

```

PS C:\Users\Howar\OneDrive\桌面\OS ppc\107034003-ppc3> make clean
del *.hex *.ihx *.lnk *.lst *.map *.mem *.rel *.rst *.sym *.asm *.lk
PS C:\Users\Howar\OneDrive\桌面\OS ppc\107034003-ppc3> make
sdcc -c testpreempt.c
testpreempt.c:31: warning 158: overflow in implicit constant conversion
sdcc -c preemptive.c
preemptive.c:89: warning 85: in function ThreadCreate unreferenced function argument : 'fp'
sdcc -o testpreempt.hex testpreempt.rel preemptive.rel
PS C:\Users\Howar\OneDrive\桌面\OS ppc\107034003-ppc3>

```

the address of functions

Value	Global	Global Defined In Module
00000014	__Producer	testpreempt
00000042	__Consumer	testpreempt
0000006B	__main	testpreempt
0000007D	__sdcc_gsinit_startup	testpreempt
00000081	__mcs51_genRAMCLEAR	testpreempt
00000082	__mcs51_genXINIT	testpreempt
00000083	__mcs51_genXRAMCLEAR	testpreempt
00000084	__timer0_ISR	testpreempt
00000088	__Bootstrap	preemptive
000000AE	__ThreadCreate	preemptive
0000013C	__ThreadYield	preemptive
0000019D	__myTimer0Handler	preemptive
00000223	__ThreadExit	preemptive

the address of variables

Value	Global	Global Defined In Module
00000000	__ABS__	preemptive
00000020	__buffer	testpreempt
00000021	__input	testpreempt
00000022	__mutex	testpreempt
00000023	__full	testpreempt
00000024	__empty	testpreempt
00000030	__savedSP	preemptive
00000034	__bitmap	preemptive
00000035	__cur_threadID	preemptive
00000036	__count	preemptive
00000037	__temp	preemptive
00000038	__new_threadID	preemptive

Before executing consumer(0042), the values of the three semaphore at 22,23,24 (mutex,full,empty respectively) are same as the initial value(1,0,1)

EdSim51DI - Version 2.1.29 | testpreempt.hex

System Clock (MHz): 11.0592 | 10000 Update Freq

RST Step Run New Load Save Copy Paste

Time: 295us - Instructions: 185

Assembly:

```

000291 MOV 20H,21H
0002C1 MOV A,45AH
0002E1 CJNE A,21H,05H
000311 MOV 21H,#41H
000341 SIMP 06H
000361 MOV A,21H
000381 MOV R7,A
000391 INC A
0003A1 MOV 21H,A
0003C1 INC 22H
0003E1 INC 23H
000401 SIMP 0D5H
00042* ORL 89H,#20H
000451 MOV 8DH,#0FAH
000481 MOV 98H,#050H
0004B1 SETB 8EH
0004D1 MOV A,23H
0004F1 JZ 0FCH

```

Data Memory:

Address	Value
00	00
01	00
02	00
03	00
04	00
05	00
06	00
07	00
08	00
09	00
0A	00
0B	00
0C	00
0D	00
0E	00
0F	00
10	00
11	00
12	00
13	00
14	00
15	00
16	00
17	00
18	00
19	00
1A	00
1B	00
1C	00
1D	00
1E	00
1F	00
20	00
21	00
22	01
23	00
24	01
25	00
26	00
27	00
28	00
29	00
2A	00
2B	00
2C	00
2D	00
2E	00
2F	00
30	46
31	56
32	00
33	00
34	00
35	00
36	00
37	00
38	00
39	00
3A	00
3B	00
3C	00
3D	00
3E	00
3F	00
40	7A
41	00
42	00
43	00
44	00
45	00
46	00
47	00
48	00
49	00
4A	00
4B	00
4C	00
4D	00
4E	00
4F	00
50	14
51	00
52	00
53	00
54	00
55	00
56	00
57	00
58	00
59	00
5A	00
5B	00
5C	00
5D	00
5E	00
5F	00
60	00
61	00
62	00
63	00
64	00
65	00
66	00
67	00
68	00
69	00
6A	00
6B	00
6C	00
6D	00
6E	00
6F	00
70	00
71	00
72	00
73	00
74	00
75	00
76	00
77	00
78	00
79	00
7A	00
7B	00
7C	00
7D	00
7E	00
7F	00

Modify RAM: addr: 0x00 0x00 value

Remove All Breakpoints

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Hardware components:

- Display-select Decoder CSIDAC WR
- Keypad Column 2
- Keypad Column 1
- Keypad Column 0
- Keypad Row 3
- Keypad Row 2
- Keypad Row 1
- Keypad Row 0
- LED 7Seg. aIDAC DB7LCD DB7
- LED 6Seg. aIDAC DB8LCD DB6
- LED 5Seg. aIDAC DB8LCD DB5
- LED 4Seg. aIDAC DB8LCD DB4
- LED 3L. aLDB8LCD DB3L RS
- LED 2L. cLDB8LCD DB2L E
- LED 1Seg. aIDAC DB8LCD DB1
- LED 0Seg. aIDAC DB8LCD DB0
- SW 7IADC DB7
- SW 6IADC DB6
- SW 5IADC DB5
- SW 4IADC DB4
- SW 3IADC DB3
- SW 2IADC DB2
- SW 1IADC DB1
- SW 0IADC DB0
- ADC 8BitComparator Output
- ADC WR
- Motor Sensor
- Display-select Input 1
- AND Gate OutputDisplay se.1 0
- ADC INTR
- Motor Control Bit IEat. UART Rx
- Motor Control Bit 0IEat. UART Tx

Hardware controls:

- AND Gate Disabled
- Key Bounce Disabled
- Standard
- No Parity
- 8-bit UART @ 4800 Baud
- Rx Reset
- Tx Send
- 0.0 V output
- Scope DAC
- ADC
- Motor Enabled

Hex display: 8888

When executing SBUF = buffer(MOV 99H, 20H) in the consumer, the values of semaphores become (0,0,0). Because the consumer is in the critical section, and hasn't consumed an input.

EdSim51DI - Version 2.1.29 | testpreempt.hex

System Clock (MHz): 11.0592 | 10000 Update Freq.

Time: 18ms 2us - Instructions: 11065

Assembly Window:

```

00042* ORL 89H,#20H
00045I MOV 8DH,#0FAH
00048I MOV 98H,#50H
0004BI SETB 8EH
0004DI MOV A,23H
0004FI JZ 0FCH
00051I JB 0E7H,0F9H
00054I DEC 23H
00056I MOV A,22H
00058I JZ 0FCH
0005AI JB 0E7H,0F9H
0005DI DEC 22H
0005F* MOV 99H,20H
00062I INC 22H
00064I INC 24H
00066I JBC 99H,0E4H
00069I SJMP 0FBH
0006BI MOV 23H,#00H
0006CI MOV 22H,#00H
  
```

Data Memory:

addr	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
00	30	00	00	01	00	01	01	31	30	00	00	00	00	00	41	
10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
20	41	42	00	00	00	00	00	00	00	00	00	00	00	00	00	
30	46	56	00	03	00	01	01	01	00	00	00	00	00	00	00	
40	43	00	00	01	00	08	30	00	00	00	00	00	00	00	00	
50	19	00	00	00	00	00	08	31	31	00	00	00	00	00	41	
60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	

Hardware Panel:

- Buttons: DI, LD, AND Gate Disabled, Key Bounce Disabled, Standard
- UART: 8-bit UART @ 4800 Baud, No Parity, Rx Reset, Tx Send
- ADC: 0.0 V input, 11111111, MAX, MIN, Motor Enabled
- 7-segment display: 8888

When executing buffer = input (MOV 20H, 21H) in the producer, the values of semaphores are also (0,0,0). Because the producer is in the critical section, and hasn't produced a new input to be consumed.

EdSim51DI - Version 2.1.29 | testpreempt.hex

System Clock (MHz): 11.0592 | 10000 Update Freq.

Time: 44ms 599us - Instructions: 26831

Assembly Window:

```

0000EI LJMP 006BH
00011I LJMP 000EH
00014* MOV 21H,#41H
00017I MOV A,24H
00019I JZ 0FCH
0001BI JB 0E7H,0F9H
0001EI DEC 24H
00020I MOV A,22H
00022I JZ 0FCH
00024I JB 0E7H,0F9H
00027I DEC 22H
00029* MOV 20H,21H
0002CI MOV A,#5AH
0002EI CINE A,21H,05H
00031I MOV 21H,#41H
00034I SJMP 06H
00036I MOV A,21H
00038I MOV R7,A
00039I INC A
  
```

Data Memory:

addr	0x00	0x01	0x02	0x03	0x04	0x05	0x06	0x07	0x08	0x09	0x0A	0x0B	0x0C	0x0D	0x0E	0x0F
00	30	00	00	01	00	01	01	30	31	00	00	00	00	00	42	
10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
20	42	43	00	00	00	00	00	00	00	00	00	00	00	00	00	
30	46	56	00	03	01	01	02	01	00	00	00	00	00	00	00	
40	43	00	00	01	00	08	30	00	00	00	00	00	00	00	42	
50	17	00	00	00	00	00	08	31	31	00	00	00	00	00	42	
60	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	
70	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	

Hardware Panel:

- Buttons: DI, LD, AND Gate Disabled, Key Bounce Disabled, Standard
- UART: 8-bit UART @ 4800 Baud, No Parity, Rx Reset, Tx Send
- ADC: 0.0 V input, 11111111, MAX, MIN, Motor Enabled
- 7-segment display: 8888