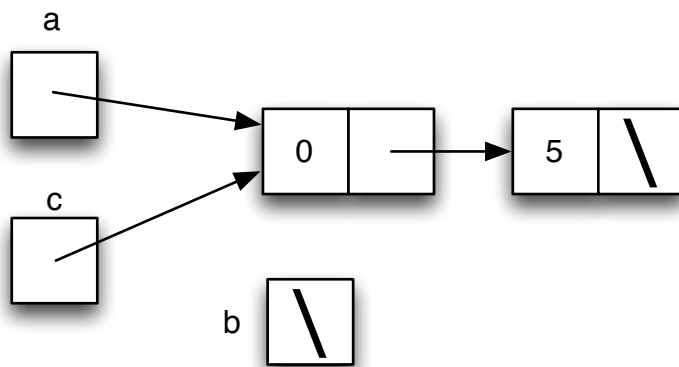# CS II: Data Structures, Pre-lab 3

Q1) Assume the following code for a ListNode:

```java
public class ListNode {
    private int data;
    private ListNode next;

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

Now consider the following diagram of ListNodes and variables. Write some lines of code that will produce the following diagram.

Your answer:

Q2)
Consider the linked list implementation below.

```java
class ListNode {
    private int data;
    private ListNode next;

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

    // insert d at the end of the list
    public void add(int d) {
        /* implementation omitted */
    }

    // insert d as the second element in the list
    public void insertSecond(int d) {
                                            //a
        ListNode n = new ListNode(d);       //b
        ListNode oldSecond = this.next;     //c
        this.next = n;                      //d
        n.next = oldSecond;                 //e
    }
}
```
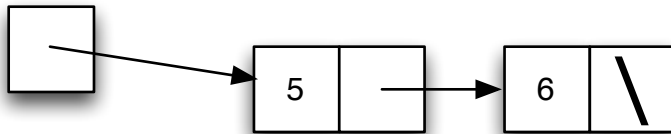
1. Suppose we have a linked list constructed in the following way.

```java
ListNode first = new ListNode(5);
first.add(6);
```

first

Then we run the following code.

```java
first.insertSecond(12);
```

Draw the boxes-and-arrow diagram after each line of insertFirst runs. **You should have 5 diagrams**: a,b,c, d, e. You must include each variable (i.e., `this`, `d`, `n`, `oldSecond`) once it is introduced.

Your Answer:

Turn your answers to the above two questions on paper to your TA at the beginning of section

Prepare for Lab in the following way

1. Download lab3.zip, unzip the file and take note of the folder you unzipped it into. You'll see two folders src and test.
2. In NetBeans: New Project... Then pick Java and Java Project from existing sources
3. On Name and Location window: Pick any name for your project
4. On Existing Sources window: Click Add folder next to Source Package Folders and find the src folder that came out of the zip file. Click Add folder next to the Test Package Folders and find the test folder. Now click finish.
5. You should see the source files in the Project explorer

Source Packages
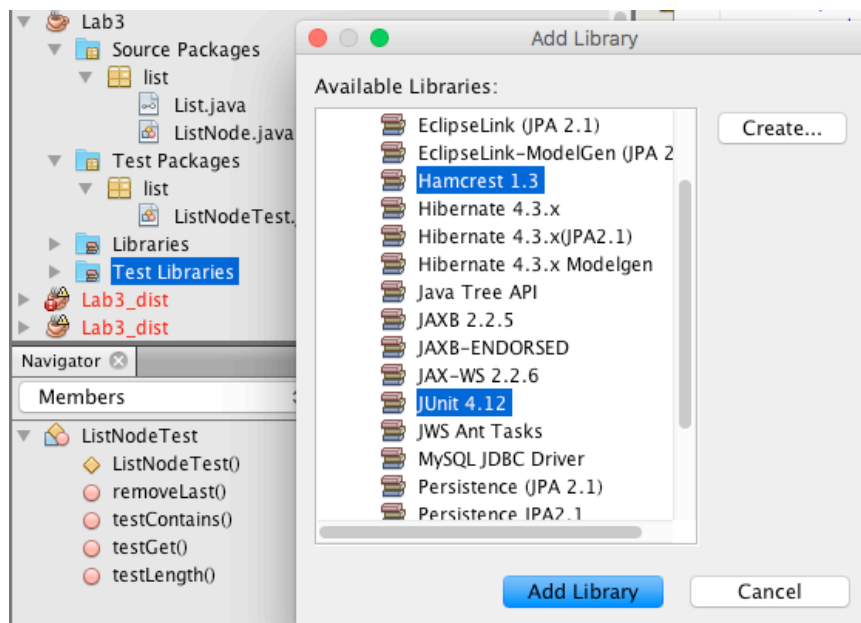   list
        List.java
        ListNode.java
Test Packages
    list
        ListNodeTest.java

6. Right click Test Libraries and pick Hamcrest 1.3 and JUnit 4.12

7. Watch this short video for a primer on running tests and debugging programs.

"Getting started with JUnit in NetBeans"
https://uiowa.instructure.com/courses/78504/modules/items/1791939

8. You are all set. Now right click ListNodeTest.java and click Run File. You should see that most of the tests fail. In section, you will fix them!