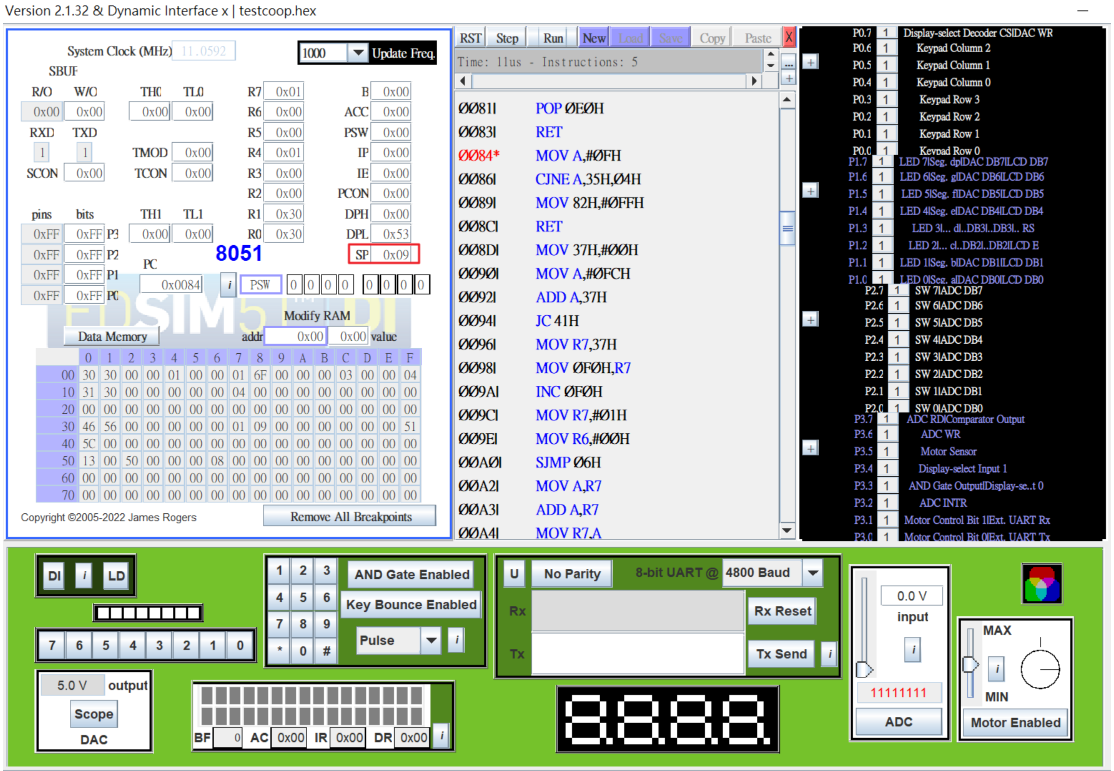
109062318 簡弘哲

1. Stack changes before and after ThreadCreate call
   According to .map file, the address of _ThreadCreate is 0084, so I set a breakpoint on there. After it stops, I keep pressing step button until SP changes to 0x3F, which is the stack pointer for main.



Version 2.1.32 & Dynamic Interface x | testcoop.hex

```
System Clock (MHz) 11.0592        1000  Update Freq.
SBUF
R/O   W/O     TH0   TL0      R7 0x01      B    0x00
0x00  0x00    0x00  0x00     R6 0x00      ACC  0x00
RXD   TXD                    R5 0x00      PSW  0x00
1     1       TMOD  0x00     R4 0x01      IP   0x00
SCON  0x00    TCON  0x00     R3 0x00      IE   0x00
                             R2 0x00      PCON 0x00
pins  bits    TH1   TL1      R1 0x30      DPH  0x00
0xFF  0xFF P3 0x00  0x00     R0 0x30      DPL  0x53
0xFF  0xFF P2           8051              SP   0x09
0xFF  0xFF P1   PC
0xFF  0xFF P0   0x0084     PSW 0 0 0 0  0 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 30 30 00 00 01 00 00 01 6F 00 00 00 03 00 00 04
10 31 30 00 00 00 00 00 04 00 00 00 00 00 00 00 00
20 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
30 46 56 00 00 00 00 00 01 09 00 00 00 00 00 00 51
40 5C 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
50 13 00 50 00 00 00 08 00 00 00 00 00 00 00 00 00
60 00 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 00
```

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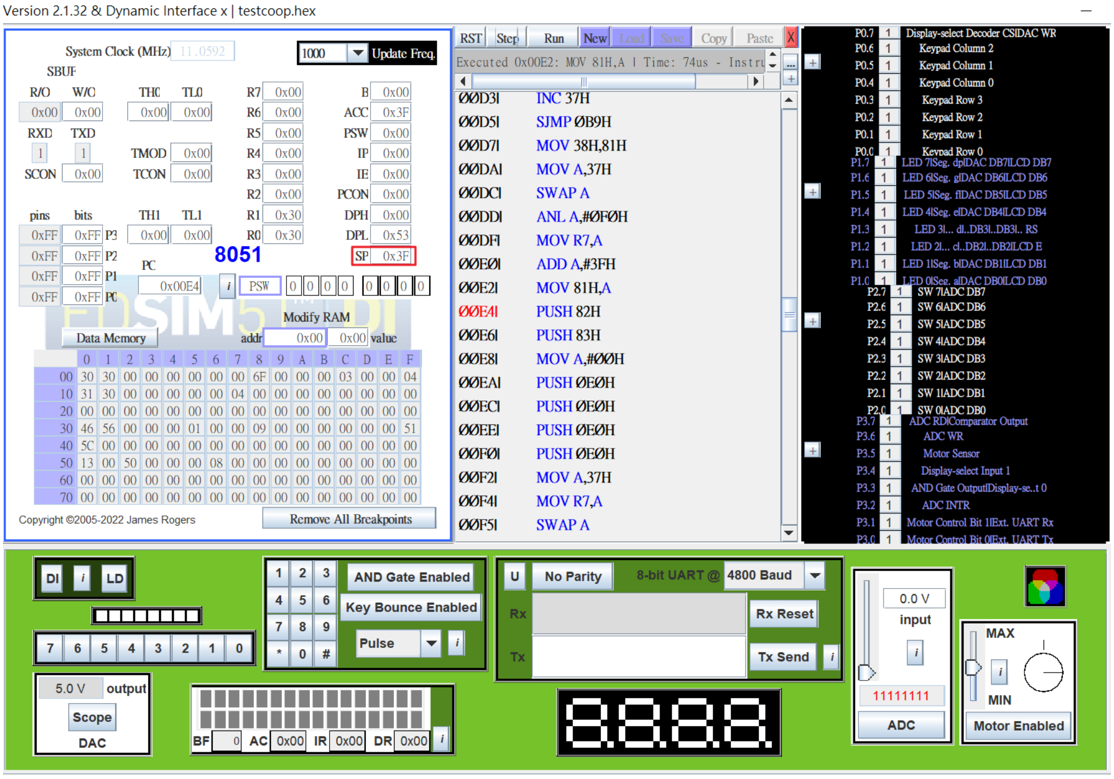
```
Time: 11us - Instructions: 5

ØØ81|    POP ØEØH
ØØ83|    RET
ØØ84*    MOV A,#ØFH
ØØ86|    CJNE A,35H,Ø4H
ØØ89|    MOV 82H,#ØFFH
ØØ8C|    RET
ØØ8D|    MOV 37H,#ØØH
ØØ9Ø|    MOV A,#ØFCH
ØØ92|    ADD A,37H
ØØ94|    JC 41H
ØØ96|    MOV R7,37H
ØØ98|    MOV ØFØH,R7
ØØ9A|    INC ØFØH
ØØ9C|    MOV R7,#Ø1H
ØØ9E|    MOV R6,#ØØH
ØØAØ|    SJMP Ø6H
ØØA2|    MOV A,R7
ØØA3|    ADD A,R7
ØØA4|    MOV R7,A
```



Version 2.1.32 & Dynamic Interface x | testcoop.hex

```
System Clock (MHz) 11.0592        1000  Update Freq.
SBUF
R/O   W/O     TH0   TL0      R7 0x00      B    0x00
0x00  0x00    0x00  0x00     R6 0x00      ACC  0x3F
RXD   TXD                    R5 0x00      PSW  0x00
1     1       TMOD  0x00     R4 0x00      IP   0x00
SCON  0x00    TCON  0x00     R3 0x00      IE   0x00
                             R2 0x00      PCON 0x00
pins  bits    TH1   TL1      R1 0x30      DPH  0x00
0xFF  0xFF P3 0x00  0x00     R0 0x30      DPL  0x53
0xFF  0xFF P2           8051              SP   0x3F
0xFF  0xFF P1   PC
0xFF  0xFF P0   0x00E4     PSW 0 0 0 0  0 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 30 30 00 00 00 00 00 00 6F 00 00 00 03 00 00 04
10 31 30 00 00 00 00 00 04 00 00 00 00 00 00 00 00
20 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
30 46 56 00 00 00 01 00 00 09 00 00 00 00 00 00 51
40 5C 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
50 13 00 50 00 00 00 08 00 00 00 00 00 00 00 00 00
60 00 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 00
```

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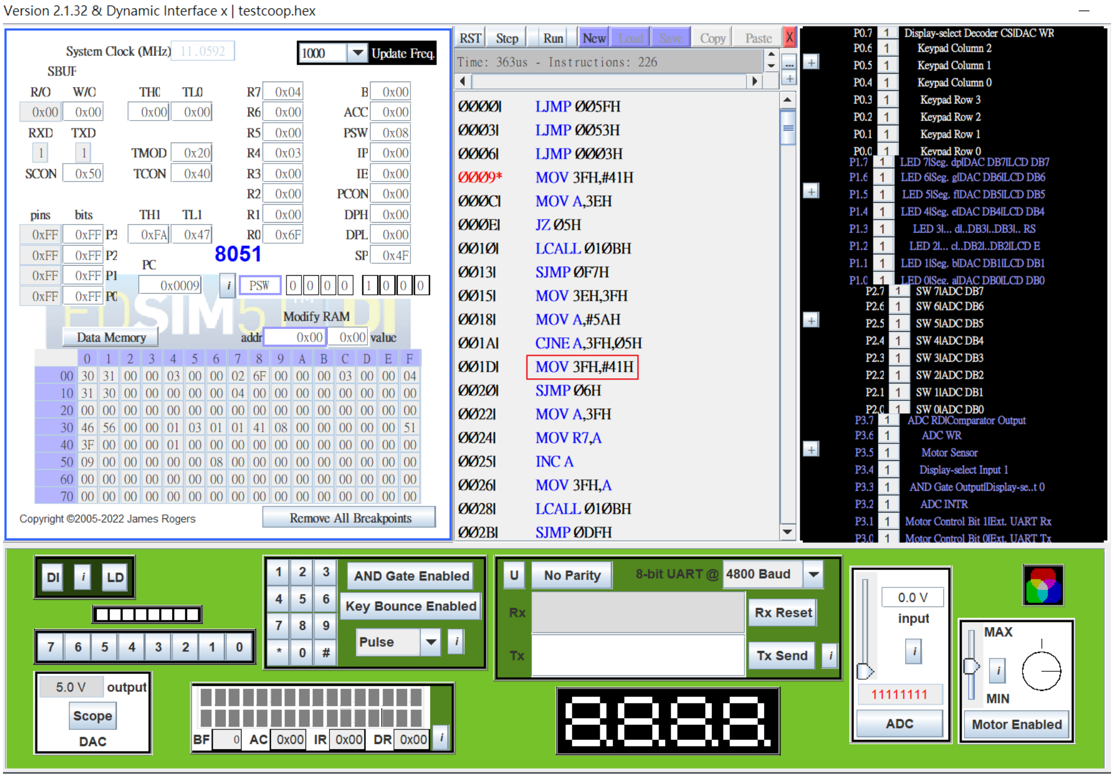
```
Executed 0x00E2: MOV 81H,A | Time: 74us - Instru

ØØD3|    INC 37H
ØØD5|    SJMP ØB9H
ØØD7|    MOV 38H,81H
ØØDA|    MOV A,37H
ØØDC|    SWAP A
ØØDD|    ANL A,#ØFØH
ØØDF|    MOV R7,A
ØØEØ|    ADD A,#3FH
ØØE2|    MOV 81H,A
ØØE4|    PUSH 82H
ØØE6|    PUSH 83H
ØØE8|    MOV A,#ØØH
ØØEA|    PUSH ØEØH
ØØEC|    PUSH ØEØH
ØØEE|    PUSH ØEØH
ØØFØ|    PUSH ØEØH
ØØF2|    MOV A,37H
ØØF4|    MOV R7,A
ØØF5|    SWAP A
```

2. Producer running

According to .map file, the address of _Producer is 0009, so I set a breakpoint on there. The red block part(address 001D) is the initialization of Producer, which corresponds to the code ch=’A’ (ch at address 0x3F)



Version 2.1.32 & Dynamic Interface x | testcoop.hex

System Clock (MHz) 11.0592   1000 Update Freq.

SBUF R/O 0x00 W/O 0x00   TH0 0x00 TL0 0x00
RXD 1 TXD 1   TMOD 0x20
SCON 0x50   TCON 0x40
TH1 0xFA TL1 0x47

pins / bits: P3 0xFF 0xFF, P2 0xFF 0xFF, P1 0xFF 0xFF, P0 0xFF 0xFF

R7 0x04, R6 0x00, R5 0x00, R4 0x03, R3 0x00, R2 0x00, R1 0x00, R0 0x6F

B 0x00, ACC 0x00, PSW 0x08, IP 0x00, IE 0x00, PCON 0x00, DPH 0x00, DPL 0x00, SP 0x4F

8051

PC 0x0009   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	30	31	00	00	03	00	00	02	6F	00	00	00	03	00	00	04
10	31	30	00	00	00	00	00	04	00	00	00	00	00	00	00	00
20	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30	46	56	00	00	01	03	01	01	41	08	00	00	00	00	00	51
40	3F	00	00	00	01	00	00	00	00	00	00	00	00	00	00	00
50	09	00	00	00	00	00	08	00	00	00	00	00	00	00	00	00
60	00	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	00

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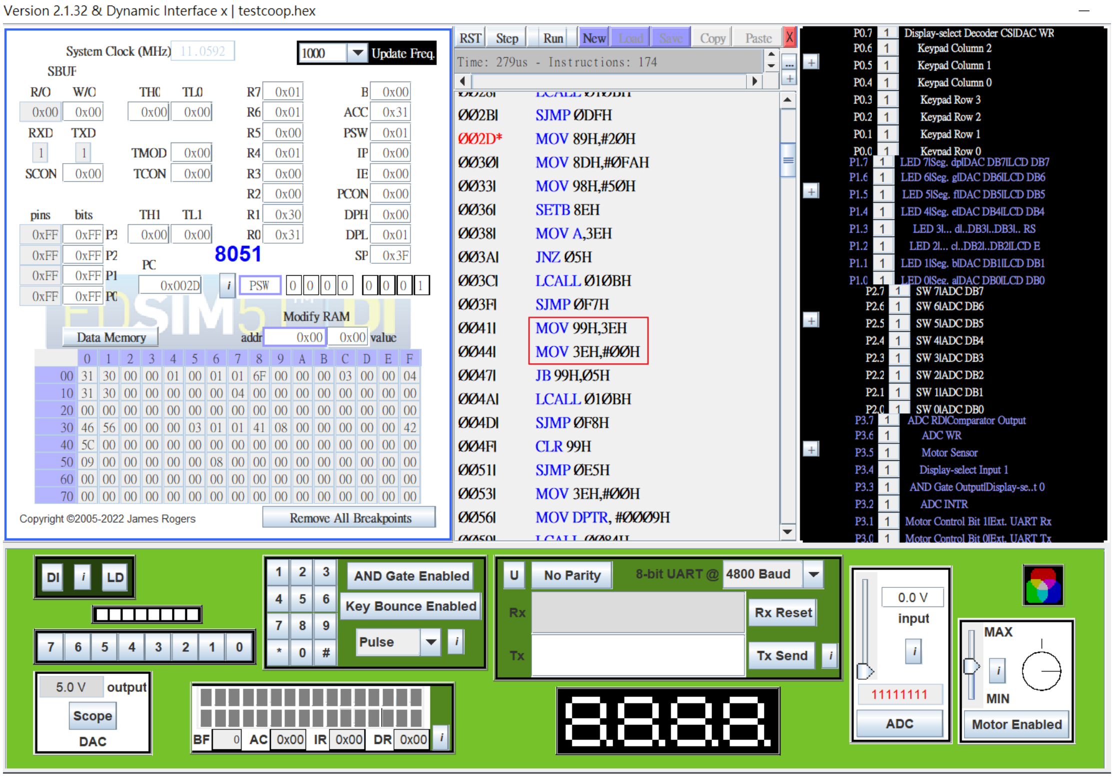
```
Time: 363us - Instructions: 226

ØØØØ|   LJMP ØØ5FH
ØØØ3|   LJMP ØØ53H
ØØØ6|   LJMP ØØØ3H
ØØØ9*   MOV 3FH,#41H
ØØØC|   MOV A,3EH
ØØØE|   JZ Ø5H
ØØ1Ø|   LCALL Ø1ØBH
ØØ13|   SJMP ØF7H
ØØ15|   MOV 3EH,3FH
ØØ18|   MOV A,#5AH
ØØ1A|   CJNE A,3FH,Ø5H
ØØ1D|   MOV 3FH,#41H
ØØ2Ø|   SJMP Ø6H
ØØ22|   MOV A,3FH
ØØ24|   MOV R7,A
ØØ25|   INC A
ØØ26|   MOV 3FH,A
ØØ28|   LCALL Ø1ØBH
ØØ2B|   SJMP ØDFH
```

3. Consumer running

According to .map file, the address of _Consumer is 002D, so I set a breakpoint on there. The red block part(address 0041~0044) is the code that I write to SBUF for output



Version 2.1.32 & Dynamic Interface x | testcoop.hex

System Clock (MHz) 11.0592 — 1000 Update Freq.

Time: 279us - Instructions: 174

```
002D*   MOV 89H,#20H
0030|   MOV 8DH,#0FAH
0033|   MOV 98H,#50H
0036|   SETB 8EH
0038|   MOV A,3EH
003A|   JNZ 05H
003C|   LCALL 010BH
003F|   SJMP 0F7H
0041|   MOV 99H,3EH
0044|   MOV 3EH,#00H
0047|   JB 99H,05H
004A|   LCALL 010BH
004D|   SJMP 0F8H
004F|   CLR 99H
0051|   SJMP 0E5H
0053|   MOV 3EH,#00H
0056|   MOV DPTR, #0009H
```

SBUF R/O 0x00, W/O 0x00; RXD 1, TXD 1; SCON 0x00; TH0 0x00, TL0 0x00; TMOD 0x00; TCON 0x00; TH1 0x00, TL1 0x00

R7 0x01, R6 0x01, R5 0x00, R4 0x01, R3 0x00, R2 0x00, R1 0x30, R0 0x31

B 0x00, ACC 0x31, PSW 0x01, IP 0x00, IE 0x00, PCON 0x00, DPH 0x00, DPL 0x01, SP 0x3F

PC 0x002D; PSW 0 0 0 0 0 0 0 1

Modify RAM addr 0x00 value 0x00

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	31	30	00	00	01	00	01	01	6F	00	00	00	03	00	00	04
10	31	30	00	00	00	00	00	04	00	00	00	00	00	00	00	00
20	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
30	46	56	00	00	00	03	01	01	41	08	00	00	00	00	00	42
40	5C	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
50	09	00	00	00	00	00	08	00	00	00	00	00	00	00	00	00
60	00	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	00

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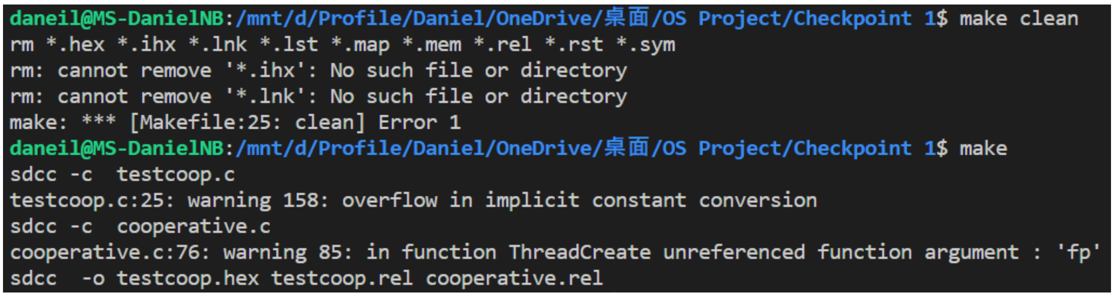
4. Typescript



```
daneil@MS-DanielNB:/mnt/d/Profile/Daniel/OneDrive/桌面/OS Project/Checkpoint 1$ 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
daneil@MS-DanielNB:/mnt/d/Profile/Daniel/OneDrive/桌面/OS Project/Checkpoint 1$ make
sdcc -c  testcoop.c
testcoop.c:25: warning 158: overflow in implicit constant conversion
sdcc -c  cooperative.c
cooperative.c:76: warning 85: in function ThreadCreate unreferenced function argument : 'fp'
sdcc  -o testcoop.hex testcoop.rel cooperative.rel
```