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3.1 Typescript for compilation

```
User@LAPTOP-59VRNRON /cygdrive/C/Users/User/Desktop/Homework/Checkpoint3
$ make clean
rm *.hex *.ihx *.lnk *.lst *.map *.mem *.rel *.rst *.sym
rm: cannot remove '*.ihx': No such file or directory
rm: cannot remove '*.lnk': No such file or directory
make: *** [Makefile:25: clean] Error 1

User@LAPTOP-59VRNRON /cygdrive/C/Users/User/Desktop/Homework/Checkpoint3
$ make
sdcc -c testpreempt.c
testpreempt.c:72: warning 158: overflow in implicit constant conversion
sdcc -c preemptive.c
preemptive.c:258: warning 85: in function ThreadCreate unreferenced function argument : 'fp'
sdcc -o testpreempt.hex testpreempt.rel preemptive.rel

User@LAPTOP-59VRNRON /cygdrive/C/Users/User/Desktop/Homework/Checkpoint3
$
```

3.2 Screenshots and explanation

The file “testpreempt.map” shows that the function Producer starts from the line 0014 and that the function Consumer starts from the line 0058.

In Producer :

When executing DEC 2AH in the line 001C, it decreases the value of empty by one since it is doing SemaphoreWait(empty).

The screenshot displays the Proton51 simulator interface. The top section shows the System Clock (MHz) at 11.0592 and the Update Freq. set to 1000. The left panel shows the I/O and pins configuration. The right panel shows the instruction list, with the current instruction being DEC 2AH at address 001C. The bottom panel shows the Data Memory and the Modify RAM section.

Address	Instruction
001C*	DEC 2AH
001E	MOV 0E0H,28H
0021	JZ 0FBH
0023*	DEC 28H
0025	MOV A,2BH
0027	ADD A,#23H
0029	MOV R0,A
002A	MOV @R0,27H
002C	MOV R6,2BH
002E	MOV R7,#00H
0030	MOV 82H,R6
0032	MOV 83H,R7
0034	INC DPTR
0035	MOV 08H,#03H
0038	MOV 09H,R7
003A	LCALL 03A7H
003D	MOV R6,82H
003F	MOV R7,83H
0041	MOV 2BH,R6

System Clock (MHz) 11.0592
1000
Update Freq.

R/O
W/O
TH0
TL0
R7
0x00
B
0x00

0x00
0x00
0x02
0x04
R6
0x00
ACC
0x03

RXD
TXD
TMOD
0x20
R5
0x00
PSW
0x10

1
1
TCON
0xD0
R4
0x00
IP
0x00

SCON
0x50
PC
0x001E
R3
0x00
IE
0x82

pins
bits
TH1
TL1
R2
0x00
PCON
0x00

0xFF
0xFF
P3
0xFA
0xFE
R1
0x00
DPH
0x00

0xFF
0xFF
P2
PC
8051
R0
0x00
DPL
0x00

0xFF
0xFF
P1
PSW
0
0
0
1
0
0
0
0
1

0xFF
0xFF
P0
Modify RAM

Data Memory
addr
0x00
0x00
value

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	02	5F	51	00	00	00	01	41	01	00	02	00	00	00	00	00
30	3F	56	66	6F	06	02	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	63	00	00	00	02	00	08	00	00	00	00	00	00	00	00	00
60	14	00	00	00	00	00	11	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	00

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Remove All Breakpoints

RST Step Run New Load Save Copy Paste
Executed 0x001C: DEC 2AH | Time: 8ms 983us - Instru

```

001C* DEC 2AH
001E MOV 0E0H,28H
002H JZ 0FBH
0023* DEC 28H
0025I MOV A,2BH
0027I ADD A,#23H
0029I MOV R0,A
002AI MOV @R0,27H
002CI MOV R6,2BH
002EI MOV R7,#00H
0030I MOV 82H,R6
0032I MOV 83H,R7
0034I INC DPTR
0035I MOV 08H,#03H
0038I MOV 09H,R7
003AI LCALL 03A7H
003DI MOV R6,82H
003FI MOV R7,83H
0041I MOV 2BH,R6

```

When executing DEC 28H in the line 0023, it decreases the value of mutex by one since it is doing SemaphoreWait(mutex).

System Clock (MHz) 11.0592
1000
Update Freq.

R/O
W/O
TH0
TL0
R7
0x00
B
0x00

0x00
0x00
0x02
0x08
R6
0x00
ACC
0x01

RXD
TXD
TMOD
0x20
R5
0x00
PSW
0x11

1
1
TCON
0xD0
R4
0x00
IP
0x00

SCON
0x50
PC
0x0023
R3
0x00
IE
0x82

pins
bits
TH1
TL1
R2
0x00
PCON
0x00

0xFF
0xFF
P3
0xFA
0xFC
R1
0x00
DPH
0x00

0xFF
0xFF
P2
PC
8051
R0
0x00
DPL
0x00

0xFF
0xFF
P1
PSW
0
0
0
1
0
0
0
0
1

0xFF
0xFF
P0
Modify RAM

Data Memory
addr
0x00
0x00
value

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	02	5F	51	00	00	00	01	41	01	00	02	00	00	00	00	00
30	3F	56	66	6F	06	02	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	63	00	00	00	02	00	08	00	00	00	00	00	00	00	00	00
60	14	00	00	00	00	00	11	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	00

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RST Step Run New Load Save Copy Paste
Time: 8ms 988us - Instructions: 4159

```

001C* DEC 2AH
001EI MOV 0E0H,28H
002H JZ 0FBH
0023* DEC 28H
0025I MOV A,2BH
0027I ADD A,#23H
0029I MOV R0,A
002AI MOV @R0,27H
002CI MOV R6,2BH
002EI MOV R7,#00H
0030I MOV 82H,R6
0032I MOV 83H,R7
0034I INC DPTR
0035I MOV 08H,#03H
0038I MOV 09H,R7
003AI LCALL 03A7H
003DI MOV R6,82H
003FI MOV R7,83H
0041I MOV 2BH,R6

```

System Clock (MHz) 11.0592

1000 Update Freq.

SBUF

R/O	W/O	TH0	TL0	R7	0x00	B	0x00
0x00	0x00	0x02	0x09	R6	0x00	ACC	0x01
RXD	TXD			R5	0x00	PSW	0x11
1	1	TMOD	0x20	R4	0x00	IP	0x00
SCON	0x50	TCON	0xD0	R3	0x00	IE	0x82
				R2	0x00	PCON	0x00
pins	bits	TH1	TL1	R1	0x00	DPH	0x00
0xFF	0xFF	P3	0xFA	0xFD	R0	DPL	0x00
0xFF	0xFF	P2				SP	0x5F
0xFF	0xFF	P1					
0xFF	0xFF	P0					

PC

0x0025

8051

PSW

0 0 0 1 0 0 0 1

Modify RAM

addr 0x00 0x00 value

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	00	E6	00	00	00	00	00	00
10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	02	5F	51	00	00	00	01	41	00	00	02	00	00	00	00	00
30	3F	56	66	6F	06	02	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	63	00	00	00	02	00	08	00	00	00	00	00	00	00	00	00
60	14	00	00	00	00	00	11	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	00

Remove All Breakpoints

RST Step Run New Load Save Copy Paste

Executed 0x0023: DEC 28H | Time: 8ms 989us - Instru

001C* DEC 2AH

001EI MOV 0E0H,28H

002II JZ 0FBH

0023* DEC 28H

0025I MOV A,2BH

0027I ADD A,#23H

0029I MOV R0,A

002AI MOV @R0,27H

002CI MOV R6,2BH

002EI MOV R7,#00H

0030I MOV 82H,R6

0032I MOV 83H,R7

0034I INC DPTR

0035I MOV 08H,#03H

0038I MOV 09H,R7

003AI LCALL 03A7H

003DI MOV R6,82H

003FI MOV R7,83H

004II MOV 2BH,R6

When executing INC 28H in the line 0052, it increases the value of mutex by one since it is doing SemaphoreSignal(mutex).

System Clock (MHz) 11.0592

1000 Update Freq.

SBUF

R/O	W/O	TH0	TL0	R7	0x00	B	0xFE
0x00	0x00	0x05	0x02	R6	0x01	ACC	0x42
RXD	TXD			R5	0x00	PSW	0x50
1	1	TMOD	0x20	R4	0x00	IP	0x00
SCON	0x50	TCON	0xD0	R3	0x00	IE	0x82
				R2	0x00	PCON	0x00
pins	bits	TH1	TL1	R1	0x00	DPH	0x00
0xFF	0xFF	P3	0xFA	0xFC	R0	DPL	0x01
0xFF	0xFF	P2				SP	0x5F
0xFF	0xFF	P1					
0xFF	0xFF	P0					

PC

0x0052

8051

PSW

0 1 0 1 0 0 0 0

Modify RAM

addr 0x00 0x00 value

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	01	00	00	00	00	00	00	00
10	23	00	00	00	00	00	01	00	00	00	00	00	00	00	00	00
20	02	5F	51	41	00	00	01	42	00	00	02	01	00	00	00	00
30	3F	56	66	6F	06	02	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	63	00	00	00	02	00	08	00	00	00	00	00	00	00	00	00
60	3D	00	CE	03	00	00	11	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	00

Remove All Breakpoints

RST Step Run New Load Save Copy Paste

Time: 9ms 85us - Instructions: 4227

002CI MOV R6,2BH

002EI MOV R7,#00H

0030I MOV 82H,R6

0032I MOV 83H,R7

0034I INC DPTR

0035I MOV 08H,#03H

0038I MOV 09H,R7

003AI LCALL 03A7H

003DI MOV R6,82H

003FI MOV R7,83H

004II MOV 2BH,R6

0043I MOV A,#5AH

0045I CJNE A,27H,05H

0048I MOV 27H,#41H

004BI SJMP 05H

004DI MOV A,27H

004FI INC A

0050I MOV 27H,A

0052* INC 28H

System Clock (MHz) 11.0592
1000
Update Freq.

R/O
W/O
TH0
TL0
R7
0x00
B
0xFE

0x00
0x00
0x05
0x03
R6
0x01
ACC
0x42

RXD
TXD
1
1
TMOD
0x20
R5
0x00
PSW
0x50

SCON
0x50
TCON
0xD0
R4
0x00
IP
0x00

pins
bits
TH1
TL1
R3
0x00
IE
0x82

0xFF
0xFF
P3
0xFA
0xFD
R2
0x00
PCON
0x00

0xFF
0xFF
P2
R1
0x00
DPH
0x00

0xFF
0xFF
P1
PC
0x0054
R0
0x23
DPL
0x01

0xFF
0xFF
P0
PSW
0
1
0
1
0
0
0
0
0
SP
0x5F

Modify RAM

Data Memory

addr
0x00
0x00
value

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	01	00	00	00	00	00	00	00
10	23	00	00	00	00	00	01	00	00	00	00	00	00	00	00	00
20	02	5F	51	41	00	00	01	42	01	00	02	01	00	00	00	00
30	3F	56	66	6F	06	02	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	63	00	00	00	02	00	08	00	00	00	00	00	00	00	00	00
60	3D	00	CE	03	00	00	11	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	00

Remove All Breakpoints

RST
Step
Run
New
Load
Save
Copy
Paste

Executed 0x0052: INC 28H | Time: 9ms 86us - Instruc

002EI
MOV R7,#00H

0030I
MOV 82H,R6

0032I
MOV 83H,R7

0034I
INC DPTR

0035I
MOV 08H,#03H

0038I
MOV 09H,R7

003AI
LCALL 03A7H

003DI
MOV R6,82H

003FI
MOV R7,83H

0041I
MOV 2BH,R6

0043I
MOV A,#5AH

0045I
CJNE A,27H,05H

0048I
MOV 27H,#41H

004BI
SJMP 05H

004DI
MOV A,27H

004FI
INC A

0050I
MOV 27H,A

0052*
INC 28H

0054*
INC 29H

When executing INC 29H in the line 0054, it increases the value of full by one since it is doing SemaphoreSignal(full).

System Clock (MHz) 11.0592
1000
Update Freq.

R/O
W/O
TH0
TL0
R7
0x00
B
0xFE

0x00
0x00
0x05
0x03
R6
0x01
ACC
0x42

RXD
TXD
1
1
TMOD
0x20
R5
0x00
PSW
0x50

SCON
0x50
TCON
0xD0
R4
0x00
IP
0x00

pins
bits
TH1
TL1
R3
0x00
IE
0x82

0xFF
0xFF
P3
0xFA
0xFD
R2
0x00
PCON
0x00

0xFF
0xFF
P2
R1
0x00
DPH
0x00

0xFF
0xFF
P1
PC
0x0054
R0
0x23
DPL
0x01

0xFF
0xFF
P0
PSW
0
1
0
1
0
0
0
0
0
SP
0x5F

Modify RAM

Data Memory

addr
0x00
0x00
value

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	01	00	00	00	00	00	00	00
10	23	00	00	00	00	00	01	00	00	00	00	00	00	00	00	00
20	02	5F	51	41	00	00	01	42	01	00	02	01	00	00	00	00
30	3F	56	66	6F	06	02	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	63	00	00	00	02	00	08	00	00	00	00	00	00	00	00	00
60	3D	00	CE	03	00	00	11	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	00

Remove All Breakpoints

RST
Step
Run
New
Load
Save
Copy
Paste

Executed 0x0052: INC 28H | Time: 9ms 86us - Instruc

002EI
MOV R7,#00H

0030I
MOV 82H,R6

0032I
MOV 83H,R7

0034I
INC DPTR

0035I
MOV 08H,#03H

0038I
MOV 09H,R7

003AI
LCALL 03A7H

003DI
MOV R6,82H

003FI
MOV R7,83H

0041I
MOV 2BH,R6

0043I
MOV A,#5AH

0045I
CJNE A,27H,05H

0048I
MOV 27H,#41H

004BI
SJMP 05H

004DI
MOV A,27H

004FI
INC A

0050I
MOV 27H,A

0052*
INC 28H

0054*
INC 29H

System Clock (MHz) 11.0592 1000 Update Freq.

SBUF

R/O	W/O	TH0	TL0	R7	0x00	B	0xFE
0x00	0x00	0x05	0x04	R6	0x01	ACC	0x42
RXD	TXD			R5	0x00	PSW	0x50
1	1	TMOD	0x20	R4	0x00	IP	0x00
SCON	0x50	TCON	0xD0	R3	0x00	IE	0x82
				R2	0x00	PCON	0x00
pins	bits	TH1	TL1	R1	0x00	DPH	0x00
0xFF	0xFF	P3	0xFA	0xFE		DPL	0x01
0xFF	0xFF	P2				SP	0x5F
0xFF	0xFF	P1					
0xFF	0xFF	P0					

PC 8051 0x0056 PSW 0 1 0 1 0 0 0 0

Modify RAM

Data Memory

addr	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
10	23	00	00	00	00	00	01	00	00	00	00	00	00	00	00	00
20	02	5F	51	41	00	00	01	42	01	01	02	01	00	00	00	00
30	3F	56	66	6F	06	02	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	63	00	00	00	02	00	08	00	00	00	00	00	00	00	00	00
60	3D	00	CE	03	00	00	11	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	00

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Executed 0x0054: INC 29H | Time: 9ms 87us - Instruc

```

0030 MOV 82H,R6
0032 MOV 83H,R7
0034 INC DPTR
0036 MOV 08H,#03H
0038 MOV 09H,R7
003A LCALL 03A7H
003C MOV R6,82H
003E MOV R7,83H
0040 MOV 2BH,R6
0042 MOV A,#5AH
0044 CJNE A,27H,05H
0046 MOV 27H,#41H
0048 SJMP 05H
004A MOV A,27H
004C INC A
004E MOV 27H,A
0050 INC 28H
0052 INC 29H
0054 SJMP 0BFH

```

In Consumer :

When executing DEC 29H in the line 0068, it decreases the value of full by one since it is doing SemaphoreWait(full).

System Clock (MHz) 11.0592 1000 Update Freq.

SBUF

R/O	W/O	TH0	TL0	R7	0x00	B	0x00
0x00	0x00	0x02	0x0E	R6	0x00	ACC	0x03
RXD	TXD			R5	0x00	PSW	0x08
1	1	TMOD	0x20	R4	0x00	IP	0x00
SCON	0x50	TCON	0xD0	R3	0x00	IE	0x82
				R2	0x00	PCON	0x00
pins	bits	TH1	TL1	R1	0x00	DPH	0x00
0xFF	0xFF	P3	0xFA	0xFE		DPL	0x02
0xFF	0xFF	P2				SP	0x4F
0xFF	0xFF	P1					
0xFF	0xFF	P0					

PC 8051 0x0068 PSW 0 0 0 0 1 0 0 0

Modify RAM

Data Memory

addr	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	01	00	00	00	00	00	00	00
10	25	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	02	5F	51	41	42	43	01	44	01	03	00	00	00	00	00	00
30	3F	56	66	6F	06	01	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	63	00	00	00	02	00	08	00	00	00	00	00	00	00	00	00
60	1A	00	00	00	00	00	10	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	00

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Time: 17ms 883us - Instructions: 8338

```

0036 MOV R7,83H
0040 MOV 2BH,R6
0042 MOV A,#5AH
0044 CJNE A,27H,05H
0046 MOV 27H,#41H
0048 SJMP 05H
004A MOV A,27H
004C INC A
004E MOV 27H,A
0050 INC 28H
0052 INC 29H
0054 SJMP 0BFH
0056 ORL 89H,#20H
0058 MOV 8DH,#0FAH
005A MOV 98H,#50H
005C SETB 8EH
005E MOV 0E0H,29H
0060 JZ 0FBH
0062 DEC 29H

```

System Clock (MHz) 11.0592

1000 Update Freq.

SBUF

R/O W/O TH0 TL0

0x00 0x00 0x02 0x0F

RXD TXD

1 1

SCON

0x50

TMOD

0x20

TCON

0xD0

pins bits

0xFF 0xFF P3

0xFF 0xFF P2

0xFF 0xFF P1

0xFF 0xFF P0

TH1 TL1

0xFA 0xFF

PC

0x006A

8051

PSW 0 0 0 0 1 0 0 0

Modify RAM

addr 0x00 0x00 value

Data Memory

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	00	01	00	00	00	00	00	00
10	25	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	02	5F	51	41	42	43	01	44	01	02	00	00	00	00	00	00
30	3F	56	66	6F	06	01	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	63	00	00	00	02	00	08	00	00	00	00	00	00	00	00	00
60	1A	00	00	00	00	10	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	00

Remove All Breakpoints

RST Step Run New Load Save Copy Paste

Executed 0x0068: DEC 29H | Time: 17ms 884us - Instr

0041I MOV 2BH,R6

0043I MOV A,#5AH

0045I CJNE A,27H,05H

0048I MOV 27H,#41H

004BI SJMP 05H

004DI MOV A,27H

004FI INC A

0050I MOV 27H,A

0052* INC 28H

0054* INC 29H

0056I SJMP 0BFH

0058I ORL 89H,#20H

005BI MOV 8DH,#0FAH

005EI MOV 98H,#50H

0061I SETB 8EH

0063I MOV 0E0H,29H

0066I JZ 0FBH

0068* DEC 29H

006AI MOV 0E0H,28H

When executing DEC 28H in the line 006F, it decreases the value of mutex by one since it is doing SemaphoreWait(mutex).

System Clock (MHz) 11.0592

1000 Update Freq.

SBUF

R/O W/O TH0 TL0

0x00 0x00 0x02 0x13

RXD TXD

1 1

SCON

0x50

TMOD

0x20

TCON

0xD0

pins bits

0xFF 0xFF P3

0xFF 0xFF P2

0xFF 0xFF P1

0xFF 0xFF P0

TH1 TL1

0xFA 0xFD

PC

0x006F

8051

PSW 0 0 0 0 1 0 0 1

Modify RAM

addr 0x00 0x00 value

Data Memory

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	01	00	00	00	00	00	00	00
10	25	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	02	5F	51	41	42	43	01	44	01	02	00	00	00	00	00	00
30	3F	56	66	6F	06	01	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	63	00	00	00	02	00	08	00	00	00	00	00	00	00	00	00
60	1A	00	00	00	00	10	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	00

Remove All Breakpoints

RST Step Run New Load Save Copy Paste

Time: 17ms 888us - Instructions: 8341

0045I CJNE A,27H,05H

0048I MOV 27H,#41H

004BI SJMP 05H

004DI MOV A,27H

004FI INC A

0050I MOV 27H,A

0052* INC 28H

0054* INC 29H

0056I SJMP 0BFH

0058I ORL 89H,#20H

005BI MOV 8DH,#0FAH

005EI MOV 98H,#50H

0061I SETB 8EH

0063I MOV 0E0H,29H

0066I JZ 0FBH

0068* DEC 29H

006AI MOV 0E0H,28H

006DI JZ 0FBH

006F* DEC 28H

System Clock (MHz) 11.0592
1000
Update Freq.

R/O
W/O
TH0
TL0
R7
0x00
B
0x00

0x00
0x00
0x02
0x14
R6
0x00
ACC
0x01

RXD
TXD
TMOD
0x20
R5
0x00
PSW
0x09

1
1
SCON
0x50
TCON
0xD0
R4
0x00
IP
0x00

pins
bits
TH1
TL1
R3
0x00
IE
0x82

0xFF
0xFF
P3
0xFA
0xFE
R2
0x00
PCON
0x00

0xFF
0xFF
P2
PC
8051
DPH
0x00

0xFF
0xFF
P1
0x0071
R1
0x00
DPL
0x02

0xFF
0xFF
P0
PSW
0
0
0
0
1
0
0
1

Modify RAM
Data Memory
addr
0x00
0x00
value

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	01	00	00	00	00	00	00	00
10	25	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	02	5F	51	41	42	43	01	44	00	02	00	00	00	00	00	00
30	3F	56	66	6F	06	01	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	63	00	00	00	02	00	08	00	00	00	00	00	00	00	00	00
60	1A	00	00	00	00	10	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	00

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RST Step Run New Load Save Copy Paste
Executed 0x006F: DEC 28H | Time: 17ms 890us - Instr

0048 MOV 27H,#41H
004B SJMP 05H
004D MOV A,27H
004F INC A
0050 MOV 27H,A
0052* INC 28H
0054* INC 29H
0056 SJMP 0BFH
0058 ORL 89H,#20H
005B MOV 8DH,#0FAH
005E MOV 98H,#50H
0061 SETB 8EH
0063 MOV 0E0H,29H
0066 JZ 0FBH
0068* DEC 29H
006A MOV 0E0H,28H
006D JZ 0FBH
006F* DEC 28H
0071 MOV A,2CH

When executing INC 28H in the line 0094, it increases the value of mutex by one since it is doing SemaphoreSignal(mutex).

System Clock (MHz) 11.0592
1000
Update Freq.

R/O
W/O
TH0
TL0
R7
0x00
B
0xFE

0x00
0x41
0x38
0x19
R6
0x01
ACC
0x01

RXD
TXD
TMOD
0x20
R5
0x00
PSW
0xC9

1
1
SCON
0x50
TCON
0xD0
R4
0x00
IP
0x00

pins
bits
TH1
TL1
R3
0x00
IE
0x82

0xFF
0xFF
P3
0xFA
0xFD
R2
0x00
PCON
0x00

0xFF
0xFF
P2
PC
8051
DPH
0x00

0xFF
0xFF
P1
0x0094
R1
0x00
DPL
0x01

0xFF
0xFF
P0
PSW
1
1
0
0
1
0
0
1

Modify RAM
Data Memory
addr
0x00
0x00
value

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	01	00	00	00	00	00	01	00	00
10	25	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	02	5F	51	41	42	43	01	44	00	02	00	00	01	00	00	00
30	3F	56	66	6F	06	01	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	89	00	CE	03	02	00	08	00	00	00	00	00	00	00	00	00
60	1A	00	00	00	00	10	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	00

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RST Step Run New Load Save Copy Paste
Time: 19ms 770us - Instructions: 9229

006F* DEC 28H
0071 MOV A,2CH
0073 ADD A,#23H
0075 MOV R1,A
0076 MOV 99H,@R1
0078 MOV R6,2CH
007A MOV R7,#00H
007C MOV 82H,R6
007E MOV 83H,R7
0080 INC DPTR
0082 MOV 08H,#03H
0084 MOV 09H,R7
0086 LCALL 03A7H
0089 MOV R6,82H
008B MOV R7,83H
008D MOV 2CH,R6
008F JBC 99H,02H
0092 SJMP 0FBH
0094* INC 28H

System Clock (MHz) 11.0592

1000 Update Freq.

SBUF

R/O W/O TH0 TL0 R7 0x00 B 0xFE

0x00 0x41 0x38 0x1A R6 0x01 ACC 0x01

RXD TXD 1 1 TMOD 0x20 R5 0x00 PSW 0xC9

SCON 0x50 TCON 0xD0 R4 0x00 IP 0x00

R3 0x00 IE 0x82

R2 0x00 PCON 0x00

R1 0x00 DPH 0x00

R0 0x01 DPL 0x01

SP 0x4F

pins bits TH1 TL1

0xFF 0xFF P3 0xFA 0xFE

0xFF 0xFF P2

0xFF 0xFF P1

0xFF 0xFF P0

PC 0x0096

PSW 1 1 0 0 1 0 0 1

Modify RAM

addr 0x00 0x00 value

Data Memory

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	01	00	00	00	00	00	01	00
10	25	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	02	5F	51	41	42	43	01	44	01	02	00	00	01	00	00	00
30	3F	56	66	6F	06	01	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	89	00	CE	03	02	00	08	00	00	00	00	00	00	00	00	00
60	1A	00	00	00	00	00	10	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	00

Remove All Breakpoints

RST Step Run New Load Save Copy Paste

Executed 0x0094: INC 28H | Time: 19ms 771us - Instr

00711 MOV A,2CH

00731 ADD A,#23H

00751 MOV R1,A

00761 MOV 99H,@R1

00781 MOV R6,2CH

007A1 MOV R7,#00H

007C1 MOV 82H,R6

007E1 MOV 83H,R7

00801 INC DPTR

00811 MOV 08H,#03H

00841 MOV 09H,R7

00861 LCALL 03A7H

00891 MOV R6,82H

008B1 MOV R7,83H

008D1 MOV 2CH,R6

008F1 JBC 99H,02H

00921 SJMP 0FBH

0094* INC 28H

0096* INC 2AH

When executing INC 2AH in the line 0096, it increases the value of empty by one since it is doing SemaphoreSignal(empty).

System Clock (MHz) 11.0592

1000 Update Freq.

SBUF

R/O W/O TH0 TL0 R7 0x00 B 0xFE

0x00 0x41 0x38 0x1A R6 0x01 ACC 0x01

RXD TXD 1 1 TMOD 0x20 R5 0x00 PSW 0xC9

SCON 0x50 TCON 0xD0 R4 0x00 IP 0x00

R3 0x00 IE 0x82

R2 0x00 PCON 0x00

R1 0x00 DPH 0x00

R0 0x01 DPL 0x01

SP 0x4F

pins bits TH1 TL1

0xFF 0xFF P3 0xFA 0xFE

0xFF 0xFF P2

0xFF 0xFF P1

0xFF 0xFF P0

PC 0x0096

PSW 1 1 0 0 1 0 0 1

Modify RAM

addr 0x00 0x00 value

Data Memory

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	01	00	00	00	00	00	01	00
10	25	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	02	5F	51	41	42	43	01	44	01	02	00	00	01	00	00	00
30	3F	56	66	6F	06	01	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	89	00	CE	03	02	00	08	00	00	00	00	00	00	00	00	00
60	1A	00	00	00	00	00	10	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	00

Remove All Breakpoints

RST Step Run New Load Save Copy Paste

Executed 0x0094: INC 28H | Time: 19ms 771us - Instr

00711 MOV A,2CH

00731 ADD A,#23H

00751 MOV R1,A

00761 MOV 99H,@R1

00781 MOV R6,2CH

007A1 MOV R7,#00H

007C1 MOV 82H,R6

007E1 MOV 83H,R7

00801 INC DPTR

00811 MOV 08H,#03H

00841 MOV 09H,R7

00861 LCALL 03A7H

00891 MOV R6,82H

008B1 MOV R7,83H

008D1 MOV 2CH,R6

008F1 JBC 99H,02H

00921 SJMP 0FBH

0094* INC 28H

0096* INC 2AH

System Clock (MHz)11.05921000Update Freq.

SBUF

R/O

W/O

TH0

TL0

R7

0x00

B

0xFE

0x00

0x41

0x38

0x1B

R6

0x01

ACC

0x01

RXD

TXD

1

1

TMOD

0x20

R5

0x00

PSW

0xC9

SCON

0x50

TCON

0xD0

R4

0x00

IP

0x00

R3

0x00

IE

0x82

R2

0x00

PCON

0x00

R1

0x00

DPH

0x00

R0

0x01

DPL

0x01

SP

0x4F

pins

bits

TH1

TL1

PC

0x0098

PSW

1

1

0

0

1

0

0

1

Modify RAM

addr

0x00

0x00

value

Data Memory

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	00	00	00	00	00	00	00	01	00	00	00	00	00	01	00
10	25	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	02	5F	51	41	42	43	01	44	01	02	01	00	01	00	00	00
30	3F	56	66	6F	06	01	00	00	00	00	00	00	00	00	00	00
40	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	89	00	CE	03	02	00	08	00	00	00	00	00	00	00	00	00
60	1A	00	00	00	00	00	10	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	00

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Remove All Breakpoints

RSTStepRunNewLoadSaveCopyPaste

Executed 0x0096: INC 2AH | Time: 19ms 772us - Instr

0073I

ADD A,#23H

0075I

MOV R1,A

0076I

MOV 99H,@R1

0078I

MOV R6,2CH

007AI

MOV R7,#00H

007CI

MOV 82H,R6

007EI

MOV 83H,R7

0080I

INC DPTR

0081I

MOV 08H,#03H

0084I

MOV 09H,R7

0086I

LCALL 03A7H

0089I

MOV R6,82H

008BI

MOV R7,83H

008DI

MOV 2CH,R6

008FI

JBC 99H,02H

0092I

SJMP 0FBH

0094*

INC 28H

0096*

INC 2AH

0098I

SJMP 0C9H