

CSCI-101 Programming 1

Lab 10, Part b - Week of November 7

INSTRUCTIONS

Inside your **labs** directory create a file named **Lab10b.java**.

Inside the **CharacterArrayList.java** file add the following methods:

1. Methods (all non-static)
 - a. A method named **add** that has two parameters. The first parameter is named **index** and holds an integer and the second parameter is named **c** and holds a character. The method inserts **c** in the array at the index specified in **index** if the value in **index** is a valid index in the array. Otherwise the method throws an **IndexOutOfBoundsException**.
 - b. A method named **remove** that has a single parameter named **index** which holds an integer. If the value in **index** is a valid index in the array then the method replaces the character at the position specified in **index** with the null character and returns the character that was replaced. If the value in **index** is not a valid index in the array the method throws an **IndexOutOfBoundsException**.
 - c. A method named **remove** that has a single parameter named **c** which holds a character. If the character in **c** exists in the array, then the method replaces the first occurrence of the character in **c** with the null character and returns **true**. Otherwise the method returns **false**.

In the **main** method in **Lab10b.java** do the following.

- I. Initialize a Scanner that can read from the keyboard.
- II. Create an instance of the **CharacterArrayList** class that can hold 10 elements.
- III. In a do-while loop (while choice is not 4) do the following:
 - a. Print the following menu
 1. Add character at index
 2. Remove from index
 3. Remove first instance
 4. Exit
 - b. Ask the user to choose a menu option
 - c. Read in the user's choice
 - d. Create a switch statement that does the following:
 - i. If the user enters **1**, ask the user for a character and an integer, read the data from the keyboard, and attempt to add the specified character to the specified index in the array using the **add** method (1A).

- ii. If the user enters **2**, ask the user for an integer, read the data from the keyboard, attempt to remove the character at the specified index using the **remove** method (1B), and print to the screen the character returned from the **remove** method.
- iii. If the user enters **3**, ask the user for a character, read the data from the keyboard, attempt to remove the first instance of the character in the array using the **remove** method (1C), and print the value returned from the **remove** method.

Testing: After writing and compiling the code in main, run **Lab10b** repeatedly until you are absolutely sure that the methods that were added to **CharacterArrayList** were implemented correctly.