CS 340 Fall 2021
Programming Quiz 1
Due 11:59 PM Friday September 17
Implement the public method `removeRepeatsI`, the private method `removeRepeatsR` and the `toString` method in the Q1 class.

The remove methods remove repeats in the list. **A repeat is a value in position n+1 in the list that matches the value in position n.**

`removeRepeatsI` **must be an iterative solution**

`removeRepeatsR` **must be a recursive solution**

I will use the main method to test your solutions. Do not change any methods or instance variables except the body of `toString`, `removeRepeatsI` and the body the private method `removeRepeatsR`. Do not add any instance variables or instance methods.
import java.io.*;
import java.util.*;

public class Q1 {
    //Implements a singly linked list of Strings

    private class Node {
        private String data;
        private Node next;
        private Node(String d, Node n) {
            data = d;
            next = n;
        }
    }

    private Node head;

    public Q1() {
        head = null; //no sentinel node
    }
}
public Q1(String s[]) {
    //PRE: s.length > 0
    head = new Node(s[0], null);
    Node temp = head;
    for (int i = 1; i < s.length; i++) {
        temp.next = new Node(s[i], null);
        temp = temp.next;
    }
}

public boolean empty() {
    return head == null;
}

public String toString() {
    //return the string representation of the list.
    //The string representation should be a [ followed by the list elements
    //separated by commas, followed by a ]. The string for the empty list is [ ]
    }
}
public void removeRepeatsI() {
//Iterative method to removes repeats
}

public void removeRepeatsR() {
//Recursive method to removes repeats
    if (head == null) return;
    head = removeRepeatsR(null, head);
}

private Node removeRepeatsR(String s, Node h) {
//Recursive method to removes repeats in the list beginning at Node h
//s is the data in the node immediately preceding h or
//s is null if h == head
}
public static void main(String args[]) {
    //Assume args.length >= 1
    Q1 list1;
    Q1 list2;
    list1 = new Q1();
    System.out.println("\n\nO: "+list1);
    list1.removeRepeatsI();
    System.out.println("I: "+list1);
    list1.removeRepeatsR();
    System.out.println("R: "+list1);
    for (String s : args) {
        list1 = new Q1(s.split(",")));
        list2 = new Q1(s.split(",")));
        System.out.println("\n\nO: "+list1);
        list1.removeRepeatsI();
        list2.removeRepeatsR();
        System.out.println("I: "+list1);
        System.out.println("R: "+list2);
    }
}
Programming Quiz 1 Example Output

0: []
I: []
R: []

0: [5,5,1,1,1,1,2,2,2,3,4,3,4,4,5,5,5]
I: [5,1,2,3,4,3,4,5]
R: [5,1,2,3,4,3,4,5]

0: [7,7,7,7,7]
I: [7]
R: [7]

0: [1,2,3,4,5]
I: [1,2,3,4,5]
R: [1,2,3,4,5]
Quiz 1 Submission

• Upload one zip file to Canvas. The zip file must contain only one file called Q1.java. Do not upload your whole Eclipse project!