

Name: Divyam Divesh

Roll No : 2201042CS

Branch : Computer Science & Engineering

Batch: 2022-2026

Microprocessor Lab Exam (SET-C)

Q.No-1)

Write an assembly program to count number of ones and zeros in an eight-bit number.

The screenshot displays a microprocessor lab software interface with three main panels:

- Registers Panel:** Shows the status of various registers. The 'Regs' section includes r0 (0x06), r1 (0x02), r2 (0x00), r3 (0x00), r4 (0x00), r5 (0x00), r6 (0x00), and r7 (0x00). The 'Sys' section includes a (0x0a), b (0x00), sp (0x07), sp_max (0x07), dptr (0x0000), PC \$ (C:0x0013), states (54), sec (0.00002700), and psw (0x00).
- Disassembly Panel:** Shows the disassembly of memory locations. The first four locations (C:0x0013 to C:0x0016) all contain the value 00 and are identified as NOP instructions.
- Assembly Panel:** Displays the assembly code for 'labexam.a51'. The code is as follows:

```
1  ORG 00H;  
2  MOV R0, #00H;  
3  MOV R1, #00H;  
4  MOV R7, #08;  
5  MOV A, #05H;  
6  LOOP:  
7  RRC A;  
8  JC LOOP1;  
9  INC R0;  
10 DJNZ R7, LOOP;  
11 SJMP AGAIN;  
12 LOOP1:  
13 INC R1;  
14 DJNZ R7, LOOP;  
15 AGAIN:  
16 END
```

Write an assembly program to Compare two 8 BIT numbers, that are stored in addresses 30H(x) and 31H(y);

If $x > y$. Find the logical AND operation between x and y ,

If $x=y$. Find the logical OR operation between x and y ,

If $x < y$. Find the logical XNOR operation between x and y .

The screenshot shows the Proteus IDE's Disassembly window. The Disassembly window displays assembly code for a comparison operation. The code includes labels 'GREATER' and 'SMALLER', and instructions like 'ORG 0000H', 'MOV R0, #30H', 'MOV R1, #31H', 'MOV A, @R0', 'MOV B, @R1', 'CJNE A, B, GREATER', 'ORL A, B', 'MOV 32H, A', 'SJMP HERE', 'JC SMALLER', 'ANL A, B', 'MOV 32H, A', 'SJMP HERE', 'XRL A, B', 'CPL A', 'MOV 32H, A', and 'END'. The 'Registers' window on the left shows the state of registers r0 through r7 and system registers a, b, sp, sp_max, dptr, PC, status, sec, and psw.

Register	Value
r0	0x30
r1	0x31
r2	0x00
r3	0x00
r4	0x00
r5	0x00
r6	0x00
r7	0x00
a	0x04
b	0x04
sp	0x07
sp_max	0x07
dptr	0x0000
PC	0x001D
status	11
sec	0.000005
psw	0x01

```

1  ORG 0000H
2
3  MOV R0, #30H
4  MOV R1, #31H
5  MOV A, @R0
6  MOV B, @R1
7  CJNE A, B, GREATER
8  ORL A, B
9  MOV 32H, A
10 SJMP HERE
11 GREATER:
12     JC SMALLER
13     ANL A, B
14     MOV 32H, A
15     SJMP HERE
16 SMALLER:
17     XRL A, B
18     CPL A
19     MOV 32H, A
20 HERE:
21 END
  
```

[illegible]