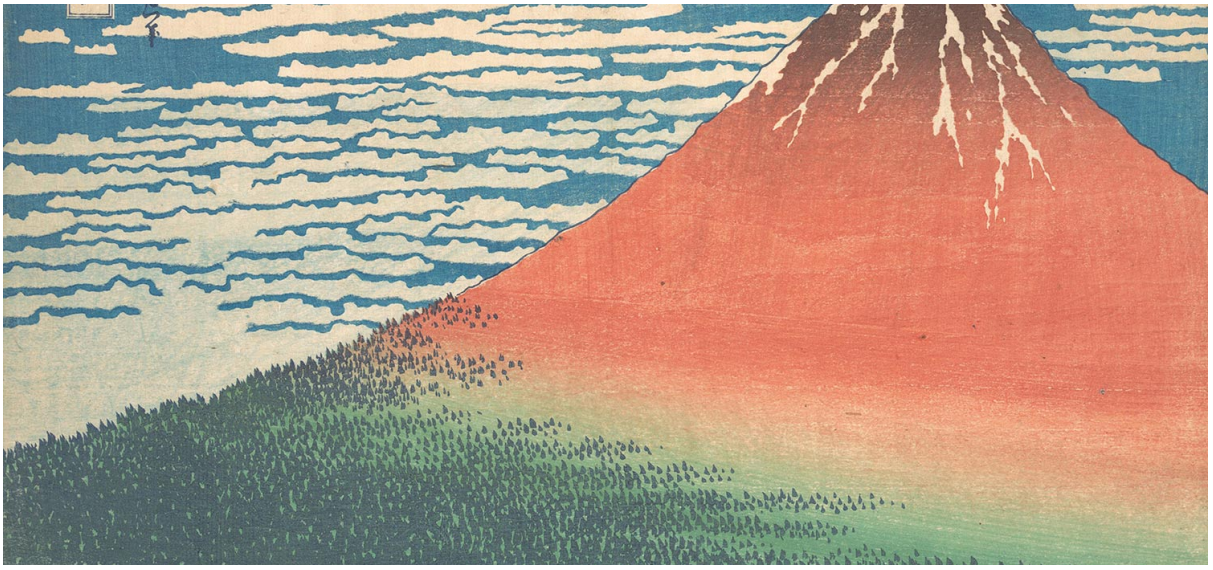
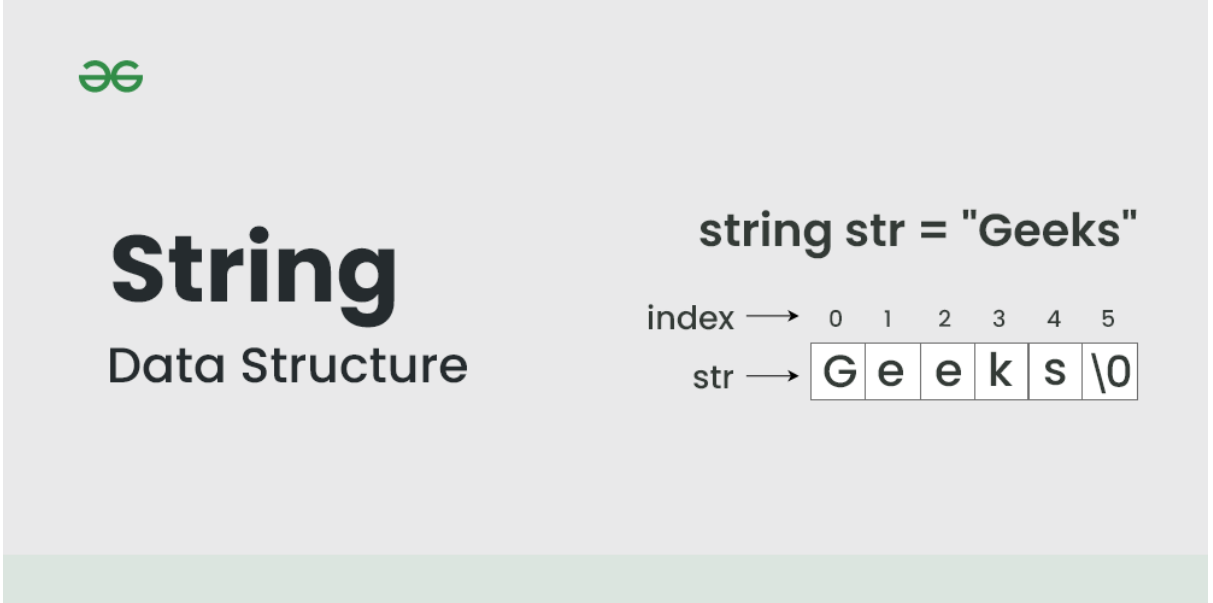


String

💡 Strings are considered a **data type** in general and are typically represented as arrays of bytes (or words) that store a sequence of characters. Strings are defined as an **array of characters**. The difference between a character array and a string is the string is terminated with a special character **'\0' .**



What Are Strings in JAVA?

Strings are the type of objects that can store the character of values and in Java, every character is stored in 16 bits i,e using UTF 16-bit encoding. A string acts the same as an array of characters in Java.


```
// Declare String without using new operator
String s = "GeeksforGeeks";

// Prints the String.
System.out.println("String s = " + s);

// Declare String using new operator
String s1 = new String("GeeksforGeeks");

// Prints the String.
System.out.println("String s1 = " + s1);
```

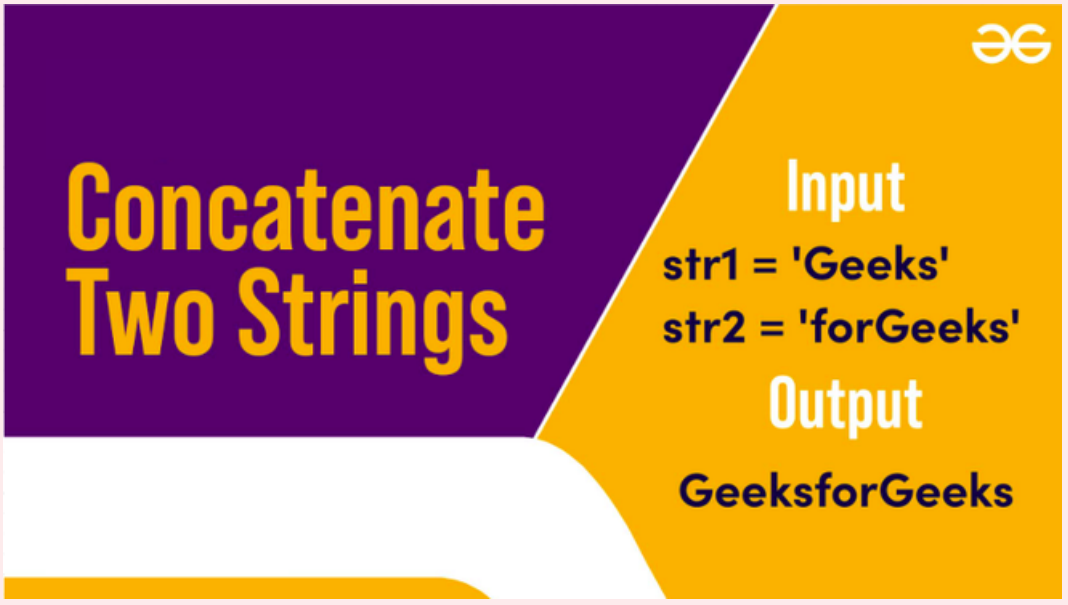
String Declaration In JAVA

```
        // Declare String without using new operator
        String s = "GeeksforGeeks";

        // Prints the String.
        System.out.println("String s = " + s);

        // Declare String using new operator
        String s1 = new String("GeeksforGeeks");

        // Prints the String.
        System.out.println("String s1 = " + s1);
```

General Operations Performed On String

📌 **Concatenation :** The process of combining more than one string together is known as Concatenation. String Concatenation is the technique of combining two strings.

```
// Custom input string 1
String s = "Geeks ";

// Custom input string 2 is passed as in arguments
// Here we are adding it to end of same string
s = s.concat("for Geeks");
```



📌 **Find in String :** A very basic operation performed on Strings is to find a given character in a string, or to find a complete string in another string.

```
String Str = new String("Welcome to geeksforgeeks");

// public String substring(int startIndex, int endIndex);
Str.substring(10, 16);
//Output : geeks

//public String substring(int begIndex);
Str.substring(10);
//Output : geeksforgeeks
```

📌 **Replacement in String :** Replacing a character, word or phrase in a String is another very common operation performed on strings.

```
String Str = new String("Welcome to geeksforgeeks");

// public String substring(int startIndex, int endIndex);
Str.substring(10, 16);
//Output : geeks

//public String substring(int begIndex);
Str.substring(10);
//Output : geeksforgeeks
```

📌 **Length of String :** Length is defined as the number of characters in a string is called the length of that string.

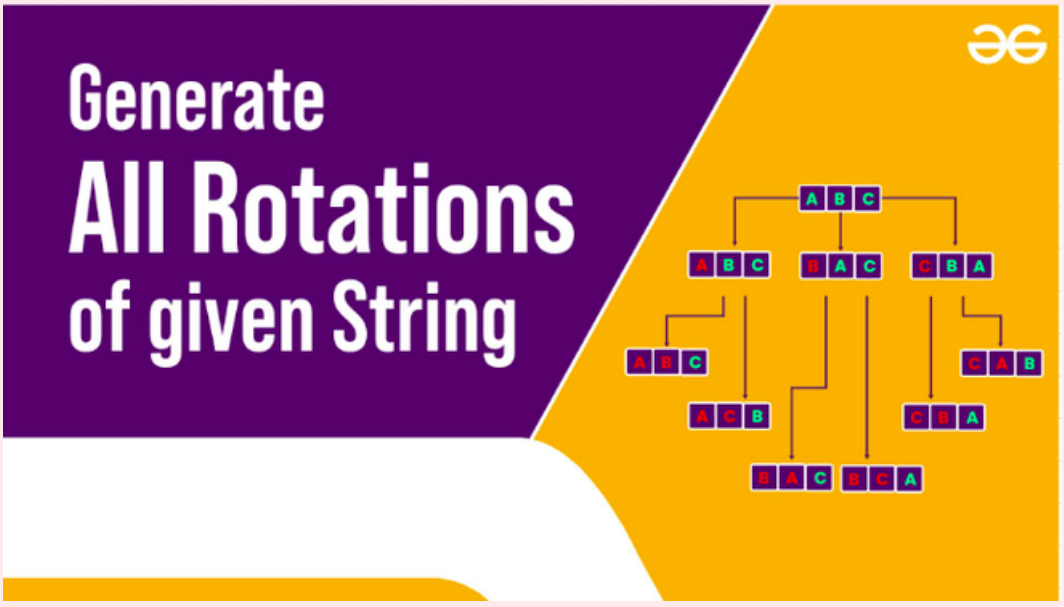
```
String str = "GeeksforGeeks";

// public int length()
str.length()
//Output : 13
```

📌 **Trim a String :** Spaces or special characters are very common in Strings, sometimes they should be removed.

```
String str = "G ee ksf or Ge ek s ";
//Custom Method -> removeSpaces(); by using " "
if (str[i] != ' ')

//By Using Replace Method
s = s.replace(" ", "");
str.replaceAll("\\s","");
```

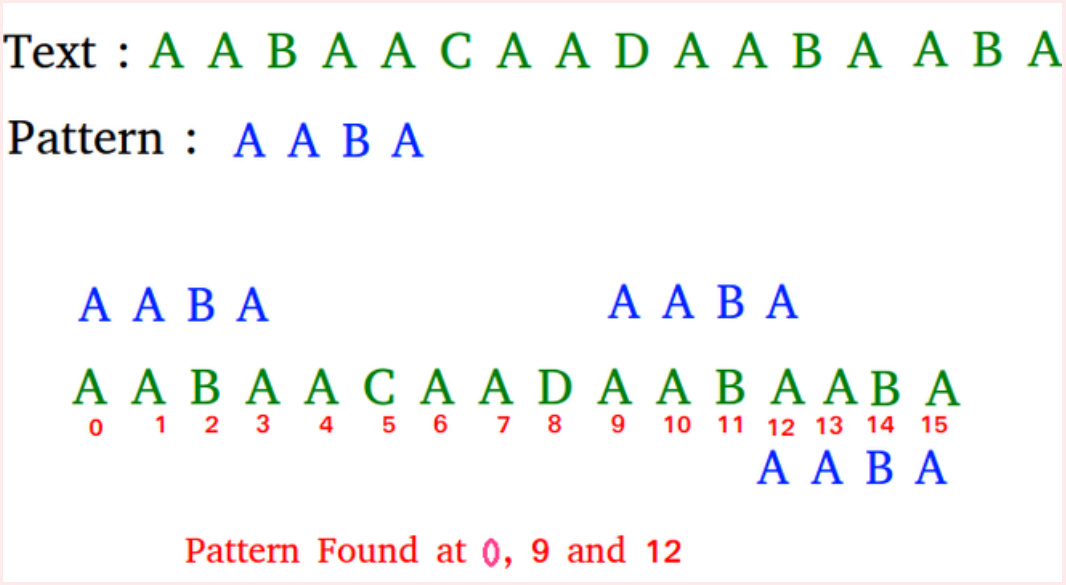
📌 **Reverse or Rotate a String :** Reverse operation is interchanging the position of characters of a string such that the first becomes the last, the second becomes the second last, and so on.

```
String str = "Geeks";
//Rotation -> By using For inside For
for (int i = 0; i < len; i++)
  for (int j = 0; j < len;j++)

//Reversing -> By Using For loop
for (int i = 0; i < len; i++)
```



📌 **Palindrome String :** A string is said to be a palindrome if the reverse of the string is the same as the string. → “abba” is a palindrome, but “abbc” is not a palindrome.

📌 **Pattern Searching :** Pattern searching is searching a given pattern in the string. The Pattern Searching algorithms are sometimes also referred to as String Searching Algorithms and are considered as a part of the String algorithms. These algorithms are useful in the case of searching a string within another string.



Advantages

Text Processing: Strings can be used to manipulate and process text in various ways, such as searching, replacing, parsing, and formatting.

Data Representation: Strings can be used to represent other data types, such as numbers, dates, and times.

Disadvantages

Memory Consumption: Strings can consume a lot of memory, this can be a problem in memory-constrained environments, such as embedded systems or mobile devices.

Immutability: In many programming languages, strings are immutable, meaning that they cannot be changed once they are created.

Ease of Use: Strings are easy to use and manipulate. They can be concatenated, sliced, and reversed, among other things.

Compatibility: Strings are widely used across programming languages, making them a universal data type.

Memory Efficiency: Strings are usually stored in a contiguous block of memory, which makes them efficient to allocate and deallocate.

Performance Overhead: String operations can be slower than operations on other data types, t is because string operations often involve copying and reallocating memory, which can be time-consuming.

Encoding and Decoding Overhead: Strings can have different character encodings, which can lead to overhead when converting between them. This can be a problem when working with data from different sources or when communicating with systems that use different encodings.

Security Vulnerabilities: Strings can be vulnerable to security vulnerabilities, such as buffer overflows or injection attacks, if not handled properly. This is because strings can be manipulated by attackers to execute arbitrary code or access sensitive data.

Applications Of String

- Plagiarism Checker
- Encoding/Decoding(Cipher Text Generation)
- Information Retrieval
- Improved Filters For The Approximate Suffix-Prefix Overlap Problems
- Network communication
- File handling
- Data analysis

Real-Time Applications Of String

- Spam Detection
- Bioinformatics

- Intrusion Detection System
- Search Engines

📚 References

GeeksforGeeks | A computer science portal for geeks

A Computer Science portal for geeks. It contains well written, well thought and well explained computer science and programming articles, quizzes and practice/competitive

https://www.geeksforgeeks.org/

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SerhatKumas - Overview

Computer engineering student who loves coding in different fields instead of focusing on a one spesific area. - SerhatKumas

https://github.com/SerhatKumas