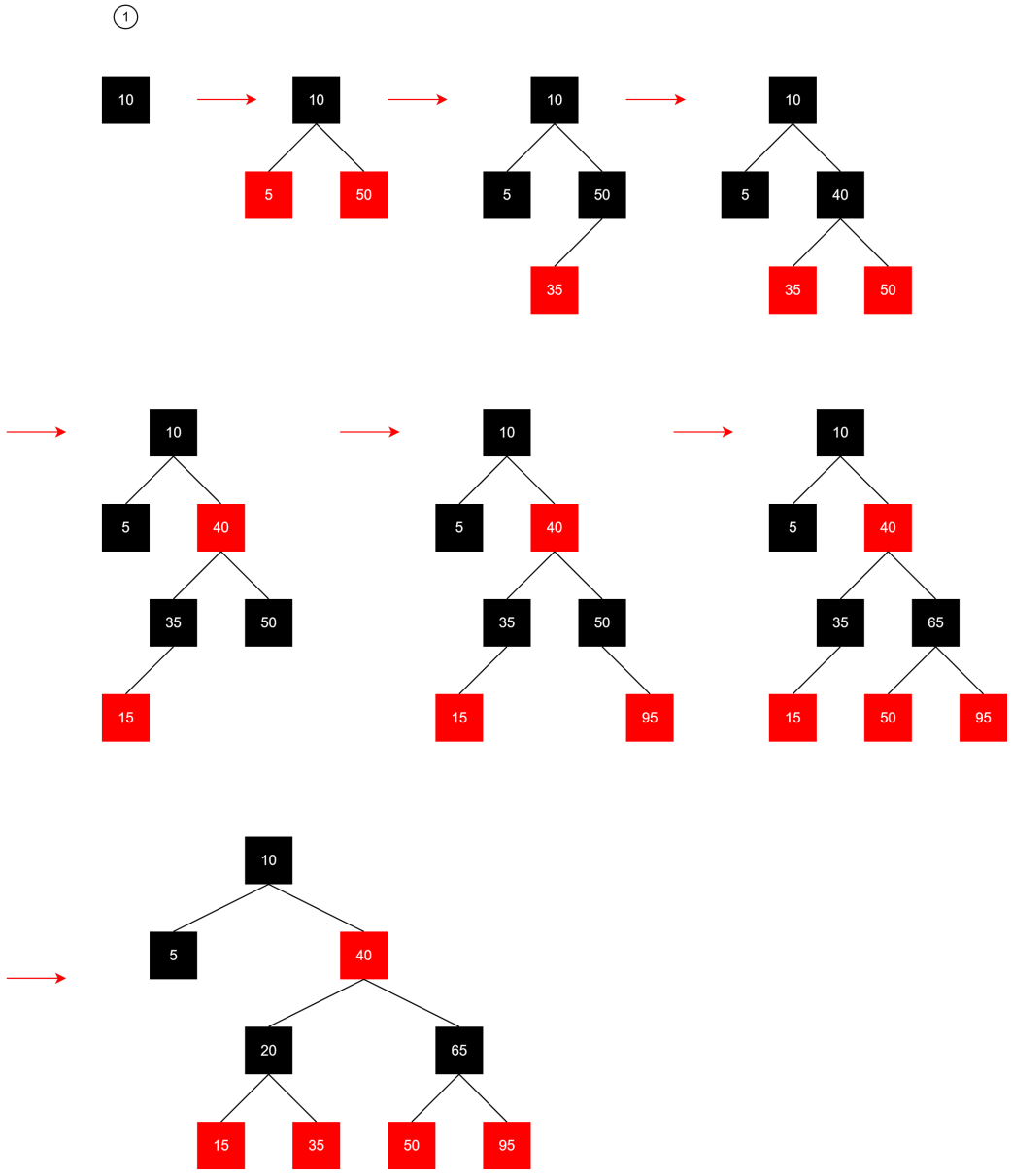
1. Red-Black Trees



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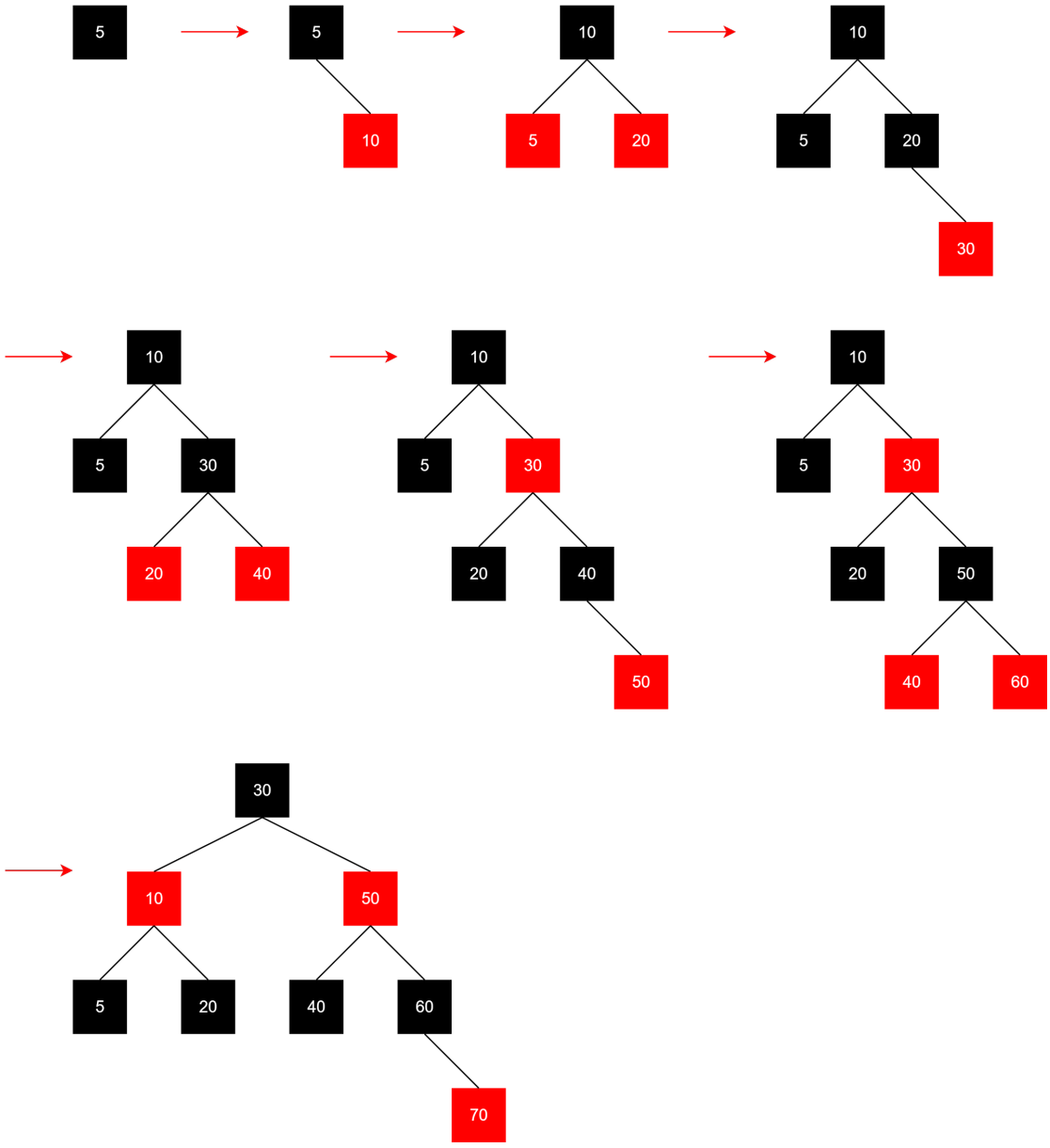
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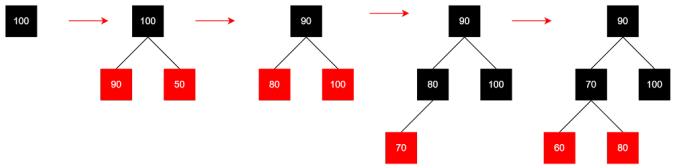
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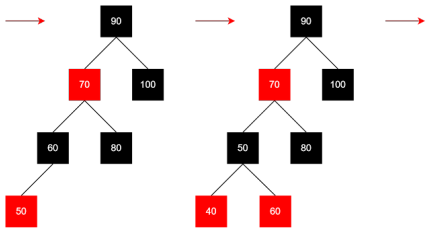
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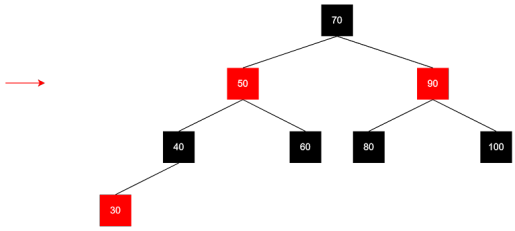
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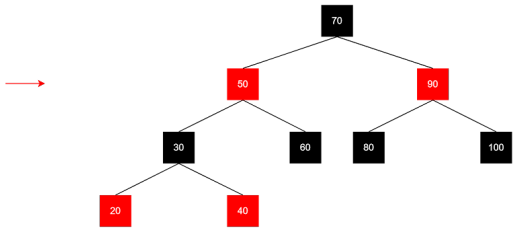
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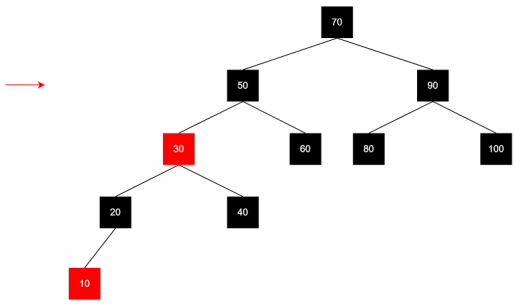
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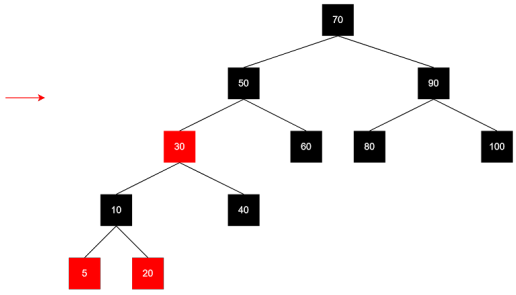
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2. 2-3-4 Trees

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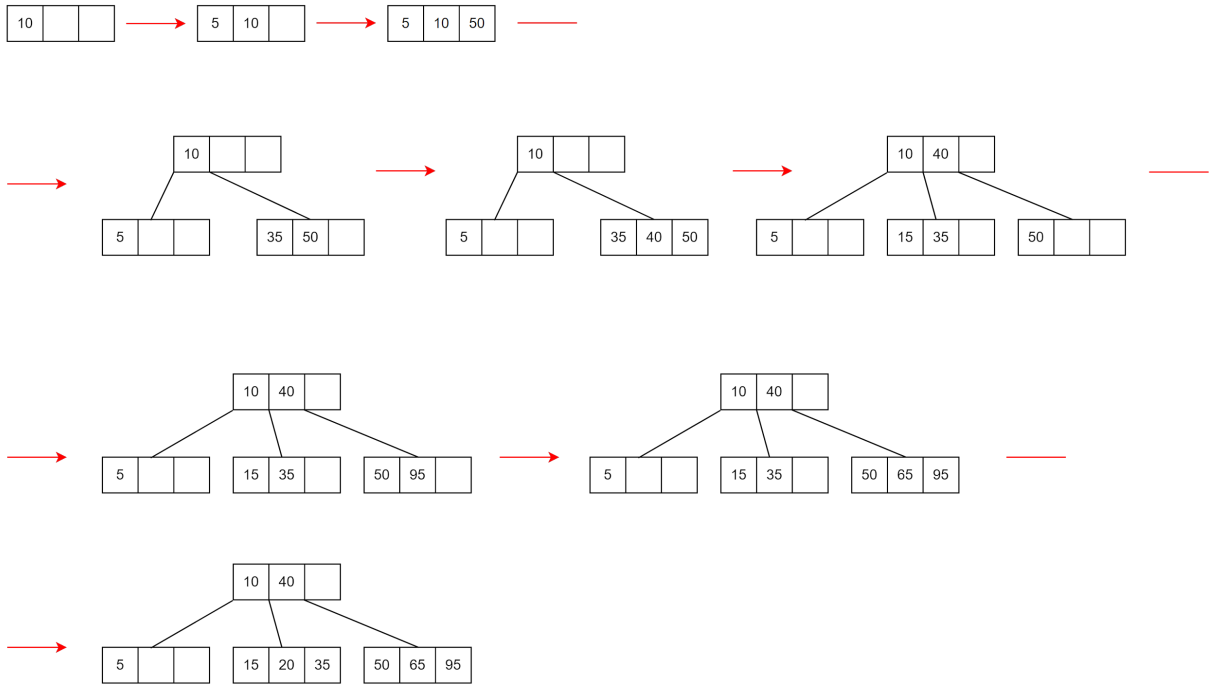

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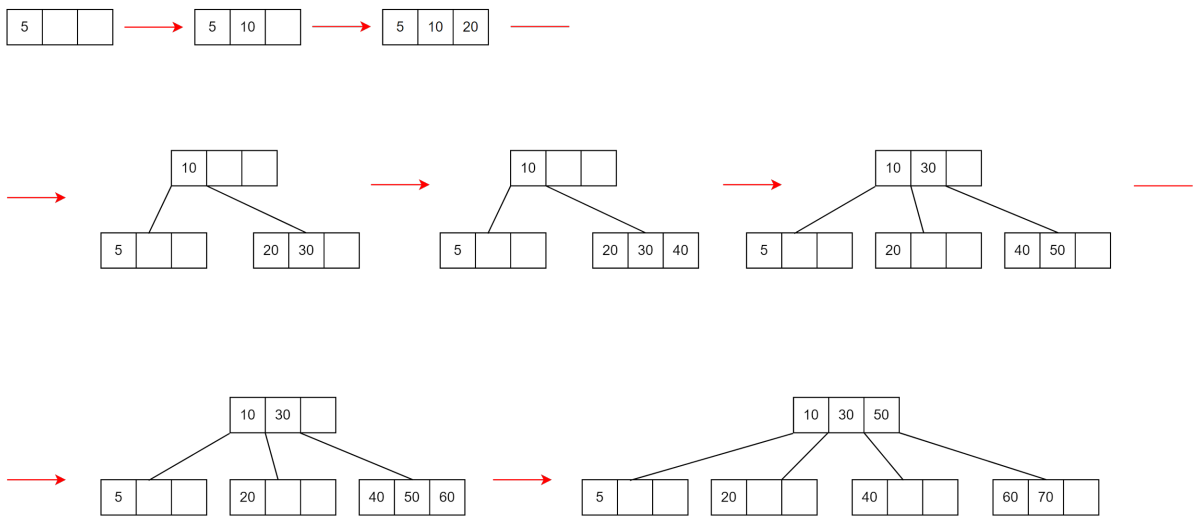

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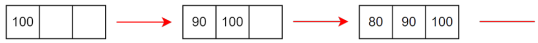
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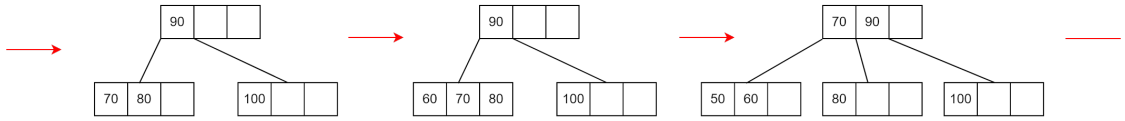
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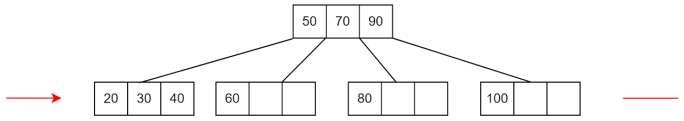
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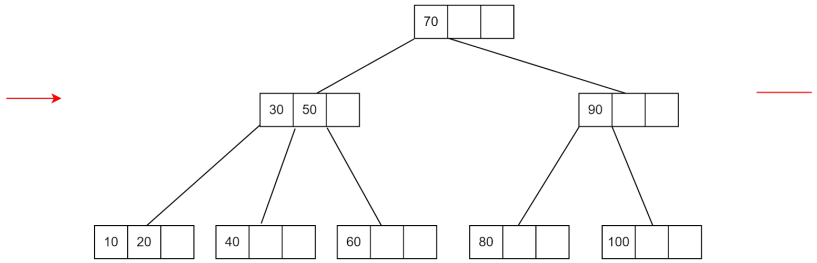
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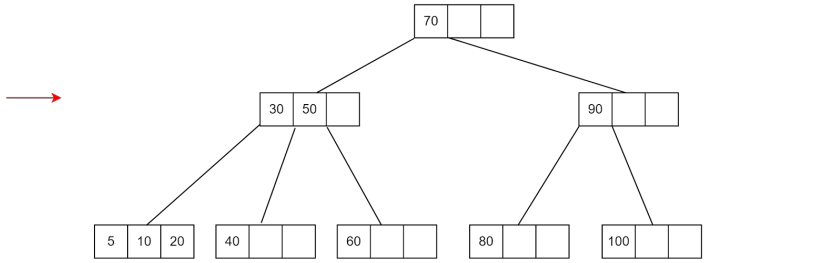
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2-3-4 Trees into Red-Black Trees

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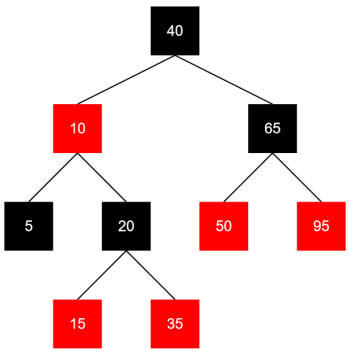

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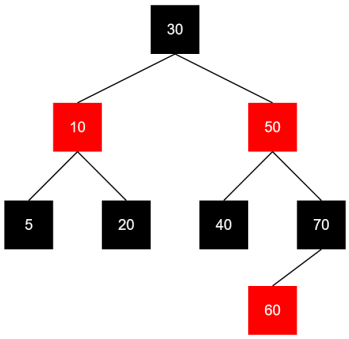

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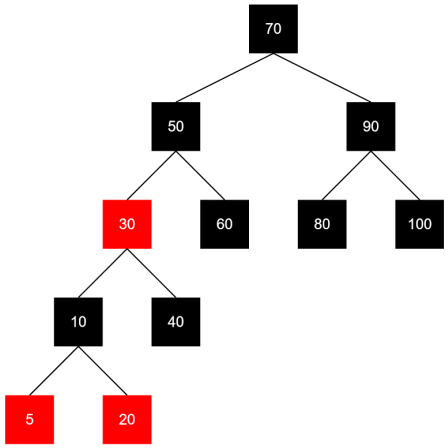

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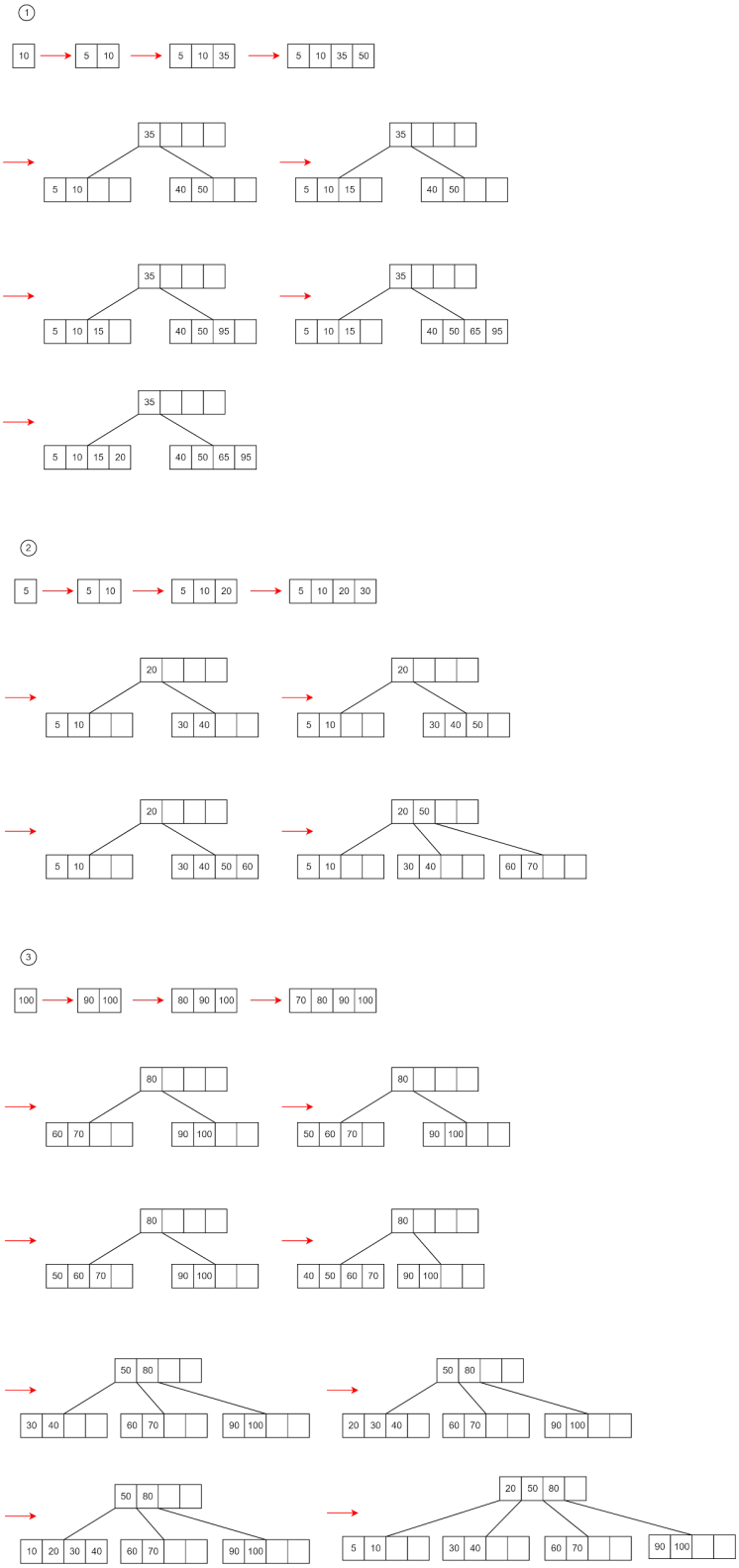
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4.

4.1. Compare the heights of the resultant trees - how do they compare with a Binary Search Tree (BST) for the same input values?

They have relatively a less height. Because they are self-balanced and some trees(2-3-4 and b tree) contain multiple indexes in the same node.

4.2. Compare the complexity of the algorithms, how much work would be required for the main operations: insert(), find(), delete()? Compare this to a BST.

BST has the time complexity of O(N). But those advanced trees are more complex than BST due to their self-balancing strategy. So they have the time complexity of O(log N). So all the advanced tree operations are more complex than BST operations.

4.3. Compare the understandability of the algorithms, which would be easier to implement?

Hard to understand →
BST < RBT < 2_3_4T < BT

4.4. Describe how an in-order traversal would work on each type of tree.

Since all these trees are in sorted(ascending) order, the in-order traversal would be in the sorted(ascending) order.