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**Depreciation :**

Minibase is a database management system intended for educational use, and is distributed subject to conditions set forth in the Terms of Distribution. It has a parser, optimizer, buffer pool manager, storage mechanisms (heap files, secondary indexes based on B+ Trees), and a disk space management system. The goal is not just to have a functional DBMS, but to have a DBMS where the individual components can be studied and implemented by students. A GUI front-end (with support for a subset of QBE), visualization tools for the buffer manager, B+ trees, query optimizer and database design (specifically, creating ER diagrams and doing normalization) are available. Minibase has been developed in conjunction with the text Database Management Systems by Raghu Ramakrishnan

**Using the above depreciation the following exercise can be solved:**

1. Indexing is used to retrive the specific record from a relation R. In Minibase, all records are stored in a heap file. And it only unclustered b+ tree indexes are currently supported.

Each entry in the index is a key and record id pair. Entries can be inserted or deleted from an index. An index search scan provides interface for accessing the records in the index.

2. For data entries it support alternative 2 in term of text . The alternative data entry is based on storage of data using dense , store key or rid-of-data-record pairs and unclustered. Data records are always stored in heap file.

3. Yes , but implementing clustered indexes. But it require major changes. we use optimizer for clustering indexes. It can run in standalone mode against synthetic catalogs .