



Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

Aim: Assembly Language Program to display character A to z in both uppercase and lowercase

Theory:

DOS provide various interrupt services that are used by the system programmer. The most commonly used interrupt is INT 21H. It invokes inbuilt DOS functions which can be used to perform various tasks. The most common tasks are reading a user input character from the screen, displaying result on the exiting program etc.

In this program, we display the characters A to Z on the DOS prompt. DOS interrupt function 02 displays the contents of DL (ASCII code) on the screen. By loading the ASCII code of 'A' in the DL register, loading AH register with 02h and calling INT 21h it is possible to display character from A to Z on the screen.

INT 21h/AH = 2 - write character to standard output.

Entry: DL = character to write, after execution AL = DL.

Example :-

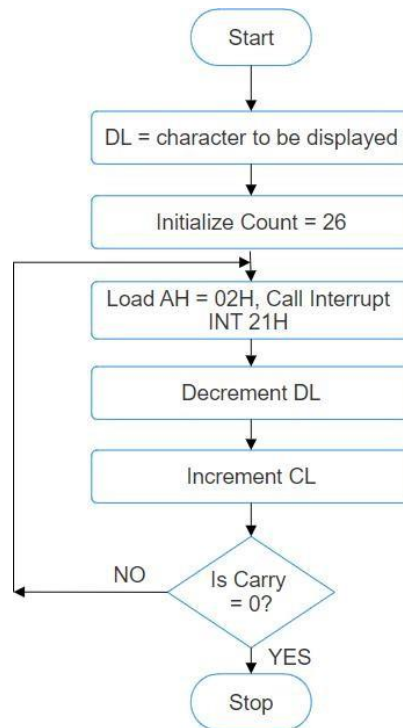
```
mov ah , 2  
mov dl , 'a'  
int 21h
```



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Flowchart:



Algorithm:

1. Start.
2. Initialize DL with 'A'.
3. Load CL with count = 26.
4. Load AH = 02H and call INT 21H.
5. Increment DL, to next character.
6. Decrement the count.
7. Repeat steps 4,5,6 till CL is not zero.
8. To end the program use DOS interrupt:
 - 1) Load AH = 41H.
 - 2) Call INT 21 H.
9. Stop.



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Program Code:

```
org 100h

mov cx, 1Ah
mov dl,'a'
L1:
mov ah, 02h
int 21h
inc dl
dec cx
jnz L1

mov dl, 0ah
int 21h
mov dl, 0dh
int 21h

mov cx, 26
mov dl,'A'
L2:
mov ah, 02h
int 21h
inc dl
dec cx
jnz L2

Ret
```

Output -





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Conclusion:

The program effectively demonstrates the conversion of characters between uppercase and lowercase forms using ASCII values. This functionality is crucial for text processing tasks, allowing for versatile manipulation and display of text in different formats.

1. Explain INT 21H.

Ans. INT 21H is a software interrupt in the x86 architecture microprocessor. It's a mechanism used by the DOS operating system to invoke various services provided by the BIOS or DOS itself.

In short, when a program wants to perform tasks like file operations, input/output, or memory management in DOS, it triggers INT 21H. The specific function to be performed is specified in the AH register before calling the interrupt.

2. Explain working of increment and decrement instructions.

Ans. Increment (INC): This instruction increases the value of a specified operand by one. For example, if the operand is in a register or memory location, the value stored there is incremented by one.

Decrement (DEC): Conversely, this instruction decreases the value of a specified operand by one. It works similarly to the increment instruction but decreases the value instead.

These instructions are typically used in looping constructs, counters, and addressing calculations. They directly affect the contents of the operand, updating it in place without the need for additional arithmetic operations.