

COP 5407: Spring 2019: QUIZ 4

Panther ID (No name please):

1. Given an element x in an n -node augmented order-statistic tree (i.e., one on which we can run OS-RANK and OS-SELECT can be executed efficiently), and a non-negative integer i , design the following function OS- i -TH-SUCCESSOR(x, i), which returns the i -th successor of x in the linear order of the tree in $O(\log n)$ time. You may assume the existence of functions:

OS-RANK(r, x), which returns the rank of x in the subtree rooted at node r ; and

OS-SELECT(r, k), which returns the item with rank k in the subtree rooted at node r .

Algorithm OS- i -TH-SUCCESSOR(ITEM x , INTEGER i)

COMMENT: computes the i -th successor of item x

COMMENT: Fill this in.

begin

end