



Computer Organization & Assembly Language

LAB 06

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BSCS-3

Task 1

The screenshot shows the emu8086 IDE interface. The assembly code in the editor window is as follows:

```
01 ; Mahnoor Zahid
02 ;66572
03 .model small
04 .stack 100h
05 .data
06 line1 db ' My CU / Biodata_$', 0
07 yourname db 0Dh,0Ah, 'Name: Mahnoor Zahid'
08 father db 0Dh,0Ah, 'Father Name:Zahid$'
09 edu db 0Dh,0Ah, 'Education: BS Computer Science'
10 skills db 0Dh,0Ah, 'Skills: C, C++, Java, Assembly Language'
11 contact db 0Dh,0Ah, 'Contact: *****'
12 endmsg db 0Dh,0Ah, '_End of CU_'
13
14 .code
15 main proc
16     ; Initialize DS
17     mov ax, @data
18     mov ds, ax
19     ; Print heading
19     mov dx, offset line1
20     mov ah, 09h
21     int 21h
22     ; Print Name
23     mov dx, offset yourname
24     mov ah, 09h
25     int 21h
26     ; Print Father Name
27     mov dx, offset father
28     mov ah, 09h
29     int 21h
30     ; Print Education
31     mov dx, offset edu
32     mov ah, 09h
33     int 21h
34     ; Print Skills
35     mov dx, offset skills
36     mov ah, 09h
37     int 21h
38     ; Print Contact
39     mov dx, offset contact
40     mov ah, 09h
41     int 21h
42     ; Print End message
43     mov dx, offset endmsg
44     mov ah, 09h
45     int 21h
46     ; Exit program
47     mov ah, 4Ch
48     int 21h
49
50 main endp
```

The emulator window displays the following output:

```
My CU / Biodata_
Name: Mahnoor Zahid
Father Name:Zahid
Education: BS Computer Science
Skills: C, C++, Java, Assembly Language
Contact: *****
_End of CU_
```

Task 2

The screenshot shows the emu8086 IDE interface. On the left, the assembly code for 'Coal_lab_6task2.asm' is displayed:

```
01 ; Mahnoor Zahid
02 ;66572
03
04 org 100h
05
06 .model small
07 .stack 100h
08
09 .data
10 msg1 db 'User Entered ', '$'
11 msg2 db ' Character : $';
12
13 .code
14 main proc
15     ; Initialize DS
16     mov ax, @data
17     mov ds, ax
18
19     mov ah, 01h
20     int 21h
21     mov bl, al
22
23     mov dl, 10h
24     mov dh, 13h
25     int 21h
26
27     mov dx, offset msg1
28     mov ah, 09h
29     int 21h
30
31     mov dl, bl
32     mov ah, 02h
33     int 21h
34
35
36     mov dx, offset msg2
37     mov ah, 09h
38     int 21h
39
40
41
42     ; Exit program
43     mov ah, 4Ch
44     int 21h
45
46 main endp
47 end main
48
49
50 ret
```

The right side of the interface features an emulator window titled 'emulator: Coal_lab_6task2.com_'. The window has a toolbar with buttons for Load, reload, step back, single step, run, and step de. Below the toolbar is a status bar showing 'SCN emulator screen (80x25 chars)'. The main area of the emulator displays the assembly code's output:

User Entered m Character:

The assembly code performs the following tasks:

- Initializes the Data Segment (DS) to point to the start of the data.
- Reads a character from the user using INT 21h, AH=01h, and stores it in BL.
- Outputs the character 'm' using INT 21h, AH=02h.
- Outputs the string "Character : \$" using INT 21h, AH=09h.
- Exits the program using INT 21h, AH=4Ch.

Task 3

The screenshot shows the emu8086 IDE interface. On the left is the assembly code editor with the file path "edit: C:\emu8086\MySource\Coal_lab_6task2.asm". The code is as follows:

```
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
04 ;66572
05
06 org 100h
07
08 .model small
09 .stack 100h
10
11 .data
12 msg1 db 'Enter a lowercase character: $'
13 msg2 db 0Dh,0Ah, 'After conversion to uppercase'
14
15 .code
16 main proc
17     mov ax,edata
18     mov ds,ax
19
20     mov dx,offset msg1
21     mov ah,09h
22     int 21h
23
24     mov ah,01h
25     int 21h
26     mov bl,al
27
28     sub bl,32
29
30     mov dx,offset msg2
31     mov ah,09h
32     int 21h
33
34     mov dl,bl
35     mov ah,02h
36     int 21h
37
38     mov ah,4Ch
39     int 21h
40 main endp
41 end main
42
43 ret
```

The assembly code window has a tooltip showing the assembly instructions for the current line:

22	int 21h
23	
24	mov ah,01h
25	int 21h
26	mov bl,al
27	

The emulator window shows the output of the program. It prompts the user to enter a lowercase character ('m') and then displays the converted uppercase character ('M'). The registers window shows the following values:

AX	4C	4D
BX	00	4D
F4200	FF	255
F4201	FF	255
F4202	CD	205
F4203	21	033