Course Title: Microprocessor and Assembly Language Lab (CSE-3812)

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Lab # 04

Understanding Advanced 8086 I/O Instructions for using Loop in Assembly Language Program.

Objective:

To understand some advanced 8086 instructions and getting familiar with the use of Loop in Assembly Language Program.

Theory:

- **Loop**

The LOOP instruction is a combination of a decrement of CX (i.e., count register) and a conditional jump. In the 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
        int 21h

MAIN ENDP
END MAIN

RET
```

Tasks to do:

1. Write an assembly language code to derive the summation of a series (1 + 2 + 3 + 4 + … + N) and store the result in BX register as well as in SUM variable. (here, value of N is 9 to run the loop).

2. Write an assembly language code to derive the summation of odd number sequence 1+3+5+7…..+ N (**use LOOP**).

   Sample Input / Output:

   Input the value of N: 9
   The sum is: 25

3. **Home Assignment:** In the next class, bring a report on different kinds of loops in C (for, while, do-while, switch-case) and their implementation in assembly language with examples.