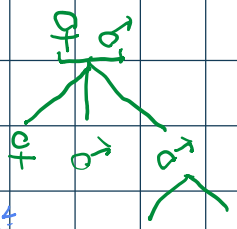
Study Note - Tree

2025年11月24日 上午 09:33

家族樹



電腦檔案總管

C:
D:
E:

- Windows
- Program Files
- Users

生物親代子代

domain IP

ip
domainname
140.138.14x.xxx
www.yzu.edu.tw

Linked List

sequential

結構 水平

子代 唯一

Tree

non linear

no cycle

階層 (hierarchy)

垂直

left, right (0~n個)

Tree → binary tree → binary search tree

degree限制

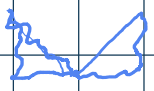
child node 0~2

parent node
child node
relationship

左子節點數 ≤ 母節點數

右子節點數 ≥ 母節點數

平衡左右子數



AVL (Adelson-Velsky and Landis) Tree

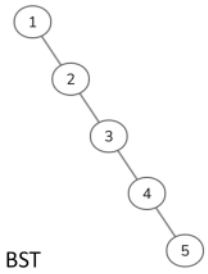
An AVL tree is a **binary search tree** in which for every node in the tree, the height of the left and right subtrees differ by at most 1.

AVL tree was named after inventors Georgy **A**delson-**V**elsky and Evgenii **L**andis, is a self-balancing binary search tree.

Balancing strategy:

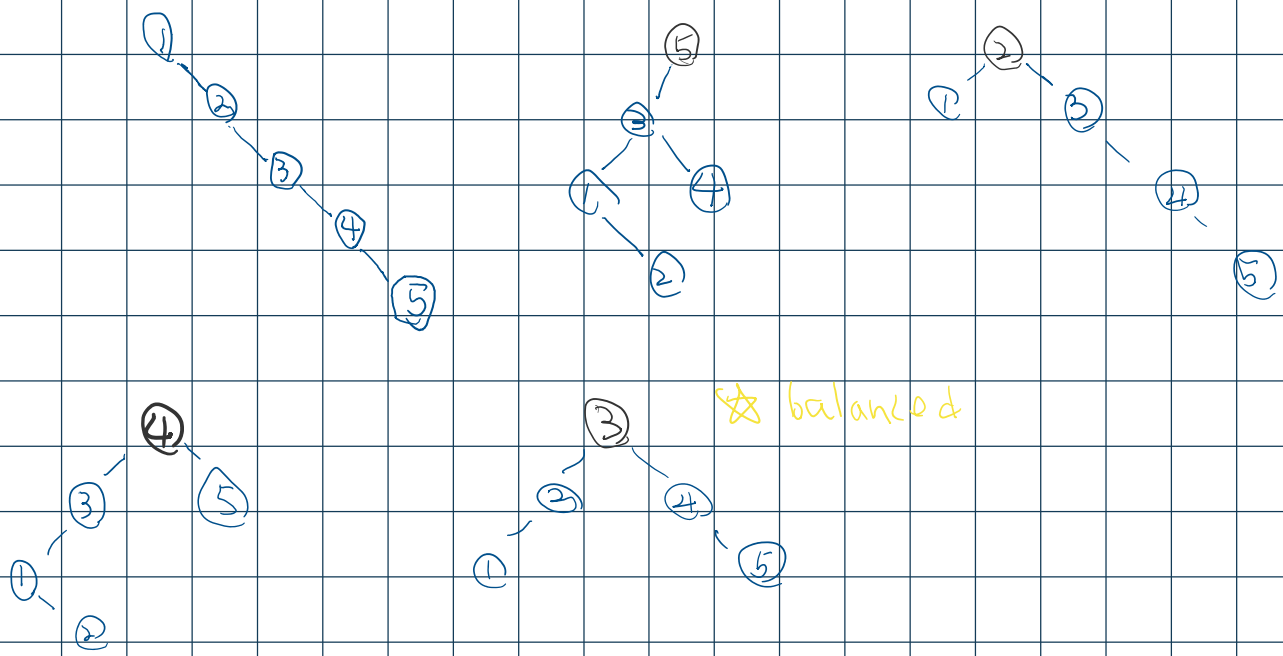
balance = let complexity ≤ O(logN)

換root



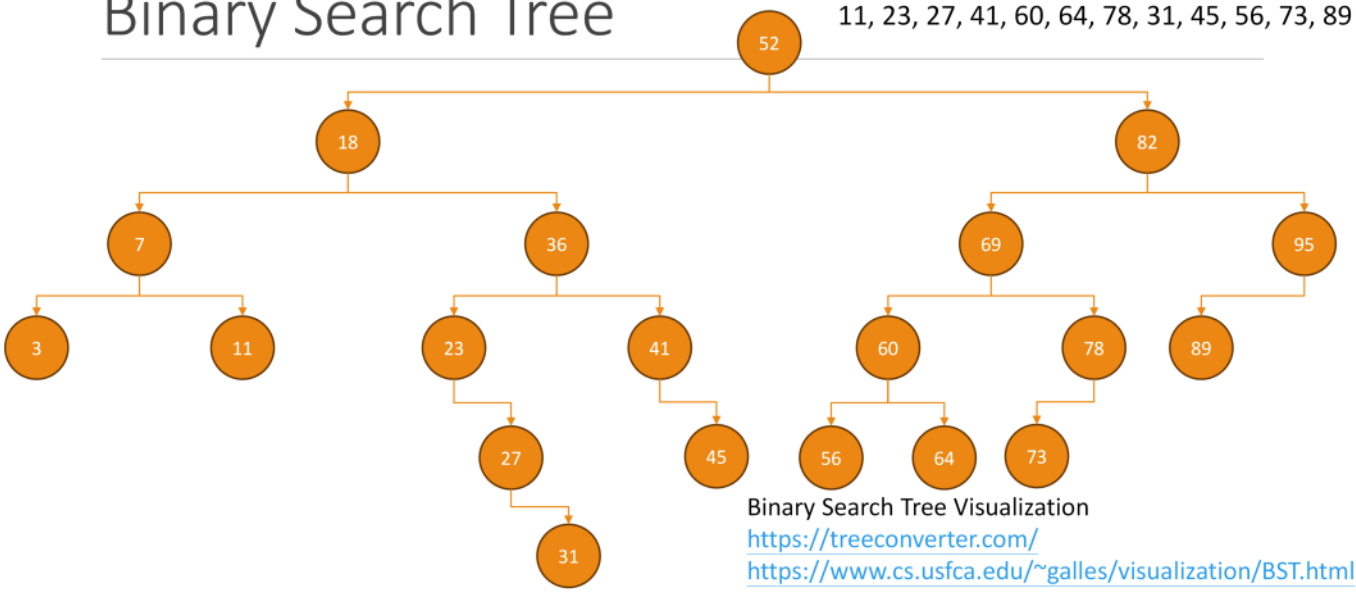
BST

AVL Tree

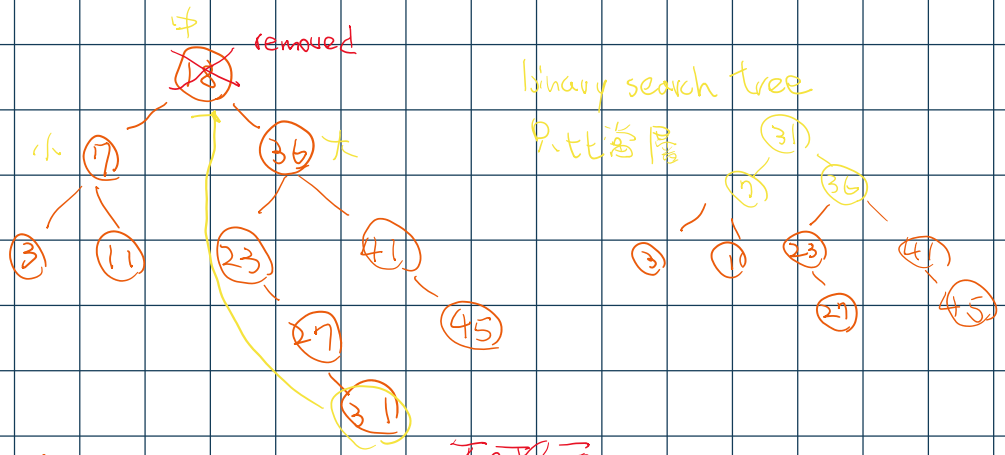


Binary Search Tree

Input integers: 52, 18, 82, 7, 69, 36, 95, 3, 11, 23, 27, 41, 60, 64, 78, 31, 45, 56, 73, 89



Binary Search Tree Visualization
https://treeconverter.com/
https://www.cs.usfca.edu/~galles/visualization/BST.html

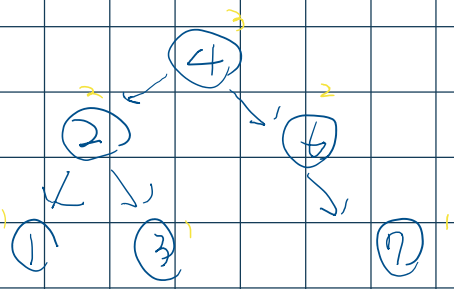


binary search tree
只比當層

和root
左子節點中最大數，必小於母節點

⇒找左子節點中最大 or 右子節點中最小

要符合AVL樹兩邊高度差≤1 如何動手?



要有位置(節點高度)

從Binary tree → Binary search tree? → AVL tree?

traverse節點 重建一棵樹