

## LAB-2

**2100030723**

Q1) TASK1,2,3

```
using System;
```

```
class Program
```

```
{
```

```
    static void Main(string[] args)
```

```
    {
```

```
        // Task 1
```

```
        int n1 = 1234;
```

```
        int result1 = CalculateSumOfOddDigits(n1);
```

```
        Console.WriteLine($"Task 1 - Input: {n1}, Result: {result1}");
```

```
        int n2 = 246;
```

```
        int result2 = CalculateSumOfOddDigits(n2);
```

```
        Console.WriteLine($"Task 1 - Input: {n2}, Result: {result2}");
```

```
        // Task 2
```

```
        int n3 = 14;
```

```
        int result3 = CountOnesInBinary(n3);
```

```
        Console.WriteLine($"Task 2 - Input: {n3}, Result: {result3}");
```

```
        int n4 = 128;
```

```
        int result4 = CountOnesInBinary(n4);
```

```
        Console.WriteLine($"Task 2 - Input: {n4}, Result: {result4}");
```

```
        // Task 3
```

```
        int n5 = 8;
```

```
int result5 = CalculateFibonacciSum(n5);  
Console.WriteLine($"Task 3 - Input: {n5}, Result: {result5}");
```

```
int n6 = 11;
```

```
int result6 = CalculateFibonacciSum(n6);
```

```
Console.WriteLine($"Task 3 - Input: {n6}, Result: {result6}");
```

```
}
```

```
static int CalculateSumOfOddDigits(int n)
```

```
{
```

```
    int sum = 0;
```

```
    while (n > 0)
```

```
    {
```

```
        int digit = n % 10;
```

```
        if (digit % 2 != 0)
```

```
            sum += digit;
```

```
        n /= 10;
```

```
    }
```

```
    return sum;
```

```
}
```

```
static int CountOnesInBinary(int n)
```

```
{
```

```
    int count = 0;
```

```
    while (n > 0)
```

```
    {
```

```
        if ((n & 1) == 1)
```

```
            count++;
```

```
        n >>= 1;
```

```
    }
```

```
    return count;
```

```

    }

    static int CalculateFibonacciSum(int n)
    {
        int sum = 0;

        int a = 0, b = 1;

        for (int i = 0; i < n; i++)
        {
            sum += a;

            int temp = a;

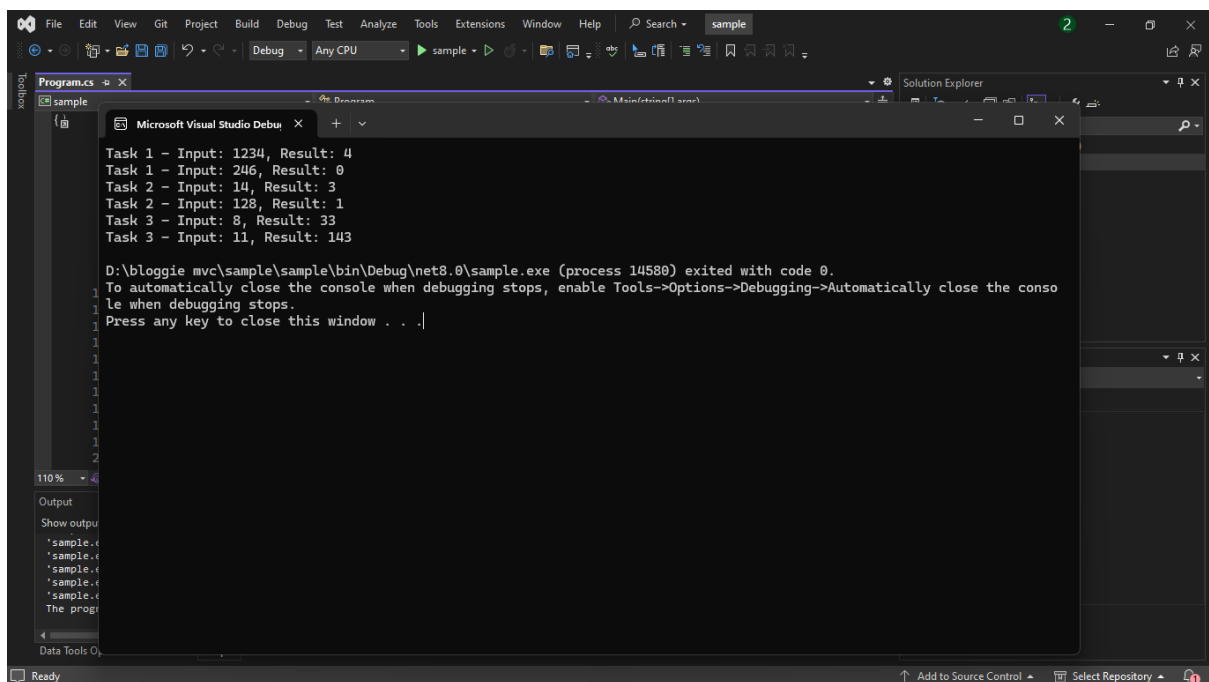
            a = b;

            b = temp + b;
        }

        return sum;
    }
}

```

OUTPUT :



Q2) ) TASK1,2,3

```
using System;
```

```
class Program
```

```
{
```

```
    static void Main(string[] args)
```

```
    {
```

```
        // Task 1
```

```
        int[] nums1 = { 10, 5, 3, 4 };
```

```
        SwapEvenValues(nums1);
```

```
        PrintArray(nums1);
```

```
        int[] nums2 = { 100, 2, 3, 4, 5 };
```

```
        SwapEvenValues(nums2);
```

```
        PrintArray(nums2);
```

```
        int[] nums3 = { 100, 2, 3, 45, 33, 8, 4, 54 };
```

```
        SwapEvenValues(nums3);
```

```
        PrintArray(nums3);
```

```
        // Task 2
```

```
        int[] nums4 = { 4, 100, 3, 4 };
```

```
        int result1 = CalculateDistance(nums4);
```

```
        Console.WriteLine($"Task 2 - Result: {result1}");
```

```
        int[] nums5 = { 5, 50, 50, 4, 5 };
```

```
        int result2 = CalculateDistance(nums5);
```

```
Console.WriteLine($"Task 2 - Result: {result2}");
```

```
int[] nums6 = { 5, 350, 350, 4, 350 };
```

```
int result3 = CalculateDistance(nums6);
```

```
Console.WriteLine($"Task 2 - Result: {result3}");
```

```
int[] nums7 = { 10, 10, 10, 10, 10 };
```

```
int result4 = CalculateDistance(nums7);
```

```
Console.WriteLine($"Task 2 - Result: {result4}");
```

```
// Task 3
```

```
int[,] matrix = {
```

```
    { 2, 4, 3, 3 },
```

```
    { 5, 7, 8, 5 },
```

```
    { 2, 4, 3, 3 },
```

```
    { 5, 7, 8, 5 }
```

```
};
```

```
ModifyMatrix(matrix);
```

```
PrintMatrix(matrix);
```

```
}
```

```
static void SwapEvenValues(int[] nums)
```

```
{
```

```
    for (int i = 0; i < nums.Length / 2; i++)
```

```
    {
```

```
        if (nums[i] % 2 == 0 && nums[nums.Length - 1 - i] % 2 == 0)
```

```
        {
```

```
            int temp = nums[i];
```

```
            nums[i] = nums[nums.Length - 1 - i];
```

```
            nums[nums.Length - 1 - i] = temp;
```

```
        }
```

```
    }  
}
```

```
static int CalculateDistance(int[] nums)
```

```
{
```

```
    int maxIndex = 0;
```

```
    int minIndex = 0;
```

```
    int max = nums[0];
```

```
    for (int i = 1; i < nums.Length; i++)
```

```
    {
```

```
        if (nums[i] > max)
```

```
        {
```

```
            max = nums[i];
```

```
            maxIndex = i;
```

```
        }
```

```
        else if (nums[i] < nums[minIndex])
```

```
        {
```

```
            minIndex = i;
```

```
        }
```

```
    }
```

```
    return Math.Abs(maxIndex - minIndex);
```

```
}
```

```
static void ModifyMatrix(int[,] matrix)
```

```
{
```

```
    int n = matrix.GetLength(0);
```

```
    for (int i = 0; i < n; i++)
```

```
    {
```

```

        for (int j = 0; j < n; j++)
        {
            if (j < i)
                matrix[i, j] = 0;
            else if (j > i)
                matrix[i, j] = 1;
        }
    }
}

```

```

static void PrintArray(int[] arr)
{
    Console.Write("{ ");
    for (int i = 0; i < arr.Length; i++)
    {
        Console.Write($"{arr[i]}");
        if (i != arr.Length - 1)
            Console.Write(", ");
    }
    Console.WriteLine("}");
}

```

```

static void PrintMatrix(int[,] matrix)
{
    int n = matrix.GetLength(0);
    for (int i = 0; i < n; i++)
    {
        Console.Write("{ ");
        for (int j = 0; j < n; j++)
        {
            Console.Write($"{matrix[i, j]}");

```

```

        if (j != n - 1)
            Console.Write(", ");
    }
    Console.WriteLine(" }");
}
}
}
}
}

```

OUTPUT :

```

10 { 4, 5, 3, 10 }
11 { 100, 4, 3, 2, 5 }
12 { 54, 4, 3, 45, 33, 8, 2, 100 }
13 Task 2 - Result: 1
14 Task 2 - Result: 2
15 Task 2 - Result: 2
16 Task 2 - Result: 0
17 { 2, 1, 1, 1 }
18 { 0, 7, 1, 1 }
19 { 0, 0, 3, 1 }
20 { 0, 0, 0, 5 }
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```

Q3)) TASK1,2,3

using System;

public enum SortOrder

{



```
    Ascending,  
    Descending  
}
```

```
class Program
```

```
{
```

```
    static void Main(string[] args)
```

```
    {
```

```
        // Task 1
```

```
        int[] array1 = { 1, 2, 3, 4, 5 };
```

```
        Console.WriteLine($"Array is sorted in ascending order: {IsSorted(array1,  
SortOrder.Ascending)}");
```

```
        int[] array2 = { 5, 4, 3, 2, 1 };
```

```
        Console.WriteLine($"Array is sorted in descending order: {IsSorted(array2,  
SortOrder.Descending)}");
```

```
        // Task 2
```

```
        int[] array3 = { 5, 17, 24, 88, 33, 2 };
```

```
        Transform(array3, SortOrder.Ascending);
```

```
        PrintArray(array3);
```

```
        int[] array4 = { 15, 10, 3 };
```

```
        Transform(array4, SortOrder.Ascending);
```

```
        PrintArray(array4);
```

```
        int[] array5 = { 15, 10, 3 };
```

```
        Transform(array5, SortOrder.Descending);
```

```
        PrintArray(array5);
```

```
        // Task 3
```

```
Console.WriteLine($"Multiplication of arithmetic progression: {MultArithmeticElements(5, 3, 4)}");
```

```
// Task 4
```

```
Console.WriteLine($"Sum of geometric progression elements: {SumGeometricElements(100, 0.5, 20)}");  
}
```

```
static bool IsSorted(int[] array, SortOrder order)
```

```
{  
    if (order == SortOrder.Ascending)  
    {  
        for (int i = 0; i < array.Length - 1; i++)  
        {  
            if (array[i] > array[i + 1])  
                return false;  
        }  
    }  
    else  
    {  
        for (int i = 0; i < array.Length - 1; i++)  
        {  
            if (array[i] < array[i + 1])  
                return false;  
        }  
    }  
    return true;  
}
```

```
static void Transform(int[] array, SortOrder order)
```

```
{  
    if (IsSorted(array, order))
```

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

```
static double MultArithmeticElements(double a1, double t, int n)  
{  
    double result = 1;  
    double current = a1;  
    for (int i = 0; i < n; i++)  
    {  
        result *= current;  
        current += t;  
    }  
    return result;  
}
```

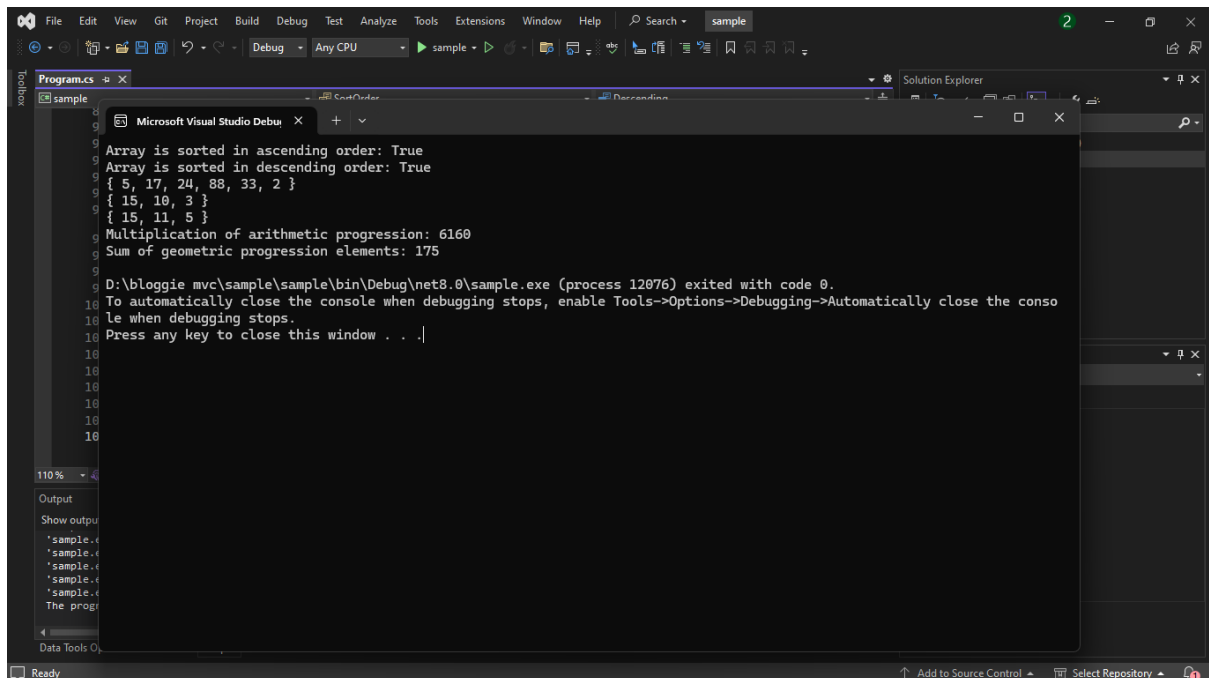
```
static double SumGeometricElements(double a1, double t, double alim)  
{  
    double sum = 0;  
    double current = a1;  
    while (current > alim)  
    {  
        sum += current;  
        current *= t;  
    }  
    return sum;  
}
```

```

static void PrintArray(int[] array)
{
    Console.Write("{ ");
    for (int i = 0; i < array.Length; i++)
    {
        Console.Write($"{array[i]}");
        if (i != array.Length - 1)
            Console.Write(", ");
    }
    Console.WriteLine(" }");
}
}

```

OUTPUT :



```

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To automatically close the console when debugging stops, enable Tools->Options->Debugging->Automatically close the console when debugging stops.
Press any key to close this window . . .|

```