

Laboratory Num. 3: LinkedList and ArrayList

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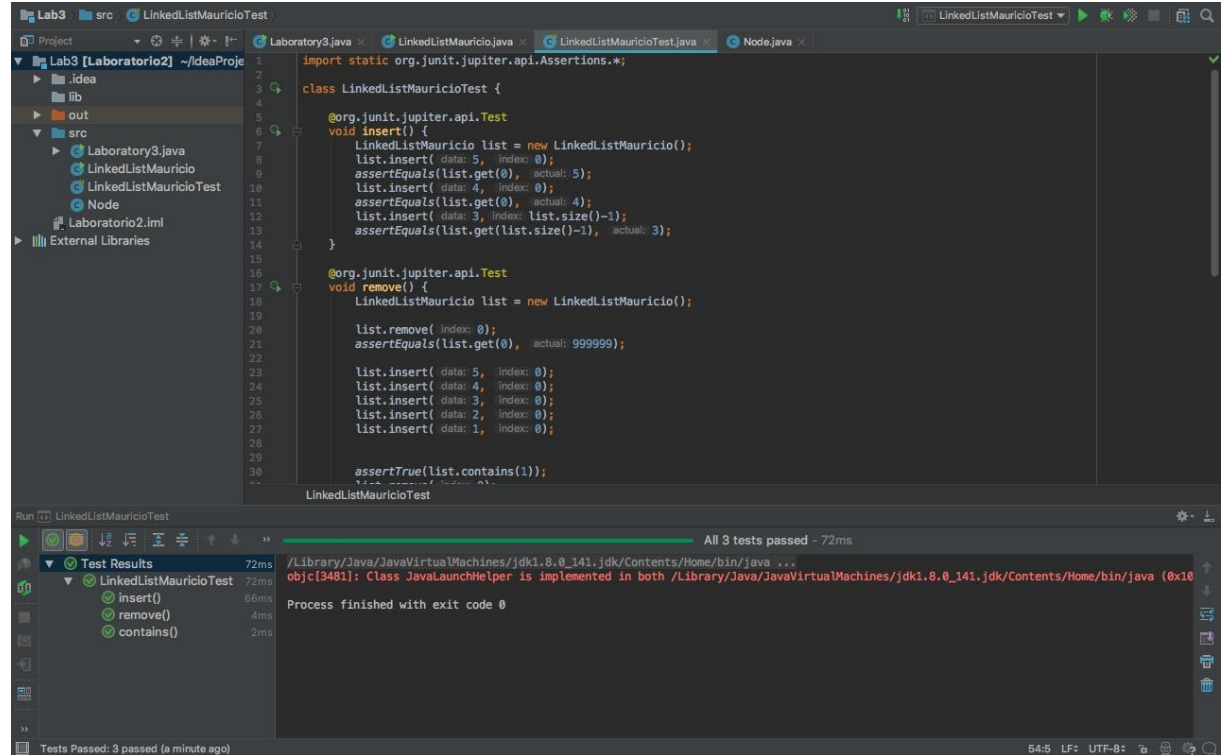
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3) Project questions

3.1

PUNTO 3.1		
EJERCICIO	LINKEDLIST	ARRAYLIST
1.1	$O(n)$	$O(n)$
1.2	$O(n)$	$O(n)$
1.3	$O(n^3)$	$O(n^2)$
1.4	$O(m*n)$	$O(m*n)$

3.2



The screenshot shows an IDE with a project named 'Lab3 [Laboratorio2]'. The source files are 'Laboratory3.java', 'LinkedListMauricio', 'LinkedListMauricioTest', and 'Node.java'. The 'LinkedListMauricioTest' file is open, showing the following code:

```
import static org.junit.jupiter.api.Assertions.*;

class LinkedListMauricioTest {

    @org.junit.jupiter.api.Test
    void insert() {
        LinkedListMauricio list = new LinkedListMauricio();
        list.insert( data: 5, index: 0);
        assertEquals(list.get(0), actual: 5);
        list.insert( data: 4, index: 0);
        assertEquals(list.get(0), actual: 4);
        list.insert( data: 3, index: list.size()-1);
        assertEquals(list.get(list.size()-1), actual: 3);
    }

    @org.junit.jupiter.api.Test
    void remove() {
        LinkedListMauricio list = new LinkedListMauricio();

        list.remove( index: 0);
        assertEquals(list.get(0), actual: 999999);

        list.insert( data: 5, index: 0);
        list.insert( data: 4, index: 0);
        list.insert( data: 3, index: 0);
        list.insert( data: 2, index: 0);
        list.insert( data: 1, index: 0);

        assertTrue(list.contains(1));
    }
}
```

The 'Run' button is clicked, and the 'Test Results' window shows the following output:

```
All 3 tests passed - 72ms
Test Results
  72ms /Library/Java/JavaVirtualMachines/jdk1.8.0_141.jdk/Contents/Home/bin/java ...
  72ms objc[348]: Class JavaLaunchHelper is implemented in both /Library/Java/JavaVirtualMachines/jdk1.8.0_141.jdk/Contents/Home/bin/java (0x10
  66ms Process finished with exit code 0
  4ms
  2ms
```

The status bar at the bottom indicates 'Tests Passed: 3 passed (a minute ago)' and '54.5 LF: UTF-8'.

```
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@org.junit.jupiter.api.Test  
void contains() {  
  
    LinkedListMauricio list = new LinkedListMauricio();  
  
    list.insert( data: 5, index: 0);  
    list.insert( data: 4, index: 0);  
    list.insert( data: 3, index: 0);  
    list.insert( data: 2, index: 0);  
    list.insert( data: 1, index: 0);  
  
    assertTrue(list.contains(5));  
}  
  
}
```

Run: All 3 tests passed - 72ms

Test Results	Time
LinkedListMauricioTest	72ms
insert()	66ms
remove()	4ms
contains()	2ms

Process finished with exit code 0

3.3

The user introduces the String with “mistakes” such as “[“or”]” which refer to “End” and “Home”. The program receives it and if it finds “[” it will send what’s after to the beginning and if it finds “]” it will send what’s after to the end of the string. In such case that there is no special character it will return the same String. Last the program will generate the string with the changes made.

3.4

$O(n^2)$, there is only one loop and “collections.reverse” also takes $O(n)$; thus, it’s $O(n^2)$.

3.5

n is the size of the ArrayList “front” and there is no m variable.

4)Exam simulation

1. a
2. b
3. $q.size() < 0$
 \leq
 $q.getLast()$
 $q.remove()$

4. lista.size()
Lista.addFirst(auxiliar.pop());
5. auxiliar1.size() < 0 auxiliar2.size() < 0
Persona.offer(edad)
6. c

5) Trabajo en Equipo y Progreso Gradual (Opcional)

Team work

Mateo Sánchez Toro: Oversaw part 1 and collaborated with parts 2 and 3.

Juan Pablo Giraldo Restrepo: Oversaw part 2 of the lab and also made the translation of the template.

Juan Felipe Londoño Gaviria: Oversaw part 3 of the lab and also made the template in Spanish.

As seen in the pictures, the communication was constant in the WhatsApp group.

