Strings

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I. Introduction

Strings in C# are objects that represent sequences of characters. They are immutable, meaning once created, their contents cannot be changed. C# provides a rich set of methods and properties for working with strings efficiently.

I.1. Declaration and Initialization

I.2. Creating Strings

You can create strings in several ways:

```
// Using string literals
string greeting = "Hello, World!";

// Using string concatenation
string fullName = "John" + " " + "Doe";

// Using string interpolation (C# 6.0+)
string message = $"Welcome, {fullName}!";

== Accessing Elements
Access array elements using their index:
```

I.3. String Properties and Methods

C# strings come with useful properties and methods:

```
string text = "Example Text";

int length = text.Length; // Returns 12

string upper = text.ToUpper(); // Returns "EXAMPLE TEXT"
string lower = text.ToLower(); // Returns "example text"

bool contains = text.Contains("amp"); // Returns true
string trimmed = "  Hello  ".Trim(); // Returns "Hello"

int index = trimmed.IndexOf('e'); // Returns 1
```

Strings are kind of special. They hold an array of chars internally. You can access characters by its 0-based index:

```
var str = "hello";
int index = str[0]; // Returns 'h'
```

I.4. String Manipulation

You can manipulate strings using various methods:

```
string original = "Hello, World!";

string substring = original.Substring(0, 5); // Returns "Hello"
string replaced = original.Replace("World", "C#"); // Returns "Hello, C#!"
string[] split = original.Split(','); // Returns ["Hello", " World!"]
```

Remember that string operations that appear to modify a string actually create a new string object.

II. Exercises

The amount of 🌶 determines how hard the excercises are.

1. Create a program that takes a sentence as input and counts the number of words in it. Assume words are separated by spaces. Print the total word count. 🌶
2. Create a program that takes an input and prints the string character by character in reversed order in new lines. 🌶🌶
3. Caesar chiffre: Write a program that can print a string as caesar encrypted value. The user enters a number as encryption key and the program displays every character shifted by that key in the alphabet. You can ignore the casing. 🌶🌶🌶

   Samples:

   ```
   Input: Hello
   Key: 7
   Output: olssv

   Input: The zoo is big
   Key: 3
   Output: Wkh crr lv elj
   ```

4. Do the same as in 3. but decode the chiffre. 🌶🌶🌶