

EPL646 – Advanced Topics in Databases

Part A:

Tree Structured Indexing

<http://www.cs.ucy.ac.cy/~dzeina/courses/epl646/labs/lab.html>

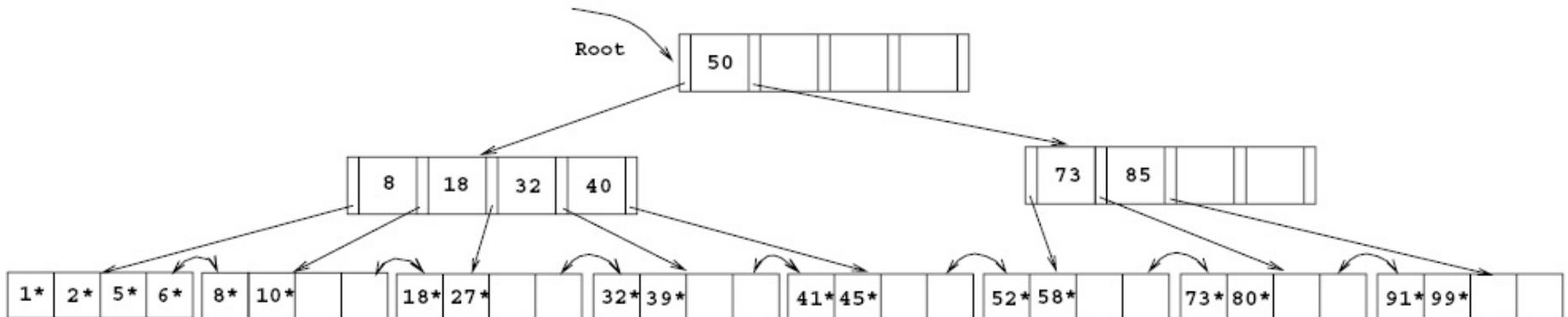


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Exercise 10.1

(Exercise 10.1) Consider the following B+ tree index of order $d = 2$



Question 1

Show the tree that would result from inserting a data entry with key 9 into this tree.

Question 2

Show the B+ tree that would result from inserting a data entry with key 3 into the original tree. How many page reads and page writes does the insertion require?

Question 3

Show the B+ tree that would result from deleting the data entry with key 8 from the original tree, assuming that the left sibling is checked for possible redistribution.

Question 4

Show the B+ tree that would result from deleting the data entry with key 8 from the original tree, assuming that the right sibling is checked for possible redistribution.

Question 5

Show the B+ tree that would result from starting with the original tree, inserting a data entry with key 46 and then deleting the data entry with key 52.

Question 6

Show the B+ tree that would result from deleting the data entry with key 91 from the original tree.

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Part B:

Hash Based Indexing

<http://www.cs.ucy.ac.cy/~dzeina/courses/epl646/labs/lab.html>

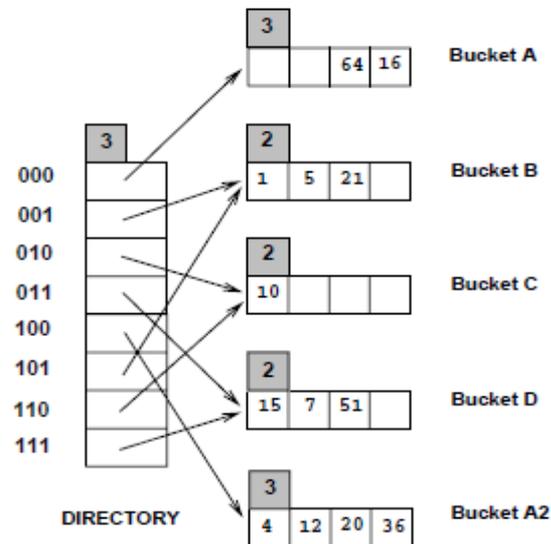


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Exercise 10.1

(Exercise 11.1) Consider the Extendible Hashing index shown below:



Question 1

What can you say about the last entry that was inserted into the index?

Question 2

What can you say about the last entry that was inserted into the index if you know that there have been no deletions from this index so far?

Question 3

Suppose you are told that there have been no deletions from this index so far.

What can you say about the last entry whose insertion into the index caused a split?

Question 4

Show the index after inserting an entry with hash value 68.

Question 5

Show the index after inserting entries with hash values 17 and 69 into the original tree.

Question 6

Show the index after deleting the entry with hash value 21 into the original tree.
(Assume that the full deletion algorithm is used.)

Question 7

Show the index after deleting the entry with hash value 10 into the original tree.

Is a merge triggered by this deletion? If not, explain why. (Assume that the full deletion algorithm is used.)

Questions?

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