Laboratory practice No. 3: Linked List and Array List

Laura María Giraldo Castrillón
Universidad Eafit
Medellín, Colombia
lmgiraldo1@eafit.edu.co

Andrés Felipe Oquendo Usma
Universidad Eafit
Medellín, Colombia
afoquendou@eafit.edu.co

3) Practice for final project defense presentation

1.

	LinkedList	**ArrayList**
Exercise 1	O(n)	O(n)
Exercise 2	O(n)	O(n)

All the exercises have the same complexity with both of the data structures, in the first exercise linked list and array list take n steps to search an then to add linked list do it on O(1) and array list on O(n), so linked list might be O(n) and array list O(2n), that for big quantity of data is the same O(n). On the second exercise both are the same if instead of use “get” method in linked list (that is O(n)) we use an iterator to go through the list using next to get the sum, and because the “get” method for array list is O (1), so the complexity for both is O(n).

2. To the exercise 2.1 we use the Java's Scanner class to read input from keyboard, then we use a while loop that decides to stop when an empty line is read. Each loop is going to be one line of the entire text, that line of text is stored in a String variable, and we initialize "index" variable to 0 (this variable will be useful to decide where to add the characters in the list if any '[' or ']' was pressed), we create a linked list (used to store each character in order) and then with a for loop (that goes until the length of the string is reached) we will evaluate the character searching for '[' and ']'. After that, we have three cases 1. If the character is '[' the index is going to be 0, because '[' means that "start" key was pressed 2. If the character is ']' index is going to be equal to the size of the list at that moment, because ']' means that "end" key was pressed, and 3. If the character is anything else instead of '[' or ']' the character is added to the list in the position "index" (that's why if "start" key was pressed, it's going to be 0, to insert in the start of the list, and if "end" key was pressed, it is going to be equal to list's size to insert in the end of the list), then the "index" variable is increased by one to continue "writing" in order. At the end we print all the characters of the list, returning the message without ‘[‘ and ‘]’ symbols and in order.

3. The complexity is O(n) where n is all the characters of the given text.

4. n defined as:

$$n = \sum_{i=0}^{m} x_i$$

where i es the current line, m is the total of lines, and each x_i is the total of characters of the line i.

4) Practice for midterms

3. In a list, "add" method adds the value into the end of the list and "remove" method removes the first element of the list and returns its value.
a) q.size() > 1
b) <=
c) q.remove()
d) q.remove()

5.
a)auxiliar1.size()>0 and auxiliar2.size()>0
b)personas.offer(edad);

6. c

7. c
8. c

9.
9.1. a
9.2. c
9.3. c

10.
10.1. d
10.2. a
10.3. b

PROFESSOR MAURICIO TORO BERMÚDEZ
Phone: (+57) (4) 261 95 00 Ext. 9473. Office: 19 - 627
E-mail: mtorobe@eafit.edu.co