



# 8051 實習

➡ 2018/03/19



### Example 3-21

Write a program to toggle all the bits of P1 every 200 ms. Assume that the crystal frequency is 11.0592 MHz, and that the system is using the AT89C51.

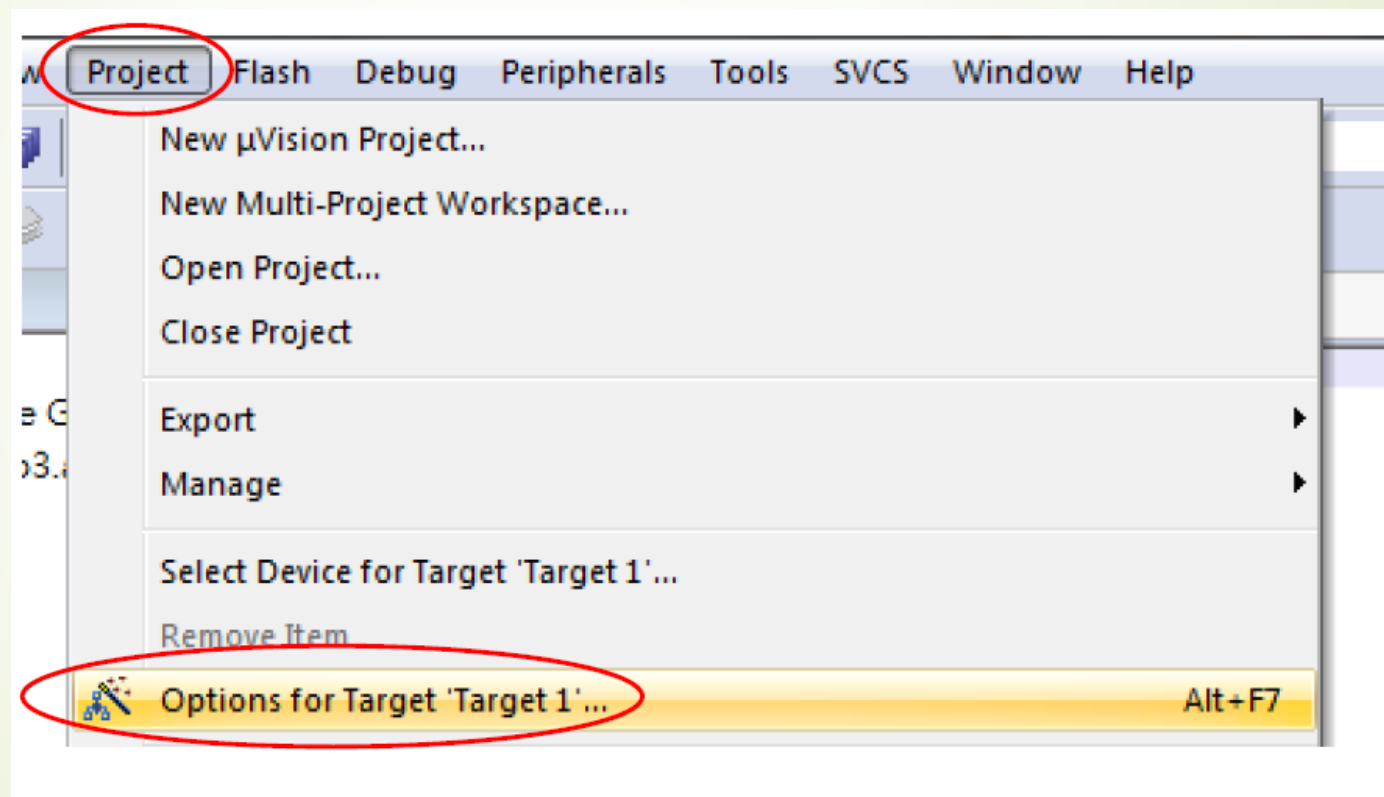
#### Solution:

;Tested for AT89C51 of 11.0592 MHz.

```
                MOV    A,#55H
AGAIN:          MOV    P1,A
                ACALL  DELAY
                CPL    A
                SJMP   AGAIN

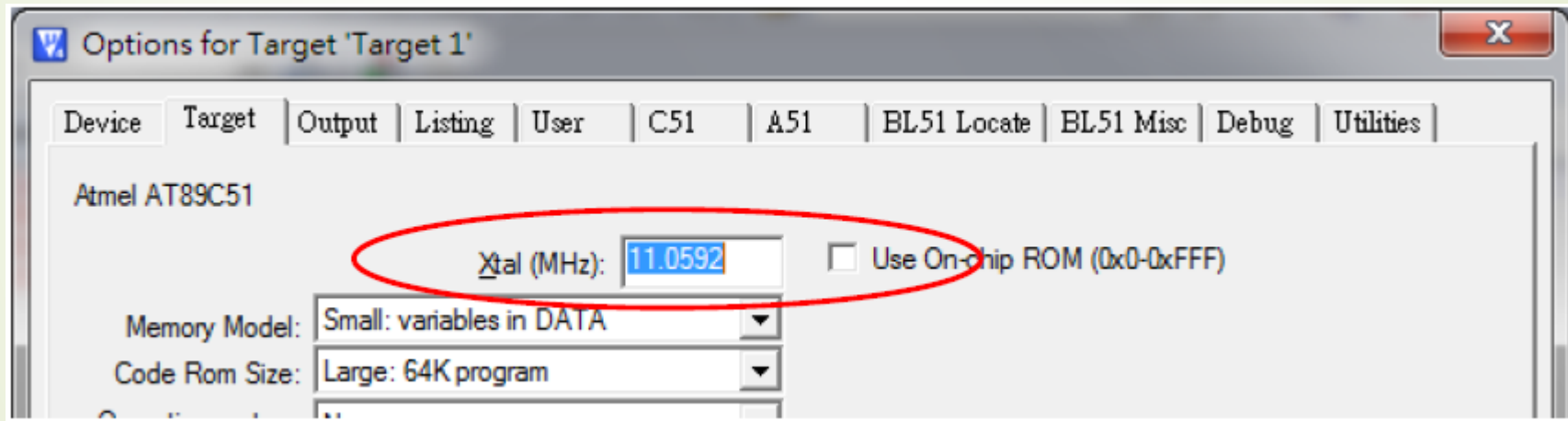
;----Time delay
DELAY:          MOV    R5,#2
HERE1:          MOV    R4,#180
HERE2:          MOV    R3,#255
HERE3:          DJNZ   R3,HERE3
                DJNZ   R4,HERE2
                DJNZ   R5,HERE1
                RET
```

# 更改XTAL



## 更改XTAL(Cont.)

- 更改頻率為11.0592MHZ



# 輸入程式碼

- 在ACALL DELAY這一行加入BreakPoint

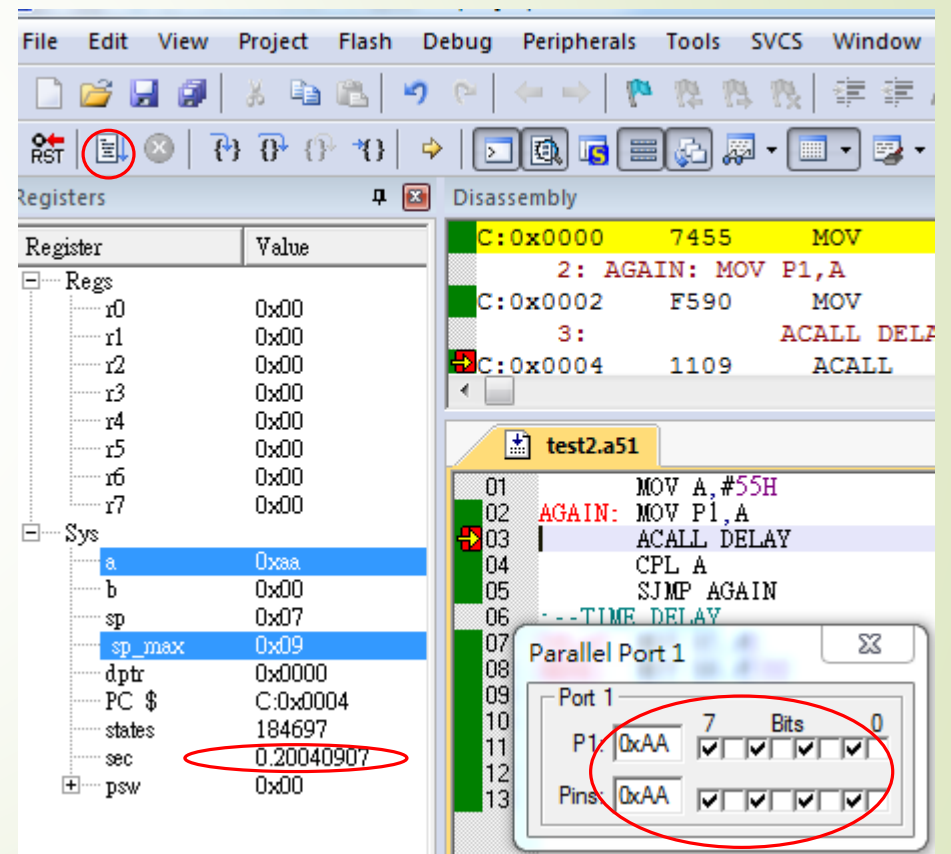
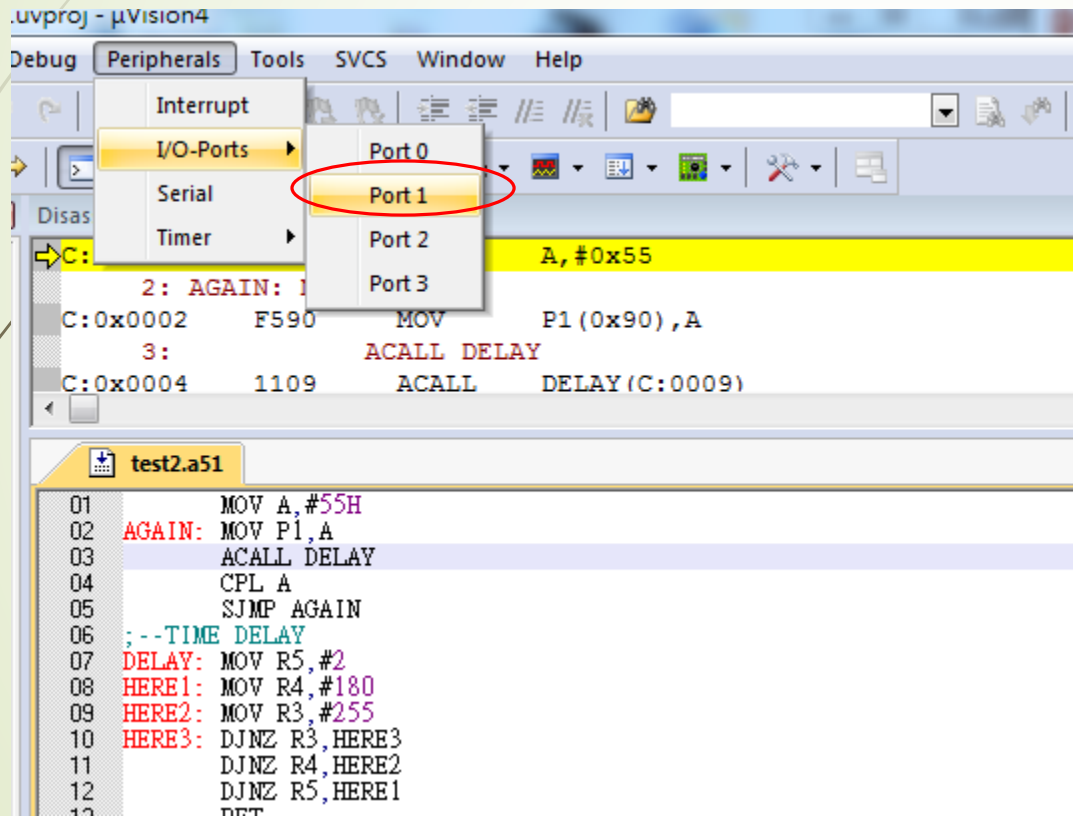
```
01 MOV A,#55H
02 AGAIN: MOV P1,A
03 ACALL DELAY
04 CPL A
05 SJMP AGAIN
06 ;--TIME DELAY
07 DELAY: MOV R5,#2
08 HERE1: MOV R4,#180
09 HERE2: MOV R3,#255
10 HERE3: DJNZ R3,HERE3
11 DJNZ R4,HERE2
12 DJNZ R5,HERE1
13 RET
```

```
ts\test.uvproj - μVision4
Debug Peripherals Tools SVCS Window Help
Start/Stop Debug Session Ctrl+F5
Reset CPU
Run F5
Stop
Step F11
Step Over F10
Step Out Ctrl+F11
Run to Cursor Line Ctrl+F10
Show Next Statement
Breakpoints... Ctrl+B
Insert/Remove Breakpoint F9
Enable/Disable Breakpoint Ctrl+F9
Disable All Breakpoints
Kill All Breakpoints Ctrl+Shift+F9
OS Support
Execution Profiling
Memory Map...
Inline Assembly...
Function Editor (Open Ini File)...
```

```
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02 AGAIN: MOV P1,A
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13 RET
```

# 觀察延遲時間和Port I的變化

- 在Debug模式下，點RUN觀察延遲時間和Port I的變化

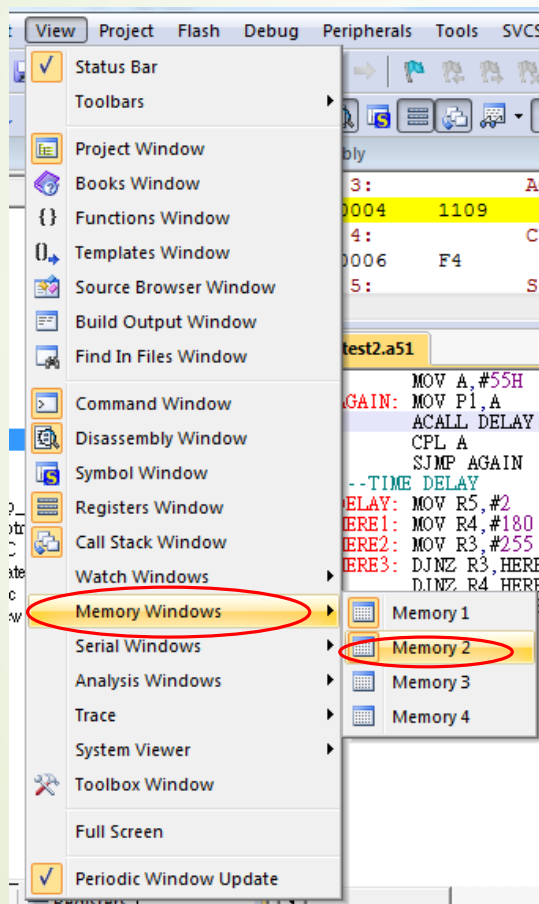




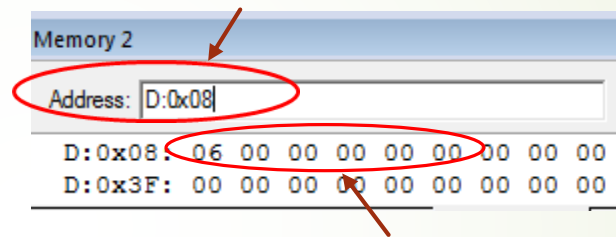
## 觀看Stack內容

- 因為stack內容是從Ram的08H開始放置
- 所以我們可以先設置Ram視窗，設置完畢後，執行程式的時候，就可以觀看stack內容了。

# 觀看Stack內容



在Address視窗內，鍵入D:0x08，就可以看RAM



Stack內容

CPU利用stack儲存CALL指令下方的指令位置  
可知道從Delay副函式回到主程式從哪個位置執行



# 練習

- 輸入程式碼，觀察Port1狀態及其變化的延遲時間和Stack暫存器內容並回答如何計算出Port1變化的延遲時間。

DJNZ: 減一,不等於0時跳

CPL: 取補數

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**Solution:**

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                DJNZ   R4,HERE2
                DJNZ   R5,HERE1
                RET
```