C# .NET Assignment 2

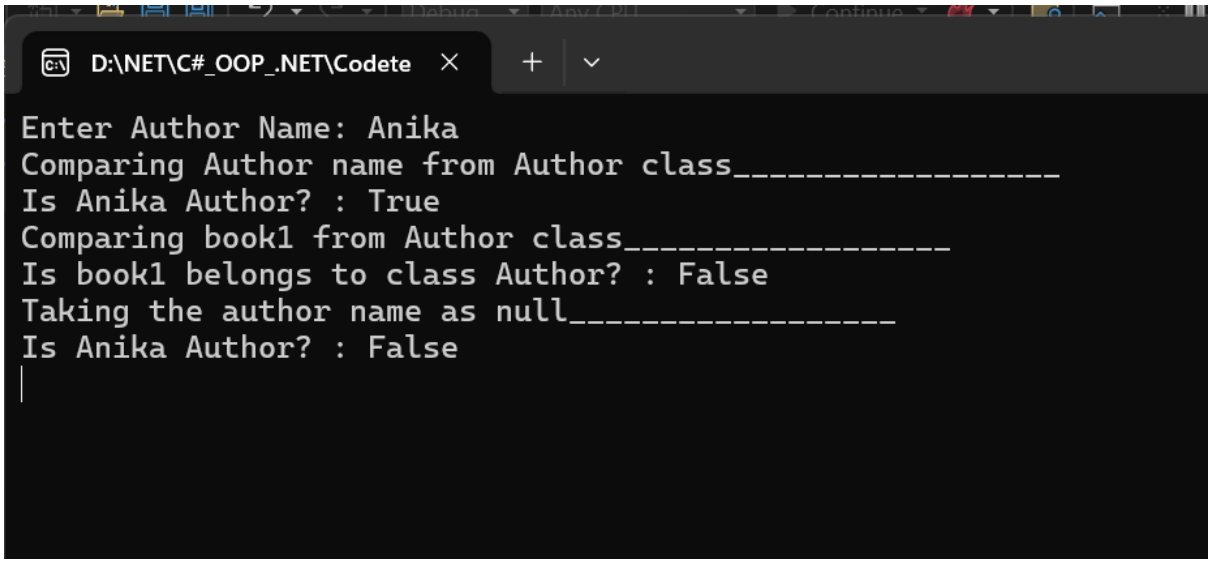
Question1: Relating two variables using is operator

DESCRIPTION: Create a console application that returns author details from two different classes using is operator .

- Define a class Author
- Define class Work
- Define a class Driver
- inside driver class check if
    - return object class Author
    - the object of Work class is also a member of Author class,
    - define object of Author class as null and again compare if it is an object of Author class

```
using System;

namespace Question1
{
  // Class Author
  class Author
  {
    public string Name { get; set; }
    public Author(string name)
    {
      Name = name;
    }
  }

  // Class Work
  class Work
  {
    public string Title { get; set; }
    public Work(string title)
    {
      Title = title;
    }
  }

  // Driver class (as per requirement)
  class Driver
  {
    static void Main(string[] args)
    {
      // Input Author Name
      Console.Write("Enter Author Name: ");
      string authorName = Console.ReadLine();

      Author a1 = new Author(authorName);
      Work w1 = new Work("book1");

      Console.WriteLine("Comparing Author name from Author class_____________________");
      Console.WriteLine($"Is {a1.Name} Author? : {a1 is Author}");

      Console.WriteLine("Comparing book1 from Author class_____________________");
      Console.WriteLine($"Is {w1.Title} belongs to class Author? : {w1 is Author}");
```

```
        Console.WriteLine("Taking the author name as null_____________________");
        Author a2 = null;
        Console.WriteLine($"Is {authorName} Author? : {a2 is Author}");

        Console.ReadLine();
    }
  }
}
```



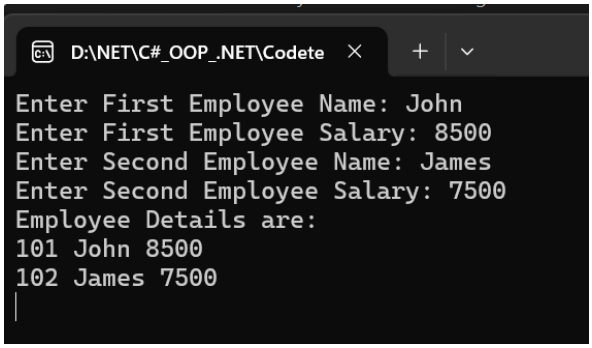
Question 2: Inheritance in employee class

DESCRIPTION:

Create a console application that takes two input as employee name and salary and returns employee details.

```
using System;
namespace Question2
{
  // Base class
  class Person
  {
    public string Name { get; set; }
  }
  // Derived class
  class Employee : Person
  {
    private static int _empCounter = 100; // auto-increment employee ID
    public int EmployeeId { get; private set; }
    public double Salary { get; set; }

    public Employee(string name, double salary)
    {
      EmployeeId = ++_empCounter;
      Name = name;
      Salary = salary;
    }
    public void Display()
    {
      Console.WriteLine($"{EmployeeId} {Name} {Salary}");
    }
```

```
    }

    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("Enter First Employee Name: ");
            string name1 = Console.ReadLine();
            Console.Write("Enter First Employee Salary: ");
            double salary1 = Convert.ToDouble(Console.ReadLine());
            Console.Write("Enter Second Employee Name: ");
            string name2 = Console.ReadLine();
            Console.Write("Enter Second Employee Salary: ");
            double salary2 = Convert.ToDouble(Console.ReadLine());
            // Create objects of Employee
            Employee emp1 = new Employee(name1, salary1);
            Employee emp2 = new Employee(name2, salary2);
            Console.WriteLine("Employee Details are:");
            emp1.Display();
            emp2.Display();
            Console.ReadLine();
        }
    }
}
```



QUESTION 3 : Calculate area of geometric shapes

DESCRIPTION:

Create a windows application that takes measurements of different geometric shapes and calculates area.

Define four methods in the name of , Area of Rectangle, Circle, Square and Triangle which calculates area of respective shapes and returns the same.

Input Format:

Enter the Length for Rectangle 20

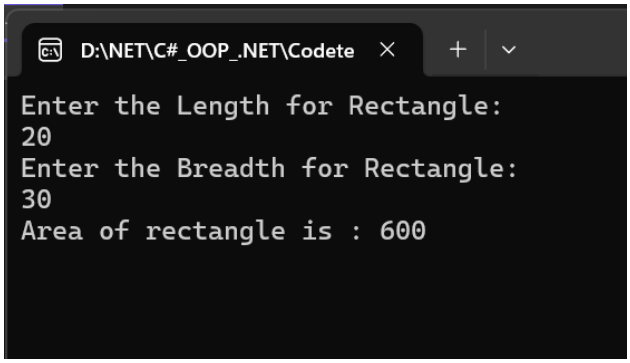
Enter the breadth for Rectangle 30

Output Format:

Area of rectangle is :600

```
using System;
namespace Question3
{
    class Shapes
    {
        public double AreaOfRectangle(double length, double breadth)
        {
```

```
        return length * breadth;
    }
    public double AreaOfCircle(double radius)
    {
        return Math.PI * radius * radius;
    }
    public double AreaOfSquare(double side)
    {
        return side * side;
    }
    public double AreaOfTriangle(double b, double h)
    {
        return 0.5 * b * h;
    }
  }
  class Program
  {
    static void Main(string[] args)
    {
        Shapes shape = new Shapes();

        Console.WriteLine("Enter the Length for Rectangle:");
        double length = Convert.ToDouble(Console.ReadLine());

        Console.WriteLine("Enter the Breadth for Rectangle:");
        double breadth = Convert.ToDouble(Console.ReadLine());

        double rectArea = shape.AreaOfRectangle(length, breadth);
        Console.WriteLine($"Area of rectangle is : {rectArea}");

        Console.ReadLine();
    }
  }
}
```

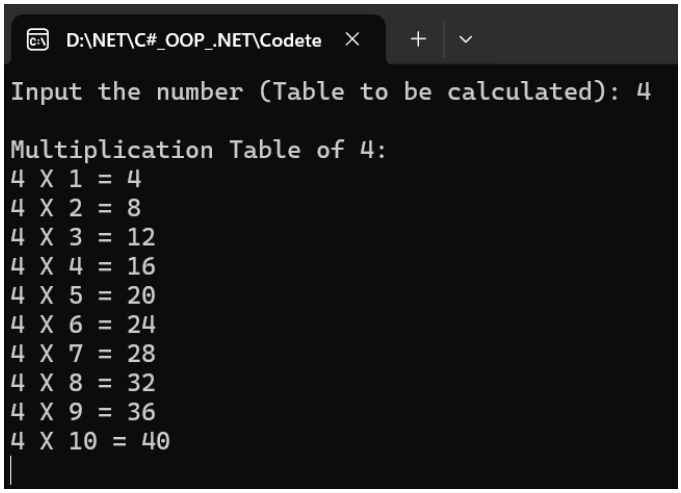


Question 4: Multiplication table

DESCRIPTION: Create a console application to take an integer as input and display its multiplication from 1 to 10

```
using System;
namespace Question4
{
  class Program
  {
    static void Main(string[] args)
    {
        Console.Write("Input the number (Table to be calculated): ");
```

```
        int num = Convert.ToInt32(Console.ReadLine());
        Console.WriteLine($"\nMultiplication Table of {num}:");
        for (int i = 1; i <= 10; i++)
        {
            Console.WriteLine($"{num} X {i} = {num * i}");
        }
        Console.ReadLine();
    }
  }
}
```



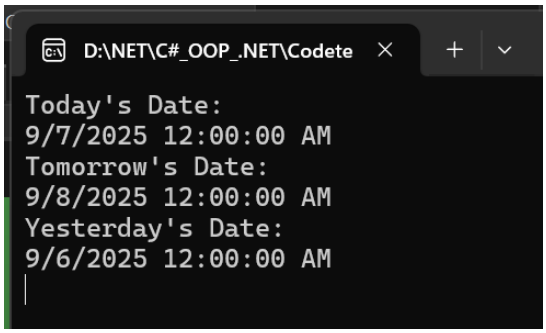
Question 5: Yesterday's date

DESCRIPTION:

Create a console application that prints yesterday's today's and tomorrow's date.

```
using System;

namespace Question5

{

  class Program

  {

    static void Main(string[] args)

    {

        DateTime today = DateTime.Today;

        DateTime tomorrow = today.AddDays(1);

        DateTime yesterday = today.AddDays(-1);

        Console.WriteLine("Today's Date:");

        Console.WriteLine(today);

        Console.WriteLine("Tomorrow's Date:");

        Console.WriteLine(tomorrow);

        Console.WriteLine("Yesterday's Date:");

        Console.WriteLine(yesterday);
```

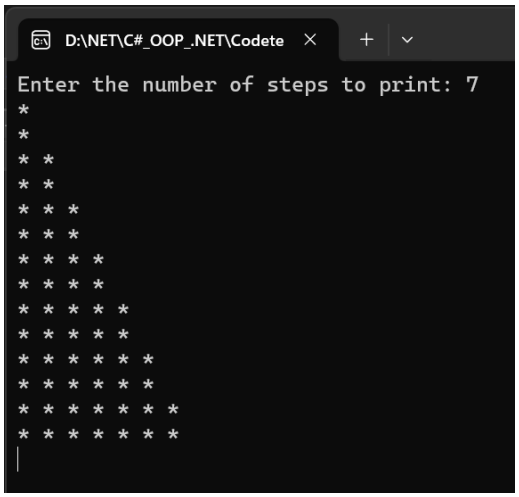
```
        Console.ReadLine();
    }
  }
}
```



Question 6: Create a console application which prints “*” s to create a staircase pattern on console.

```
using System;

namespace Question6
{
  class Program
  {
    static void Main(string[] args)
    {
        Console.Write("Enter the number of steps to print: ");
        int steps = Convert.ToInt32(Console.ReadLine());
        for (int i = 1; i <= steps; i++)
        {
          // print two rows for each step
          for (int row = 1; row <= 2; row++)
          {
            for (int star = 1; star <= i; star++)
            {
              Console.Write("* ");
            }
            Console.WriteLine();
          }
        }
        Console.ReadLine();
    }
```

```
    }
}
```



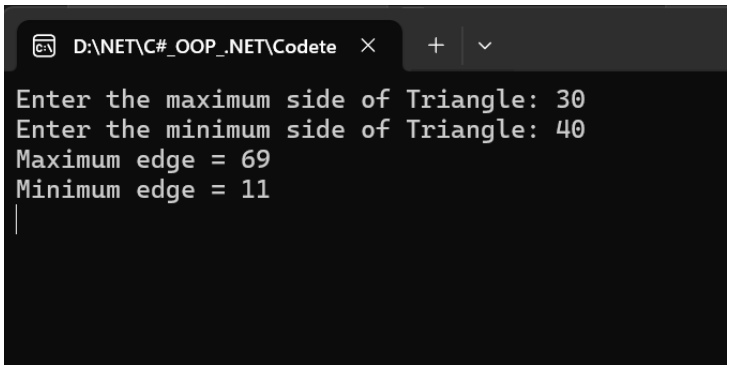
Question 7: Maximum and Minimum edge of triangle
DESCRIPTION:
Create a console application to display Maximum and Minimum edge of triangle

For a triangle with sides **a, b, c**:

- The **maximum possible third edge** = a + b - 1
- The **minimum possible third edge** = |a - b| + 1

```
using System;
namespace Question7
{
    class Program
    {
        static void Main(string[] args)
        {
            Console.Write("Enter the maximum side of Triangle: ");
            int side1 = Convert.ToInt32(Console.ReadLine());
            Console.Write("Enter the minimum side of Triangle: ");
            int side2 = Convert.ToInt32(Console.ReadLine());
            int maxEdge = side1 + side2 - 1;
            int minEdge = Math.Abs(side1 - side2) + 1;
            Console.WriteLine($"Maximum edge = {maxEdge}");
```

```
        Console.WriteLine($"Minimum edge = {minEdge}");
        Console.ReadLine();
    }
  }
}
```



Question 8: Score generator

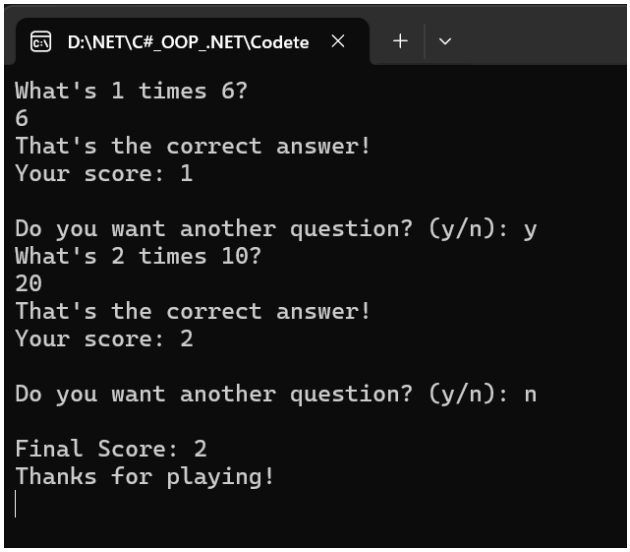
DESCRIPTION:

Create a console application which two generates random integers repeatedly and asks the user to enter the product of two, if user inputs correct answer 1 mark is allotted and if the answer is wrong then 0 marks.

1. Generates two random integers.
2. Asks the user for the product.
3. Gives 1 point for correct answer, 0 for wrong.
4. Displays the result and score.

```
using System;
namespace Question8
{
  class Program
  {
    static void Main(string[] args)
    {
      Random rnd = new Random();
      int score = 0;
      string choice;
      do
      {
        int num1 = rnd.Next(1, 11);
        int num2 = rnd.Next(1, 11);

        Console.WriteLine($"What's {num1} times {num2}?");
        int answer;

        // Input validation
        while (!int.TryParse(Console.ReadLine(), out answer))
        {
          Console.WriteLine("Please enter a valid integer!");
```

```
        }

        if (answer == num1 * num2)
        {
            Console.WriteLine("That's the correct answer!");
            score++;
        }
        else
        {
            Console.WriteLine($"Wrong answer! The correct answer was {num1 * num2}");
        }

        Console.WriteLine($"Your score: {score}");

        Console.Write("\nDo you want another question? (y/n): ");
        choice = Console.ReadLine()?.ToLower();

    } while (choice == "y" || choice == "yes");

    Console.WriteLine($"\nFinal Score: {score}");
    Console.WriteLine("Thanks for playing!");
    Console.ReadLine();
  }
 }
}
```

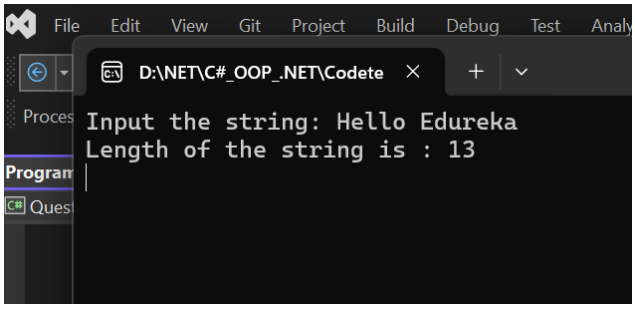


Question 9: Length of the string .

DESCRIPTION: Create a console application which takes a string as input and prints the length of that string.

```
using System;

namespace Question9
{
  class Program
  {
    static void Main(string[] args)
    {
```

```
        Console.Write("Input the string: ");
        string input = Console.ReadLine();

        int length = input.Length;

        Console.WriteLine($"Length of the string is : {length}");
        Console.ReadLine();
    }
  }
}
```



Question 10 : Matrix multiplication

DESCRIPTION: Create a console application which two integers as size of 1st matrix to store in 1 st array and another two integers as size of 2nd matrix to store in 2nd array also it takes each element of the matrices from user as input and prints the multiplication result of matrices.

```
using System;

namespace Question10
{
  class Program
  {
    static void Main(string[] args)
    {
      // Input first matrix size
      Console.Write("Enter the number of rows for the first matrix: ");
      int row1 = Convert.ToInt32(Console.ReadLine());
      Console.Write("Enter the number of columns for the first matrix: ");
      int col1 = Convert.ToInt32(Console.ReadLine());

      int[,] matrix1 = new int[row1, col1];

      // Input second matrix size
      Console.Write("Enter the number of rows for the second matrix: ");
      int row2 = Convert.ToInt32(Console.ReadLine());
      Console.Write("Enter the number of columns for the second matrix: ");
      int col2 = Convert.ToInt32(Console.ReadLine());

      int[,] matrix2 = new int[row2, col2];

      // Validate multiplication condition
      if (col1 != row2)
      {
        Console.WriteLine("Matrix multiplication is not possible. Columns of first matrix must equal rows of second matrix.");
        return;
      }
```

```
        // Input first matrix elements
        Console.WriteLine("Input elements in the first matrix:");
        for (int i = 0; i < row1; i++)
        {
            for (int j = 0; j < col1; j++)
            {
                Console.Write($"element - [{i}],[{j}] : ");
                matrix1[i, j] = Convert.ToInt32(Console.ReadLine());
            }
        }

        // Input second matrix elements
        Console.WriteLine("Input elements in the second matrix:");
        for (int i = 0; i < row2; i++)
        {
            for (int j = 0; j < col2; j++)
            {
                Console.Write($"element - [{i}],[{j}] : ");
                matrix2[i, j] = Convert.ToInt32(Console.ReadLine());
            }
        }

        // Multiply matrices
        int[,] result = new int[row1, col2];

        for (int i = 0; i < row1; i++)
        {
            for (int j = 0; j < col2; j++)
            {
                result[i, j] = 0;
                for (int k = 0; k < col1; k++)
                {
                    result[i, j] += matrix1[i, k] * matrix2[k, j];
                }
            }
        }

        // Print first matrix
        Console.WriteLine("\nThe First matrix is:");
        for (int i = 0; i < row1; i++)
        {
            for (int j = 0; j < col1; j++)
            {
                Console.Write(matrix1[i, j] + " ");
            }
            Console.WriteLine();
        }

        // Print second matrix
        Console.WriteLine("\nThe Second matrix is:");
        for (int i = 0; i < row2; i++)
        {
            for (int j = 0; j < col2; j++)
            {
                Console.Write(matrix2[i, j] + " ");
            }
            Console.WriteLine();
        }

        // Print result matrix
        Console.WriteLine("\nThe multiplication of two matrices is:");
        for (int i = 0; i < row1; i++)
        {
            for (int j = 0; j < col2; j++)
            {
                Console.Write(result[i, j] + " ");
```

```
        }
            Console.WriteLine();
        }

        Console.ReadLine();
    }
  }
}
```