Laboratory No. X: Write the Theme of the Laboratory

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3) Mock project support questions

1.

	ArrayList	LinkedList
Exercise 1.1	-	O(1)
Exercise 1.2	O(n^2)	O(n^3)
Exercise 1.3	-	O(n)
Exercise 1.4	-	O(n)

2. The implementation of exercise two was done as follows:

This class is based on a method which initially receives a text as a parameter, within this we implement a simple linked list of type String, in which we will previously save the modified text. Within the variables of this exercise we find an integer type (index) which will indicate the position in which the text will be added within the list, a Boolean type (initial key) that will serve as a basis to identify when finding one of the special characters ('[') which indicates that the beginning letter was pressed internally, and finally a String type in which we will concatenate the parts of the modified text that are inside the list, doing it within a for will go through the size of the list.

Internally this Code works by traversing the size of the text entered by the user initially as a parameter, within this the conditions are followed if the program found a special start or exit character, which will be verified with a substring of the original string, when finding the start key '[' the boolean variable will become true and the index in which the position will be specified will start at 0, otherwise the Boolean variable will be false, that is to say when finding the exit key '] '. After traversing the entire String and not finding more of these special characters, it will be verified where the start key was found and added to the list specifying the position in which it will be added and the text to be added, increasing the index in one otherwise, the text found with the exit key ']' will simply be added to the list.

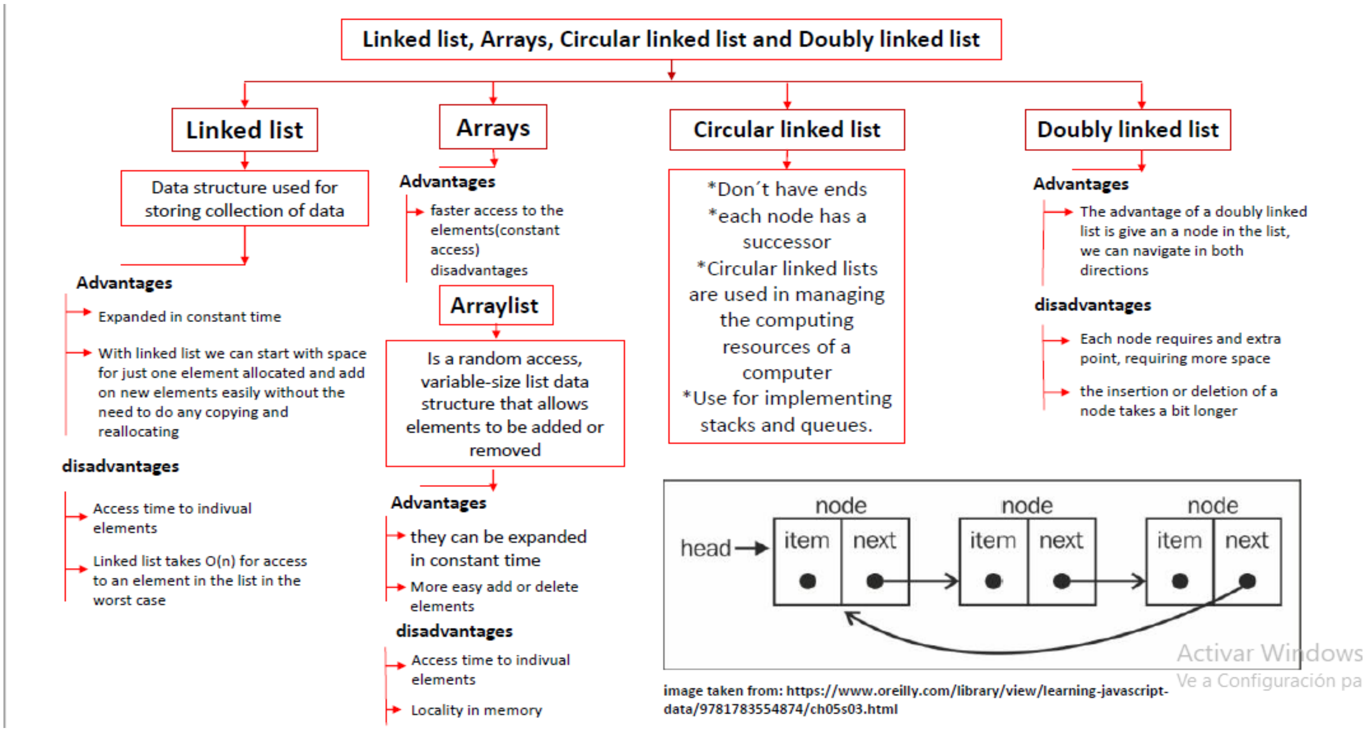
4) partial drill

1. *a*
2. *c*
3. *02. q.size()>1*
03. i<=num
04. q.pop()
0.6 q.get(0)

4. a. lista.size()>0
   b. lista.add(auxiliar.pop())
5. a. auxiliar1.size()>0
   b. auxiliar2.size()>0
   c. personas.offer(edad);
6. c
7. a
8. d
9. 9.1 a
   9.2 c
   9.3 c
10. 10.1 d
    10.2 a
    10.3 b

5) Recommended reading (optional)

The text mainly talks about the linked lists, making short comparisons with double linked lists, arrays, array list and circular linked list. Throughout the text are based on 3 important aspects or basic operations: traverse the element (array, list, and others), insert elements (at the beginning, end or randomly) and delete elements (at the beginning, end or randomly).
The linked list is a data structure used to store the data collection, it has a number of nodes in which each node has a pointer to the next element.
One of the major advantages of the linked list is that we can start with a space for a single assigned element and add new elements easily without the need to copy and reassign, on the other hand, it brings a disadvantage; in linked list it takes O (n) to access an element of the list in the worst case and the access of time to individual elements is more complicated.



Linked list, Arrays, Circular linked list and Doubly linked list

Linked list

Data structure used for storing collection of data

Advantages

- Expanded in constant time
- With linked list we can start with space for just one element allocated and add on new elements easily without the need to do any copying and reallocating

disadvantages

- Access time to indivual elements
- Linked list takes O(n) for access to an element in the list in the worst case

Arrays

Advantages

- faster access to the elements(constant access)

disadvantages

Arraylist

Is a random access, variable-size list data structure that allows elements to be added or removed

Advantages

- they can be expanded in constant time
- More easy add or delete elements

disadvantages

- Access time to indivual elements
- Locality in memory

Circular linked list

*Don´t have ends
*each node has a successor
*Circular linked lists are used in managing the computing resources of a computer
*Use for implementing stacks and queues.

image taken from: https://www.oreilly.com/library/view/learning-javascript-data/9781783554874/ch05s03.html

Doubly linked list

Advantages

- The advantage of a doubly linked list is give an a node in the list, we can navigate in both directions

disadvantages

- Each node requires and extra point, requiring more space
- the insertion or deletion of a node takes a bit longer