## CSE 331L / EEE 332L: (Lab 5),

Section: 7 & 8, Fall 2019

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## Loop

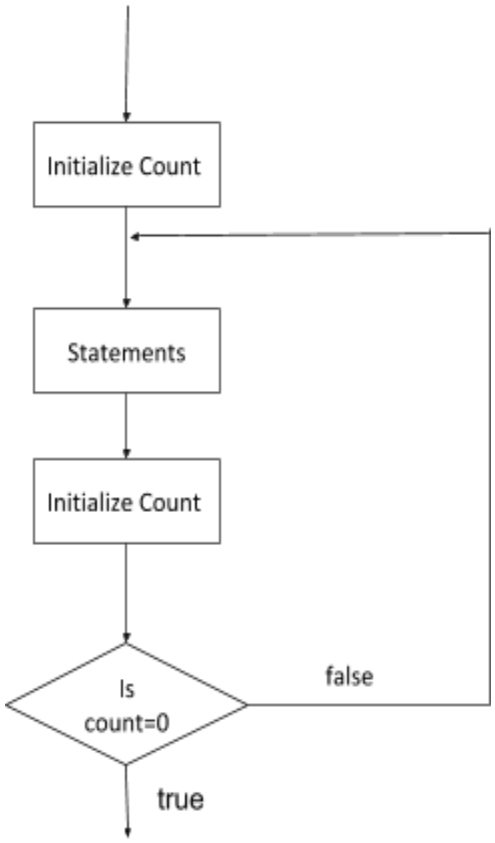
**1. print the first five characters of ascii table**

```
ORG 100H
.MODEL SMALL
.STACK 100H
.CODE
MAIN PROC
        MOV AH, 2
        MOV CX, 5
        MOV DL, 0

        PRINT_LOOP:
                INT 21H
                INC DL
                LOOP PRINT_LOOP    ;
CX=CX-1

        EXIT:
        MOV AH, 4CH
        INT 21H

MAIN ENDP
END MAIN
```




**Logic Instructions**

| a | b | a AND b | a OR b | a XOR b | NOT a | Instructions |
|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 1 | 0 | 1 | Opcode destination, source |
| 0 | 1 | 0 | 1 | 1 | 1 | |
| 1 | 0 | 0 | 1 | 1 | 0 | |
| 1 | 1 | 1 | 0 | 0 | 0 | |

**Mask**

| a | b | a AND b | a OR b | a XOR b | | a | b | a AND b | a OR b | a XOR b |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 0 | 0 | 0 | | 0 | 1 | 0 | 1 | 1 |
| 1 | 0 | 0 | 1 | 1 | | 1 | 1 | 1 | 1 | 0 |
| 1 | 0 | 0 | 1 | 1 | | 1 | 1 | 1 | 1 | 0 |

## Example: Check if input contains even number

```
        MOV AH, 1
        INT 21H

        TEST AL, 1
        JZ PRINT

PRINT:
        MOV AH, 2
        MOV DL, 'E'
        INT 21H
        JMP EXIT

EXIT:
        MOV AH, 4CH
        INT 21H
```

**Array: Index mode**

- BX, SI, DI registers hold the offset addresses of a memory locations. Their segment numbers are contained in DS.

**Example: find the summation of the numbers of an array**

```
arr db 90h, 23h, 21h, 43h, 33h
```

```
        XOR AX, AX              ;CLEAR AX
        XOR BX, BX              ;CLEAR BX
        MOV CX, 5

PRINT:
        MOV DL, ARR[BX]    ; mov dl, [si/di]
        INC BX                  ; inc si/di

        MOV AH, 2
        INT 21H

        LOOP PRINT
```

**Example: Declare an array of size 10 without any initial data. Prompt the user to enter a line of text and store it into the array. Terminate the program if the number of user input key exceeds the array size or user inputs a carriage return.**

```
ORG 100H
.MODEL SMALL
.STACK 100H
.DATA
        MY_STRING DB 10 DUP (?),'$'
.CODE
        MAIN PROC
        MOV AX, @DATA
        MOV DS, AX
```

```
        XOR BX, BX      ;INITIALIZE STRING INDEX
        MOV CX, 10      ;SET COUNTER TO MAX COUNT
        MOV AH, 1       ;FUNCTION# 1


        PRINT:
          INT 21H           ;INPUT FOR EACH LOOP

          CMP AL, 0DH   ;COMPARE IF INPUT KEY IS CRET
          JE EXIT           ;JUMP TO EXIT IF AL HOLDS CRET

          MOV MY_STRING[BX],AL          ;LOAD INPUT CHAR INTO STRING
          INC BX                        ;UPDATE STRING INDEX

          LOOP PRINT                    ;CX=CX-1 & REPEAT LOOP IF CX!=0


        EXIT:
          MOV AH, 2
          MOV DL, 0AH
          INT 21H
          MOV DL, 0DH
          INT 21H

          MOV AH, 9
          LEA DX, MYSTRING
          INT 21H

          MOV AH, 4CH
          INT 21H

        MAIN ENDP
END MAIN
```

**Task**

1. Read a character, check if it is ‘a’ or ‘A’. if yes, print a message “the character: a” or “the character: A”
2. Write a count-loop that will print the following shape

```
**********
**********
**********
**********
**********
**********
**********
**********
**********
```

3. Replace each uppercase letter in the following string by its lowercase equivalent. Use index addressing mode.

   MSG DB “THIS IS CSE 331 LAB CLASS 5$”

4. Write a program that will prompt the user to enter a hex digit character (“0”.....”9” or “A”.....”F”), display it on the next line in decimal.

   Sample 1:

   Enter a Hex digit: B

   The decimal value of B is 11

   Sample 2:

   Enter a Hex digit: 3

   The decimal value of 3 is 3