COFFEE RUST DETECTION FOR CATURRA VARIETY USING DECISION TREES

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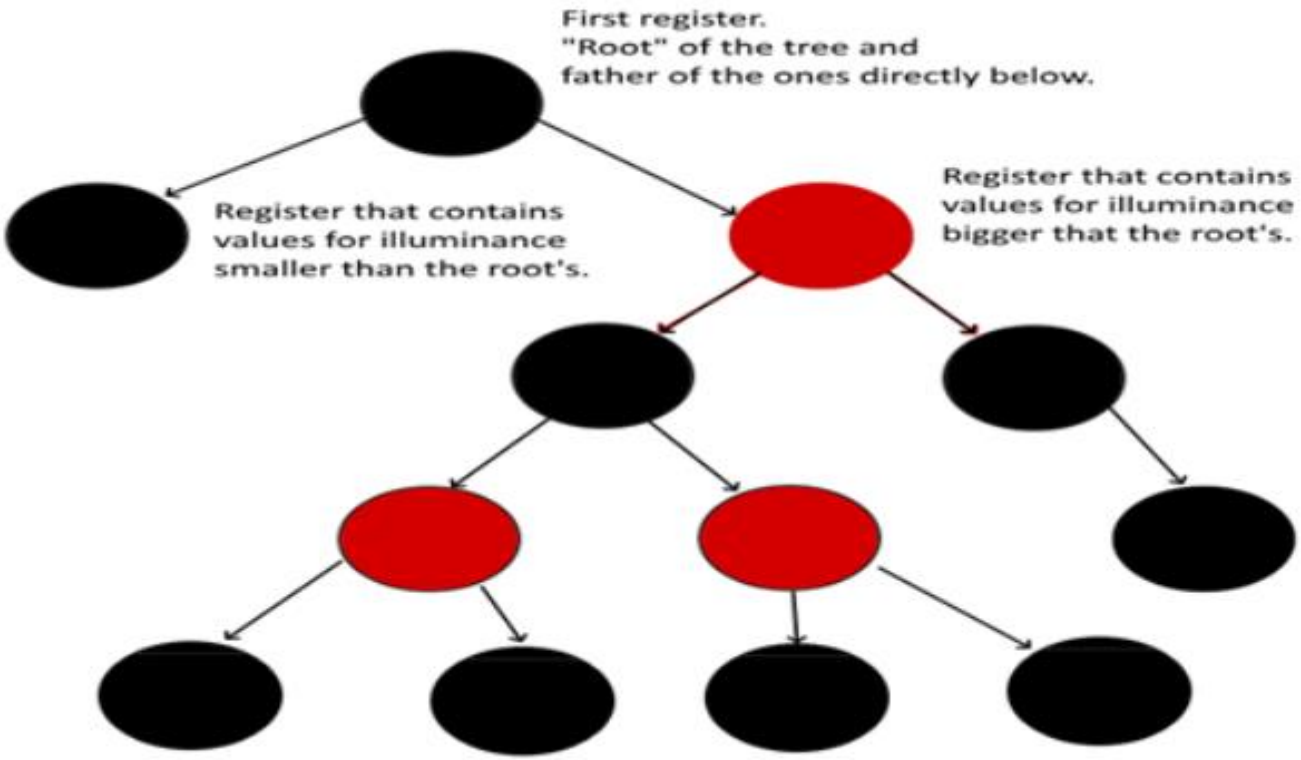
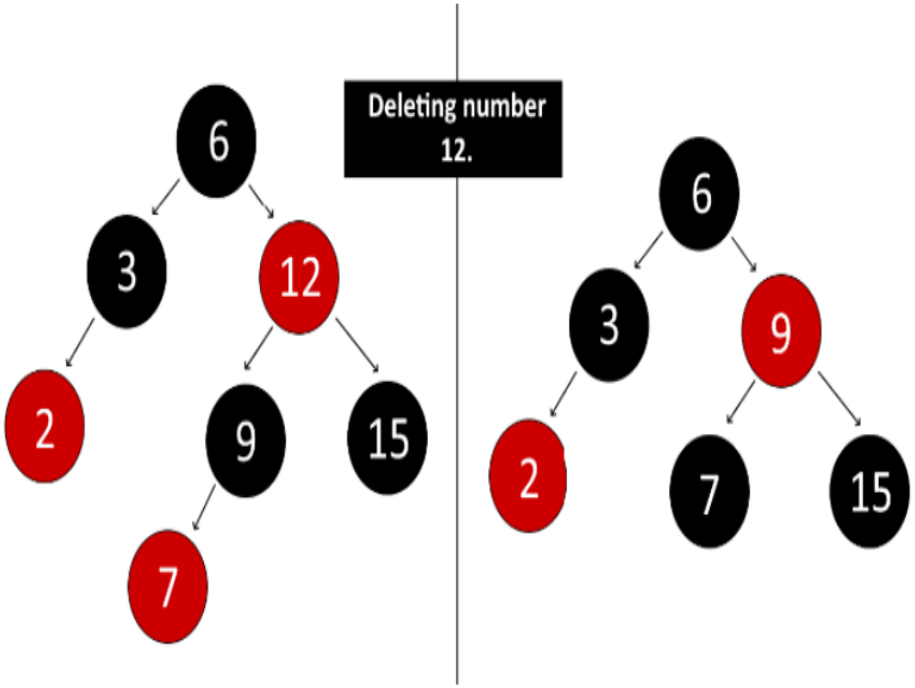
Designed Data Structures



Data Structure Operations



METHOD	COMPLEXITY
Search	O(log(n))
Insertion	O(log(n))
Removal	O(log(n))

Design Criteria of the Data Structure

- Black-red trees allow us to insert, delete, and search in a complexity time O(log(n)).
- We can easily find a corresponding Black-red tree for any tree of the form 2-3-4.
- The longest path from the root node to the last leaf node cannot be greater than twice the shortest path, this means a big advantage for us, because this characteristic produces a well balanced tree.
- Black-red trees follow an easy way to work: right if data is bigger, left in other case.

Time and Memory Consumption

OPERATION	TIME FOR TRAINING DATASET	TIME FOR TESTING DATASET
Creation	23.5 ms	17.3 ms
Insertion	9.8 ms	10.6 ms
Removal	4.5 ms	6.4 ms
Search	3.2 ms	5.4 ms

	MEMORY USAGE FOR TRAINING DATASET	MEMORY USAGE FOR TESTING DATASET
Creation	84.2MB	82.7MB