

# Binary Search Tree

- 1) Left mode data < Parent mode data
- 2) Right mode data > Parent mode data

✓ ✓ ✓  
100, 80, 120, 50, 90, 150

search - Best / average

key = 90

$O(\log_2 n)$

Leaf  
Node

↳ No child nodes BST

100 — Root Node

BST-1

Internal node

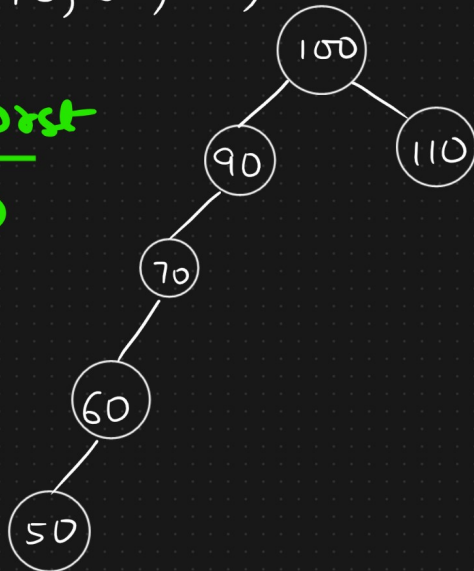
Worst case  
Scenario

100, 90, 70, 60, 50, 110

search - worst

key = 50

$O(n)$



skewed BST

Left skewed  
BST

Right skewed  
BST

↳ left skewed

Binary Search  
Tree

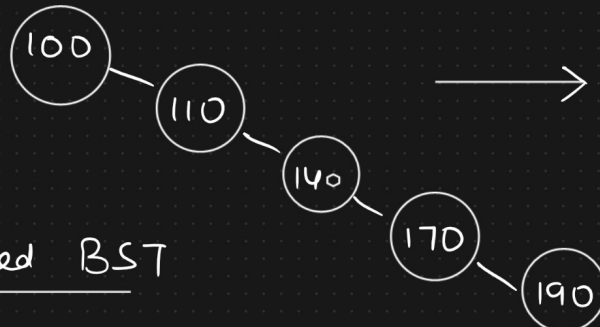
BST-2

Worst case Scenario

key = 210

$O(n)$

100, 110, 140, 170, 190, 210



BST-3

unbalanced BST

↳ Right skewed

Binary Search  
Tree

Note:

210

1. Balanced BST (Best/Average)  $\rightarrow O(\log_2 n)$

2. Unbalanced BST (Worst)  $\rightarrow O(n)$

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Skewness

self balancing  
Tree

- 1. AVL Tree
- 2. Red Black Tree

Rule & Regulations