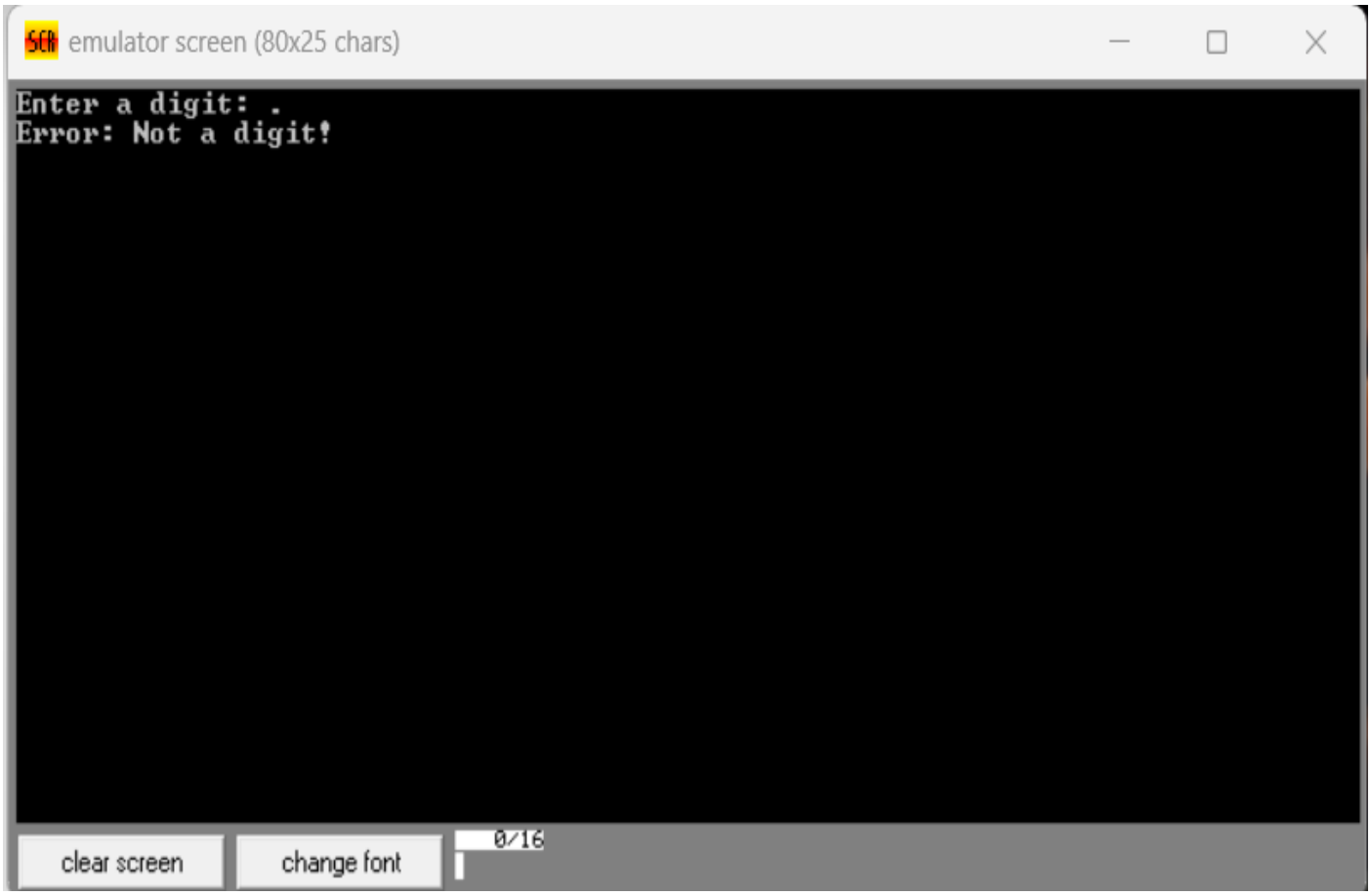
1. Write a program in assembly language to take a single-digit integer from the user and print it on the screen.

CODE:

```
ORG 100h

; Display message "Enter a digit: "
MOV DX, OFFSET msg_input  ; Load the address of the input prompt message
MOV AH, 09h       ; Function 09h of INT 21h is used to display a string
INT 21h           ; Call DOS interrupt to print the input message

; Read a single character from the user (digit)
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 (keep AL unchanged for future use)

; Check if the character is a digit (0-9)
CMP AL, '0'       ; Compare AL with '0'
JL NotDigit       ; If the input is less than '0', it is not a digit
CMP AL, '9'       ; Compare AL 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 (stored in BL)
MOV DL, BL        ; Move the entered digit (from BL) to DL for display
MOV AH, 02h       ; Function 02h of INT 21h is used to print a single character
INT 21h           ; Call DOS interrupt to print the entered digit

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

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               ; End of program
```



Practice set:

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

; 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