Lab Homework Week 7 Report

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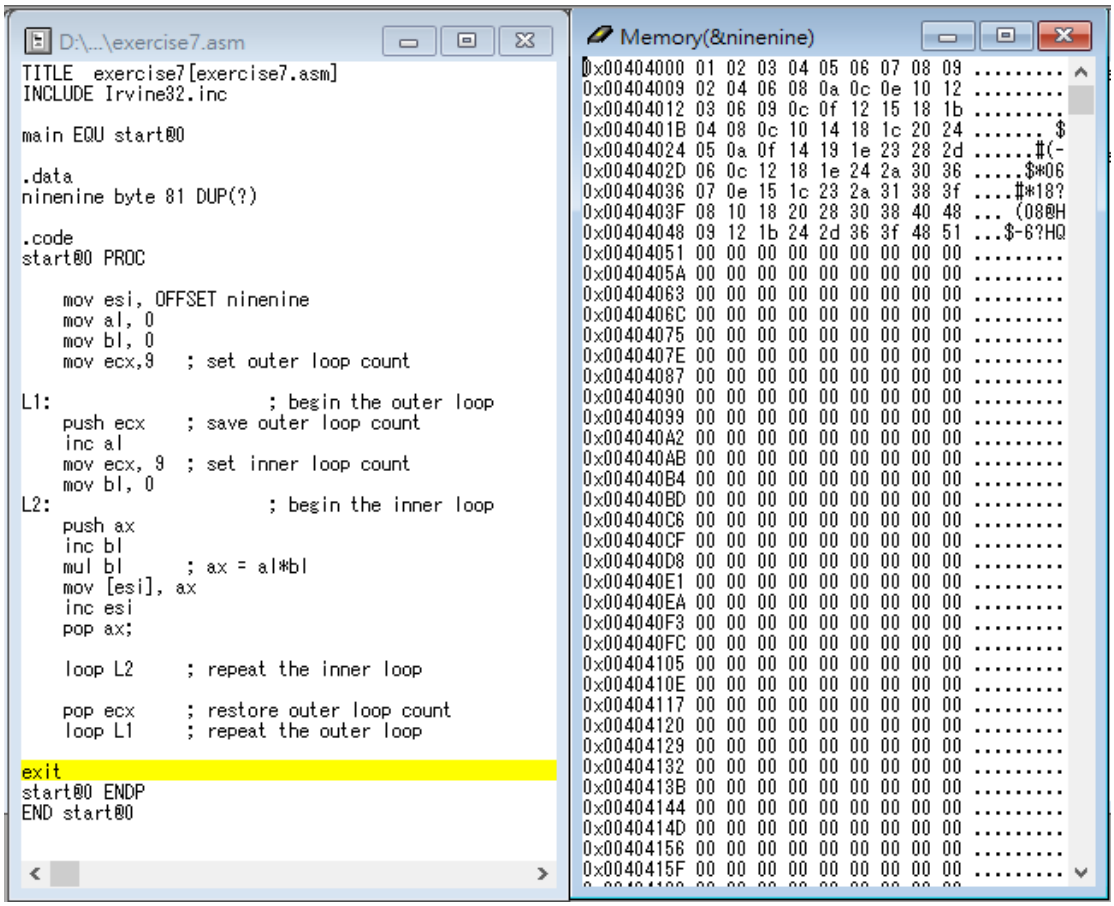
Objective:

To understand how to write simple Assembly program and program structure. Use the course content to learn data in memory storage and how to use MUL instruction. Make a program that stored multiplication table from 1*1 to 9*9 as shown as in the memory.

exercise7.asm

```
1  TITLE  exercise7[exercise7.asm]
2  INCLUDE Irvine32.inc
3
4  main EQU start@0
5
6  .data
7  ninenine byte 81 DUP(?)
8
9  .code
10 start@0 PROC
11
12     mov esi, OFFSET ninenine
13     mov al, 0
14     mov bl, 0
15     mov ecx,9    ; set outer loop count
16
17 L1:              ; begin the outer loop
18     push ecx     ; save outer loop count
19     inc al
20     mov ecx, 9   ; set inner loop count
21     mov bl, 0
22 L2:              ; begin the inner loop
23     push ax
24     inc bl
25     mul bl       ; ax = al*bl
26     mov [esi], ax
27     inc esi
28     pop ax;
29
30     loop L2 ; repeat the inner loop
31
32     pop ecx ; restore outer loop count
33     loop L1 ; repeat the outer loop
34
35 exit
36 start@0 ENDP
37 END start@0
```



Explanation:

We set ecx to 9 in order to loop L1 for 9 times. In L1, we pushed ecx to preserve the count of L1, and then set ecx to 9 to prepare for the L2 loop. We also used inc al to increase multiplicand by one. In L2, we pushed ax in order to preserve from the change of al so that we could implemented the 9x9 table correctly. Finally, we used inc esi to make esi point to next byte. This way, we could finish 9x9 table eventually.

Review:

The assignment of today is to code a 9x9 multiplication table which gave us a chance to review the instructions of mul, loop, push, pop and esi pointer. We have done 9*1 to 9*9 in previous class which let us be able to refer to it. At first, we didn’t know how to implement nested loop so we refer to the ppt of chapter 5. After that, we searched the concept of 9x9 table by assembly from Google and adjust the code: push and pop instructions, also we clarified the idea of FIFO in stack. Finally, we finished this lab assignment.