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Difference between Binary tree and B-tree - GeeksforGeeks

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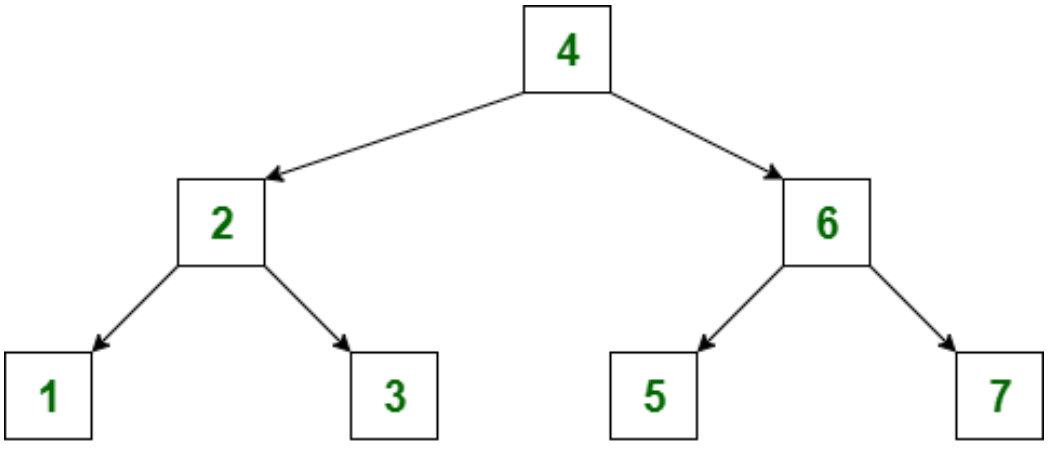
B-Tree **:** B-Tree is known as a self-balancing tree as its nodes are sorted in the inorder traversal. Unlike the binary trees, in B-tree, a node can have more than two children. B-tree has a height of logM N (Where ‘M’ is the order of tree and N is the number of nodes). And the height is adjusts automatically at each

update. In the B-tree data is sorted in a specific order, with the lowest value on the left and the highest value on the right. To insert the data or key in B-tree is more complicated than binary tree.

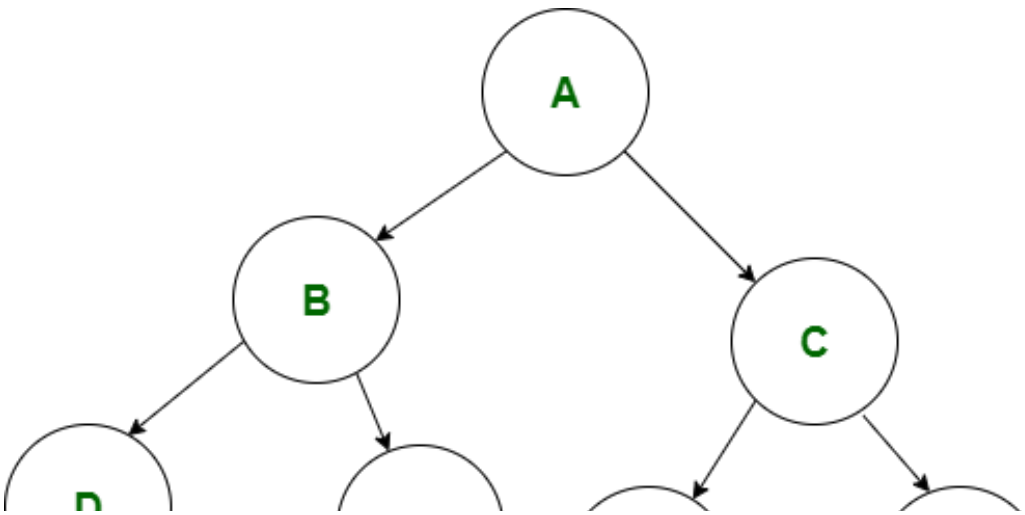
There are some conditions that must be hold by the B-Tree:

- All the leaf nodes of the B-tree must be at the same level.
- Above the leaf nodes of the B-tree, there should be no empty sub-trees.
- B- tree's height should lie as low as possible.



B-Tree

Binary Tree : A binary tree is the special type of general tree. Unlike B-tree, in a binary tree a node can have at most two nodes. In a binary tree, there is a limitation on the degree of a node because the nodes in a binary tree can't have more than two child node(or degree two). The topmost node of a binary tree is called root node and there are mainly two subtrees one is left-subtree and another is right-sub-tree. Unlike the general tree, the binary tree can be empty. Like B-tree, binary tree can also be sorted in inorder traversal. But it can also be sorted in preorder as well as postorder. In binary tree, data insertion is not complicated than B-tree.



Binary Tree

Let’s see the difference between B-tree and Binary tree:

S.NO	B-tree	Binary tree
1.	In a B-tree, a node can have maximum ‘M'(‘M’ is the order of the tree) number of child nodes.	While in binary tree, a node can have maximum two child nodes or sub-trees.
2.	B-tree is called a sorted tree as its nodes are sorted in inorder traversal.	While binary tree is not a sorted tree. It can be sorted in inorder, preorder, or postorder

S.NO	B-tree	Binary tree
		traversal.
3.	B-tree has a height of log(M*N) (Where ‘M’ is the order of tree and N is the number of nodes).	While binary tree has a height of $log_2(N)$ (Where N is the number of nodes).
4.	B-Tree is performed when the data is loaded into the disk.	Unlike B-tree, binary tree is performed when the data is loaded in the RAM(faster memory).
5.	B-tree is used in DBMS(code indexing, etc).	While binary tree is used in Huffman

S.NO	B-tree	Binary tree
		coding and Code optimization and many others.
6.	To insert the data or key in B-tree is more complicated than a binary tree.	While in binary tree, data insertion is not more complicated than B-tree.
7.	B-tree is a self-balancing tree. The height of the tree is automatically adjusted on each update.	A binary tree is not a self-balancing tree.