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DSA Lab 2

10/11/17

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| --- | --- | --- | --- |
| Class | MyArrayList | MyLinkedList | MyCircularLinkedList |
| Test1 | NA (more than one second) | NA | 1 second |
| Test2 | <1 second | NA | <1 second |
| Test3 | 1 second | NA | <1 second |
| Test4 | NA (more than one second) | NA | NA |

# MyArrayList

Test 2 start: 18:06:21

Test 2 end: 18:06:21

<1s second

Test 3 start: 18:06:21

Test 3 end: 18:06:22

<1 second

Test 4 start: 18:06:22

Test 4 end: Not finished as of submitting deadline

While most of the functions for MyArrayList work fine when tested individually, we were not able to get our tests to run for MyArrayList. Based on the amount of time the first test runs before a NullPointerException is thrown, you would assume that the MyArrayList class has a hard time performing insertions quickly. In an ideal situation, an array list would indeed give us worse performance with insertions, O(n) vs the O(1) performance of a LinkedList.

Deletion with an ArrayList will also be slower, operating at O(1) at best and 0(n) at worst. This is especially because an ArrayList must shift all of the remaining elements after a deletion of an element. With a linked list you deal with two pointers per element, which allows you to quickly connect the two elements to either side.

Conversely, when searching with an ArrayList, the performance is O(1), which is faster than the LinkedList. This is because a LinkedList has to check through every element in the list, whereas an array list does not.

# MyLinkedList

We were not able to begin work on MyLinkedList. There is little to document on this work. I would hypothesize that a singular linked list would have a harder time searching through itself, but an easier time deleting elements or inserting elements than an array list.

# MyCircularArrayList

Test 1 start: 17:38:28

Test 1 end: 17:38:39

Time: 1 second.

Test 2 start: 17:38:39

Test 2 end: 17:38:39

Time: <1 second.

Test 3 start: 17:38:39

Test 3 end: 17:38:39

Time: <1 second.

Test 4 start: 17:38:39

Test 4 end: Exception in thread "main" java.lang.NullPointerException

Time: N/A