Exercise: Find Output

```
class Program
{
static void Main()
{
string sampleText = "hello world, welcome to C# programming world";

Console.WriteLine("IndexOf examples:");
Console.WriteLine("IndexOf('w') -> " + sampleText.IndexOf('w'));
Console.WriteLine("IndexOf('o', 5) -> " + sampleText.IndexOf('o', 5));
Console.WriteLine("IndexOf(\"world\") -> " + sampleText.IndexOf("world"));
Console.WriteLine("IndexOf(\"world\", 10) -> " + sampleText.IndexOf("world", 10));

Console.WriteLine("\nLastIndexOf examples:");
Console.WriteLine("LastIndexOf('w') -> " + sampleText.LastIndexOf('w'));
Console.WriteLine("LastIndexOf('o', 20) -> " + sampleText.LastIndexOf('o', 20));
Console.WriteLine("LastIndexOf(\"world\") -> " + sampleText.LastIndexOf("world"));
Console.WriteLine("LastIndexOf(\"world\", 30) -> " + sampleText.LastIndexOf("world", 30));
}
}
```

Answer:

```
IndexOf examples:
IndexOf('w') -> 6
IndexOf('o', 5) -> 7
IndexOf("world") -> 6
IndexOf("world", 10) -> 39

LastIndexOf examples:
LastIndexOf('w') -> 39
LastIndexOf('o', 20) -> 17
LastIndexOf("world") -> 39
LastIndexOf("world", 30) -> 6
```


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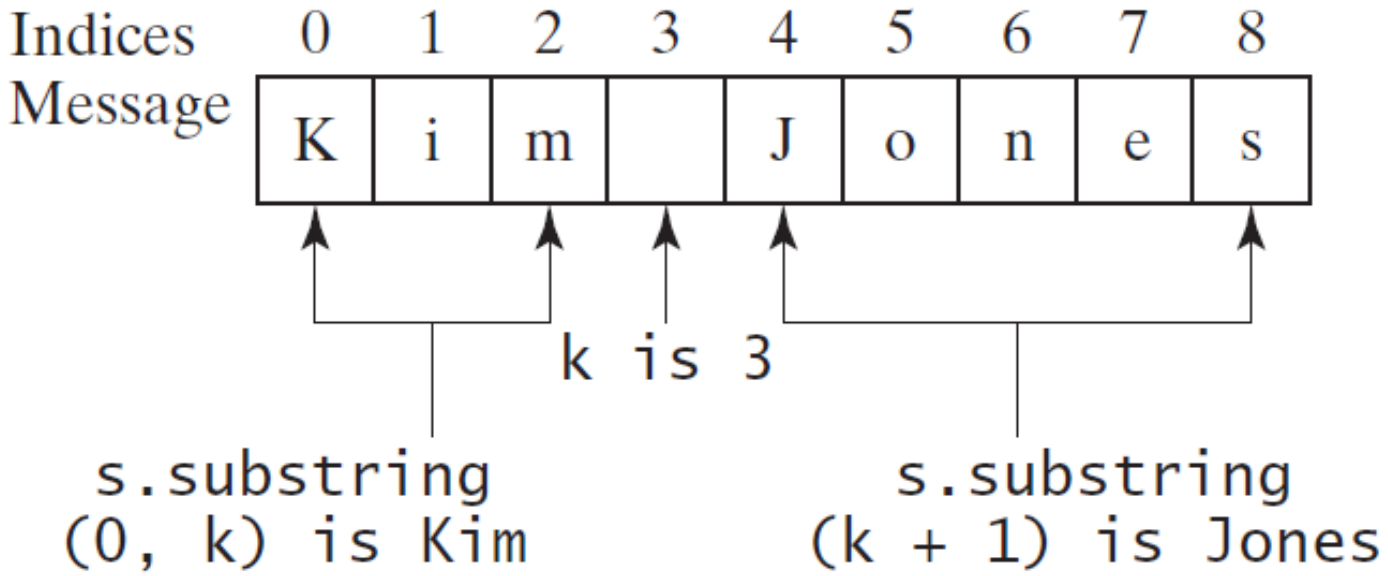
Finding a Character or a Substring in a String

```
int k = s.indexOf(' ');
String firstName = s.substring(0, k);
String lastName = s.substring(k + 1);
```

What is special about substring method???



Answer: This substring method is an overloaded method and it either takes as input the beginIndex or the beginIndex and number of characters to extract.

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Conversion between Strings and Numbers

Where do you need these conversions????? Any idea????

- We can convert a numeric string into a number using

```
int intValue = int.Parse(intString);
double doubleValue = double.Parse(doubleString);
```

- We can also convert numbers back to string using the string concatenation operator

```
String s = number + "";
```

- **Note** that if the string is not a numeric string, the conversion would cause a runtime error.

Answer: We need these methods while reading/writing from/to a text file.

Mini Exercise

- Show two ways to concatenate the following two strings together to get the string "Hi, mom.":

```
String hi = "Hi, ";
String mom = "mom.";
```

- How long is the string returned by the following expression? What is the string?

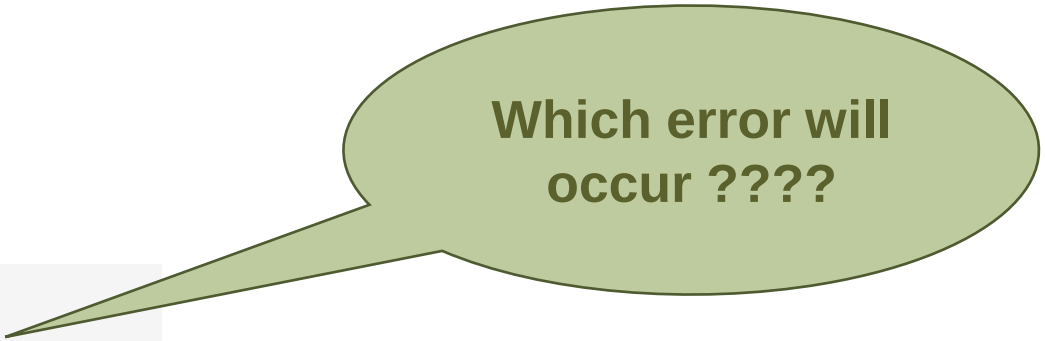
```
"Was it a car or a cat I saw?".Substring(9, 3)
```

Answer:

- string.Concat(hi,mom) or hi + mom.
- It's 3 characters in length: car. It does not include the space after car.
- 1020
- 30

```
string x = "10";
int y = 20;
string z = x + y;
int p = y + int.Parse(x);
System.Console.WriteLine(z);
System.Console.WriteLine(p);
```

Error Example




```
public static void Main(string[] args)
{
    int result = CalculateFactorial(5);
    Console.WriteLine($"Factorial: {result}");
}

static int CalculateFactorial(int n)
{
    return n * CalculateFactorial(n - 1);
}
```

Answer:

(Unhandled) **StackOverflowException:** This exception occurs when a program exceeds the allowed memory space on the call stack. This usually happens due to excessive recursion, as in this example. Each recursive call to CalculateFactorial adds a new frame to the call stack, and without a base case to stop the recursion, the stack eventually overflows.

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Mini Exercise 1

Question: Is there anything wrong with this exception handler as written? Will this code compile?

```
try {

} catch (Exception e) {

} catch (ArithmeticException a) {

}
```

Answer:

This first handler catches exceptions of type Exception; therefore, it catches any exception, including ArithmeticException. The second handler could never be reached. This code will not compile.

When handling exceptions in C#, always place the more specific catch blocks before the more general ones to avoid unreachable code errors.

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Mini Exercise 2

Question: What exception types can be caught by the following handler?

```
catch (Exception e) {

}
```

What is wrong with using this type of exception handler?

Answer: While this handler can catch any exception, it's generally not recommended to use it as the only exception handler in your code, because

Lack of specificity: It doesn't differentiate between different types of exceptions, so you can't handle specific exceptions in a targeted way.

Hides potential issues: It might catch exceptions that you didn't anticipate, potentially masking underlying problems in your code.

Mini Exercise 3: Write Output


```
public class Test: Exception { }

public class Example
{
    public static void Main(string args)
    {
        try
        {
            throw new Test();
        }
        catch (Test t)
        {
            Console.WriteLine("Got the Test Exception");
        }
        finally
        {
            Console.WriteLine("Inside finally block");
        }
    }
}
```

What is special about Test class?

Answer:

This a a custom exception
Got the Test Exception
Inside finally block

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Mini Exercise 4a: Identify Exception

```
public class ExceptionDemo {
    public static void Main(string[] args) {
        try {
            int[] a = new int[10];
            a[11] = 9;
        }
        catch (                                    ) {
            Console.WriteLine("                    ");
        }
    }
}
```

Answer:
IndexOutOfRangeException

https://beginnersbook.com/2013/04/exception-handling-examples/

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Mini Exercise 4b: Identify Exception

```
public class ExceptionDemo {
    public static void Main(string[] args) {
        try
        {
            int num = int.Parse("XYZ");
            Console.WriteLine(num);
        }
        catch (                    e) {
            Console.WriteLine(                                  );
        }
    }
}
```

Answer:
FormatException

https://beginnersbook.com/2013/04/exception-handling-examples/

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Mini Exercise 4c: Identify Exception

```
public class ExceptionDemo {
    public static void Main(string[] args) {
        try
        {
            string str = "beginnersbook";
            Console.WriteLine(str.Length);
            char c = str[0];
            c = str[40];
            Console.WriteLine(c);
        }
        catch (
            Console.WriteLine("
        }
    }
}
```

Answer:
IndexOutOfRangeException

https://beginnersbook.com/2013/04/exception-handling-examples/

Mini Exercise 4d: Identify Exception

```
public class ExceptionDemo {
    public static void Main(string[] args) {
        try
        {
            string str = null;
            Console.WriteLine(str.Length);
        }
        catch (                                    ) {
            Console.WriteLine(                                    );
        }
    }
}
```

Answer:
NullReferenceException

https://beginnersbook.com/2013/04/exception-handling-examples/

Mini Exercise 4e: Find Output


```
try
{
    string input = null;
    int result = int.Parse(input); // Null value parsing
}
catch (ArgumentNullException ex)
{
    Console.WriteLine("Null argument exception caught.");
}
catch (FormatException ex)
{
    Console.WriteLine("Format exception caught.");
}
catch (Exception ex)
{
    Console.WriteLine($"General exception caught: {ex.Message}");
}
```

Answer:

- When input=null, ArgumentNullException is thrown when a method receives a null argument where it's not allowed.
- When input= “”, int.Parse() expects a valid numeric string, and since “” is not a valid format for a number, it throws a FormatException.
- So, the **FormatException** is caught by the second catch block, and the message "Format exception caught." is displayed.