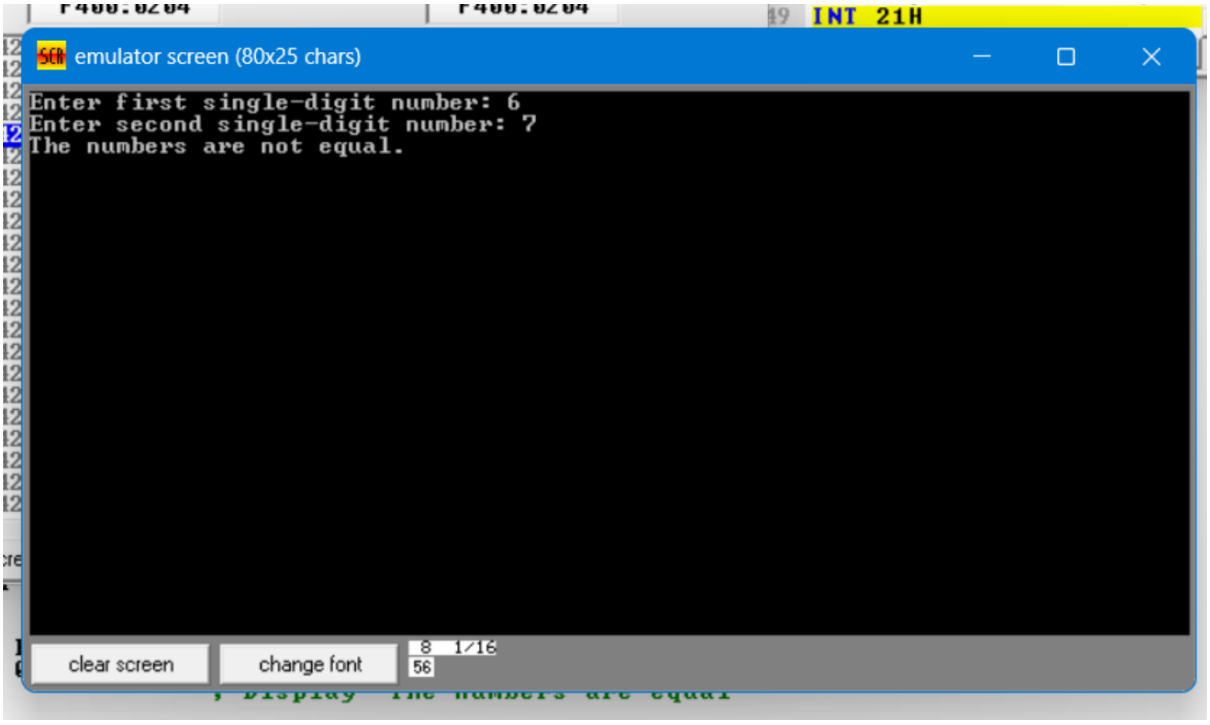
1. Write a program in assembly language to take two single-digit numbers as input and display whether they are equal or not.

```
CODE
.MODEL SMALL
.STACK 100H
.DATA
   PROMPT1 DB 'Enter first single-digit number: $'
   PROMPT2 DB 0DH, 0AH, 'Enter second single-digit number: $'
   EQUAL_MSG DB 0DH, 0AH, 'The numbers are equal.$'
   NOT_EQUAL_MSG DB 0DH, 0AH, 'The numbers are not equal.$'

.CODE
MAIN PROC
   MOV AX, @DATA
   MOV DS, AX

   ; Prompt and take the first number as input
   LEA DX, PROMPT1
   MOV AH, 09H
   INT 21H          ; Display prompt1
   MOV AH, 01H
   INT 21H          ; Take first input (ASCII)
   SUB AL, '0'       ; Convert ASCII to integer (0-9)
   MOV BL, AL        ; Store the first number in BL

   ; Prompt and take the second number as input
   LEA DX, PROMPT2
   MOV AH, 09H
   INT 21H          ; Display prompt2
   MOV AH, 01H
   INT 21H          ; Take second input (ASCII)
   SUB AL, '0'       ; Convert ASCII to integer (0-9)

   ; Compare the two numbers
   CMP BL, AL
   JE EQUAL         ; If equal, jump to EQUAL label

   ; Numbers are not equal
   LEA DX, NOT_EQUAL_MSG
   MOV AH, 09H
   INT 21H          ; Display "The numbers are not equal"
   JMP EXIT         ; Jump to exit

EQUAL:
   LEA DX, EQUAL_MSG
```

```
    MOV AH, 09H
    INT 21H          ; Display "The numbers are equal"

EXIT:
    MOV AH, 4CH       ; Terminate program
    INT 21H
```

Output:



```
Enter first single-digit number: 6
Enter second single-digit number: 7
The numbers are not equal.
```

2. Write a program in assembly language to check whether a single-digit number is odd or
even.

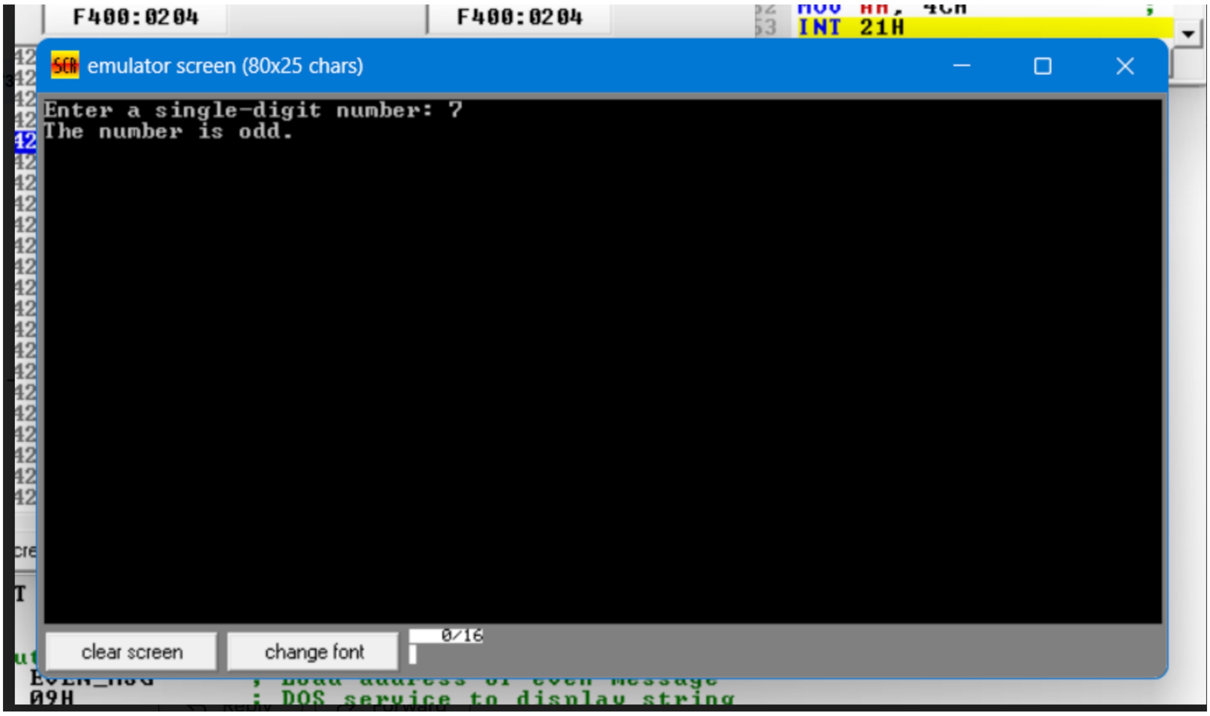
//CODE//

```
.MODEL SMALL
.STACK 100H
.DATA
    PROMPT DB 'Enter a single-digit number: $'
    EVEN_MSG DB 0DH, 0AH, 'The number is even.$'
    ODD_MSG DB 0DH, 0AH, 'The number is odd.$'
```

```
.CODE
MAIN PROC
   MOV AX, @DATA
   MOV DS, AX

   ; --- Input Section ---

   ; Display prompt to enter a number
   LEA DX, PROMPT       ; Load address of prompt message
   MOV AH, 09H          ; DOS service to display string
   INT 21H              ; Display "Enter a single-digit number: "

   MOV AH, 01H          ; DOS service to take single character input
   INT 21H              ; Take input (ASCII code in AL)
   SUB AL, '0'          ; Convert ASCII to integer (0-9)

   ; --- Odd/Even Check Section ---

   ; Check if the number is divisible by 2 (even or odd)
   MOV BL, AL           ; Store the input number in BL
   MOV AH, 0            ; Clear AH for division
   MOV AL, BL           ; Move the number to AL for division
   MOV CL, 2            ; Divisor is 2
   DIV CL               ; Divide the number by 2 (AL = AL/2, remainder in AH)

   CMP AH, 0            ; Check the remainder (stored in AH)
   JE EVEN              ; If remainder is 0, number is even, jump to EVEN label

   ; --- Output Section for Odd Case ---
   LEA DX, ODD_MSG      ; Load address of odd message
   MOV AH, 09H          ; DOS service to display string
   INT 21H              ; Display "The number is odd."
   JMP EXIT             ; Jump to exit

EVEN:
   ; --- Output Section for Even Case ---
   LEA DX, EVEN_MSG     ; Load address of even message
   MOV AH, 09H          ; DOS service to display string
   INT 21H              ; Display "The number is even."
   JMP EXIT             ; Jump to exit

EXIT:
   ; Program termination
   MOV AH, 4CH          ; DOS service to terminate program
   INT 21H
```

```
MAIN ENDP
END MAIN
```

Output


F400:0204
F400:0204
INT 21H
emulator screen (80x25 chars)
clear screen
change font
0/16
09H
; DOS service to display string

```
Enter a single-digit number: 7
The number is odd.
```