# TEACHER’s guide

# Strings

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**OBJECTIVES:** The student will use the standard Java String class to solve string-processing problems.

The student will understand what an immutable object is.

The student will understand the difference between a char and a string.

The student will be able to use a variety of methods from the String class.

The student will understand what object references are.

The student will understand the null value.

**ACTIVITIES/TIME:** Two Weeks

**MATERIALS:** Student Lesson A10: *Strings*

Worksheet A10.1, *String Review*

Worksheet A10.2, *Objects and Object References*

Lab Assignment A10.1, *StringUtil*

Lab Assignment A10.2, *CarRental*

Lab Assignment A10.3, *RomanNumerals*

Teacher’s Guide, Lesson A10: *Strings*

Worksheet A10.1, *Answer Sheet*

Worksheet A10.2, *Answer Sheet*

Lab Assignment A10.1, Answers, *StringUtil.java*

Lab Assignment A10.2, Answers, *CarRental.java*

Lab Assignment A10.3, Answers, *RomanNumerals.java*

Quiz A10

Quiz A10 – *Answer Sheet*

**REFERENCES:**

**INSTRUCTOR**

**NOTES:** Java contains a built in String class. String processing should focus on using strings to solve problems, and not how Java implements Strings.

Java Strings have a few special properties that the Student Lesson covers. The concatenation operator is quite useful and automatically converts expressions to a string if any expression to the left or right of the + operator is a string.

String objects are reference types. They contain an address. The == operator checks to see if the addresses are the same. To compare the strings themselves you must use one of the comparison methods: equals, equalsIgnoreCase, compareTo.

It is very important to completely cover the shortcuts allowed in Strings. This is another good time to review how objects really work; hence the section on object references.

The String class is immutable. This means there is no method in the String class that can modify the original string. This sounds more restrictive than it actually is. For example, to change a String sentence to uppercase, you can use

sentence = sentence.toUpper()

This creates a new object containing the uppercase characters and changes the variable, sentence, to reference the new object. The old object is still in memory but it is now garbage and the Java garbage collector will take care of it automatically.

The lab assignments are a lot of fun for the students. You are encouraged to add other string processing questions to the lab. Lab Assignment A10.3, *RomanNumerals* might be challenging for some.

Quiz A10 covers String manipulation.

**WORKSHEET**

**NOTES:** Worksheet A10.1, *String Review* gives the students practice on different methods of the String class. It is tedious having all these methods on one page; however, students need to see examples of how they can be used. In practice, students will rarely use all these methods for one application.

Worksheet A10.2, *Objects and Object References* is a great review to ensure proper understanding of the material.