Laboratory practice No. 4: Trees

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3) Practice for final project defense presentation

1. The main problem of the genealogical trees is that they are composed of Strings, therefore they do not have a key value that allows their correct organization and that later the search or the insertion in it is faster. However, you can think of a key code that is related to the String, as in the Hash tables, this would help to make the route of the tree faster, but it should be taken into account that in this key women and Men must differentiate. Therefore, I consider that if a tree can be made more effective using the correct key.

2. In number 2.1 the algorithm reads the values entered by the user of the tree in preorder, according to this sequence a binary search tree is generated, taking into account that the largest go to the right and the lowest to the left, after that the tree has been created this tree is traversed in post-order and these values are printed. This algorithm gives ease of reading to the tree, since when entered in pre-order, it is known that the first value that is entered will be the root.

3. The complexity of the algorithm in point 2.1 is based on the following methods:

```
public void printPosOrder(Node node){
      if(node != null){
         printPosOrder(node.left); // T(n)= T(n/2) + C (in average)
         printPosOrder(node.right); // T(n)= T(n/2) + C (in average)
         System.out.println(node.data);
      }
   }
```

Recursive equation

$T(n) = 2T(n/2) + C$

Notation Big O

$O(n)$

4. In this case, for the implementation of this algorithm there are no variables n and m, we only have the variable n which is the number of nodes in the tree. With this n it is managed which node is being visited during the recursion. In the case that the algorithm works with two cycles it could be taken into account that the variable m could appear. In this case, the variable n would refer to the number of values that are entered and the variable m would refer to a list in which the nodes would be organized in post-order mode.

4) Practice for midterms

1. **A)** altura(rait.izq)
   B) altura(raiz.der)
2. **C.** 3
3. **A)** false;
   B) a.data;
   C) (a.left, sum – a.data)
   D) (a.right, sum – a.data)
4. **4.1) C.** T(n) = 2T(n/2) + C (It really is the option b)
   4.2) A. O(n)
   4.3) D. Wilkenson, Joaquina, Eustaquia, Florinda, Eustaquio, Jovín, Sufranio, Piolina, Wilberta, Piolín, Usnavy.
   4.4) A. Change the order of lines 03, 04 and 05 by 05, 04, 03
5. **A)** p.dato == toInsert
   B) toInsert > p.data
6. **6.1) D.** 4
   6.2) return 0;
   6.3) == 0
7. **7.1) 1**. 0, 2, 1, 7, 5, 10, 13, 11, 9, 4
   7.2) 2. 2
8. **B.** 2
9. **A.** 5, 3, 6, 1, 7, 4, 8, 0, 2
10. **B.** No

***5)* Recommended reading**

- **a)** Title
- **b)** Main ideas
- **c)** Concept map

6) Team work and gradual progress

a) Meeting minutes

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Member	Date	Done	Doing	To do
Sebastián	09/10/2018			point 1.1
Sebastián	09/10/2018	**Point 1.1**	point 1.2	test for point 1.2
Sebastián	10/10/2018	**point 1.2**	test for point 1.2	Point 2.1 and it analysis
Sebastián	11/10/2018	**point 2.1**	test for point 2.1	Practice for midterms
Sebastián	12/10/2018	**practice for mindterms**		Practice for final project defense presentation
Sebastián	13/10/2018	**Practice for final project defense presentation**		recommended reading
Yhoan	03/10/2018	**recommended reading**		upload the laboratory

b) History of changes of the code

History changes of code		
Version	**Code**	**Status**
1.0	1.1	
1.0	1.2	
2.0	1.2	
3.0	1.2	
1.0	2.1	
2.0	2.1	
3.0	2.1	

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