Experiment 4A

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Aim: RB tree Insertion

Theory: Red-Black trees are self balancing, meaning that the tree adjusts itself automatically after each insertion or deletion operation. It uses a simple but powerful mechanism to maintain balance, by colouring each node in the tree either red or black. Time complexity for operations such as insertion, deletion and searching is always O(log n).

Cases to be considered for insertion in Red Black Tree.

→ If tree is empty create new node as root node with color black.
→ If tree is not empty, create new node as leaf node with colour red.
→ If parent of new node is black then exit.
→ If parent of new node is red, then check the color of parents sibling node.
→ If color is black or null then do suitable rotation and re-color.
→ If colour is red then recolor and also check if parents parent of newnode is not root node then recolor it and recheck.

Conclusion: After performing insertion on the Red Black tree, it can be concluded that the tree maintains its properties