**IT3020 - Database Systems**

BSc (Hons) in IT

Faculty of Computing

Sri Lanka Institute of Information Technology

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Tutorial 6 – File Organization and Indexing Techniques

1. Which of the three basic file organizations would you choose for a file where the most frequent operations are as follows?

    a. Search for records based on a range of field values.
    b. Perform inserts and scans where the order of records does not matter.
    c. Search for records based on a particular field value.

2. Consider a relation stored as a randomly ordered file for which the only index is an unclustered index on a field called *sal.* If you want to retrieve all records with *sal* > 20, is using the index always the best alternative? Explain.

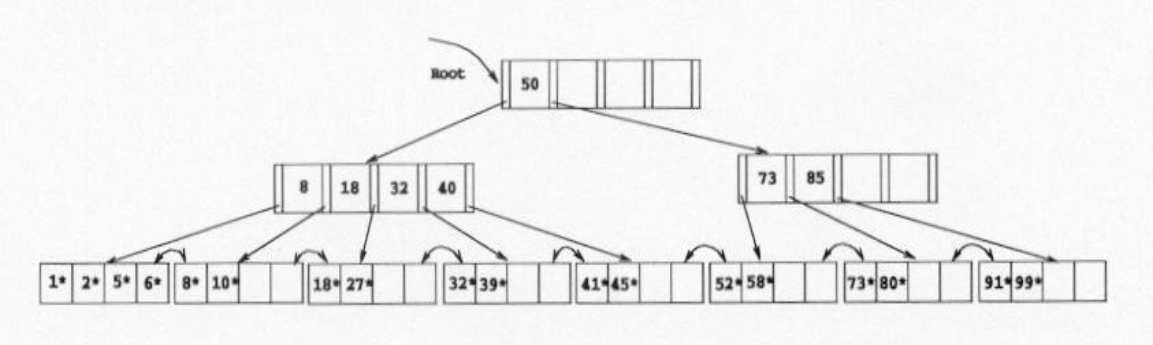
3. Consider the B+ tree index of order d = 2 shown in Figure.

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

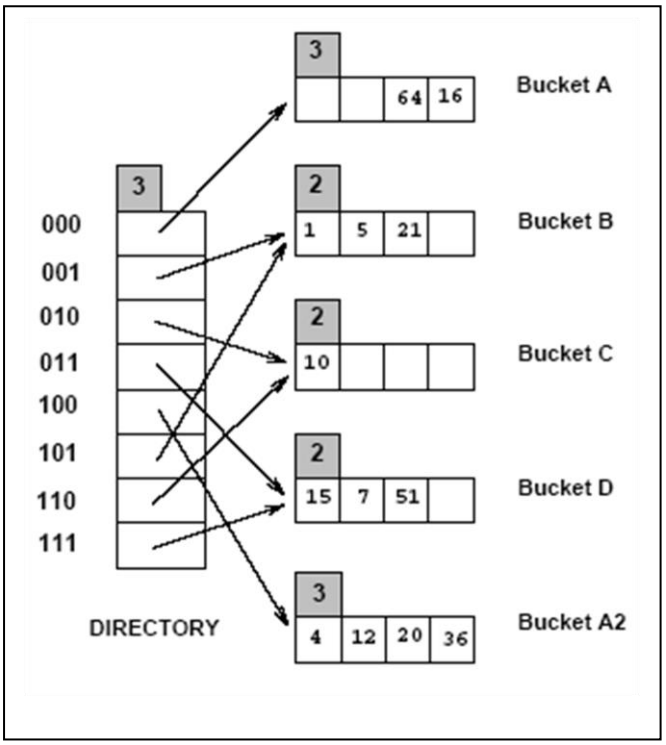
    b. Show the B+ tree that would result from inserting a data entry with key 3 into the original tree.

    c. 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.

    d. 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.



4. Consider the Extendible Hashing index shown in Figure. Answer the following questions about this index.




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

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

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

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