**COA LAB –9**

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 ; Starting point for COM file

start:

; Prompt for first digit

mov ah, 09h ; DOS function to print string

lea dx, prompt1 ; Load address of prompt1 message

int 21h ; Print message

; Read first digit

mov ah, 01h ; Function to read a character from input

int 21h ; Read character (AL gets the value)

sub al, '0' ; Convert ASCII to integer

mov bl, al ; Store first digit in BL

; Print a newline

mov ah, 09h ; DOS function to print string

lea dx, newline ; Load address of newline

int 21h ; Print newline

; Prompt for second digit

mov ah, 09h ; DOS function to print string

lea dx, prompt2 ; Load address of prompt2 message

int 21h ; Print message

; Read second digit

mov ah, 01h ; Function to read a character from input

int 21h ; Read character (AL gets the value)

sub al, '0' ; Convert ASCII to integer

; Compare both digits

cmp bl, al ; Compare the first and second digits

je equal ; If equal, jump to equal section

jne not\_equal ; If not equal, jump to not\_equal section

equal:

; Print a newline

mov ah, 09h ; DOS function to print string

lea dx, newline ; Load address of newline

int 21h ; Print newline

; Print "Numbers are equal"

mov ah, 09h ; DOS interrupt to print a string

lea dx, msg\_equal ; Load address of the message

int 21h ; Print message

jmp done ; Jump to end of the program

not\_equal:

; Print a newline

mov ah, 09h ; DOS function to print string

lea dx, newline ; Load address of newline

int 21h ; Print newline

; Print "Numbers are not equal"

mov ah, 09h ; DOS interrupt to print a string

lea dx, msg\_not\_equal ; Load address of the message

int 21h ; Print message

done:

; Exit the program

mov ah, 4Ch ; DOS terminate program function

int 21h ; Exit program

prompt1 db 'Enter first digit: $' ; Prompt message for first digit

prompt2 db 'Enter second digit: $' ; Prompt message for second digit

msg\_equal db 'Numbers are equal$', 0 ; Message for equal numbers

msg\_not\_equal db 'Numbers are not equal$', 0 ; Message for unequal numbers

newline db 0Dh, 0Ah, '$' ; Newline characters (carriage return + line feed)

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

**Code**

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

; Display message for single digit number input

MOV DX, OFFSET msg\_input1

MOV AH, 09h ; Function 09h to display a string

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

; Read single digit number

MOV AH, 01h ; Function 01h to read a single character from input

INT 21h ; Call DOS interrupt to read the first digit

SUB AL, 30h ; Convert ASCII to decimal (subtract '0')

MOV BL, AL ; Store first number in BL

; Check if the number is odd or even

MOV AL, BL ; Move first number to AL

AND AL, 01h ; Perform bitwise AND with 1 to check if the number is odd

JZ first\_even ; If zero flag is set, the number is even

MOV DX, OFFSET odd\_msg1

JMP display\_first ; If the number is odd, jump to display

first\_even:

MOV DX, OFFSET even\_msg1

display\_first:

MOV AH, 09h ; Function 09h to display a string

INT 21h ; Call DOS interrupt to print the result of first number

end\_program:

; Terminate the program

MOV AH, 4Ch ; Function 4Ch to terminate the program

INT 21h ; Call DOS interrupt to exit

; Data section

msg\_input1 DB 0Dh, 0Ah, 'Enter the single digit number: $'

odd\_msg1 DB 0Dh, 0Ah, 'The single digit number is odd.$'

even\_msg1 DB 0Dh, 0Ah, 'The single digit number is even.$'

END

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