

Difference Between String StringBuffer and StringBuilder in Java

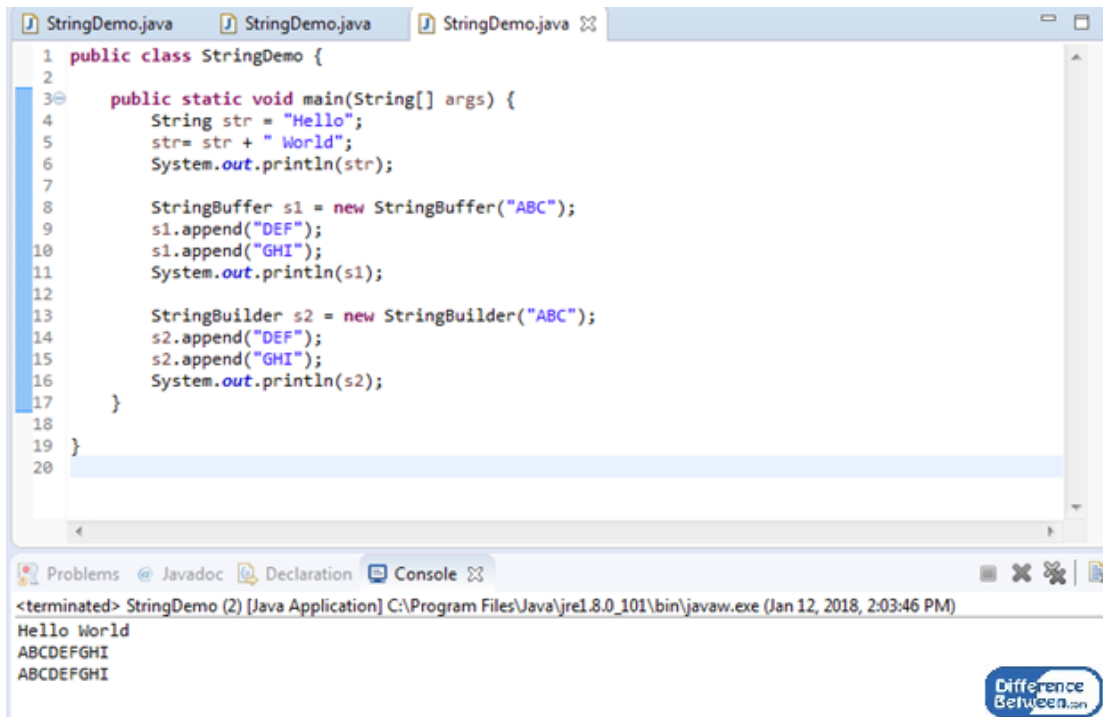
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Key Difference - String StringBuffer vs StringBuilder in Java

String, StringBuffer and String Builder are classes in [Java](#). String is widely used in Java programming. Once an [object](#) of String is created, it is not possible to change them. Each time a change occurs to the String, it creates a new String. Even if it is a concatenation to an existing String it creates a new String. This causes memory wastage. StringBuffer and StringBuilder classes in Java are used to modify String. The **key difference** between String, StringBuffer and StringBuilder in Java is that **String is a class to create an object of type String that is a sequence of characters, StringBuffer is a class that is used to modify Strings that provides thread safety, and StringBuilder is a class that is used to modify Strings that do not provide thread safety.**

What is String in Java?

String class is in java.lang package. Each time the programmer creates a String, it is an object of type String. Strings are immutable meaning once the object is created, it cannot be changed. Objects created using wrapper classes such as [Integer](#), [Byte](#), Float, Double are also immutable. A string literal is enclosed in double quotes. e.g. "Hello World". Each time a string literal created, the Java Virtual Machine (JVM) checks the String constant pool. If the String exists, a reference to the String constant pool is returned. If it is a new String, that object is created in the String constant pool.



```
1 public class StringDemo {
2
3     public static void main(String[] args) {
4         String str = "Hello";
5         str = str + " World";
6         System.out.println(str);
7
8         StringBuffer s1 = new StringBuffer("ABC");
9         s1.append("DEF");
10        s1.append("GHI");
11        System.out.println(s1);
12
13        StringBuilder s2 = new StringBuilder("ABC");
14        s2.append("DEF");
15        s2.append("GHI");
16        System.out.println(s2);
17    }
18
19 }
20
```

Problems Javadoc Declaration Console

<terminated> StringDemo (2) [Java Application] C:\Program Files\Java\jre1.8.0_101\bin\javaw.exe (Jan 12, 2018, 2:03:46 PM)

Hello World
ABCDEFghi
ABCDEFghi

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Figure 01: Java program using String, StringBuffer and StringBuilder

Refer the below piece of code.

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

```
s1 = s1 + "World";
```

```
System.out.println(s1);
```

In the first statement, s1 is referring to the "Hello" in the String constant pool. In the second statement, JVM does not change the existing String. Instead, it creates a new String as "Hello World" and s1 is now referring to that new String. The exiting "Hello" object still exists in the String constant pool.

If there is a code which is,

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

```
String s2 = s1;
```

s1, s2 both will be referring to the String object "Hello".

What is StringBuffer in Java?

StringBuffer class is used to make String objects mutable. Therefore, those objects can be modified. StringBuffer defined four constructors. StringBuffer(), StringBuffer(int size), StringBuffer(String str), StringBuffer (charSequence [] ch)

Refer the code below,

```
StringBuffer s1= new StringBuffer("Hello");
```

```
s1.append("World");
```

```
System.out.println(s1);
```

In statement 1, s1 is referring to the "Hello" object in a heap. The object is mutable because it is created using StringBuffer. In statement 2, "World" is appended to the same "Hello" String object.

String objects created with StringBuffer class can save memory. StringBuffer provides thread safety because two threads cannot access the same method in the StringBuffer class simultaneously. Thread safety decrease StringBuffer performance. StringBuffer class contain methods such as append(), insert(), reverse(), replace().

What is StringBuilder in Java?

StringBuilder class is used to make String objects mutable. Therefore, those objects can be modified. The functionality is similar to StringBuffer, but this does not provide thread safety. StringBuilder has constructors such as StringBuilder(), StringBuilder(int size), StringBuilder(String str).

Refer the below code.

```
StringBuilder s1 = new StringBuilder("Hello");
```

```
s1.append("World");
```

```
System.out.println(s1);
```

In statement 1, s1 is referring to the "Hello" object in a heap. The object is mutable because it is created using StringBuilder. In statement 2, "World" is appended to the same "Hello" String object. There is no creation of completely new String object.

String objects created with StringBuilder class can save memory. Unlike in StringBuffer, StringBuilder does not provide thread safety because two threads can access the same method in the StringBuilder class simultaneously. StringBuilder class contain methods such as append(), insert(), reverse(), replace().

What is the Similarity Between String StringBuffer and StringBuilder in Java?

- All can be used to create Strings.

What is the Difference Between String StringBuffer and StringBuilder in Java?

String vs StringBuffer vs StringBuilder	
String	The string is a Java class which is used to create an object of type String which is a sequence of characters.
StringBuffer	StringBuffer is a Java class that is used to create String objects which can be modified with thread safety.
StringBuilder	StringBuilder is a class that is used to create string objects which can be modified without thread safety.
Mutability	
String	The string is an immutable class.
StringBuffer	StringBuffer is a mutable class.
StringBuilder	StringBuilder is a mutable class.
Thread Safety	
String	Methods of String are thread safe.
StringBuffer	Methods of StringBuffer are thread-safe and synchronized.
StringBuilder	Methods of StringBuilder are not threaded safe and not synchronized.
Performance	
String	The string is fast.
StringBuffer	StringBuffer is slow.
StringBuilder	StringBuilder is fast.

Summary - String StringBuffer vs StringBuilder in Java

String, StringBuffer and StringBuilder appear to be the same, but they have different meanings. All of these are Java classes. The difference between String, StringBuffer and StringBuilder in Java is that, String is class to create an object of type String which is a set of characters, StringBuffer is a class that is used to modify Strings and provide thread safety, while StringBuilder is a class that is used to modify Strings which does not provide thread safety.

Reference:

1. "String vs StringBuffer vs StringBuilder." JournalDev, 30 July 2017. [Available here](#)
2. "Java Hungry." Difference Between String , StringBuilder and StringBuffer Classes with Example : Java | Java Hungry. [Available here](#)
3. tutorialspoint.com. "Java Strings." [The Point](#). [Available here](#)

How to Cite this Article?

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