**Program No.: 02**

**Program Title:** Assembly Language Program for taking input and print it.

**Objective**

To develop an assembly language program that takes a single character input from the user and displays it on the screen using DOS interrupts.

**Introduction**

Assembly language allows direct interaction with the hardware through low-level instructions. In this lab, we explore basic I/O operations in x86 assembly using DOS interrupts. Specifically, we use INT 21H to read a character from the user and then print that character on the screen. This simple program demonstrates how input and output are managed at the assembly level.

**Equipment** **and** **Software** **Used**

* Assembler: MASM/TASM
* Emulator: Emu8086
* Operating System: Windows with DOS emulation

**Code** **Explanation**

**Header** **Section**

.model small: Specifies a memory model suitable for small programs with separate code and data segments.

.stack 100H: Allocates 256 bytes of stack space.

**Data Section**

.data: This section is empty since no variables or constants are defined. The program uses only CPU registers for data handling.

**Code Section**

**Input Character:**

mov ah, 1: AH = 01H: Function to read a single character from the keyboard

int 21H: INT 21H: DOS interrupt used for input; the character is stored in the AL register.

**Display Character:**

mov dl, al: Moves the input character from AL to DL, the register used for output.

mov ah, 2: AH = 02H: Function to display the character stored in DL.

int 21H: INT 21H: DOS interrupt used for output.

**Exit the Program**

mov ah, 4Ch: AH = 4Ch: DOS function to terminate the program.

int 21H: INT 21H: Exit call to return control to the operating system.

**Code** **Implementation**

|  |  |
| --- | --- |
| .model small  .stack 100H  .data  .code  main proc  mov ah, 1 ; Input character function  int 21H ; Read from keyboard  mov dl, al ; Move input to output register  mov ah, 2 ; Output character function  int 21H ; Display on screen | mov ah, 4Ch ; Exit program function  int 21H ; Terminate  main endp  end main |

**Observations**

The program waits for a keypress from the user.

After the user presses a key, the character is immediately echoed back to the screen.

Only one character can be taken and displayed in this implementation.

It uses DOS interrupts, demonstrating basic system-level I/O handling.

**Conclusion**

This lab successfully demonstrated a basic assembly program for input and output using INT 21H. Understanding these low-level operations strengthens knowledge of how higher-level language functions like scanf and printf are implemented behind the scenes. This program also helps in building a foundation for more complex assembly tasks involving strings and file I/O.