

## Laboratory practice No. 2: Linked List and Array List

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### 3) Practice for final project defense presentation

#### 3.1

In order to solve the question of in which exercises is better to use array list or linked list, we think that neither of them should be used, because both of them would have a complexity  $O(n)$  and for example the linked list could be useful in add or remove an elements at the beginning, but when comes at looking for something on the list this method would have to search through all the elements of the list. It would be needed another data structure more efficient.

	ARRAYLIST	LINKEDLIST
EXERCISE 1.1	$O(n)$	$O(n)$
EXERCISE 1.3	$O(n)$	$O(n)$

#### 3.2

**2.1)** The method "keyboard" is a void method that receives a String as parameter, first we create a LinkedList of characters, this is where we will organize the String, then we declare a Boolean variable initialized at false(e), and an int variable at cero(cont), have a loop ( $i = 0$  to length of the string) that goes through the whole string, if a character in position  $i$  equals to '[' e is true, we add 1 to  $i$ , so it will avoid this character and we put cont at cero, on the other way if the character equals to ']' e is false and we also add 1 to  $i$ ; next, if e is true we will add the characters at position  $i$  at the beginning of the LinkedList by the method add that receives position and character to be added, where position will be our variable cont, and also, in this if, we increment cont in one at a time; if e is false, we add the characters at the end of the LinkedList. When this for ends, we create a new LinkedList, that will be the answer to this problem, then we have a while loop that removes the characters from our first LinkedList, and add them to the new one, but, if in the first LinkedList there are '[' or ']', they will be only removed. Finally, the methods uses a for loop to print al the characters in the answer (LinkedList).

**2.4)** The method balanceBrackets receives a String and returns a String, it works in the following way, first we declare a Boolean variable (b) initialized at true, then we use a queue to save half of the string, but not just as it is, we save the "reflection" of the first half; for example if the half of the String is "{[" in the queue we will add "}]"; then we use a while loop to compare both halves of the string by removing the elements in the queue and comparing each of them to each character on the seconf half of the string, beginning at the last one, if

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**ESTRUCTURA DE DATOS 1**  
**Código ST0245**

one of them is different from the corresponding one in the queue, then b will be false, and we break the loop. Finally, if b is true, the method will return "YES"; on the other hand, if b is false, the method returns "NO"

### 3.3

EXERCISE	COMPLEXITY
2.2	O(n)
2.4	O(n/2)

### 3.4

In both exercises, the variable n represents the length of the String that them receive as parameter

## 4) Practice for midterms

4.1 c

4.2 c

4.3 a) q.size() > 1

b) <=

c) q.remove()

d) q.remove()

4.4 a) lista.size()

b) lista.add(auxiliar.pop());

4.5 a) auxiliar1.size() > 0

b) auxiliar2.size() > 0

c) personas.offer(edad)

4.6 a

4.7 c

4.8 a) a

b) c

c) c

4.9 a) d

b) a

c) b

4.10 a) b

b) b

4.11 a) !s1.isEmpty()

b) s1.pop()

c) s2.pop()

4.12 a) iv

b) i

4.13 a) iii

b) iv

4.14 iii

## 5) Recommended reading (optional)

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