COMPUTER ORGANIZATION AND ARCHITECTURE

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

CODE:

```
ORG 100h
; Display the message "Enter the first digit: "
MOV DX, OFFSET msg_input1
MOV AH, 09h
INT 21h
; Read the first digit from the user
MOV AH, 01h
INT 21h
SUB AL, '0'        ; Convert ASCII to integer
MOV BL, AL         ; Store the first digit in BL
; Display the message "Enter the second digit: "
MOV DX, OFFSET msg_input2
MOV AH, 09h
INT 21h
; Read the second digit from the user
MOV AH, 01h
INT 21h
SUB AL, '0'        ; Convert ASCII to integer
MOV CL, AL         ; Store the second digit in CL
; Compare the two digits
CMP BL, CL         ; Compare the two digits
JE digits_equal    ; Jump if equal
```

```
; Display message for not equal
MOV DX, OFFSET msg_not_equal
MOV AH, 09h
INT 21h
JMP end_program
digits_equal:
; Display message for equal
MOV DX, OFFSET msg_equal
MOV AH, 09h
INT 21h
end_program:
; Terminate the program
MOV AH, 4Ch
INT 21h
; Data section with messages
msg_input1  DB 'Enter the first digit: $'
msg_input2  DB 0Dh, 0Ah, 'Enter the second digit: $'
msg_equal   DB 0Dh, 0Ah, 'The digits are equal.$'
msg_not_equal DB 0Dh, 0Ah, 'The digits are not equal.$'
END
```

OUTPUT:

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

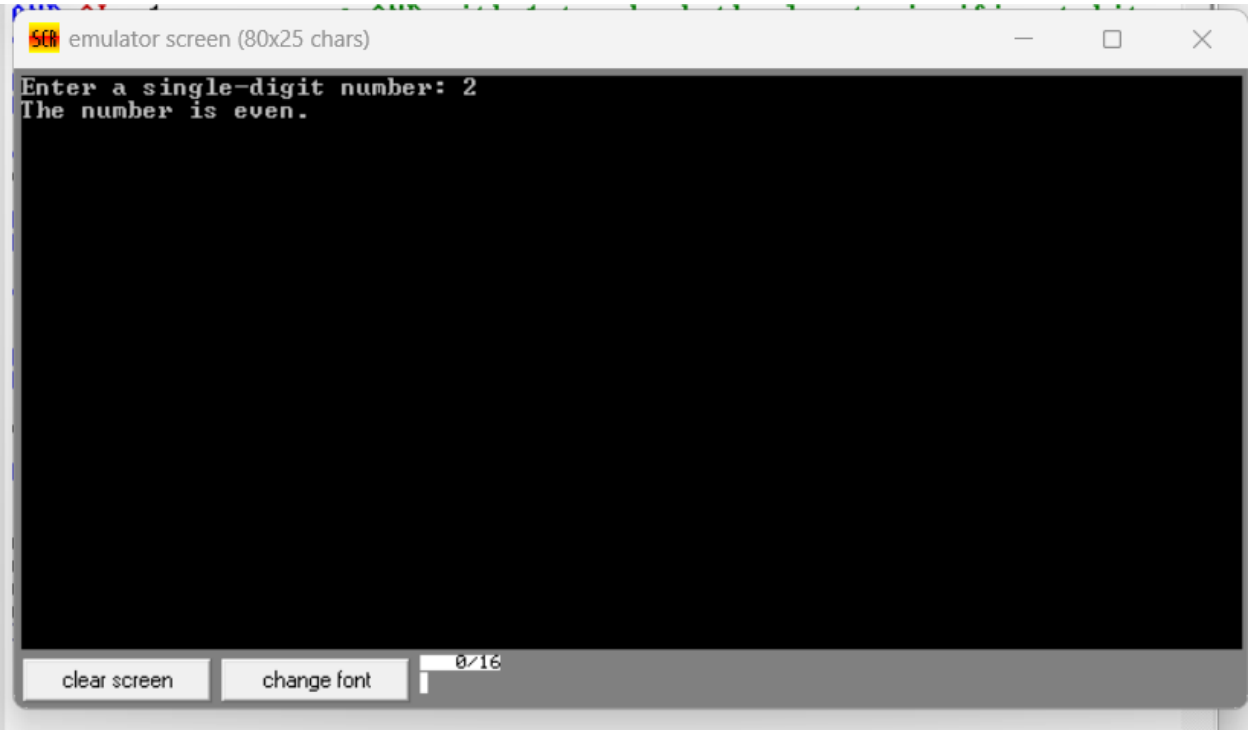
CODE:

```
ORG 100h

; Display the message "Enter a single-digit number: "

MOV DX, OFFSET msg_input

MOV AH, 09h

INT 21h

; Read the digit from the user

MOV AH, 01h

INT 21h

SUB AL, '0'         ; Convert ASCII to integer

; Check if the digit is between 0 and 9

CMP AL, 0           ; Check if less than 0

JB  invalid_input   ; If below 0, jump to invalid input
```

```
CMP AL, 9          ; Check if greater than 9
JA  invalid_input   ; If above 9, jump to invalid input
; Check if the number is odd or even
AND AL, 1          ; AND with 1 to check the least significant bit
JZ  even_number     ; If result is 0, it's even
; Display message for odd
MOV DX, OFFSET msg_odd
MOV AH, 09h
INT 21h
JMP end_program
even_number:
; Display message for even
MOV DX, OFFSET msg_even
MOV AH, 09h
INT 21h
JMP end_program
invalid_input:
; Display invalid input message
MOV DX, OFFSET msg_invalid
MOV AH, 09h
INT 21h
end_program:
; Terminate the program
MOV AH, 4Ch
INT 21h
; Data section with messages
msg_input      DB 'Enter a single-digit number: $'
```

```
msg_even        DB 0Dh, 0Ah, 'The number is even.$'
msg_odd         DB 0Dh, 0Ah, 'The number is odd.$'
msg_invalid     DB 0Dh, 0Ah, 'Invalid input. Please enter a single-digit number (0-9).$'
END
```

OUTPUT:



GITHUB LINK: https://github.com/vishnupriyavavyya/COA-LAB-TASK-9