CIS 044:   
Introduction to Data Structures Using Java

Lab 3

**Instructor**

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**Guidelines**

**Please follow the guidelines below:**

**Submit the homework and lab solutions in the drop box. For a programming question, submit a .java file (for source code) and a .txt file for program output. If the problem involves other questions, submit a separate .txt file to answer the question.**

P1 (40 points)

Consider strings that can be split so that their first half is the same as their second half (ignoring blanks, punctuation, and case). For example, the string "booboo" can be split into "boo" and "boo". Another example is "hello, hello". After ignoring blanks and the comma, the two halves of the string are the same. However, the string "rattan" has unequal halves, as does the string "abcab". Add a method

**public static boolean check(String s)**

to the class Array Queue (your function must be in the file **ArrayQueue.java)**  that returns true when s has the property above and false otherwise. **You must use methods from QueueInterface.java** and **ArrayQueue.java**. Do not use stacks or recursion.

P2 (60 points)

Part 1 - In this problem, we will add new methods to the class ArrayQueue

Suppose that we want to add a method to a class of queues that will splice two queues together. This method adds to the end of a queue all items that are in a second queue (making the second queue empty). The header of the method could be as follows:

**public void splice(QueueInterface<T> anotherQueue)**

Write this method for the class ArrayQueue

Part 2 - Add the method

**public boolean enqueueNoDuplicate(T item)**

which adds **item** if it is not already in the queue. If item is already present, no change to the queue takes place and the method returns false. Otherwise, the method returns true.