COA-LAB-8(AP22110011637)

1. Write a program in assembly language to display a two-digit number on the screen. The two-digits number is required to be taken in the program itself.

Code:
```
  ORG 100h  ; Origin for .COM file format

 _start:
  ; Display message "The two-digit number is: "
  MOV DX, OFFSET msg_output
  MOV AH, 09h
  INT 21h

  ; Hardcoded two-digit number
  MOV AL, '4'  ; First digit
  MOV DL, AL
  MOV AH, 02h  ; DOS function to display character
  INT 21h

  MOV AL, '5'  ; Second digit
  MOV DL, AL
  INT 21h

  ; Move to a new line
  MOV DL, 0Dh  ; Carriage return
  MOV AH, 02h
  INT 21h

  MOV DL, 0Ah  ; Line feed
  INT 21h

  ; Terminate the program
  MOV AH, 4Ch
  INT 21h

msg_output DB 'The two-digit number is: $'

END
```
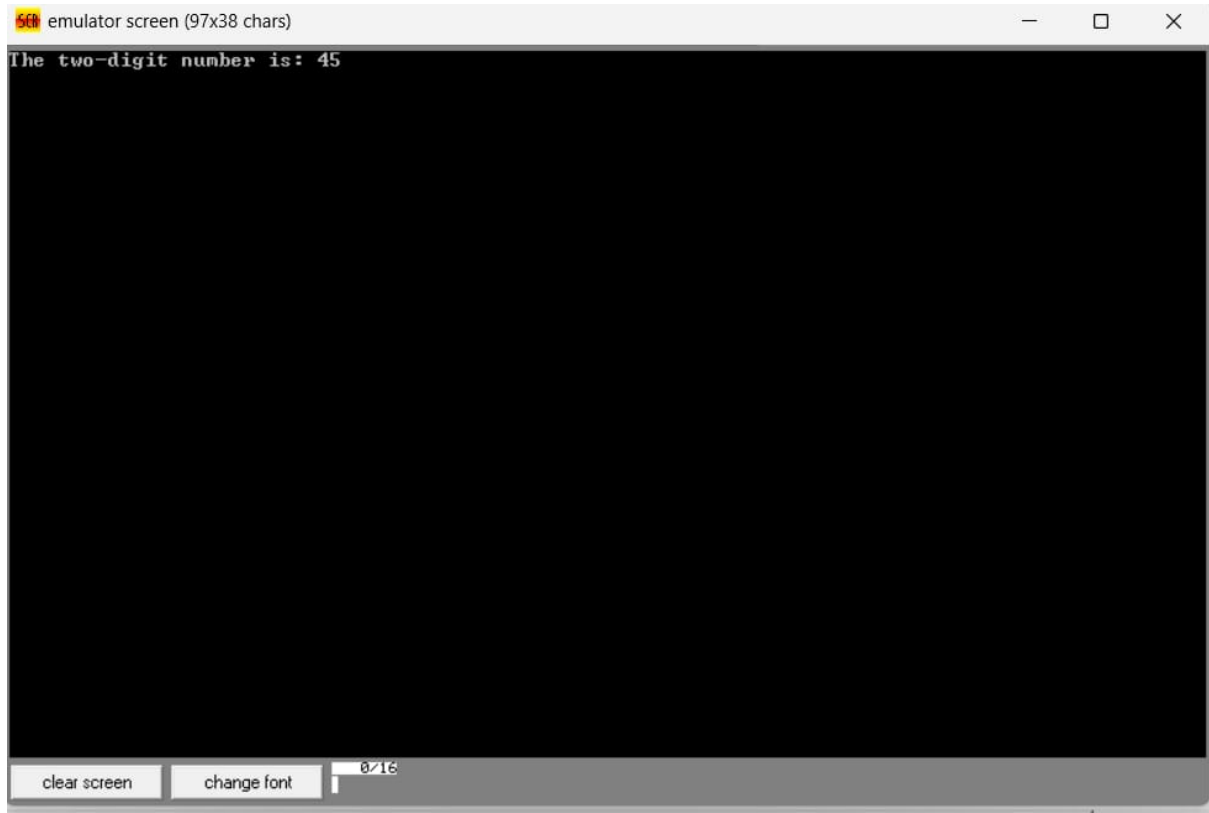
Output:

```
The two-digit number is: 45
```

clear screen   change font

2. Write an assembly language program to take two single-digit integers from the user and print the result of addition on the screen.

Code:

```
ORG 100h

; Prompt for first digit
mov ah, 09h         ; DOS interrupt to display a string
lea dx, msg1        ; Load address of the first message
int 21h             ; Display the message

mov ah, 01h         ; DOS interrupt to read a character
int 21h             ; Read first digit
sub al, '0'         ; Convert ASCII to integer
mov bl, al          ; Store first number in BL

; Print a new line after input
mov ah, 02h
mov dl, 0Dh         ; Carriage return (CR)
int 21h
mov dl, 0Ah         ; Line feed (LF)
int 21h

; Prompt for second digit
```

```asm
mov ah, 09h          ; DOS interrupt to display a string
lea dx, msg2         ; Load address of the second message
int 21h              ; Display the message

mov ah, 01h          ; DOS interrupt to read a character
int 21h              ; Read second digit
sub al, '0'          ; Convert ASCII to integer
add bl, al           ; Add second number to BL (BL now holds the sum)

; Print a new line after input
mov ah, 02h
mov dl, 0Dh          ; Carriage return (CR)
int 21h
mov dl, 0Ah          ; Line feed (LF)
int 21h

; Check if the sum is greater than 9 (two-digit number)
cmp bl, 9
jg two_digits        ; If sum > 9, jump to handle two-digit result

mov ah, 09h          ; DOS interrupt to display a string
lea dx, msg3         ; Load address of the sum message
int 21h              ; Display the sum message

; Print single-digit sum
add bl, '0'          ; Convert to ASCII
mov dl, bl           ; Move sum to DL for printing
mov ah, 02h          ; DOS interrupt to print a character
int 21h              ; Print the result
jmp done             ; Jump to the end of the program

two_digits:
; Handle two-digit result (sum >= 10)
mov ah, 09h          ; DOS interrupt to display a string
lea dx, msg3         ; Load address of the sum message
int 21h              ; Display the sum message

mov al, bl           ; Move sum to AL
mov ah, 0
mov dl, 10
div dl               ; AL = quotient (tens), AH = remainder (ones)

; Print tens digit
add al, '0'          ; Convert to ASCII
mov dl, al
mov bh, ah           ; Move tens to DL
mov ah, 02h          ; DOS interrupt to print a character
int 21h              ; Print tens digit

; Print ones digit
```
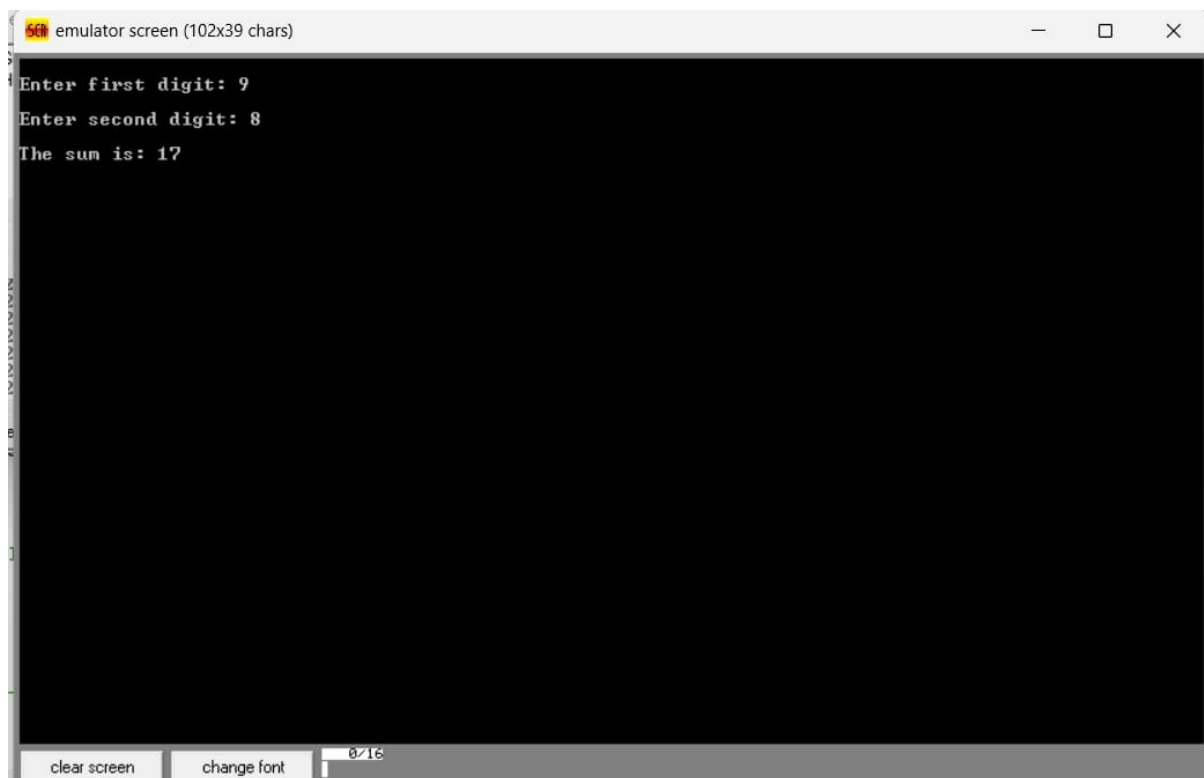
```
mov ah, bh
mov al, ah              ; Move ones to AL
add al, '0'             ; Convert to ASCII
mov dl, al              ; Move ones to DL
mov ah, 02h             ; DOS interrupt to print a character
int 21h                 ; Print ones digit

done:
; Exit program
mov ah, 4Ch             ; DOS interrupt to exit the program
int 21h

msg1 db 0Dh, 0Ah, 'Enter first digit: $'  ; Message for first input, with newline
msg2 db 0Dh, 0Ah, 'Enter second digit: $' ; Message for second input, with newline
msg3 db 0Dh, 0Ah, 'The sum is: $'         ; Message for sum result, with newline
```

Output: