[CO215 , CO Lab 2021] **CO Lab Assignment-7**

---------- **Report**----------

Roll number: CSB19057

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Objectives:

1. To learn using alternative addressing modes;
2. To observe the implications of the addressing modes;

Exercises:

Title: AddVector2

```
org 100h
.MODEL SMALL
.STACK 100H
.DATA
V1 DB 1, 2, 3, 4, 5, 6
V2 DB 13, 12, 45, 27, 31, 41
V3 DB ?, ?, ?, ?, ?, ?
num DB 6
ten db 10
spc db &#39
output_msg DB 10, 13, &#39
.CODE
   main PROC
   .STARTUP
      mov cl, num
      mov ch, 0
      mov ax, 0
   Add_loop:
      mov al, V1[si]
      add al, V2[si]
      mov V3[si], al
      inc si
      dec cl
      jne add_loop

   mov ah, 09h
   lea dx, output_msg
```

```
    int 21h
    mov si, OFFSET V3
    mov cl, num
    Print_loop:
    mov ax, 0
    mov al, V3[si]
    inc si
    div ten
    push ax
    mov dl, al
    add dl, 30h
    mov ah, 02h
    int 21h
    pop ax
    mov dl, ah
    add dl, 30h
    mov ah, 02h
    int 21h
    mov ah,09h
    lea dx, spc
    int 21h
    dec cl
    jne Print_loop

    mov ah ,4ch
    mov al ,0
    int 21h
main ENDP
END main
;CSB19057
```

Observations:

AddVector1

Instruction Number	Starting memory location	Machine code in hexadecimal
1	0712C	8A138
2	0712E	02002
3	07130	88136

4	07133	46070
5	07134	47071
6	07135	45069
7	07136	FE254
8	07138	75117
9	0712C	8A138
10	0712E	02002
11	07130	88136
12	07133	46070
13	07134	47071
14	07135	45069
15	07136	FE254
16	07138	75117
17	0712C	8A138
18	0712E	02002
19	07130	88136
20	07133	46070
21	07134	47071
22	07135	45069
23	07136	FE254
24	07138	75117
25	0712C	8A138
26	0712E	02002
27	07130	88136
28	07133	46070
29	07134	47071
30	07135	45069
31	07136	FE254
32	07138	75117
33	0712C	8A138
34	0712E	02002
35	07130	88136
36	07133	46070
37	07134	47071
38	07135	45069
39	07136	FE254
40	07138	75117
41	0712C	8A138
42	0712E	02002
43	07130	88136
44	07133	46070
45	07134	47071
46	07135	45069
47	07136	FE254

48	07138	75117

AddVector2

Instruction Number	Starting memory location	Machine code in hexadecimal
1	07123	8A138
2	07127	02002
3	0712B	88136
4	0712F	46070
5	07130	FE254
6	07132	75117
7	07123	8A138
8	07127	02002
9	0712B	88136
10	0712F	46070
11	07130	FE254
12	07132	75117
13	07123	8A138
14	07127	02002
15	0712B	88136
16	0712F	46070
17	07130	FE254
18	07132	75117
19	07123	8A138
20	07127	02002
21	0712B	88136
22	0712F	46070
23	07130	FE254
24	07132	75117
25	07123	8A138
26	07127	02002
27	0712B	88136
28	0712F	46070
29	07130	FE254
30	07132	75117
31	07123	8A138
32	07127	02002
33	0712B	88136
34	0712F	46070
35	07130	FE254
36	07132	75117

Comparison:

Program	No. of Instructions	Program Length (Bytes)	Number of Memory Operations	
AddVector1	8	93	26	
AddVector2	6	95	26	

Learning Outcome:

From the practical we found that the number of operations decreased from 8 to 6 for each add operation in loop in the fist program against the second program.

Use of Alternative Addressing Modes:

1. Program Readability:
   Program readability is better in register indexed addressing mode as compared to indirect addressing mode.

2. Program Efficiency:
   Program efficiency is equally efficient in both the addressing mode. Also, number of instructions in add loop in AddVector1 is less compared to the AddVector2 program.