Data Structures

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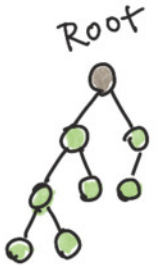
BST

Binary Search Tree

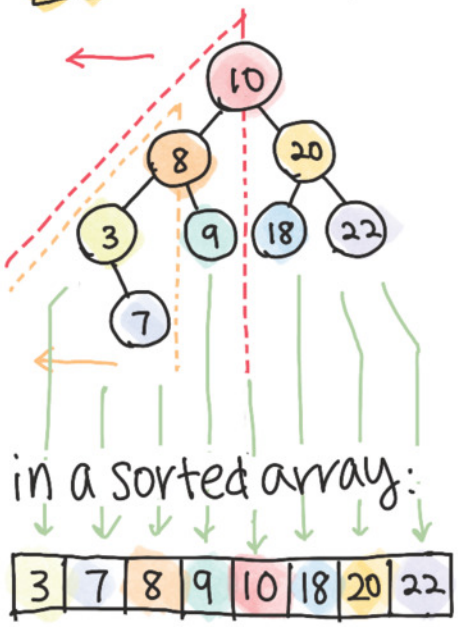


Binary tree → Binary heap

→ Binary Search Tree

- tree data structure
- each node has at most 2 children
- a.k.a. ordered or sorted binary tree
- fast look up
  e.g. phone number lookup table by name

Rule of thumb

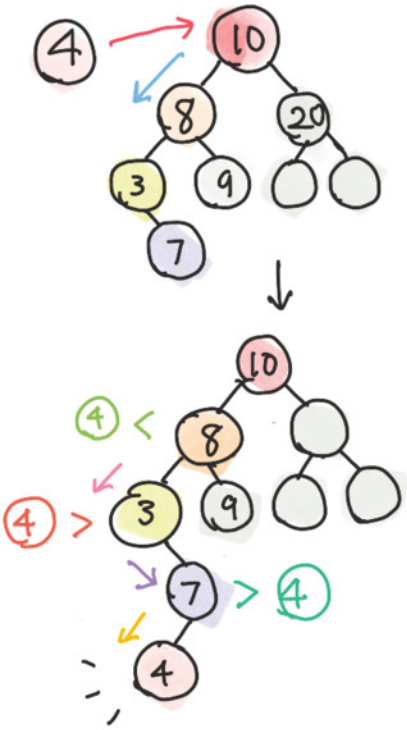


in a sorted array:

3	7	8	9	10	18	20	22

- ★ each value of all nodes in the left subtrees is lesser
  - △ (10)'s left subtrees : 8, 3, 9, 7
  - △ (8) : 3, 7 ← smaller than parent
- ★ each value of all nodes in the right subtrees is larger
- ★ no duplicate values

Insertion → Always add to the lowest spot to be a leaf 🍃 No rearrange!



Let's add (4)

1. Compare w/ the root first.
2. (4) < (10) so go left.
3. then compare w/ the next, (8)
4. (4) < (8) so go left
5. Compare w/ the (3)
6. (4) > (3) so go right.
7. Compare w/ the (7)
8. (4) < (7), so add to the left! Done.

Complexity:
Ave. O(log n)
Worst. O(n)