

Z.H.C.E.T., Aligarh Muslim University – Aligarh

Microprocessor Lab

(COC 3940)

REPORT

Objective: Compute $a + b + c - d$ where a, b, c and d are integers. Take the integer inputs in a C/C++ program and perform the required operations in a subroutine in assembly language.

Submitted to: **Dr Nesar Ahmad**

Submitted by: **Ravi Sahni**

Faculty No.: 17 COB **085**

Enrolment No.: GJ 7718

Serial No.: **24**

Class: B. Tech. (A3CO)

Objective: Compute $a + b + c - d$ where a, b, c and d are integers. Take the integer inputs in a C/C++ program and perform the required operations in a subroutine in assembly language.

Program:

The following is the C++ main (**main.cpp**) with an assembly language function (int sum_sub(int a, int b, int c, int d)).

```
#include <iostream>

extern "C" int sum_sub(int a, int b, int c, int d);

using namespace std;

int main()
{
    int a,b,c,d;
    cout<<"\n Enter the values:\n a: ";
    cin>>a;
    cout<<" b: ";
    cin>>b;
    cout<<" c: ";
    cin>>c;
    cout<<" d: ";
    cin>>d;
    cout<<"\n a+b+c-d = "<<sum_sub(a,b,c,d)<<endl;
    return 0;
}
```

The function, in assembly language file (**func.asm**) is as follows:

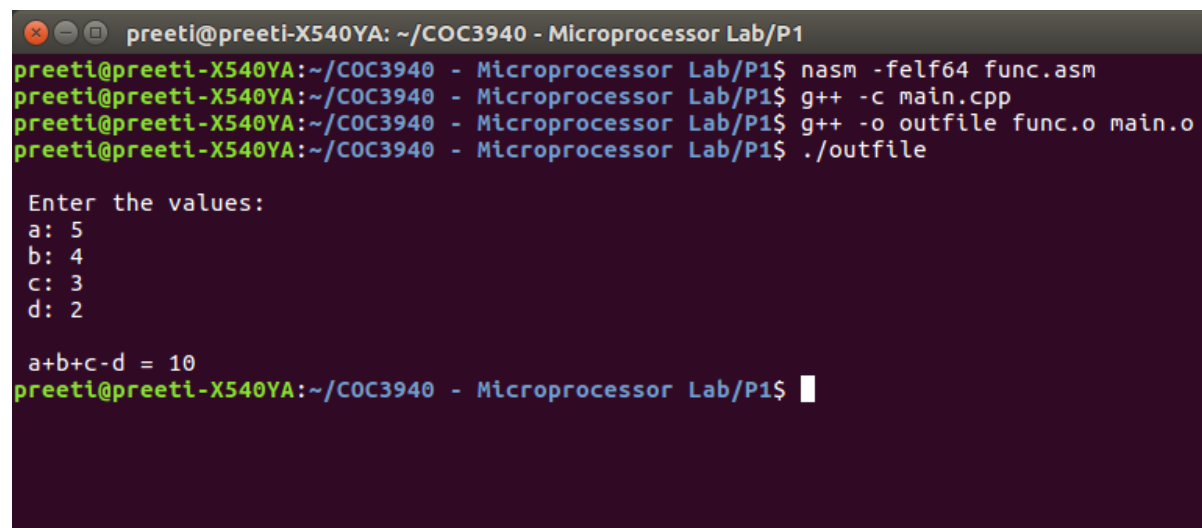
```
section .text
global sum_sub
sum_sub:
    mov eax, edi
    add eax, esi
    add eax, edx
    sub eax, ecx
    ret
```

Compiling, Assembling, and Linking Instructions (Ubuntu):

Considering that the C++ main is named **main.cpp**, and the assembly source file is named **func.asm**, the commands to compile, assemble, link, and execute as follows:

```
$ nasm -felf64 func.asm
$ g++ -c main.cpp
$ g++ -o outfile func.o main.o
$ ./outfile
```

Sample Input and Output:



```
preeti@preeti-X540YA: ~/COC3940 - Microprocessor Lab/P1
preeti@preeti-X540YA:~/COC3940 - Microprocessor Lab/P1$ nasm -felf64 func.asm
preeti@preeti-X540YA:~/COC3940 - Microprocessor Lab/P1$ g++ -c main.cpp
preeti@preeti-X540YA:~/COC3940 - Microprocessor Lab/P1$ g++ -o outfile func.o main.o
preeti@preeti-X540YA:~/COC3940 - Microprocessor Lab/P1$ ./outfile

Enter the values:
a: 5
b: 4
c: 3
d: 2

a+b+c-d = 10
preeti@preeti-X540YA:~/COC3940 - Microprocessor Lab/P1$
```
