B. Tree

B. Tree was designed to minimize file accesses.
A BTree is a balanced m-way tree.
To reduce disk access :-

(a) Height of the tree must be minimum
(b) There must be no empty subtree above the leaves of the tree.
(c) The leaves of the tree must be in the same level.
(d) The tree is allowed to grow towards the root not towards leaf.
(e) All internal nodes except the root will have maximum m children & minimum m/2 children.

(A) Searching is done in same like m-way Tree

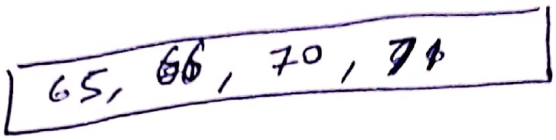
(B) Insertion
(1) New key is added to the leaf node
(2) If the node was not full then insertion is over.
(3) If node was full then node is split into two nodes on the same level and the median key value is sent up the tree to the parent node.

Question

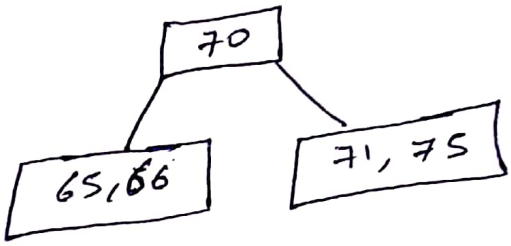
Insert in a B-Tree of order 5

65, 71, 70, 66, 75, 68, 72, 77, 74, 69, 83, 73, 82, 88, 67, 76, 78, 84, 85, 80 into an empty tree

Step 1 65, 71, 70, 66

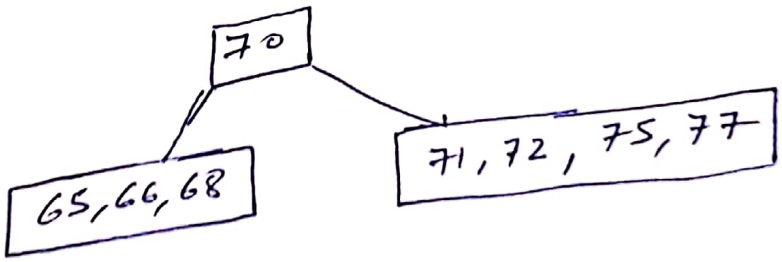


Step 2 75



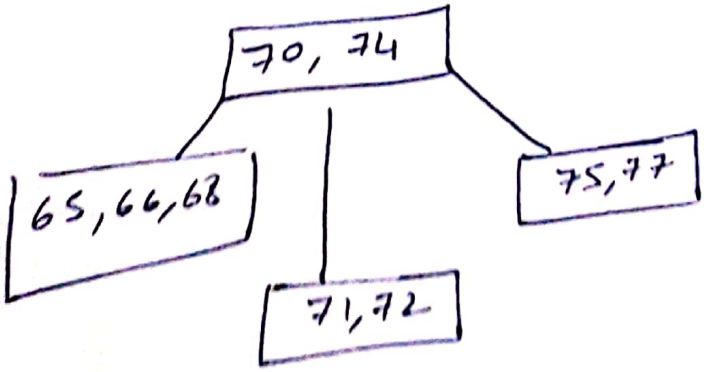
Step 3

68, 72, 77



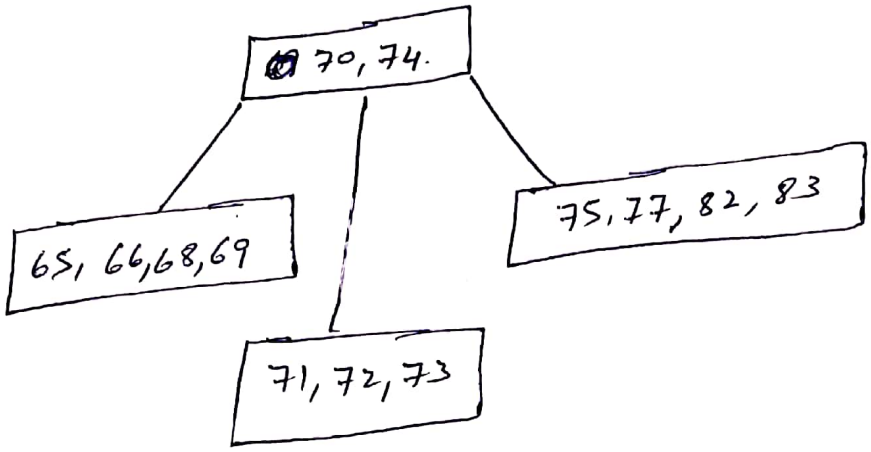
Step 4

74



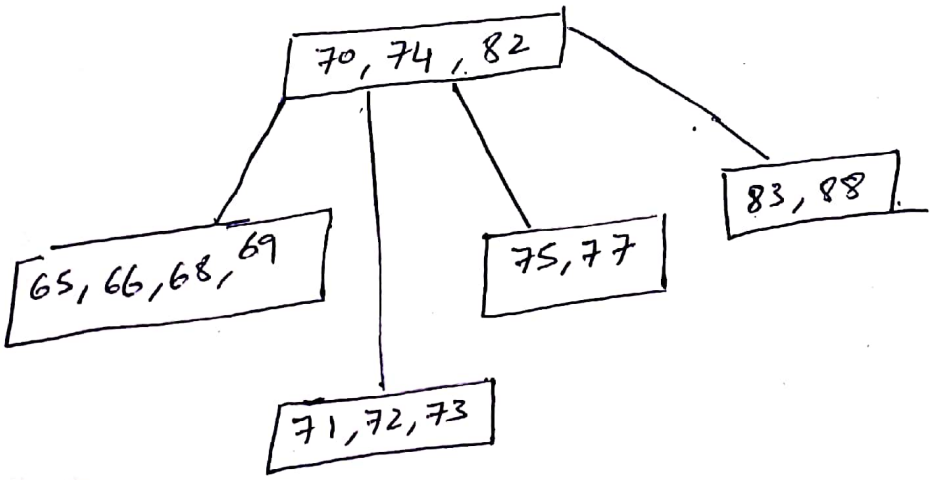
Step 5

69, 83, 73, 82



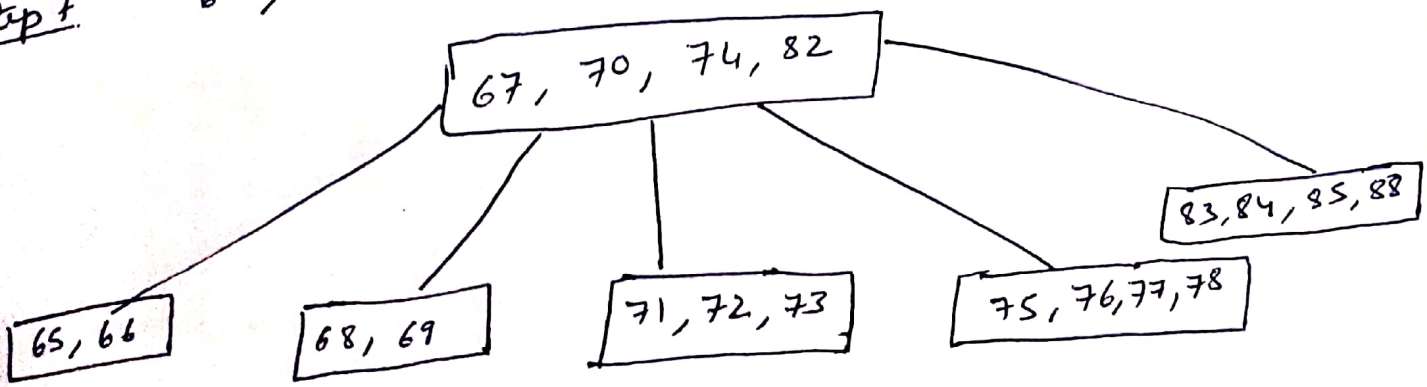
Step 6

88

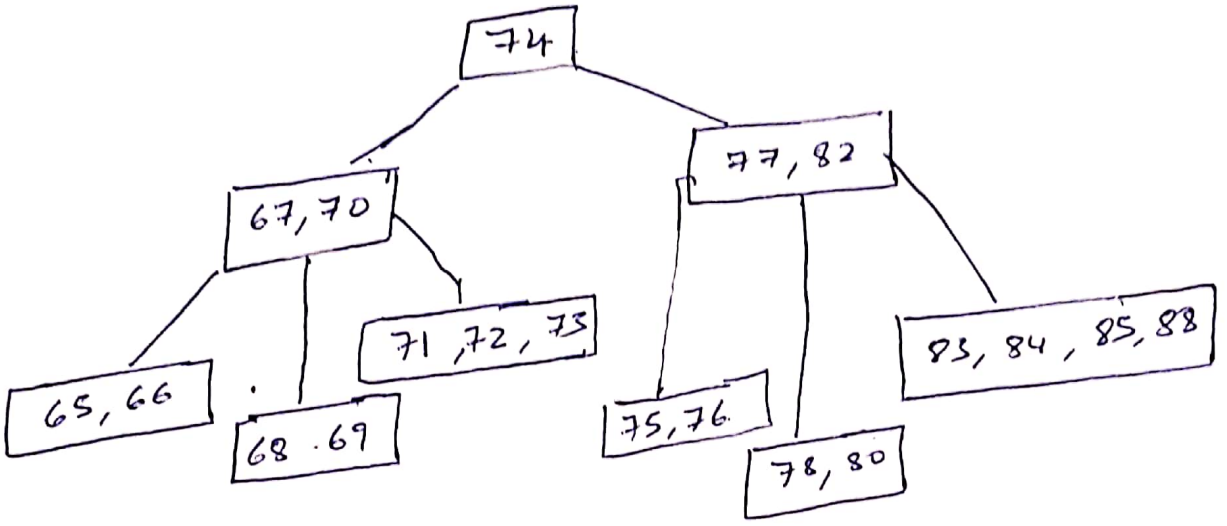


Step 7

67, 76, 78, 84, 85

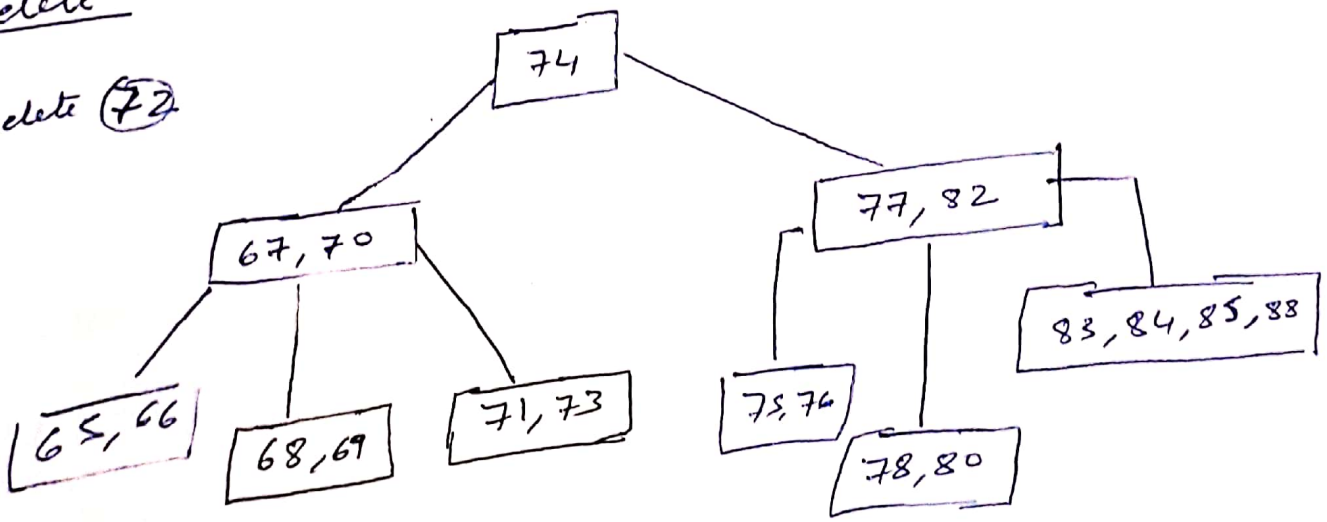


VIII) 80



Delete 72, 82 from the above tree

Delete (72)



Delete (80)