MCU8-PIC101 動手做實驗使用手冊

—. Lab1

- 1. 開啟 MPLAB X IDE
- 2. Files \rightarrow New Project



3. Microchip Embedded \rightarrow Standalone Project

X New Project	Choose Project	×
1. Choose Project 2	Categories:	Projects: Standalone Project Project Existing MPLAB IDE V8 Project Prebuik (Hex, Loadable Image) Project User Makefile Project Library Project Import START MPLAB Project Import Atmel Studio Project
	Description: Creates a new standalone applicatio project.	n project. It uses an IDE-generated makefile to build your
	< E	ack Next > Finish Cancel Help

- 4. Next
- 5. Family : Mid-Range 8-bit MCUs
- 6. Device : PIC16F18446
- 7. Tool : Simulator

🔀 New Project			\times
Steps	Select Device		
Choose Project Select Device Select Header Select Plugin Board Select Plugin Board	Family:	id-Range 8-bit MCUs (PIC10/12/16/MCP) 🧹	
 Select Compiler Select Project Name and Folder 	Device:	PIC 16F 18446 ~	
	Tool:	Simulator V Show All	
MPLAB X IDE			
		< Back Next > Finish Cancel Help	

- 8. Next
- 9. pic-as(v2.41)

🔀 New Project		×
Steps	Select Compiler	
 Choose Project Select Device Select Header Select Plugin Board Select Compiler Select Project Name and Folder 	Compiler Toolchains -XC8 -XC8 (v2.41) [C:\Program Files\Microchip\xc8\v2.41\bin] -pic-as -pic-as (v2.41) [C:\Program Files\Microchip\xc8\v2.41\pic-as\bin]	
MPLAB X IDE		

10.Next

- 11.Project Name : lab1
- 12.Project Location : C:\RTC101\example\ex1
- 13.Project Folder: C:\RTC101\example\ex1\lab1.X
- 14.勾選 Set as main project
- 15.Finish

🔀 New Project			\times
Steps	Select Project Name	and Folder	
 Choose Project Select Device Select Header Select Plugin Board Select Compiler Select Plugin Point Annual Folder 	Project Name: Project Location: Project Folder:	lab1 D:\data\RTC\RTC101\example\ex1 D:\data\RTC\RTC101\example\ex1\Jab1.X	
MPLAB'	Overwrite existing Also delete source Set as main project Use project location	i project. is. it on as the project folder	
XIDE	Encoding: ISO	-8859-1	
		< Back Next > Finish Cancel	Help

16.加入已經存在的檔案: Source Files→滑鼠右鍵→Add Existing Item→選擇存放檔案的目錄 →選擇檔案

Select Item							×
Look in:	ex1				\sim	🗈 📸 🎟 •	
Recent Items	lab1.X lab1.asm						
Desktop							
Documents							Store path as:
This PC							 Auto Relative Absolute
1	File name:	lab 1. asm					Copy Select
Network	Files of type:	All Files				~	Cancel
		Projects ×	Files	Classes	1		
		⊡ ≣ lab1					
		🖶 値 He	ader Files				

17.或是加入新檔案: Source Files→滑鼠右鍵→New

a. 選擇 AssemblyFile.asm→輸入 File Name:, 選擇目錄→ Finish

Libraries
 Loadables

Important Files Linker Files Source Files Lab1.asm

b. 選擇 Other→Assembler→選擇 AssemblyFile.asm or AssemblyFile.s 均可→Finish

🔀 New AssemblyFile.asm		×
Steps	Name and Location	
 Choose File Type Name and Location 	File Name: newAsmTemplate1	
	Project: lab1	
	Folder:	Browse
	Created File: D:\data\RTC\RTC101\example\ex1\ab1.X\newAsmTemplate1.asm	
	< Back Next > Finish Cance	el Help

18.Source Files→點選檔案

19.编輯你的檔案

20.编譯程式

- a. Build
- b. Clear and Build





- 22.File → Project Properties → Simulator → Debug Options → Debug startup → Halt at Reset Vector
- 23.Debug reset \rightarrow ResetVector \rightarrow Apply \rightarrow OK
- 24. File \rightarrow Project Properties \rightarrow pic-as Linker \rightarrow General \rightarrow Custom linker options \rightarrow
 - ResetVector→填寫-presetVec=oh → Apply → OK
- 25. 此程式的第一部分是清除 0x20 ~ 0x7F RAM 為 0, 要如何看程式執行的結果是否正確?在 line 72 點一下,設中斷點於此, Window → Target Memory Views → File Registers

26.在 line 81 點一下,再次設中斷點,程式的第二部分是設 0x20~0x7F RAM 為 0xFF. 有修改過 內容的 file register 會被以紅色顯示

27.Window \rightarrow Debugging \rightarrow Stopwatch



28.File \rightarrow Project Properties \rightarrow Simulator \rightarrow Oscilator Options \rightarrow Instruction Frequency(Fcyc) \rightarrow 4 \rightarrow Apply \rightarrow OK

29.File →Project Properties →Loading → 勾選 Load symbols when programming or building for production → Apply → OK

General File Inclusion/Exclusion <u>Conf: [default]</u>	Load symbols when progra	mming or building for production (slows pr of dist/default/production/lab1.X.producti 1.X.production.unified.hex (merged with	ocess) on.hex or extra loadable	es)	
Simulator	Extra loadables:				
····· • Libraries	Item	Configuration	Include		Add Loadable Project
 Building iiii o pic-as Global Options 				~	Add Loadable File
 pic-as Assembler pic-as Linker 					Duplicate
					Remove
					Up
					Down
hanage configurations.					

 $_$. Lab2

1. 使用 Lab1 所學習到的 debug 技巧,比較 Lab1 & lab2 執行時間 & 程式記憶體所占空間 & RAM 所在位址

- 1. 依 lab1 步驟建立一個新 project, project name : lab3
- 2. 分別在"To Do" Key in 下列程式

call delay_1ms movlw VAL_US ; 1us movwf count ; 1us

3. Compile 成功後以 Stopwatch 觀看執行時間是否為 1ms?

;

4. 嘗試延遲時間改為 0.5, 10 & 20ms

四. Lab4

- 1. 在 MPLAB X IDE 環境中打開 lab4
- 2. 分別在"To Do" Key in 下列程式

bsf LATA2 ; bcf LATA2 ; movlw d_200 decfszc_200,f ;

五.Lab5

- 1. 在 MPLAB X IDE 中開啟 lab5
- 2. 分別在"To Do" Key in 下列程式

btfss SW3

goto pushkey

movlw on_count

- movwf on_time
- movlw off_count
- movwf off_time
- 3. 加碼練習: LED ON or OFF 的時間可以任意修改為 1~255ms

六. Lab6

- 1. 在 MPLAB X IDE 中開啟 lab6
- 2. 分別在"To Do" Key in 下列程式
 - movlw 0b10100001 movlw 0b0000000

movlw time_base movwf TMR0H bcf TMR0IF bsf T0EN

七. Lab7

- 1. 在 MPLAB X IDE 中開啟 lab7
- 2. 分別在"To Do" Key in 下列程式

movlw	0b00001101
movwf	RA2PPS
movlw	0b00000100 ; set PWM6 clock source from Timer2
movwf	CCPTMRS1

八. Lab8

- 1. 在 MPLAB X IDE 中開啟 lab8
- 2. 研讀 lab8 程式,嘗試解讀出每行指令的用途,請分享給大家聽.