**Assignment No.1**

**Title:** Array Addition

**Aim:** Write an 8086 Assembly Language Program (ALP) to add array of N numbers

stored in the memory.

**Objective:** To be familiar with the format of assembly language program along with

different assembler directives and different functions of the DOS Interrupt.

**Theory:** Suppose there are ‘n’ numbers stored in memory. Therefore the counter is set to value n. Also a pointer is set to the point to the base address of memory location where the data is stored.

Initialize a register, set AL to zero to store resultant addition. Add the numbers one by one to register while incrementing the pointer and decrementing the counter one by one till it becomes zero.

**Directives used:**

1. . model 🡪 Initializes memory model before defining any segment. It can be

tiny, small, medium, compact, large. Programmer can choose the memory

model based on the requirement.

1. .data 🡪 start of data segment
2. . code🡪 start of code segment
3. DB (Define Byte)🡪 allocates and initializes bytes of storage
4. End🡪End of the program module.

**Instructions used:**

1. Mov: destination, source

Move the contents of source register into destination register.

1. Lea: load effective address into dx register.
2. Inc: increments contents of specified register.
3. Dec: decrement contents of specified register.
4. Jnz: Jump if not zero to specified label.
5. Rol: rotate 4 times the contents of dx register.
6. Cmp: compare contents of specified register.
7. Jbe: jump before exit to specified label.
8. And: logically ands the contents of specified register with the specified value.
9. Add: Add contents of source and destination and p[ut the result in destination.

**Interrupts used:**

1. INT 21H, Function 4CH🡪 terminate the code properly and return to the DOS Prompt.
2. INT 21H, Function 02H 🡪Display a number or character on the screen.
3. INT 21H, Function 09H🡪 Display the string on the screen

**Input:** An array of N numbers stored in Memory.

**Output:** Addition of the numbers stored in the array.

**Algorithm:**

1. Start

2. Initialize data segment

3. Add given array elements.

4. Display message that addition of n element is:

5. Get LSD

6. Swap two numbers to get original number.

7. Get ASCII value to get decimal number.

8. Display that digit on screen

9. Get MSD

10. Get ASCII value of that to get decimal number.

11. Display MSD on screen

12. Terminate program & transfer control to os.

13. Stop

**Macros:** Not used

**Procedures:** Not used

**Calculations:**

**1+2+3+4+5= (15)10**

**= (0F) hex**

**Conclusion:** Thus, we have written an 8086 Assembly Language Program (ALP) to add array of N numbers and stored in the memory.

**Platform Used:** Windows XP, Turbo Assembler.