Department of
Computer Science and Engineering

Title: Implementation of loop using assembly language.

Microprocessors and microcontrollers

CSE 304

Green University of Bangladesh

1 Objective(s)

- To gather knowledge how to use loop in assembly language.

2 Problem analysis

Loop is a sequence of statements that is repeated. This repetition of statements must be controlled by a specific condition otherwise the program will break down.The LOOP instruction is a combination of a decrement of CX 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. Here CX is the count register which is used for executing repeating statements in assembly language.

Example:

```
;this is a comment
;initialize count register CX to loop count.
top:
;body of the loop
;Here goes your repeating statements.
LOOP top ;Branch back to Label top
```

3 Summation of first N numbers using assembly language.

```
1  .MODEL SMALL
2  .STACK 100H
3  .DATA
4  N DB 9
5  .CODE
6  MAIN PROC
7  MOV AX, @DATA
8  MOV DS, AX
9  XOR BX, BX ; reset
10 MOV AX, N
11 MOV CX,AX ;INITIALIZE COUNT REGISTER WITH N(HERE 9)
12 START: ADD BX,CX ; looping level start
13 loop start ;CX decrements automatically.
14 MOV AH, 02H
15 INT 21H
16 MAIN ENDP
17 END MAIN
18 }
```

4 Input/Output

Output of the program is given below.

```
Input: 9
Summation: 45
```

5 Discussion & Conclusion

Based on the focused objective(s) to understand about the loops in assembly language and the additional lab exercise made me more confident towards the fulfilment of the objectives(s).

6 Lab Task (Please implement yourself and show the output to the instructor)

1. Implement a loop to find out the summation of 1+2+3+.....+100, also try to implement it without loop.(Use formula).
2. Implement a loop to find out the summation of $1^2 + 2^2 + 3^2 + ... + n^2$.You can take n from user as an input.

7 Lab Exercise (Submit as a report)

- Use loop to find out the summation of 1+3+5+7+.....+99. Also try to find out the summation using formula.
- Take a number n from user. After that find out the factorial of that number n. (Suppose for n=5, you have to find out factorial= $1 \times 2 \times 3 \times 4 \times 5$.
- Take numbers as input from the user and print whether the given number is odd or even. You have to iterate the process until user press "N". If user press "N" terminate your program otherwise for given number print whether it is odd or even.

8 Policy

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