Lab Work - 02

Course Name: Microprocessor and Microcontroller Lab

Course: CSE 316

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Introduction

The provided code is a simple assembly language program written in 8086 architecture that counts from 0 to 9 and displays the numbers on the screen. It uses the DOS interrupt 21H to print characters on the screen.

Code explanation

.MODEL SMALL

This line specifies the memory model of the program. Here, it is using the small memory model.

.STACK 100H

This line reserves a stack memory of 100H (256 bytes) for the program.

.DATA

This segment declares the data variables used in the program.

PROMPT DB

'The counting from 0 to 9 is : $' This line declares a prompt message that will be displayed on the screen before printing the numbers.

.CODE

This segment contains the executable code of the program.

MAIN PROC

This line defines the main procedure of the program.

MOV AX, @DATA

MOV DS, AX

These two lines initialize the data segment (DS) register to point to the start of the data segment.

LEA DX, PROMPT

MOV AH, 9

INT 21H

These lines load the prompt message to the DX register and call the DOS interrupt 21H to display it on the screen.

MOV CX, 10

This line initializes the CX register to 10, which will be used as the counter for the loop.

MOV AH, 2

MOV DL, 48

These lines set the output function to print a character on the screen and set the DL register to 48, which is the ASCII code for '0'.

@LOOP:

This is a label used for the loop.

INT 21H

This line calls the DOS interrupt 21H to print the character stored in the DL register.

INC DL

This line increments the DL register to point to the next ASCII character.

DEC CX

This line decrements the CX register to count down to 0.

JNZ @LOOP

This line jumps to the label @LOOP if the CX register is not zero yet, which will continue the loop until it reaches 0.

MOV AH, 4CH

INT 21H

These two lines set the DOS exit function to terminate the program.

MAIN ENDP

END MAIN

The lines `MAIN ENDP` and `END MAIN` mark the end of the main procedure and the end of the program, respectively.

`MAIN ENDP` is used to indicate the end of the `MAIN` procedure, which was defined earlier in the code using `MAIN PROC`. This allows the assembler to keep track of the scope of the procedure, making it easier to identify errors and optimize the code.

`END MAIN` marks the end of the entire program. This indicates that the assembler should stop assembling the code and generate the corresponding executable file.

In summary, `MAIN ENDP` and `END MAIN` are important markers in the assembly language code, which indicate the end of the main procedure and the end of the program, respectively.

Conclusion

This assembly language program demonstrates a simple counter that counts from 0 to 9 and displays the numbers on the screen. It uses the DOS interrupt 21H to print characters on the screen and demonstrates the use of the data segment, loop, and register manipulation.