CS 340 Spring 2023
Programming Project 1

Due 11:59 PM Friday February 3
Programming Project 1

• Implement the SortedStringList class shown on the following slides.

• The class implements a double linked list of strings that are maintained in both ascending (following the next references) and descending order (following the previous reference).

• You **CANNOT** add instance variables to the SortedStringList class. This will not normally be the case for projects but I want you to solve problems created by the fact that you cannot add instance variables to this project. You can add private methods. You will need to add an instance variable to the iterators.

• Include your name in a comment at the top of the file
import java.io.*;
import java.util.*;

public class SortedStringList {
    //implements a double linked list of strings.
    //The strings are sorted in ascending order following the next reference
    //and sorted in the descending following the prev reference
    private class Node {
        private String data;
        private Node prev;
        private Node next;

        private Node(String s, Node p, Node n) {
            data = s;
            prev = p;
            next = n;
        }
    }

    private Node head;

    public boolean empty() {
        return head == null;
    }
}
public void insert(String s) {
    //insert s into the list maintaining the sorted order
    //the list can contain duplicates
}

public void removeAll(String s) {
    //remove all occurrences of s from the list
}

public String longestString() {
    //PRE: !empty()
    //returns the longest string in the list
    //calls a recursive method that does the work
    //do not change this method.
    return longestString(head);
}

private String longestString(Node h) {
    //PRE: h != null
    //a recursive method that returns the longest string in the list
    //beginning at node h
}
public class AscendingIterator implements Iterator<String> {
    //An iterator that returns data in the list in ascending order

    public AscendingIterator() {
    }

    public boolean hasNext() {
    }

    public String next() {
    }

    public void remove() {
        //optional method not implemented
    }

    public Iterator<String> ascending() {
        //return a new iterator object
        return new AscendingIterator();
    }
}
public class DescendingIterator implements Iterator<String> {
    // An iterator that returns data in the list in descending order

    public DescendingIterator() {
    }

    public boolean hasNext() {
    }

    public String next() {
    }

    public void remove() {
        // optional method not implemented
    }
}

public Iterator<String> descending() {
    // return a new iterator object
    return new DescendingIterator();
}
Programming Project 1 Submission

• Upload one zip file to Canvas. The zip file must contain only one file called SortedStringList.java. Do not upload your whole Eclipse project!

• You have to write code to test your program but I will write my own test driver. Do not upload your test driver code.

• This project must be submitted on time.