Java String Class - Overview

Introduction

In Java, the String class is a built-in class that represents a sequence of characters.

It belongs to the 'java.lang' package, so we don't need to import it explicitly.

Example:

```
String greeting = "Hello, World!";
```

Key Features of the String Class

- Immutable: Once created, a string's content cannot be changed.

- Stored in String pool: Reuses common strings to save memory.

- Final class: Cannot be extended (public final class String).

- Implements: Serializable, Comparable<String>, CharSequence.

Example:

```
String str = "Hello";

str.toUpperCase(); // str remains 'Hello'
```

Creating Strings

1. Using string literal:

```
String s1 = "Hello";
```

2. Using new keyword:

```
String s2 = new String("Hello");
```

Example:

```
String name1 = "John";
```

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```
String name2 = new String("John");
```

Common String Methods

Examples:

```
String s = "Hello";

s.length() -> 5

s.charAt(0) -> 'H'

s.substring(0, 4) -> "Hell"

s.equals("Hello") -> true

s.equalsIgnoreCase("hello") -> true

s.compareTo("World") -> negative value (because H < W)

s.contains("ell") -> true

s.toUpperCase() -> "HELLO"

s.toLowerCase() -> "hello"

" hello ".trim() -> "hello"

s.replace('H', 'J') -> "Jello"

"a,b,c".split(",") -> ["a", "b", "c"]

s.indexOf('e') -> 1

"".isEmpty() -> true
```

Immutability Example

```
String s = "Hello";

s.concat(" World");

System.out.println(s); // Output: Hello
```

To reflect the change:

```
s = s.concat(" World");

System.out.println(s); // Output: Hello World
```

String Comparison

```
String a = "Java";

String b = new String("Java");

System.out.println(a == b);      // false (different memory)

System.out.println(a.equals(b)); // true (same content)
```

String Pool Concept

```
String s1 = "Java";

String s2 = "Java";

System.out.println(s1 == s2); // true (same object from pool)
```

Using the 'new' keyword always creates a new object:

```
String s3 = new String("Java");

System.out.println(s1 == s3); // false
```

String Class Declaration (Simplified)

```
public final class String implements java.io.Serializable,

                    Comparable<String>,

                    CharSequence {
```

```
    // many methods and fields

}
```