3. Typescript and screenshots

3.1 Typescript for compilation

```
PS C:\Users\peggy\Downloads\OS_cp2> make clean
del *.hex *.ihx *.lnk *.lst *.map *.mem *.rel *.rst *.sym *.asm *.lk
PS C:\Users\peggy\Downloads\OS_cp2> make
sdcc -c  testpreempt.c
testpreempt.c:79: warning 158: overflow in implicit constant conversion
sdcc -c  preemptive.c
sdcc  -o testpreempt.hex testpreempt.rel preemptive.rel
```

3.2 Screenshots and explanation

Memory location of functions:

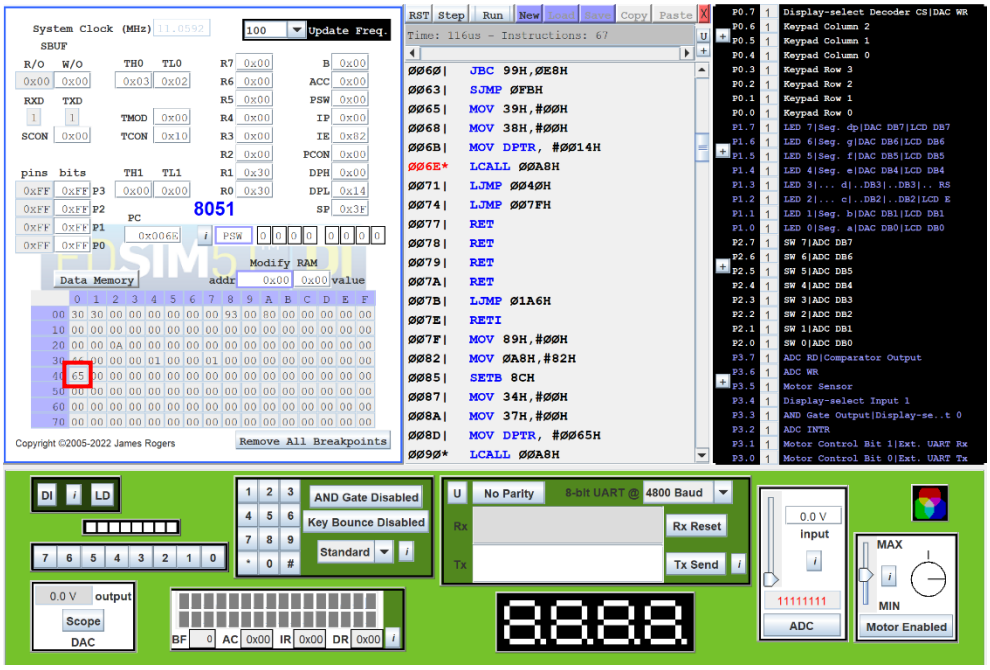
```
286         Value  Global                          Global Defined In Module
287         -----  -------------------------------  ------------------------
288   C:    00000014 _Producer                      testpreempt
289   C:    00000040 _Consumer                      testpreempt
290   C:    00000065 _main                          testpreempt
291   C:    00000074 __sdcc_gsinit_startup          testpreempt
292   C:    00000078 __mcs51_genRAMCLEAR            testpreempt
293   C:    00000079 __mcs51_genXINIT               testpreempt
294   C:    0000007A __mcs51_genXRAMCLEAR           testpreempt
295   C:    0000007B _timer0_ISR                    testpreempt
296   C:    0000007F _Bootstrap                     preemptive
297   C:    000000A8 _ThreadCreate                  preemptive
298   C:    00000128 _ThreadYield                   preemptive
299   C:    00000189 _ThreadExit                    preemptive
300   C:    000001A6 _myTimer0Handler               preemptive
```

Memory location of variables:

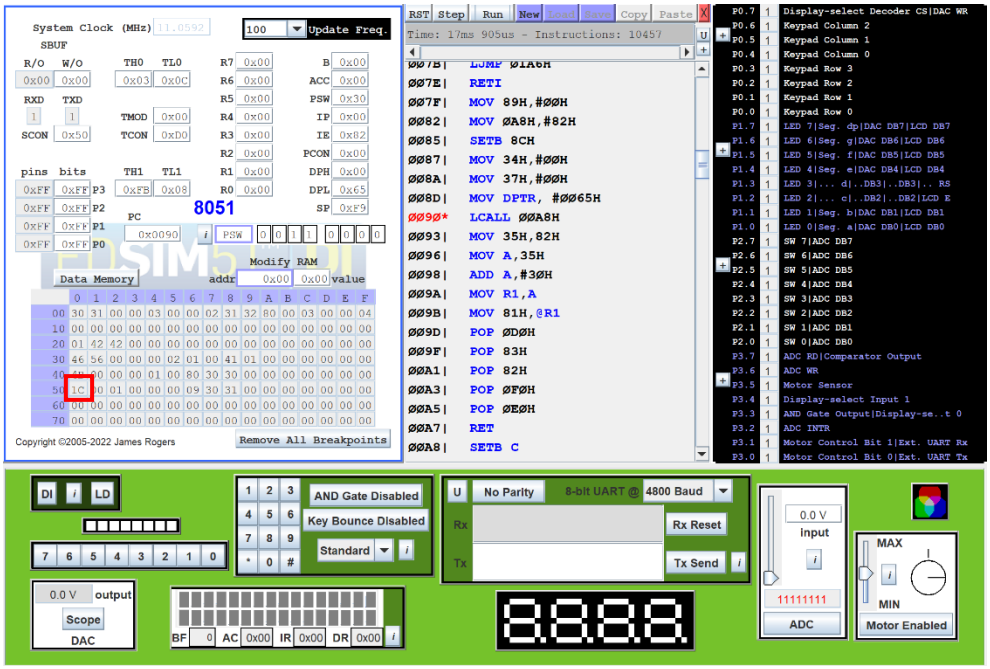
```
16   __data __at (0x30) char savedSP[4];
17   __data __at (0x34) char threadBitmap;
18   __data __at (0x35) char threadId;
19   __data __at (0x36) char threadId_new;
20   __data __at (0x37) char threadCount;
21   __data __at (0x22) char tempSP;
```

- **Take one screenshot before each ThreadCreate call. Explain how the stack changes.**

  ThreadCreate for main/Consumer:

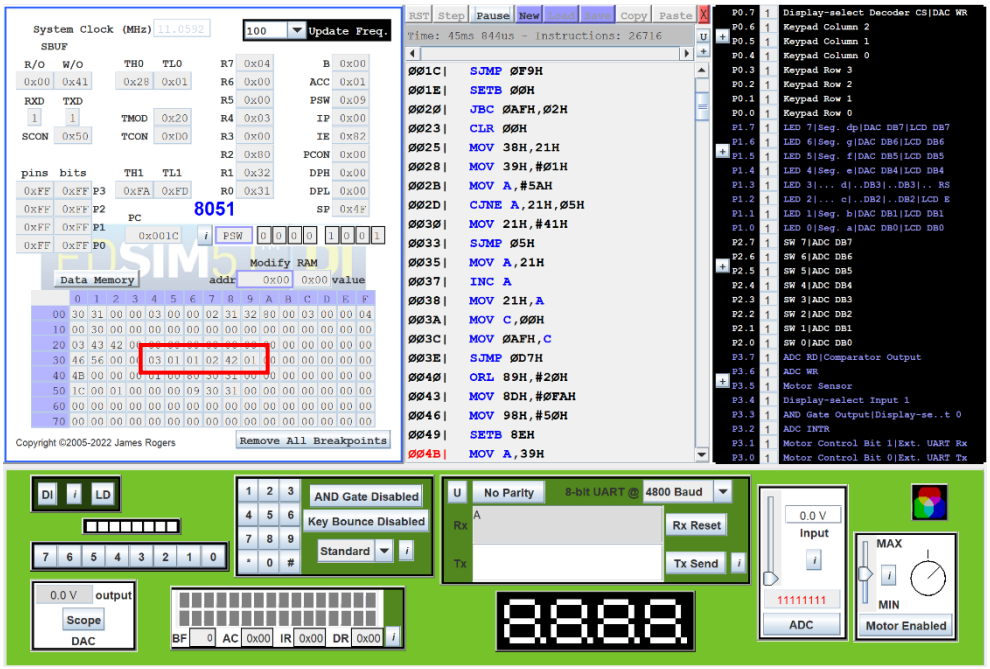


ThreadCreate for Producer:



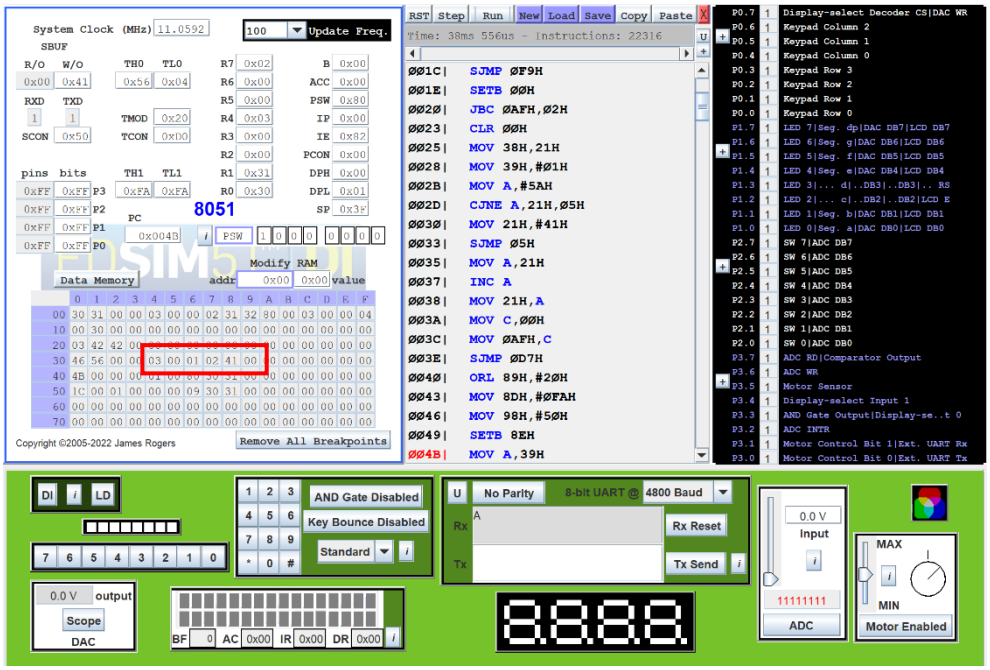
- **Take one screenshot when the Producer is running. How do you know?**

  Current thread ID (stored at 0x35) is 1, which is the thread ID of Producer.



- **Take one screenshot when the Consumer is running. How do you know?**

  Current thread ID (stored at 0x35) is 0, which is the thread of Consumer.



- **How can you tell that the interrupt is triggering on a regular basis?**

  Since myTimer0Handler is located at 0x01A6, we set a breakpoint at 01A6 of assembly code.