Lesson 8: Comparing Strings

45 minutes

Overview

How can I determine if a list of `String`s are in alphabetical order?

Students explore the functionality of the `compareTo()` method then write an algorithm to sort a list of `String`s in alphabetical order. Students implement their algorithms in Java and practice using the `compareTo()` method to determine if one `String` comes before another and to sort a list of `String`s in alphabetical order.

Standards

Full Course Alignment

CSA Conceptual Framework

▶ **VAR-1** - To find specific solutions to generalizable problems, programmers include variables in their code so that the same algorithm runs using different input values

Agenda

Warm Up (10 minutes)
  CS Pyramid

Activity (30 minutes)
  Comparing Strings
  Sorting Strings

Wrap Up (5 minutes)
  Software Engineering Skills
  Assessment: Check for Understanding
  AP Classroom Topic Questions

Objectives

Students will be able to:

- Implement algorithms using the `compareTo()` method in the `String` class

Preparation

- Check the **Teacher's Lounge** for verified teachers on the CSA Forum to find additional strategies or resources shared by fellow teachers

Links

Heads Up! Please make a copy of any documents you plan to share with students.

For the students

- **U6L8 Extra Practice** - Handout

Vocabulary

- **Lexicographical Order** - Placing words in alphabetical order

Teaching Guide

Warm Up (10 minutes)

CS Pyramid

🎤 *Remarks*

> We have learned a lot of new terms so far! Let's review some of these terms through a game of CS Pyramid.

Group: Place students in pairs.

Do This: Review the instructions for playing CS Pyramid.

Do This: Play the music clip to cue the CS Pyramid activity, and direct students to play CS Pyramid. Click through the animated slide to display each pyramid, and direct students to switch roles with each new pyramid.

Activity (30 minutes)

Comparing Strings (10 minutes)

Remarks

> The `String` class has a `compareTo()` method for comparing two `String`s. Let's take a look at how it works.

Do This: Review the lesson objectives.

Group: Place students in pairs.

Do This: Direct students to Level 1 on Code Studio to investigate the program with a partner. Students make the changes to the program as prompted.

1 **Investigate: Comparing Strings**

Discuss: Click through the animated slide to display the prompts.

- *What do you notice about the code in this program?*
- *What do you wonder about the code in this program?*

Discussion Goal: Students note that the `compareTo()` method returns a numerical value. Students also notice that the number correlates with whether the `String` comes before or after the other `String`. Students may wonder why the method doesn't return a `boolean` value instead of a number.

Do This: Define *lexicographical order*.

Do This: Click through the animated slide to demonstrate the `compareTo()` method.

Sorting Strings (20 minutes)

Remarks

> The `compareTo()` method is useful for when we need to sort a list of `String`s in lexicographical order. In natural language processing programs and devices, software engineers often need to organize text to make it easier to work with in their programs.

Group: Place students in pairs.

Do This: Have students write pseudocode to sort a list of `String`s in lexicographical order.

Do This: Direct students to Level 2 on Code Studio to complete Levels 2 and 3. Students complete a Check for Understanding, then continue to Level 3 to implement their algorithm. On Level 4, students complete a choice level to use the `compareTo()` method.

2-4 **Sorting Strings**

2 ✓ 3 4

Wrap Up (5 minutes)

Software Engineering Skills

Remarks

> You have made a lot of progress in developing your software engineering skills. We have seen how these skills are useful to solve a variety of problems and create programs like what we have used in our daily lives.

Discuss: Click through the animated slide to display the prompts.

- *How has your perception of software engineering changed in this unit?*
- *How have your software engineering skills improved in this unit?*

Discussion Goal: Students share how their perception of software engineering has changed, including how computer science influences different industries and decisions. Students identify the software engineering skills and characteristics they feel they improved in this unit.

Do This: Review the concepts covered in this lesson.

Display: Key Vocabulary

Assessment: Check for Understanding

Check For Understanding Question(s) and solutions can be found in each lesson on Code Studio. These questions can be used for an exit ticket.

5 ✓ **Check for Understanding**

AP Classroom Topic Questions

To assign questions from the AP Classroom Question Bank that align with this lesson, create a custom quiz in AP Classroom by searching the Question Bank for the Essential Knowledge statements listed at the top of this lesson plan. You can find instructions and video demonstrations to do this on **AP Central**.

The following Topic Questions in AP Classroom can be assigned as a formative assessment for this lesson:

- Topic Questions 2.7

Note: *Some Learning Objectives and Essential Knowledge statements in the suggested Topic Questions are covered in later units.*