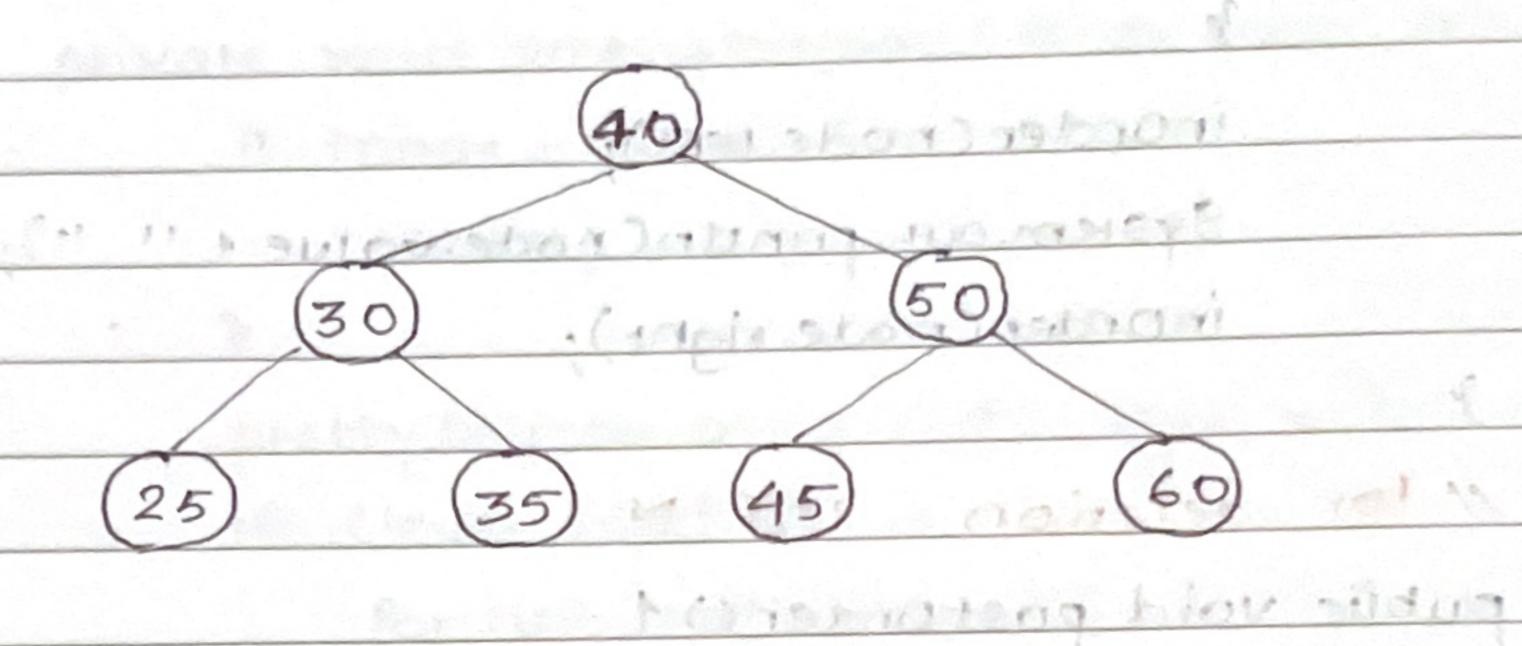
Binary search tree (BST)

A binary search tree follows some order to arrange the elements. In Binary search tree, the value of left node must be smaller than parent node and the value of right node must be greater than the parent node.

TILLY.



Advantage of Binary search tree

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- · Searching an element in Binary search tree is easy as the almays have a hint that which subtree has the desired element.
- · As compared to array and linked list insertion and deletion operations are faster in BST.

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Implementation (Main short) relation

public class Node 1

private int value;

private Node left;

private Node right;

private int height;

public Node (int value) (

public int get value () 1
return value,

this value - value,

private Node root, armon how and in if chode invit) 1 return -1; Public BSTOE & public int height (Node node) Horsif (node == null) & horse to many return -1; Time to and and stail harmon knowledge bior serving return node height; FERMS - STOTO TI public boolean isempty of return node - - null; 3 Characterior of his tar public void insert (int value) 1 nobt = insert (value, root); 3. Mana catherine mind baros baroluged private Norde insert (int value, Node node) 1 if (node -- null)-Kaplad andload sileiug node - new Mode (value); return node; When shall be mid restord beville if cyalue & node, value) 1 - along node.left - insert (value, node.left); if (value > noder value) & int noderright insert (value, noderight); (toroly about) node height - Math. max Cheight (node. let), height (node. right)) +1; beturn node; On about most " warment your it.

```
public void populate (intt I noms)?
      for cinti-o, ix nums.iength; itt)1
      this insert (nums [i]);
                               1 3 STEEL SILVER
          public void populated sorred (2) 1 111
               populated sorted Conums, or nums, length),
                                11- 1111111
          private void populated sorred Cint Journs, int start, only
                     114 ind story 1111th
              end) 1
                ir (start 7- end) 1
                   return; 1 Overson nosmod and
                         iller - There Truist
      int mid = (start + end)/2;
      this insert (nums (mid)); " bis side
        populated sorred (nums, start, mid);
        populated Sorred (nums, midtl, end);
        & Cohon about mily int your about adeviso
          public boolean balanced () 1
              return balanced (root),
          privare boolean balanced (Mode node)
              if (node = = null) nd some survey
         Constant return truen distant
             tetum Math abs (height (node left) - neight (node ight)
       Kala & balanced (node left) & & balanced
              (nodengnt)
short toisely (1919 board toised) or a front defined when
         public void displayed
```

	private void display (Node node, string details) ?
	in in it (model-anoll)
	is both 1991 and of therum programed organismin agreement
	san and-know ad tonger about you foll as affelia
15	System. out. println (details + node value)
	display (node left, "left child of " thode value + ":");
	display (node right, " Right child of the node value + ":");
11	throw how an about the peut the proof word was
	J. Tea Iomno o
	it will califord more incertion and the torner day being
61	Problems with Binary Search, Tree.
101	Unbalanced trees! In a standard BST nodes are inserted
03	in a way that can lead to formation of long chains.
	The result is unbalanced itree, where the height can become
	bad as O(N) in the worst case, making operations like
	search insert and delete inefficent compared to the ideal
	O(log N) time complexity.
	Solution: Self Balancing Binary Tree
	Balanced Trees
	A balanced tree is one where for every node in the tree,
	the difference in the height of the left and right subtree
31	10-1-1-1, or 0.
	This condition ensures that the tree remains approximately
	balanced at all-times.
	The test of the form to be a series of the s
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