





CSE3103 : Database

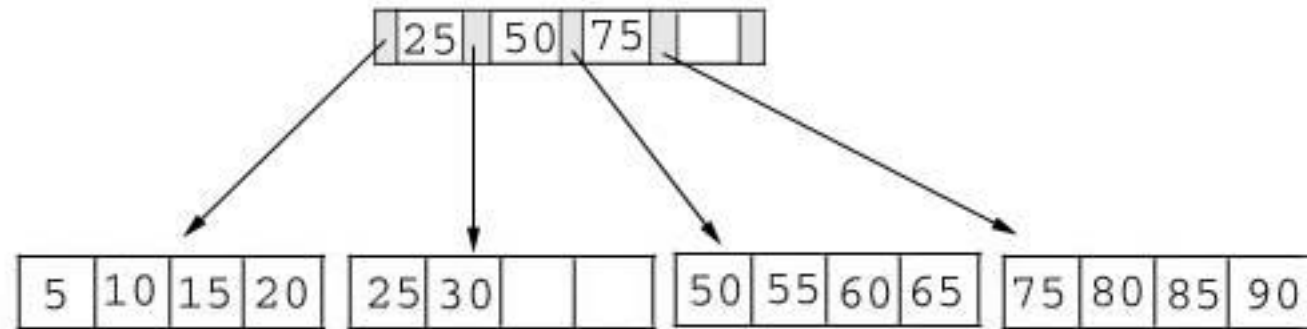
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Insertion

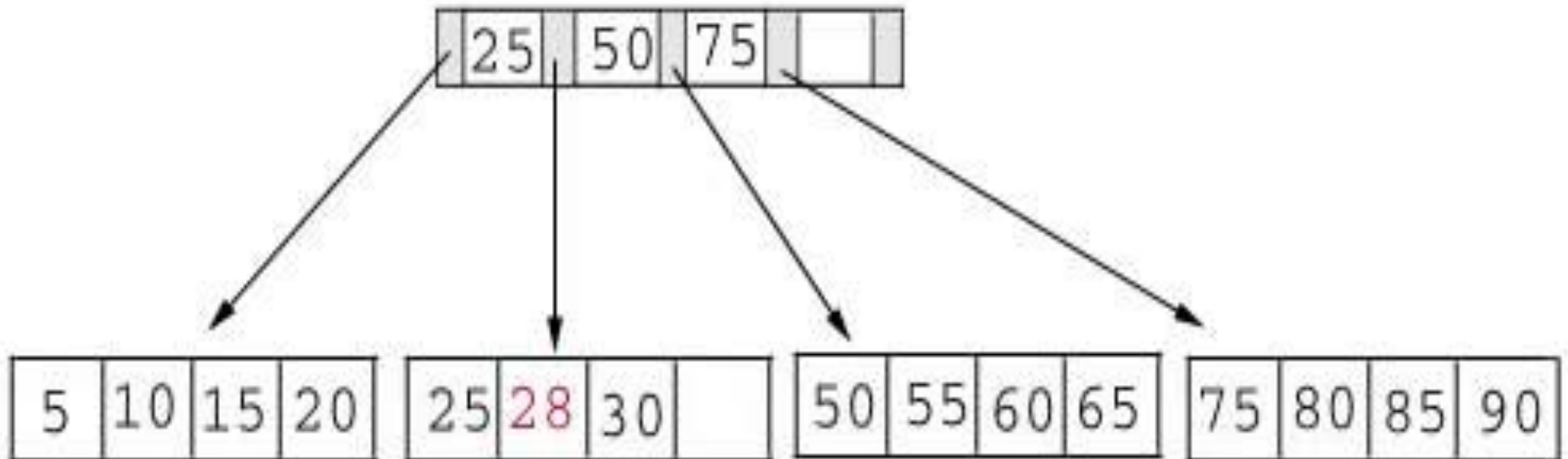
- inserting a value into a B+ tree may unbalance the tree, so rearrange the tree if needed.
- Example #1: insert 28 into the below tree.



Fits inside the
leaf

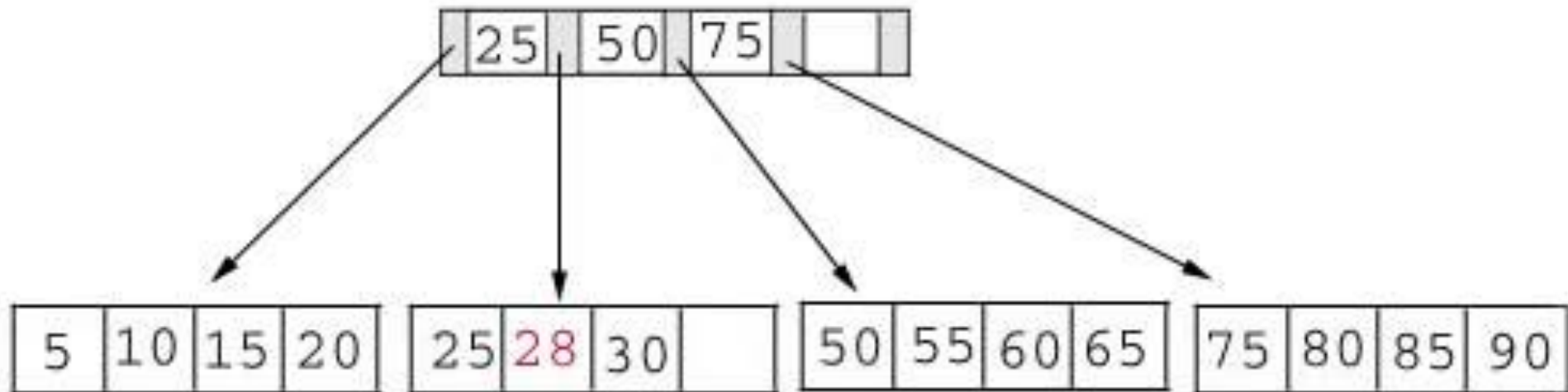
Insertion

■ Result:



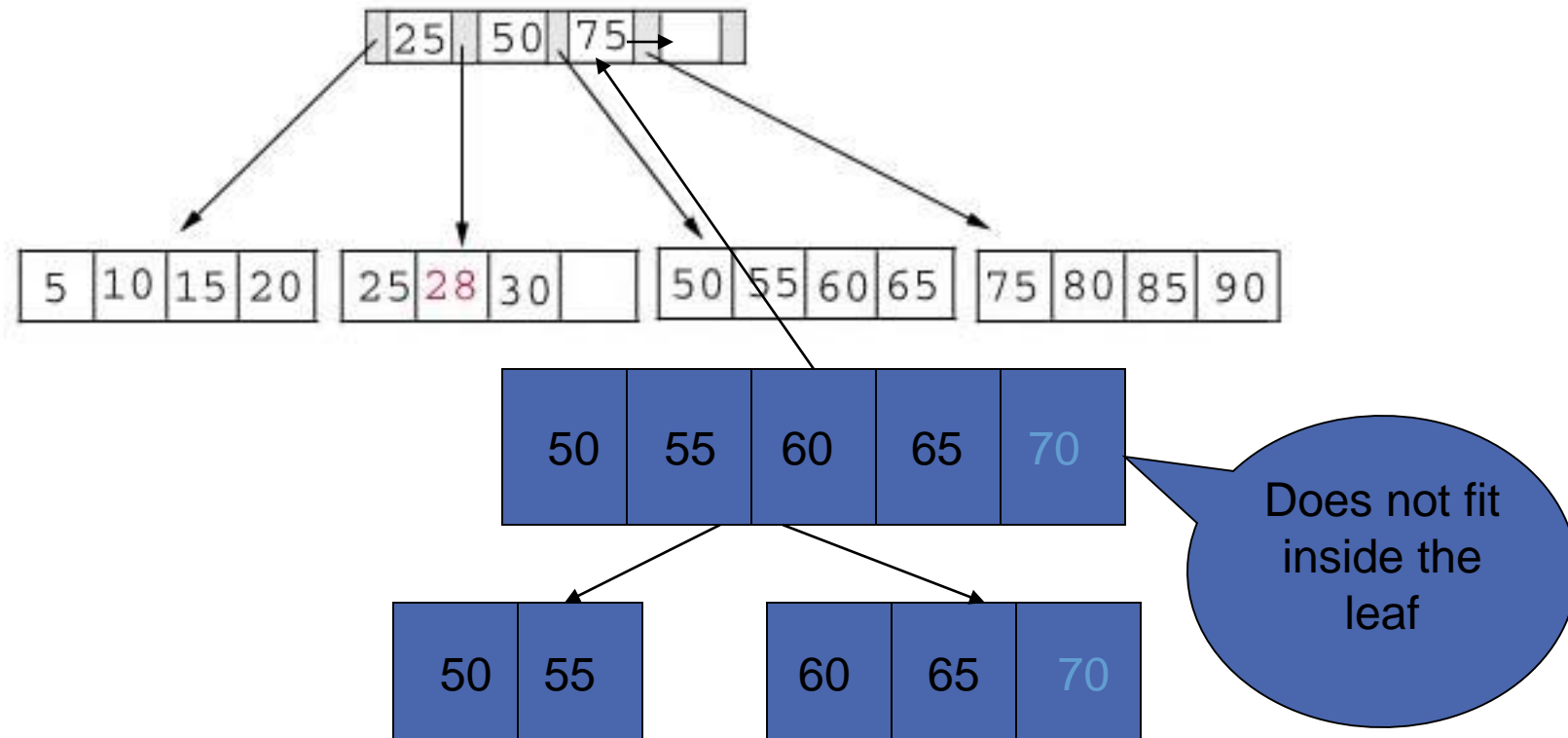
Insertion

- Example #2: insert 70 into below tree



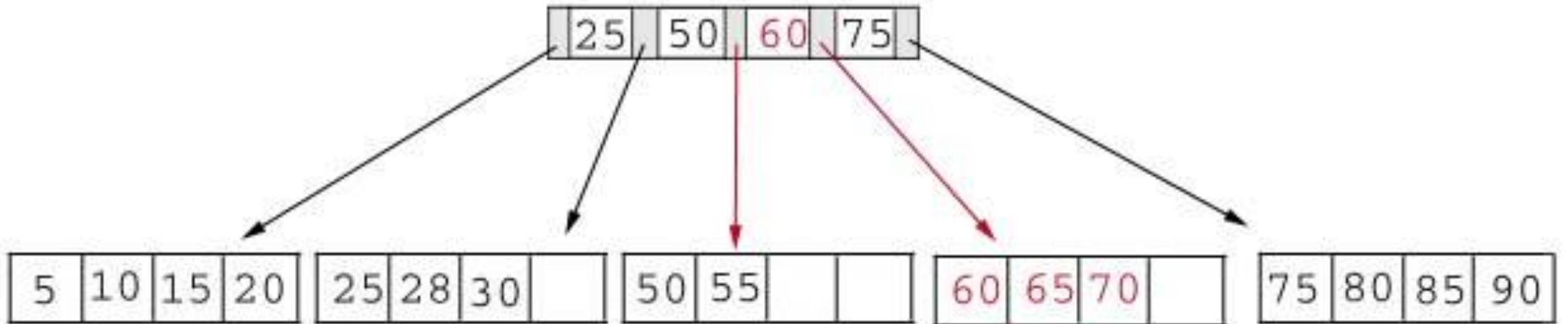
Insertion

- Process: split the leaf and propagate middle key up the tree



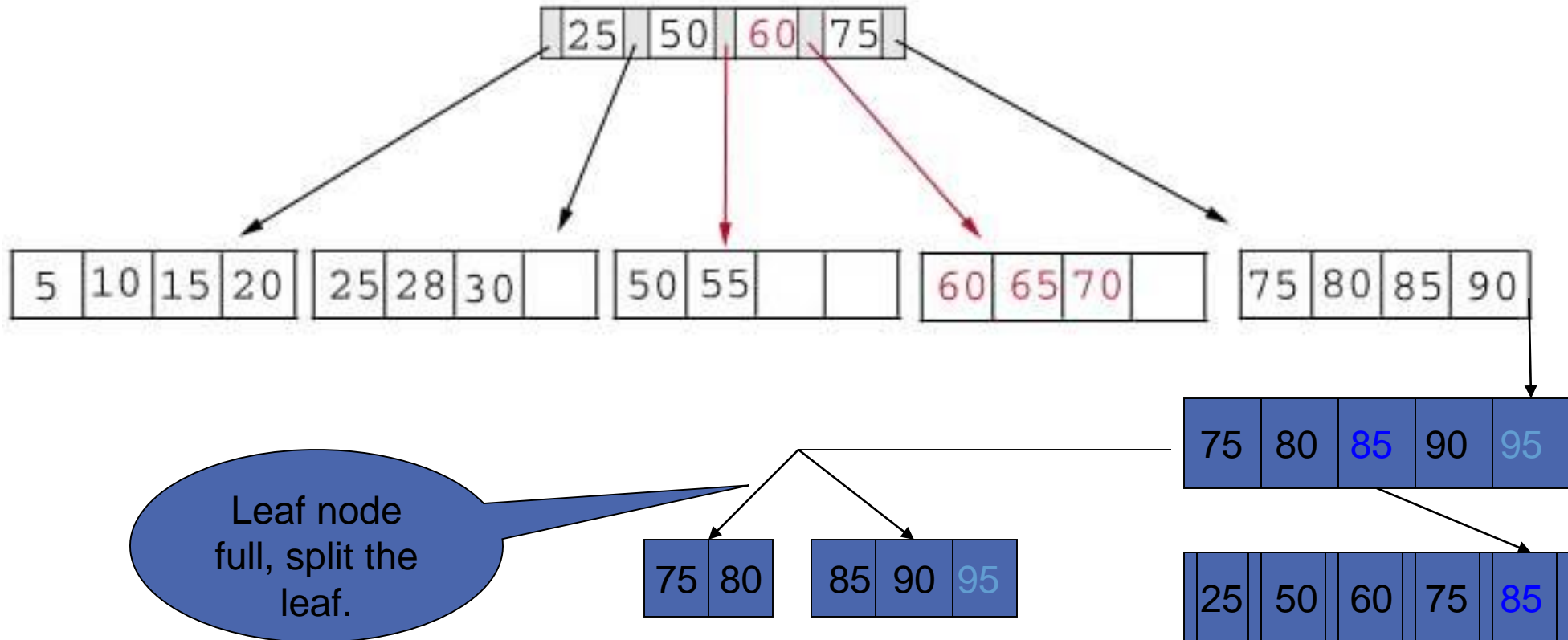
Insertion

- Result: chose the middle key 60, and place it in the index page between 50 and 75.



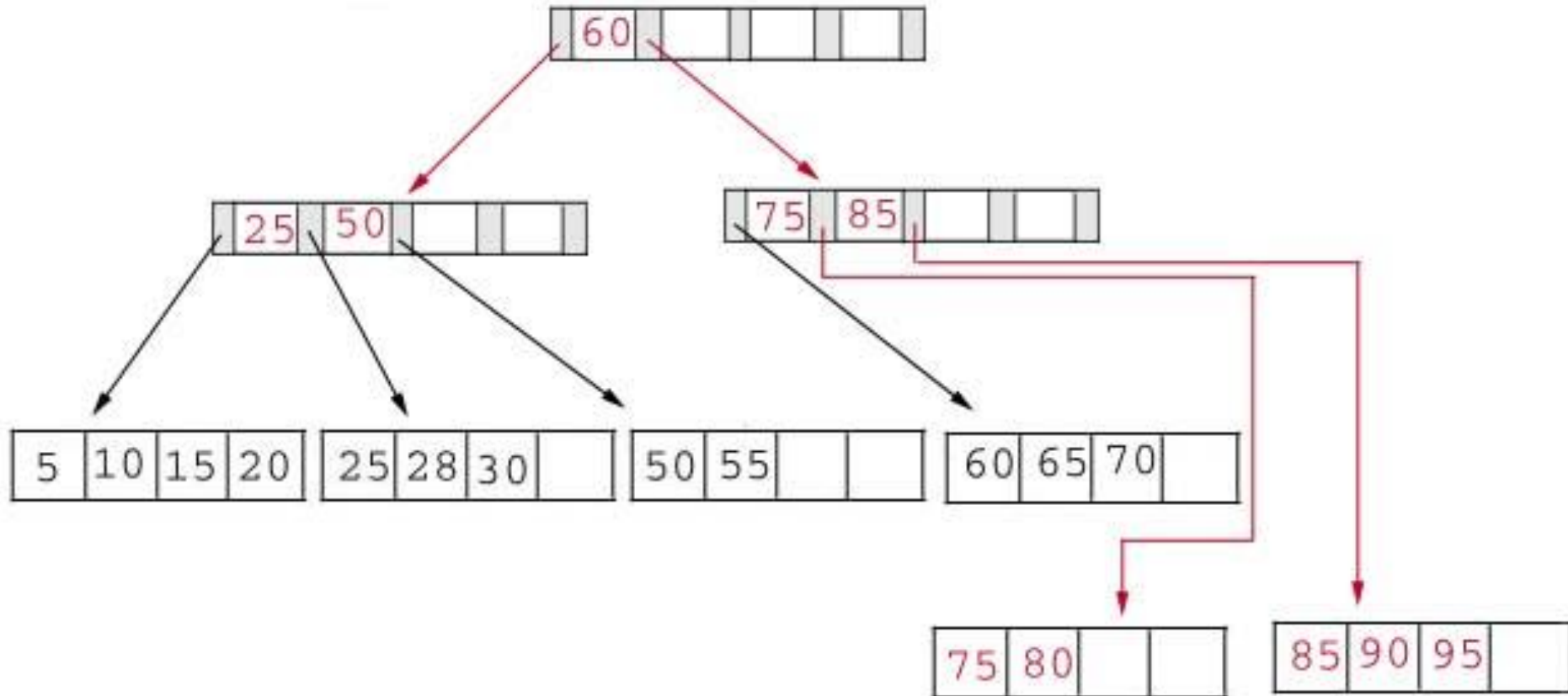
Insertion

- Exercise: add a key value 95 to the below tree.



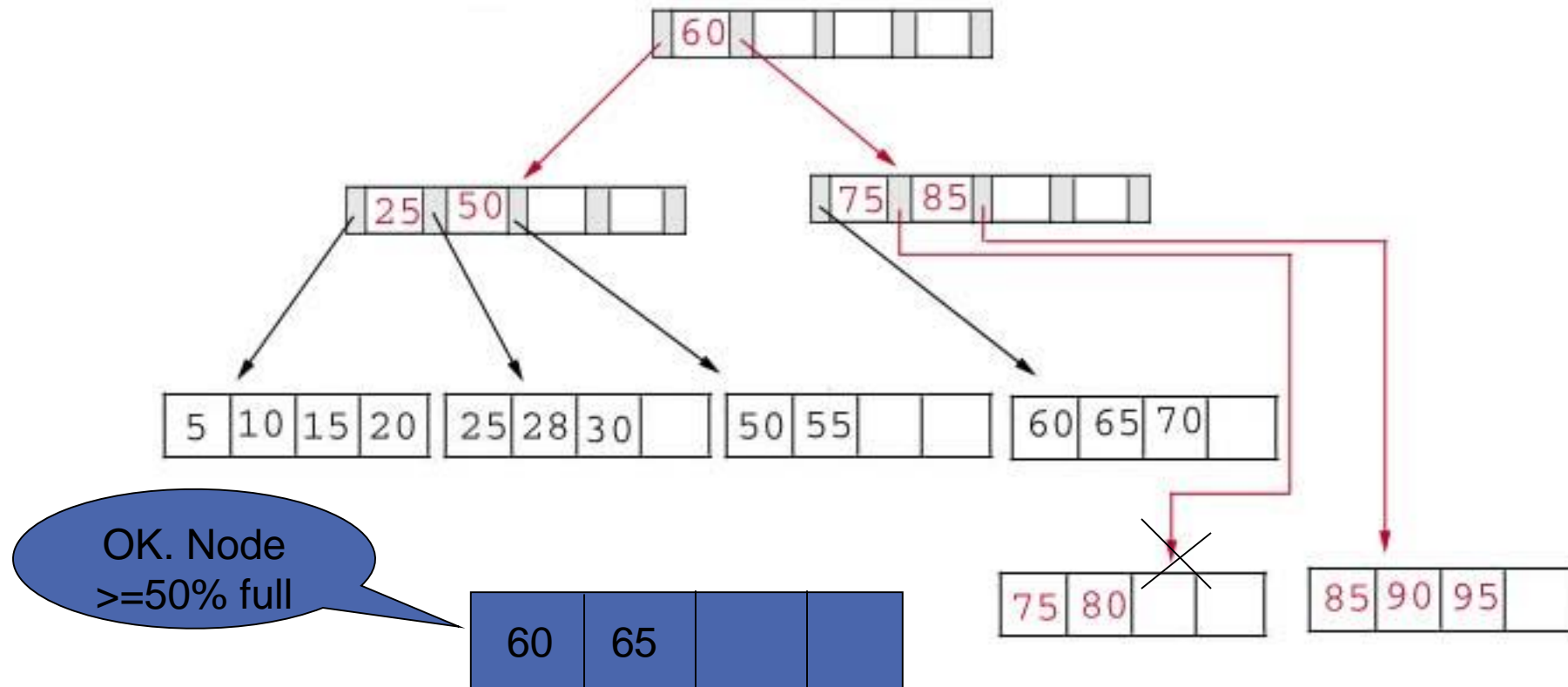
Insertion

- Result: again put the middle key 60 to the index page and rearrange the tree.



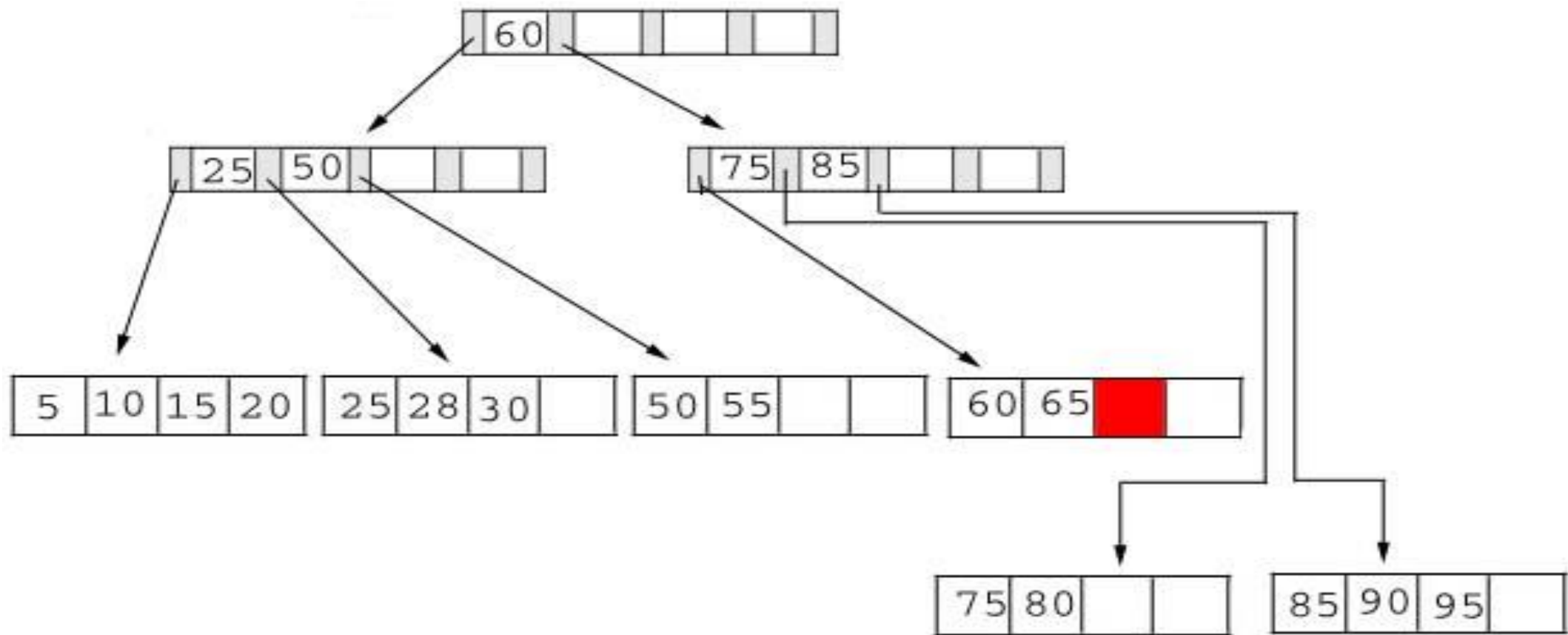
Deletion

- Same as insertion, the tree has to be rebuilt if the deletion result violate the rule of B+ tree.
- Example #1: delete 70 from the tree



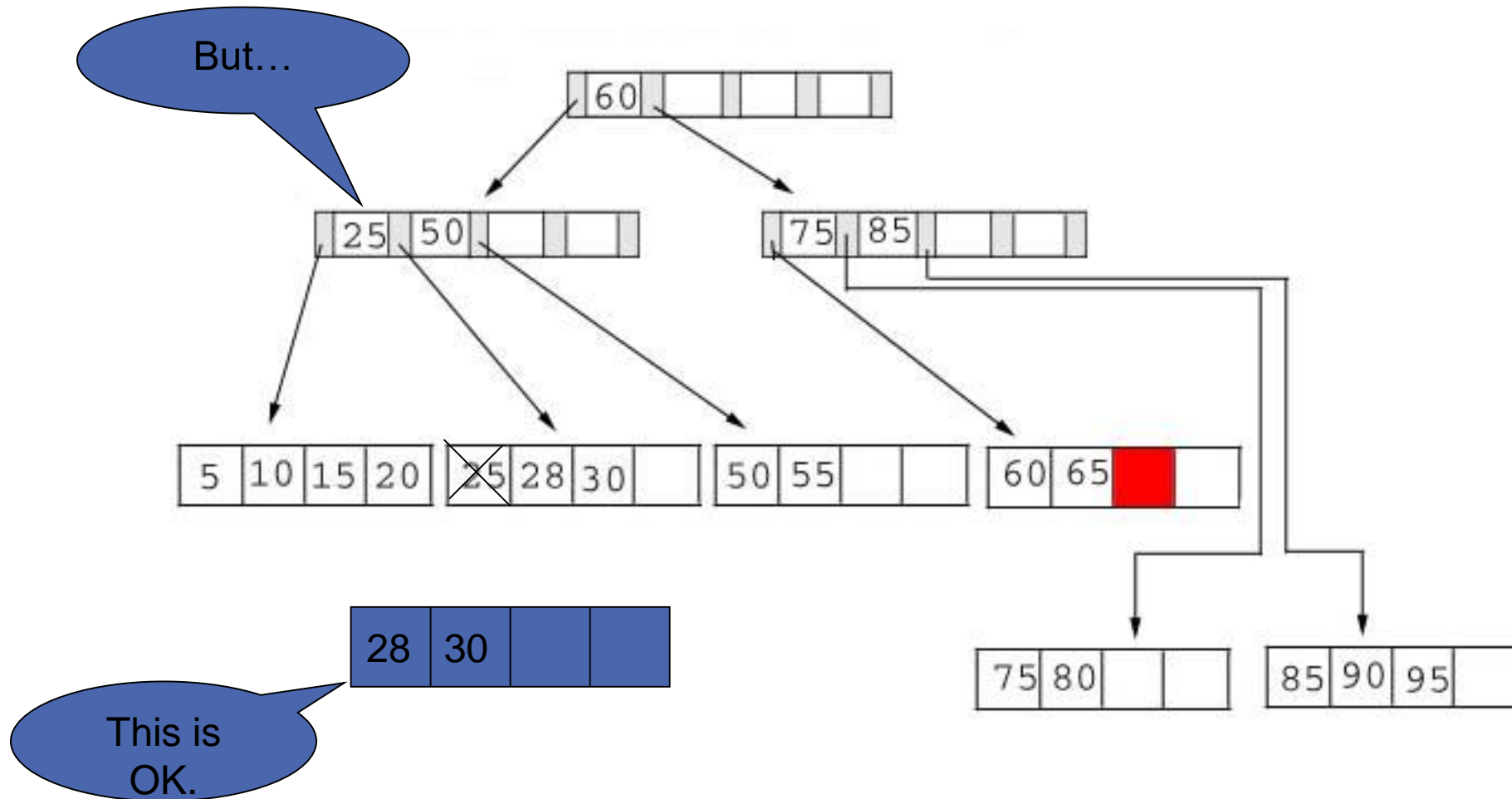
Deletion

■ Result:



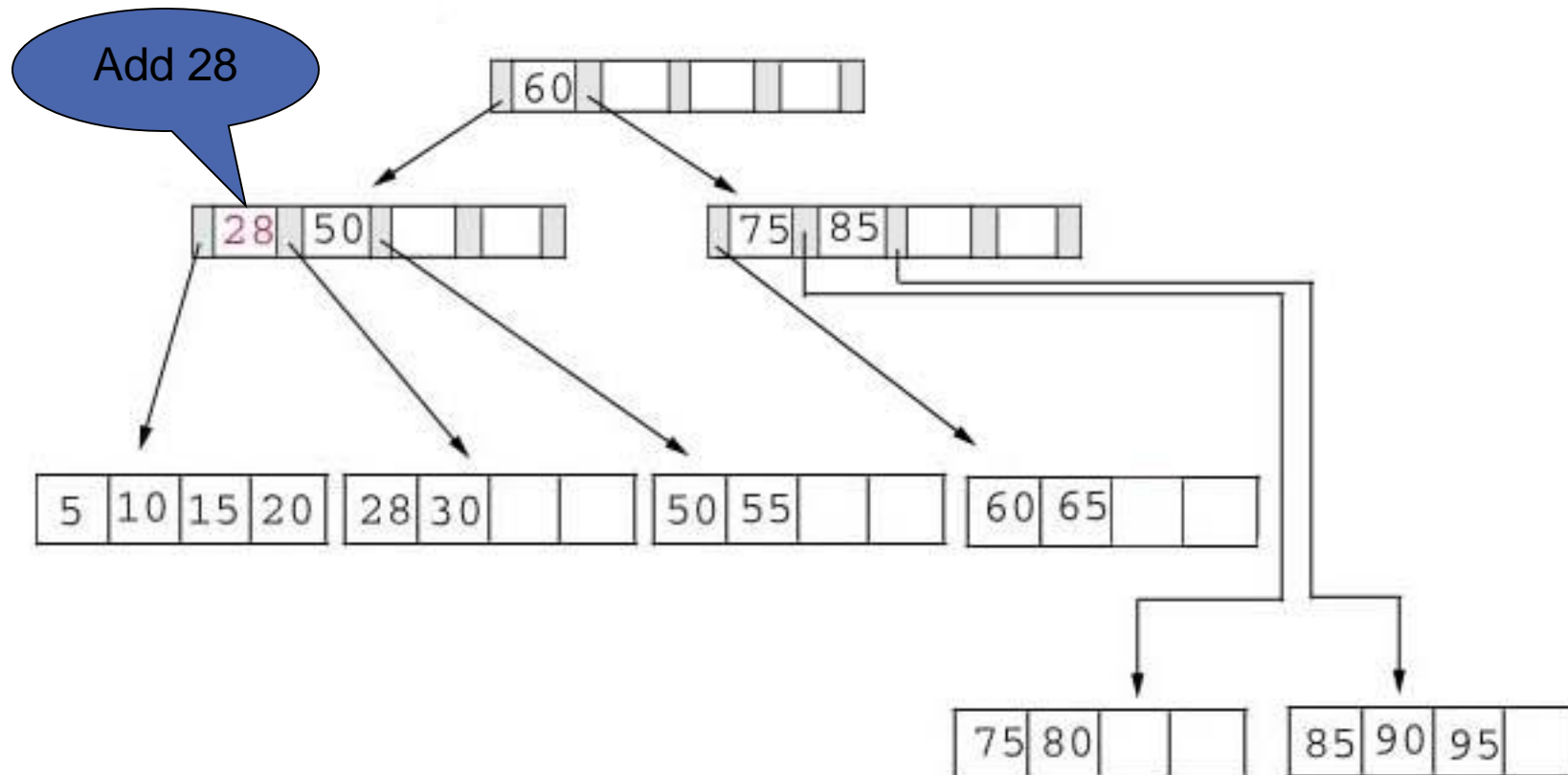
Deletion

Example #2: delete 25 from below tree, but 25 appears in the index page.



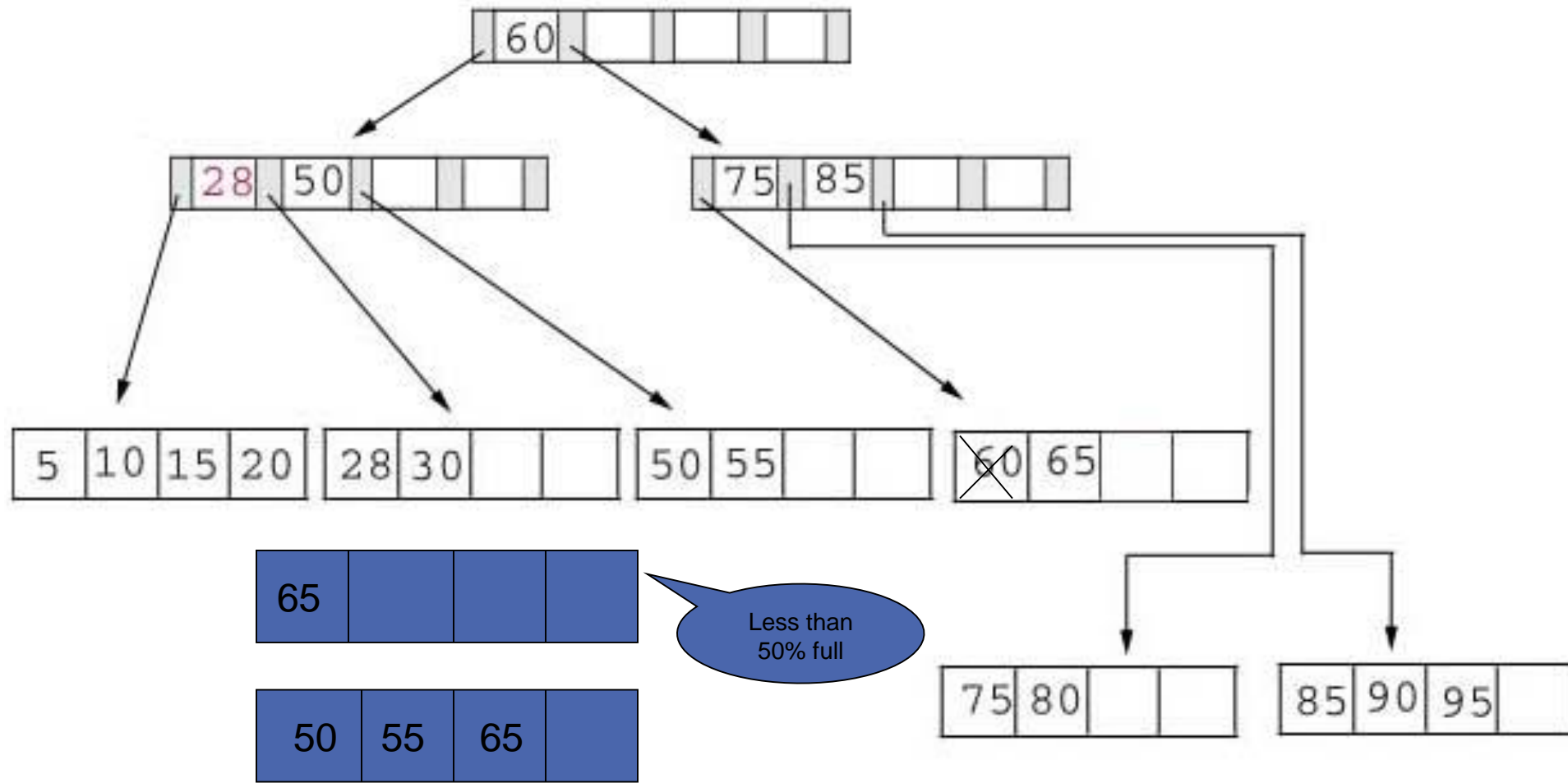
Deletion

- Result: replace 28 in the index page.



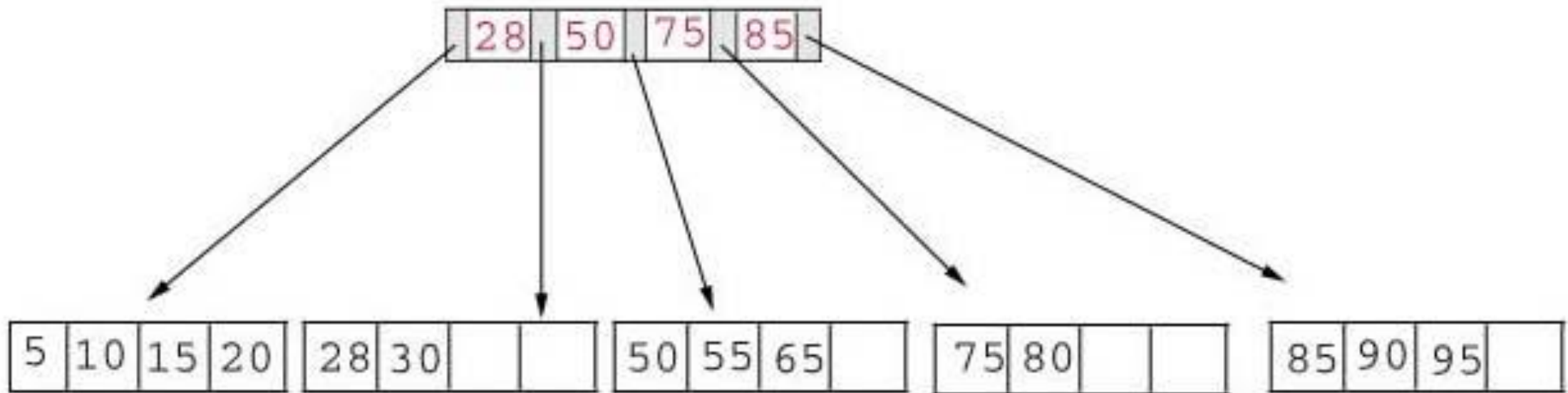
Deletion

- Example #3: delete 60 from the below tree



Deletion

- Result: delete 60 from the index page and combine the rest of index pages.



Assume a tree where each node can contain three pointers . Enter the values

K Y A N C O M L P U X D F

