Question 7:

Aim:

The aim of this program is to demonstrate inheritance and method overriding in C#. The StudentMark class inherits from the Student class, adding functionality to input and display marks and determine the student's grade based on their average marks.

PROGRAM:

```
using System;

class Student
{
    // Data members for student's basic details
    public string Name { get; set; }
    public int Age { get; set; }
    public string Address { get; set; }
    public string MobileNumber { get; set; }

    // Method to read student basic details
    public virtual void GetData()
    {
        Console.Write("Enter student name: ");
        Name = Console.ReadLine();

        Console.Write("Enter student age: ");
        Age = int.Parse(Console.ReadLine());

        Console.Write("Enter student address: ");
        Address = Console.ReadLine();

        Console.Write("Enter student mobile number: ");
        MobileNumber = Console.ReadLine();
    }

    // Method to print student basic details
    public virtual void PrintData()
    {
        Console.WriteLine("\n--- Student Details ---");
        Console.WriteLine($"Name: {Name}");
        Console.WriteLine($"Age: {Age}");
        Console.WriteLine($"Address: {Address}");
        Console.WriteLine($"Mobile Number: {MobileNumber}");
    }
}

// Subclass inheriting from Student class
class StudentMark : Student
{
    // Data members for student's marks
    public double MathMark { get; set; }
```

```
public double ScienceMark { get; set; }
public double EnglishMark { get; set; }

// Override GetData method to include marks input
public override void GetData()
{
    // Call base class GetData() to input basic details
    base.GetData();

    // Input marks
    Console.Write("Enter Math mark: ");
    MathMark = double.Parse(Console.ReadLine());

    Console.Write("Enter Science mark: ");
    ScienceMark = double.Parse(Console.ReadLine());

    Console.Write("Enter English mark: ");
    EnglishMark = double.Parse(Console.ReadLine());
}

// Override PrintData method to include marks output
public override void PrintData()
{
    // Call base class PrintData() to print basic details
    base.PrintData();

    // Print marks
    Console.WriteLine("\n--- Student Marks ---");
    Console.WriteLine($"Math Mark: {MathMark}");
    Console.WriteLine($"Science Mark: {ScienceMark}");
    Console.WriteLine($"English Mark: {EnglishMark}");

    // Print grade based on average marks
    FindGrade();
}

// Method to find and display the grade based on average marks
public void FindGrade()
{
    double averageMark = (MathMark + ScienceMark + EnglishMark) / 3;

    string grade;
    if (averageMark >= 90)
        grade = "A+";
    else if (averageMark >= 75)
        grade = "A";
    else if (averageMark >= 60)
        grade = "B";
    else if (averageMark >= 50)
        grade = "C";
    else
        grade = "Fail";

    Console.WriteLine($"Grade: {grade}");
```

```
    }
}

// Main class to access members of both Student and StudentMark classes
class Program
{
    static void Main(string[] args)
    {
        // Create an instance of the StudentMark class
        StudentMark student = new StudentMark();

        // Call methods to get and print student details and marks
        student.GetData();
        student.PrintData();
    }
}
```

Input:

```
Enter student name: Aravind
Enter student age: 20
Enter student address: 123 Main St
Enter student mobile number: 9876543210
Enter Math mark: 85
Enter Science mark: 78
Enter English mark: 90
```

Output:

```
--- Student Details ---
Name: Aravind
Age: 20
Address: 123 Main St
Mobile Number: 9876543210

--- Student Marks ---
Math Mark: 85
Science Mark: 78
English Mark: 90

Grade: A+
```

Main.cs

Share Run

```
        TotalBillsPaid = double.Parse(Console.ReadLine());
    }

    // Method to display patient details
    public void DisplayPatientInfo()
    {
        Console.WriteLine("\n--- Patient Details ---");
        Console.WriteLine($"Name: {Name}");
        Console.WriteLine($"Date of Admission: {DateOfAdmission
            .ToShortDateString()}");
        Console.WriteLine($"Age: {Age}");
        Console.WriteLine($"Disease: {Disease}");
        Console.WriteLine($"Date of Discharge: {DateOfDischarge
            .ToShortDateString()}");
        Console.WriteLine($"Total Bills Paid: {TotalBillsPaid:C}");
    }
}

class Hospital
{
    static void Main(string[] args)
    {
        // Create an instance of the Patient class
        Patient patient = new Patient();

        // Call the method to get patient information
        patient.GetPatientInfo();

        // Call the method to display patient information
        patient.DisplayPatientInfo();
    }
}
```

Output

```
mono /tmp/2QUA2UghBO.exe
Enter patient name: John Doe
Enter date of admission (yyyy-mm-dd): 2023-08-15
Enter age of patient: 45
Enter disease: Hypertension
Enter date of discharge (yyyy-mm-dd): 2023-09-01
Enter total bills paid:  1500.751500.75

--- Patient Details ---
Name: John Doe
Date of Admission: 08/15/2023
Age: 45
Disease: Hypertension
Date of Discharge: 09/01/2023
Total Bills Paid: ?1,500.75

=== Code Execution Successful ===
```