

Programming Assignment 3 - Linked Lists

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Due Monday by 11:59pm **Points** 100 **Submitting** a file upload
File Types java and cs **Available** Apr 28 at 7:30pm - Jun 18 at 11:59pm about 2 months

Introduction

For this assignment you will be building upon an implementation a singly linked list. A skeletal implementation of a singly linked list is provided as a starting point for the assignment. It was derived from code taken from the text, "Starting out with Java: from control structures through data structures", 3rd edition, Tony Gaddis and Godfrey Muganda.

The Modifications

Add the following methods to LinkedList:

```
// return true if the String 'e' is in the list
public boolean contains( String e );

// sort the list using a recursive merge sort
public void mergeSort();

// Remove the duplicates from a sorted list
public void removeDuplicates();

// compute the intersection and return its reference, of the linked list
// specified by the incoming parameter and the list referenced by 'this'
public LinkedList intersect( LinkedList list );

// compute the union and return its reference, of the linked list
// specified by the incoming parameter and the list referenced by 'this'
public LinkedList union( LinkedList list );
```

Do NOT put a "public static void main()" in LinkedList.java. Include an additional file in your project that contains method main. Include enough tests in method main() to demonstrate that all the requirements of the assignment have been met.

Hint

The intersect and union methods are set operations. Recall that a set does not have duplicates. The lists that result from the computations should contain no duplicates.

Extra Credit

Extra credit will be given to solutions that are the most efficient with respect to execution time and memory usage. However, in order for a submission to be considered for extra credit, all of the requirements of the assignment must be met.

What to Upload to Canvas

When you are finished with the assignment, upload the source files only to Canvas. There should be two files to your submission; the modified `LinkedList.java`, and an additional file with a method `main` that uses the class `LinkedList`.