



Computer Organization & Assembly Language

LAB 07

Submitted to:

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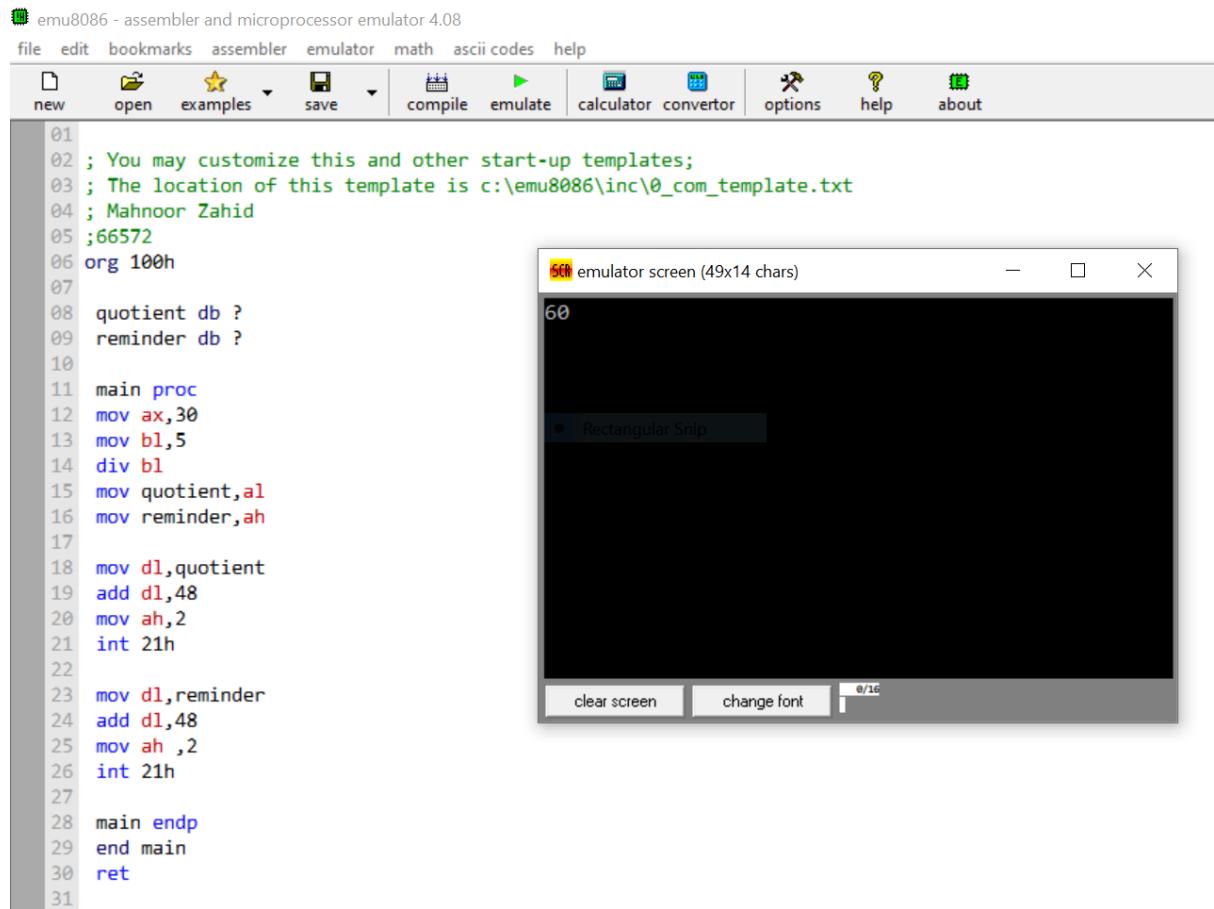
Submitted by:

Mahnoor Zahid

66572

BSCS-3

Class Task 1



The screenshot shows the emu8086 assembler and emulator interface. The main window displays assembly code for a division program. The code includes comments for customization, author information, and assembly instructions for initializing registers (AX, BX), performing division (DIV), and outputting results (MOV DL, quotient; ADD DL, 48; MOV AH, 2; INT 21H). It also handles the remainder (MOV DL, reminder; ADD DL, 48; MOV AH, 2; INT 21H) and ends the program (MAIN ENDP; END MAIN; RET). The right side of the interface shows the emulator screen with the number '60' displayed.

```
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 org 100h
06
07 quotient db ?
08 remainder db ?
09
10
11 main proc
12 mov ax,30
13 mov bx,5
14 div bx
15 mov quotient,al
16 mov remainder,ah
17
18 mov dl,quotient
19 add dl,48
20 mov ah,2
21 int 21h
22
23 mov dl,remainder
24 add dl,48
25 mov ah ,2
26 int 21h
27
28 main endp
29 end main
30 ret
31
```

Class Task 2

The screenshot shows the emu8086 software interface. The main window displays assembly code for dividing two digits. The code includes comments like ;Mahnoor Zahid and ;program to divide two digits. It uses the small model and defines data for remainder and quotient. The assembly instructions include DIV BL, MOV CL, MOV CH, MOV AX, INT 21H, ADD DL, MOV AH, and INT 21H. The output window shows the results: quotient 5 and remainder 0.

```
01 ;Mahnoor Zahid
02 ;66572
03 ;program to divide two digits
04 .model small
05 .data
06 rm DB "remainder $"
07 qt DB "quotient $"
08 .code
09 main proc
10
11 mov ax,25
12 mov bl,5
13 div bl
14 mov cl, al
15 mov ch, ah
16 mov ax,@data
17 mov ds,ax
18 mov dx, offset qt
19 mov ah,9
20 int 21h
21 mov dl, cl
22 add dl,48
23 mov ah,2
24 int 21h
25 mov dx, 10
26 mov ah, 2
27 int 21h
28 mov dx,13
29 mov ah, 2
30 int 21h
31 mov ax, @data
32 mov ds, ax
33 mov dx, offset rm
34 mov ah,9
35 int 21h
36 mov dl, ch
37 add dl, 48
38 mov ah,2
39 int 21h
40 mov ah,4ch
41 int 21h
42
43 ret
```

Output window:
quotient 5
remainder 0

Lab Task 1

The screenshot shows the emu8086 interface. The assembly code window contains the following code:

```
01 ;Mahnoor Zahid 66572
02 .model small
03 .stack 100h
04 .data
05 msg1 db 'Enter first number: $'
06 msg2 db 0Dh,0Ah,'Enter second number: $'
07 msg3 db 0Dh,0Ah,'Product is: $'
08 num1 db ?
09 num2 db ?
10 result db ?
11
12 .code
13 main proc
14 mov ax, @data
15 mov ds, ax
16 mov ah, 09h
17 int 21h
18 mov ah, 01h
19 int 21h
20 sub al, 30h
21 mov num1, al
22 mov dx, offset msg2
23 mov ah, 09h
24 int 21h
25 mov ah, 01h
26 int 21h
27 sub al, 30h
28 mov num2, al
29 mov al, num1
30 mov bl, num2
31 mul bl
32 mov result, al
33 mov dx, offset msg3
34 mov ah, 09h
35 int 21h
36 mov dl, result
37 add dl, 30h
38 mov ah, 02h
39 int 21h
40 mov ah, 4Ch
41 int 21h
42
43 ret
```

The emulator screen window shows the following output:

```
Enter first number: 2
Enter second number: 2
Product is: 4
```

Lab Task 2

The screenshot shows the emu8086 interface. On the left is the assembly code editor with the following code:

```
01 ;Mahnoor Zahid 66572
02 .model small
03 .stack 100h
04 .data
05 msg1 db 'Enter a number (0-9): $'
06 msg2 db 0Dh,0Ah, 'Square of the number is: $'
07 num db ?
08 result db ?

09 .code
10 main proc
11 mov ax, @data
12 mov ds, ax
13
14 mov dx, offset msg1
15 mov ah, 09h
16 int 21h
17 mov ah, 01h
18 int 21h
19
20 sub al, 30h
21 mov num, al
22 mov al, num
23 mov bl, num
24 mul bl
25 mov result, al
26
27 mov dx, offset msg2
28 mov ah, 09h
29 int 21h
30
31 mov dl, result
32 add dl, 30h
33 mov ah, 02h
34 int 21h
35
36 mov ah, 4Ch
37 int 21h
38 main endp
39 end main
40
41 ret
42
43
```

On the right is a terminal window titled "SCR emulator screen (42x11 chars)" showing the output of the program. It displays:

```
Enter a number (0-9): 3
Square of the number is: 9
```

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

Lab Task 3

emu8086 - assembler and microprocessor emulator 4.08

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```
01 ;Mahnoor Zahid 66572
02
03 .model small
04 .stack 100h
05 .data
06 msg1 db 'Enter a number: $'
07 msg2 db 0Dh,0Ah, 'Cube of the number is: $'
08 num db ?
09 result db ?
10 .code
11 main proc
12 mov ax, @data
13 mov ds, ax
14 mov dx, offset msg1
15 mov ah, 09h
16 int 21h
17
18 mov ah, 01h
19 int 21h
20 sub al, 30h
21 mov num, al
22
23 mov al, num
24 mov bl, num
25 mul bl
26 mov bl, al
27 mov al, num
28 mul bl
29 mov result, al
30
31 mov dx, offset msg2
32 mov ah, 09h
33 int 21h
34
35 mov dl, result
36 add dl, 30h
37 mov ah, 02h
38 int 21h
39
40 mov ah, 4Ch
41 int 21h
42
43 ret
```

SCR emulator screen (41x11 chars)

Enter a number: 2
Cube of the number is: 8

clear screen change font 0/16