SSN College of Engineering Department of Computer Science and Engineering

III year - UCS1512 – Microprocessors Lab

Display a string

Exp No: 10

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Date: 13/10/2020

Aim:

To design 8086-program for displaying a string.

Procedure for executing MASM:

1. Run Dosbox and mount your masm folder to a drive in dosbox.
2. Goto the mounted drive.
3. Save the 8086 program with extension .asm in the same folder using command “edit”
4. After creating the file, assemble it using the command “masm filename.asm”
5. Link the file using the command “link filename.obj;”
6. Use debug command with filename.exe to execute and analyse the memory contents, “debug filename.exe”.
7. In debug, command “u” will display the unassembled code.
8. Use command “d segment:offset” to see the content of memory locations starting from segment:offset address.
9. To change the value in memory, use the command “e segment:offset”
10. Verify the memory contents to ensure the updates (using command “d”).
11. . Execute using the command “g” and check the outputs.
12. “q” to exit from debug and “exit” to exit from command prompt and to close the Dosbox.

Algorithm:

1. START: Move the starting address of data segment to AX register and move the data from AX register to DS register.
2. Move 9H to AH register.
3. Calling int 21H with AH == 9 will display the contents from the offset stored in DX register.
4. Move the hexadecimal value 4C into AH register. INT 21H means invoke the interrupt identified by the hexadecimal number 21. In MS-DOS, invoking interrupt 21h while AH = 4Ch causes the current process to terminate and uses the value of register AL as the exit code of the process.

Program:

```
DATA SEGMENT
        MESSAGE DB "THIS IS THE STRING$"
DATA ENDS

CODE SEGMENT
ASSUME CS:CODE,DS:DATA
START:  MOV AX,DATA
        MOV DS,AX
        MOV AH,9                    ; DOS FUNCTION #9
        MOV DX,OFFSET MESSAGE       ; OFFSET OF THE STRING
        INT 21H                     ; DISPLAY IT
        MOV Ah,4CH
        INT 21H
CODE ENDS
END START
```

	Program	**Comments**
START:	MOV AX, DATA MOV DS, AX	Transferring the data from DATA to AX register and from AX register to DS register.
	MOV AH,9	DOS FUNCTION #9
	MOV DX, OFFSET MESSAGE	OFFSET OF THE STRING.
	MOV AH,4CH	Setup function-4C of the int21.
	INT 21H	Call BIOS int21 to return to DOS.

Unassembled Code:

```
-U
076C:0000 B86A07        MOV     AX,076A
076C:0003 8ED8          MOV     DS,AX
076C:0005 B409          MOV     AH,09
076C:0007 BA0000        MOV     DX,0000
076C:000A CD21          INT     21
076C:000C B44C          MOV     AH,4C
076C:000E CD21          INT     21
076C:0010 F9            STC
076C:0011 B700          MOV     BH,00
076C:0013 D1E3          SHL     BX,1
076C:0015 8B87AE16      MOV     AX,[BX+16AE]
076C:0019 3B46FE        CMP     AX,[BP-02]
076C:001C 7709          JA      0027
076C:001E 8946FE        MOV     [BP-02],AX
```

Snapshot of sample input and output:

```
-G
THIS IS THE STRING
Program terminated normally
```

Result:

Thus the 8086 program for displaying a string is executed successfully in DOS-BOX