1.) Write a program to show function overloading in C#

Source Code :

```
using System;
namespace Assignment1
{
    class FunctionOverloading
    {
        static int Area (int l) => l * l;
        static int Area (int l, int b) => l * b;
        static void Main (string[] args)
        {
            Console.Writeline ($" The area of square with
                length 5 is { Area (5) } ");
            Console.Write Line ($" The area of rectangle with
                length 5 and breadth 7 is { Area (5, 7) } ");
            Console.ReadKey ();
        }
    }
}
```

Output :

```
The area of square with length 5 is 25
The area of rectangle with length 5 and breadth 7
is 35
```

2.) Write a program to show Inhesitance in C#.

Source Code :

```
class InhesitanceTest
{
    public class Animal
    {
        public string color = " white ";
        public virtual void eat ()
        {
            Console.WriteLine ("\t Eating... ");
        }
    }
    public class Dog : Animal
    {
        public overide void eat ()
        {
            Console.WriteLine ("\t Dog is Eating...");
        }
        public void bark ()
        {
            Console.WriteLine ("\t Barking...");
        }
        public void showColor ()
        {
            Console.WriteLine ($"\t Animal Base Color :
                 {base.color} ");
            Console.WriteLine ($"\t Dog color : {color} ");
        }
    }
```

```
        static void Main (string [] args)
        {
            Dog dog = new Dog();
            dog.bark();
            dog.showColor ();
            dog.eat ()
            Console.ReadKey ();
        }
    }
}
```

Output:

```
Barking...
Animal Bae Color : white
Dog color : white
Dog is Eating...
```

3.) Write a program to Handle Divide By Zero Exception and Index Out Of Range Exception.

Source Code :

```
⋮
class ExceptionTest
{
  static void Main (string[] args)
  {
      var a = 11;
      var b = 0;
      try
      {
        var c = a/b;
      }
      catch ( DivideByZero Exception e)
      {
       Console.WriteLine (e.Message);
      }
      List<string> languages = new list<string>(){
         "Python", "Java", "C#", "JavaScript", "C++", "PHP",
          "R", "Scala", "Swift", "Kotlin" };
     for (int i=0 ; i<11 ; i++)
     {
        try
        {
         Console.WriteLine (languages[i]);
        }
        catch ( Argument Out of Range Exception e)
        {
         Console. ~~Read~~ WriteLine ( e.Message);
        }
     }
  }
}
```

Output

```
Attempted to divide by zero.
Python
Java
C#
JavaScript
C++
PHP
R
Scala
Swift
Kotlin
Index was out of Range. Must be non-negative
and less than the size of the collection.
Parameter name : index
```

4.) WAP to handle file in C#.

a. Create and Write to a file

b. Check whether file exists

c. Read from a file

Source Code :

```
 :
 class FileHandleTest
 {
   static void Main (string[] args)
   {
      ~~Var~~
      File.WriteAllText ("newfile.txt", "Creating and
      Writing to a file");
      if (! File.Exists ("newfile.txt"))
        {
         Console.WriteLine ("File doesnot exist");
        }
      else~~et~~
       {
        Console.Write Line ("File Exists");
       }
      string txt = File.ReadAll Text ("newfile.txt");
      Console.WriteLine (txt);
      Console.ReadKey ();
   }
 }
:
```

Output

```
File Exists
Creating and Writing to a file.
```

5.) WAP in LINQ Syntax

a.) First create list of strings with 4 string values

b.) Get and show all string from List with LINQ

c.) Filter and show the list containing the matching string text.

Source Code

```
:
class LinqTest
{
 static void Main (string[] args)
 {
   List<string> fruits = new List<string> () {
        "apple", "mango", "banana", "grapes"
     };
   var fruitQuery = ~~fruit~~ from fruit in fruits select fruit;
   Console.WriteLine ("Get and show all item in querylist");
   foreach ( var fruit in fruitQuery)
   { Console.Write (fruit + ", ");
   }
   var matchFruits = from fruit in fruits where fruit.
                        Contains ("ap") select fruit;
   Console.WriteLine ("\n Filtering and showing item which
          contains 'ap' ");
   foreach (var fruit in matchFruits)
   {
    Console.Write (fruit + ", ");
   }
   Console.ReadKey ();
 }
}
;
```

Output

```
Get and show all item in queryList
apple, mongo, banana, grapes,
Filtering and showing item which contain 'op'
apple, grapes,
```

6.) Write an asynchronous program in C#.

Source Code :

```
:
class AsyncTest
{
public static async Task Main()
  {
    await foreach (var item in MessageAsync())
    {
      System.Console.WriteLine(item);
    }
    Console.ReadKey();
  }
 static async IAsyncEnumerable<string> MessageAsync()
  {
    await Task.Delay(2000);
    yield return "Hello!";
    await Task.Delay(2000);
    yield return "Hello";
  }
}
:
```

Output

```
Hello!
Hello!
```

CONCLUSION

Hence, we are able to implement function overloading, inheritance, exception handling, file handling, LINQ syntax & asynchronous programming using C#.