CS221 Assembly Language

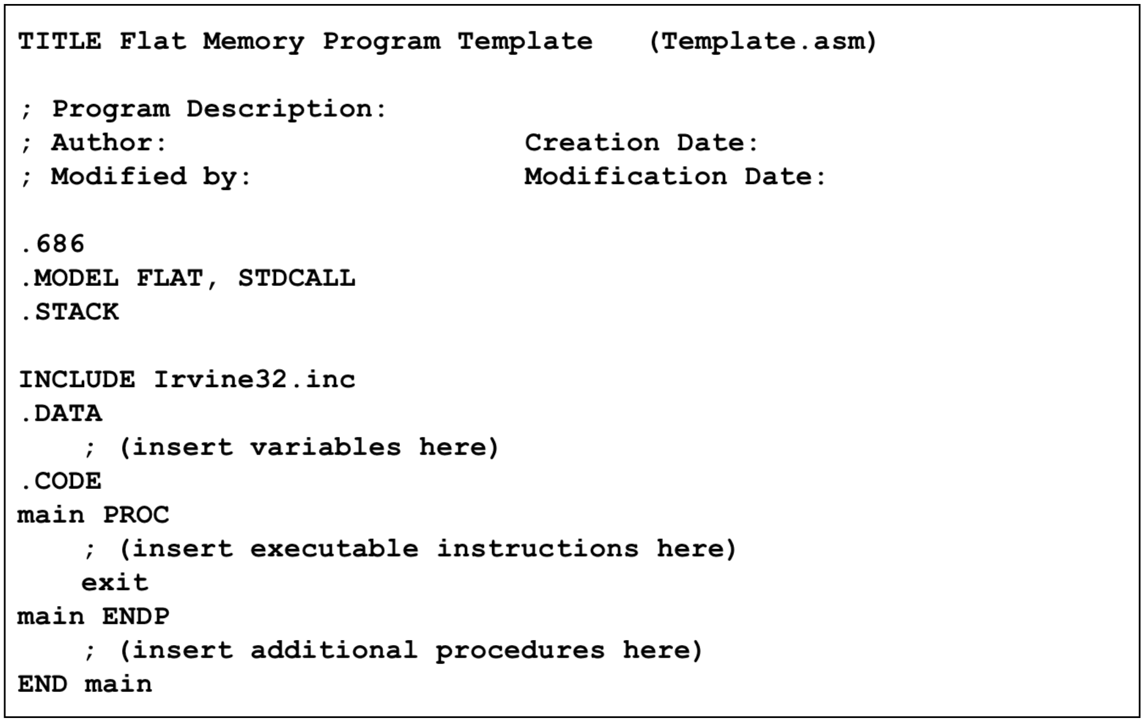
Lab3

Prof. Mohamed Ben Othman

1- **Practice**:

Addressing Modes:

use the given program template to declare the variety of addressing modes we studied in lecture slides 5.



```
TITLE Flat Memory Program Template   (Template.asm)

; Program Description:
; Author:                        Creation Date:
; Modified by:                   Modification Date:

.686
.MODEL FLAT, STDCALL
.STACK

INCLUDE Irvine32.inc
.DATA
    ; (insert variables here)
.CODE
main PROC
    ; (insert executable instructions here)
    exit
main ENDP
    ; (insert additional procedures here)
END main
```

Use your slides to:

A- declare an array (called a1) of word and initialize it with 10 integer values.

B- make a loop (using loop instruction) to add the values of this array and store the total in a variable called totalarray:

a. wherever there is register addressing mode put a comment mentioning that.

b. wherever there is an immediate addressing mode put a comment mentioning that.

c. in a first solution use only direct addressing

d. in a second solution use only a base addressing mode (use ebx as base address register)

e. in a third solution use only index addressing mode (use esi as index register)

f. in a fourth solution use mixed base-index addressing mode (use ebx as base and esi as index registers)

g. in fifth solution use base-index-with scale addressing mode)

Exercise:

instructions	data declaration	macros	Registers
mov add inc loop cmp jne	byte, word	WriteString WriteInt	eax, ebx, esi, edi
		WriteDec	

A- declare two arrays (called a1 and a2) of word and initialize them with 10 integer values each.

B- declare an array (called intersection) of 10 non-initialized words.

C- use two nested loops (using loop instruction) in the outer loop take the value from a1 and store it in a register, in the inner loop check if the value is in a2 by using cmp instruction and jne to jump if it is not equal. If it is equal add the value to the third array and break the loop.

D- print the intersection array

Note:

1- for those do not know how to use cmp and jne:

cmp eax, ebx ; compares the two values eax and ebx
; you can compare the values of two registers, a register and variable in the memory …
Both operands should have the same size
jne label ; jumps to the label if the flag Zero is not set (in this case if the two values are not equal).

2- To print a string (buffer):

```
mov  edx,OFFSET buffer    ; display the buffer
call WriteString
```

3- To print an Integer:

```
the integer you would like to print should be in eax
call WriteInt
```

4- You should practice and do the exercise home and, in the Lab time: the first half the instructor will check your homework, take notes, and answer your questions if you have any. The second half will be a quiz.

2- Quiz:

The first Quiz will be this week.