INFS2200/7903 – Relational Database Systems

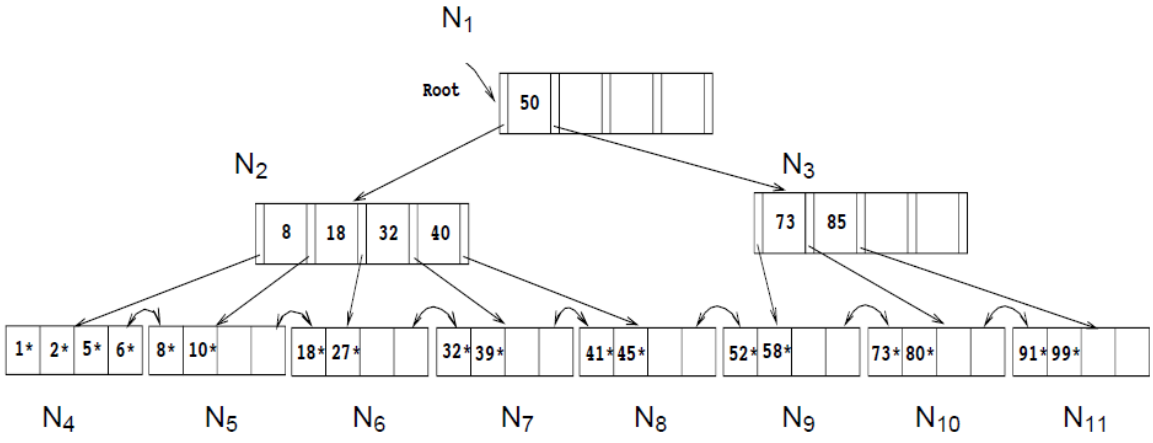
School of Information Technology and Electrical Engineering (ITEE), UQ

Tutorial 6

Question 1 Consider the B+ tree index of order p = 5 shown in the figure below. Answer each of the following questions:

A. List all the tree nodes that must be visited to answer the following query: “Get all records with search key equal to 10”.

B. What is the minimum number of tree nodes that must be visited to answer the following query: “Get all records with search key greater than 30”? List all the visited tree nodes.



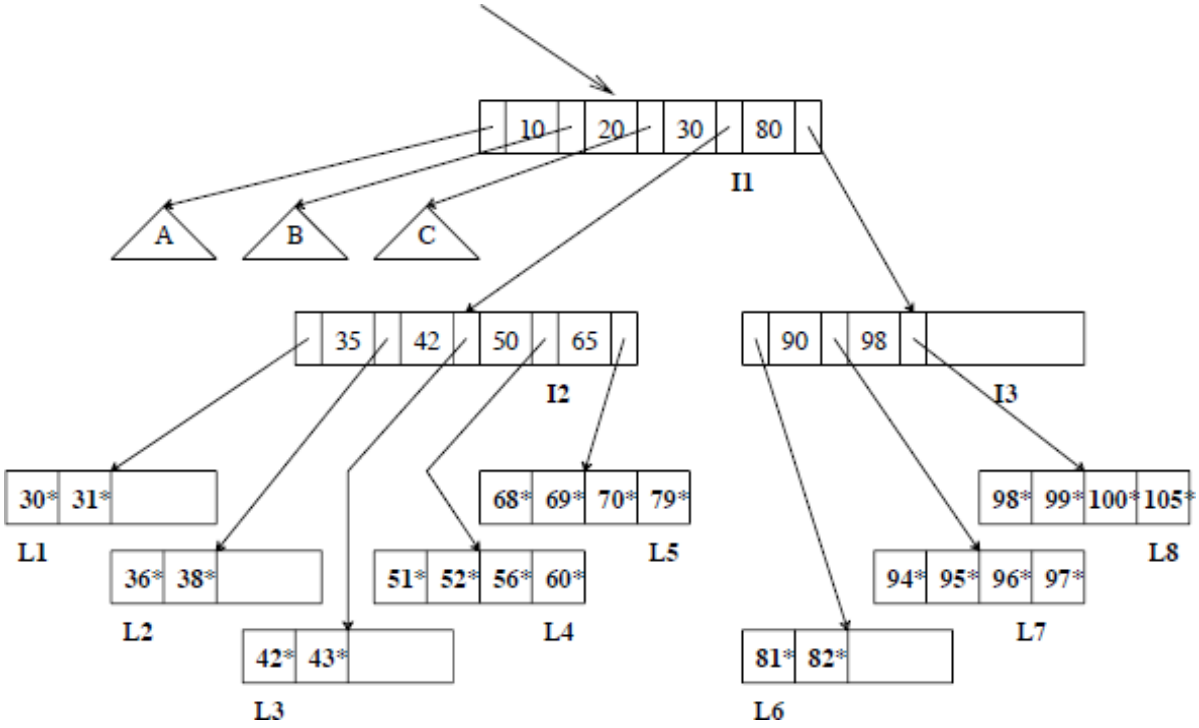
Question 2 Consider the B+ tree index of order p = 5 shown in the figure below. Note that subtrees A, B, and C are not fully specified and their content is not needed for answering this question. Assume that in the case of a leaf node split, the keys are redistributed according to the following rule: 2 keys stay in the old node and the remaining keys are moved to a new node.

Answer each of the following questions:

A. Name all the tree nodes that must be fetched to answer the following query: “Get all records with search key greater than 38.”

B. Show the B+ tree that would result from inserting a record with search key 109 into the tree.

C. Name a search key value such that inserting it into the (original) tree would cause an increase in the height of the tree.


10
20
30
80
I1
A
B
C
35
42
50
65
I2
90
98
I3
30*
31*
L1
36*
38*
L2
42*
43*
L3
51*
52*
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70*
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L6
94*
95*
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97*
L7
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99*
100*
105*
L8