

QUESTION #13

SCAPERGOAT TREE

How to insert a value in a ScapeGoat tree.

TREES

Solution

To insert value x in a Scapegoat Tree:

1. Create a new node u and insert x using the BST insertion.
2. If ($\text{depth of } u > \log_{3/2} n$),
Balance tree.
3. To make balanced, find a scapegoat:
 - 3.1 Until ($\text{size}(w) > (2/3) * \text{size}(w.\text{parent})$),
walk from node u to node w .
 - 3.2 $w = \text{scapegoat}$
 - 3.3 Rebuild the subtree rooted at $w.\text{parent}$.

Nerving Into
Data Structures

Solution

In rebuilding,

1. Convert the subtree to the most possible balanced BST.
2. First store inorder traversal of BST in an array.
3. Build a new BST from array by recursively dividing it into two halves.

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