

# Checkpoint2

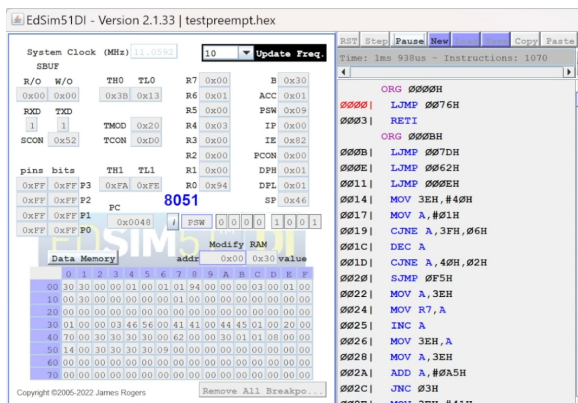
## 1.Typescript for compilation

I chose to implement on the Windows operating system, so I cannot use the 'rm' command. Here, I opted to use the 'del' command to achieve the same functionality.

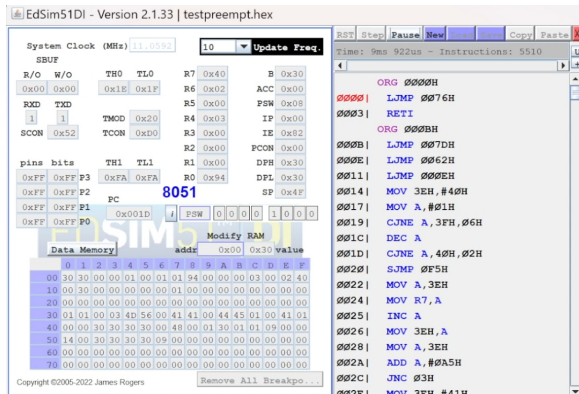
```
C:\清大資工\OS\112os\ppc2>make clean
del *.hex *.ihx *.lnk *.lst *.map *.mem *.rel *.rst *.sym

C:\清大資工\OS\112os\ppc2>make
sdcc -c testpreempt.c
sdcc -c preemptive.c
preemptive.c:279: warning 85: in function ThreadCreate unreferenced function argument : 'fp'
sdcc -o testpreempt.hex testpreempt.rel preemptive.rel
```

## 2-1.Take one screenshot before each ThreadCreate call. Explain how the stack changes

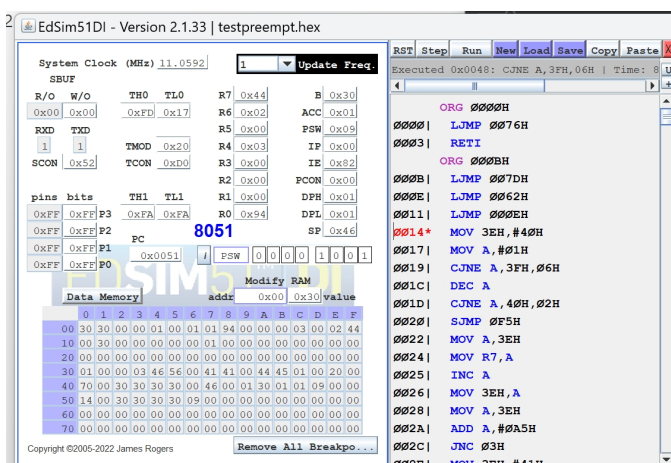


- 1.The original SP is stored in tempSP (0x38H), and the SP is changed to 0x3F (thread 0 stack).
- 2.Push DPL DPH in thread0 stack
- 3.Initial ACC,B,DPL,DPH,PSW value and push those in thread 0 stack,so SP in point to 0x46H
- 4.Restore original SP from tempSP and Save thread0 SP in 0x34H



- 1.The original SP is stored in tempSP (0x38H), and the SP is changed to 0x4F (thread 1 stack).
- 2.Push DPL DPH in thread 1 stack
- 3.Initial ACC,B,DPL,DPH,PSW value and push those in thread 1 stack,so SP in point to 0x56H
- 4.Restore original SP from tempSP and Save thread 1 SP in 0x35H

## 2-2.Take one screenshot when the Producer is running. How do you know?



Area	Addr	Size	Decimal Bytes (Attributes)
CSEG	00000014	0000037E =	894. bytes (REL,CON,CODE)
Value	Global	Global Defined In Module	
C: 00000014	._Producer	testpreempt	
C: 00000039	._Consumer	testpreempt	
C: 00000062	._main	testpreempt	
C: 00000076	._sdcc_gsinit_startup	testpreempt	
C: 0000007A	._mcs51_genRAMCLEAR	testpreempt	
C: 0000007B	._mcs51_genXINIT	testpreempt	
C: 0000007C	._mcs51_genXRAMCLEAR	testpreempt	
C: 0000007D	._timer0_ISR	testpreempt	
C: 00000081	._Bootstrap	preemptive	
C: 000000C9	._ThreadCreate	preemptive	
C: 00000189	._myTimer0Handler	preemptive	
C: 00000277	._ThreadYield	preemptive	
C: 00000360	._ThreadExit	preemptive	

ASxxxx Linker V03.00 + NoICE + sld, page 12.

Files Linked [ module(s) ]

testpreempt.rel [ ]

preemptive.rel [ ]

producer is running,because 0014 is the address of producer function.

## 2-3.Take one screenshot when the Consumer is running. How do you know?

EdSim51DI - Version 2.1.33 | testpreempt.hex

System Clock (MHz) 11.0592

SBUF

R/O	W/O	TH0	TL0	R7	B
0x00	0x00	0xFD	0x17	0x44	0x30

RXD TXD

1 1

TMOD 0x20

SCON 0x52

TCON 0xD0

pins bits

TH1 TL1

0xFF 0xFF P3 0xFA 0xFA

0xFF 0xFF P2

0xFF 0xFF P1 8051

0xFF 0xFF P0

PC 0x0051

PSW 0 0 0 0 1 0 0 1

Data Memory

addr	0x00	0x30	value
0	0	1	2
1	3	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
A	0	0	0
B	0	0	0
C	0	0	0
D	0	0	0
E	0	0	0
F	0	0	0

Modify RAM

Remove All Breakpo...

RST Step Run New Load Save Copy Paste

Executed 0x0048: CJNE A,3FH,06H | Time: 8

Address	Instruction
001C	DEC A
001D	CJNE A,40H,02H
0020	SJMP 0F5H
0022	MOV A,3EH
0024	MOV R7,A
0025	INC A
0026	MOV 3EH,A
0028	MOV A,3EH
002A	ADD A,#0A5H
002C	JNC 03H
002E	MOV 3EH,#41H
0031	MOV 3FH,#01H
0034	MOV 40H,#00H
0037	SJMP 0DEH
0039	ORL 09H,#20H
003C	MOV 8DH,#0FAH
003F	MOV 98H,#50H
0042	SETB 8EH
0044	SETB 99H
0046	MOV A,#01H
0048	CJNE A,3FH,06H

Area	Addr	Size	Decimal Bytes (Attributes)
CSEG	00000014	0000037E =	894. bytes (REL,CON,CODE)
	Value	Global	Global Defined In Module
C:	00000014	_Producer	testpreempt
C:	00000039	_Consumer	testpreempt
C:	00000062	_main	testpreempt
C:	00000076	__sdcc_gsinit_startup	testpreempt
C:	0000007A	__mcs51_genRAMCLEAR	testpreempt
C:	0000007B	__mcs51_genXINIT	testpreempt
C:	0000007C	__mcs51_genXRAMCLEAR	testpreempt
C:	0000007D	_timer0_ISR	testpreempt
C:	00000081	_Bootstrap	preemptive
C:	000000C9	_ThreadCreate	preemptive
C:	00000189	_myTimer0Handler	preemptive
C:	00000277	_ThreadYield	preemptive
C:	00000360	_ThreadExit	preemptive

ASxxxx Linker V03.00 + NoICE + sld, page 12.

Files Linked	[ module(s) ]
testpreempt.rel	[ ]
preemptive.rel	[ ]

consumer is running,because 0039 is the address of consumer function.

## 2-4.How can you tell that the interrupt is triggering on a regular basis?

Due to the PC address being switched between 0x17, 0x19(Producer's addr.), and 0x46, 0x48, 0x51(Consumer's addr.), interrupts are triggered on a regular basis.