Lab # 03

8086 String Display and Loop Instructions using Assembly Language in EMU8086.

Objective:

Understand 8086 string display and loop instructions using Assembly Language Program.

Theory:

- **String Display Instruction**

  At first define the string to be displayed under DATA SEGMENT:

  .DATA
  test_string DB 'My first string', 0Dh, 0Ah, '$'

  Then, display the string in the command prompt as:
  MOV AH, 9
  LEA DX, test_string
  INT 21h

- **Loop:** LOOP instruction is a combination of a decrement of CX (i.e., count register). In 8086, LOOP decrements CX and if CX is not equal to zero, it jumps to the address indicated by the label. If CX becomes a 0, the next sequential instruction executes.

Assembly Language Program Example for Loop:

Count-controlled LOOP to display a row of 50 stars (*).
org 100h

```
.DATA        ; Data segment starts
.CODE        ; Code segment starts

MAIN PROC
       mov ax, @DATA
       mov ds, ax
       xor cx, cx  ; reset the CX register

       mov cx, 50
       mov ah, 2
       mov dl, '*'

       top:   int 21h
              loop top

       mov ah, 4ch    ; equivalent function number of RETURN
       int 21h             ; Input-Output Interrupt
MAIN ENDP
END MAIN
RET
```

Tasks to do:

1. Write an assembly language program that stores a string in a variable. Now, display the string and using loop calculate number of characters in that string and store that number in DL part of Data Register DX.

   Sample Input / Output:
   Input in a String: *input_string DB 'We are IUT Students', 0Dh, 0Ah, '$'*
   Output at DL: *We are IUT Students*
             15h (Equivalent of Decimal 21 or Binary 00010101 B)