

Computer Science Department/College of Engineering and Computer Science

CSc 20: Programming Concepts and Methodology II

Lab 6 - Linear Linked List

Objective:

This lab will give you a practice with writing a linear linked list. To this work, you are building a list of any object. However, for testing, your list data element would be **CsusStudent** (from your previous lab). You will use your debugger to examine your list.

Preparation: (at home)

Read course book's Building Java Programs book, 4th edition, Chapter 16 (sections 1,2, and 3).

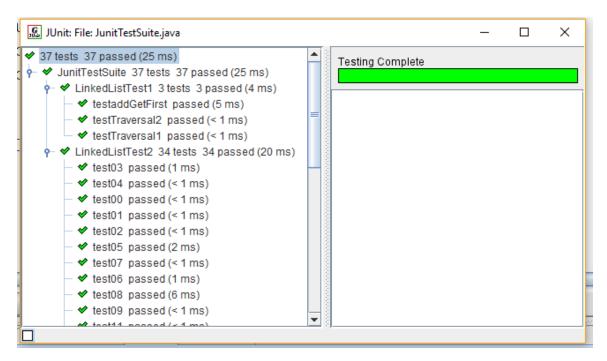
Lab work (in school laboratory):

This lab's objective is to develop methods (see attached diagram) for a linear linked list. The algorithms for these methods will be discussed in your lecture. You are given the following UML class diagram:

Class LinkedList private head : Node private current: Node size: int insertBefore(o) - Add an object o before the current position. insertAfter(o) - Add an object o after the current position. remove(o) - Object o is removed from the list. currentData() - Return the current object's data. size() - Return the number of objects on the list. forward() - Move the current position forward one position. backward() - Move the current position backward one position. resetCurrent() - Reset the current position at the first element. addFirst() - Add object to the first of the list addLast() - Add object to the last of the list getFirst() - Get first object getLast() - Get last object removeFirst() - Remove first object removeLast() - Remove last object

Activities:

- 1. Copy instructor's class (LinkedList.java) from Canvas into your working directory. Please also ensure that your previous lab's **CsusStudent.java** is the same directory.
- 2. Provide the pre-condition(s) and post-condition(s) as comment block to each method.
- 3. Develop your program according the pseudo code given in your lecture.
- 4. Test your program by running its main method.
- 5. Run JunitTestSuite test program. This suite will, in turn, run 2 sample of your instructor's unit tests LinkedListTest1.java and LinkedListTest2.java to validate your work. Please ensure all files: JunitTestSuite.java, LinkedListTest1.java and LinkedListTest2.java are resided in the same directory as your LinkedList.java. Show your test results to your instructor before turning your lab to Canvas. Here is a sample of a run of JunitTestSuite:



Deliverables:

Turn in your modified LinkedList.java including (1) Pre/Post conditions and (2) your programs's Junit test output file in PDF format to Canvas.

Demo your work, including the execution of JunitTestSuite, to the instructor and obtain sign-off note.