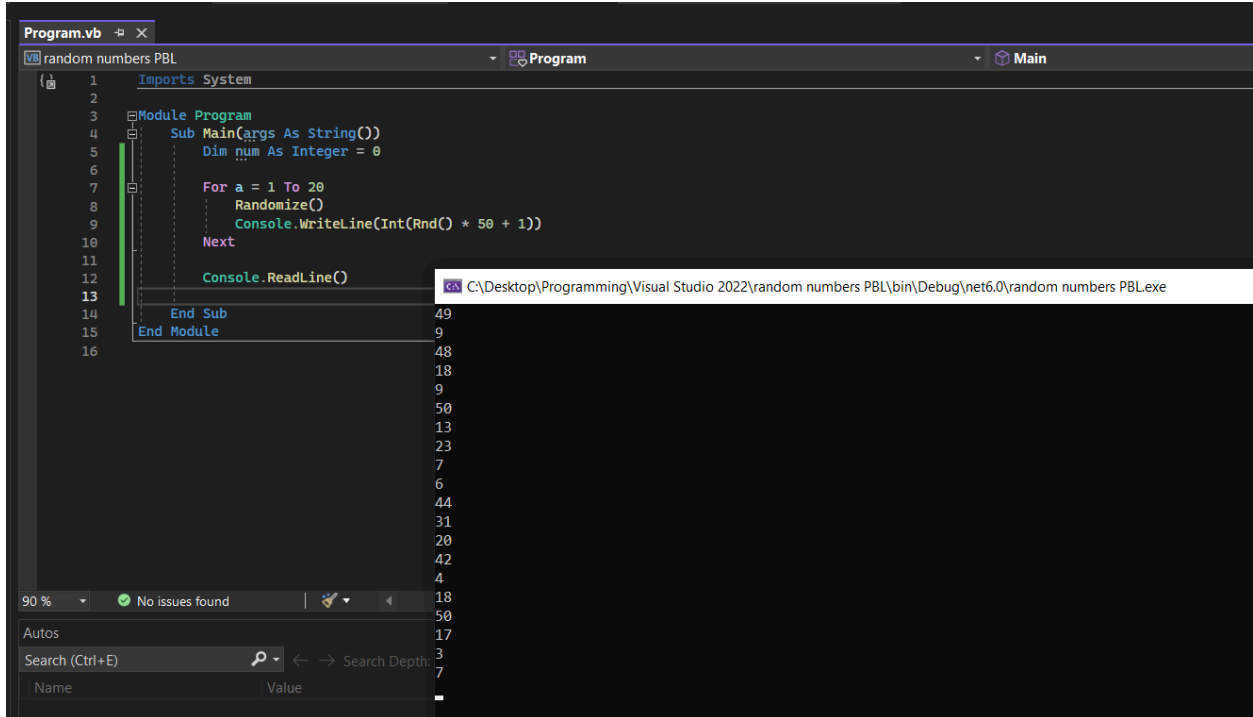


PBL 9 Topic : Random numbers

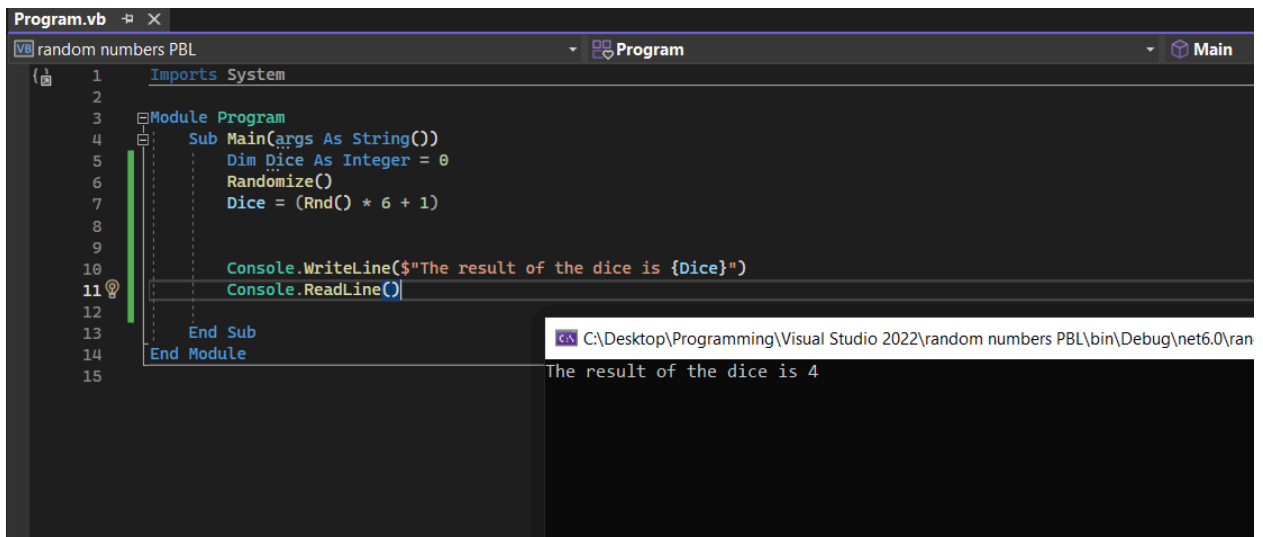
1. Write a program to generate 20 numbers between 1 to 50.



```
1 Imports System
2
3 Module Program
4     Sub Main(args As String())
5         Dim num As Integer = 0
6
7         For a = 1 To 20
8             Randomize()
9             Console.WriteLine(Int(Rnd() * 50 + 1))
10        Next
11
12        Console.ReadLine()
13    End Sub
14 End Module
```

The screenshot shows the Visual Studio 2022 IDE with a VB.NET project named 'random numbers PBL'. The code in 'Program.vb' generates 20 random numbers between 1 and 50. The output window shows the following sequence of numbers: 49, 9, 48, 18, 9, 50, 13, 23, 7, 6, 44, 31, 20, 42, 4, 18, 50, 17, 3, 7.

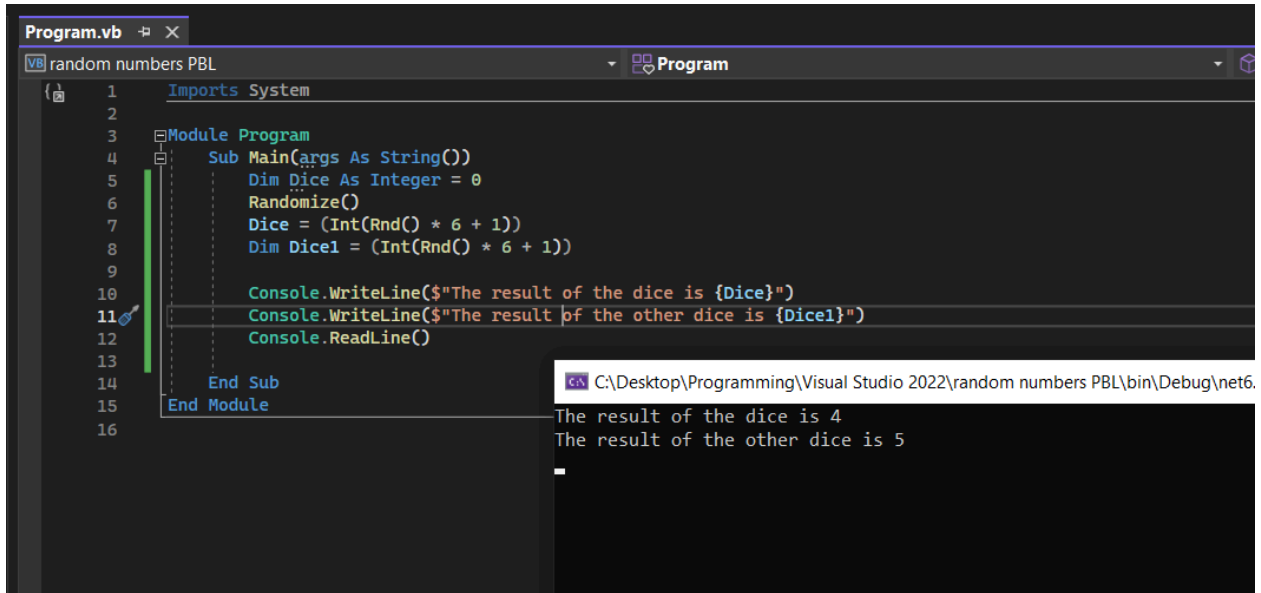
2. Write a program to show the output of a throw of a dice.



```
1 Imports System
2
3 Module Program
4     Sub Main(args As String())
5         Dim Dice As Integer = 0
6         Randomize()
7         Dice = (Rnd() * 6 + 1)
8
9
10        Console.WriteLine($"The result of the dice is {Dice}")
11        Console.ReadLine()
12    End Sub
13 End Module
```

The screenshot shows the Visual Studio 2022 IDE with a VB.NET project named 'random numbers PBL'. The code in 'Program.vb' simulates a dice throw. The output window shows the message: 'The result of the dice is 4'.

3. Write a program to show the output of a throw of 2 dice.



```
1 Imports System
2
3 Module Program
4     Sub Main(args As String())
5         Dim Dice As Integer = 0
6         Randomize()
7         Dice = (Int(Rnd() * 6 + 1))
8         Dim Dice1 = (Int(Rnd() * 6 + 1))
9
10        Console.WriteLine($"The result of the dice is {Dice}")
11        Console.WriteLine($"The result of the other dice is {Dice1}")
12        Console.ReadLine()
13
14    End Sub
15 End Module
```

C:\Desktop\Programming\Visual Studio 2022\random numbers PBL\bin\Debug\net6.

The result of the dice is 4
The result of the other dice is 5

4. Programming languages provide built-in functions to generate random numbers.
To be truly random, the frequency of each number generated should be the same.

Write a program to do the following.

The program should:

- generate 200 random numbers between 1 and 10 inclusive
- keep a count of the number of times each number is generated
- calculate the expected frequency of each number 1 to 10
- output the actual frequency of each number 1 to 10
- output the difference between the actual frequency and the expected frequency.

An example of the output is as follows :

The expected frequency is 20.

Number	Frequency	Difference
1	17	-3
2	21	1
3	12	-8
4	28	8
5	20	0
6	19	-1
7	21	1
8	16	-4
9	24	4
10	22	2

Program.vb

random numbers PBL

Program

Main

```
1 Imports System
2
3 Module Program
4     Sub Main(args As String())
5         Dim num1, num2, num3, num4, num5, num6, num7, num8, num9, num10 As Integer
6
7         For a = 1 To 200
8             Randomize()
9             Dim num As Integer
10            num = Int(Rnd() * 10 + 1)
11            If (num = 1) Then
12                num = num1 + 1
13            ElseIf (num = 2) Then
14                num2 = num2 + 1
15            ElseIf (num = 3) Then
16                num3 = num3 + 1
17            ElseIf (num = 4) Then
18                num4 = num4 + 1
19            ElseIf (num = 5) Then
20                num5 = num5 + 1
21            ElseIf (num = 6) Then
22                num6 = num6 + 1
23            ElseIf (num = 7) Then
24                num7 = num7 + 1
25            ElseIf (num = 8) Then
26                num8 = num8 + 1
27            ElseIf (num = 9) Then
28                num9 = num9 + 1
29            ElseIf (num = 10) Then
```

C:\Desktop\Programming\Visual Studio 2022\random numbers PBL\bin\Debug\net6.0\random numbers PBL.exe

The expected frequency is (200/10) 20.
Number: 1, frequency: 0, difference -20
Number: 2, frequency: 26, difference 6
Number: 3, frequency: 22, difference 2
Number: 4, frequency: 22, difference 2
Number: 5, frequency: 18, difference -2
Number: 6, frequency: 21, difference 1
Number: 7, frequency: 25, difference 5
Number: 8, frequency: 15, difference -5
Number: 9, frequency: 13, difference -7
Number: 10, frequency: 14, difference -6

90 % No issues found