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Quiz 8

Section 402

1. **b) To improve the performance of a database query.** Indices help point to where a specific record will be on a specific table using a search key. They can relate to the order of records in a table but not the actual order the tables themselves are stored in.
2. **c) Ordered and Hash.** These are the basic types of index. The other options are more like subsets or subtypes of these two. For example sparse is only every so many records in a table have a search key while in dense each record has a search key that points to it but both of these belong to ordered indexes.

2a. **a) 1** SQL server only supports B+ tree but you can use different “styles” like clustered and unclustered.

1. **e) All of the above.** Space overhead must be considered because an index takes up space but also improves performance. Access time is the primary goal of indexing while deletion and insertion time make maintaining the database easier.
2. **a) An index is created based upon a search key.** Search keys link to one or more records but don’t have to be unique to a single tuple. Also not every record needs a search key as in the case of a sparse index.
3. **a) Clustered index.** A clustered index can also be called a primary index. The order of search keys in the index matches the order of records in the table.
4. **c) The system inserts an index entry with the search-key value and pointer to the new record into the index at the appropriate position.** For example in a B+ tree a numeric value will be inserted so that all values are in ascending order.
5. **d) an ordered, multilevel index that has a balanced branch structure.** The B+ tree has multilevel consisting of root, internal, and leaf nodes. The values in the index are ordered (for example numerical order) and by definition the tree is balanced.
6. **b) an internal node.** Internal nodes connect to other nodes, for example leaf nodes to the root nodes, they do not point to the table itself.
7. **b) The value of the first entry in the second left-most leaf node.**
8. **e) All of the above** In the same way inserting may cause a node to be split deleting may require nodes to be removed resulting in more reorganization. This could result in changing the number of levels and it’s possible to miss values in non-leaf levels.
9. **b) Limited flexibility in accessing data.** When searching there is only one path you will be able to go down the tree. For example if the search keys are numbers then the direction you go is determined by the value you were pointed to from the previous level.
10. **a) CREATE INDEX < indexName > ON < relation-Name > ( < attributeList > );** The proper syntax is to use CREATE and INDEX to signify you are creating an index. Then you specify the table with ON and providing the name of that table with the attributes in parenthesis.