CS272 Lab Assignment #4.

In this assignment you will need to use DoubleNode.java and DoubleLinkedSeq.java.

0: Read Chapter 4 from the textbook.

1: Implement the Sequence class from Section 4.5. Outline of Java code for this class is available in DoubleLinkedSeq.java. Your sequence class must have five private instance variables as described in Section 4.5. You need to use DoubleNode.java for your node class. Follow instructions from Section 4.5, except that you do not need to put your class in a package. You need to write the invariant for your sequence ADT (invariant is explained on p.126). You need to add implementations instead of blank implementations for the following:

- constructor DoubleLinkedSeq( )
- addAfter
- addBefore
- addAll
- advance
- clone
- concatenation
- getCurrent
- isCurrent
- removeCurrent
- size
- start

In addition to that you need to implement the following methods:

- toString - a method that represents the sequence as a string in any reasonable (clear) format which shows the order of elements and what the current element is. For example, 3.0 5.2 (3.7) 6.1 represents a sequence of numbers 3.0 – 5.2 – 3.7 – 6.1 with the current element 3.7 in parentheses.
- reverse – a method that returns a new sequence that contains the same elements as the original sequence but in reverse order. The original sequence should remain unchanged. The current element in the reversed sequence should be null. For instance, if original sequence contains elements 1.2 - 3.5 - 4.3 - 6.44 in this order, then the new sequence should contain elements 6.44 - 4.3 - 3.5 - 1.2. The header of the method should be the following:

  public DoubleLinkedSeq reverse( )

- everyOther – a method that returns a new sequence that contains every other element of the original sequence starting from the first element (1st element, 3rd element, etc.). The original sequence should remain unchanged. The current element in the new sequence should be null. For instance, if original sequence contains elements 1.2 - 3.5 - 4.3 - 6.44, then the new sequence should contain elements 1.2 - 4.3. If the original sequence contains elements 3.2 - 2.5 - 1.0 - 7.1 - 9.5, then the method should return sequence 3.2 - 1.0 - 9.5. The header of the method should be the following:

public DoubleLinkedSeq everyOther( )

- removeSmaller – a method that removes from the sequence all elements that are less than a given value which is passed as a parameter. The current element is set to null. For instance, if original sequence contains elements 5.2 - 3.5 - 4.3 - 6.44 – 2.5 and the value is 5.0, then the sequence should become 5.2 - 6.44. If all elements in the sequence are less than the value, then the sequence should become empty. The header of the method should be the following:

  public void removeSmaller(double value)

Make sure to include **specifications** for *toString, reverse, everyOther, and removeSmaller* methods as comments in your code. Method specifications should follow the guidelines from Section 1.1 (pp.7-8).

2: Write a test program to test your code. Name your test program TestSequence. Your test program should test all the methods in your DoubleLinkedSeq class and print messages that show what is being tested.

What to submit:

- Submit DoubleNode.java, DoubleLinkedSeq.java, and TestSequence.java on Canvas.