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Sonargaon University (SU)

সোনারগাঁও ইউনিভার্সিটি (এসইউ)

Lab Report

Course Title : Microprocessor & Assembly Language Programming Sessional

Course Code : CSE312

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Summer - 2024

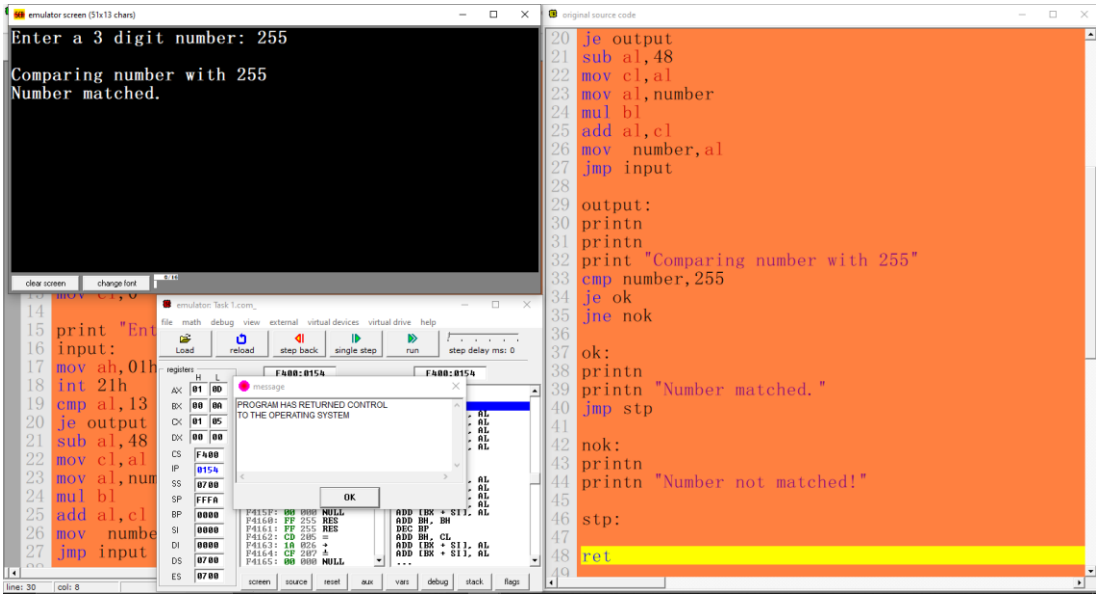
Submission Date : 24 August 2024

Lab Report

- ## Task 1

Name: Loop and nested loop operations (Patterns, dynamic input etc.)

Solve - Loop Patterns with dynamic input




```
include emu8086.inc
org 100h

.data
number db ?

.code
mov ax,@data
mov ds,ax
mov ah,00
mov bl,10
mov number,0
mov cl,0

print "Enter a 3 digit number: "
input:
mov ah,01h
int 21h
cmp al,13
je output
sub al,48
mov cl,al
mov al,number
mul bl
add al,cl
mov  number,al
jmp input

```

```
29. output:
30. printn
31. printn
32. print "Comparing number with 255"
33. cmp number,255
34. je ok
35. jne nok
36.
37. ok:
38. printn
39. printn "Number matched."
40. jmp stp
41.
42. nok:
43. printn
44. printn "Number not matched!"
45.
46. stp:
47.
48. Ret
```

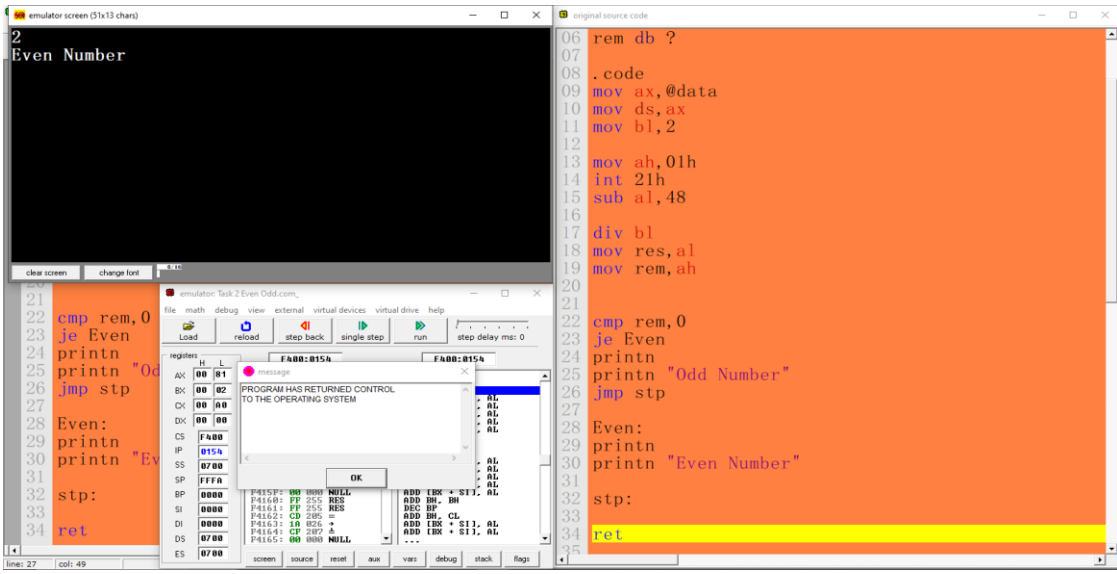
- # Task 2

Name: Conditions and nested conditions (Even/odd, positive/negative, vowel/consonant, validation etc.)

Solve - Even/odd with Conditions

```
1. include emu8086.inc
2. org 100h
3.
4. .data
5. res db ?
6. rem db ?
7.
8. .code
9. mov ax,@data
```

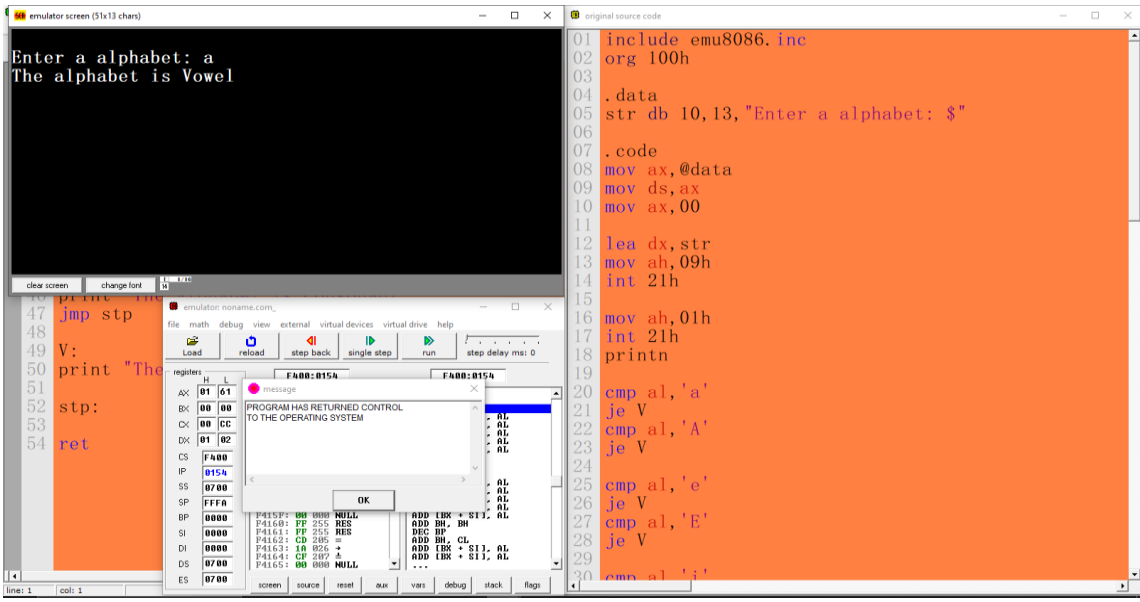
10. mov ds,ax
11. mov bl,2
12.
13. mov ah,01h
14. int 21h
15. sub al,48
16.
17. div bl
18. mov res,al
19. mov rem,ah
20.
21.
22. cmp rem,0
23. je Even
24. printn
25. printn "Odd Number"
26. jmp stp
27.
28. Even:
29. printn
30. printn "Even Number"
31.
32. stp:
33.
34. Ret



Solve - Vowel/Consonant with Conditions

1. include emu8086.inc
2. org 100h
3.
4. .data
5. str db 10,13,"Enter a alphabet: $"
6.
7. .code

8. mov ax,@data
9. mov ds,ax
10. mov ax,00
11.
12. lea dx,str
13. mov ah,09h
14. int 21h
15.
16. mov ah,01h
17. int 21h
18. printn
19.
20. cmp al,'a'
21. je V
22. cmp al,'A'
23. je V
24.
25. cmp al,'e'
26. je V
27. cmp al,'E'
28. je V
29.
30. cmp al,'i'
31. je V
32. cmp al,'I'
33. je V
34.
35. cmp al,'o'
36. je V
37. cmp al,'O'
38. je V
39.
40. cmp al,'u'
41. je V



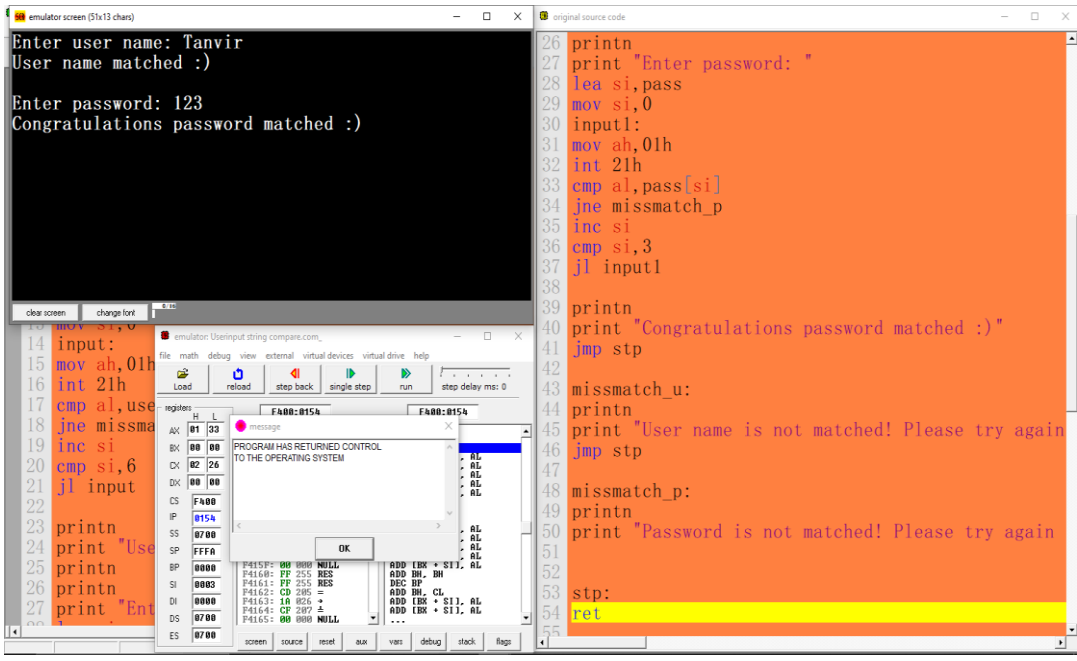
42. cmp al,'U'
43. je V
44.
45. C:
46. print "The alphabet is Consonant"
47. jmp stp
48.
49. V:
50. print "The alphabet is Vowel"
51.
52. stp:
53.
54. Ret

- # Task 3

Name: **String operations (String comparison, length of string, array etc.)**

Solve - String comparison operation

1. include emu8086.inc
2. org 100h
3.
4. .data
5. username db "Tanvir$"
6. pass db "123$"
7. .code
8. mov ax,@data
9. mov ds,ax
10.
11. print "Enter user name: "
12. lea si,username
13. mov si,0
14. input:
15. mov ah,01h

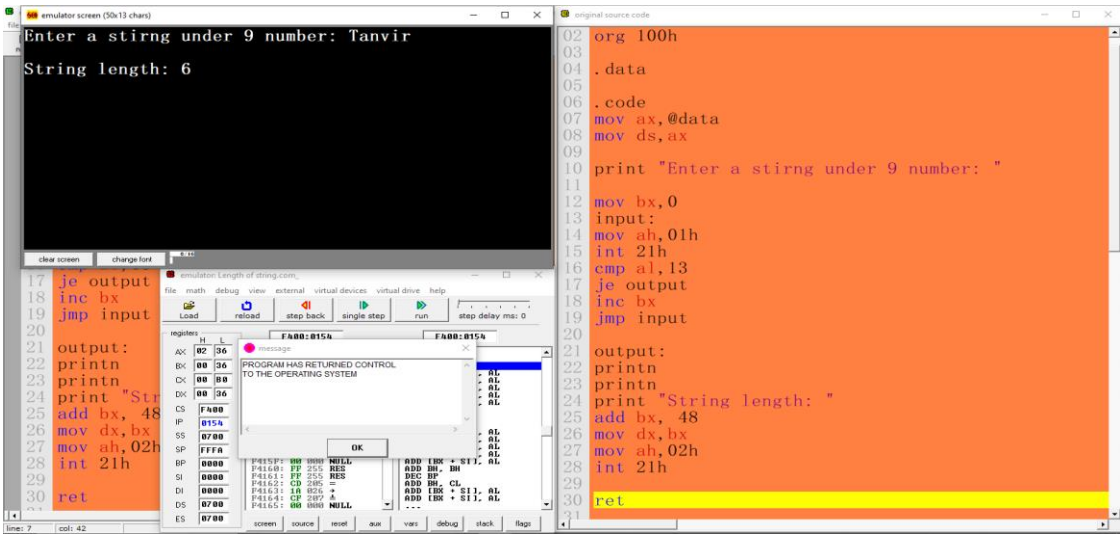


```
int 21h
cmp al,username[si]
jne missmatch_u
inc si
cmp si,6
jl input

printn
print "User name matched :)"
printn
printn
print "Enter password: "
lea si,pass
mov si,0
input1:
mov ah,01h
int 21h
cmp al,pass[si]
jne missmatch_p
inc si
cmp si,3
jl input1

printn
print "Congratulations password matched :)"
jmp stp

missmatch_u:
printn
print "User name is not matched! Please try again :|"
jmp stp

missmatch_p:
printn
```

```
50. print "Password is not matched! Please try again :|"
51.
52. stp:
53. ret
```

Solve - Length of a string

```
1.  include emu8086.inc
2.  org 100h
3.
4.  .data
5.
6.  .code
7.  mov ax,@data
8.  mov ds,ax
9.
10. print "Enter a stirng under 9 number: "
11.
12. mov bx,0
13. input:
14. mov ah,01h
15. int 21h
16. cmp al,13
17. je output
18. inc bx
19. jmp input
20.
21. output:
22. printn
23. printn
24. print "String length: "
25. add bx, 48
26. mov dx,bx
27. mov ah,02h
28. int 21h
```



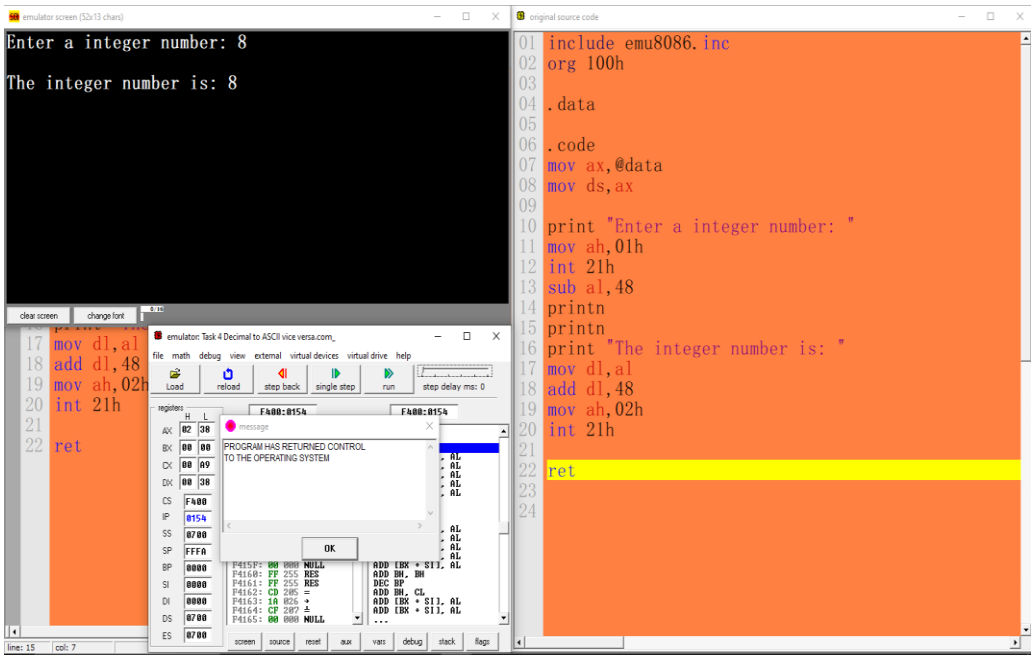
29.

30. ret

- # Task 4

Name: **ASCII value operations (Decimal to ASCII vice versa, Dynamic input, Upper case/lower case etc.)**

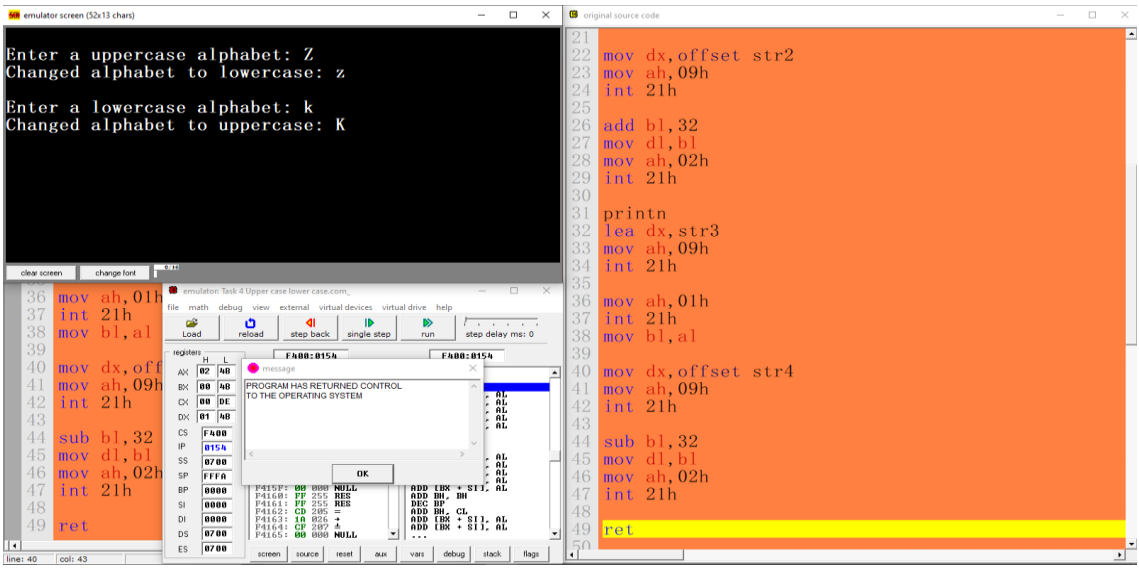
Solve - Decimal to ASCII vice versa



1. include emu8086.inc
2. org 100h
3.
4. .data
5.
6. .code
7. mov ax,@data
8. mov ds,ax
9.
10. print "Enter a integer number: "
11. mov ah,01h
12. int 21h
13. sub al,48
14. printn
15. printn
16. print "The integer number is: "
17. mov dl,al
18. add dl,48
19. mov ah,02h
20. int 21h
21.
22. Ret

Solve - Upper case/lower case

```
include emu8086.inc
org 100h

.data
str1 db 10,13,"Enter a uppercase alphabet: $"
str2 db 10,13,"Changed alphabet to lowercase: $"
str3 db 10,13,"Enter a lowercase alphabet: $"
str4 db 10,13,"Changed alphabet to uppercase: $"

.code
mov ax,@data
mov ds,ax

lea dx,str1
mov ah,09h
int 21h

mov ah,01h
int 21h
mov bl,al

mov dx,offset str2
mov ah,09h
int 21h

add bl,32
mov dl,bl
mov ah,02h
int 21h

printn
lea dx,str3
mov ah,09h
```



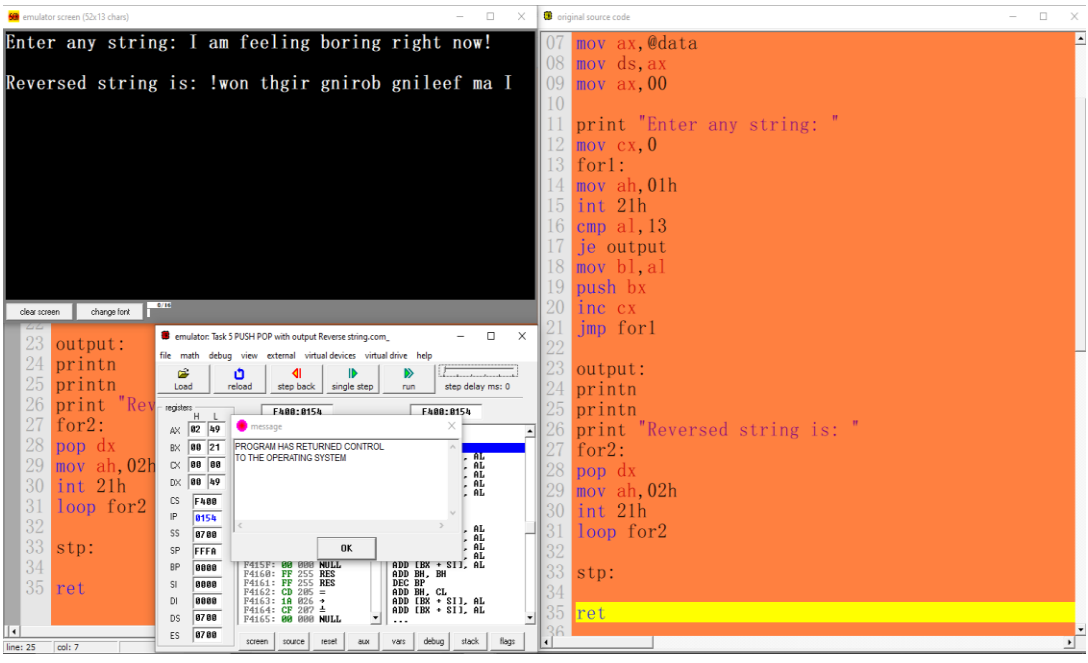
34. int 21h
35.
36. mov ah,01h
37. int 21h
38. mov bl,al
39.
40. mov dx,offset str4
41. mov ah,09h
42. int 21h
43.
44. sub bl,32
45. mov dl,bl
46. mov ah,02h
47. int 21h
48.
49. Ret

- # Task 5

Name: Stack operation (PUSH/POP, Reverse string etc.)

Solve – PUSH + POP with output Reverse string

1. include emu8086.inc
2. org 100h
3.
4. .data
5.
6. .code
7. mov ax,@data
8. mov ds,ax
9. mov ax,00
10.
11. print "Enter any string: "
12. mov cx,0
13. for1:



```
14. mov ah,01h
15. int 21h
16. cmp al,13
17. je output
18. mov bl,al
19. push bx
20. inc cx
21. jmp for1
22.
23. output:
24. printn
25. printn
26. print "Reversed string is: "
27. for2:
28. pop dx
29. mov ah,02h
30. int 21h
31. loop for2
32.
33. stp:
34.
35. Ret
```

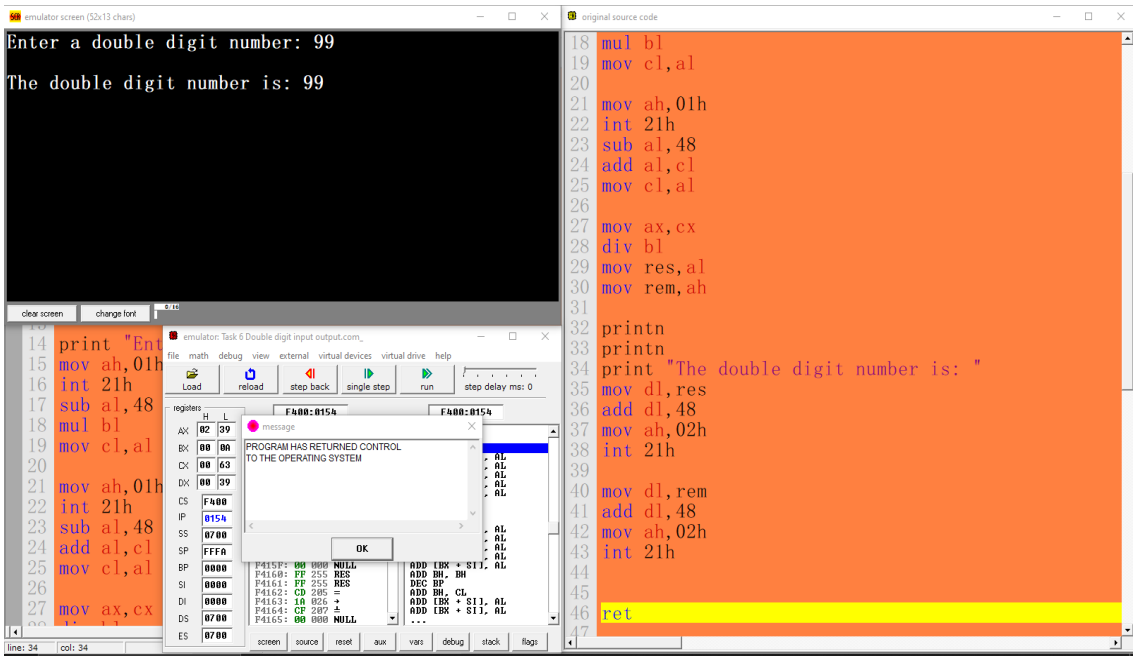
- # Task 6

Name: **Arithmetic and logical operations (Double digit input/output etc.)**

Solve - Double digit input/output

```
1. include emu8086.inc
2. org 100h
3.
4. .data
5. res db ?
6. rem db ?
7.
```

```
8.  .code
9.  mov ax,@data
10. mov ds,ax
11. mov bl,10
12. mov ah,00
13.
14. print "Enter a double digit number: "
15. mov ah,01h
16. int 21h
17. sub al,48
18. mul bl
19. mov cl,al
20.
21. mov ah,01h
22. int 21h
23. sub al,48
24. add al,cl
25. mov cl,al
26.
27. mov ax,cx
28. div bl
29. mov res,al
30. mov rem,ah
31.
32. printn
33. printn
34. print "The double digit number is: "
35. mov dl,res
36. add dl,48
37. mov ah,02h
38. int 21h
39.
40. mov dl,rem
41. add dl,48
```



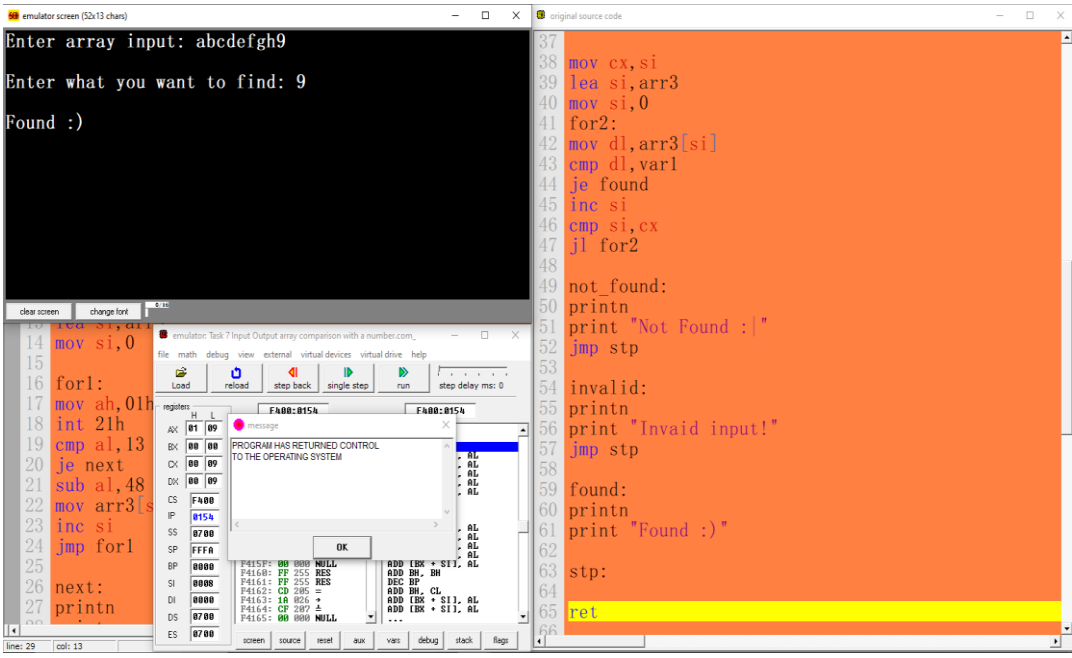
42. mov ah,02h
43. int 21h
44.
45.
46. Ret

- # Task 7

Name: Array related operations (I/O array, comparison etc.)

Solve – Input + Output array, comparison with a number

1. include emu8086.inc
2. org 100h
3.
4. .data
5. arr3 db 20 dup(?)
6. var1 db ?
7.
8. .code
9. mov ax,@data
10. mov ds,ax
11.
12. print "Enter array input: "
13. lea si,arr3
14. mov si,0
15.
16. for1:
17. mov ah,01h
18. int 21h
19. cmp al,13
20. je next
21. sub al,48
22. mov arr3[si],al
23. inc si
24. jmp for1



```
25.
26. next:
27. printn
28. printn
29. print "Enter what you want to find: "
30. mov ah,01h
31. int 21h
32. cmp al,13
33. je invalid
34. sub al,48
35. mov var1,al
36. printn
37.
38. mov cx,si
39. lea si,arr3
40. mov si,0
41. for2:
42. mov dl,arr3[si]
43. cmp dl,var1
44. je found
45. inc si
46. cmp si,cx
47. jl for2
48.
49. not_found:
50. printn
51. print "Not Found :|"
52. jmp stp
53.
54. invalid:
55. printn
56. print "Invaid input!"
57. jmp stp
58.
```

```
59. found:
60. printn
61. print "Found :)"
62.
63. stp:
64.
65. Ret
```

The End.