

## Lab 1: Tasks on C# Basics Concepts

### IN-LAB:

1. Write a C# code to implement the simple calculator?

**TASK1:** It's required to create a simple calculator with addition and subtraction operations for two integer numbers

For example, how to find the sum of given integer values **a** and **b**. You have a skeleton code:

```
public static int Add(int a, int b)
{
    //TODO Delete line below and write your own solution
    throw new NotImplementedException();
}
```

### Task1:

```
Program.cs
program1
Main(string[] args)
1 // See https://aka.ms/new-console-template for more information
2
3 using System;
4 namespace program1;
5
6 class Program {
7     public static void Main(string[] args)
8     {
9         int a = 5;
10        int b = 10;
11        int sum = a + b;
12        Console.WriteLine(sum);
13
14        if (a < b)
15        {
16            Console.WriteLine("a is less than b");
17        }
18        else
19        {
20            Console.WriteLine("a is bigger than b");
21        }
22        for(int i = 0; i <= a; i++)
23        {
24            Console.WriteLine("value = " + i);
25        }
26
27        Console.WriteLine("Welcome to c#");
28
29        int age;
30        Console.WriteLine("age :");
31        Convert.ToInt32(Console.ReadLine());
32
33        int z = Math.Max(10, 77);
34
35    }
36
37 }
```

```
Output
Show output from: Build
Build started at 07:56...
1>----- Build started: Project: program1, Configuration: Debug Any CPU --
1>Skipping analyzers to speed up the build. You can execute 'Build' or 'Rebuild' command to run analyzers.
1>C:\Users\Sambu\source\repos\program1\program1\Program.cs(30,13,30,16): warning CS0168: The variable 'age' is declared but never used
1>program1 -> C:\Users\Sambu\source\repos\program1\program1\bin\Debug\net8.0\program1.dll
1>Done building project "program1.csproj".
```

1. Write a C# code to solve the TASK2 and TASK3.

**TASK2:** For a given integer  $n$  calculate the value which is equal to:

1. squared number, if its value is strictly positive;
2. modulus of a number, if its value is strictly negative;
3. zero, if the integer  $n$  is zero.

Example

**n = 4    result = 16**

**n = -5    result = 5**

**n = 0    result = 0**

**TASK3:** Find the maximum integer, that can be obtained by numbers of an arbitrary three-digit positive integer  $n$  permutation ( $100 \leq n \leq 999$ ).

Example

**n = 165    result = 651**

## task2:

```
gram.cs x
Lab1task2
Main()
1 using System;
2 using static System.Runtime.InteropServices.JavaScript.JSType;
3
4 class Lab1task2
5 {
6     static void Main()
7     {
8         Console.Write("Enter a number : ");
9         int n = Convert.ToInt32(Console.ReadLine());
10
11         int result = 0;
12
13         if (n > 0)
14         {
15             result = n * n;
16         }
17         else if (n < 0)
18         {
19             result = Math.Abs(n);
20         }
21
22         Console.WriteLine("Result: " + result);
23     }
24 }
25
26
27
28
29
30
```

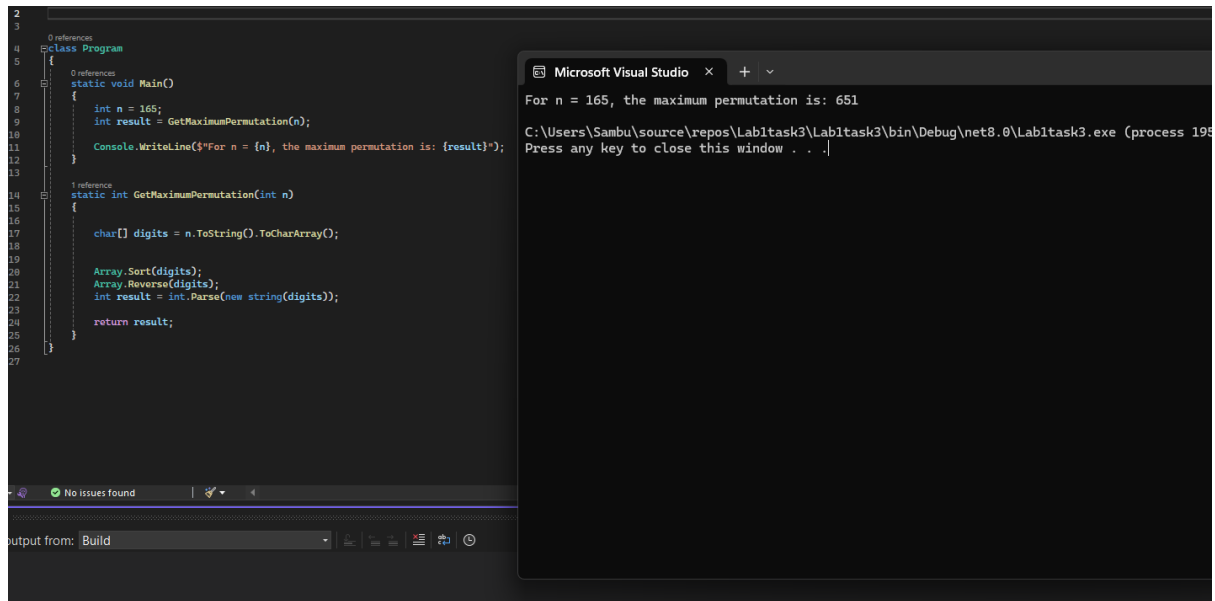
Microsoft Visual Studio x + v

Enter a number : 4  
Result: 16  
C:\Users\Sambu\source\repos\Lab1task2\Lab1task2\bin\Debug\net8.0\Lab1task2.exe (process 35180) e  
Press any key to close this window . . .|

No issues found

put  
ow output from: Build

## task3:



The screenshot shows the Microsoft Visual Studio IDE. On the left, the 'Program.cs' file is open, displaying the following C# code:

```
2
3
4 class Program
5 {
6     static void Main()
7     {
8         int n = 165;
9         int result = GetMaximumPermutation(n);
10
11         Console.WriteLine($"For n = {n}, the maximum permutation is: {result}");
12     }
13
14     static int GetMaximumPermutation(int n)
15     {
16         char[] digits = n.ToString().ToCharArray();
17
18         Array.Sort(digits);
19         Array.Reverse(digits);
20         int result = int.Parse(new string(digits));
21
22         return result;
23     }
24 }
25
26
27
```

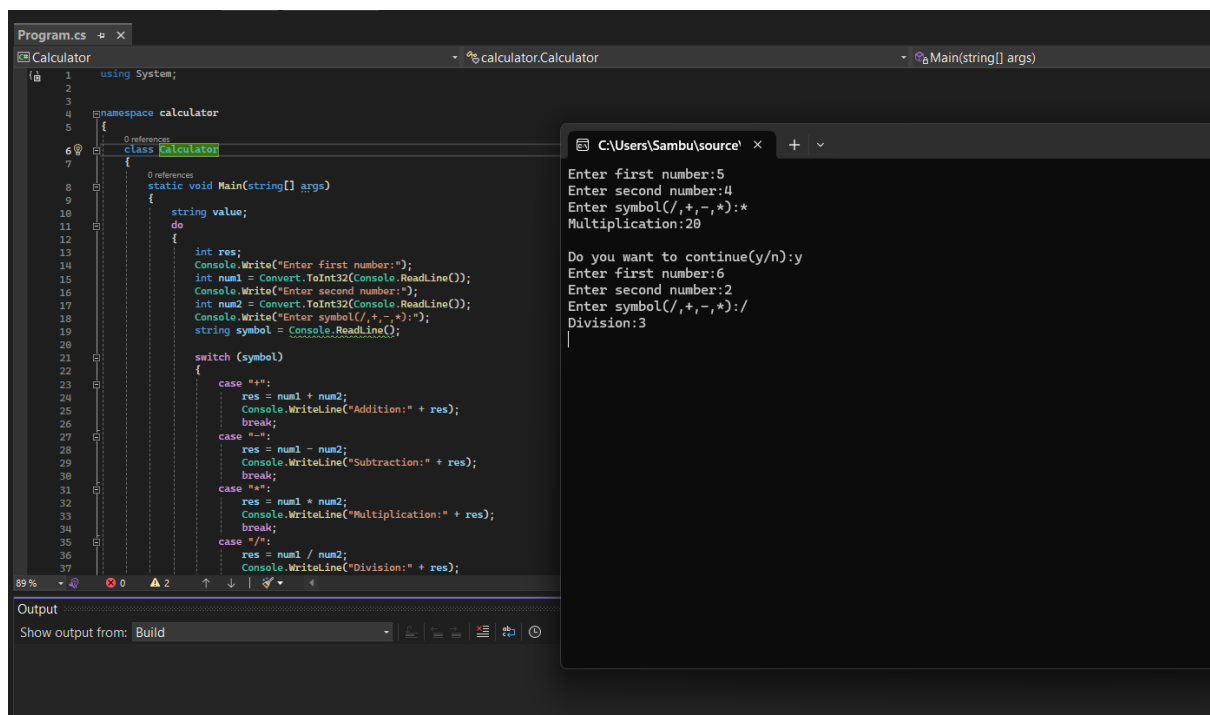
On the right, the 'Output' window shows the execution result:

```
Microsoft Visual Studio x + v
For n = 165, the maximum permutation is: 651
C:\Users\Sambu\source\repos\Lab1task3\Lab1task3\bin\Debug\net8.0\Lab1task3.exe (process 198)
Press any key to close this window . . .
```

## POST-LAB

1. Implement a proper calculator with all the functionalities like addition, subtraction, multiplication, division and square root.

## Answer:



The screenshot shows the Microsoft Visual Studio IDE. On the left, the 'Program.cs' file is open, displaying the following C# code:

```
1 using System;
2
3 namespace calculator
4 {
5     class Calculator
6     {
7         static void Main(string[] args)
8         {
9             string value;
10             do
11             {
12                 int res;
13                 Console.WriteLine("Enter first number:");
14                 int num1 = Convert.ToInt32(Console.ReadLine());
15                 Console.WriteLine("Enter second number:");
16                 int num2 = Convert.ToInt32(Console.ReadLine());
17                 Console.WriteLine("Enter symbol(+, -, *, /):");
18                 string symbol = Console.ReadLine();
19
20                 switch (symbol)
21                 {
22                     case "+":
23                         res = num1 + num2;
24                         Console.WriteLine("Addition: " + res);
25                         break;
26                     case "-":
27                         res = num1 - num2;
28                         Console.WriteLine("Subtraction: " + res);
29                         break;
30                     case "*":
31                         res = num1 * num2;
32                         Console.WriteLine("Multiplication: " + res);
33                         break;
34                     case "/":
35                         res = num1 / num2;
36                         Console.WriteLine("Division: " + res);
37                 }
38             } while (Console.ReadLine() != "n");
39         }
40     }
41 }
```

On the right, the 'Output' window shows the execution result:

```
C:\Users\Sambu\source\ x + v
Enter first number:5
Enter second number:4
Enter symbol(+, -, *, /):*
Multiplication:20
Do you want to continue(y/n):y
Enter first number:6
Enter second number:2
Enter symbol(+, -, *, /):/
Division:3
```

