

# CS II: Data Structures

## Pre-lab 3

Consider the sentinel linked list implementation below.

```
class SLinkedList {
    private ListNode header;

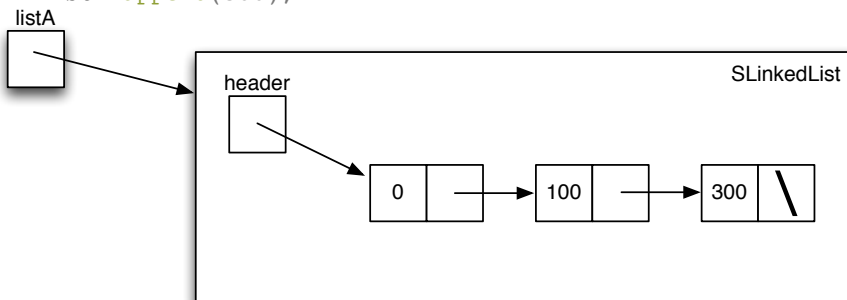
    public SLinkedList() {
        // empty list is just the header ListNode
        header = new ListNode(0);
    }

    public void insertFirst(int d) {
        ListNode n = new ListNode(d); //a
        ListNode first = header.next; //b
        header.next = n;               //c
        n.next = first;                //d
    }

    private class ListNode {
        int data;
        ListNode next;
        ListNode(int d) {
            data = d;
            next = null;
        }
    }
}
```

1. Suppose we have a SLinkedList constructed in the following way.

```
SLinkedList listA = new SLinkedList();
listA.append(100);
listA.append(300);
```



Then we run the following code.

```
listA.insertFirst(12);
```

Draw the boxes-and-arrow diagram after each line of insertFirst runs. You should have 4 diagrams: a,b,c, d. You must include each variable (i.e., d, n, first) once it is introduced.

**Turn your answers to #1 as paper to your TA at the beginning of section**

2. Follow the directions below to prepare for the lab exercises.
  - i. Download the code for Lab 3  
[http://homepage.cs.uiowa.edu/~bdmyers/cs2230\\_fa17//public/labs/WK3/lab3.zip](http://homepage.cs.uiowa.edu/~bdmyers/cs2230_fa17//public/labs/WK3/lab3.zip)
  - ii. In NetBeans: File | Import Project | From zip...
  - iii. You should now see the project in NetBeans with the name Lab3\_dist
  - iv. Open SLinkedList.java in the NetBeans editor (the file is under src/list in the project).  
You'll notice that there is a red underline indicating an error.

```
public class SLinkedList implements List {
```

Fix this error with **as little code as possible**. By "as little code as possible", we mean if you add a method don't bother filling in the method body.

- v. Now you are ready to test the SLinkedList class. Watch this short video for a primer on running tests and debugging programs.

"Getting started with JUnit in NetBeans"

<https://uiowa.instructure.com/courses/64804/modules/items/1512480>

- vi. Now run the tests yourself. Right-click on SLinkedList.java and choose Test File. You should see the following output.

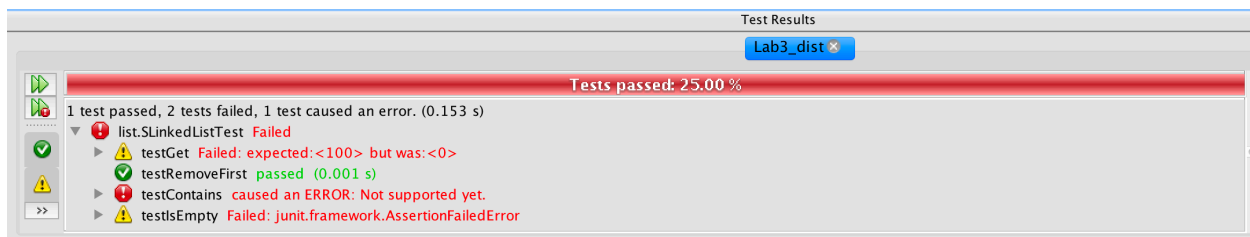


Image alt text: the JUnit window is shown with testGet, testContains, testEmpty failing and testRemoveFirst passing.

This is the end of the pre-lab. During this week's section you will work on fixing SLinkedList.java to make more tests pass.