);
21     }
22 }
23
```

說明：

新建Project，加入 mbed-os-example-blinky，這是已經建好的code，會以 500ms 的頻率讓 LED1 閃爍 (500ms 亮、500ms 暗)，DigitalOut 指定Pin 腳 LED1 為數位訊號輸出，並命名為 led，利用迴圈及剛才設定的頻率使 LED1 閃爍。

二、Create and Compile a mbed program

2、mbed-os-test-program2

```
1  #include "mbed.h"
2
3  DigitalOut myLED(LED1);
4  DigitalOut myLED2(LED3);
5
6  void Led(DigitalOut &ledpin);
7
8  int main()
9  {
10     myLED = 1;
11     myLED2 = 1;
12     while (true)
13     {
14         Led(myLED);
15         Led(myLED2);
16     }
17 }

1  #include "mbed.h"
2
3  void Led(DigitalOut &ledpin)
4  {
5     for (int i = 0; i < 10; ++i)
6     {
7         //blink for 10 times
8         ledpin = !ledpin; // toggle led
9         ThisThread::sleep_for(100ms);
10    }
```

說明：

新建Project，引入 mbed01，指定 Pin 腳 LED1、LED3 為數位訊號輸出，並命名為 myLED、myLED2，利用迴圈及 LED function 使 LED1 閃爍。

LED function：取得腳位 LED1、LED3 的位置，進行 100ms 一次閃爍、閃爍 10 次的指令。

二、Create and Compile a mbed program

3、mbed-os-test-program3

```
1  #include "mbed.h"
2
3
4  // Blinking rate in milliseconds
5  #define BLINKING_RATE    1000ms
6
7
8  int main()
9  {
10     // Initialise the digital pin LED1 as an output
11     DigitalOut led(LED1);
12
13     for(int i=0; i<10; i++){
14         led = !led;
15         ThisThread::sleep_for(BLINKING_RATE);
16         printf("%1.5f\n", 3.14159);
17     }
18 }
```

① Problems × Output × >_ DISCO-L455I (B-L455I-IOT01A) × Libr

```
%1.5f
```

說明：

新建Project，引入 mbed01，會以 1000ms 的頻率讓 LED1 閃爍，DigitalOut 指定Pin 腳 LED1為數位訊號輸出，並命名為 led，利用迴圈及剛才設定的頻率使 LED1 閃爍，且每次閃爍都會 print 出字串。

二、Create and Compile a mbed program

3、mbed-os-test-program3

```
1  #include "mbed.h"
2
3
4  // Blinking rate in milliseconds
5  #define BLINKING_RATE    1000ms
6
7
8  int main()
9  {
10     // Initialise the digital pin LED1 as an output
11     DigitalOut led(LED1);
12
13     for(int i=0; i<10; i++){
14         led = !led;
15         ThisThread::sleep_for(BLINKING_RATE);
16         printf("%.5f\n", 3.14159);
17     }
18 }
```

① Problems × Output

%.5f
%.5f
%.5f
%.5f
%.5f
%.5f
%.5f
%.5f
%.5f
%.5f

```
"callback-nontrivial": {
  "help": "Enables support for non-trivial callable objects in C++",
  "value": true,
  "printf_lib": "std",
}
```

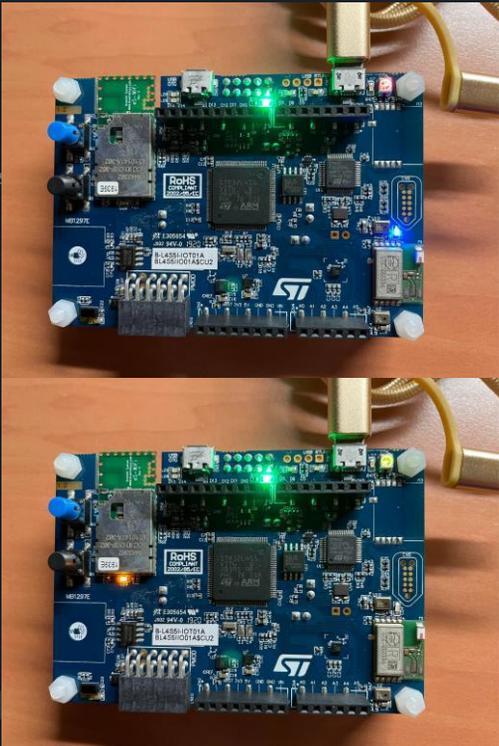
%.5f
3.14159
3.14159
3.14159
3.14159
3.14159
3.14159
3.14159
3.14159
3.14159
3.14159

說明：

設定更改 targets.json、mbed_lib.json，使 print 出值能夠印出 3.14159 (取小數後五位)。

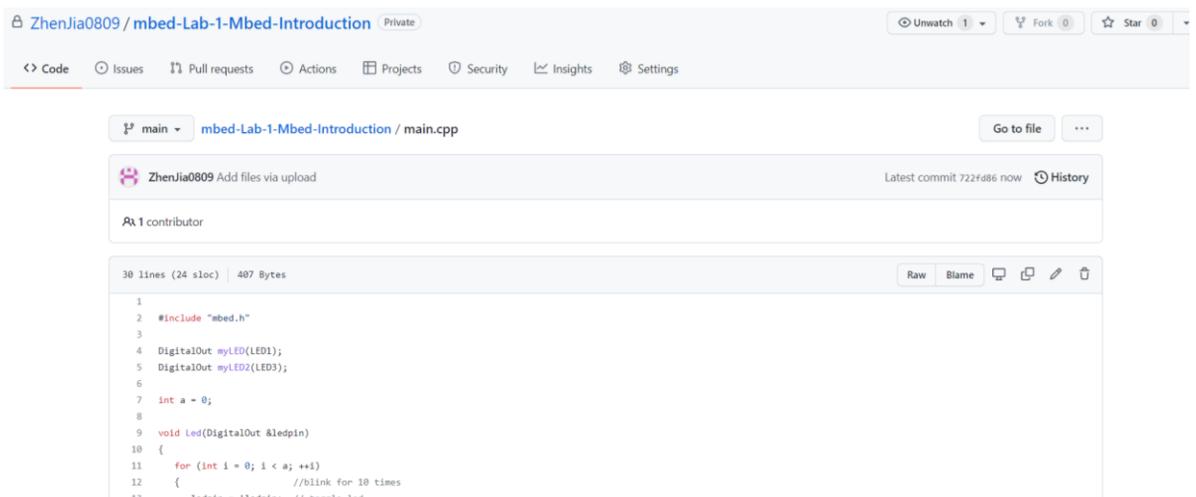
三、Demo Part

```
Setting Started x main.cpp .../mbed-os-test-program3 x main.cpp .../mbed-os-test-Demo x target
1
2 #include "mbed.h"
3
4 DigitalOut myLED(LED1);
5 DigitalOut myLED2(LED3);
6
7 int a = 0;
8
9 void Led(DigitalOut &ledpin)
10 {
11     for (int i = 0; i < a; ++i)
12     { //blink for 10 times
13         ledpin = !ledpin; // toggle led
14         ThisThread::sleep_for(100ms);
15     }
16 }
17
18 int main()
19 {
20     myLED = 0;
21     myLED2 = 0;
22     while (true)
23     {
24         a = 6;
25         Led(myLED);
26         a = 4;
27         Led(myLED2);
28     }
29 }
30
31
```



說明：

利用之前program的LED funtion，使 LED1 以 100ms 的頻率閃爍 3 次、LED3 閃爍 2 次，重複循環。



```
1
2 #include "mbed.h"
3
4 DigitalOut myLED(LED1);
5 DigitalOut myLED2(LED3);
6
7 int a = 0;
8
9 void Led(DigitalOut &ledpin)
10 {
11     for (int i = 0; i < a; ++i)
12     { //blink for 10 times
13         ledpin = !ledpin; // toggle led
```

四、遇到的問題

裝載MSYS2時，一直無法開啟正確的檔案，所以重新安裝，過後就可以正常使用了。

五、討論

架設環境花了很長一段時間，因為對全新的介面不熟，所以處理了非常久，希望之後會越來越順利。