



8051 實習

➡ 2017/10/02



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.

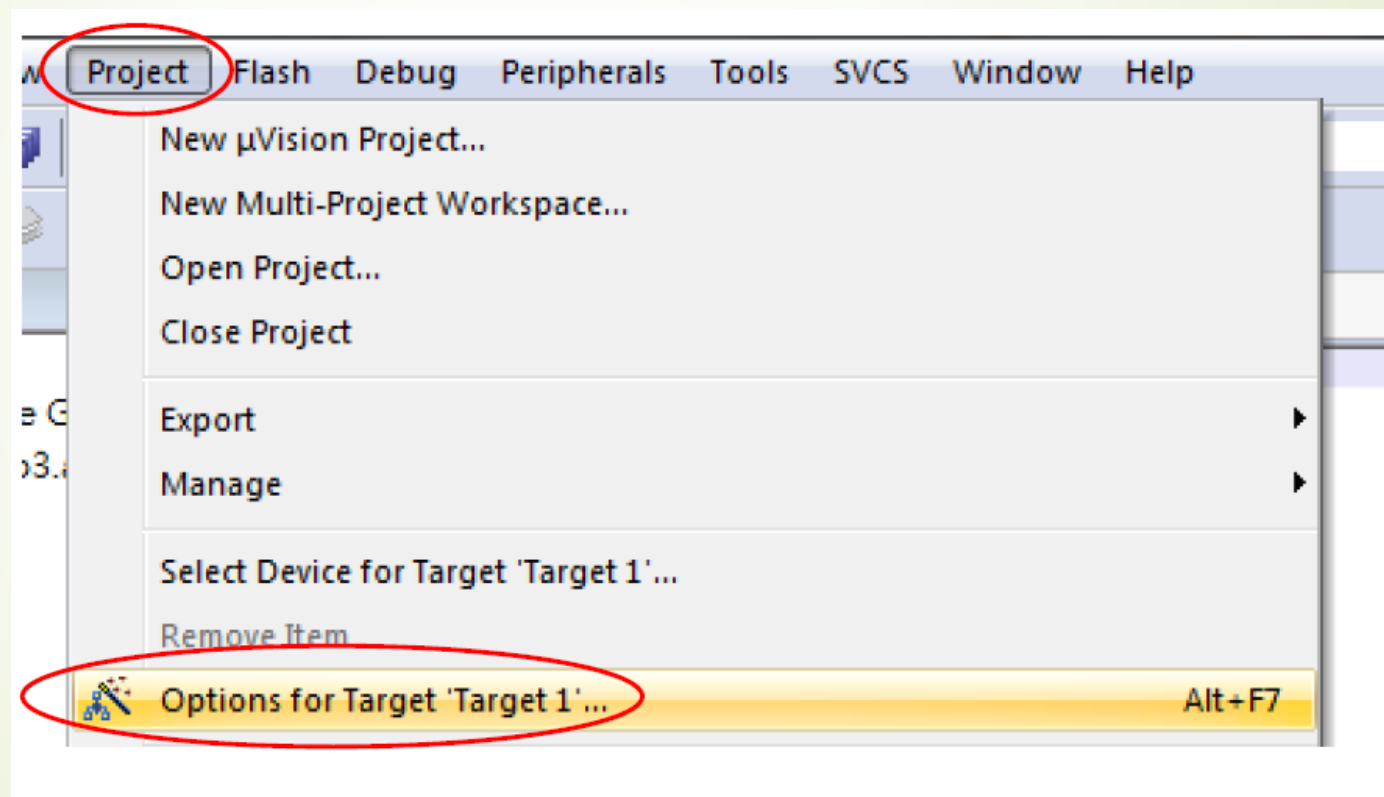
Solution:

;Tested for AT89C51 of 11.0592 MHz.

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

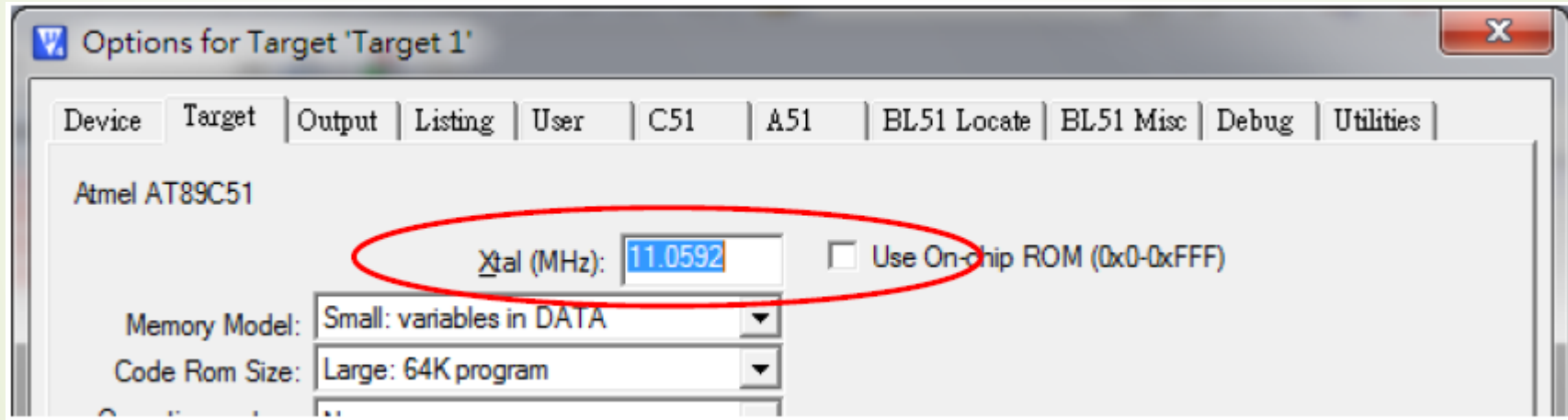
;----Time delay
DELAY:          MOV    R5,#2
HERE1:          MOV    R4,#180
HERE2:          MOV    R3,#255
HERE3:          DJNZ   R3,HERE3
                DJNZ   R4,HERE2
                DJNZ   R5,HERE1
                RET
```

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

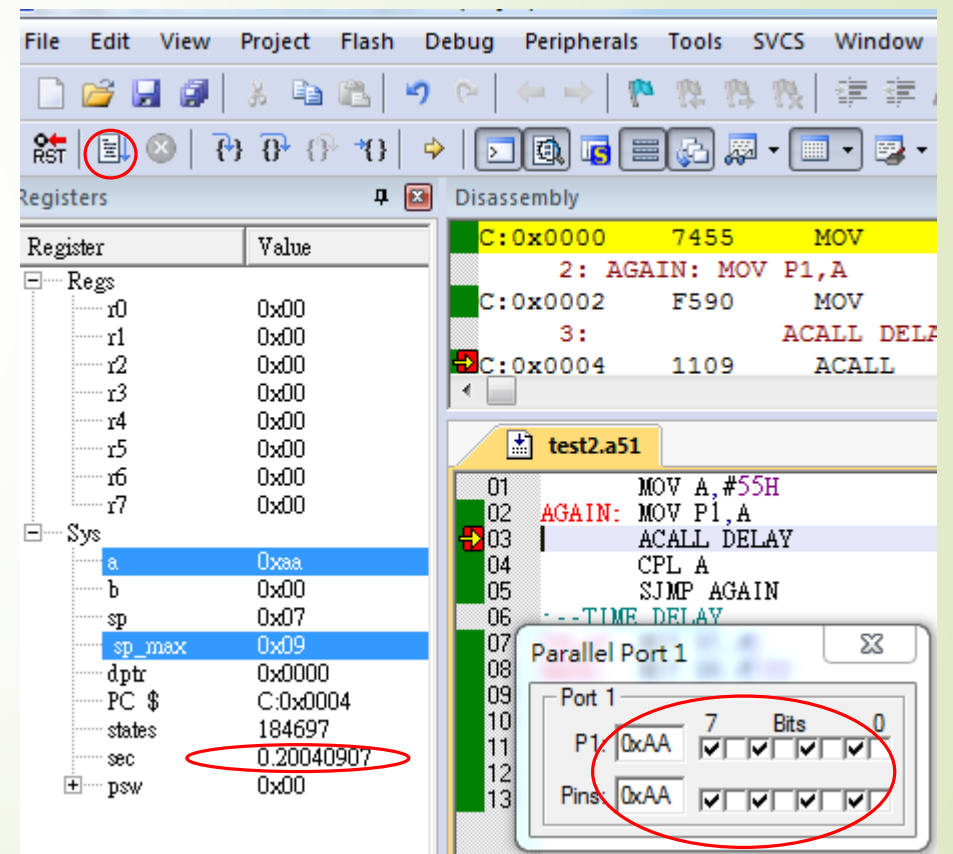
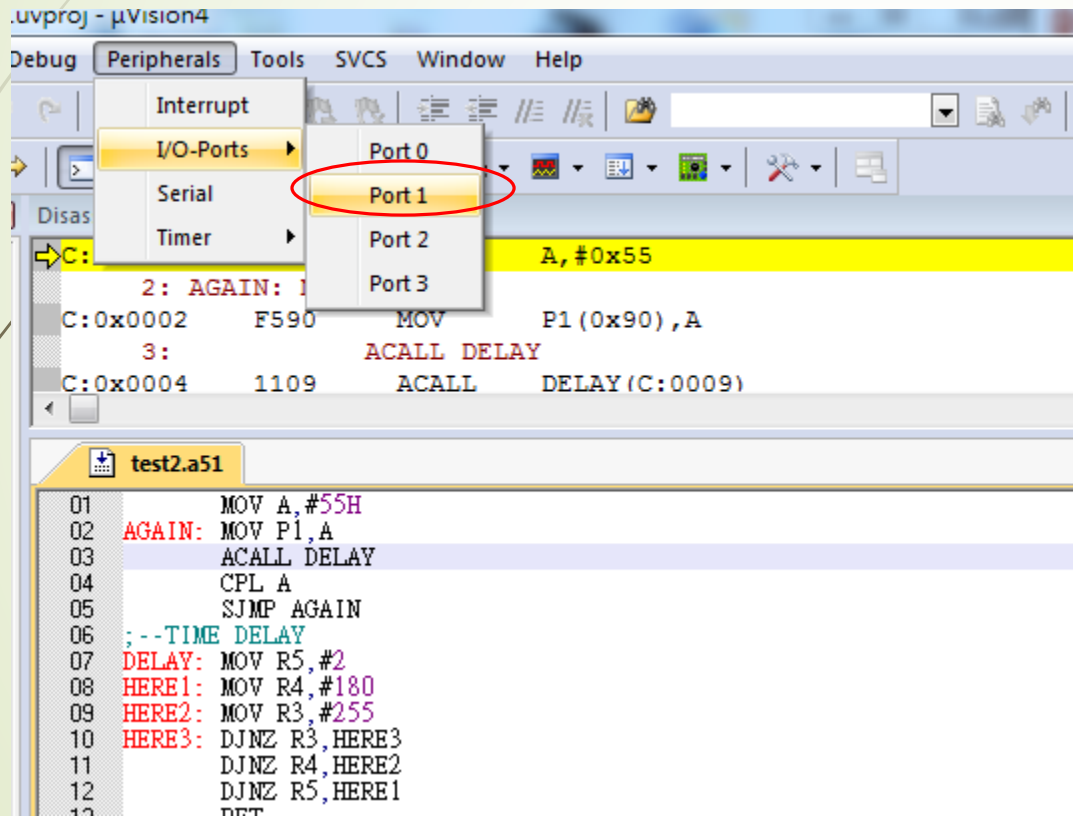
Debug Peripherals Tools SVCS Window Help

- 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)...

```
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
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10 HERE3: DJNZ R3, HERE3
11 DJNZ R4, HERE2
12 DJNZ R5, HERE1
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

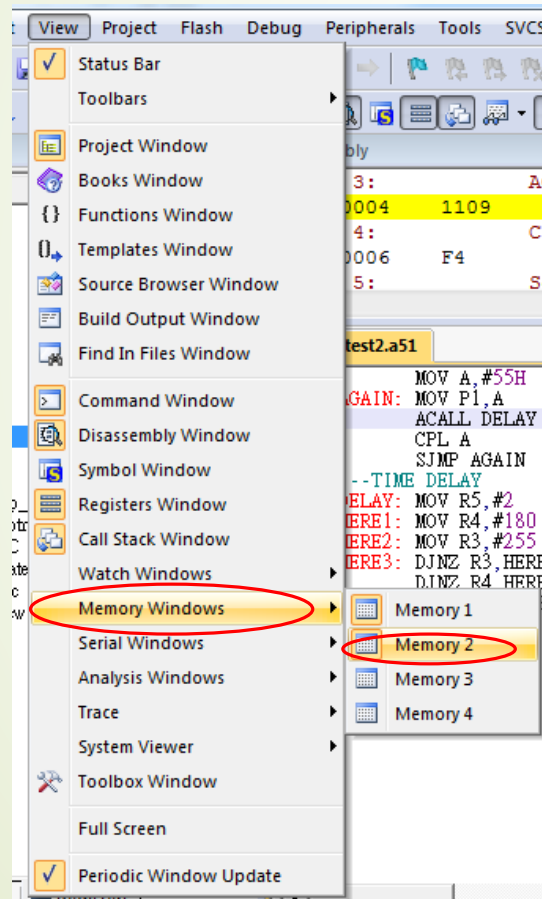




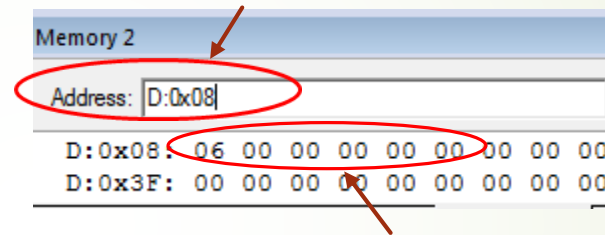
觀看Stack內容

- 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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```