Computer Organization & Assembly Language

Lab-5

Loop, Label, Increment and Program to print 0 to 9 digits in Assembly Language-1

What is Loop?

Loop is series of instructions that is repeated until terminating condition is reached.

What is the structure of loop?

Loop consist following basic instructions

```
Mov dx,'a'
Mov ah,2
INT 21h
```

If you want to call this set of instruction again an again, you need to put these instruction into a block of label such as:

```
LabelName:
        Mov dx,'a'
        Mov ah,2
        INT 21h
Loop LabelName
```

But this is unconditional loop that means it won't contain the number of repetations.

Loop, Label, Increment and Program to print 0 to 9 digits in Assembly Language-2

To make loop conditional or terminate upon your desired number of times, you need a **COUNTER Register** this time.

Mov CX, 10 (It will automatically decrement by 1)

Label Rules:

1. Label can be placed at the beginning of the statement.
2. No reserve word will be assigned as a label such as: (Add, Sub, Mov etc.)
3. Colon (:) must be placed after Label Name while initializing. But not while calling.

```
LabelName:
        Mov dx,'a'
        Mov ah,2
        INT 21h
Loop LabelName
```

Loop, Label, Increment and Program to print 0 to 9 digits in Assembly Language-3

```
dosseg ;dos segment
.model small
.stack 100h
.data
.code
Main proc
Mov cx,10
L1:
Mov dx,48
Mov ah,2
INT 21h
Loop L1
mov ah,4ch
INT 21h
Main endp
End Main
```

This program will print 0 (zero) 10 times without an increment of a digit. Because we have not used the increment as such.

Counter Register set with value 10 times to repeat.

Loop Name Initialized.

Value 0 passed to data register for printing.

Loop called again.

Loop, Label, Increment and Program to print 0 to 9 digits in Assembly Language-4

```
dosseg ;dos segment
.model small
.stack 100h
.data
.code
Main proc
Mov cx,10
Mov dx,48
L1:
Mov ah,2
INT 21h
Loop L1
mov ah,4ch
INT 21h
Main endp
End Main
```

If I pass the value 0(zero) into dx register before initializing a loop, it will again print the Zero (0), ten (10) times. But it will be initialized at starting and not in the loop again an again.

Counter Register set with value 10 times to repeat.

Value 0 passed to data register for printing.

Loop Name Initialized.

Loop called again.

Loop, Label, Increment and Program to print 0 to 9 digits in Assembly Language-5

```
dosseg ;dos segment
.model small
.stack 100h
.data
.code
Main proc
Mov cx,10
Mov dx,48
L1:
Mov ah,2
INT 21h
Add dx,1
Loop L1
mov ah,4ch
INT 21h
Main endp
End Main
```

In this program we have added an increment into a dx register value. So this program will generate the output as we desired to print 0 to 9 numbers.

Adding a 1 number into the dx register. You can either use Inc 1 instead

DosBox Commands

- Edit Filename.asm (to create new file if not exists/open existing file)
- MASM Filename.asm; (to convert into object file using MASM assembler)
- LINK Filename.obj; (to convert object file into execution file using linker)
- To execute the exe file you just created,
  - Filename.exe (it will execute)

- NOTE: (Semicolon is mandatory while converting via assembler and linker only)