

**Assignment 7 (10points) Due Date: submit zip file on Canvas by 11:59pm on Tuesday, 12/8/2020**

(Please follow the instructions on the file "Assignment requirements" to name your project, zip the entire project and upload the zip file on canvas)

Construct the **Client** class using the array [1, 18, 2, 7, 18, 39, 20] in the main method of your program to test the **LinkedList** class's methods.

(You will need to have your **ListNode** class included as well)

Construct the **LinkedList** class with the following additional methods:

Write a method called **size** that accepts no argument and returns the current number of elements in the list.

Write a method called **indexOf** that accepts an integer as a parameter and returns the index in the list of the first occurrence of that value, or -1 if the value is not found in the list. For example, if the list stores [1, 18, 2, 7, 18, 39, 18, 40], then the first index of 18 is 1 and the first index of 3 is -1.

Write another method **deleteBack** that deletes the last value (the value at the back of the list) and returns the delete value. If the list is empty, throw a NoSuchElementException.

Write a method called **removeAll** that removes all occurrences of a particular value. For example, if the list stores [1, 18, 2, 7, 18, 39, 18, 40], the call of list.removeAll(18); would change the list to store [1, 2, 7, 39, 40]

Write another method **doubleList** that doubles the size of a list by appending a copy of the original sequence to the end of the list. For example, if the list stores [1, 8, 2, 7], your method should change it to store [1, 8, 2, 7, 1, 8, 2, 7].

**Please include the Precondition and Postcondition for each method in the LinkedList class.**

Please produce the result as the sample run below.

Sample runs:

list = [1, 18, 2, 7, 18, 39, 20]

**list.size() is 7**

**list.indexOf(2) is 2**

**list.deleteBack() is 20**

**After list.deleteBack()**

**list = [1, 18, 2, 7, 18, 39]**

**After list.removeAll(18)**

**list = [1, 2, 7, 39]**

**After list.doubleList()**

**list = [1, 2, 7, 39, 1, 2, 7, 39]**