CECS 262

LAB 4
EXAMINING THE CALL INSTRUCTIONS

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Objective:

- To examine the call instructions.

Reference:

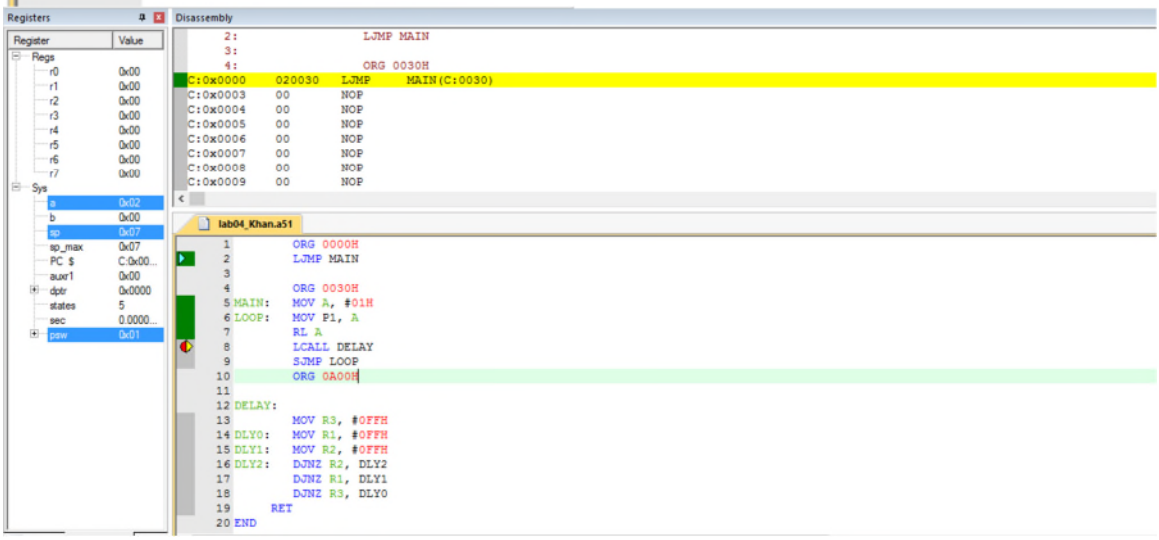
- Mazidi and Mazidi, "The 8051 Microcontroller and Embedded Systems," Chapter 3.

Tasks:

1. Modify chasingcat.a51 in the following way: write a delay function and use function call for delay. Use instruction LCALL, and put your delay function at location 0A00H. Screen shot the stack contents, SP value and PC value before the function call and before executing the first instruction in the function.

lab04_Khan.a51

```
1          ORG 0000H
2          LJMP MAIN
3
4          ORG 0030H
5 MAIN:    MOV A, #01H
6 LOOP:    MOV P1, A
7          RL A
8          LCALL DELAY
9          SJMP LOOP
10         ORG 0A00H
11
12 DELAY:
13         MOV R3, #0FFH
14 DLY0:   MOV R1, #0FFH
15 DLY1:   MOV R2, #0FFH
16 DLY2:   DJNZ R2, DLY2
17         DJNZ R1, DLY1
18         DJNZ R3, DLY0
19      RET
20 END
21
```



2. Modify task1 to use ACALL instead of LCALL and put your delay function immediately after you main function. Screen shot the stack contents, SP value and PC value before the function call and before executing the first instruction in the function.

lab04_Khan_2.a51

```
1  ORG 0000H
2          LJMP MAIN
3
4          ORG 0030H
5  MAIN:   MOV A, #01H
6  DELAY:
7          MOV R3, #0FFH
8  LOOP:   MOV P1, A
9          RL A
10         ACALL DELAY
11         SJMP LOOP
12         ORG 0A00H
13
14 ;DELAY:
15         ;MOV R3, #0FFH
16 DLY0:   MOV R1, #0FFH
17 DLY1:   MOV R2, #0FFH
18 DLY2:   DJNZ R2, DLY2
19         DJNZ R1, DLY1
20         DJNZ R3, DLY0
21     RET
22 END
23
```

Registers

Register	Value
Regs	
r0	0x00
r1	0x00
r2	0x00
r3	0xff
r4	0x00
r5	0x00
r6	0x00
r7	0x00
Sys	
a	0x02
b	0x00
sp	0x07
sp_max	0x07
PC $	C:0x0037
auxr1	0x00
dptr	0x0000
states	6
sec	0.000001
psw	0x01

Disassembly

```
    10:                 ACALL DELAY
C:0x0037    1132      ACALL     DELAY(C:0032)
    11:                 SJMP LOOP
    12:                 ORG 0A00H
    13:
    14: ;DELAY:
    15:                 ;MOV R3, #0FFH
C:0x0039    80F9      SJMP      LOOP(C:0034)
C:0x003B    00        NOP
C:0x003C    00        NOP
C:0x003D    00        NOP
```

lab04_Khan_2.a51

```
4          ORG 0030H
5  MAIN:   MOV A, #01H
6  DELAY:
7          MOV R3, #0FFH
8  LOOP:   MOV P1, A
9          RL A
10         ACALL DELAY
11         SJMP LOOP
12         ORG 0A00H
13
14 ;DELAY:
15         ;MOV R3, #0FFH
16 DLY0:   MOV R1, #0FFH
17 DLY1:   MOV R2, #0FFH
18 DLY2:   DJNZ R2, DLY2
19         DJNZ R1, DLY1
20         DJNZ R3, DLY0
21     RET
22 END
23
```