20DCS103 - Rushik. Rathod

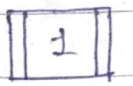
DBMS Assignment

Date Page 1

* Construct a B+ tree for the following set of key values : 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. Values are added in given order only. Construct B+ tree for cases where the number of pointers are four in one node and perform the following delete operations: delete 3, 5 and 10.

→ Given, Max no. of pointers = 4 = p. which is equal to the order of B+ tree.

∴ Max no. of keys can be added into only one node is = p - 1 = 3.

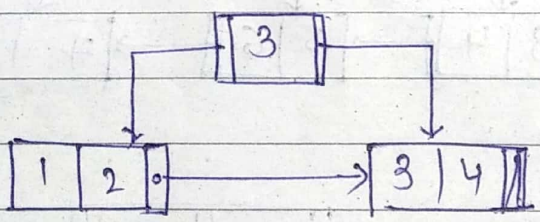
inserting 1 → 

inserting 2 → 

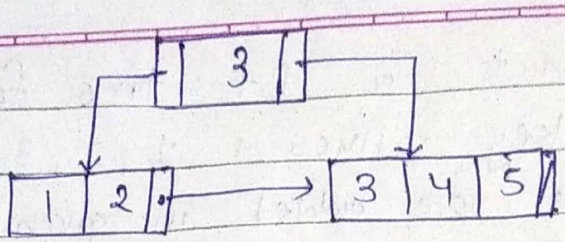
inserting 3 → 

inserting 4 → 1 2 3 4

mid element.



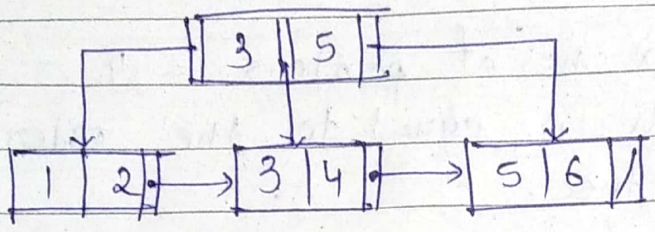
inserting 5



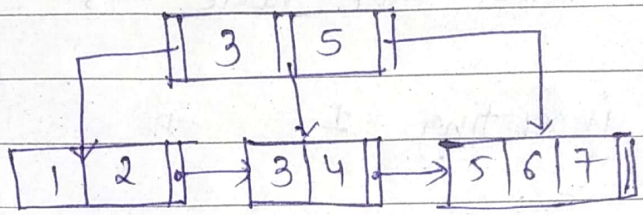
inserting 6

3 , 4 , 5 , 6

mid element.



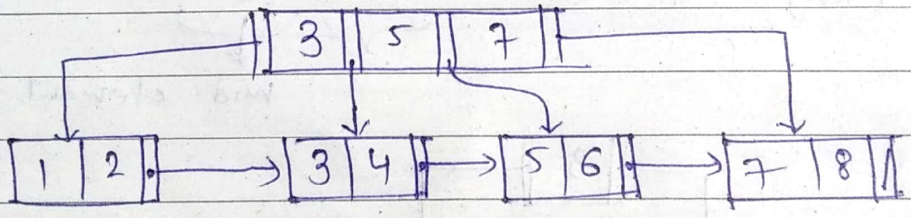
inserting 7



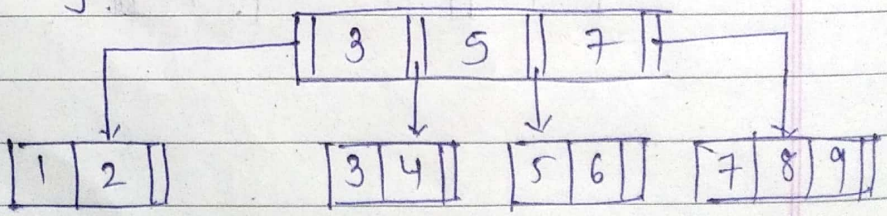
inserting 8

5 , 6 , 7 , 8

mid element.



inserting 9.



inserting 10

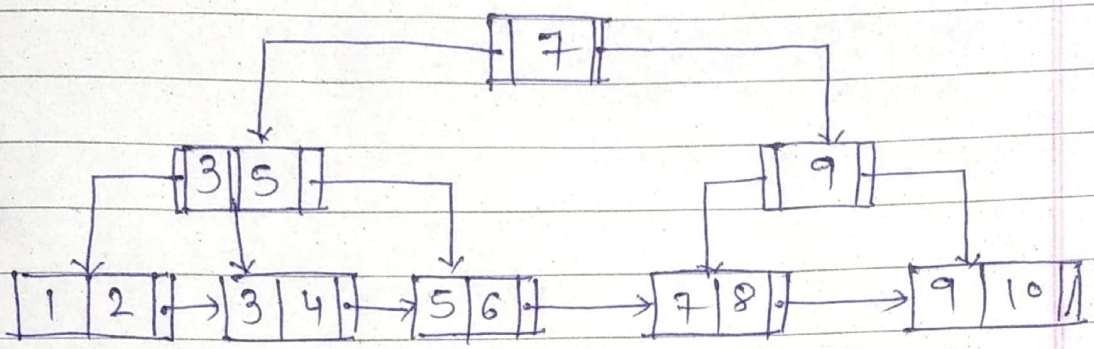
7, 8, 9, 10

mid element

After promoting 9 to the root,

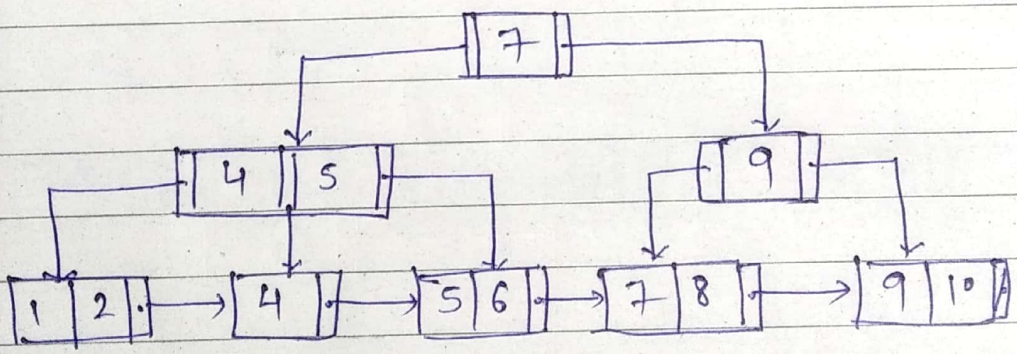
3, 5, 7, 9

mid element



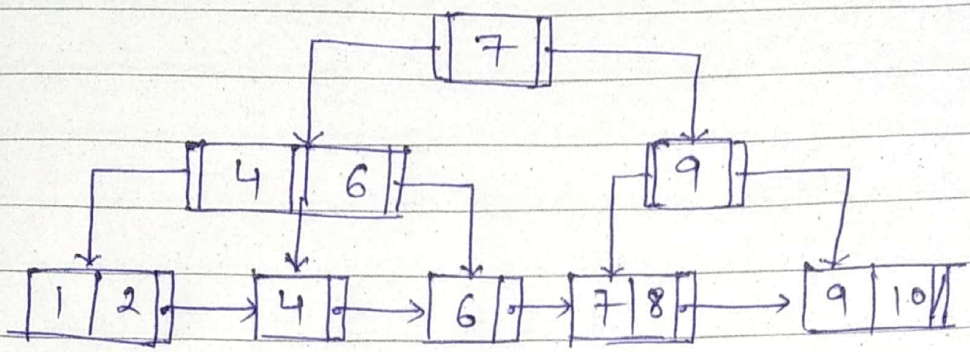
→ Now deleting 3 :

here node consisting 3 is having more keys than the minimum number of keys.
Therefore, to delete 3 we just need to promote it's another key.



→ deleting 5 :

Ageim the same method will be implemented as the same scenario has arise.



→ deleting 10 :

As a node consisting 10 is a leaf node and 10 is the only key, therefore we can directly remove it.

∴ The Resultant B+ tree we get is,