

TEXT BOOK: DATABASE SYSTEMS BY Ramez Elmasri and Shamkant B. Navathe

What is Database ?

A database is an organized collection of data, so that it can be easily accessed and managed.

What is Database Management System ?

Database management system is a software which is used to manage the database

What are the types of DBMS ?

Relational database.
Object oriented database.
Hierarchical database.
Network database

What is ER Model ?

Entity Relationship Model (ER Modeling) is a graphical approach to database design

What is Entity ?

An entity is a real world object which can be easily identifiable. For example, in a school database, students, teachers, classes, and courses offered can be considered as entities. All these entities have some attributes or properties that give them their identity.

What is Attribute ?

An attribute is a property or characteristic of an entity

What is Constraints ?

Constraints are the conditions forced on the columns of the table to meet the data integrity

What is Key ?

Keys are very important part of Relational database model. They are used to establish and identify relationships between tables and **also to uniquely identify any record or row of data inside a table**. These are used in identifying and establishing relationships between tables

What is Indexing ?

Indexing is used to optimize the performance of a database by minimizing the number of disk accesses required when a query is processed

What is Primary Key ?

The PRIMARY KEY constraint uniquely identifies each record in a table. Primary keys must contain UNIQUE values, and cannot contain NULL values.

What is Foreign Key ?

A Foreign Key is a database key that is used to link two tables together

What is Candidate Key ?

Candidate key is a single key or a group of multiple keys that uniquely identify rows in a table

What is Super Key ?

A super key is a combination of columns that uniquely identifies any row within a relational database management system (RDBMS) table

What is Unique Key ?

Unique key is a constraint that is used to uniquely identify a tuple in a table

What is DDL ?

Data Definition Language -It Consist SQL commands that can be used to define the database schema

State DDL Command

CREATE
DROP
ALTER
TRUNCATE
COMMENT
RENAME

What is DML ?

Its full form is Data Manipulation Language .DML commands are used to modify the database. It is responsible for all form of changes in the database

State DML Command

INSERT
UPDATE
DELETE
SELECT

What is Normalization ?

Normalization is the process of reorganizing data in a database so that **redundancy** can removed.

- **1NF**: Also known as the First Normal Form. This rule states that a column of a table can hold only an atomic (single) value.
- **2NF**: Short for second normal form. To apply the rule of 2NF, a table should be in 1NF. The rule states that any non-prime attribute (i.e. attribute that is not part of any candidate key) should not be dependent on the proper subset of the table's candidate key.(i.e. Remove partial dependency)
- **3NF**: Third normal form, the table should already be in 2NF. The rule states that any transitive dependency (functional) of a "non-prime" feature on a super key should be removed.
- **BCNF**: Advanced and stricter version of 3NF, also more popularly known as 3.5NF. For BCNF, a table should be in 3NF and follow the rule that for any functional dependency $A \rightarrow B$, A should be the super key of the table.

What is Denormalization ?

Denormalization is a database optimization technique in which we add redundant data to one or more tables

What is Redundancy ?

Redundancy means having multiple copies of same data in the database

What is SQL ?

SQL (Structured Query Language) is a standardized programming language that's used to manage relational databases and perform various operations on the data in them

What is NoSQL ?

NoSQL databases, also known as not only SQL are non-tabular databases that provides a mechanism for storage and retrieval of data.

What is Aggregate Function ?

Aggregate functions in DBMS take multiple rows from the table and return a value according to the query. Various Aggregate Functions

- 1) Count()
- 2) Sum()
- 3) Avg()
- 4) Min()
- 5) Max()

Differentiate Between char & varchar

CHAR is fixed length and VARCHAR is variable length

Differentiate Between Delete & Truncate

DELETE is a DML(Data Manipulation Language) command and is used when we specify the row(tuple) that we want to remove or delete from the table or relation.

TRUNCATE is a DDL(Data Definition Language) command and is used to delete all the rows or tuples from a table. Table structure remains.

DROP is a DDL command used to delete the entire table including its structure.

What is RDBMS ?

RDBMS stands for Relational DataBase Management Systems. It is basically a program that allows us to create, delete, and update a relational database in the form of tables or relations.

MySQL is an open-source relational database management system, which stores data in tables and maintains a relationship between the data. It uses the most powerful query language, SQL, for database access

What are ACID properties?

Answer: ACID properties are for transactions:

- **A => Atomicity:** The entire transaction happens in one go. (All or nothing)
- **C => Consistency:** Database must be consistent before and after the transaction.
- **I => Isolation:** Transactions do not interfere with each other; multiple transactions can happen simultaneously.
- **D => Durability:** A successful transaction is reflected even if a system failure happens.

Explain correlated subqueries in DBMS.

Correlated subqueries are subqueries that are executed once for each row processed by its main statement. For example:

```
select student_id, student_name, marks from students where salary >
(select avg(salary) from students );
```

What is a hashing technique in a database?

Answer: Hashing is the transformation of a string of characters into a usually shorter fixed-length value or key that represents the original string. Hashing is used to index and retrieve items in a database because it is faster to find the item using the shorter hashed key than to find it using the original value.

What is Cursor ?

Cursor is a Temporary Memory or Temporary Work Station. It is Allocated by Database Server at the Time of Performing operations User.

What is Implicit Cursor ?

Implicit Cursors are also known as Default Cursors of SQL SERVER. These Cursors are allocated by SQL SERVER when the user performs DML operations.

What is Explicit Cursor ?

Explicit Cursors are Created by Users whenever the user requires them. Explicit Cursors are used for Fetching data from Table in Row-By-Row Manner.

What is Trigger ?

Triggers are the SQL statements that are automatically executed when there is any change in the database

What is Views ?

Views in SQL are kind of virtual tables

What is PL/SQL ?

PL/SQL is an extension of SQL language that combines the data manipulation power of SQL with the processing power of procedural language. Its full form is Procedural Language for SQL.

What is ROLLBACK ?

ROLLBACK in SQL is a transactional control language which is used to undo the transactions that have not been saved in database

What is COMMIT ?

COMMIT in SQL is a transaction control language which is used to permanently save the changes done in the transaction in tables/databases

What is Stored Procedure ?

A stored procedure is a subroutine available to applications that access a relational database management system

What is Checkpoint ?

The checkpoint is a type of mechanism where all the previous logs are removed from the system and permanently stored in the storage disk

What is Deadlock ?

In a database, a deadlock is an unwanted situation in which two or more transactions are waiting indefinitely for one another to give up locks

What is SAVEPOINT ?

SAVEPOINT command is used to temporarily save a transaction so that you can rollback to that point whenever required.

What is Transaction ?

A transaction can be defined as a logical unit of work on the database