Laboratory practice No.4 : Complete the title of the laboratory practice

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3) Practice for final project defense presentation

3.1 We are using the octree which is a data structure where each internal node has exactly 8 "children", are mostly used to partition a three-dimensional space, recursively dividing it into eight octants.
We chose this structure because it makes raising the bee problem much easier.

3.2
3.3
3.4 The inputpre function would be log(n) and the outputpos would be O(n).
3.5 n being the number of given int
3.6

4) Practice for midterms

4.1 *B,d*
4.2 *c*
4.3 ***a)*** *false*
4.3 b) a.data
4.3 c) a.iq, suma-a.data
4.3 d) a.der, suma-a.data

4.4 .
- ***4.4.1*** b
- ***4.4.2*** a
- ***4.4.3*** d

4.9 a
4.13.1 raíz.id
4.13.2 a

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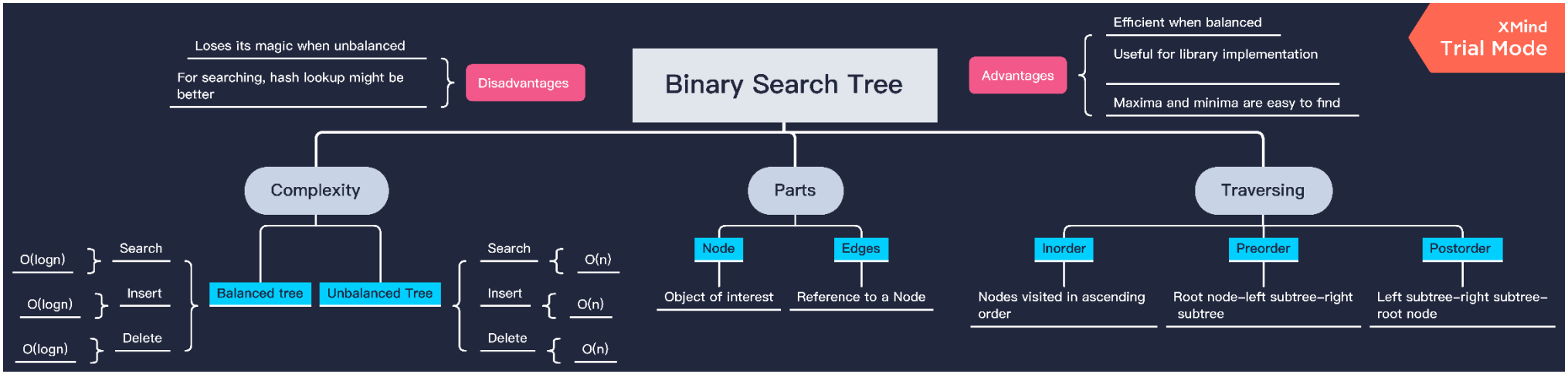
5) Recommended reading (optional)



-Summary

Binary trees are a fundamental data storage structure. They have the same advantages of two different data structures at the same time (if maintained balanced). Specifically, They are as efficient in searching information as in an ordered array, and as efficient in deletion and insertion as a linked list. Binary trees are a special case of multiway trees, the former ones only contain a maximum amount of two ‘children’ for each node. At the same time, a tree is a special case of a more general structure called ‘graph’, which is made out of nodes and edges. Nodes contain the important information and the edges (the connective lines) the references in memory of those objects. Nonetheless, the special

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features of these data structures are only valid if it is a more or less balanced structure, that is, there is almost the same or the same number of sub-trees in each half of the main tree. Every tree has a 'root node', this is the first object, from which the others (children) are inherited; an unbalanced tree would have far more nodes in either the right or left sub-tree (considering them from the two children, right and left ones, of the root node). To have more insight about this situation, the complexities for search, insertion and deletion of a balanced tree are all O(logn), while these complexities in an unbalanced tree (worst scenario) would be O(n). In conclusion, for their nature, trees are a powerful tool for library implementations, that combine the main features of linked lists and ordered arrays, however, they are very likely to lose these properties if the data is inserted in an ascending or descending way, this is, a non-random sequence of data.

6) Team work and gradual progress (optional)

Teamwork

We met on Sunday, after having shared some ideas about the laboratory work, we had to do. We did everything together as we usually do.

We worked for 4 straight hours, because we don't usually have time along the week. We had a short 15 minutes recess after these 4 hours and worked for a final hour.

We prepare everything before writing down the lab report. We meet through Microsoft Teams and one of us shares his screen. We try to solve these challenges together, while one of us writes the code down. We prefer to work like this, even if it is a bit inefficient, because this way we make sure we all acquire the knowledge and practice with the laboratory's tasks

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