

Binary Search



Trees

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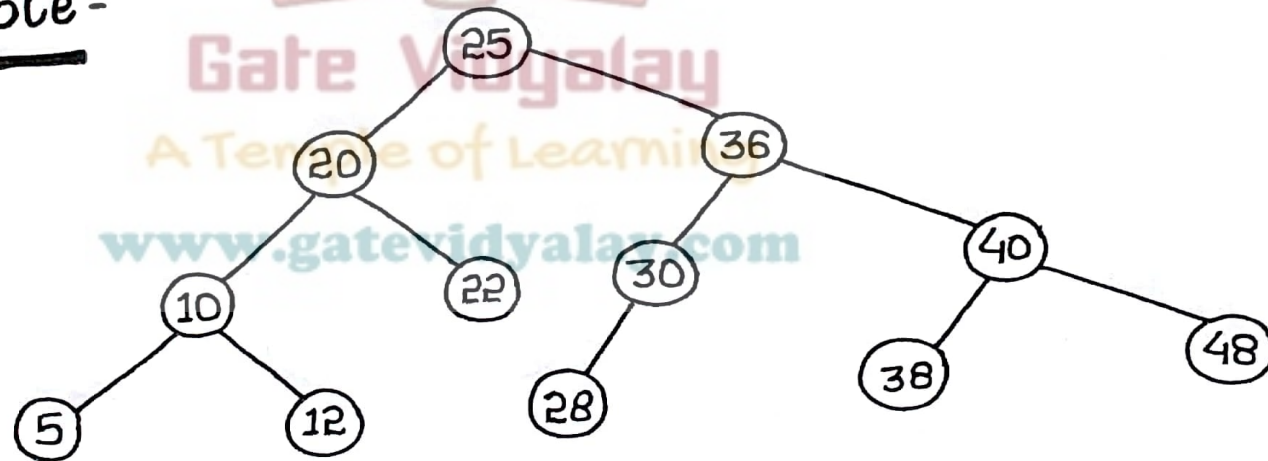


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Definition-

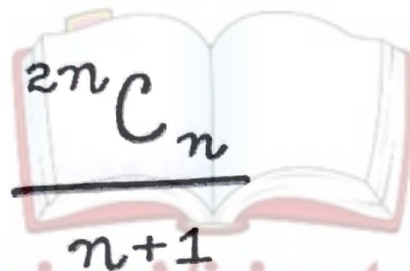
Binary Search Tree (BST) is a special kind of binary tree in which every node contains smaller values only in its left subtree and only larger values in its right subtree.

Example-



Number of distinct BSTs with 'n' distinct

Keys -


$$\frac{2^n C_n}{n+1}$$

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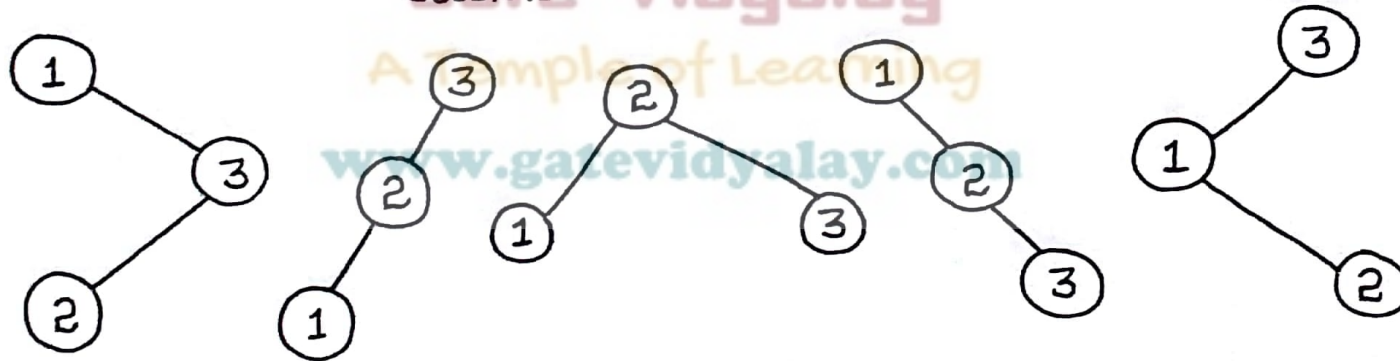
Example -

Number of distinct Binary search Trees with 3 distinct keys

$$= \frac{2 \times 3}{3+1} C_3$$
$$= 5$$

Consider three distinct keys are - 1, 2, 3

Possible BSTs are -



Construction of BST -

Question -

Construct a Binary Search Tree (BST) for the following sequence of numbers -

50, 70, 60, 20, 90, 10, 40, 100

Solution -

When elements are given in a sequence, we consider the first element as the root node.

- Insert 50 -



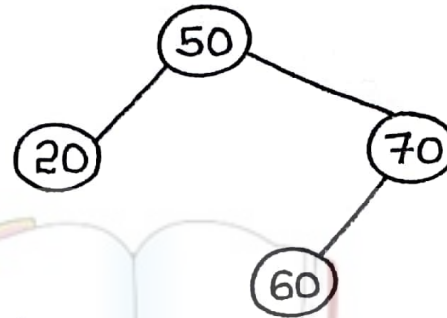
- Insert 70 -



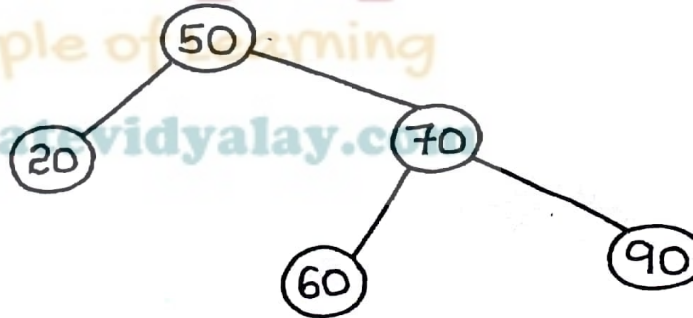
- Insert 60 -



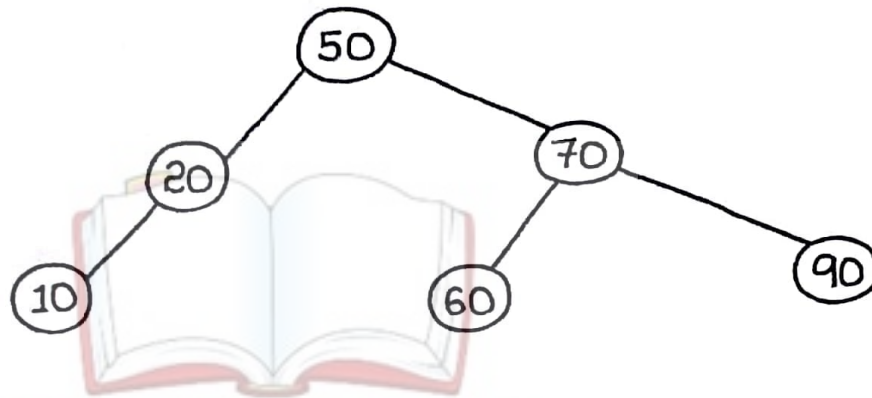
- Insert 20 -



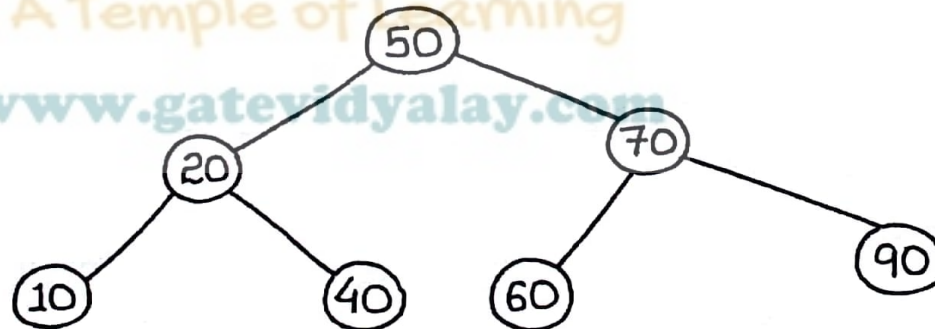
- Insert 90 -



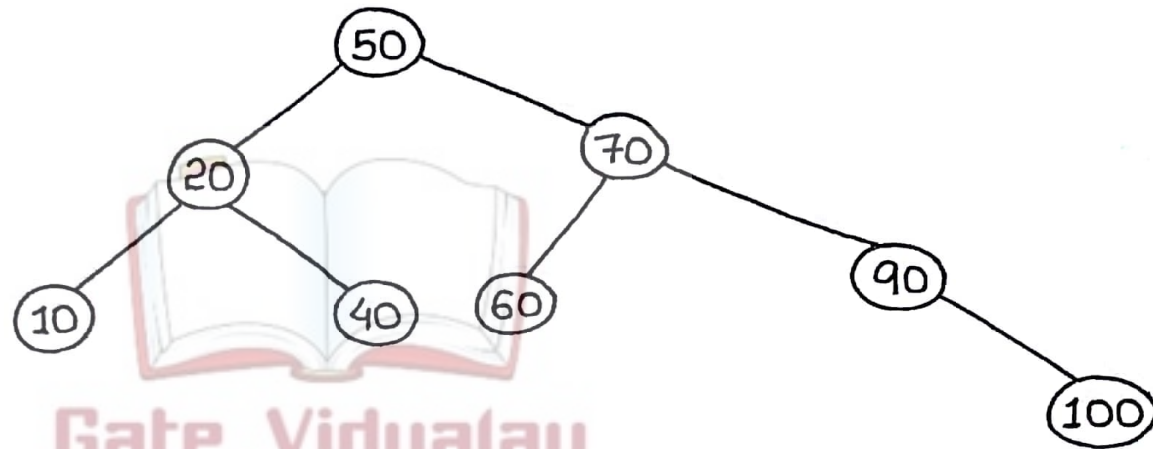
- Insert 10 -



- Insert 40 -



- Insert 100 -



This is the required Binary search Tree.

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