**Theory: Increment and decrement**

 10 minutes0 / 4 problems solved

Skip this topicStart practicing

In this topic, we will discuss one of the most famous operations in programming: **increment**. It is used in many programming languages including Java to increase a variable by one. Fun fact: this operation is used in the name of C++, and signifies the evolutionary nature of the changes from C.

**Using ++ and -- in Java**

Java has two opposite operations called increment (++) and decrement (--) to increase/decrease the value of a variable by one.

int n = 10;  
n++; // 11  
n--; // 10

The code above is actually the same as below.

int n = 10;  
n += 1; // 11  
n -= 1; // 10

## Prefix and postfix forms

Both **increment** and **decrement**operators have two forms which are very important when using the result in the current statement:

* **prefix** (++n or --n) increases/decreases the value of a variable before it is used;
* **postfix**(n++ or n--) increases/decreases the value of a variable after it is used.

The following examples demonstrate both forms of increment.

**Prefix increment:**

int a = 4;  
int b = ++a;  
  
System.out.println(a); // 5  
System.out.println(b); // 5

In this case, the value of a has been incremented and then assigned to b. So, b is 5.

**Postfix increment:**

int a = 4;  
int b = a++;  
  
System.out.println(a); // 5  
System.out.println(b); // 4

In Java, postfix operator has higher precedence than the assignment operator. However, it returns the original value of a, not the incremented one. That's why when we assign a++ to b, we actually assign 4, while a itself has already been incremented. So, b is 4 and a is 5.

If that's still not clear enough for you, take a look at the code:

int a = 4;  
System.out.println(a++ + a); // this is 9

We hope that now you fully understand increment and decrement and their prefix and postfix forms.

## Theory: Characters

 8 minutes0 / 5 problems solved

Skip this topicStart practicing

The char type is used to represent letters (both uppercase and lowercase), digits, and other symbols. Each character is just a symbol enclosed in single quotes.

char lowerCaseLetter = 'a';  
char upperCaseLetter = 'Q';  
char number = '1';  
char space = ' ';  
char dollar = '$';

This type can represent all characters in all languages as well as some special and computer symbols. It corresponds to the **Unicode** format. Unicode is a computer encoding methodology that assigns a unique number for every character. It doesn't matter what language, or computer platform it's on. This is important in a global, networked world, and for computer systems that must accommodate multiple languages and special characters. Unicode truly unifies all of these into a single standard.

## Initializing characters with codes

A character can be also created using its hexadecimal code in [the Unicode table](https://unicode-table.com/en/). The code starts with \u.

char ch = '\u0040'; // it represents '@'  
System.out.println(ch); // @

Although we use a sequence of characters to represent such code, the code represents exactly one character.

As an example, Latin capital letters have hexadecimal codes from '\u0041' to '\u005A', and Latin small letters have codes from '\u0061' to '\u007A'.

The char type has a minimum value encoded as '\u0000' and the maximum value encoded as '\uffff'.

It is also possible to initialize a char with a positive integer number.

char ch = 64;  
System.out.println(ch); // @

The number 64 just corresponds to the Unicode hexadecimal code '\u0040'.

Any char variable may be considered as an unsigned integer value in the range from 0 to 65535.

## ****Retrieving subsequent****characters

There are two operators for adding (+) and subtracting (-) integer numbers in order to get the next and previous character according to the Unicode order.

char ch = 'b';  
ch += 1; // 'c'  
ch -= 2; // 'a'

It is also possible adding and subtracting one character to / from another one.

char ch = 'b';  
ch += 'a';  
ch -= 'b';  
System.out.println(ch); // prints 'a' without quotes

Actually, these operations manipulate with codes of characters, 'b' has the next code after 'a'.

It is possible to use increment (++) and decrement (--) operators in prefix and postfix forms.

char ch = 'A';  
ch += 10;  
System.out.println(ch);   // 'K'  
System.out.println(++ch); // 'L'  
System.out.println(++ch); // 'M'  
System.out.println(--ch); // 'L'

**Escape sequences**

There are some special characters starting with backslash \ which are known as the escape or control sequences. They do not have corresponding symbols and cannot be found on a keyboard. To represent such characters we use a pair of regular symbols. In a program, this pair will be considered as exactly one character with the appropriate code.

* '\n' is the newline character;
* '\t' is the tab character;
* '\r' is the carriage return character;
* '\\' is the backslash character itself;
* '\'' is the single quote mark;
* '\"' is the double quote mark.

Here are several examples:

System.out.print('\t'); // makes a tab  
System.out.print('a');  // prints 'a'  
System.out.print('\n'); // goes to the new line  
System.out.print('c');  // prints 'c'

This code prints:

  a  
c

There is also a character to represent a single space ' '. It is just a regular character, not an escape sequence.

**String**

 29 minutes0 / 5 problems solved

Skip this topicStart practicing

**The String type**

String is a reference type consisting of characters. It is one of the most widely used types in Java. Here is an example of a string: "Hello, Java". This string is a sequence of 11 characters, including one space.

This type has some features:

* **immutable type**: it's impossible to change a character in a string;
* it has methods for getting individual characters and extracting substrings;
* individual characters can be accessed by indexes, the first character has the index **0**, the last one – **the length of the string**–**1**;
* non-primitive type.

## Creating strings

A string literal is surrounded by a pair of double quotes, for instance:

String simpleString = "It is a simple string"; // a simple string  
System.out.println(simpleString);  // it prints "It is a simple string"  
  
String anotherString = "This is\na multiple\nstring"; // a string with escape sequences  
System.out.println(anotherString); // it prints the result in several lines

A string can represent a long character sequence (text). A string can have one or zero characters.

String strangeText = "aaaaaaaaaaaassssssssssss gggggggggggggggggggg ddddddddddd qqqqqq ffff";  
  
String emptyString = "";  
  
String s = "s"; // a string consisting of one character

A string can be null. It means no value assigned.

String nullString = null; // it is null

Another way to create a variable of String is by using the keyword new.

String str = new String("my-string"); // it creates an object and assigns it

**Get the length and characters of a string**

Any string has two useful methods:

* length() returns the number of characters in the string;
* charAt(int index) returns a character by its index;

Here is an example:

String s = "Hi, all";  
  
int len = s.length(); // the len is 7  
  
char theFirstChar = s.charAt(0);  // 'H' has the index 0  
  
char theFifthChar = s.charAt(4); // 'a' has the index 4  
  
char theLastChar = s.charAt(s.length() - 1); // 'l' has the index 6

You can easily get a character of a string by the index, but you can't change characters because strings are immutable in Java.

**Useful methods of strings**

The standard library of Java provides a lot of useful methods for processing strings:

* isEmpty() returns true if the string is empty, otherwise – false;
* toUpperCase() returns a new string in uppercase;
* toLowerCase() returns a new string in lowercase;
* startsWith(prefix) returns true if the string starts with the given string prefix, otherwise, false;
* endsWith(suffix) returns true if the string ends with the given string suffix, otherwise, false.
* contains(...) returns true if the string contains the given string or character;
* substring(beginIndex, endIndex) returns a substring of the string in the range: beginIndex, endIndex - 1;
* replace(old, new) returns a new string obtained by replacing all occurrences of old with new that can be chars or strings.
* trim() returns a copy of the string obtained by omitting the leading and trailing whitespace. Note that whitespace includes not only space character, but mostly everything that looks empty: tab, carriage return, newline character, etc.

See the following example to better understand these methods:

String text = "The simple text string";  
  
boolean empty = text.isEmpty(); // false  
  
String textInUpperCase = text.toUpperCase(); // "THE SIMPLE TEXT STRING"  
  
boolean startsWith = textInUpperCase.startsWith("THE"); // true  
  
/\* replace all space characters with empty strings \*/  
String noSpaces = textInUpperCase.replace(" ", ""); // "THESIMPLETEXTSTRING"  
  
String textWithWhitespaces = "\t text with whitespaces   !\n  \t";  
  
String trimmedText = textWithWhitespaces.trim(); // "text with whitespaces

## Exceptions when processing strings

When working with strings, there can be several exceptions.

1. NullPointerException. If a string is null and you call a method of the string, it throws NullPointerException.

String s = null;  
int length = s.length(); // it throws NullPointerException

2. StringIndexOutOfBoundsException**.** If you try to access a non-existing character by an index then this exception occurs.

String s = "ab";  
char c = s.charAt(2); // it throws StringIndexOutOfBoundsException because i

## Concatenating strings

Two strings can be concatenated using the "+" operator or the concat method. Both approaches lead to the same results.

String firstName = "John";  
String lastName = "Smith";  
  
// concatenation using the "+" operator  
String fullName1 = firstName + " " + lastName; // "John Smith"  
  
// concatenation using the concat method   
String fullName2 = firstName.concat(" ").concat(lastName); // "John Smith"

When we concatenate two strings a new string is created (because strings are **immutable**).

**Important:**in the general case str1 + str2 is not the same as str2 + str1 because the concatenation is not a commutative operation.

**Appending values to a string**

It's possible to add values of different types to a string. The value will be automatically converted to a string. See an example below.

String str = "str" + 10 + false; // the result is "str10false"

In the example above, the order of execution is:

1. "str" + 10 => "str10"
2. "str10" + false = "str10false"

Let's see a more complex example:

String shortString = "str";  
int number = 100;  
  
String result1 = shortString + number + 50; // the result is "str10050"  
String result2 = number + 50 + shortString; // what is the result2?

The result2 is 150str, because, first, we calculate a sum of number and 50 and then concat it with str. The order of operations is important.

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String shortString = "str";  
int number = 100;  
  
String result1 = shortString + number + 50; // the result is "str10050"  
String result2 = number + 50 + shortString; // what is the result2?

The result2 is 150str, because, first, we calculate a sum of number and 50 and then concat it with str. The order of operations is important.

## How to compare strings correctly?

Since String is a reference type you shouldn't compare strings using ==or != operators. In this case, only addresses will be compared, but not actual values.

String has two convenient methods for comparing the equivalence of the actual content of one string with the content of another string: equals(other) and equalsIgnoreCase(other). See an example below.

String first = "first";  
String second = "second";  
  
String anotherFirst = "first";  
String secondInUpperCase = "SECOND";  
  
System.out.println(first.equals(second)); // false, the strings have different values  
System.out.println(first.equals(anotherFirst)); // true, the strings have the same value  
  
System.out.println(second.equals(secondInUpperCase)); // false, the strings have different cases  
System.out.println(second.equalsIgnoreCase(secondInUpperCase)); // true, it ignores cases

Do not forget the rules when comparing strings.

Write a program that reads the name of a city and checks if the name ends with **"burg"**.

Keep in mind, a city can have a short name.

The program should output **true** or **false**.

 Report a typo

**Sample Input 1:**

Augsburg

**Sample Output 1:**

true

**Sample Input 2:**

Saint Petersburg

**Sample Output 2:**

true

**Sample Input 3:**

Tu

**Sample Output 3:**

false

 Write a program

import java.util.Scanner;

public class Main {

    public static void main(String[] args) {

        Scanner scanner = new Scanner(System.in);

        System.out.println(scanner.nextLine().endsWith("burg"));

Write a program that reads a string and replaces all occurrences of the letter 'a' with the letter 'b'.

The program should print out the resulting string.

 Report a typo

**Sample Input 1:**

aaa

**Sample Output 1:**

bbb

**Sample Input 2:**

bca

**Sample Output 2:**

bcb

 Write a program

import java.util.Scanner;

class Main {

    public static void main(String[] args) {

        System.out.println(

                new Scanner(System.in)

                        .nextLine()

                        .replace("a", "b"));

    }

}

**String documentation**

[SKIP NAVIGATION LINKS](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#skip.navbar.top)

* [OVERVIEW](https://docs.oracle.com/javase/8/docs/api/overview-summary.html)
* [PACKAGE](https://docs.oracle.com/javase/8/docs/api/java/lang/package-summary.html)
* CLASS
* [USE](https://docs.oracle.com/javase/8/docs/api/java/lang/class-use/String.html)
* [TREE](https://docs.oracle.com/javase/8/docs/api/java/lang/package-tree.html)
* [DEPRECATED](https://docs.oracle.com/javase/8/docs/api/deprecated-list.html)
* [INDEX](https://docs.oracle.com/javase/8/docs/api/index-files/index-1.html)
* [HELP](https://docs.oracle.com/javase/8/docs/api/help-doc.html)

**Java™ Platform  
Standard Ed. 8**

* [**PREV CLASS**](https://docs.oracle.com/javase/8/docs/api/java/lang/StrictMath.html)
* [**NEXT CLASS**](https://docs.oracle.com/javase/8/docs/api/java/lang/StringBuffer.html)
* [FRAMES](https://docs.oracle.com/javase/8/docs/api/index.html?java/lang/String.html)
* [NO FRAMES](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html)
* [ALL CLASSES](https://docs.oracle.com/javase/8/docs/api/allclasses-noframe.html)
* SUMMARY:
* NESTED |
* [FIELD](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#field.summary) |
* [CONSTR](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#constructor.summary) |
* [METHOD](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#method.summary)
* DETAIL:
* [FIELD](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#field.detail) |
* [CONSTR](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#constructor.detail) |
* [METHOD](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#method.detail)

compact1, compact2, compact3

java.lang

## Class String

* [java.lang.Object](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html)
  + java.lang.String
* **All Implemented Interfaces:**

[Serializable](https://docs.oracle.com/javase/8/docs/api/java/io/Serializable.html), [CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang), [Comparable](https://docs.oracle.com/javase/8/docs/api/java/lang/Comparable.html)<[String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html)>

public final class **String**

extends [Object](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html)

implements [Serializable](https://docs.oracle.com/javase/8/docs/api/java/io/Serializable.html), [Comparable](https://docs.oracle.com/javase/8/docs/api/java/lang/Comparable.html)<[String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html)>, [CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html)

The String class represents character strings. All string literals in Java programs, such as "abc", are implemented as instances of this class.

Strings are constant; their values cannot be changed after they are created. String buffers support mutable strings. Because String objects are immutable they can be shared. For example:

String str = "abc";

is equivalent to:

char data[] = {'a', 'b', 'c'};

String str = new String(data);

Here are some more examples of how strings can be used:

System.out.println("abc");

String cde = "cde";

System.out.println("abc" + cde);

String c = "abc".substring(2,3);

String d = cde.substring(1, 2);

The class String includes methods for examining individual characters of the sequence, for comparing strings, for searching strings, for extracting substrings, and for creating a copy of a string with all characters translated to uppercase or to lowercase. Case mapping is based on the Unicode Standard version specified by the [Character](https://docs.oracle.com/javase/8/docs/api/java/lang/Character.html) class.

The Java language provides special support for the string concatenation operator ( + ), and for conversion of other objects to strings. String concatenation is implemented through the StringBuilder(or StringBuffer) class and its append method. String conversions are implemented through the method toString, defined by Object and inherited by all classes in Java. For additional information on string concatenation and conversion, see Gosling, Joy, and Steele, *The Java Language Specification*.

Unless otherwise noted, passing a null argument to a constructor or method in this class will cause a [NullPointerException](https://docs.oracle.com/javase/8/docs/api/java/lang/NullPointerException.html" \o "class in java.lang) to be thrown.

A String represents a string in the UTF-16 format in which supplementary characters are represented by surrogate pairs (see the section [Unicode Character Representations](https://docs.oracle.com/javase/8/docs/api/java/lang/Character.html#unicode) in the Character class for more information). Index values refer to char code units, so a supplementary character uses two positions in a String.

The String class provides methods for dealing with Unicode code points (i.e., characters), in addition to those for dealing with Unicode code units (i.e., char values).

**Since:**

JDK1.0

**See Also:**

[Object.toString()](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html#toString--), [StringBuffer](https://docs.oracle.com/javase/8/docs/api/java/lang/StringBuffer.html), [StringBuilder](https://docs.oracle.com/javase/8/docs/api/java/lang/StringBuilder.html), [Charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html), [Serialized Form](https://docs.oracle.com/javase/8/docs/api/serialized-form.html#java.lang.String)

### *Field Summary*

|  |  |
| --- | --- |
| **Fields** | |
| **Modifier and Type** | **Field and Description** |
| static [**Comparator**](https://docs.oracle.com/javase/8/docs/api/java/util/Comparator.html)<[**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html)> | [**CASE\_INSENSITIVE\_ORDER**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#CASE_INSENSITIVE_ORDER)  A Comparator that orders String objects as by compareToIgnoreCase. |

### *Constructor Summary*

|  |
| --- |
| **Constructors** |
| **Constructor and Description** |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String--)()  Initializes a newly created String object so that it represents an empty character sequence. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-)(byte[] bytes)  Constructs a new String by decoding the specified array of bytes using the platform's default charset. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-java.nio.charset.Charset-)(byte[] bytes, [**Charset**](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html) charset)  Constructs a new String by decoding the specified array of bytes using the specified [**charset**](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html). |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-int-)(byte[] ascii, int hibyte)  **Deprecated.**  This method does not properly convert bytes into characters. As of JDK 1.1, the preferred way to do this is via the String constructors that take a [**Charset**](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html), charset name, or that use the platform's default charset. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-int-int-)(byte[] bytes, int offset, int length)  Constructs a new String by decoding the specified subarray of bytes using the platform's default charset. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-int-int-java.nio.charset.Charset-)(byte[] bytes, int offset, int length, [**Charset**](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html) charset)  Constructs a new String by decoding the specified subarray of bytes using the specified [**charset**](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html). |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-int-int-int-)(byte[] ascii, int hibyte, int offset, int count)  **Deprecated.**  This method does not properly convert bytes into characters. As of JDK 1.1, the preferred way to do this is via the String constructors that take a [**Charset**](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html), charset name, or that use the platform's default charset. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-int-int-java.lang.String-)(byte[] bytes, int offset, int length, [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) charsetName)  Constructs a new String by decoding the specified subarray of bytes using the specified charset. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-java.lang.String-)(byte[] bytes, [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) charsetName)  Constructs a new String by decoding the specified array of bytes using the specified [**charset**](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html). |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-char:A-)(char[] value)  Allocates a new String so that it represents the sequence of characters currently contained in the character array argument. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-char:A-int-int-)(char[] value, int offset, int count)  Allocates a new String that contains characters from a subarray of the character array argument. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-int:A-int-int-)(int[] codePoints, int offset, int count)  Allocates a new String that contains characters from a subarray of the [**Unicode code point**](https://docs.oracle.com/javase/8/docs/api/java/lang/Character.html#unicode) array argument. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) original)  Initializes a newly created String object so that it represents the same sequence of characters as the argument; in other words, the newly created string is a copy of the argument string. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-java.lang.StringBuffer-)(**[StringBuffer](https://docs.oracle.com/javase/8/docs/api/java/lang/StringBuffer.html" \o "class in java.lang)** buffer)  Allocates a new string that contains the sequence of characters currently contained in the string buffer argument. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-java.lang.StringBuilder-)([**StringBuilder**](https://docs.oracle.com/javase/8/docs/api/java/lang/StringBuilder.html) builder)  Allocates a new string that contains the sequence of characters currently contained in the string builder argument. |

### *Method Summary*

|  |  |
| --- | --- |
| **All Methods**[**Static Methods**](javascript:show(1);)[**Instance Methods**](javascript:show(2);)[**Concrete Methods**](javascript:show(8);)[**Deprecated Methods**](javascript:show(32);) | |
| **Modifier and Type** | **Method and Description** |
| char | [**charAt**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#charAt-int-)(int index)  Returns the char value at the specified index. |
| int | [**codePointAt**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#codePointAt-int-)(int index)  Returns the character (Unicode code point) at the specified index. |
| int | [**codePointBefore**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#codePointBefore-int-)(int index)  Returns the character (Unicode code point) before the specified index. |
| int | [**codePointCount**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#codePointCount-int-int-)(int beginIndex, int endIndex)  Returns the number of Unicode code points in the specified text range of this String. |
| int | [**compareTo**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#compareTo-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) anotherString)  Compares two strings lexicographically. |
| int | [**compareToIgnoreCase**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#compareToIgnoreCase-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) str)  Compares two strings lexicographically, ignoring case differences. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**concat**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#concat-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) str)  Concatenates the specified string to the end of this string. |
| boolean | [**contains**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#contains-java.lang.CharSequence-)(**[CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang)** s)  Returns true if and only if this string contains the specified sequence of char values. |
| boolean | [**contentEquals**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#contentEquals-java.lang.CharSequence-)(**[CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang)** cs)  Compares this string to the specified CharSequence. |
| boolean | [**contentEquals**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#contentEquals-java.lang.StringBuffer-)(**[StringBuffer](https://docs.oracle.com/javase/8/docs/api/java/lang/StringBuffer.html" \o "class in java.lang)** sb)  Compares this string to the specified StringBuffer. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**copyValueOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#copyValueOf-char:A-)(char[] data)  Equivalent to **[valueOf(char[])](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html" \l "valueOf-char:A-)**. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**copyValueOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#copyValueOf-char:A-int-int-)(char[] data, int offset, int count)  Equivalent to **[valueOf(char[], int, int)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html" \l "valueOf-char:A-int-int-)**. |
| boolean | [**endsWith**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#endsWith-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) suffix)  Tests if this string ends with the specified suffix. |
| boolean | [**equals**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#equals-java.lang.Object-)([**Object**](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html) anObject)  Compares this string to the specified object. |
| boolean | [**equalsIgnoreCase**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#equalsIgnoreCase-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) anotherString)  Compares this String to another String, ignoring case considerations. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**format**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#format-java.util.Locale-java.lang.String-java.lang.Object...-)([**Locale**](https://docs.oracle.com/javase/8/docs/api/java/util/Locale.html) l, [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) format, [**Object**](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html)... args)  Returns a formatted string using the specified locale, format string, and arguments. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**format**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#format-java.lang.String-java.lang.Object...-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) format, [**Object**](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html)... args)  Returns a formatted string using the specified format string and arguments. |
| byte[] | [**getBytes**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#getBytes--)()  Encodes this String into a sequence of bytes using the platform's default charset, storing the result into a new byte array. |
| byte[] | [**getBytes**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#getBytes-java.nio.charset.Charset-)([**Charset**](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html) charset)  Encodes this String into a sequence of bytes using the given [**charset**](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html), storing the result into a new byte array. |
| void | [**getBytes**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#getBytes-int-int-byte:A-int-)(int srcBegin, int srcEnd, byte[] dst, int dstBegin)  **Deprecated.**  This method does not properly convert characters into bytes. As of JDK 1.1, the preferred way to do this is via the **[getBytes()](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html" \l "getBytes--)** method, which uses the platform's default charset. |
| byte[] | [**getBytes**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#getBytes-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) charsetName)  Encodes this String into a sequence of bytes using the named charset, storing the result into a new byte array. |
| void | [**getChars**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#getChars-int-int-char:A-int-)(int srcBegin, int srcEnd, char[] dst, int dstBegin)  Copies characters from this string into the destination character array. |
| int | [**hashCode**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#hashCode--)()  Returns a hash code for this string. |
| int | [**indexOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#indexOf-int-)(int ch)  Returns the index within this string of the first occurrence of the specified character. |
| int | [**indexOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#indexOf-int-int-)(int ch, int fromIndex)  Returns the index within this string of the first occurrence of the specified character, starting the search at the specified index. |
| int | [**indexOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#indexOf-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) str)  Returns the index within this string of the first occurrence of the specified substring. |
| int | [**indexOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#indexOf-java.lang.String-int-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) str, int fromIndex)  Returns the index within this string of the first occurrence of the specified substring, starting at the specified index. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**intern**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#intern--)()  Returns a canonical representation for the string object. |
| boolean | [**isEmpty**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#isEmpty--)()  Returns true if, and only if, [**length()**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#length--) is 0. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**join**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#join-java.lang.CharSequence-java.lang.CharSequence...-)(**[CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang)** delimiter, **[CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang)**... elements)  Returns a new String composed of copies of the CharSequence elements joined together with a copy of the specified delimiter. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**join**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#join-java.lang.CharSequence-java.lang.Iterable-)(**[CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang)** delimiter, **[Iterable](https://docs.oracle.com/javase/8/docs/api/java/lang/Iterable.html" \o "interface in java.lang)**<? extends **[CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang)**> elements)  Returns a new String composed of copies of the CharSequence elements joined together with a copy of the specified delimiter. |
| int | [**lastIndexOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#lastIndexOf-int-)(int ch)  Returns the index within this string of the last occurrence of the specified character. |
| int | [**lastIndexOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#lastIndexOf-int-int-)(int ch, int fromIndex)  Returns the index within this string of the last occurrence of the specified character, searching backward starting at the specified index. |
| int | [**lastIndexOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#lastIndexOf-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) str)  Returns the index within this string of the last occurrence of the specified substring. |
| int | [**lastIndexOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#lastIndexOf-java.lang.String-int-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) str, int fromIndex)  Returns the index within this string of the last occurrence of the specified substring, searching backward starting at the specified index. |
| int | [**length**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#length--)()  Returns the length of this string. |
| boolean | [**matches**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#matches-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) regex)  Tells whether or not this string matches the given [**regular expression**](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#sum). |
| int | [**offsetByCodePoints**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#offsetByCodePoints-int-int-)(int index, int codePointOffset)  Returns the index within this String that is offset from the given index by codePointOffset code points. |
| boolean | [**regionMatches**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#regionMatches-boolean-int-java.lang.String-int-int-)(boolean ignoreCase, int toffset, [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) other, int ooffset, int len)  Tests if two string regions are equal. |
| boolean | [**regionMatches**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#regionMatches-int-java.lang.String-int-int-)(int toffset, [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) other, int ooffset, int len)  Tests if two string regions are equal. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**replace**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#replace-char-char-)(char oldChar, char newChar)  Returns a string resulting from replacing all occurrences of oldChar in this string with newChar. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**replace**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#replace-java.lang.CharSequence-java.lang.CharSequence-)(**[CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang)** target, **[CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang)** replacement)  Replaces each substring of this string that matches the literal target sequence with the specified literal replacement sequence. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**replaceAll**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#replaceAll-java.lang.String-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) regex, [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) replacement)  Replaces each substring of this string that matches the given [**regular expression**](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#sum) with the given replacement. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**replaceFirst**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#replaceFirst-java.lang.String-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) regex, [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) replacement)  Replaces the first substring of this string that matches the given [**regular expression**](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#sum) with the given replacement. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html)[] | [**split**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#split-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) regex)  Splits this string around matches of the given [**regular expression**](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#sum). |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html)[] | [**split**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#split-java.lang.String-int-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) regex, int limit)  Splits this string around matches of the given [**regular expression**](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#sum). |
| boolean | [**startsWith**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#startsWith-java.lang.String-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) prefix)  Tests if this string starts with the specified prefix. |
| boolean | [**startsWith**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#startsWith-java.lang.String-int-)([**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) prefix, int toffset)  Tests if the substring of this string beginning at the specified index starts with the specified prefix. |
| [**CharSequence**](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html) | [**subSequence**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#subSequence-int-int-)(int beginIndex, int endIndex)  Returns a character sequence that is a subsequence of this sequence. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**substring**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#substring-int-)(int beginIndex)  Returns a string that is a substring of this string. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**substring**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#substring-int-int-)(int beginIndex, int endIndex)  Returns a string that is a substring of this string. |
| char[] | [**toCharArray**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#toCharArray--)()  Converts this string to a new character array. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**toLowerCase**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#toLowerCase--)()  Converts all of the characters in this String to lower case using the rules of the default locale. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**toLowerCase**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#toLowerCase-java.util.Locale-)([**Locale**](https://docs.oracle.com/javase/8/docs/api/java/util/Locale.html) locale)  Converts all of the characters in this String to lower case using the rules of the given Locale. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**toString**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#toString--)()  This object (which is already a string!) is itself returned. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**toUpperCase**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#toUpperCase--)()  Converts all of the characters in this String to upper case using the rules of the default locale. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**toUpperCase**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#toUpperCase-java.util.Locale-)([**Locale**](https://docs.oracle.com/javase/8/docs/api/java/util/Locale.html) locale)  Converts all of the characters in this String to upper case using the rules of the given Locale. |
| [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**trim**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#trim--)()  Returns a string whose value is this string, with any leading and trailing whitespace removed. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**valueOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#valueOf-boolean-)(boolean b)  Returns the string representation of the boolean argument. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**valueOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#valueOf-char-)(char c)  Returns the string representation of the char argument. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**valueOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#valueOf-char:A-)(char[] data)  Returns the string representation of the char array argument. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**valueOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#valueOf-char:A-int-int-)(char[] data, int offset, int count)  Returns the string representation of a specific subarray of the char array argument. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**valueOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#valueOf-double-)(double d)  Returns the string representation of the double argument. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**valueOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#valueOf-float-)(float f)  Returns the string representation of the float argument. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**valueOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#valueOf-int-)(int i)  Returns the string representation of the int argument. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**valueOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#valueOf-long-)(long l)  Returns the string representation of the long argument. |
| static [**String**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) | [**valueOf**](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#valueOf-java.lang.Object-)([**Object**](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html) obj)  Returns the string representation of the Object argument. |

### Methods inherited from class java.lang.[Object](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html)

[clone](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html#clone--), [finalize](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html#finalize--), [getClass](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html" \l "getClass--), [notify](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html#notify--), [notifyAll](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html" \l "notifyAll--), [wait](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html#wait--), [wait](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html#wait-long-), [wait](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html#wait-long-int-)

### Methods inherited from interface java.lang.[CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html)

[chars](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html#chars--), [codePoints](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \l "codePoints--)

### *Field Detail*

#### CASE\_INSENSITIVE\_ORDER

public static final [Comparator](https://docs.oracle.com/javase/8/docs/api/java/util/Comparator.html)<[String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html)> CASE\_INSENSITIVE\_ORDER

A Comparator that orders String objects as by compareToIgnoreCase. This comparator is serializable.

Note that this Comparator does not take locale into account, and will result in an unsatisfactory ordering for certain locales. The java.text package provides Collators to allow locale-sensitive ordering.

**Since:**

1.2

**See Also:**

[Collator.compare(String, String)](https://docs.oracle.com/javase/8/docs/api/java/text/Collator.html#compare-java.lang.String-java.lang.String-)

### *Constructor Detail*

#### String

public String()

Initializes a newly created String object so that it represents an empty character sequence. Note that use of this constructor is unnecessary since Strings are immutable.

#### String

public String([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) original)

Initializes a newly created String object so that it represents the same sequence of characters as the argument; in other words, the newly created string is a copy of the argument string. Unless an explicit copy of original is needed, use of this constructor is unnecessary since Strings are immutable.

**Parameters:**

original - A String

#### String

public String(char[] value)

Allocates a new String so that it represents the sequence of characters currently contained in the character array argument. The contents of the character array are copied; subsequent modification of the character array does not affect the newly created string.

**Parameters:**

value - The initial value of the string

#### String

* + - public String(char[] value,
    - int offset,

int count)

Allocates a new String that contains characters from a subarray of the character array argument. The offset argument is the index of the first character of the subarray and the count argument specifies the length of the subarray. The contents of the subarray are copied; subsequent modification of the character array does not affect the newly created string.

**Parameters:**

value - Array that is the source of characters

offset - The initial offset

count - The length

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - If the offset and count arguments index characters outside the bounds of the value array

#### String

* + - public String(int[] codePoints,
    - int offset,

int count)

Allocates a new String that contains characters from a subarray of the [Unicode code point](https://docs.oracle.com/javase/8/docs/api/java/lang/Character.html#unicode) array argument. The offset argument is the index of the first code point of the subarray and the count argument specifies the length of the subarray. The contents of the subarray are converted to chars; subsequent modification of the int array does not affect the newly created string.

**Parameters:**

codePoints - Array that is the source of Unicode code points

offset - The initial offset

count - The length

**Throws:**

[IllegalArgumentException](https://docs.oracle.com/javase/8/docs/api/java/lang/IllegalArgumentException.html) - If any invalid Unicode code point is found in codePoints

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - If the offset and count arguments index characters outside the bounds of the codePoints array

**Since:**

1.5

#### String

* + - [@Deprecated](https://docs.oracle.com/javase/8/docs/api/java/lang/Deprecated.html)
    - public String(byte[] ascii,
    - int hibyte,
    - int offset,

int count)

**Deprecated.** *This method does not properly convert bytes into characters. As of JDK 1.1, the preferred way to do this is via the String constructors that take a*[*Charset*](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html)*, charset name, or that use the platform's default charset.*

Allocates a new String constructed from a subarray of an array of 8-bit integer values.

The offset argument is the index of the first byte of the subarray, and the count argument specifies the length of the subarray.

Each byte in the subarray is converted to a char as specified in the method above.

**Parameters:**

ascii - The bytes to be converted to characters

hibyte - The top 8 bits of each 16-bit Unicode code unit

offset - The initial offset

count - The length

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - If the offset or count argument is invalid

**See Also:**

[String(byte[], int)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-int-), [String(byte[], int, int, java.lang.String)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-int-int-java.lang.String-), [String(byte[], int, int, java.nio.charset.Charset)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-int-int-java.nio.charset.Charset-), [String(byte[], int, int)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-int-int-), [String(byte[], java.lang.String)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-java.lang.String-), [String(byte[], java.nio.charset.Charset)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-java.nio.charset.Charset-), [String(byte[])](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-)

#### String

* + - [@Deprecated](https://docs.oracle.com/javase/8/docs/api/java/lang/Deprecated.html)
    - public String(byte[] ascii,

int hibyte)

**Deprecated.** *This method does not properly convert bytes into characters. As of JDK 1.1, the preferred way to do this is via the String constructors that take a*[*Charset*](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html)*, charset name, or that use the platform's default charset.*

Allocates a new String containing characters constructed from an array of 8-bit integer values. Each character *c*in the resulting string is constructed from the corresponding component *b* in the byte array such that:

***c*** == (char)(((hibyte & 0xff) << 8)

| (***b*** & 0xff))

**Parameters:**

ascii - The bytes to be converted to characters

hibyte - The top 8 bits of each 16-bit Unicode code unit

**See Also:**

[String(byte[], int, int, java.lang.String)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-int-int-java.lang.String-), [String(byte[], int, int, java.nio.charset.Charset)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-int-int-java.nio.charset.Charset-), [String(byte[], int, int)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-int-int-), [String(byte[], java.lang.String)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-java.lang.String-), [String(byte[], java.nio.charset.Charset)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-java.nio.charset.Charset-), [String(byte[])](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#String-byte:A-)

#### String

* + - public String(byte[] bytes,
    - int offset,
    - int length,
    - [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) charsetName)

throws [UnsupportedEncodingException](https://docs.oracle.com/javase/8/docs/api/java/io/UnsupportedEncodingException.html)

Constructs a new String by decoding the specified subarray of bytes using the specified charset. The length of the new String is a function of the charset, and hence may not be equal to the length of the subarray.

The behavior of this constructor when the given bytes are not valid in the given charset is unspecified. The [CharsetDecoder](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/CharsetDecoder.html" \o "class in java.nio.charset) class should be used when more control over the decoding process is required.

**Parameters:**

bytes - The bytes to be decoded into characters

offset - The index of the first byte to decode

length - The number of bytes to decode

charsetName - The name of a supported [charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html)

**Throws:**

[UnsupportedEncodingException](https://docs.oracle.com/javase/8/docs/api/java/io/UnsupportedEncodingException.html) - If the named charset is not supported

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - If the offset and length arguments index characters outside the bounds of the bytes array

**Since:**

JDK1.1

#### String

* + - public String(byte[] bytes,
    - int offset,
    - int length,

[Charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html) charset)

Constructs a new String by decoding the specified subarray of bytes using the specified [charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html). The length of the new String is a function of the charset, and hence may not be equal to the length of the subarray.

This method always replaces malformed-input and unmappable-character sequences with this charset's default replacement string. The [CharsetDecoder](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/CharsetDecoder.html" \o "class in java.nio.charset) class should be used when more control over the decoding process is required.

**Parameters:**

bytes - The bytes to be decoded into characters

offset - The index of the first byte to decode

length - The number of bytes to decode

charset - The [charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html) to be used to decode the bytes

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - If the offset and length arguments index characters outside the bounds of the bytes array

**Since:**

1.6

#### String

* + - public String(byte[] bytes,
    - [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) charsetName)

throws [UnsupportedEncodingException](https://docs.oracle.com/javase/8/docs/api/java/io/UnsupportedEncodingException.html)

Constructs a new String by decoding the specified array of bytes using the specified [charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html). The length of the new String is a function of the charset, and hence may not be equal to the length of the byte array.

The behavior of this constructor when the given bytes are not valid in the given charset is unspecified. The [CharsetDecoder](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/CharsetDecoder.html" \o "class in java.nio.charset) class should be used when more control over the decoding process is required.

**Parameters:**

bytes - The bytes to be decoded into characters

charsetName - The name of a supported [charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html)

**Throws:**

[UnsupportedEncodingException](https://docs.oracle.com/javase/8/docs/api/java/io/UnsupportedEncodingException.html) - If the named charset is not supported

**Since:**

JDK1.1

#### String

* + - public String(byte[] bytes,

[Charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html) charset)

Constructs a new String by decoding the specified array of bytes using the specified [charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html). The length of the new String is a function of the charset, and hence may not be equal to the length of the byte array.

This method always replaces malformed-input and unmappable-character sequences with this charset's default replacement string. The [CharsetDecoder](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/CharsetDecoder.html" \o "class in java.nio.charset) class should be used when more control over the decoding process is required.

**Parameters:**

bytes - The bytes to be decoded into characters

charset - The [charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html) to be used to decode the bytes

**Since:**

1.6

#### String

* + - public String(byte[] bytes,
    - int offset,

int length)

Constructs a new String by decoding the specified subarray of bytes using the platform's default charset. The length of the new String is a function of the charset, and hence may not be equal to the length of the subarray.

The behavior of this constructor when the given bytes are not valid in the default charset is unspecified. The [CharsetDecoder](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/CharsetDecoder.html" \o "class in java.nio.charset) class should be used when more control over the decoding process is required.

**Parameters:**

bytes - The bytes to be decoded into characters

offset - The index of the first byte to decode

length - The number of bytes to decode

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - If the offset and the length arguments index characters outside the bounds of the bytes array

**Since:**

JDK1.1

#### String

public String(byte[] bytes)

Constructs a new String by decoding the specified array of bytes using the platform's default charset. The length of the new String is a function of the charset, and hence may not be equal to the length of the byte array.

The behavior of this constructor when the given bytes are not valid in the default charset is unspecified. The [CharsetDecoder](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/CharsetDecoder.html" \o "class in java.nio.charset) class should be used when more control over the decoding process is required.

**Parameters:**

bytes - The bytes to be decoded into characters

**Since:**

JDK1.1

#### String

public String([StringBuffer](https://docs.oracle.com/javase/8/docs/api/java/lang/StringBuffer.html" \o "class in java.lang) buffer)

Allocates a new string that contains the sequence of characters currently contained in the string buffer argument. The contents of the string buffer are copied; subsequent modification of the string buffer does not affect the newly created string.

**Parameters:**

buffer - A StringBuffer

#### String

public String([StringBuilder](https://docs.oracle.com/javase/8/docs/api/java/lang/StringBuilder.html) builder)

Allocates a new string that contains the sequence of characters currently contained in the string builder argument. The contents of the string builder are copied; subsequent modification of the string builder does not affect the newly created string.

This constructor is provided to ease migration to StringBuilder. Obtaining a string from a string builder via the toString method is likely to run faster and is generally preferred.

**Parameters:**

builder - A StringBuilder

**Since:**

1.5

### *Method Detail*

#### length

public int length()

Returns the length of this string. The length is equal to the number of [Unicode code units](https://docs.oracle.com/javase/8/docs/api/java/lang/Character.html#unicode) in the string.

**Specified by:**

[length](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html#length--) in interface [CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang)

**Returns:**

the length of the sequence of characters represented by this object.

#### isEmpty

public boolean isEmpty()

Returns true if, and only if, [length()](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#length--) is 0.

**Returns:**

true if [length()](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#length--) is 0, otherwise false

**Since:**

1.6

#### charAt

public char charAt(int index)

Returns the char value at the specified index. An index ranges from 0 to length() - 1. The first char value of the sequence is at index 0, the next at index 1, and so on, as for array indexing.

If the char value specified by the index is a [surrogate](https://docs.oracle.com/javase/8/docs/api/java/lang/Character.html#unicode), the surrogate value is returned.

**Specified by:**

[charAt](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html#charAt-int-) in interface [CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang)

**Parameters:**

index - the index of the char value.

**Returns:**

the char value at the specified index of this string. The first char value is at index 0.

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - if the index argument is negative or not less than the length of this string.

#### codePointAt

public int codePointAt(int index)

Returns the character (Unicode code point) at the specified index. The index refers to char values (Unicode code units) and ranges from 0 to [length()](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#length--)- 1.

If the char value specified at the given index is in the high-surrogate range, the following index is less than the length of this String, and the char value at the following index is in the low-surrogate range, then the supplementary code point corresponding to this surrogate pair is returned. Otherwise, the char value at the given index is returned.

**Parameters:**

index - the index to the char values

**Returns:**

the code point value of the character at the index

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - if the index argument is negative or not less than the length of this string.

**Since:**

1.5

#### codePointBefore

public int codePointBefore(int index)

Returns the character (Unicode code point) before the specified index. The index refers to char values (Unicode code units) and ranges from 1 to [length](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html#length--).

If the char value at (index - 1) is in the low-surrogate range, (index - 2) is not negative, and the char value at (index - 2) is in the high-surrogate range, then the supplementary code point value of the surrogate pair is returned. If the char value at index - 1 is an unpaired low-surrogate or a high-surrogate, the surrogate value is returned.

**Parameters:**

index - the index following the code point that should be returned

**Returns:**

the Unicode code point value before the given index.

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - if the index argument is less than 1 or greater than the length of this string.

**Since:**

1.5

#### codePointCount

* + - public int codePointCount(int beginIndex,

int endIndex)

Returns the number of Unicode code points in the specified text range of this String. The text range begins at the specified beginIndex and extends to the char at index endIndex - 1. Thus the length (in chars) of the text range is endIndex-beginIndex. Unpaired surrogates within the text range count as one code point each.

**Parameters:**

beginIndex - the index to the first char of the text range.

endIndex - the index after the last char of the text range.

**Returns:**

the number of Unicode code points in the specified text range

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - if the beginIndex is negative, or endIndex is larger than the length of this String, or beginIndex is larger than endIndex.

**Since:**

1.5

#### offsetByCodePoints

* + - public int offsetByCodePoints(int index,

int codePointOffset)

Returns the index within this String that is offset from the given index by codePointOffset code points. Unpaired surrogates within the text range given by index and codePointOffset count as one code point each.

**Parameters:**

index - the index to be offset

codePointOffset - the offset in code points

**Returns:**

the index within this String

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - if index is negative or larger then the length of this String, or if codePointOffset is positive and the substring starting with index has fewer than codePointOffset code points, or if codePointOffset is negative and the substring before index has fewer than the absolute value of codePointOffset code points.

**Since:**

1.5

#### getChars

* + - public void getChars(int srcBegin,
    - int srcEnd,
    - char[] dst,

int dstBegin)

Copies characters from this string into the destination character array.

The first character to be copied is at index srcBegin; the last character to be copied is at index srcEnd-1 (thus the total number of characters to be copied is srcEnd-srcBegin). The characters are copied into the subarray of dst starting at index dstBegin and ending at index:

dstBegin + (srcEnd-srcBegin) - 1

**Parameters:**

srcBegin - index of the first character in the string to copy.

srcEnd - index after the last character in the string to copy.

dst - the destination array.

dstBegin - the start offset in the destination array.

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - If any of the following is true:

* + - * srcBegin is negative.
      * srcBegin is greater than srcEnd
      * srcEnd is greater than the length of this string
      * dstBegin is negative
      * dstBegin+(srcEnd-srcBegin) is larger than dst.length

#### getBytes

* + - [@Deprecated](https://docs.oracle.com/javase/8/docs/api/java/lang/Deprecated.html)
    - public void getBytes(int srcBegin,
    - int srcEnd,
    - byte[] dst,

int dstBegin)

**Deprecated.** *This method does not properly convert characters into bytes. As of JDK 1.1, the preferred way to do this is via the [getBytes()](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html" \l "getBytes--) method, which uses the platform's default charset.*

Copies characters from this string into the destination byte array. Each byte receives the 8 low-order bits of the corresponding character. The eight high-order bits of each character are not copied and do not participate in the transfer in any way.

The first character to be copied is at index srcBegin; the last character to be copied is at index srcEnd-1. The total number of characters to be copied is srcEnd-srcBegin. The characters, converted to bytes, are copied into the subarray of dst starting at index dstBegin and ending at index:

dstBegin + (srcEnd-srcBegin) - 1

**Parameters:**

srcBegin - Index of the first character in the string to copy

srcEnd - Index after the last character in the string to copy

dst - The destination array

dstBegin - The start offset in the destination array

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - If any of the following is true:

* + - * srcBegin is negative
      * srcBegin is greater than srcEnd
      * srcEnd is greater than the length of this String
      * dstBegin is negative
      * dstBegin+(srcEnd-srcBegin) is larger than dst.length

#### getBytes

* + - public byte[] getBytes([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) charsetName)

throws [UnsupportedEncodingException](https://docs.oracle.com/javase/8/docs/api/java/io/UnsupportedEncodingException.html)

Encodes this String into a sequence of bytes using the named charset, storing the result into a new byte array.

The behavior of this method when this string cannot be encoded in the given charset is unspecified. The [CharsetEncoder](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/CharsetEncoder.html" \o "class in java.nio.charset) class should be used when more control over the encoding process is required.

**Parameters:**

charsetName - The name of a supported [charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html)

**Returns:**

The resultant byte array

**Throws:**

[UnsupportedEncodingException](https://docs.oracle.com/javase/8/docs/api/java/io/UnsupportedEncodingException.html) - If the named charset is not supported

**Since:**

JDK1.1

#### getBytes

public byte[] getBytes([Charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html) charset)

Encodes this String into a sequence of bytes using the given [charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html), storing the result into a new byte array.

This method always replaces malformed-input and unmappable-character sequences with this charset's default replacement byte array. The [CharsetEncoder](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/CharsetEncoder.html" \o "class in java.nio.charset) class should be used when more control over the encoding process is required.

**Parameters:**

charset - The [Charset](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/Charset.html) to be used to encode the String

**Returns:**

The resultant byte array

**Since:**

1.6

#### getBytes

public byte[] getBytes()

Encodes this String into a sequence of bytes using the platform's default charset, storing the result into a new byte array.

The behavior of this method when this string cannot be encoded in the default charset is unspecified. The [CharsetEncoder](https://docs.oracle.com/javase/8/docs/api/java/nio/charset/CharsetEncoder.html" \o "class in java.nio.charset) class should be used when more control over the encoding process is required.

**Returns:**

The resultant byte array

**Since:**

JDK1.1

#### equals

public boolean equals([Object](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html) anObject)

Compares this string to the specified object. The result is true if and only if the argument is not null and is a String object that represents the same sequence of characters as this object.

**Overrides:**

[equals](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html#equals-java.lang.Object-) in class [Object](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html)

**Parameters:**

anObject - The object to compare this String against

**Returns:**

true if the given object represents a String equivalent to this string, false otherwise

**See Also:**

[compareTo(String)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#compareTo-java.lang.String-), [equalsIgnoreCase(String)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html" \l "equalsIgnoreCase-java.lang.String-)

#### contentEquals

public boolean contentEquals([StringBuffer](https://docs.oracle.com/javase/8/docs/api/java/lang/StringBuffer.html" \o "class in java.lang) sb)

Compares this string to the specified StringBuffer. The result is true if and only if this String represents the same sequence of characters as the specified StringBuffer. This method synchronizes on the StringBuffer.

**Parameters:**

sb - The StringBuffer to compare this String against

**Returns:**

true if this String represents the same sequence of characters as the specified StringBuffer, false otherwise

**Since:**

1.4

#### contentEquals

public boolean contentEquals([CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang) cs)

Compares this string to the specified CharSequence. The result is true if and only if this String represents the same sequence of char values as the specified sequence. Note that if the CharSequence is a StringBuffer then the method synchronizes on it.

**Parameters:**

cs - The sequence to compare this String against

**Returns:**

true if this String represents the same sequence of char values as the specified sequence, false otherwise

**Since:**

1.5

#### equalsIgnoreCase

public boolean equalsIgnoreCase([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) anotherString)

Compares this String to another String, ignoring case considerations. Two strings are considered equal ignoring case if they are of the same length and corresponding characters in the two strings are equal ignoring case.

Two characters c1 and c2 are considered the same ignoring case if at least one of the following is true:

* + - * The two characters are the same (as compared by the == operator)
      * Applying the method [Character.toUpperCase(char)](https://docs.oracle.com/javase/8/docs/api/java/lang/Character.html" \l "toUpperCase-char-) to each character produces the same result
      * Applying the method [Character.toLowerCase(char)](https://docs.oracle.com/javase/8/docs/api/java/lang/Character.html" \l "toLowerCase-char-) to each character produces the same result

**Parameters:**

anotherString - The String to compare this String against

**Returns:**

true if the argument is not null and it represents an equivalent String ignoring case; false otherwise

**See Also:**

[equals(Object)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#equals-java.lang.Object-)

#### compareTo

public int compareTo([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) anotherString)

Compares two strings lexicographically. The comparison is based on the Unicode value of each character in the strings. The character sequence represented by this String object is compared lexicographically to the character sequence represented by the argument string. The result is a negative integer if this String object lexicographically precedes the argument string. The result is a positive integer if this String object lexicographically follows the argument string. The result is zero if the strings are equal; compareTo returns 0 exactly when the [equals(Object)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#equals-java.lang.Object-) method would return true.

This is the definition of lexicographic ordering. If two strings are different, then either they have different characters at some index that is a valid index for both strings, or their lengths are different, or both. If they have different characters at one or more index positions, let *k* be the smallest such index; then the string whose character at position *k* has the smaller value, as determined by using the < operator, lexicographically precedes the other string. In this case, compareTo returns the difference of the two character values at position k in the two string -- that is, the value:

this.charAt(k)-anotherString.charAt(k)

If there is no index position at which they differ, then the shorter string lexicographically precedes the longer string. In this case, compareTo returns the difference of the lengths of the strings -- that is, the value:

this.length()-anotherString.length()

**Specified by:**

[compareTo](https://docs.oracle.com/javase/8/docs/api/java/lang/Comparable.html#compareTo-T-) in interface [Comparable](https://docs.oracle.com/javase/8/docs/api/java/lang/Comparable.html)<[String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html)>

**Parameters:**

anotherString - the String to be compared.

**Returns:**

the value 0 if the argument string is equal to this string; a value less than 0 if this string is lexicographically less than the string argument; and a value greater than 0 if this string is lexicographically greater than the string argument.

#### compareToIgnoreCase

public int compareToIgnoreCase([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) str)

Compares two strings lexicographically, ignoring case differences. This method returns an integer whose sign is that of calling compareTo with normalized versions of the strings where case differences have been eliminated by calling Character.toLowerCase(Character.toUpperCase(character)) on each character.

Note that this method does not take locale into account, and will result in an unsatisfactory ordering for certain locales. The java.text package provides collators to allow locale-sensitive ordering.

**Parameters:**

str - the String to be compared.

**Returns:**

a negative integer, zero, or a positive integer as the specified String is greater than, equal to, or less than this String, ignoring case considerations.

**Since:**

1.2

**See Also:**

[Collator.compare(String, String)](https://docs.oracle.com/javase/8/docs/api/java/text/Collator.html#compare-java.lang.String-java.lang.String-)

#### regionMatches

* + - public boolean regionMatches(int toffset,
    - [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) other,
    - int ooffset,

int len)

Tests if two string regions are equal.

A substring of this String object is compared to a substring of the argument other. The result is true if these substrings represent identical character sequences. The substring of this String object to be compared begins at index toffset and has length len. The substring of other to be compared begins at index ooffset and has length len. The result is false if and only if at least one of the following is true:

* + - * toffset is negative.
      * ooffset is negative.
      * toffset+len is greater than the length of this String object.
      * ooffset+len is greater than the length of the other argument.
      * There is some nonnegative integer *k* less than len such that: this.charAt(toffset + *k*) != other.charAt(ooffset + *k*)

**Parameters:**

toffset - the starting offset of the subregion in this string.

other - the string argument.

ooffset - the starting offset of the subregion in the string argument.

len - the number of characters to compare.

**Returns:**

true if the specified subregion of this string exactly matches the specified subregion of the string argument; false otherwise.

#### regionMatches

* + - public boolean regionMatches(boolean ignoreCase,
    - int toffset,
    - [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) other,
    - int ooffset,

int len)

Tests if two string regions are equal.

A substring of this String object is compared to a substring of the argument other. The result is true if these substrings represent character sequences that are the same, ignoring case if and only if ignoreCase is true. The substring of this String object to be compared begins at index toffset and has length len. The substring of other to be compared begins at index ooffset and has length len. The result is false if and only if at least one of the following is true:

* + - * toffset is negative.
      * ooffset is negative.
      * toffset+len is greater than the length of this String object.
      * ooffset+len is greater than the length of the other argument.
      * ignoreCase is false and there is some nonnegative integer *k* less than len such that:
      * this.charAt(toffset+k) != other.charAt(ooffset+k)

* + - * ignoreCase is true and there is some nonnegative integer *k* less than len such that:
      * Character.toLowerCase(this.charAt(toffset+k)) !=
      * Character.toLowerCase(other.charAt(ooffset+k))

and:

Character.toUpperCase(this.charAt(toffset+k)) !=

Character.toUpperCase(other.charAt(ooffset+k))

**Parameters:**

ignoreCase - if true, ignore case when comparing characters.

toffset - the starting offset of the subregion in this string.

other - the string argument.

ooffset - the starting offset of the subregion in the string argument.

len - the number of characters to compare.

**Returns:**

true if the specified subregion of this string matches the specified subregion of the string argument; false otherwise. Whether the matching is exact or case insensitive depends on the ignoreCase argument.

#### startsWith

* + - public boolean startsWith([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) prefix,

int toffset)

Tests if the substring of this string beginning at the specified index starts with the specified prefix.

**Parameters:**

prefix - the prefix.

toffset - where to begin looking in this string.

**Returns:**

true if the character sequence represented by the argument is a prefix of the substring of this object starting at index toffset; false otherwise. The result is false if toffset is negative or greater than the length of this String object; otherwise the result is the same as the result of the expression

this.substring(toffset).startsWith(prefix)

#### startsWith

public boolean startsWith([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) prefix)

Tests if this string starts with the specified prefix.

**Parameters:**

prefix - the prefix.

**Returns:**

true if the character sequence represented by the argument is a prefix of the character sequence represented by this string; false otherwise. Note also that true will be returned if the argument is an empty string or is equal to this String object as determined by the [equals(Object)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#equals-java.lang.Object-) method.

**Since:**

1. 0

#### endsWith

public boolean endsWith([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) suffix)

Tests if this string ends with the specified suffix.

**Parameters:**

suffix - the suffix.

**Returns:**

true if the character sequence represented by the argument is a suffix of the character sequence represented by this object; false otherwise. Note that the result will be true if the argument is the empty string or is equal to this String object as determined by the [equals(Object)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#equals-java.lang.Object-) method.

#### hashCode

public int hashCode()

Returns a hash code for this string. The hash code for a String object is computed as

s[0]\*31^(n-1) + s[1]\*31^(n-2) + ... + s[n-1]

using int arithmetic, where s[i] is the *i*th character of the string, n is the length of the string, and ^ indicates exponentiation. (The hash value of the empty string is zero.)

**Overrides:**

[hashCode](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html#hashCode--) in class [Object](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html)

**Returns:**

a hash code value for this object.

**See Also:**

[Object.equals(java.lang.Object)](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html#equals-java.lang.Object-), [System.identityHashCode(java.lang.Object)](https://docs.oracle.com/javase/8/docs/api/java/lang/System.html#identityHashCode-java.lang.Object-)

#### indexOf

public int indexOf(int ch)

Returns the index within this string of the first occurrence of the specified character. If a character with value ch occurs in the character sequence represented by this String object, then the index (in Unicode code units) of the first such occurrence is returned. For values of ch in the range from 0 to 0xFFFF (inclusive), this is the smallest value *k* such that:

this.charAt(*k*) == ch

is true. For other values of ch, it is the smallest value *k* such that:

this.codePointAt(*k*) == ch

is true. In either case, if no such character occurs in this string, then -1 is returned.

**Parameters:**

ch - a character (Unicode code point).

**Returns:**

the index of the first occurrence of the character in the character sequence represented by this object, or -1 if the character does not occur.

#### indexOf

* + - public int indexOf(int ch,

int fromIndex)

Returns the index within this string of the first occurrence of the specified character, starting the search at the specified index.

If a character with value ch occurs in the character sequence represented by this String object at an index no smaller than fromIndex, then the index of the first such occurrence is returned. For values of ch in the range from 0 to 0xFFFF (inclusive), this is the smallest value *k* such that:

(this.charAt(*k*) == ch) && (*k* >= fromIndex)

is true. For other values of ch, it is the smallest value *k* such that:

(this.codePointAt(*k*) == ch) && (*k* >= fromIndex)

is true. In either case, if no such character occurs in this string at or after position fromIndex, then -1 is returned.

There is no restriction on the value of fromIndex. If it is negative, it has the same effect as if it were zero: this entire string may be searched. If it is greater than the length of this string, it has the same effect as if it were equal to the length of this string: -1 is returned.

All indices are specified in char values (Unicode code units).

**Parameters:**

ch - a character (Unicode code point).

fromIndex - the index to start the search from.

**Returns:**

the index of the first occurrence of the character in the character sequence represented by this object that is greater than or equal to fromIndex, or -1 if the character does not occur.

#### lastIndexOf

public int lastIndexOf(int ch)

Returns the index within this string of the last occurrence of the specified character. For values of ch in the range from 0 to 0xFFFF (inclusive), the index (in Unicode code units) returned is the largest value *k* such that:

this.charAt(*k*) == ch

is true. For other values of ch, it is the largest value *k* such that:

this.codePointAt(*k*) == ch

is true. In either case, if no such character occurs in this string, then -1 is returned. The String is searched backwards starting at the last character.

**Parameters:**

ch - a character (Unicode code point).

**Returns:**

the index of the last occurrence of the character in the character sequence represented by this object, or -1 if the character does not occur.

#### lastIndexOf

* + - public int lastIndexOf(int ch,

int fromIndex)

Returns the index within this string of the last occurrence of the specified character, searching backward starting at the specified index. For values of ch in the range from 0 to 0xFFFF (inclusive), the index returned is the largest value *k* such that:

(this.charAt(*k*) == ch) && (*k* <= fromIndex)

is true. For other values of ch, it is the largest value *k* such that:

(this.codePointAt(*k*) == ch) && (*k* <= fromIndex)

is true. In either case, if no such character occurs in this string at or before position fromIndex, then -1 is returned.

All indices are specified in char values (Unicode code units).

**Parameters:**

ch - a character (Unicode code point).

fromIndex - the index to start the search from. There is no restriction on the value of fromIndex. If it is greater than or equal to the length of this string, it has the same effect as if it were equal to one less than the length of this string: this entire string may be searched. If it is negative, it has the same effect as if it were -1: -1 is returned.

**Returns:**

the index of the last occurrence of the character in the character sequence represented by this object that is less than or equal to fromIndex, or -1 if the character does not occur before that point.

#### indexOf

public int indexOf([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) str)

Returns the index within this string of the first occurrence of the specified substring.

The returned index is the smallest value *k* for which:

this.startsWith(str, *k*)

If no such value of *k* exists, then -1 is returned.

**Parameters:**

str - the substring to search for.

**Returns:**

the index of the first occurrence of the specified substring, or -1 if there is no such occurrence.

#### indexOf

* + - public int indexOf([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) str,

int fromIndex)

Returns the index within this string of the first occurrence of the specified substring, starting at the specified index.

The returned index is the smallest value *k* for which:

*k* >= fromIndex && this.startsWith(str, *k*)

If no such value of *k* exists, then -1 is returned.

**Parameters:**

str - the substring to search for.

fromIndex - the index from which to start the search.

**Returns:**

the index of the first occurrence of the specified substring, starting at the specified index, or -1 if there is no such occurrence.

#### lastIndexOf

public int lastIndexOf([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) str)

Returns the index within this string of the last occurrence of the specified substring. The last occurrence of the empty string "" is considered to occur at the index value this.length().

The returned index is the largest value *k* for which:

this.startsWith(str, *k*)

If no such value of *k* exists, then -1 is returned.

**Parameters:**

str - the substring to search for.

**Returns:**

the index of the last occurrence of the specified substring, or -1 if there is no such occurrence.

#### lastIndexOf

* + - public int lastIndexOf([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) str,

int fromIndex)

Returns the index within this string of the last occurrence of the specified substring, searching backward starting at the specified index.

The returned index is the largest value *k* for which:

*k* <= fromIndex && this.startsWith(str, *k*)

If no such value of *k* exists, then -1 is returned.

**Parameters:**

str - the substring to search for.

fromIndex - the index to start the search from.

**Returns:**

the index of the last occurrence of the specified substring, searching backward from the specified index, or -1 if there is no such occurrence.

#### substring

public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) substring(int beginIndex)

Returns a string that is a substring of this string. The substring begins with the character at the specified index and extends to the end of this string.

Examples:

"unhappy".substring(2) returns "happy"

"Harbison".substring(3) returns "bison"

"emptiness".substring(9) returns "" (an empty string)

**Parameters:**

beginIndex - the beginning index, inclusive.

**Returns:**

the specified substring.

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - if beginIndex is negative or larger than the length of this String object.

#### substring

* + - public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) substring(int beginIndex,

int endIndex)

Returns a string that is a substring of this string. The substring begins at the specified beginIndex and extends to the character at index endIndex - 1. Thus the length of the substring is endIndex-beginIndex.

Examples:

"hamburger".substring(4, 8) returns "urge"

"smiles".substring(1, 5) returns "mile"

**Parameters:**

beginIndex - the beginning index, inclusive.

endIndex - the ending index, exclusive.

**Returns:**

the specified substring.

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - if the beginIndex is negative, or endIndex is larger than the length of this String object, or beginIndex is larger than endIndex.

#### subSequence

* + - public [CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang) subSequence(int beginIndex,

int endIndex)

Returns a character sequence that is a subsequence of this sequence.

An invocation of this method of the form

str.subSequence(begin, end)

behaves in exactly the same way as the invocation

str.substring(begin, end)

**Specified by:**

[subSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html#subSequence-int-int-) in interface [CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang)

**API Note:**

This method is defined so that the String class can implement the [CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang) interface.

**Parameters:**

beginIndex - the begin index, inclusive.

endIndex - the end index, exclusive.

**Returns:**

the specified subsequence.

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - if beginIndex or endIndex is negative, if endIndex is greater than length(), or if beginIndex is greater than endIndex

**Since:**

1.4

#### concat

public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) concat([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) str)

Concatenates the specified string to the end of this string.

If the length of the argument string is 0, then this String object is returned. Otherwise, a String object is returned that represents a character sequence that is the concatenation of the character sequence represented by this String object and the character sequence represented by the argument string.

Examples:

"cares".concat("s") returns "caress"

"to".concat("get").concat("her") returns "together"

**Parameters:**

str - the String that is concatenated to the end of this String.

**Returns:**

a string that represents the concatenation of this object's characters followed by the string argument's characters.

#### replace

* + - public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) replace(char oldChar,

char newChar)

Returns a string resulting from replacing all occurrences of oldChar in this string with newChar.

If the character oldChar does not occur in the character sequence represented by this String object, then a reference to this String object is returned. Otherwise, a String object is returned that represents a character sequence identical to the character sequence represented by this String object, except that every occurrence of oldChar is replaced by an occurrence of newChar.

Examples:

"mesquite in your cellar".replace('e', 'o')

returns "mosquito in your collar"

"the war of baronets".replace('r', 'y')

returns "the way of bayonets"

"sparring with a purple porpoise".replace('p', 't')

returns "starring with a turtle tortoise"

"JonL".replace('q', 'x') returns "JonL" (no change)

**Parameters:**

oldChar - the old character.

newChar - the new character.

**Returns:**

a string derived from this string by replacing every occurrence of oldChar with newChar.

#### matches

public boolean matches([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) regex)

Tells whether or not this string matches the given [regular expression](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#sum).

An invocation of this method of the form *str*.matches(*regex*) yields exactly the same result as the expression

[Pattern](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html).[matches(*regex*, *str*)](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#matches-java.lang.String-java.lang.CharSequence-)

**Parameters:**

regex - the regular expression to which this string is to be matched

**Returns:**

true if, and only if, this string matches the given regular expression

**Throws:**

[PatternSyntaxException](https://docs.oracle.com/javase/8/docs/api/java/util/regex/PatternSyntaxException.html) - if the regular expression's syntax is invalid

**Since:**

1.4

**See Also:**

[Pattern](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html)

#### contains

public boolean contains([CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang) s)

Returns true if and only if this string contains the specified sequence of char values.

**Parameters:**

s - the sequence to search for

**Returns:**

true if this string contains s, false otherwise

**Since:**

1.5

#### replaceFirst

* + - public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) replaceFirst([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) regex,

[String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) replacement)

Replaces the first substring of this string that matches the given [regular expression](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#sum) with the given replacement.

An invocation of this method of the form *str*.replaceFirst(*regex*, *repl*) yields exactly the same result as the expression

[Pattern](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html).[compile](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#compile-java.lang.String-)(*regex*).[matcher](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#matcher-java.lang.CharSequence-)(*str*).[replaceFirst](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Matcher.html" \l "replaceFirst-java.lang.String-)(*repl*)

Note that backslashes (\) and dollar signs ($) in the replacement string may cause the results to be different than if it were being treated as a literal replacement string; see [Matcher.replaceFirst(java.lang.String)](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Matcher.html" \l "replaceFirst-java.lang.String-). Use [Matcher.quoteReplacement(java.lang.String)](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Matcher.html" \l "quoteReplacement-java.lang.String-) to suppress the special meaning of these characters, if desired.

**Parameters:**

regex - the regular expression to which this string is to be matched

replacement - the string to be substituted for the first match

**Returns:**

The resulting String

**Throws:**

[PatternSyntaxException](https://docs.oracle.com/javase/8/docs/api/java/util/regex/PatternSyntaxException.html) - if the regular expression's syntax is invalid

**Since:**

1.4

**See Also:**

[Pattern](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html)

#### replaceAll

* + - public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) replaceAll([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) regex,

[String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) replacement)

Replaces each substring of this string that matches the given [regular expression](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#sum) with the given replacement.

An invocation of this method of the form *str*.replaceAll(*regex*, *repl*) yields exactly the same result as the expression

[Pattern](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html).[compile](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#compile-java.lang.String-)(*regex*).[matcher](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#matcher-java.lang.CharSequence-)(*str*).[replaceAll](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Matcher.html" \l "replaceAll-java.lang.String-)(*repl*)

Note that backslashes (\) and dollar signs ($) in the replacement string may cause the results to be different than if it were being treated as a literal replacement string; see [Matcher.replaceAll](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Matcher.html" \l "replaceAll-java.lang.String-). Use [Matcher.quoteReplacement(java.lang.String)](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Matcher.html" \l "quoteReplacement-java.lang.String-) to suppress the special meaning of these characters, if desired.

**Parameters:**

regex - the regular expression to which this string is to be matched

replacement - the string to be substituted for each match

**Returns:**

The resulting String

**Throws:**

[PatternSyntaxException](https://docs.oracle.com/javase/8/docs/api/java/util/regex/PatternSyntaxException.html) - if the regular expression's syntax is invalid

**Since:**

1.4

**See Also:**

[Pattern](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html)

#### replace

* + - public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) replace([CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang) target,

[CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html) replacement)

Replaces each substring of this string that matches the literal target sequence with the specified literal replacement sequence. The replacement proceeds from the beginning of the string to the end, for example, replacing "aa" with "b" in the string "aaa" will result in "ba" rather than "ab".

**Parameters:**

target - The sequence of char values to be replaced

replacement - The replacement sequence of char values

**Returns:**

The resulting string

**Since:**

1.5

#### split

* + - public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html)[] split([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) regex,

int limit)

Splits this string around matches of the given [regular expression](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#sum).

The array returned by this method contains each substring of this string that is terminated by another substring that matches the given expression or is terminated by the end of the string. The substrings in the array are in the order in which they occur in this string. If the expression does not match any part of the input then the resulting array has just one element, namely this string.

When there is a positive-width match at the beginning of this string then an empty leading substring is included at the beginning of the resulting array. A zero-width match at the beginning however never produces such empty leading substring.

The limit parameter controls the number of times the pattern is applied and therefore affects the length of the resulting array. If the limit *n* is greater than zero then the pattern will be applied at most *n* - 1 times, the array's length will be no greater than *n*, and the array's last entry will contain all input beyond the last matched delimiter. If *n* is non-positive then the pattern will be applied as many times as possible and the array can have any length. If *n* is zero then the pattern will be applied as many times as possible, the array can have any length, and trailing empty strings will be discarded.

The string "boo:and:foo", for example, yields the following results with these parameters:

|  |  |  |
| --- | --- | --- |
| **Regex** | **Limit** | **Result** |
| : | 2 | { "boo", "and:foo" } |
| : | 5 | { "boo", "and", "foo" } |
| : | -2 | { "boo", "and", "foo" } |
| o | 5 | { "b", "", ":and:f", "", "" } |
| o | -2 | { "b", "", ":and:f", "", "" } |
| o | 0 | { "b", "", ":and:f" } |

An invocation of this method of the form *str.*split(*regex*, *n*) yields the same result as the expression

[Pattern](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html).[compile](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#compile-java.lang.String-)(*regex*).[split](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#split-java.lang.CharSequence-int-)(*str*, *n*)

**Parameters:**

regex - the delimiting regular expression

limit - the result threshold, as described above

**Returns:**

the array of strings computed by splitting this string around matches of the given regular expression

**Throws:**

[PatternSyntaxException](https://docs.oracle.com/javase/8/docs/api/java/util/regex/PatternSyntaxException.html) - if the regular expression's syntax is invalid

**Since:**

1.4

**See Also:**

[Pattern](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html)

#### split

public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html)[] split([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) regex)

Splits this string around matches of the given [regular expression](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html#sum).

This method works as if by invoking the two-argument [split](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#split-java.lang.String-int-) method with the given expression and a limit argument of zero. Trailing empty strings are therefore not included in the resulting array.

The string "boo:and:foo", for example, yields the following results with these expressions:

|  |  |
| --- | --- |
| **Regex** | **Result** |
| : | { "boo", "and", "foo" } |
| o | { "b", "", ":and:f" } |

**Parameters:**

regex - the delimiting regular expression

**Returns:**

the array of strings computed by splitting this string around matches of the given regular expression

**Throws:**

[PatternSyntaxException](https://docs.oracle.com/javase/8/docs/api/java/util/regex/PatternSyntaxException.html) - if the regular expression's syntax is invalid

**Since:**

1.4

**See Also:**

[Pattern](https://docs.oracle.com/javase/8/docs/api/java/util/regex/Pattern.html)

#### join

* + - public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) join([CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang) delimiter,

[CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html)... elements)

Returns a new String composed of copies of the CharSequence elements joined together with a copy of the specified delimiter.

For example,

String message = String.join("-", "Java", "is", "cool");

// message returned is: "Java-is-cool"

Note that if an element is null, then "null" is added.

**Parameters:**

delimiter - the delimiter that separates each element

elements - the elements to join together.

**Returns:**

a new String that is composed of the elements separated by the delimiter

**Throws:**

[NullPointerException](https://docs.oracle.com/javase/8/docs/api/java/lang/NullPointerException.html) - If delimiter or elements is null

**Since:**

1.8

**See Also:**

[StringJoiner](https://docs.oracle.com/javase/8/docs/api/java/util/StringJoiner.html)

#### join

* + - public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) join([CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang) delimiter,

[Iterable](https://docs.oracle.com/javase/8/docs/api/java/lang/Iterable.html)<? extends [CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html)> elements)

Returns a new String composed of copies of the CharSequence elements joined together with a copy of the specified delimiter.

For example,

List<String> strings = new LinkedList<>();

strings.add("Java");strings.add("is");

strings.add("cool");

String message = String.join(" ", strings);

//message returned is: "Java is cool"

Set<String> strings = new LinkedHashSet<>();

strings.add("Java"); strings.add("is");

strings.add("very"); strings.add("cool");

String message = String.join("-", strings);

//message returned is: "Java-is-very-cool"

Note that if an individual element is null, then "null" is added.

**Parameters:**

delimiter - a sequence of characters that is used to separate each of the elements in the resulting String

elements - an Iterable that will have its elements joined together.

**Returns:**

a new String that is composed from the elements argument

**Throws:**

[NullPointerException](https://docs.oracle.com/javase/8/docs/api/java/lang/NullPointerException.html) - If delimiter or elements is null

**Since:**

1.8

**See Also:**

[join(CharSequence,CharSequence...)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#join-java.lang.CharSequence-java.lang.CharSequence...-), [StringJoiner](https://docs.oracle.com/javase/8/docs/api/java/util/StringJoiner.html" \o "class in java.util)

#### toLowerCase

public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) toLowerCase([Locale](https://docs.oracle.com/javase/8/docs/api/java/util/Locale.html) locale)

Converts all of the characters in this String to lower case using the rules of the given Locale. Case mapping is based on the Unicode Standard version specified by the [Character](https://docs.oracle.com/javase/8/docs/api/java/lang/Character.html) class. Since case mappings are not always 1:1 char mappings, the resulting String may be a different length than the original String.

Examples of lowercase mappings are in the following table:

|  |  |  |  |
| --- | --- | --- | --- |
| **Language Code of Locale** | **Upper Case** | **Lower Case** | **Description** |
| tr (Turkish) | \u0130 | \u0069 | capital letter I with dot above -> small letter i |
| tr (Turkish) | \u0049 | \u0131 | capital letter I -> small letter dotless i |
| (all) | French Fries | french fries | lowercased all chars in String |
| (all) | capiotacapchi capthetacapupsil capsigma | iotachi thetaupsilon sigma | lowercased all chars in String |

**Parameters:**

locale - use the case transformation rules for this locale

**Returns:**

the String, converted to lowercase.

**Since:**

1.1

**See Also:**

[toLowerCase()](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#toLowerCase--), [toUpperCase()](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html" \l "toUpperCase--), [toUpperCase(Locale)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html" \l "toUpperCase-java.util.Locale-)

#### toLowerCase

public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) toLowerCase()

Converts all of the characters in this String to lower case using the rules of the default locale. This is equivalent to calling toLowerCase(Locale.getDefault()).

**Note:** This method is locale sensitive, and may produce unexpected results if used for strings that are intended to be interpreted locale independently. Examples are programming language identifiers, protocol keys, and HTML tags. For instance, "TITLE".toLowerCase() in a Turkish locale returns "t\u0131tle", where '\u0131' is the LATIN SMALL LETTER DOTLESS I character. To obtain correct results for locale insensitive strings, use toLowerCase(Locale.ROOT).

**Returns:**

the String, converted to lowercase.

**See Also:**

[toLowerCase(Locale)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#toLowerCase-java.util.Locale-)

#### toUpperCase

public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) toUpperCase([Locale](https://docs.oracle.com/javase/8/docs/api/java/util/Locale.html) locale)

Converts all of the characters in this String to upper case using the rules of the given Locale. Case mapping is based on the Unicode Standard version specified by the [Character](https://docs.oracle.com/javase/8/docs/api/java/lang/Character.html) class. Since case mappings are not always 1:1 char mappings, the resulting String may be a different length than the original String.

Examples of locale-sensitive and 1:M case mappings are in the following table.

|  |  |  |  |
| --- | --- | --- | --- |
| **Language Code of Locale** | **Lower Case** | **Upper Case** | **Description** |
| tr (Turkish) | \u0069 | \u0130 | small letter i -> capital letter I with dot above |
| tr (Turkish) | \u0131 | \u0049 | small letter dotless i -> capital letter I |
| (all) | \u00df | \u0053 \u0053 | small letter sharp s -> two letters: SS |
| (all) | Fahrvergnügen | FAHRVERGNÜGEN |  |

**Parameters:**

locale - use the case transformation rules for this locale

**Returns:**

the String, converted to uppercase.

**Since:**

1.1

**See Also:**

[toUpperCase()](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#toUpperCase--), [toLowerCase()](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html" \l "toLowerCase--), [toLowerCase(Locale)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html" \l "toLowerCase-java.util.Locale-)

#### toUpperCase

public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) toUpperCase()

Converts all of the characters in this String to upper case using the rules of the default locale. This method is equivalent to toUpperCase(Locale.getDefault()).

**Note:** This method is locale sensitive, and may produce unexpected results if used for strings that are intended to be interpreted locale independently. Examples are programming language identifiers, protocol keys, and HTML tags. For instance, "title".toUpperCase() in a Turkish locale returns "T\u0130TLE", where '\u0130' is the LATIN CAPITAL LETTER I WITH DOT ABOVE character. To obtain correct results for locale insensitive strings, use toUpperCase(Locale.ROOT).

**Returns:**

the String, converted to uppercase.

**See Also:**

[toUpperCase(Locale)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#toUpperCase-java.util.Locale-)

#### trim

public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) trim()

Returns a string whose value is this string, with any leading and trailing whitespace removed.

If this String object represents an empty character sequence, or the first and last characters of character sequence represented by this String object both have codes greater than '\u0020' (the space character), then a reference to this String object is returned.

Otherwise, if there is no character with a code greater than '\u0020' in the string, then a String object representing an empty string is returned.

Otherwise, let *k* be the index of the first character in the string whose code is greater than '\u0020', and let *m* be the index of the last character in the string whose code is greater than '\u0020'. A String object is returned, representing the substring of this string that begins with the character at index *k* and ends with the character at index *m*-that is, the result of this.substring(k, m + 1).

This method may be used to trim whitespace (as defined above) from the beginning and end of a string.

**Returns:**

A string whose value is this string, with any leading and trailing white space removed, or this string if it has no leading or trailing white space.

#### toString

public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) toString()

This object (which is already a string!) is itself returned.

**Specified by:**

[toString](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html#toString--) in interface [CharSequence](https://docs.oracle.com/javase/8/docs/api/java/lang/CharSequence.html" \o "interface in java.lang)

**Overrides:**

[toString](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html#toString--) in class [Object](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html)

**Returns:**

the string itself.

#### toCharArray

public char[] toCharArray()

Converts this string to a new character array.

**Returns:**

a newly allocated character array whose length is the length of this string and whose contents are initialized to contain the character sequence represented by this string.

#### format

* + - public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) format([String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) format,

[Object](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html)... args)

Returns a formatted string using the specified format string and arguments.

The locale always used is the one returned by [Locale.getDefault()](https://docs.oracle.com/javase/8/docs/api/java/util/Locale.html" \l "getDefault--).

**Parameters:**

format - A [format string](https://docs.oracle.com/javase/8/docs/api/java/util/Formatter.html#syntax)

args - Arguments referenced by the format specifiers in the format string. If there are more arguments than format specifiers, the extra arguments are ignored. The number of arguments is variable and may be zero. The maximum number of arguments is limited by the maximum dimension of a Java array as defined by The Java™ Virtual Machine Specification. The behaviour on a null argument depends on the [conversion](https://docs.oracle.com/javase/8/docs/api/java/util/Formatter.html#syntax).

**Returns:**

A formatted string

**Throws:**

[IllegalFormatException](https://docs.oracle.com/javase/8/docs/api/java/util/IllegalFormatException.html) - If a format string contains an illegal syntax, a format specifier that is incompatible with the given arguments, insufficient arguments given the format string, or other illegal conditions. For specification of all possible formatting errors, see the [Details](https://docs.oracle.com/javase/8/docs/api/java/util/Formatter.html#detail) section of the formatter class specification.

**Since:**

1.5

**See Also:**

[Formatter](https://docs.oracle.com/javase/8/docs/api/java/util/Formatter.html)

#### format

* + - public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) format([Locale](https://docs.oracle.com/javase/8/docs/api/java/util/Locale.html) l,
    - [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) format,

[Object](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html)... args)

Returns a formatted string using the specified locale, format string, and arguments.

**Parameters:**

l - The [locale](https://docs.oracle.com/javase/8/docs/api/java/util/Locale.html) to apply during formatting. If l is null then no localization is applied.

format - A [format string](https://docs.oracle.com/javase/8/docs/api/java/util/Formatter.html#syntax)

args - Arguments referenced by the format specifiers in the format string. If there are more arguments than format specifiers, the extra arguments are ignored. The number of arguments is variable and may be zero. The maximum number of arguments is limited by the maximum dimension of a Java array as defined by The Java™ Virtual Machine Specification. The behaviour on a null argument depends on the [conversion](https://docs.oracle.com/javase/8/docs/api/java/util/Formatter.html#syntax).

**Returns:**

A formatted string

**Throws:**

[IllegalFormatException](https://docs.oracle.com/javase/8/docs/api/java/util/IllegalFormatException.html) - If a format string contains an illegal syntax, a format specifier that is incompatible with the given arguments, insufficient arguments given the format string, or other illegal conditions. For specification of all possible formatting errors, see the [Details](https://docs.oracle.com/javase/8/docs/api/java/util/Formatter.html#detail) section of the formatter class specification

**Since:**

1.5

**See Also:**

[Formatter](https://docs.oracle.com/javase/8/docs/api/java/util/Formatter.html)

#### valueOf

public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) valueOf([Object](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html) obj)

Returns the string representation of the Object argument.

**Parameters:**

obj - an Object.

**Returns:**

if the argument is null, then a string equal to "null"; otherwise, the value of obj.toString() is returned.

**See Also:**

[Object.toString()](https://docs.oracle.com/javase/8/docs/api/java/lang/Object.html#toString--)

#### valueOf

public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) valueOf(char[] data)

Returns the string representation of the char array argument. The contents of the character array are copied; subsequent modification of the character array does not affect the returned string.

**Parameters:**

data - the character array.

**Returns:**

a String that contains the characters of the character array.

#### valueOf

* + - public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) valueOf(char[] data,
    - int offset,

int count)

Returns the string representation of a specific subarray of the char array argument.

The offset argument is the index of the first character of the subarray. The count argument specifies the length of the subarray. The contents of the subarray are copied; subsequent modification of the character array does not affect the returned string.

**Parameters:**

data - the character array.

offset - initial offset of the subarray.

count - length of the subarray.

**Returns:**

a String that contains the characters of the specified subarray of the character array.

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - if offset is negative, or count is negative, or offset+count is larger than data.length.

#### copyValueOf

* + - public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) copyValueOf(char[] data,
    - int offset,

int count)

Equivalent to [valueOf(char[], int, int)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#valueOf-char:A-int-int-).

**Parameters:**

data - the character array.

offset - initial offset of the subarray.

count - length of the subarray.

**Returns:**

a String that contains the characters of the specified subarray of the character array.

**Throws:**

[IndexOutOfBoundsException](https://docs.oracle.com/javase/8/docs/api/java/lang/IndexOutOfBoundsException.html) - if offset is negative, or count is negative, or offset+count is larger than data.length.

#### copyValueOf

public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) copyValueOf(char[] data)

Equivalent to [valueOf(char[])](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html" \l "valueOf-char:A-).

**Parameters:**

data - the character array.

**Returns:**

a String that contains the characters of the character array.

#### valueOf

public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) valueOf(boolean b)

Returns the string representation of the boolean argument.

**Parameters:**

b - a boolean.

**Returns:**

if the argument is true, a string equal to "true" is returned; otherwise, a string equal to "false" is returned.

#### valueOf

public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) valueOf(char c)

Returns the string representation of the char argument.

**Parameters:**

c - a char.

**Returns:**

a string of length 1 containing as its single character the argument c.

#### valueOf

public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) valueOf(int i)

Returns the string representation of the int argument.

The representation is exactly the one returned by the Integer.toString method of one argument.

**Parameters:**

i - an int.

**Returns:**

a string representation of the int argument.

**See Also:**

[Integer.toString(int, int)](https://docs.oracle.com/javase/8/docs/api/java/lang/Integer.html#toString-int-int-)

#### valueOf

public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) valueOf(long l)

Returns the string representation of the long argument.

The representation is exactly the one returned by the Long.toString method of one argument.

**Parameters:**

l - a long.

**Returns:**

a string representation of the long argument.

**See Also:**

[Long.toString(long)](https://docs.oracle.com/javase/8/docs/api/java/lang/Long.html#toString-long-)

#### valueOf

public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) valueOf(float f)

Returns the string representation of the float argument.

The representation is exactly the one returned by the Float.toString method of one argument.

**Parameters:**

f - a float.

**Returns:**

a string representation of the float argument.

**See Also:**

[Float.toString(float)](https://docs.oracle.com/javase/8/docs/api/java/lang/Float.html#toString-float-)

#### valueOf

public static [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) valueOf(double d)

Returns the string representation of the double argument.

The representation is exactly the one returned by the Double.toString method of one argument.

**Parameters:**

d - a double.

**Returns:**

a string representation of the double argument.

**See Also:**

[Double.toString(double)](https://docs.oracle.com/javase/8/docs/api/java/lang/Double.html#toString-double-)

#### intern

public [String](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html) intern()

Returns a canonical representation for the string object.

A pool of strings, initially empty, is maintained privately by the class String.

When the intern method is invoked, if the pool already contains a string equal to this String object as determined by the [equals(Object)](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#equals-java.lang.Object-) method, then the string from the pool is returned. Otherwise, this String object is added to the pool and a reference to this String object is returned.

It follows that for any two strings s and t, s.intern() == t.intern() is true if and only if s.equals(t) is true.

All literal strings and string-valued constant expressions are interned. String literals are defined in section 3.10.5 of the The Java™ Language Specification.

**Returns:**

a string that has the same contents as this string, but is guaranteed to be from a pool of unique strings.

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* [**NEXT CLASS**](https://docs.oracle.com/javase/8/docs/api/java/lang/StringBuffer.html)
* [FRAMES](https://docs.oracle.com/javase/8/docs/api/index.html?java/lang/String.html)
* [NO FRAMES](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html)
* [ALL CLASSES](https://docs.oracle.com/javase/8/docs/api/allclasses-noframe.html)
* SUMMARY:
* NESTED |
* [FIELD](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#field.summary) |
* [CONSTR](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#constructor.summary) |
* [METHOD](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#method.summary)
* DETAIL:
* [FIELD](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#field.detail) |
* [CONSTR](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#constructor.detail) |
* [METHOD](https://docs.oracle.com/javase/8/docs/api/java/lang/String.html#method.detail)

[Submit a bug or feature](http://bugreport.sun.com/bugreport/)  
For further API reference and developer documentation, see [Java SE Documentation](https://docs.oracle.com/javase/8/docs/index.html). That documentation contains more detailed, developer-targeted descriptions, with conceptual overviews, definitions of terms, workarounds, and working code examples.  
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