***1. Write a program in assembly language to take a single-digit integer from the user and print it on the screen*.**

**CODE:**

ORG 100h ; Origin, to specify that the program starts at 100h (COM file format)

; Display message "Enter a digit: "

MOV DX, OFFSET msg\_input ; Load the address of the input message

MOV AH, 09h ; Function 09h of INT 21h is used to display a string

INT 21h ; Call DOS interrupt to print the message

; Read a single character from the user

MOV AH, 01h ; Function 01h of INT 21h is used to read a character

INT 21h ; Call DOS interrupt to get the character

MOV BL, AL ; Store the input character in BL

; Check if the character is a digit (0-9)

CMP BL, '0' ; Compare BL with '0'

JL NotDigit ; If the input is less than '0', it is not a digit

CMP BL, '9' ; Compare BL with '9'

JG NotDigit ; If the input is greater than '9', it is not a digit

; Print the message "The entered digit is: "

MOV DX, OFFSET msg\_output ; Load the address of the output message

MOV AH, 09h ; Function 09h of INT 21h is used to display a string

INT 21h ; Call DOS interrupt to print the output message

; Print the entered digit

MOV DL, BL ; Move the digit to DL

MOV AH, 02h ; Function 02h of INT 21h is used to print a single character

INT 21h ; Call DOS interrupt to print the character

JMP EndProgram ; Jump to the end of the program

NotDigit:

; If the input is not a digit, display an error message

MOV DX, OFFSET msg\_error ; Load the address of the error message

MOV AH, 09h ; Function 09h of INT 21h is used to display a string

INT 21h ; Call DOS interrupt to print the error message

EndProgram:

; Terminate the program

MOV AH, 4Ch ; Function 4Ch of INT 21h terminates the program

INT 21h ; Call DOS interrupt to exit

; Data Section

msg\_input DB 'Enter a digit: $' ; Input prompt

msg\_output DB 0Dh, 0Ah, 'The entered digit is: $' ; Output message

msg\_error DB 0Dh, 0Ah, 'Error: Not a digit! $' ; Error message

END

**OUTPUT:**

**A screenshot of a computer

Description automatically generated**

**A screenshot of a computer

Description automatically generated**

***2. Write a program in assembly language to take two single-digit integers from the user and print the result of subtraction on the screen.***

**CODE:**

ORG 100h ; Origin, to specify that the program starts at 100h (COM file format)

; Display message "Enter the first digit: "

MOV DX, OFFSET msg\_input1 ; Load the address of the first input message

MOV AH, 09h ; Function 09h of INT 21h is used to display a string

INT 21h ; Call DOS interrupt to print the message

; Read the first digit from the user

MOV AH, 01h ; Function 01h of INT 21h is used to read a character

INT 21h ; Call DOS interrupt to get the character

SUB AL, '0' ; Convert ASCII to integer by subtracting '0'

MOV BL, AL ; Store the first digit in BL

; Display message "Enter the second digit: "

MOV DX, OFFSET msg\_input2 ; Load the address of the second input message

MOV AH, 09h ; Function 09h of INT 21h is used to display a string

INT 21h ; Call DOS interrupt to print the message

; Read the second digit from the user

MOV AH, 01h ; Function 01h of INT 21h is used to read a character

INT 21h ; Call DOS interrupt to get the character

SUB AL, '0' ; Convert ASCII to integer by subtracting '0'

MOV BH, AL ; Store the second digit in BH

; Perform subtraction: BL - BH

SUB BL, BH ; Subtract the second digit (BH) from the first (BL)

; Print the message "The result of subtraction is: "

MOV DX, OFFSET msg\_output ; Load the address of the output message

MOV AH, 09h ; Function 09h of INT 21h is used to display a string

INT 21h ; Call DOS interrupt to print the output message

; Check if the result is negative

CMP BL, 0 ; Compare the result with 0

JGE PositiveResult ; Jump to PositiveResult if the result is non-negative

; Negative result, print the negative sign

MOV DL, '-' ; Load the ASCII value for the negative sign '-'

MOV AH, 02h ; Function 02h of INT 21h is used to print a single character

INT 21h ; Call DOS interrupt to print the negative sign

; Convert the negative result to positive for display

NEG BL ; Negate the value to convert it to a positive

PositiveResult:

; Convert the result to ASCII

ADD BL, '0' ; Convert the result back to ASCII

; Print the result of subtraction

MOV DL, BL ; Move the result to DL

MOV AH, 02h ; Function 02h of INT 21h is used to print a single character

INT 21h ; Call DOS interrupt to print the character

EndProgram:

; Terminate the program

MOV AH, 4Ch ; Function 4Ch of INT 21h terminates the program

INT 21h ; Call DOS interrupt to exit

; Data Section

msg\_input1 DB 'Enter the first digit: $' ; Input prompt for the first digit

msg\_input2 DB 0Dh, 0Ah, 'Enter the second digit: $' ; Input prompt for the second digit

msg\_output DB 0Dh, 0Ah, 'The result of subtraction is: $' ; Output message

END ; End of program

**OUTPUT:**

A screenshot of a computer

Description automatically generated

