**Program No.: 01**

**Program Title:** Assembly Language Program for printing “DHAKA INTERNATIONAL UNIVERSITY”

**Objective**

To develop a simple assembly language program using MASM/TASM that prints the string “DHAKA INTERNATIONAL UNIVERSITY” using DOS interrupt INT 21H.

**Introduction**

Assembly language is a low-level programming language that is closely related to machine code. It allows programmers to write instructions that directly control the hardware. In this lab, we aim to use Assembly Language to print a string by individually displaying each character using DOS interrupts. This helps understand how characters are handled at the processor level and how interrupts are used for output.

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

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

**Code** **Explanation**

**Header** **Section**

model small: Defines a memory model suitable for small programs.

stack 100H: Allocates 256 bytes of stack memory.

**Data Section**

.data : This section is used for declaring variables or constants. In this case, it’s empty because we directly print characters without storing them.

**Code Section**

The code section starts with the main procedure.

We use a loop of MOV and INT 21H instructions to print each character.

Each character of “DHAKA INTERNATIONAL UNIVERSITY” is printed using:

mov dl, 'D' ; Load character

mov ah, 2 ; Function to display character

int 21H ; Interrupt to print character

**Exit the Program**

mov ah, 4Ch

int 21H

This exits the program gracefully using DOS function 4Ch.

**Code** **Implementation**

|  |  |
| --- | --- |
| .model small  .stack 100H  .data  .code  main proc  ; DHAKA  MOV dl, 'D'  mov ah, 2  int 21H  mov dl, 'H'  mov ah, 2  int 21H  mov dl, 'A'  mov ah, 2  int 21H  mov dl, 'K'  mov ah, 2  int 21H  mov dl, 'A'  mov ah, 2  int 21H  mov dl, ' '  mov ah, 2  int 21H  ; INTERNATIONAL  mov dl, 'I'  mov ah, 2  int 21H  mov dl, 'N'  mov ah, 2  int 21H  mov dl, 'T'  mov ah, 2  int 21H  mov dl, 'E'  mov ah, 2  int 21H  mov dl, 'R'  mov ah, 2  int 21H  mov dl, 'N'  mov ah, 2  int 21H  mov dl, 'A'  mov ah, 2  int 21H  mov dl, 'T'  mov ah, 2  int 21H  mov dl, 'I'  mov ah, 2  int 21H | mov dl, 'O'  mov ah, 2  int 21H  mov dl, 'N'  mov ah, 2  int 21H  mov dl, 'A'  mov ah, 2  int 21H  mov dl, 'L'  mov ah, 2  int 21H  mov dl, ' '  mov ah, 2  int 21H  ; UNIVERSITY  mov dl, 'U'  mov ah, 2  int 21H  mov dl, 'N'  mov ah, 2  int 21H  mov dl, 'I'  mov ah, 2  int 21H  mov dl, 'V'  mov ah, 2  int 21H  mov dl, 'E'  mov ah, 2  int 21H  mov dl, 'R'  mov ah, 2  int 21H  mov dl, 'S'  mov ah, 2  int 21H  mov dl, 'I'  mov ah, 2  int 21H  mov dl, 'T'  mov ah, 2  int 21H  mov dl, 'Y'  mov ah, 2  int 21H  ; Exit  mov ah, 4Ch  int 21H  main endp  end main |

**Observations**

Each character is displayed one-by-one using INT 21H.

The program correctly prints the sentence “DHAKA INTERNATIONAL UNIVERSITY” on the screen.

Using Emu8086 emulator, the output was observed in the emulator screen.

**Conclusion**

This lab demonstrated a basic assembly language program that uses DOS interrupts to display characters. It gave practical experience with register operations, memory models, and system interrupts in x86 architecture. Understanding such low-level operations helps in grasping how high-level languages interface with hardware.