

# Mbed Lab 1 Report

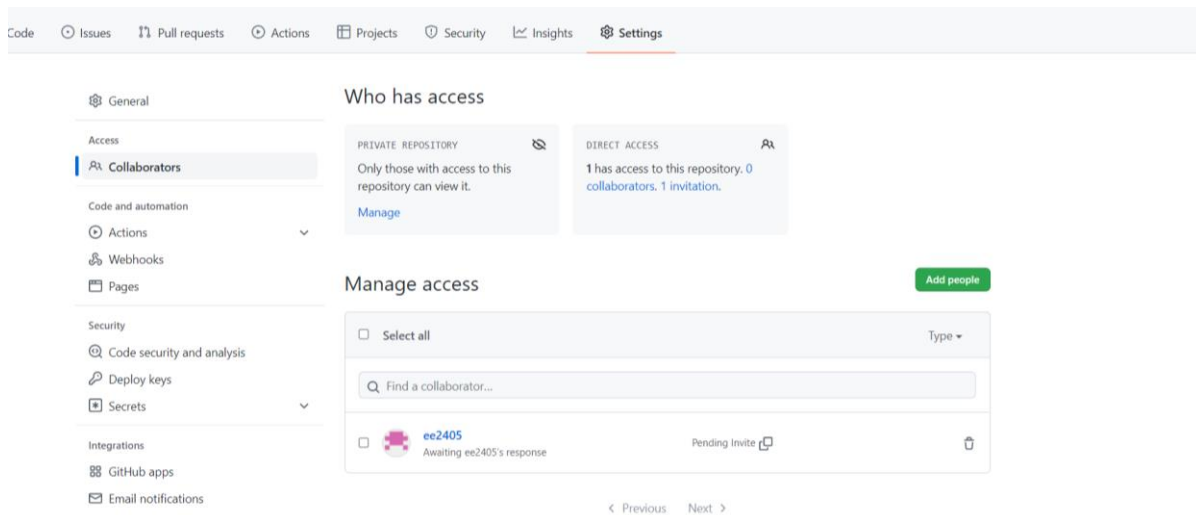
## Mbed Introduction

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# 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 includes a circular avatar with a purple and white checkerboard pattern, the username 'ZhenJia0809', and an 'Edit profile' button. 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 header includes navigation links for Pull requests, Issues, Marketplace, and Explore. The footer contains copyright information for 2022 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

The screenshot shows the GitHub user profile page for 'ZhenJia0809'. The 'SSH and GPG keys' section is active, displaying a single SSH key for 'tomkitty512@gmail.com'. The key details include the SHA256 fingerprint 'deX1sths1d000xktUjy424bZAmFH1j58o0w0g0PZZYM', the date 'Added on 2 Mar 2022', and the permissions 'Never used — Read/write'. A 'Delete' button is visible next to the key. Below the key list, there are links for 'Generating SSH keys' and 'Troubleshooting SSH problems'. The 'GPG keys' section is empty, and the 'Vigilant mode' section is also empty.

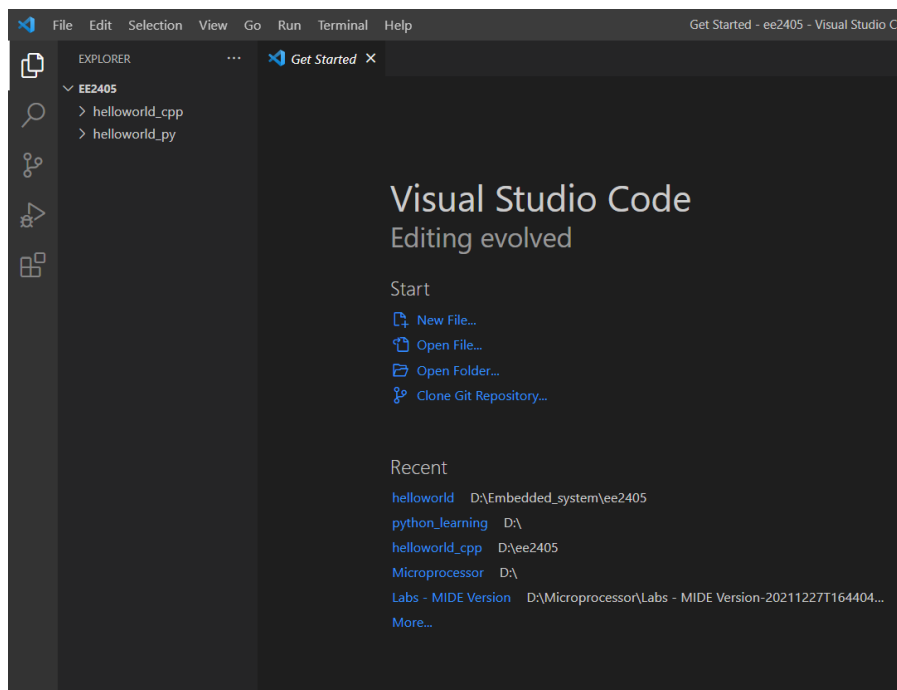
## 一、環境建置

### 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
%1.5f
%1.5f
%1.5f
%1.5f
%1.5f
%1.5f
%1.5f
%1.5f
%1.5f
%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 }
```

Problems × Output

%1.5f  
%1.5f  
%1.5f  
%1.5f  
%1.5f  
%1.5f  
%1.5f  
%1.5f  
%1.5f  
%1.5f

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

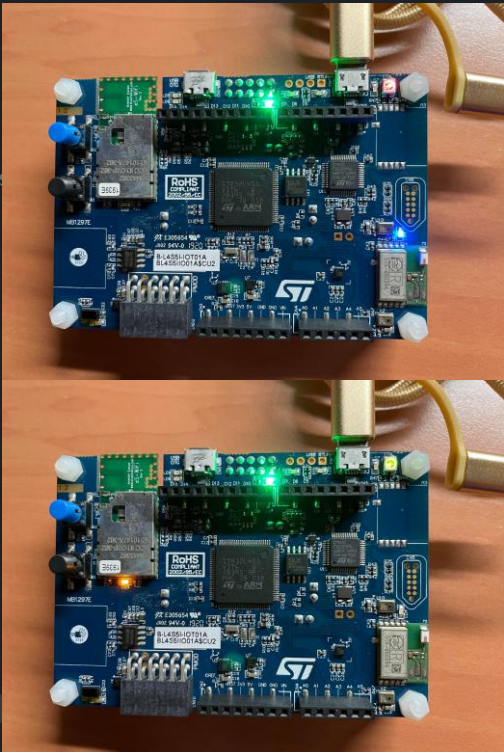
%1.5f  
3.14159  
3.14159  
3.14159  
3.14159  
3.14159  
3.14159  
3.14159  
3.14159  
3.14159  
3.14159

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)。

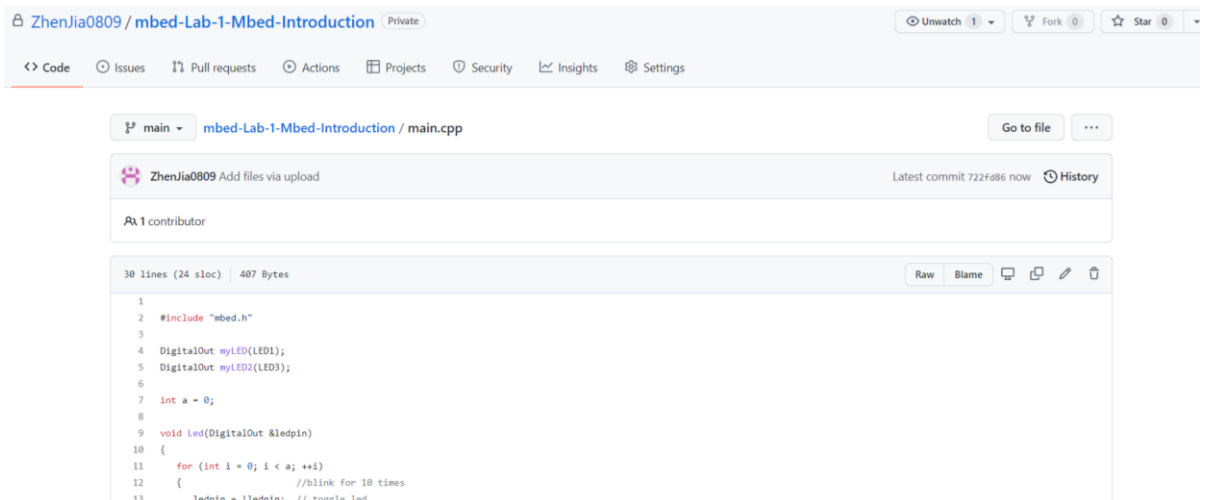
### 三、Demo Part

```
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。