* Data Structures and Algorithms (DSA) - Assignment Number - 5

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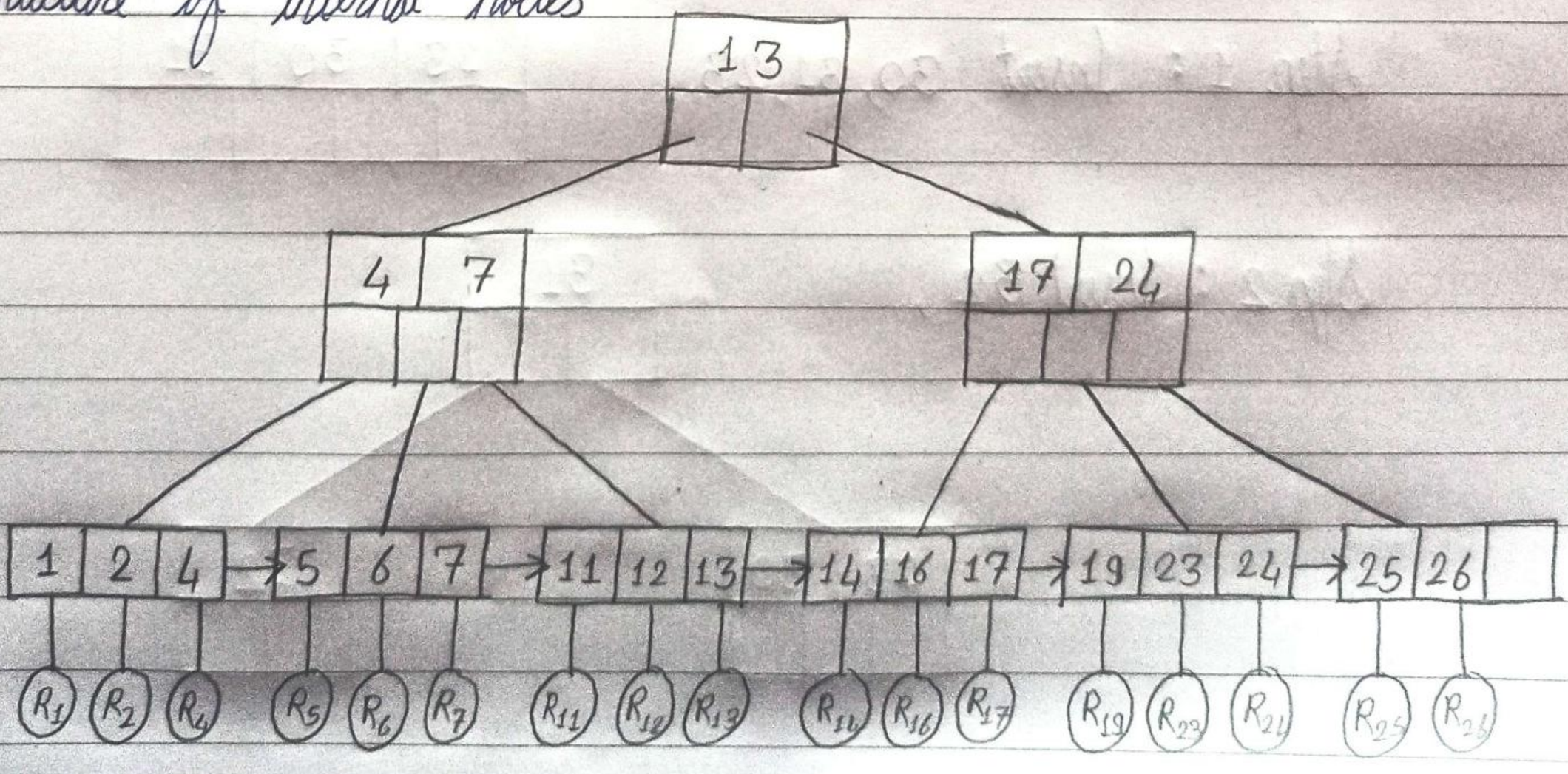
Q-1. What is B+ tree? Give the structure of its internal node. What are the variation of B+ tree?

→ In B+ tree, from leaf nodes, reference to any other node can be possible. The leaves in B+ tree form a linked list which is useful in scanning the nodes sequentially. The insertion and deletion operations are similar to B-trees.

Structure of internal nodes-



From leaf node only, any key can be accessed of entire tree. There is no need to traverse the tree in inorder fashion. Thus B+ trees gives faster access to any key.

There are two variants of B-trees:

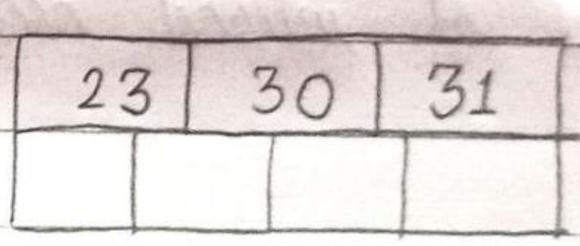
1) The B+ tree - It is a B-tree in which data is stored only in the leaf nodes due to which efficient data access is possible.

2) The B* tree - It is a B-tree in which each node except root node is at least 2/3 full rather than just half full.

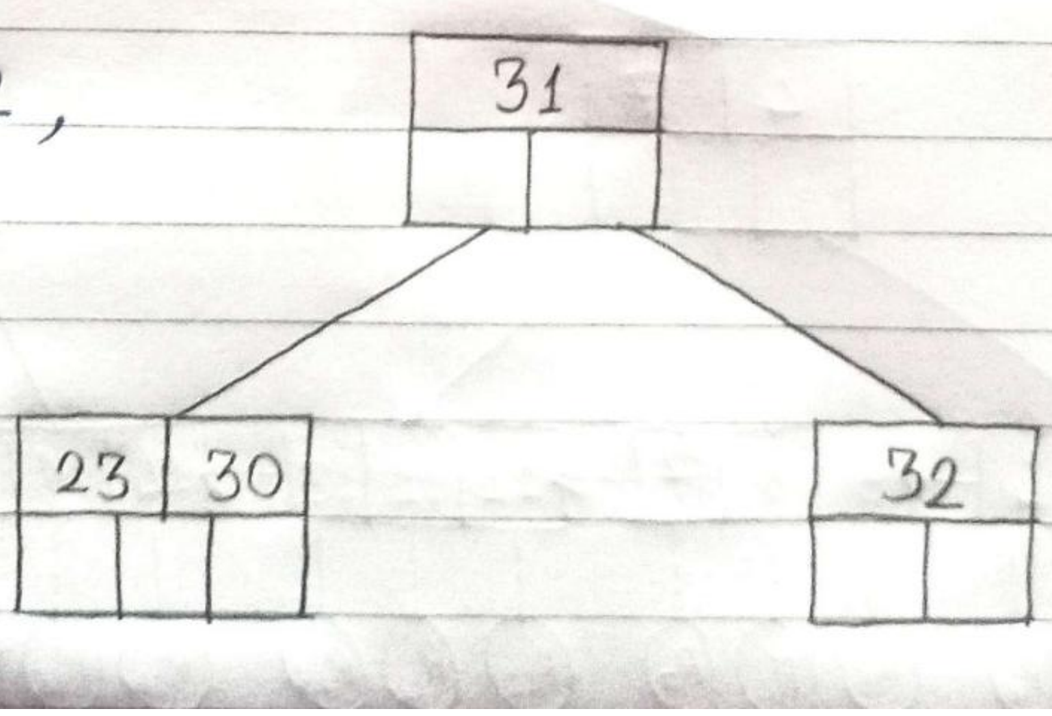
Q-2. Build B tree of order 4 for following data:
30, 31, 23, 32, 22, 28, 24, 29, 15, 26, 27, 34, 33, 36.

→ We have B tree of order 4. That means maximum 3 key are allowed in each node.

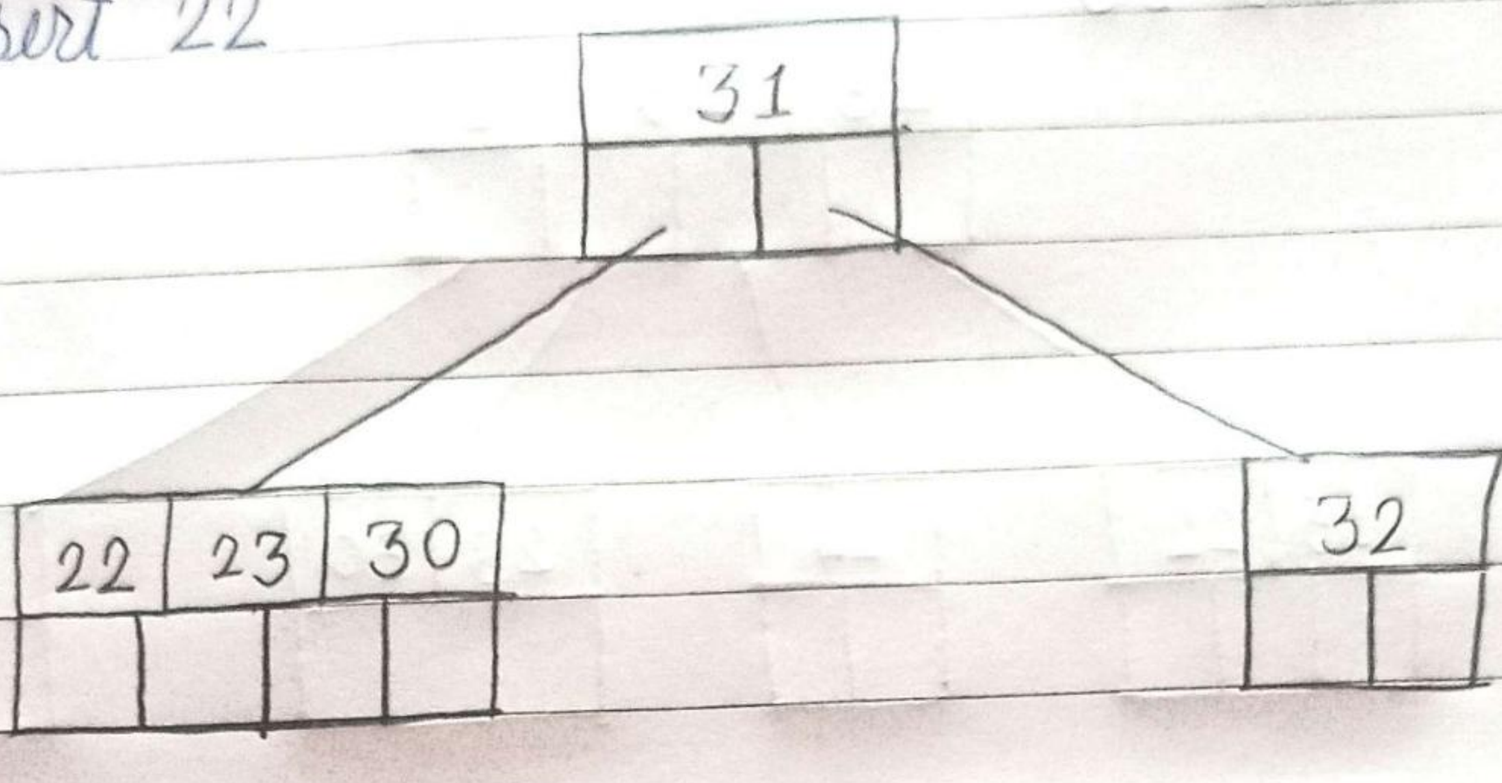
Step 1: Insert 30, 31, 23.



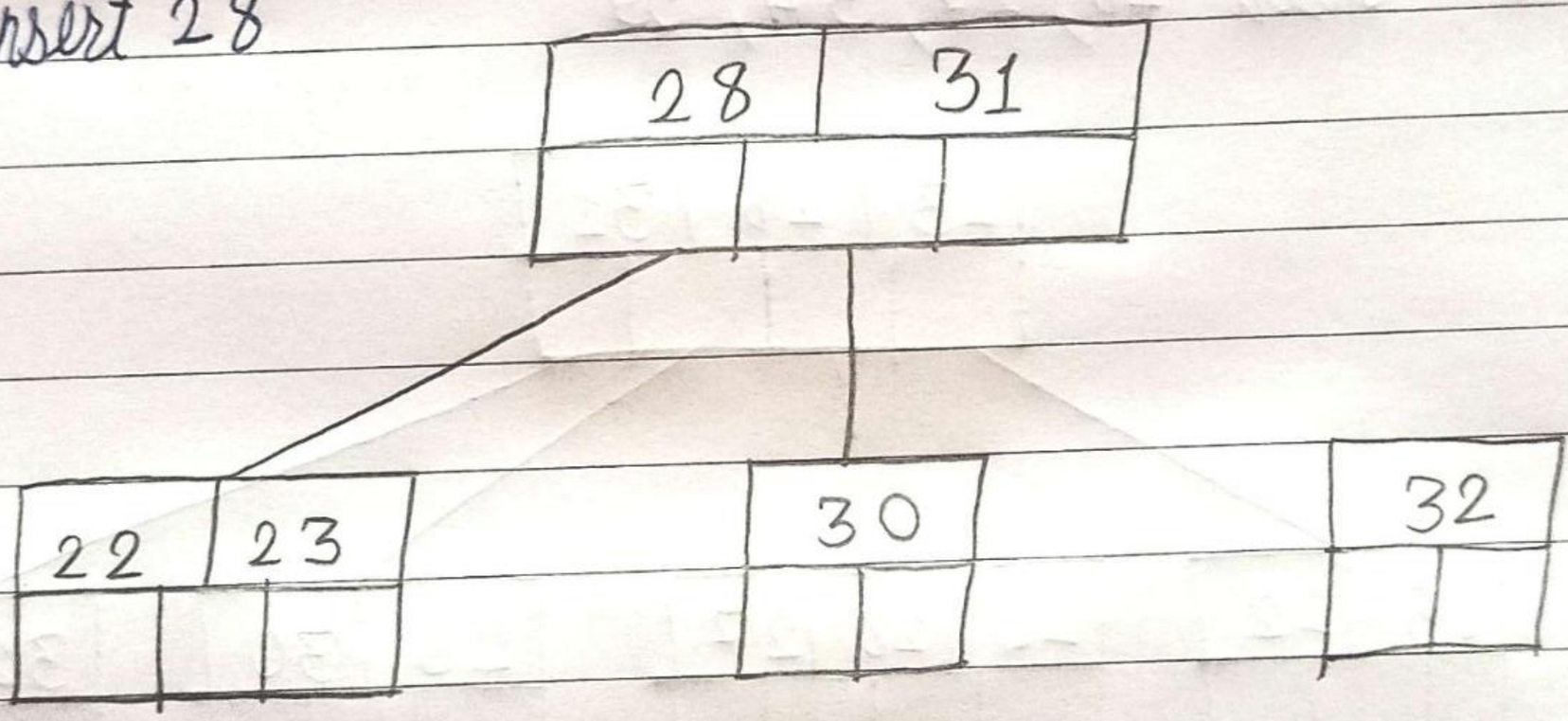
Step 2: Insert 32,



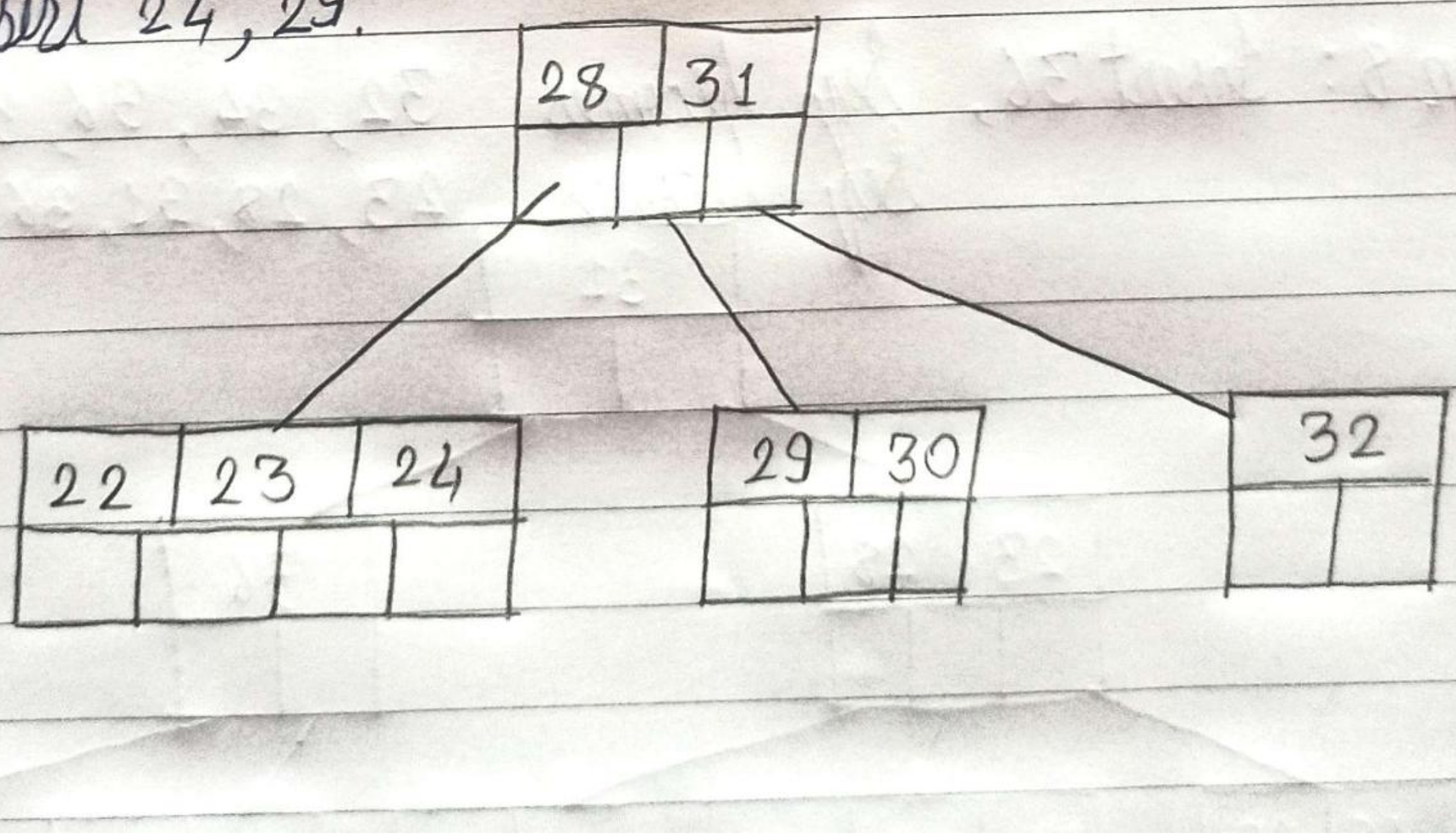
Step 3: Insert 22



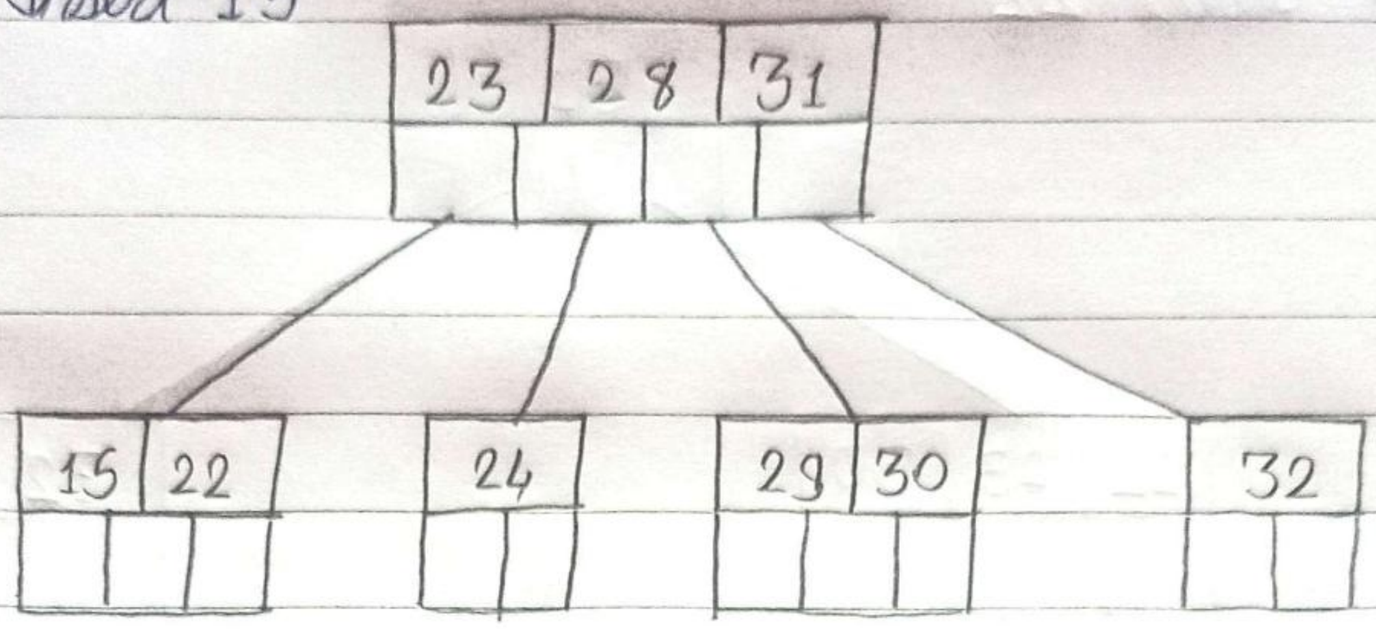
Step 4: Insert 28



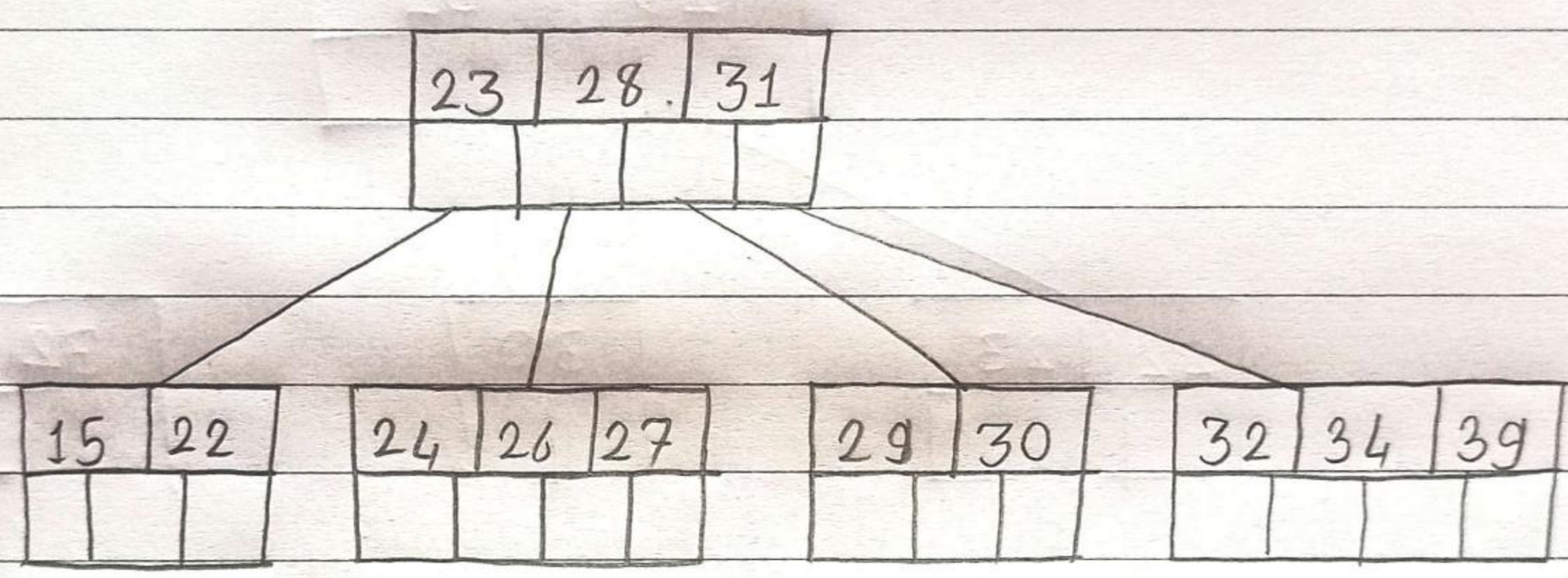
Step 5: Insert 24, 29.



Step 6: Insert 15



Insert 7: Insert 26, 27, 34, 39.



Step 8: Insert 36, Sep becomes 32, 34, 36, 39 , 36 push up.
Sep becomes 23, 28, 31, 36 , 31 push up.