



**Course Name:** Information and Communication Technologies Lab

**LAB # 5:** (a) Introduction to Conditional statements in C Programming  
(b) Introduction to loops in C Programming

Department	Registration Number/Name	Semester/Section
BS CEN	F24604018/Muhammad Hamzah Iqbal	1
Date	Instructor's Name	Instructor's Signature
14/10/2024	Iqra Ashraf	

**Objectives:**

- To understand the basics of C programming.
- To get familiar with Conditional statements.
- To get familiar with loops in C Programming.

## Lab Tasks:

### Lab 5(a)

**Question 01:** Design a calculator in C that can perform the following binary operations on two numbers obtained from user. The choice of operation should also be available to the user.

1. Addition
2. Subtraction
3. Multiplication
4. Division

### Outputs:

Addition

```
Task1_Lab5.cpp x Task2_Lab5.c x Task3_Lab5.cpp x Task4_Lab5.cpp x
1 #include<stdio.h>
2 int main()
3 {
4     int a;
5     float b,c;
6     printf("1.Addition\n2.Subtraction\n3.Multiplication\n4.Division\n");
7     printf("Hello Enter a value of x (1,2,3,4) of which operation : 1\n");
8     printf("Enter 2 numbers(with space in between them) : 19 29\n");
9     printf("Addition of both numbers is = 48.00\n");
10 }
```

Subtraction

```
Task1_Lab5.cpp x Task2_Lab5.c x Task3_Lab5.cpp x Task4_Lab5.cpp x
1 #include<stdio.h>
2 int main()
3 {
4     int a;
5     float b,c;
6     printf("1.Addition\n2.Subtraction\n3.Multiplication\n4.Division\n");
7     printf("Hello Enter a value of x (1,2,3,4) of which operation : 2\n");
8     printf("Enter 2 numbers(with space in between them) : 16 5\n");
9     printf("Subtraction of both number is = 11.00\n");
10 }
```

Multiplication

```
Task1_Lab5.cpp x Task2_Lab5.c x Task3_Lab5.cpp x Task4_Lab5.cpp x
1 #include<stdio.h>
2 int main()
3 {
4     int a;
5     float b,c;
6     printf("1.Addition\n2.Subtraction\n3.Multiplication\n4.Division\n");
7     printf("Hello Enter a value of x (1,2,3,4) of which operation : 3\n");
8     printf("Enter 2 numbers(with space in between them) : 9 89\n");
9     printf("Multiplication of both numbers is = 801.00\n");
10 }
```

Division

```
Task1_Lab5.cpp x Task2_Lab5.c x Task3_Lab5.cpp x Task4_Lab5.cpp x
1 #include<stdio.h>
2 int main()
3 {
4     int a;
5     float b,c;
6     printf("1.Addition\n2.Subtraction\n3.Multiplication\n4.Division\n");
7     printf("Hello Enter a value of x (1,2,3,4) of which operation : 4\n");
8     printf("Enter 2 numbers(with space in between them) : 190 9\n");
9     printf("Division of both numbers is = 21.11\n");
10 }
```

## **Code :**

```
#include<stdio.h>

int main()

{int a;

float b,c;

float add,subtract,multiply,divide;

printf("1.Addition \n");

printf("2.Subtraction \n");

printf("3.Multiplication \n");

printf("4.Division \n");

printf("Hello Enter a value of x (1,2,3,4) of which operation : ");

scanf("%d",&a);


printf("Enter 2 numbers(with space in between them) : ");

scanf("%d %d",&b,&c);

if(a==1) //Addition

{

add=b+c;

printf("Additon of both numbers is = %.2f \n",add);}


else if(a==2) //Subtraction

{subtract=b-c;

printf("Subtraction of both number is = %.2f",subtract);}


else if(a==3) //Multiplication

{multiply=b*c;

printf("Multiplication of both numbers is = %.2f",multiply);}


else //Division

{

divide=b/c;

printf("Division of both numbers is = %.2f",divide);

}

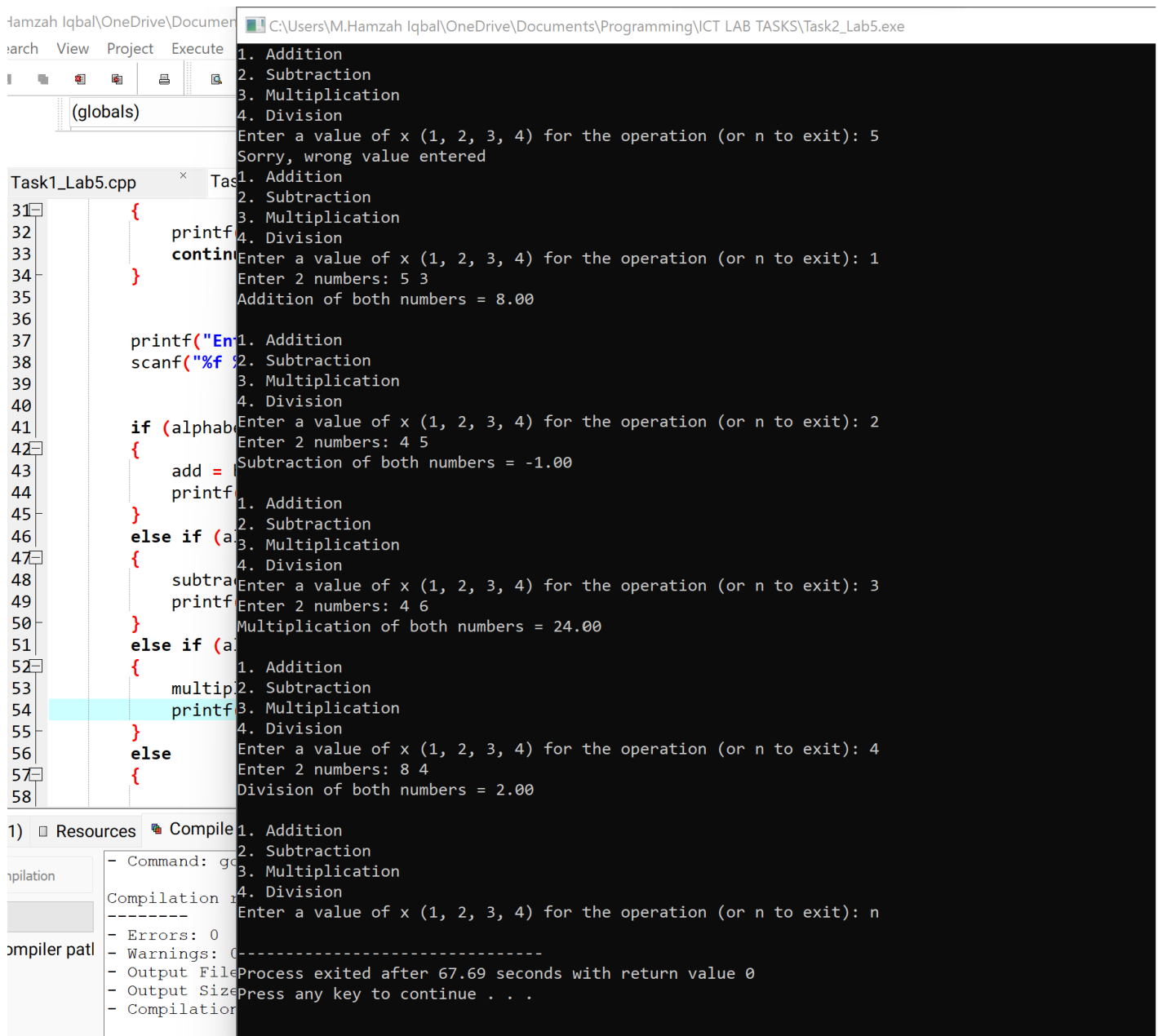
return 0;

}
```

## Question 02:

Modify your design of the calculator such that it won't terminate after just one execution but instead asks from the user to enter a specific key to terminate. Otherwise, your calculator should keep on asking for the new numbers and operation.

## Output:



```
hamzah Iqbal\OneDrive\Documents\Programming\Task2_Lab5.exe
1. Addition
2. Subtraction
3. Multiplication
4. Division
Enter a value of x (1, 2, 3, 4) for the operation (or n to exit): 5
Sorry, wrong value entered
1. Addition
2. Subtraction
3. Multiplication
4. Division
Enter a value of x (1, 2, 3, 4) for the operation (or n to exit): 1
Enter 2 numbers: 5 3
Addition of both numbers = 8.00
1. Addition
2. Subtraction
3. Multiplication
4. Division
Enter a value of x (1, 2, 3, 4) for the operation (or n to exit): 2
Enter 2 numbers: 4 5
Subtraction of both numbers = -1.00
1. Addition
2. Subtraction
3. Multiplication
4. Division
Enter a value of x (1, 2, 3, 4) for the operation (or n to exit): 3
Enter 2 numbers: 4 6
Multiplication of both numbers = 24.00
1. Addition
2. Subtraction
3. Multiplication
4. Division
Enter a value of x (1, 2, 3, 4) for the operation (or n to exit): 4
Enter 2 numbers: 8 4
Division of both numbers = 2.00
Press any key to continue . . .
```

```
Task1_Lab5.cpp
31 {
32     printf
33     contin
34 }
35
36
37 printf("En
38 scanf("%f %
39
40
41 if (alpha
42 {
43     add =
44     printf
45 }
46 else if (a
47 {
48     subtra
49     printf
50 }
51 else if (a
52 {
53     multip
54     printf
55 }
56 else
57 {
58
```

```
1) Resources Compile
- Command: gcc
Compilation
- Errors: 0
- Warnings: 0
- Output File: Task1_Lab5.exe
- Output Size: 10240 bytes
- Compilation
```

## Code:

```
#include<stdio.h>

#include<stdlib.h>

int main()

{ float a, b, c;

int add, subtract, multiply;

float divide;

char alphabet;

int i = 1;

while (i > 0)

{ printf("1. Addition \n");

printf("2. Subtraction \n");

printf("3. Multiplication \n");

printf("4. Division \n");

printf("Enter a value of x (1, 2, 3, 4) for the operation (or n to exit): ");

scanf(" %c", &alphabet);

if (alphabet == 'n') // Exit condition if specific character entered

{ exit(0); }

// Handling wrong input by user

if (alphabet < '1' || alphabet > '4')

{

printf("Sorry, wrong value entered \n");

continue; // Skip to the next iteration of the loop

}

printf("Enter 2 numbers: "); //Taking input from user

scanf("%d %d", &b, &c);

if (alphabet == '1')

{ add = b + c;

printf("Addition of both numbers = %d \n \n", add);}

else if (alphabet == '2')

{subtract = b - c;

printf("Subtraction of both numbers = %d \n \n", subtract); }

else if (alphabet == '3')

{ multiply = b * c;

printf("Multiplication of both numbers = %d \n \n", multiply); }

else

{divide = b / c;

printf("Division of both numbers = %.2f \n \n", divide); }

i++; //increment in value of i, to satisfy loop condition

}

return 0; }
```

## Lab 5(b)

### Question 01:

Write a program in C to display n terms of natural number and their sum.

Code:

```
#include<stdio.h>

int main()
{
    int a,sum=0;

    printf("Enter the number of terms you want the sum of (n) in natural numbers: ");

    scanf("%d",&a);

    printf("Numbers are : \n");

    for(int i=0;i<=a;i++)
    {
        printf(" %d ",i);

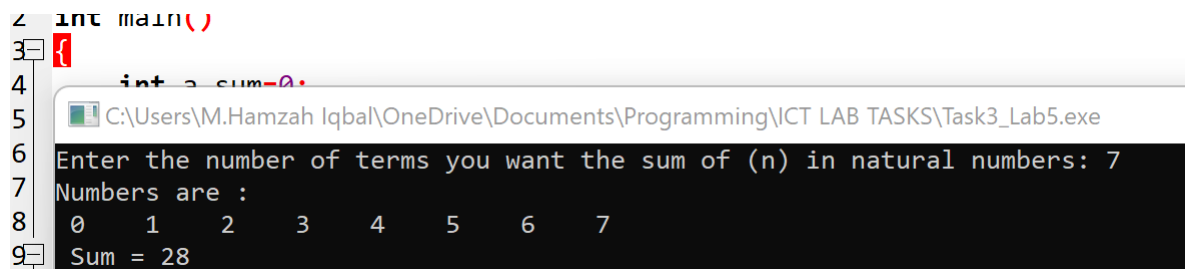
        sum=sum+i;

    }

    printf(" \n Sum = %d",sum);

    return 0;
}
```

### Output:



The screenshot shows a code editor with the C program code and a terminal window below it. The terminal window displays the output of the program. The user has entered 7 as the number of terms. The program outputs the numbers 0 through 7 and their sum, which is 28.

```
2 int main()
3 {
4     int a,sum=0;
5     printf("Enter the number of terms you want the sum of (n) in natural numbers: ");
6     scanf("%d",&a);
7     printf("Numbers are : \n");
8     for(int i=0;i<=a;i++)
9     {
10         printf(" %d ",i);
11         sum=sum+i;
12     }
13     printf(" \n Sum = %d",sum);
14     return 0;
15 }
```

Enter the number of terms you want the sum of (n) in natural numbers: 7  
Numbers are :  
0 1 2 3 4 5 6 7  
Sum = 28

### Question 02:

Write a Program to add numbers until the user enters zero. (Hint: Use do while)

#### Code:

```
#include<stdio.h>

int main()
{int num,sum=0;

    do
    {
        printf("Enter a number(and 0 to exit) :");
        scanf("%d",&num);
        sum=sum+num;
    }

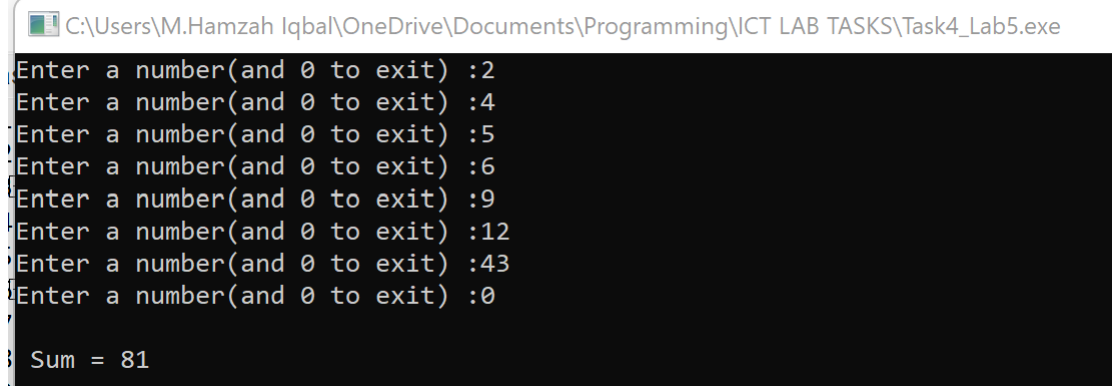
    while(num!=0);

    printf("\n");
    printf(" Sum = %d",sum);

    return 0;

}
```

#### Output:



```
C:\Users\M.Hamzah Iqbal\OneDrive\Documents\Programming\ICT LAB TASKS\Task4_Lab5.exe
Enter a number(and 0 to exit) :2
Enter a number(and 0 to exit) :4
Enter a number(and 0 to exit) :5
Enter a number(and 0 to exit) :6
Enter a number(and 0 to exit) :9
Enter a number(and 0 to exit) :12
Enter a number(and 0 to exit) :43
Enter a number(and 0 to exit) :0
Sum = 81
```

**Conclusion:**

To sum up, the four exercises aimed to improve basic C programming abilities, especially regarding basic input/output, loops, and control structures. In Task 1, a calculator with binary operations was shown, allowing users to do addition, subtraction, multiplication, and division. In Task 2, the calculator was improved to run continuously until the user chose to stop using it. Task 3 involved the usage of loops by introducing natural number sequences and their total. Lastly, Task 4 asked user for integers as input until a termination condition was satisfied by using a do-while loop. When combined, these exercises improved understanding about C's user interface, arithmetic operations, and iteration.