

Tutorial – 2

1. Predict and write output for the following code.

```
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q1
    {
        static void Main(string[] args)
        {
            /* local variable definition */

            int a = 10;

            /* check the boolean condition using if statement */

            if (a < 20)
            {

                /* if condition is true then print the following */

                Console.WriteLine("a is less than 20");

            }

            Console.WriteLine("value of a is : {0}", a);

            Console.ReadLine();

        }
    }
}
```

Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q1
a is less than 20
value of a is : 10
```

2. Write missing statement to get the desired output.

```
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q2
    {
        static void Main(string[] args)
        {
            /* local variable definition */
            int a = 100;
            /* check the boolean condition */
            if (a < 20)
            {
                /* if condition is true then print the following */
                Console.WriteLine("a is less than 20");
            }
            else
            {
                /* if condition is false then print the following */
                Console.WriteLine("a is not less than 20");
            }
            Console.WriteLine("value of a is : {0}", a);
            Console.ReadLine()
        }
    }
}
```

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Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q2
a is not less than 20
value of a is : 100
```

3. Correct the following code and write output for the corrected code.

```
using System;
namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q3
    {
        static void Main(string[] args)

        {
            string firstName = "John";
            string lastName = "Doe";

            Console.WriteLine("Name: " + firstName + " " + lastName);

            Console.WriteLine("Please enter a new first name:");
            firstName = Console.ReadLine();

            Console.WriteLine("New name: " + firstName + " " +
lastName);
            Console.ReadLine();

        }
    }
}
```

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Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q3
Name: John Doe
Please enter a new first name:
Tony
New name: Tony Doe
```

4.Input two number A and B. perform different operations using different operators and different data types available in C#. (Note : Follow all the operators and data types to do above task. Use Online help whenever necessary.)

```
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q4
    {
        static void Main(string[] args)
        {
            // Input numbers
            Console.Write("Enter number A: ");
            string inputA = Console.ReadLine();
            Console.Write("Enter number B: ");
            string inputB = Console.ReadLine();

            // Conversions to different data types
            int a = int.Parse(inputA);
            int b = int.Parse(inputB);
            float af = float.Parse(inputA);
            float bf = float.Parse(inputB);
            double ad = double.Parse(inputA);
            double bd = double.Parse(inputB);
            decimal amd = decimal.Parse(inputA);
            decimal bmd = decimal.Parse(inputB);

            Console.WriteLine("\n=== Integer Operations ===");
```

```
Console.WriteLine($"A + B = {a + b}");
Console.WriteLine($"A - B = {a - b}");
Console.WriteLine($"A * B = {a * b}");
Console.WriteLine($"A / B = {a / b}");
Console.WriteLine($"A % B = {a % b}");
Console.WriteLine($"A == B ? {a == b}");
Console.WriteLine($"A > B ? {a > b}");
Console.WriteLine($"A < B ? {a < b}");

Console.WriteLine("\n=== Float Operations ===");
Console.WriteLine($"A / B = {af / bf}");
Console.WriteLine($"A * B = {af * bf}");

Console.WriteLine("\n=== Double Operations ===");
Console.WriteLine($"A / B = {ad / bd}");
Console.WriteLine($"A * B = {ad * bd}");

Console.WriteLine("\n=== Decimal Operations ===");
Console.WriteLine($"A + B = {amd + bmd}");
Console.WriteLine($"A - B = {amd - bmd}");

Console.WriteLine("\n=== Boolean & Logical Operators
===");
bool cond1 = a > b;
bool cond2 = a % 2 == 0;
Console.WriteLine($"A > B = {cond1}");
Console.WriteLine($"A is Even? {cond2}");
Console.WriteLine($"(A > B) && (A Even)? {cond1 &&
cond2}");
Console.WriteLine($"(A > B) || (A Even)? {cond1 ||
cond2}");

Console.WriteLine("\n=== Character & String Operations
===");
char c1 = (char)(65 + a % 26); // convert number to char
char c2 = (char)(65 + b % 26);
```

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```
Console.WriteLine($"Char from A: {c1}, Char from B:
{c2}");

string s1 = inputA;
string s2 = inputB;
Console.WriteLine($"Concatenation: {s1 + s2}");
Console.WriteLine($"String Equality: {s1 == s2}");

Console.WriteLine("\n=== Bitwise Operators (int) ===");
Console.WriteLine($"A & B = {a & b}");
Console.WriteLine($"A | B = {a | b}");
Console.WriteLine($"A ^ B = {a ^ b}");
Console.WriteLine($"~A = {~a}");
Console.WriteLine($"A << 1 = {a << 1}");
Console.WriteLine($"A >> 1 = {a >> 1}");

Console.WriteLine("\n=== Unary Operators ===");
Console.WriteLine($"++A = {++a}");
Console.WriteLine($"--B = {--b}");

    }
}
```

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Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q4
Enter number A: 40
Enter number B: 30

=== Integer Operations ===
A + B = 70
A - B = 10
A * B = 1200
A / B = 1
A % B = 10
A == B ? False
A > B ? True
A < B ? False

=== Float Operations ===
A / B = 1.333333
A * B = 1200

=== Double Operations ===
A / B = 1.3333333333333333
A * B = 1200

=== Decimal Operations ===
A + B = 70
A - B = 10

=== Boolean & Logical Operators ===
A > B = True
A is Even? True
(A > B) && (A Even)? True
(A > B) || (A Even)? True

=== Character & String Operations ===
Char from A: 0, Char from B: E
Concatenation: 4030
String Equality: False

=== Bitwise Operators (int) ===
A & B = 8
A | B = 62
A ^ B = 54
~A = -41
A << 1 = 80
A >> 1 = 20

=== Unary Operators ===
++A = 41
--B = 29
```

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5.Rearrange the given code to correct the program. The resultant program will be to enter 5 elements into an array and print sum of these elements.

```
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q5
    {
        static void Main(string[] args)
        {
            int[] arr = new int[5];
            int sum = 0;

            for (int i = 0; i < 5; i++)
            {
                Console.Write("Enter Element {0}: ", i);
                string str = Console.ReadLine();
                arr[i] = Convert.ToInt32(str);
            }

            for (int i = 0; i < 5; i++)
            {
                sum = sum + arr[i];
            }

            Console.WriteLine("Sum of Elements : {0}", sum);
            Console.Read();
        }
    }
}
```


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Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q5
Enter Element 0: 10
Enter Element 1: 20
Enter Element 2: 30
Enter Element 3: 40
Enter Element 4: 50
Sum of Elements : 150
```

6: Write missing statement to get the desired output.

```
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q6
    {
        static void Main(string[] args)
        {
            Console.WriteLine("Hello, World!");

            Console.WriteLine("You entered the following {0} command
line arguments:",

                args.Length);

            for (int i = 0; i < args.Length; i++)
            {
                Console.WriteLine(args[i]);
            }
        }
    }
}
```

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Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q6 A B C D
Hello, World!
You entered the following 4 command line arguments:
A
B
C
D
```

7 : Predict and write the output of the given code.

```
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q7
    {
        class NumberManipulator
        {
            public void swap(ref int x, ref int y)
            {
                int temp;
                temp = x; /* save the value of x */
                x = y;    /* put y into x */
                y = temp; /* put temp into y */
            }
        }
        class TestRef
        {
            static void Main(string[] args)
            {
                NumberManipulator n = new NumberManipulator();
                /* local variable definition */
                int a = 100;
                int b = 200;
                Console.WriteLine("Before swap, value of a : {0}",
```

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```
a);  
        Console.WriteLine("Before swap, value of b : {0}",  
b);  
        /* calling a function to swap the values */  
        n.swap(ref a, ref b);  
        Console.WriteLine("After swap, value of a : {0}", a);  
        Console.WriteLine("After swap, value of b : {0}", b);  
        Console.ReadLine();  
    }  
}  
}
```

Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q7  
Before swap, value of a : 100  
Before swap, value of b : 200  
After swap, value of a : 200  
After swap, value of b : 100
```

8 : Find out error code and correct it. Write the output of the corrected code.

```
using System;  
  
namespace _24SOECE13043_Dharmraj_sodha.LAB2  
{  
    class NumberManipulator  
    {  
        public int getValues(out int x, out int y, out int z)  
        {  
            Console.Write("Enter the first value: ");  
            x = Convert.ToInt32(Console.ReadLine());  
  
            Console.Write("Enter the second value: ");  
            y = Convert.ToInt32(Console.ReadLine());  
        }  
    }  
}
```

```
        Console.WriteLine("Enter the Thried value: ");
        z = Convert.ToInt32(Console.ReadLine());

        int sum = x + y + z;
        return sum;
    }
}
class TestOut
{
    static void Main(string[] args)
    {
        NumberManipulator n = new NumberManipulator();
        /* local variable definition */
        int a, b, c, sum;
        /* calling a function to get the values */
        sum = n.getValues(out a, out b, out c);
        Console.WriteLine("After method call, value of a :
{0}", a);
        Console.WriteLine("After method call, value of b :
{0}", b);
        Console.WriteLine("After method call, value of c :
{0}", c);
        Console.WriteLine("Sum : {0}", sum);
    }
}
}
```

Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q8
Enter the first value: 10
Enter the second value: 20
Enter the Thried value: 30
After method call, value of a : 10
After method call, value of b : 20
After method call, value of c : 30
Sum : 60
```

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9 : Given an array A containing $2*N+2$ positive numbers, out of which $2*N$ numbers exist in pairs whereas the other two number occur exactly once and are distinct. Find the other two numbers.

```
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q9
    {
        static void Main(string[] args)
        {
            Console.Write("Enter N: ");
            int N = int.Parse(Console.ReadLine());

            int size = 2 * N + 2;
            int[] arr = new int[size];

            Console.WriteLine($"Enter {size} elements:");
            for (int i = 0; i < size; i++)
            {
                arr[i] = int.Parse(Console.ReadLine());
            }

            // Step 1: Sort the array
            Array.Sort(arr);

            // Step 2: Traverse to find numbers without pairs
            int[] result = new int[2];
            int idx = 0;

            for (int i = 0; i < size - 1; i++)
            {
                if (arr[i] == arr[i + 1])
                {
                    i++; // skip the pair
                }
            }
        }
    }
}
```

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```
        else
        {
            result[idx++] = arr[i];
        }
    }

    // Last element may be unpaired
    if (idx < 2)
        result[idx++] = arr[size - 1];
    Console.WriteLine("Output:");
    Array.Sort(result); // for neat output
    Console.WriteLine($"{result[0]} {result[1]}");
}
}
```

Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q9
Enter N: 2
Enter 6 elements:
5
4
7
3
5
7
Output:3 4
```

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10: Given a matrix $mat[][]$ of size $N \times M$, where every row and column is sorted in increasing order, and a number X is given. The task is to find whether element X is present in the matrix or not.

```
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q9
    {
        static void Main(string[] args)
        {
            Console.Write("Enter N: ");
            int N = int.Parse(Console.ReadLine());

            int size = 2 * N + 2;
            int[] arr = new int[size];

            Console.WriteLine($"Enter {size} elements:");
            for (int i = 0; i < size; i++)
            {
                arr[i] = int.Parse(Console.ReadLine());
            }

            // Step 1: Sort the array
            Array.Sort(arr);

            // Step 2: Traverse to find numbers without pairs
            int[] result = new int[2];
            int idx = 0;

            for (int i = 0; i < size - 1; i++)
            {
                if (arr[i] == arr[i + 1])
                {
                    i++; // skip the pair
                }
            }
        }
    }
}
```

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```
        else
        {
            result[idx++] = arr[i];
        }
    }

    // Last element may be unpaired
    if (idx < 2)
        result[idx++] = arr[size - 1];
    Console.WriteLine("Output:");
    Array.Sort(result); // for neat output
    Console.WriteLine($"{result[0]} {result[1]}");
}
}
```

Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q10
0
1
```

11: Write a program to find the sum of N elements of an Array.

```
using System;
namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q11
    {
        static void Main(string[] args)
        {
            Console.WriteLine("Enter number of elements (N): ");
            int N = int.Parse(Console.ReadLine());

            int[] arr = new int[N];
            Console.WriteLine("Enter the elements:");
```


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```
for (int i = 0; i < N; i++)
{
    arr[i] = int.Parse(Console.ReadLine());
}

int sum = 0;
for (int i = 0; i < N; i++)
{
    sum += arr[i];
}

Console.WriteLine($"Sum of array elements = {sum}");
}
}
```

Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q11
Enter number of elements (N): 3
Enter the elements:
5
4
3
Sum of array elements = 12
```

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12: Write a program to find the element from an Array and print 1 if element is found else print 0.

```
using System;
namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q12
    {
        static void Main(string[] args)
        {
            Console.Write("Enter number of elements (N): ");
            int N = int.Parse(Console.ReadLine());

            int[] arr = new int[N];
            Console.WriteLine("Enter the elements:");
            for (int i = 0; i < N; i++)
            {
                arr[i] = int.Parse(Console.ReadLine());
            }

            Console.Write("Enter element to search: ");
            int X = int.Parse(Console.ReadLine());

            int found = 0; // flag

            for (int i = 0; i < N; i++)
            {
                if (arr[i] == X)
                {
                    found = 1;
                    break;
                }
            }
            Console.WriteLine(found);
        }
    }
}
```

Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q12
Enter number of elements (N): 3
Enter the elements:
12
34
98
Enter element to search: 34
1
```

13. Write a Program that will accept the amount and find how many minimum no of notes you required for that.

```
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q13
    {
        static void Main(string[] args)
        {
            // Denominations available in Indian currency
            int[] notes = { 2000, 500, 200, 100, 50, 20, 10, 5, 2, 1 };

            Console.WriteLine("Enter the amount: ");
            int amount = int.Parse(Console.ReadLine());

            Console.WriteLine("Minimum number of notes required:");

            foreach (int note in notes)
            {
                int count = amount / note;
                if (count > 0)
```

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```
{
    Console.WriteLine($"Notes of Rs.{note} =
{count}");
    amount %= note;
}
}
}
}
```

Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q13
Enter the amount: 2225
Minimum number of notes required:
Notes of Rs.2000 = 1
Notes of Rs.200 = 1
Notes of Rs.20 = 1
Notes of Rs.5 = 1
```

14. Write a Program to find the eligibility of admission for a professional course based on the following criteria:

```
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q14
    {
        static void Main(string[] args)
        {
            Console.Write("Input the marks obtained in Maths : ");
            int maths = int.Parse(Console.ReadLine());

            Console.Write("Input the marks obtained in Physics : ");
            int physics = int.Parse(Console.ReadLine());
```

```
        Console.WriteLine("Input the marks obtained in Chemistry :  
");  
        int chemistry = int.Parse(Console.ReadLine());  
  
        int totalAll = maths + physics + chemistry;  
        int totalMathPhy = maths + physics;  
  
        if (maths >= 65 && physics >= 55 && chemistry >= 50 &&  
            (totalAll >= 180 || totalMathPhy >= 140))  
        {  
            Console.WriteLine("The candidate is eligible for  
admission.");  
        }  
        else  
        {  
            Console.WriteLine("The candidate is not eligible for  
admission.");  
        }  
    }  
}
```

Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q14  
Input the marks obtained in Maths : 70  
Input the marks obtained in Physics : 80  
Input the marks obtained in Chemistry : 90  
The candidate is eligible for admission.
```

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15. Write a Program which accepts name from the user and prints the same

```
using System;

namespace _24SOECE13043_Dharmraj_sodha.LAB2
{
    class Q15
    {
        static void Main(string[] args)
        {
            Console.Write("Enter your name: ");
            string name = Console.ReadLine();

            Console.WriteLine("You entered: " + name);
        }
    }
}
```

Output:

```
C:\Users\dharm\source\repos\24SOECE13043_Dharmraj_sodha\LAB2>Q15
Enter your name: R K University
You entered: R K University
```