External Exam Program List (Year 2021-22)

1. **Introduction to .NET framework and C# Language.**
   a) **WAP to perform basic arithmetic operations like addition, subtraction, multiplication and division using switch case.**

```
using System;
class Program
{
    static void Main()
    {
        Console.Write("Enter No1: ");
        int a = Convert.ToInt16(Console.ReadLine());
        Console.Write("Enter No2: ");
        int b = Convert.ToInt16(Console.ReadLine());
        Console.WriteLine("1.Addition");
        Console.WriteLine("2.Subtraction");
        Console.WriteLine("3.Divsion");
        Console.WriteLine("4.Multiplication");
        int c = Convert.ToInt16(Console.ReadLine());
        switch (c)
        {
             case 1:
                Console.WriteLine("Addition Of Two Numbers : "+(a+b));
                break;
             case 2:
                Console.WriteLine("Subtraction Of Two Numbers : "+(a-b));
                break;
             case 3:
                Console.WriteLine("Division Of Two Numbers : "+(a / b));
                break;
             case 4:
                Console.WriteLine("Multiplicaion Of Two Numbers : "+(a*b));
                break;
             default:
                Console.WriteLine("Choose Only 1 To 4 ");
                break;
        }
        Console.ReadLine();
    }
}
```

   b) **WAP to calculate the factorial of number using recursion.**

```
using System;
namespace FactorialExample
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.WriteLine("Enter a number");
            int number = Convert.ToInt32(Console.ReadLine());
            long fact = GetFactorial(number);
            Console.WriteLine("{0} factorial is {1}", number, fact);
            Console.ReadKey();
        }
        private static long GetFactorial(int number){
            if (number == 0){
                return 1;
            }
            return number * GetFactorial(number - 1);
        }
    }
}
```

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2. Introduction to .NET framework and C# Language.

a) WAP to check the number is Prime or not.

```
using System;
public class PrimeNumberExample
{
    public static void Main(string[] args)
    {
        int n, i, m = 0, flag = 0;
        Console.Write("Enter the Number to check Prime: ");
        n = int.Parse(Console.ReadLine());
        m = n / 2;
        for (i = 2; i <= m; i++)
        {
            if (n % i == 0)
            {
                Console.Write("Number is not Prime.");
                flag = 1;
                break;
            }
        }
        if (flag == 0)
            Console.Write("Number is Prime.");
    }
}
```

c) WAP to check the number is even or odd.

```
using System;
namespace check1
{
    class Program
    {
        static void Main(string[] args)
        {
            int i;
            Console.Write("Enter a Number : ");
            i = int.Parse(Console.ReadLine());
            if (i % 2 == 0)
            {
                Console.Write("Entered Number is an Even Number");
                Console.Read();
            }
            else
            {
                Console.Write("Entered Number is an Odd Number");
                Console.Read();
            }
        }
    }
}
```

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3. Command Line Argument

a) WAP to find the maximum number and minimum number in three given numbers using conditional operator.

```
using System;
public class Exercise39
{
       static void Main(string[] args)
       {
              Console.WriteLine("\nInput first integer:");
              int x = Convert.ToInt32(Console.ReadLine());
              Console.WriteLine("Input second integer:");
              int y = Convert.ToInt32(Console.ReadLine());
              Console.WriteLine("Input third integer:");
              int z = Convert.ToInt32(Console.ReadLine());

              Console.WriteLine("Largest of three: " + Math.Max(x,
              Math.Max(y, z)));
              Console.WriteLine("Lowest of three: " + Math.Min(x,
              Math.Min(y, z)));
       }
}
```

b) WAP to input an alphabet as character in lower case and display in an upper case or vice-versa.

```
using System;
public class upperlower
{
    public static void Main()
    {
        string str1;
        char[] arr1;
        int l=0, i;
        char ch;
        Console.Write("Input the string : ");
        str1 = Console.ReadLine();
        l = str1.Length;
        arr1 = str1.ToCharArray(0, l);

        Console.Write("\nAfter conversion, the string is : ");
        for (i = 0; i < l; i++)
        {
            ch = arr1[i];
            if (Char.IsLower(ch))
                Console.Write(Char.ToUpper(ch));
            else
                Console.Write(Char.ToLower(ch));
        }
        Console.Write("\n\n");
    }
}
```

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4. **Implement following programs**
   a) **WAP to display the day of week with constant value (Mon=1, Sat=6) using enumeration.**

```
using System;
public class EnumExample
{
    public enum Days { Sun, Mon, Tue, Wed, Thu, Fri, Sat };

    public static void Main()
    {
        int a = (int)Days.Sun;
        int b = (int)Days.Mon;
        int c = (int)Days.Tue;
        int d = (int)Days.Wed;
        int e = (int)Days.Thu;
        int f = (int)Days.Fri;
        int g = (int)Days.Sat;
        Console.WriteLine("Sun = {0}", a);
        Console.WriteLine("Mon = {0}", b);
        Console.WriteLine("Tue = {0}", c);
        Console.WriteLine("Web = {0}", d);
        Console.WriteLine("Thu = {0}", e);
        Console.WriteLine("Fri = {0}", f);
        Console.WriteLine("Sat = {0}", g);
    }
}
```

   b) **WAP to implement following concepts to calculate area of different shapes (Circle, Triangle, Rectangle, Square)**
      - **Use ref and out parameters.**

2. **Implement a program to demonstrate the abstract class & inheritance. Define account as an abstract class in which take the acc_no, name, acc_bal as class member & use SetInfo(), DispAcc() to set & display account information. Define partial sav_acc & public curr_acc as derived class in which use perform the deposit, withdraw (500>) and display the saving & current account information using switch case.**

3. **WAP to implement inheritance for Vehicle, Bus, Truck, Transport class to display fuel needed and distance covered by that vehicle use Method overriding.**

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4. **Implement the C# program to demonstrate Array class & perform the following operations.**
   1. Copy 2. GetLenth 3. Reverse

```
using System;
namespace csprogram
{
	public class arrayclassprogram
	{
		public static void Main(string[] args)
		{
			int[] arr = new int[6] { 7, 8, 9, 4, 5, 3 };
			int[] arr2 = new int[6];

			//copy
			Console.WriteLine("1) Copy");
			Array.Copy(arr, arr2, arr2.Length);
			Console.WriteLine("\nprint arr :");
			for (int i = 0; i < arr.Length; i++)
			{
				Console.Write(arr[i]+" ");
			}
			Console.WriteLine("\n\nprint arr2 :");
			for (int i = 0; i < arr2.Length; i++)
			{
				Console.Write(arr2[i]+" ");
			}

			//Getlength
			Console.WriteLine("\n\n2) GetLength");
			Console.WriteLine("GetLength : " + arr.Length);

			//Reverse
			Console.WriteLine("\n\n3) Reverse");
			Array.Reverse(arr);
			Console.WriteLine("print reverse arr : ");
			for (int i = 0; i < arr.Length; i++)
			{
				Console.Write(arr[i] + " ");
			}
			Console.WriteLine("\n\n");

		}
	}
}
```

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5. Implement the C# program to demonstrate Array class & perform the following operations.

1. GetUpperBound 2. GetLowerBound 3. Sort

//getupperbound and getlowerbound

```
using System;
namespace lowerupper
{
   class Program
       {
          static void Main(string[] args)
              {
                 //GetLowerBound
                 Array arr = Array.CreateInstance(typeof(String), 6);
                 arr.SetValue("One", 0);
                 arr.SetValue("Two", 1);
                 arr.SetValue("Three", 2);
                 arr.SetValue("Four", 3);
                 arr.SetValue("Five", 4);
                 arr.SetValue("six", 5);
                 Console.WriteLine("Lower Bound:-{0}",
                 arr.GetLowerBound(0).ToString());
                 Console.WriteLine("Upper Bound :-  {0}",
                 arr.GetUpperBound(0).ToString());
                  Console.ReadLine();
              }
       }
}
```

//sort

```
using System;
namespace lowerupper
{
       class Program
       {
              static void Main(string[] args)
              {
                     int[] arr = new int[6] {65,34,22,986,456,333};
                     Console.WriteLine("before sorting : ");
                     for (int i = 0; i < arr.Length; i++)
                     {
                            Console.Write(arr[i] + " ");
                     }
                     Console.WriteLine("\n\nafter sorting : ");
                     Array.Sort(arr);
                     for (int i = 0; i < arr.Length; i++)
                     {
                            Console.Write(arr[i] + " ");
                     }
                     Console.WriteLine("\n\n");
              }
       }
}
```

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6. Implement the C# program to demonstrate ArrayList class & perform the following operations

1. Insert

```
using System;
using System.Collections;

namespace ArrayListApplication
{
class Program
{
       static void Main(string[] args)
       {
              ArrayList personList = new ArrayList();
              personList.Add("aditi");
              personList.Add("tanaya");
              personList.Add("anusha");
              Console.WriteLine("=====Original List======");
              foreach(string arrayItem in personList)
              {
                     Console.WriteLine(arrayItem);
              }
              personList.Insert(1,"saurabh");
              Console.WriteLine("=====Modify List======");
              foreach (string arrayItem in personList){
                     Console.WriteLine(arrayItem);
              }
              Console.Read();
       }
}
}
```

2.Remove

```
using System;
using System.Collections;

namespace ArrayListApplication
{
class Program
{
  static void Main(string[] args)
  {
      ArrayList personList = new ArrayList();
      personList.Add("aditi");
      personList.Add("saurabh");
      personList.Add("anusha");
      personList.Add("tanaya");
      personList.Add("raj");
      Console.WriteLine("=====Original List======");
      foreach (String arrayItem in personList)
      {
          Console.WriteLine(arrayItem);
      }
      //remove first item from person list using index
      personList.Remove("raj");
      Console.WriteLine("=====Modified List======");
      foreach (String arrayItem in personList)
      {
          Console.WriteLine(arrayItem);
      }
      Console.Read();
  }
}
}
```

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3.sort

```
using System;
using System.Collections;
namespace ArrayListApplication
{
class Program
{
  static void Main(string[] args)
  {
      ArrayList personList = new ArrayList();
      personList.Add("abc");
      personList.Add("xyz");
      personList.Add("mnp");
      personList.Add("ghi");
      personList.Add("jiu");
      Console.WriteLine("========== Original List===============");
      foreach (String mylist in personList)
      {
          Console.WriteLine(mylist);
      }
      //sort the list
      personList.Sort();
      Console.WriteLine("========== Sorted List===============");
      foreach (String mylist in personList)
      {
          Console.WriteLine(mylist);
      }
      Console.Read();
  }
}
}
```

7. Implement the C# program to demonstrate ArrayList class & perform the following operations

1. Reverse

```
using System;
using System.Collections;
namespace ArrayListApplication{
  class Program{
      static void Main(string[] args){
          ArrayList personList = new ArrayList();
          personList.Add("abc");
          personList.Add("xyz");
          personList.Add("mnp");
          personList.Add("ghi");
          personList.Add("jiu");
          Console.WriteLine("========== Original List===============");
          foreach (String mylist in personList){
              Console.WriteLine(mylist);
          }
          //reverse the list
          personList.Reverse();
          Console.WriteLine("========== Sorted List===============");
          foreach (String mylist in personList)
          {
              Console.WriteLine(mylist);
          }
          Console.Read();
      }
  }
}
```

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2. Count the elements

```
using System;
using System.Collections;
class count
{
    public static void Main()
    {
        ArrayList myList = new ArrayList();
        myList.Add(1);
        myList.Add(2);
        myList.Add(3);
        myList.Add(4);
        myList.Add(5);
        //count the elements
        Console.WriteLine("Number of elements: " + myList.Count);
    }
}
```

3. Clear

```
using System;
using System.Collections;

namespace ArrayListApplication
{
class Program
{
  static void Main(string[] args)
  {
      ArrayList personList = new ArrayList();
      personList.Add("Sandeep");
      personList.Add("Raviendra");
      personList.Add("Shaijal");
      int totalItems = personList.Count;
      Console.WriteLine(string.Format($"Total Number Of Items in ArrayList:
      {totalItems}"));
      //Remove all items from person list
      personList.Clear();
      totalItems = personList.Count;
      Console.WriteLine(string.Format($"Total Number Of Items in ArrayList:
      {totalItems}"));
      Console.Read();

  }
}
}
```

8. Implement the C# program to demonstrate Multidimensional array (2D Array) and perform following operations: 1. Insertion 2. Searching 3. Display

Implement programs,

a) To display the structure of class room seating arrangement using jagged array. (For example: In a class room, numbers of students in each and every row are different. Display roll numbers of students in each row.)

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b) For checked

```
using System;
namespace CSharpProgram
{
    class Program
    {
        static void Main(string[] args)
        {
            checked
            {
                int val = int.MaxValue;
                Console.WriteLine(val + 2);
            }
        }
    }
}
```

c) and unchecked operators.

```
using System;
namespace CSharpProgram
{
    class Program
    {
        static void Main(string[] args)
        {
            unchecked
            {
                int val = int.MaxValue;
                Console.WriteLine(val + 2);
            }
        }
    }
}
```

9. WAP to display the details of employees of company (Company name, empld, EmpName, department, Basic salary, DA, HRA, Gross salary where DA=50%(Basic), HRA=20%(Basic), TA=10%(Basic) calculate Gross salary) use following concepts

a) Method Overloading b) Constructor Overloading

```
using System;
public class employee
{
    String com_name, empname, dept;
    int empid;
    double salary, hra = 0.2, tr = 0.1, da = 0.5;
    public employee(){
        com_name = "DXC";
        empname = "aditi";
        dept = "CSE";
        empid = 111;
        salary = 40000;
    }
    public employee(string cn, string en, string dep, int id, double s){
        com_name = cn;
        empname = en;
        dept = dep;
        empid = id;
        salary = s;
    }
    void totalsalary(){
        Console.WriteLine("\ncomapny_name : {0} \nEmp_name : {1}
\ndepartment : {2}", com_name, empname, dept);
```

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```
            salary = salary + (salary * hra + salary * tr + salary * da);
            Console.WriteLine("total salary : " + salary);
        }
        double totalsalary(double hra, double tr, double da){
            Console.WriteLine("\ncomapny_name : {0} \nEmp_name : {1}
    \ndepartment : {2}", com_name, empname, dept);
            salary = salary + (salary * hra + salary * tr + salary * da);
            return salary;

        }
        public static void Main(){
            employee e = new employee();
            e.totalsalary();
            employee e1 = new employee("TCS", "anusha", "CSE", 222, 40000);
            double p = e1.totalsalary(0.1, 0.2, 0.3);
            Console.WriteLine("salary of employee : " + p);
        }
    }
```

10. Implement the C# program to

a) Demonstrate the operator overloading in which overload the '+' operator & perform matrix addition & show the result in matrix format.

```
using System;
class Matrix{
        public const int DimSize = 3;
        private double[,] m_matrix = new double[DimSize, DimSize];
        public double this[int x, int y]{
                get { return m_matrix[x, y]; }
                set { m_matrix[x, y] = value; }
        }
        public static Matrix operator +(Matrix mat1, Matrix mat2){
                Matrix newMatrix = new Matrix();

                for (int x = 0; x < DimSize; x++)
                        for (int y = 0; y < DimSize; y++)
                                newMatrix[x, y] = mat1[x, y] + mat2[x, y];
                return newMatrix;
        }
}

class MatrixTest{
        public static Random m_rand = new Random();
        static void Main(){
                Matrix mat1 = new Matrix();
                Matrix mat2 = new Matrix();
                InitMatrix(mat1);
                InitMatrix(mat2);
                Console.WriteLine("Matrix 1: ");
                PrintMatrix(mat1);
                Console.WriteLine("Matrix 2: ");
                PrintMatrix(mat2);
                Matrix mat3 = mat1 + mat2;
                Console.WriteLine();
                Console.WriteLine("Matrix 1 + Matrix 2 = ");
                PrintMatrix(mat3);
                Console.ReadLine();
        }
        public static void InitMatrix(Matrix mat){
                for (int x = 0; x < Matrix.DimSize; x++)
                        for (int y = 0; y < Matrix.DimSize; y++)
                                mat[x, y] = m_rand.NextDouble();
        }
```

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```
        public static void PrintMatrix(Matrix mat){
            Console.WriteLine();
            for (int x = 0; x < Matrix.DimSize; x++){
                Console.Write("[ ");
                for (int y = 0; y < Matrix.DimSize; y++){
                    Console.Write("{0,2:#.00}", mat[x, y]);
                    if ((y + 1 % 2) < 3)
                        Console.Write(", ");
                }
                Console.WriteLine(" ]");
            }
            Console.WriteLine();
        }
    }
```

b) Demonstrate the method overloading in which take Area() & overload it and calculate the area of square, circle, rectangle and triangle.

11. String manipulation using String & String builder class.

a) WAP to demonstrate different String operations to perform on a given string. -Append, -Insert, -Remove, -Replace,

```
using System;
using System.Text;
public class Exercise1
{
    public static void Main()
    {
        StringBuilder s = new StringBuilder(" object ");
        Console.WriteLine(s);

        s.Append(" language ");
        Console.WriteLine(s);

        s.Insert(7, " oriented ");
        Console.WriteLine(s);

        s.Replace(" oriented ", " basic ");
        Console.WriteLine(s);

        s.Remove(2, 4);
        Console.WriteLine(s);
    }
}
```

12. String manipulation using String class.

b) WAP to demonstrate different String operations to perform on a given string. -Concat, -Compare, -Equals, -Substring.

```
using System;
using System.Text;
public class Exercise1
{
    public static void Main()
    {
```

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```
        string str1 = "aditi";
        string str2 = "kadam";

        string str3 = String.Concat(str1, str2);
        Console.WriteLine("Concatinate : "+str3);

        Console.WriteLine("Compare : "+String.Compare(str1, str2));

        Console.WriteLine("Equals : "+str1.Equals(str2));

        Console.WriteLine("Sub String1 : " + str1.Substring(3));
    }
}
```

13. String manipulation using String builder class.

WAP to demonstrate the SringBuilder class. Input two strings - "DYPCET" and "kolhapur". Convert these strings to one string as "KOLHAPURdypcet".

```
using System;
using System.Text;
public class Exercise1
{
    public static void Main()
    {
        string str1 = "DYPCET";
        string str2 = "kolhapur";
        Console.WriteLine("\nBefore : ");
        Console.WriteLine(str1);
        Console.WriteLine(str2);
        string str3 = String.Concat(str1, str2);
        string str4 = str2.ToUpper();
        string str5 = str1.ToLower();
        Console.WriteLine("\n\nAfter : ");
        string str6 = String.Concat(str4, str5);
        Console.WriteLine(str6);
    }
}
```

14. Delegates and Properties.

a) **WAP to perform arithmetic operations using delegate.**

b) **Define Person class that has two properties: `Name` (string) and `Age` (int). Both properties are read/write.**

```
using System;
namespace ConsoleApp3{
    class Student{
        private string code = "N.A";
        private string name = "not known";
        private int age = 0;
        public string Code{
            get{
                return code;
            }
            set{
                code = value;
            }
        }
        public string Name{
            get{
                return name;
            }
```

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```
            set{
                name = value;
            }
        }
        public int Age{
            get{
                return age;
            }
            set{
                age = value;
            }
        }
        public override string ToString(){
            return "\nCode = "+Code+ ",\nName = "+Name+ ",\nAge = "+Age;
        }
    }
    class ExampleDemo{
        public static void Main(){
            Student s = new Student();
            s.Code = "111";
            s.Name = "Aditi";
            s.Age = 20;
            Console.WriteLine("Student Info: {0}", s);
            s.Age += 1;
            Console.WriteLine("\n\nStudent Info: {0}", s);
            Console.ReadKey();
        }
    }
}
```

15. Design Student Admission form using Windows Form Application. Form should consists of – textbox, label, combo box, calendar, radio buttons, check box, list box, rich textbox, button controls.

```
using System;
using System.Data;
using System.Windows.Forms;
using System.Data.OleDb;
namespace databaseaccess
{
    public partial class Form1 : Form
    {
        OleDbConnection con = new
       OleDbConnection(@"Provider=Microsoft.ACE.OLEDB.12.0;Data
Source=C:\Users\DELL\Documents\student.accdb");
        public Form1()
        {
            InitializeComponent();
        }
        private void button1_Click(object sender, EventArgs e)
        {

            con.Open();
            OleDbCommand cmd = con.CreateCommand();
            cmd.CommandType = CommandType.Text;
            cmd.CommandText = "insert into stud1 values('" + textBox1.Text +
          "','" + textBox2.Text + "','" + textBox3.Text + "','" +
textBox4.Text + "')";
            cmd.ExecuteNonQuery();
            string msg = "successfully inserted";
            MessageBox.Show(msg);
            con.Close();
```

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```
        }
        private void button4_Click(object sender, EventArgs e)
        {
            con.Open();
            OleDbCommand cmd = con.CreateCommand();
            cmd.CommandType = CommandType.Text;
            cmd.CommandText = "update stud1 set name='gayatri' where
       Rollno = 1";
        cmd.ExecuteNonQuery();
            string msg = "successfully updated";
            MessageBox.Show(msg);
            con.Close();
        }
        private void button2_Click(object sender, EventArgs e)
        {
            con.Open();
            OleDbCommand cmd = con.CreateCommand();
            cmd.CommandType = CommandType.Text;
            cmd.CommandText = "select * from stud1";
            cmd.ExecuteNonQuery();
            DataTable dt = new DataTable();
            OleDbDataAdapter da = new OleDbDataAdapter(cmd);
            da.Fill(dt); dataGridView1.DataSource = dt;
            con.Close();
        }
        private void button3_Click(object sender, EventArgs e)
        {
            con.Open();
            OleDbCommand cmd = con.CreateCommand();
            cmd.CommandType = CommandType.Text;
            cmd.CommandText = "delete from stud1 where Rollno=2";
            cmd.ExecuteNonQuery();
            string msg = "successfully deleted";
            MessageBox.Show(msg);
            con.Close();
        }
    }
}
```

16. Implement the calculator using window form application to perform arithmetic operations.

```
namespace calculatorWindowForm
{
    public partial class Form1 : Form
    {
        double firstnumber;
        string operation;
        public Form1()
        {
            InitializeComponent();
        }

        private void button3_Click(object sender, EventArgs e)
        {
            if (textBox1.Text == "0" && textBox1.Text != "null")
            {
                textBox1.Text = "2";
            }
            else
```

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```
    {
        textBox1.Text = textBox1.Text + "2";
    }
}

private void button12_Click(object sender, EventArgs e)
{
    firstnumber = Convert.ToDouble(textBox1.Text);
    textBox1.Text = "0";
    operation = "-";
}

private void groupBox2_Enter(object sender, EventArgs e)
{

}

private void button13_Click(object sender, EventArgs e)
{
    firstnumber = Convert.ToDouble(textBox1.Text);
    textBox1.Text = "0";
    operation = "*";
}

private void button2_Click(object sender, EventArgs e)
{
    if (textBox1.Text == "0" && textBox1.Text != "null")
    {
        textBox1.Text = "1";
    }
    else
    {
        textBox1.Text = textBox1.Text + "1";
    }
}

private void button1_Click(object sender, EventArgs e)
{
    textBox1.Text = textBox1.Text + "0";
}

private void button4_Click(object sender, EventArgs e)
{
    if (textBox1.Text == "0" && textBox1.Text != "null")
    {
            textBox1.Text = "3";
       }
       else
       {
           textBox1.Text = textBox1.Text + "3";
       }
   }

   private void button5_Click(object sender, EventArgs e)
   {
       if (textBox1.Text == "0" && textBox1.Text != "null")
       {
           textBox1.Text = "4";
       }
       else
       {
           textBox1.Text = textBox1.Text + "4";
       }
```

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```
}

private void button6_Click(object sender, EventArgs e)
{
    if (textBox1.Text == "0" && textBox1.Text != "null")
    {
       textBox1.Text = "5";
    }
 else
    {
        textBox1.Text = textBox1.Text + "5";
    }
}

private void button7_Click(object sender, EventArgs e)
{
    if (textBox1.Text == "0" && textBox1.Text != "null")
    {
        textBox1.Text = "6";
    }
    else
    {
        textBox1.Text = textBox1.Text + "6";
    }
}

private void button8_Click(object sender, EventArgs e)
{
    if (textBox1.Text == "0" && textBox1.Text != "null")
    {
        textBox1.Text = "7";
    }
    else
    {
        textBox1.Text = textBox1.Text + "7";
    }
}

private void button9_Click(object sender, EventArgs e)
{
    if (textBox1.Text == "0" && textBox1.Text != "null")
    {
        textBox1.Text = "8";
    }
    else
    {
        textBox1.Text = textBox1.Text + "8";
    }
}

private void button10_Click(object sender, EventArgs e)
{
    if (textBox1.Text == "0" && textBox1.Text != "null")
    {
        textBox1.Text = "9";
    }
    else
    {
        textBox1.Text = textBox1.Text + "9";
    }
}

private void button11_Click(object sender, EventArgs e)
```

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```
        {
            firstnumber = Convert.ToDouble(textBox1.Text);
            textBox1.Text = "0";
            operation = "+";
        }

        private void button14_Click(object sender, EventArgs e)
        {
            firstnumber = Convert.ToDouble(textBox1.Text);
            textBox1.Text = "0";
            operation = "/";
        }

        private void button18_Click(object sender, EventArgs e)
        {
            double secondnumber;
            double result;
            secondnumber = Convert.ToDouble(textBox1.Text);
            if(operation == "+")
            {
                result = (firstnumber + secondnumber);
                textBox1.Text = Convert.ToString(result);
                firstnumber = result;
            }
            if (operation == "-")
            {
                result = (firstnumber - secondnumber);
                textBox1.Text = Convert.ToString(result);
                firstnumber = result;
            }
            if (operation == "*")
            {
                result = (firstnumber * secondnumber);
                textBox1.Text = Convert.ToString(result);
                firstnumber = result;
            }
            if(operation == "/")
            {
                if(secondnumber == 0)
                {
                    textBox1.Text = "cannot divided by zero";
                }
                else
                {
                    result = (firstnumber / secondnumber);
                    textBox1.Text = Convert.ToString(result);
                    firstnumber = result;
                }
            }
        }

        private void button19_Click(object sender, EventArgs e)
        {
            textBox1.Text = textBox1.Text + ".";
        }

        private void button17_Click(object sender, EventArgs e)
        {
            textBox1.Text = "0";
        }
    }
}
```

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17. **Implement Windows Form application to design a form to have sign in and login facility using database connectivity.**
https://www.c-sharpcorner.com/article/create-loginsign-in-and-registration-sign-up-form-in-c-sharp-windows-form-with-da/

18. **Implement Windows Form application that performs INSERT query and also displays the List of Books available in a Library System by fetching the details from a database.**
https://www.c-sharpcorner.com/UploadFile/1e050f/insert-update-and-delete-record-in-datagridview-C-Sharp/

19. **Implement the C# program to demonstrate the thread in which perform following operations.**

1. Creating thread

```
using System;
using System.Threading;
class Program
{
    static void Main()
    {
        Thread workerThread = new Thread(new ThreadStart(Print));
        workerThread.Start();
        for (int i = 0; i < 10; i++)
        {
            Console.WriteLine($"Main thread: {i}");
            Thread.Sleep(200);
        }

        Console.ReadKey();
    }
    static void Print()
    {
        for (int i = 11; i < 20; i++)
        {
            Console.WriteLine($"Worker thread: {i}");
            Thread.Sleep(1000);
        }
    }
}
```

2. Pause the thread

```
using System;
using System.Threading;
namespace Sample{
    class Demo{
        static void Main(string[] args)
        {
            for (int i = 0; i < 10; i++){
                Console.WriteLine("Sleep for 1 second!");
                Thread.Sleep(1000);
            }
            Console.ReadLine();
        }
    }
}
```

3. Destroy the thread.

```
using System;
```

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```
using System.Threading;
class ExampleofThread{
       public void thread(){
              for (int x = 0; x < 3; x++){
                     Console.WriteLine(x);
              }
       }
}
class ThreadExample{
public static void Main(){
  ExampleofThread obj = new ExampleofThread();
  Thread thr = new Thread(new ThreadStart(obj.thread));
  thr.Start();
  Console.WriteLine("Thread is abort");
  thr.Abort();
}
}
```

20. Implement the C# program to demonstrate the delegate in which perform the addition, subtraction, multiplication of numbers using delegate.

```
using System;
delegate int NumberChanger(int n);
namespace example
{
    class Delegate
    {
        static int num = 10;
        public static int AddNum(int a)
        {
            num += a;
            return num;
        }
        public static int SubNum(int b)
        {
            num -= b;
            return num;
        }

        public static int MultNum(int c)
        {
            num *= c;
            return num;
        }
        public static int getNum()
        {
            return num;
        }

        static void Main(string[] args)
        {

            NumberChanger n1 = new NumberChanger(AddNum);
            NumberChanger n2 = new NumberChanger(SubNum);
            NumberChanger n3 = new NumberChanger(MultNum);
            n1(25);
            Console.WriteLine("Value of add Num: {0}", getNum());
            n2(45);
            Console.WriteLine("Value of sub Num: {0}", getNum());
            n3(5);
            Console.WriteLine("Value of multi Num: {0}", getNum());
            Console.ReadKey();
        }
    }}
```

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21. Creating C# Class Library (DLL). Implement windows form application to

a) **Add, Subtract, multiply and divide two numbers and display result using window form application.**
b) **Find given number is Prime or not.**