1. Write a program in assembly language to display a two-digit number on the screen. Thetwo-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, '7' ; First digit

MOV DL, AL

MOV AH, 02h ; DOS function to display character

INT 21h

MOV AL, '7' ; 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

is: $' ; Message for sum result, with newline

A screenshot of a computer

Description automatically generated

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

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

A screenshot of a computer

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