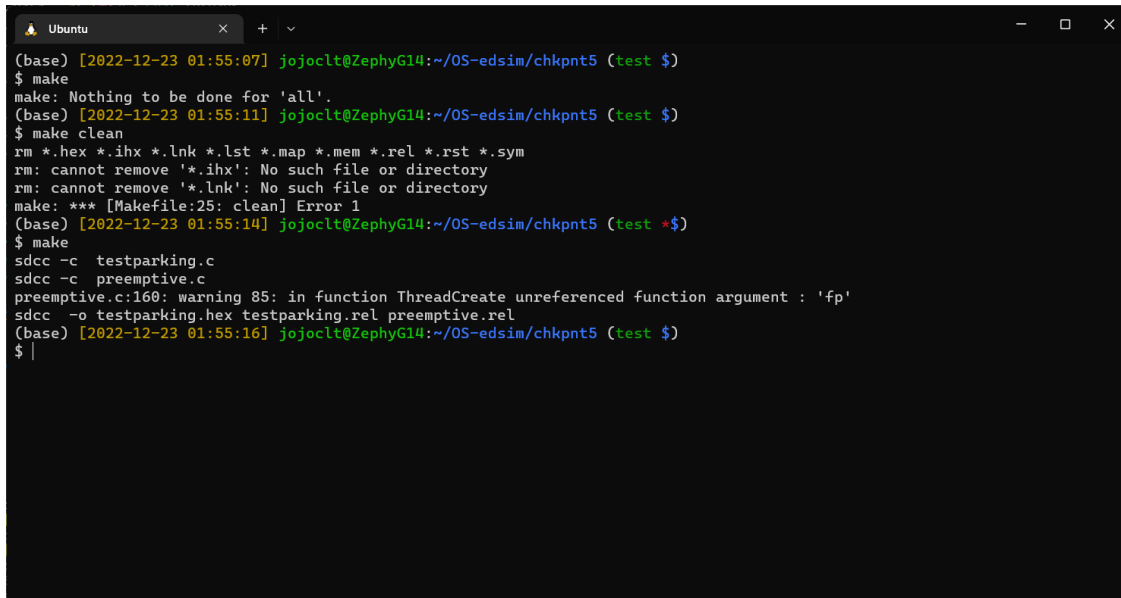


Programming Project Checkpoint#5

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[1] Typescript for compilation



```
(base) [2022-12-23 01:55:07] jojoelt@ZephyrG14:~/OS-edsim/chkpnt5 (test $)
$ make
make: Nothing to be done for 'all'.
(base) [2022-12-23 01:55:11] jojoelt@ZephyrG14:~/OS-edsim/chkpnt5 (test $)
$ 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
(base) [2022-12-23 01:55:14] jojoelt@ZephyrG14:~/OS-edsim/chkpnt5 (test *)$
$ make
sdcc -c testparking.c
sdcc -c preemptive.c
preemptive.c:160: warning 85: in function ThreadCreate unreferenced function argument : 'fp'
sdcc -o testparking.hex testparking.rel preemptive.rel
(base) [2022-12-23 01:55:16] jojoelt@ZephyrG14:~/OS-edsim/chkpnt5 (test $)
$
```

[2] Screenshots and explanation

1) delay(n), now()

Delay implementation - When it is called, the thread is delayed by n time units

(current_time + n), where the time units are based on the timer-0 ISR.

When the timer-0 ISR is called, it will increase the global timer when the thread is at thread#0.

If all the threads call delay() and finish their delays all at the same time, it will use the first found thread that is free.

2) Thread Termination and Creation

I added the Semaphores for Thread Creation and Termination.

```
ThreadID ThreadCreate(FunctionPtr fp) {
    SemaphoreWait(&threads);
    EA = 0;

    for (createdThread = 0; createdThread < MAXTHREADS; createdThread++) {
        tmp = bitmap & (1 << createdThread);
        if (tmp) continue;
        break;
    }

    bitmap |= (1 << createdThread);
    startStack = ((createdThread+3) << 4) | 0x0F;
}
```

```
void ThreadExit(void) {
    __critical {
        bitmap = bitmap ^ (1 << currentThread);
        SemaphoreSignal(&threads);
    }
    EA = 0;
    do {
        currentThread = (currentThread+1) % MAXTHREADS;
        if ((currentThread == 0 && bitmap) timer++;
        tmp = bitmap & (1 << currentThread);
        if (tmp)
            break;
    } while (1);
}
```

3. Parking Lot Example

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	01	00	00	01	00	00	08	00	00	00	00	0F	0D	04			
10	00	00	00	00	00	05	01	01	00	00	00	00	00	0D	05	01			
20	47	57	67	77	00	00	02	5F	41	00	00	1A	04	02	20	20			
30	FF	05	07	05	00	00	00	02	04	05	02	03	05	05	07	0D			
40	01	24	06	E9	07	06	09	00	08	06	09	06	09	00	00	00			
50	00	07	06	09	AC	02	C8	00	08	06	09	00	00	00	00	00			
60	00	07	06	09	69	03	D0	00	08	06	09	00	00	00	00	00			
70	00	07	06	09	EB	01	D8	00	08	06	09	00	00	00	00	00			

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Remove All Breakpoints

EdSim51DI - External UART - cl

U No Parity

C0: 0-2@0
C1: 0-3@1
C2: 2-5@0
C3: 4-5@1
C4: 5-7@1

Rx

Where 0x35-0x39 is arrival time and 0x3A to 0x3E is departure time, and 0x2B is the parking_lot status by bit.