

Laboratory practice No. 3: LinkedList and ArrayList

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3) Practice for final project defense presentation

3.1

| Exercise | ArrayList | LinkedList |
|--------------|--------------|------------|
| 1.1 (query1) | $O(n^2 * m)$ | $O(n*m)$ |
| 1.1 (query2) | $O(m+r)$ | $O(m+r)$ |

Taking into account the reading process and, where:

- n: number of students
- m: number of semesters of the student
- r: number of subjects of the semester

3.2 The implementation in 2.1 uses a while loop where the lines are read, inside them, there is some auxiliar variables as the code, which indicates if the character will be inserted at the front or in the end; an int aux and string sub, that allows to use the original string by parts using "substring" in a for loop. Also, the program has a LinkedList where the strings, in the correct order, are stored and ready to print.

3.3 The complexi of the implementation 2.1 is (notation in github):

$$T(n) = (C_1 + C_2 + C_4 + C_5 + C_6 + C_7 + C_8 + C_{10} + C_{11} + C_{12} + C_{13})n + (C_3 + C_9)n^2 + C_{14}$$

$$T(n) \text{ es } O((C_1 + C_2 + C_4 + C_5 + C_6 + C_7 + C_8 + C_{10} + C_{11} + C_{12} + C_{13})n + (C_3 + C_9)n^2 + C_{14})$$

$$O((C_3 + C_9)n^2) \text{ //sum rule}$$

$$O(n^2) \text{ //product rule}$$

3.4

-n: is the length of the string.

4) Practice for midterms

1. c
2. c
3.
 - a. q.size() > 1
 - b. <=
 - c. q.remove()

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ESTRUCTURA DE DATOS 1
Código ST0245

- d. q.remove()
4.
 - a. lista.size()
 - b. lista.add(auxiliar.pop());
5.
 - a. auxiliar1.size()>0 auxiliar2.size()>0
 - b. personas.offer(edad)
6. a
7. c
8.
 - a. a
 - b. c
 - c. c
9.
 - a. d
 - b. a
 - c. b
10.
 - a. c
 - b. b
11.
 - a. s1.size()>=0
 - b. s1.pop()
 - c. s2.pop()
12.
 - a. iv
 - b. i
13.
 - a. iii.
 - b. iv.
14. iii

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