

## Chapter 4: Physical Database Design and Performance

Define each of the following terms:

- a. file organization
- b. heap file organization
- c. sequential file organization
- d. indexed file organization
- e. hashed file organization
- f. denormalization
- g. composite key
- h. secondary key
- i. data type
- j. join index

### **Answer:**

- a. **File organization** is a technique to store the records of file in efficient way. All files are logically organized in a sequence of records. In relational database, tuples of relations are of different size so user does not have to design file organization.
- b. In **Heap File Organization**, the operating system allocate the file anywhere in the memory. All records in Heap File Organization is managed by software. Heap File Organization does not support any ordering. In heap file organization if the data block is full, then the next record is stored in the new block.
- c. In **Sequential File Organization** records are stored sequentially according to the primary key values. Every record contains an attribute to uniquely identify the record.

- d. Records are stored either sequentially or non-sequentially in **Indexed File Organization**. Software is used in this file organization to store the record on the basis of index. In indexed file organization records are arranged by record key. Index is a table that contains the value to determine the location of file.
- e. **In Hashed File Organization**, the address of records is determined by hashing algorithm. In hashed file organization hash function is used to find the address of block to store the records. Each primary key value is divided by appropriate prime number in hashing algorithm to store the records.
- f. **Denormalization** is a technique that is used to enhance the speed of accessing the stored data. Denormalization is the process of converting normalized relations into non-normalized physical record.
- g. **Composite key** is the combination of two or more than two column that is used to uniquely identify each row in particular table. Sometime it is also known as concatenated key. In other word a primary key that is made by combination of more than one column is called composite key.
- h. **Secondary key** is a key that is used to speed up the search. A secondary key is not necessary to contain unique column. Secondary key is combination of one or more than one column for which more than one record have the same combination of value. Secondary key is also called a nonunique key.
- i. **Data type** is an attribute specified by system software for organizational data. Basically data type is a format that specifies the range of value and type of value. When data is stored in variable, each variable must be assign the specific data type.
- j. **join index** is used to join two or more than two table by applying the index on column. join index save the query processing time by retrieving the data on the basis of predefined condition. In other word, join index is used to find the records of same or different table that match the some criteria.