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**Relational Database Management System**

1. What is normalization? And what explains different normalization forms?

**Answer**

**Normalization**

Normalization is a technique for organizing data in a database. Normalization is a database design technique that reduces data redundancy. The stages of organizing data are called normal forms.

There are **different normalization forms**. They are

* First Normal Form (1 NF)

Data is stored in tables uniquely identified by primary key.

Data within table is stored in individual columns.

No repeating groups.

* Second Normal Form(2 NF)
  + Should be in 1 NF
  + data related to the primary key is stored in the table.
* Third Normal Form(3 NF)

Should be in 2 NF

Each column should be non transitively dependent on table’s primary key.

1. **Primary Key**

* It is the first key used to identify one and only one instance of an entity uniquely
* In a student table, **student\_id** is the primary key.

**Foreign Key**

* Foreign keys are the column of the table used to point to the primary key of another table.
* In a student table, there is a department\_id which is from the department table that contains department\_id and department\_name. Here department\_id in student table is found to be the foreign key.

**Candidate Key**

* A candidate key is an attribute or set of attributes that can uniquely identify a tuple.
* In a Student table,id is the primary key but there are other attributes like roll\_no which is found to be the candidate key.

**Super Key**

* Super key is an attribute set that can uniquely identify a tuple. A super key is a superset of a candidate key.
* In student table , there can be student name and student id. Student name can be same but student id cannot be same.This combination is called a super key.

1. Advantages of RDBMS

**Answer**

* Data is stored in the form of tables which is related to each other.
* Data fetching is fast in relational database management system
* Data is stored in the form of tables which are related to each other.
* Example: MySQL, PostgreSQL

1. How is RDBMS is preferable over DBMS?

**Answer**

* RDBMS supports **multiple users** at a time while DBMS supports a single user at a time
* **Normalization** can be achieved in RDBMS while DBMS does not achieve normalization (organizing data).
* Data in each table can be related to another table in RDBMS with the help of relationships such as **one to one**, **one to many** and **many to many** while DBMS does not have any relationships.
* **RDBMS** has higher security when compared to DBMS.
* **DBMS** stores data in file while **RDBMS** stores data in the tables.

**These are the reasons why RDBMS is preferred over DBMS.**

1. Database

**Answer**

* Database is a systematic collection of data. Database generally consists of tables.
* Each table has rows and columns
* Each column has different datatype fields.
* Each row store records of different fields.

1. Issues with traditional file-based systems that make DBMS a better choice

**Answer**

* Data redundancy
* Inconsistency
* Difficulty in accessing data.
* Everyone can access data.
* Data is not secure

1. Different Languages in DBMS

**Answer**

* **Data Definition Language**

**DDL** stands for **Data Definition Language.**DDL is used to store the information such as the number of tables,the number of rows and columns in each table.

**Some of the DDL tasks are**

**Create**

It is used to create the objects in the database.

**Alter**

It is used to alter the structure of the database.

**Drop**

It is used to delete the objects in the database.

**Truncate**

It is used to delete all the records in the database.

* **Data Manipulation Language**

It is used for manipulating data in the database such as retrieving data based on conditions, inserting the data, updating the data, deleting the data etc

Some **DML** tasks are

**Select**

Retrieve data from the table in a database.

**Insert**

Insert data into the table in a database.

**Update**

Update the existing data from a table in a database.

**Delete**

Delete the record in a database.

* **Data Control Language**

DCL is generally known as the data control language. It is used to retrieve the stored or saved data.

The DCL execution is generally transactional.

Some tasks under **DCL**

**Grant**

It is used to give user access privileges to a database.

**Revoke**

It is used to back permissions from the user.

* **Transactional Control Language**

TCL is used to run the changes made by the DML statement.

Some tasks under **TCL** are

**Commit**

It is used to save the transaction on the database.

**Rollback**

It is used to restore the database.

1. Different types of relationships among tables in DBMS

**Answer**

There are three types of relationships among tables in DBMS.

They are

1. One to One relationship
2. One to Many relationship
3. Many to Many relationship

**One to One relationship**

Each record of one table is related to only one record of the another table.

For Example : One student has only one progress report and one progress report has only one student.

This is an example for one to one relationship.

**One to Many relationship or Many to One relationship**

Each record of one table can be related to one or more than one record of another table.

For example: One customer can have many accounts. But each account can have only one customer.

**Many to Many relationship**

A single record of the first table can be related to one or more than one record of the second table and each record of the second table can be related to one or more record of the first table.

For example:

**One customer** can have **many products** and **one product** can have **many customers**.

**These are the different relationships among tables in DBMS.**

1. Difference between delete and truncate commands in DBMS

**Answer**

**Delete**

* Delete is a Data Manipulation Language (DML).
* Delete is generally used to delete a particular record or the whole table with the help of a condition clause **WHERE**.
* Delete is generally found to delete a particular table rows in the table and it is used for manipulating data.
* **Syntax**: delete from table\_name where condition.

**Truncate**

* Truncation is a data definition language (DDL).
* Truncate is generally used to delete all the rows in a table but doesn’t delete the schema.
* Truncate doesn’t contain WHERE clause.
* **Syntax**: truncate table\_name;