Homework 1

• Implement the class shown on the following slides. The class implements a sorted linked list of Comparable objects. The list is sorted in **descending order**. You must write a test driver to test your program. Your implementation of the class must not depend on your test driver because I will use my own test driver to test your program.
import java.io.*;
import java.util.*;

public class SortedList<T extends Comparable<? super T>> {
    //Implements a generic singly linked list of Comparable objects
    //Sorted in descending order

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

    private Node head; //Reference to the first node in the list
    private int size; //The number of elements in the list
Sorted List

//When comparing elements in the list use equals or compareTo
//do not use ==

public SortedList() {
    //Constructor for an empty list
    head = null; //no sentinel node
    size = 0;
}

public SortedList(SortedList<T> s1, SortedList<T> s2) {
    //PRE: s1.size() > 0 && s2.size() > 0
    // Constructor for the list created from two SortedLists
    //A new SortedList is created containing all the data from s1 and s2
    //The implementation must take advantage of the fact that s1 and s2
    //are sorted. The implementation cannot use the insert method
}
public void insert(T item) {
    // If an element in the list matches item do nothing (i.e. the list must not contain
    // duplicates)
    // otherwise insert item into the list so the list remains sorted
}

public void remove(T item) {
    // if an element in the list matches item then remove the element for the list
    // otherwise do nothing
}

public boolean find(T item) {
    //Return true if the list contains an element that matches item
    //otherwise return false
    //Your implementation must be recursive
    //You can do most of the work in an auxiliary private recursive method
}

custom int size() {
    //Return the number of items in the list
}

custom String toString() {
    //Return a string representation of the list
    //The string representation of the list is a [ followed by the items in the list
    //separated by commas followed by a ]
    //For example a list of integers could look like [107,50,10,7,3,2]
}
Homework 1 Submission

- At the top of the file include a comment that lists your name.

- Add a comment for each private method or private instance variable you add.

- Email me (tgendreau@uwlax.edu) only one file called SortedList.java. Do not email me your test driver. The file must contain your implementation of SortedList. If you use System.out.println to debug your program those lines should be put in a comment (or removed). Your debug output should not print when I test your program.