



Computer Organization & Assembly Language

LAB 09

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BSCS-3

Task 1

The screenshot shows the emu8086 software interface. The main window displays assembly code for a program that prompts the user for a one-digit number and checks if it is positive or zero. The code uses BIOS interrupt 21h to interact with the user.

```
01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0_com_template.txt
03 ; Mahnoor Zahid 66572
04 org 100h
05
06 .data
07 msg1 DB 10,13, "Enter a one-digit number: $"
08 msg2 DB 10,13, "The number is positive.$"
09 msg3 DB 10,13, "The number is zero.$"
10
11 .code
12 main proc
13     mov ax, @data
14     mov ds, ax
15
16     ; --- Ask for input ---
17     mov dx, offset msg1
18     mov ah, 9
19     int 21h
20
21     ; --- Take one character ---
22     mov ah, 1
23     int 21h
24     sub al, 30h      ; Convert to ASCII digit
25     mov bl, al
26
27     ; --- Check if zero ---
28     cmp bl, 0
29     je zero_label    ; If zero, jump to zero_label
30     jg positive_label ; If greater than zero, jump to positive_label
31
32 zero_label:
33     mov dx, offset msg3
34     mov ah, 9
35     int 21h
36     jmp exit
37
38 positive_label:
39     mov dx, offset msg2
40     mov ah, 9
41     int 21h
42
43 exit:
44     mov ah, 4Ch
45     int 21h
46
47 main endp
48 end main
49
50 ret
51
```

The terminal window in the bottom right shows the output of the program. When the user enters '2', the program outputs:

```
Enter a one-digit number: 2
The number is positive.
```

At the bottom of the terminal window, there are buttons for 'clear screen' and 'change font', and a status bar showing '0/16'.

Task 2

The screenshot shows the emu8086 interface. The main window displays assembly code for a program that compares two values (A and B) entered by the user. The code includes sections for data, input, comparison, and output. The terminal window shows the execution of the program, where it prompts for values A and B, compares them, and prints the result.

```
01 ; You may customize this and other start-up templates;
02 ; The location of this template is c:\emu8086\inc\0_com_template.txt
03 ; Mahnoor Zahid 66572
04 org 100h
05
06 .data
07 msg1 DB 10,13, "Enter value for A: $"
08 msg2 DB 10,13, "Enter value for B: $"
09 msg_gt DB 10,13, "A is greater than B$"
10 msg_lt DB 10,13, "A is less than B$"
11
12 .code
13 main proc
14     mov ax, @data
15     mov ds, ax
16
17     ; --- Input A ---
18     mov dx, offset msg1
19     mov ah, 9
20     int 21h
21
22     mov ah, 1      ; in
23     int 21h        ; Enter value for A: 5
24     mov bl, al      ; st
25     sub bl, 30h      ; co
26
27     ; --- Input B ---
28     mov dx, offset msg2
29     mov ah, 9
30     int 21h
31
32     mov ah, 1      ; in
33     int 21h        ; Enter value for B: 7
34     mov bh, al      ; st
35     sub bh, 30h      ; co
36
37     ; --- Compare A and B ---
38     cmp bl, bh
39     jg greater
40     jl lesser
41     jmp exit        ; if
42
43 greater:
44     mov dx, offset msg_gt
45     mov ah, 9
46     int 21h
47     jmp exit
48
49 lesser:
50     mov dx, offset msg_lt
51     mov ah, 9
52     int 21h
53
54 exit:
55     mov ah, 4Ch
56     int 21h
57
58 main endp
59 end main
60
61
62 ret
```

emu8086 - assembler and microprocessor emulator 4.08

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60 emulator screen (80x25 chars)

clear screen change font 0/16