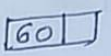
(Q) Construct a B+ tree with Order 3 with the following elements.

60, 30, 10, 40, 50, 20, 35

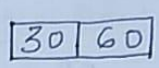
→ root node contains minimum 2 children (1 Key)

→ other nodes contain minimum $\lceil \frac{3}{2} \rceil = 2$ children (1 Key)

Insert 60:



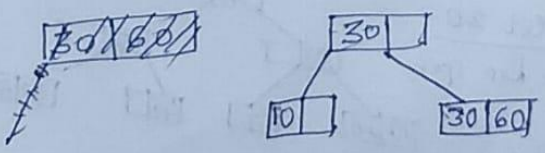
insert 30:



insert 10: node is full. ~~split the node~~

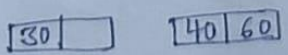
write in the order
10 30 60
split the leaf node

copy up middle key 30

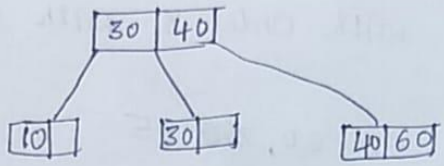


insert 40: node is full. split the leaf node. copy up middle key

30 40 60



(2)



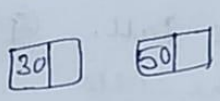
Insert 50 :

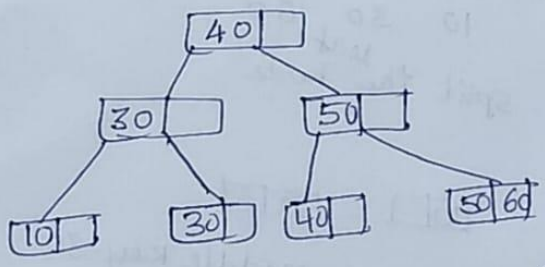
node is full. split the leaf node. copy up middle key.

40 50 60

parent node is full. so split the index node. push up middle key

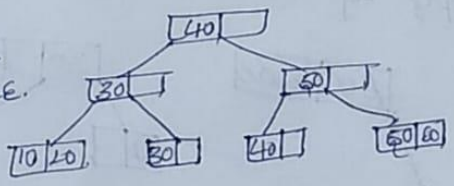
30 40 50





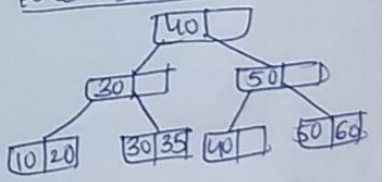
Insert 20

node has space.

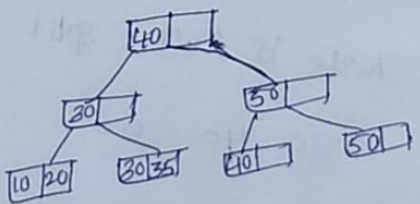


Insert 35 :

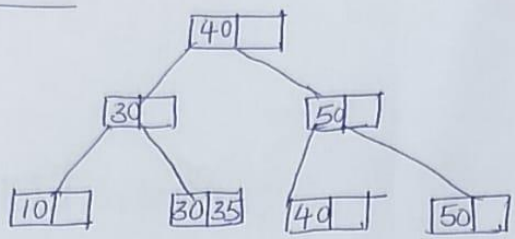
node has space



Delete 60



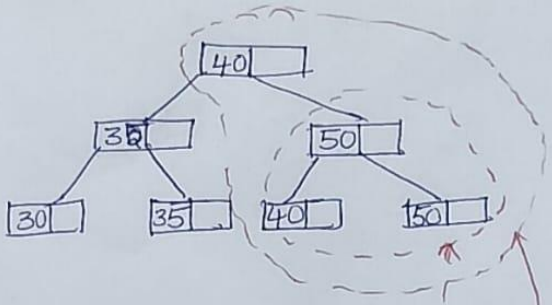
Delete 20:



After deleting 20, node has 2 children

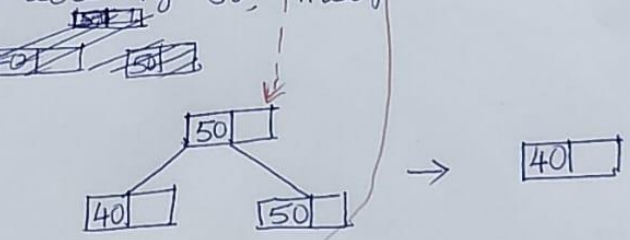
Delete 10:

After deleting 10 node becomes empty. Borrow ~~item~~ key from sibling node 30|35



Delete 50:

After deleting 50, merge the nodes ~~50 40~~



- Merge 40 with its parent node 40