

70-483 : Programming in C#



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Control Flow



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Conditional Statements



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In this section...

- If / else statements
- Switch / Case statements
- Conditional Operator : $a ? c : c$

Conditional Statements



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If / else

- ▶ `if (condition)`
 - ▶ `someStatement`
- ▶ `else if (anotherCondition)`
 - ▶ `anotherStatement`
- ▶ `else`
 - ▶ `yetAnotherStatement`



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If / else

```
if (condition)
{
    someStatements
}
else
{
    otherStatements
}
```



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Nested If Statements

```
if (condition)
{
    if (anotherCondition)
        ...
    else
        ...
}
```



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Switch / case

```
switch(role)
{
    case Role.Admin:
        ...
        break;
    case Role.Moderator:
        ...
        break;
    default:
        ...
        break;
}
```



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Demo IfElse and SwitchCase



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Program.cs

Conditionals.Program

Main(string[] args)

```
using System;
```

```
namespace Conditionals
```

```
{
```

```
    class Program
```

```
    {
```

```
        static void Main(string[] args)
```

```
        {
```

```
            int hour = 10;
```

```
            if (hour > 0 && hour < 12)
```

```
            {
```

```
                Console.WriteLine("It's morning.");
```

```
            }
```

```
            else if (hour >= 12 && hour < 18)
```

```
            {
```

```
                Console.WriteLine("It's afternoon.");
```

```
            }
```

```
            else
```

```
            {
```

```
                Console.WriteLine("It's evening.");
```

```
            }
```

```
        }
```

```
    }
```

```
}
```

C:\Windows\system32\cmd.exe

It's morning.

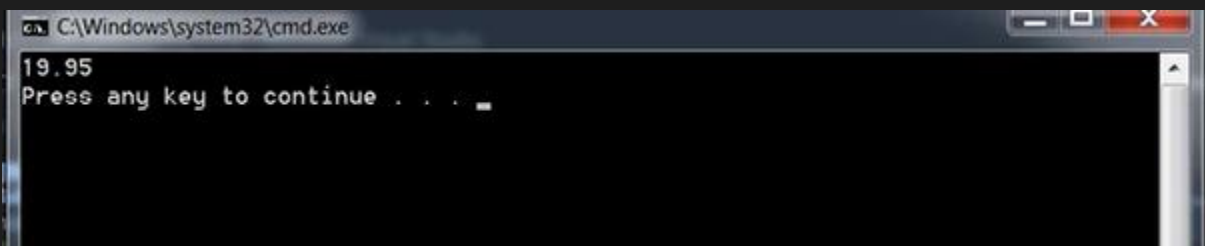
Press any key to continue . . .

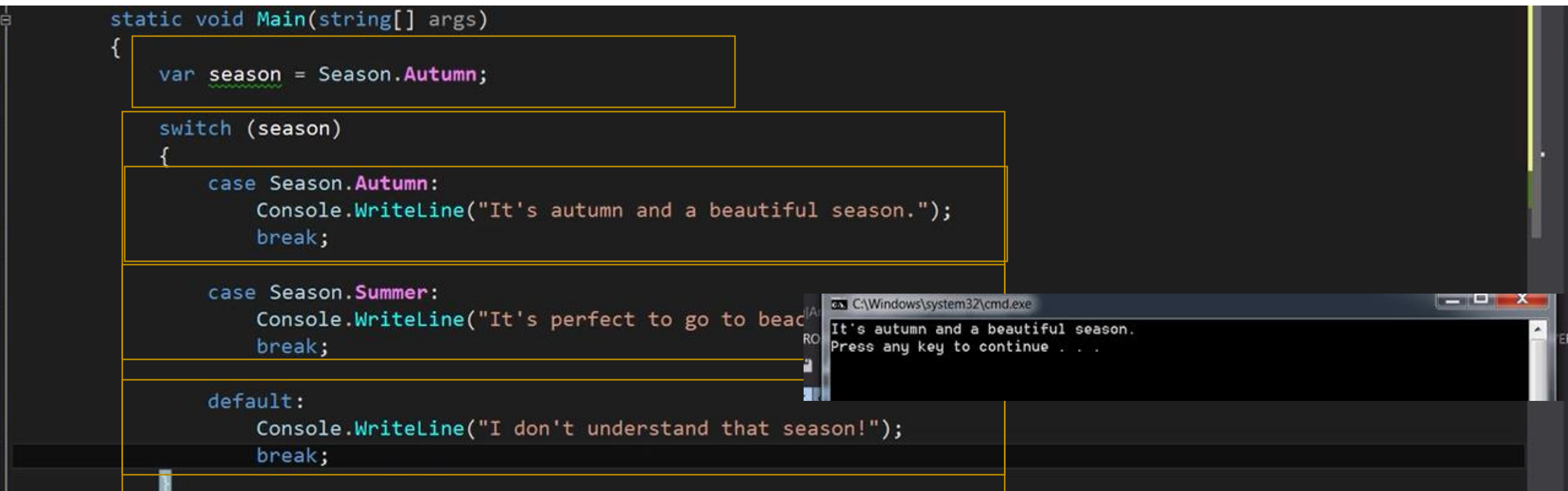
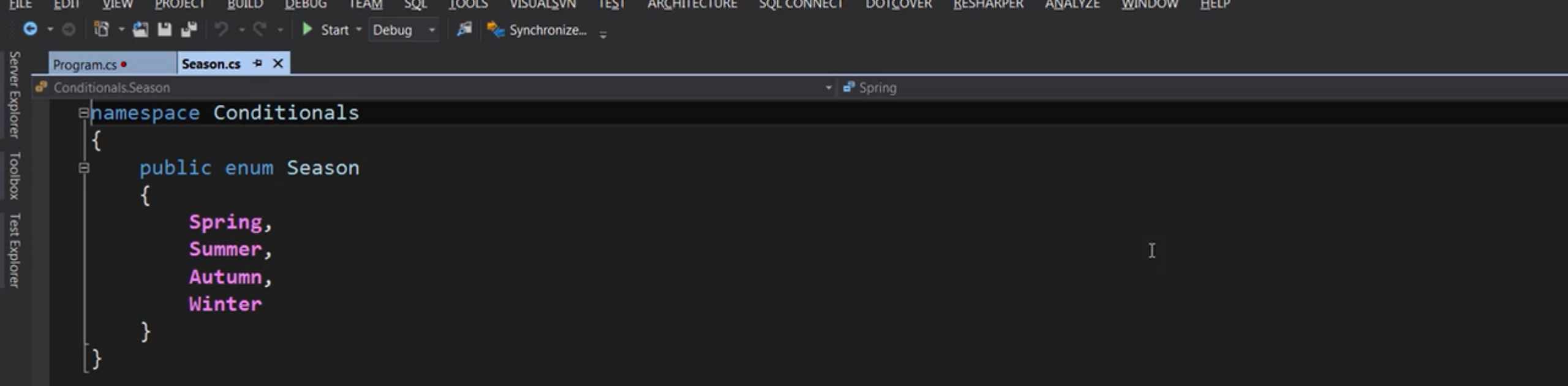
```

namespace Conditionals
{
    class Program
    {
        static void Main(string[] args)
        {
            bool isGoldCustomer = true;
            float price;
            if (isGoldCustomer)
                price = 19.95f;
            else
                price = 29.95f;

            float price = (isGoldCustomer) ? 19.95f : 29.95f;
        }
    }
}

```





Program.cs Season.cs

Conditionals.Program

Main(string[] args)

```
using System;

namespace Conditionals
{
    class Program
    {
        static void Main(string[] args)
        {
            var season = Season.Autumn;

            static void Main(string[] args)
            {
                var season = Season.Autumn;

                switch (season)
                {
                    case Season.Autumn:
                    case Season.Summer:
                        Console.WriteLine("We've got promotion");
                        break;

                    default:
                        Console.WriteLine("I don't understand that season!");
                        break;
                }
            }
        }
    }
}
```

Exercises



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Exercises 1, 2, 3

1- Write a program and ask the user to enter a number.

The number should be between 1 to 10. If the user enters a valid number, display "Valid" on the console. Otherwise, display "Invalid".

2- Write a program which takes two numbers from the console and displays the maximum of the two.

3- Write a program and ask the user to enter the width and height of an image. Then tell if the image is landscape or portrait.

Exercise 4

4- Your job is to write a program for a speed camera.

Write a program that asks the user to enter the speed limit.

Once set, the program asks for the speed of a car.

If the user enters a value less than the speed limit, program should display Ok on the console.

If the value is above the speed limit, the program should calculate the number of demerit points.

For every 5km/hr above the speed limit, 1 demerit points should be incurred and displayed on the console.

If the number of demerit points is above 12, the program should display License Suspended.

Iteration Statements



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In this lecture...

- For loops
- Foreach loops
- While loops
- Do-While loops




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For loops

```
for (var i = 0; i < 10; i++)  
{  
    ...  
}
```

Initialization Clause Condition Clause Iteration Clause



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Foreach Loops

```
foreach (var number in numbers)  
{  
    ...  
}
```



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While loops

```
while (i < 10)  
{  
    ...  
    i++;  
}
```



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Do-While Loops

```
do  
{  
    ...  
    i++,  
} while (i < 10);
```



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Break and Continue

- `Break`: jumps out of the loop
- `continue`: jumps to the next iteration



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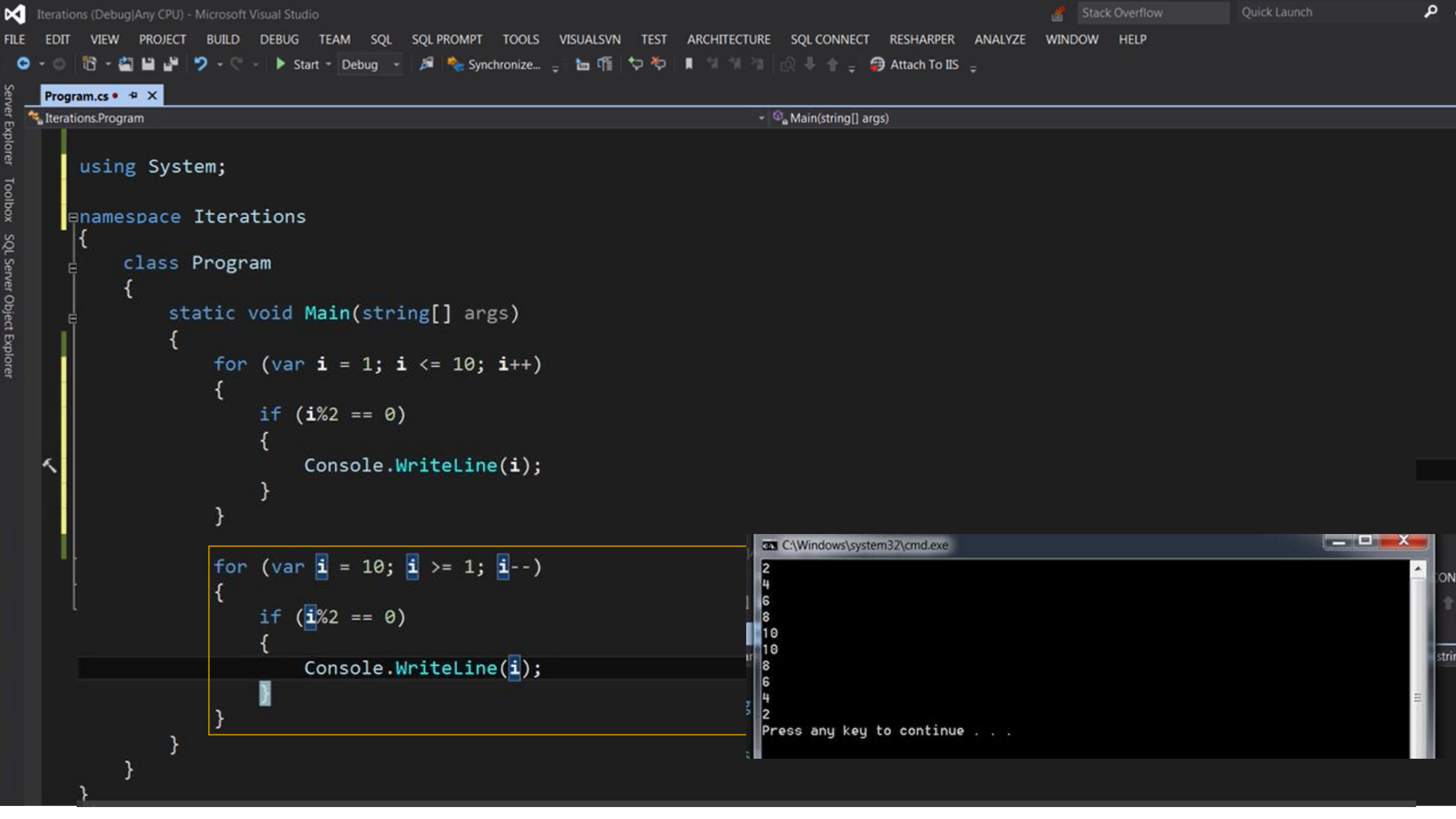
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Demo For Loops



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Program.cs

Iterations.Program

Main(string[] args)

```
using System;
```

```
namespace Iterations
```

```
{  
    class Program
```

```
{  
    static void Main(string[] args)
```

```
{  
    for (var i = 1; i <= 10; i++)
```

```
{  
        if (i%2 == 0)
```

```
{  
            Console.WriteLine(i);
```

```
}  
    }  
    for (var i = 10; i >= 1; i--)
```

```
{  
        if (i%2 == 0)
```

```
{  
            Console.WriteLine(i);
```

C:\Windows\system32\cmd.exe

2
4
6
8
10
10
8
6
4
2

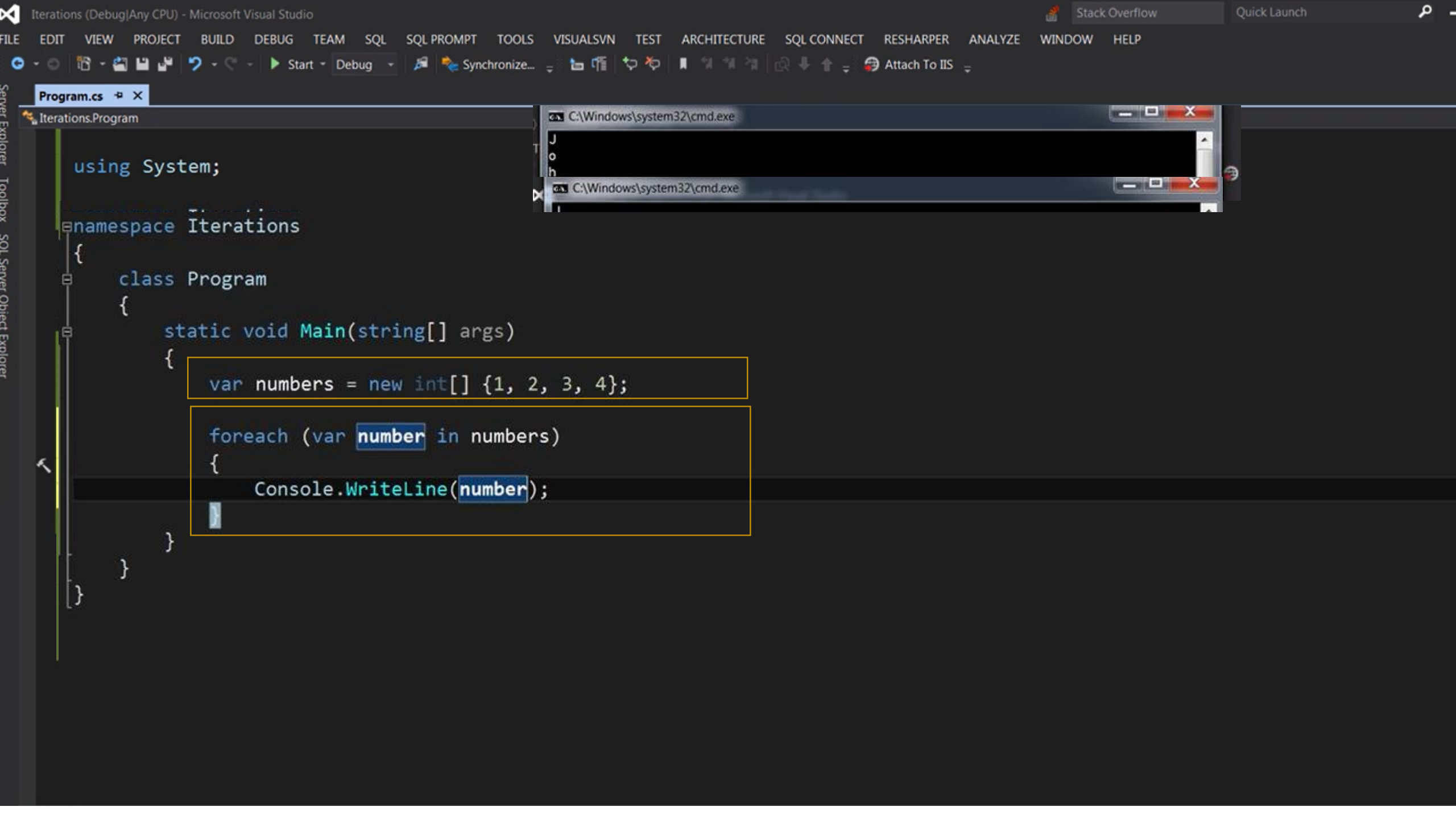
Press any key to continue . . .

Demo Foreach Loops



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Demo While Loops



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Program.cs

Iterations.Program

Main(string[] args)

```
using System;
```

```
namespace Iterations
```

```
{
```

```
    class Program
```

```
    {
```

```
        static void Main(string[] args)
```

```
        {
```

```
            //for (var i = 1; i <= 10; i++)
            //{
            //    if (i% 2 == 0)
            //        Console.WriteLine(i);
            //}
```

```
            var i = 0;
            while (i <= 10)
            {
                if (i % 2 == 0)
                    Console.WriteLine(i);

                i++;
            }
```

```
        }
```

```
    }
```

```
}
```

Program.cs

Iterations.Program

Main(string[] args)

```
using System;
```

```
namespace Iterations
```

```
{
```

```
    class Program
```

```
    {
```

```
        static void Main(string[] args)
```

```
        {
```

```
            while (true)
```

```
            {
```

```
                Console.Write("Type your name: ");
```

```
                var input = Console.ReadLine();
```

```
                if (String.IsNullOrEmpty(input))  
                    break;
```

```
                Console.WriteLine("@Echo: " + input);
```

```
            }
```

```
        }
```

```
    }
```

C:\Windows\system32\cmd.exe

Type your name: Mosh

@Echo: Mosh

Type your name: John

@Echo: John

Type your name:

Press any key to continue . . .

Program.cs

Iterations.Program

Main(string[] args)

```
using System;
```

```
namespace Iterations
```

```
{
```

```
    class Program
```

```
    {
```

```
        static void Main(string[] args)
```

```
        {
```

```
            while (true)
```

```
            {
```

```
                Console.WriteLine("Type your name: ");
```

```
                var input = Console.ReadLine();
```

```
                if (!String.IsNullOrWhiteSpace(input))
```

```
                {
```

```
                    Console.WriteLine("@Echo: " + input);
```

```
                    continue;
```

```
                }
```

```
            break;
```

```
        }
```

```
    }
```

```
}
```

```
}
```



Random Class



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Program.cs

CSharpFundamentals.Program

Main(string[] args)

```
using System;
```

```
namespace CSharpFundamentals
```

```
{
```

```
    class Program
```

```
    {
```

```
        static void Main(string[] args)
```

```
        {
```

```
            var random = new Random();
```

```
            for (var i = 0; i < 10; i++)
```

```
                Console.Write((char)('a' + random.Next(0, 26)));
```

```
            Console.WriteLine();
```

```
        }
```

```
    }
```

```
}
```

Solution Explorer - CSharpFundamentals

Search Solution Explorer - CSharpFundamentals

Solution 'CSharpFundamentals' (1 project)

CSharpFundamentals

Properties

References

App.config

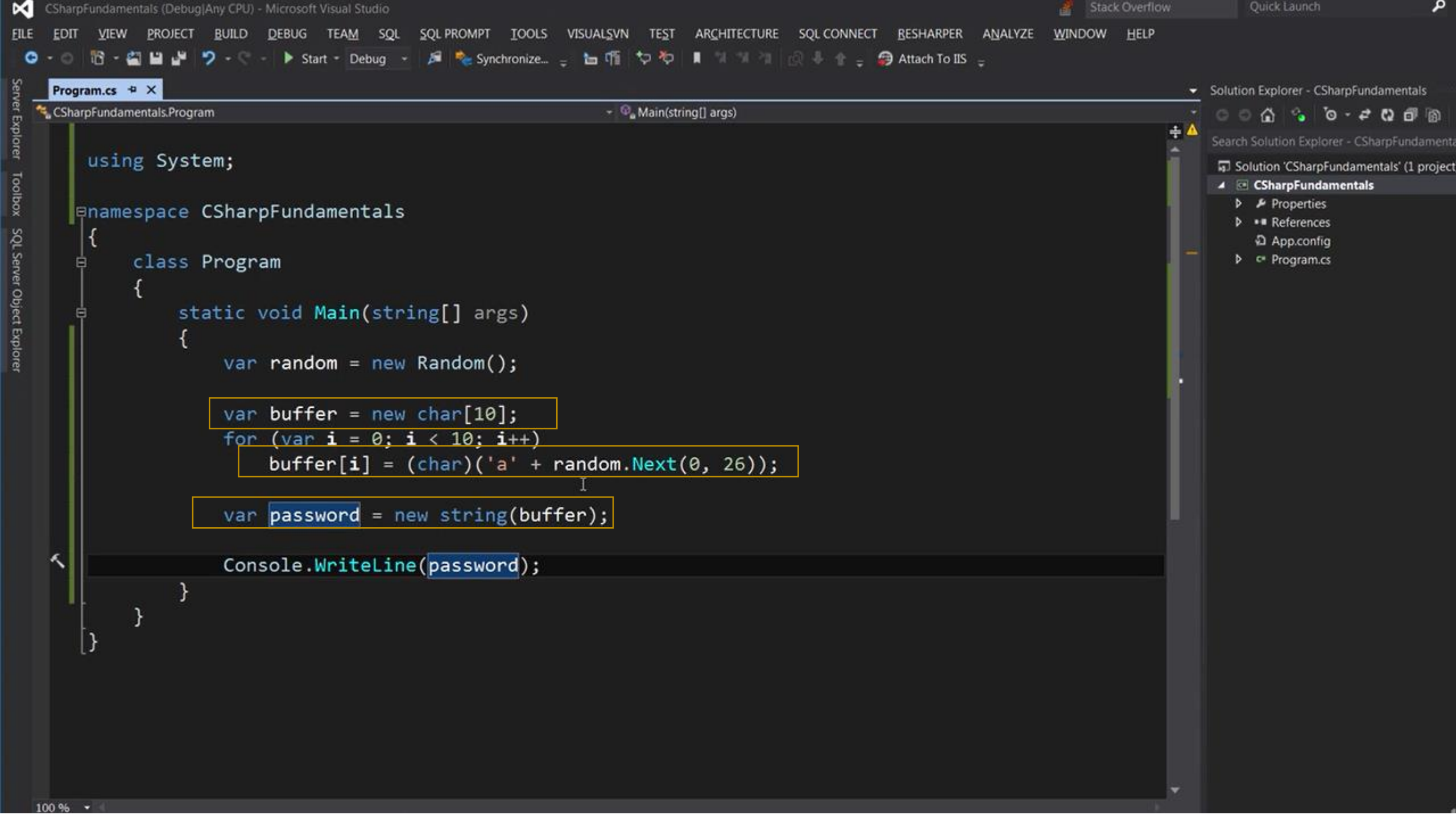
Program.cs

One More Improvement



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Exercises



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Exercises – 1, 2, 3

1- Write a program to count how many numbers between 1 and 100 are divisible by 3 with no remainder. Display the count on the console.

2- Write a program and continuously ask the user to enter a number or "ok" to exit. Calculate the sum of all the previously entered numbers and display it on the console.

3- Write a program and ask the user to enter a number. Compute the factorial of the number and print it on the console.

For example, if the user enters 5, the program should calculate $5 \times 4 \times 3 \times 2 \times 1$ and display it as $5! = 120$.



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Exercises – 4, 5

4- Write a program that picks a random number between 1 and 10. Give the user 4 chances to guess the number.

If the user guesses the number, display "**You won**"; otherwise, display "**You lost**".

(To make sure the program is behaving correctly, you can display the secret number on the console first.)

5- Write a program and ask the user to enter a series of numbers separated by comma. Find the maximum of the numbers and display it on the console.

For example, if the user enters "5, 3, 8, 1, 4", the program should display 8.



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