B- tree

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B-Tree (Balanced tree)

In a B-Tree of order **m**, each node can have up to m children or m pointers and m-1 keys (values).

order = m

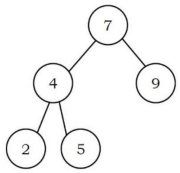
Max^m no. of children = m

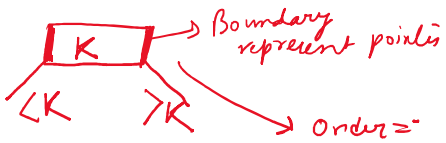
Max^m no. of keys = m − 1

Binary search tree:

1. Order is 2. Why? Because each node can have maximum 2 children or 2 pointers and each node has only 1 value or 1 key.

a)

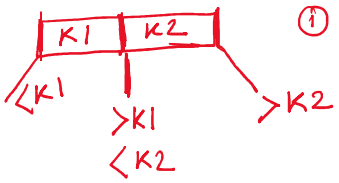




order = 3,

Max no. of children = 3,

Max no. of keys in a node = 3 − 1 = 2.



① Sorted order K1 < K2

Insertion in B-tree

1. Insertion of new nodes should be always at last level.
2. B tree grows in upward direction.
3. Keys should be sorted inside a node.

Order = 3

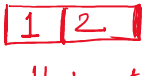
Max_no of child = 3

Max_no. of keys = 2.

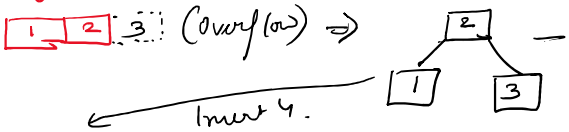
Insert following in B-Tree of order 3.

1 2 3 4 5 6 7 8 9

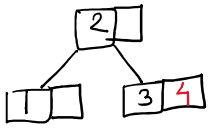
① Mid element = 2



Insert 3.

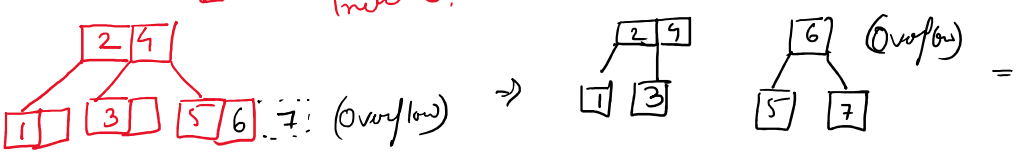


Insert 4.



Insert 5.

Insert 6.



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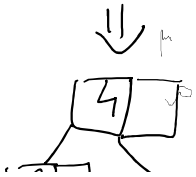
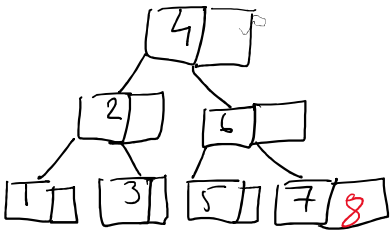
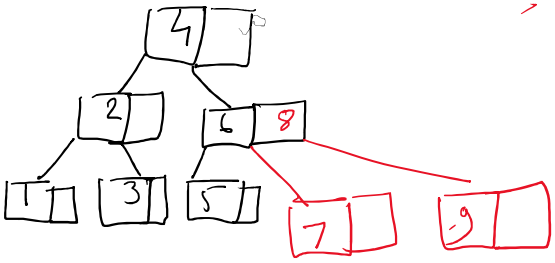




Overflow



Rotation -

Left child = minimum
Right child = Maximum
Root = Remaining.