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Class : MCA(DS) SEM-1

Subject: DBMS

INTERNAL ASSIGNMENT (2-7)

Assignment 5 :

Q 5.1) **a. Create a table and get alternative odd records from it**

Ans : -- Create a sample table

CREATE TABLE odd\_table (

id INT,

data VARCHAR(50)

);

-- Insert some sample data

INSERT INTO odd\_table (id, data)

VALUES

(1, 'Record 1'),

(2, 'Record 2'),

(3, 'Record 3'),

(4, 'Record 4'),

(5, 'Record 5');

-- Retrieve odd records

SELECT \* FROM odd\_table WHERE id % 2 = 1;

Output :

A screenshot of a computer

Description automatically generated

Q 5.2) Create a table and get alternative even records from it

Ans -- Create a sample table

CREATE TABLE even\_table (

id INT,

data VARCHAR(50)

);

-- Insert sample data all at once

INSERT INTO even\_table (id, data)

VALUES

(1, 'Record 1'),

(2, 'Record 2'),

(3, 'Record 3'),

(4, 'Record 4'),

(5, 'Record 5'),

(6, 'Record 6'),

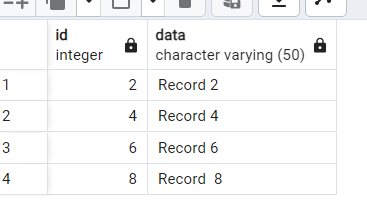
(7, 'Record 7'),

(8, 'Record 8'),

-- Retrieve alternative even records

SELECT \* FROM even\_table WHERE id % 2 = 0;

Output :



Q 5.3) Retrieve common records from 2 tables

Ans :

SELECT id, data FROM odd\_table

INTERSECT

SELECT id, data FROM even\_table;

Output :

A screenshot of a computer

Description automatically generated

Assignment 7 : What is normalization?  Explain various normalization forms with appropriate example.

Ans :Normalization is a process in relational database design that organizes data and minimizes data redundancy by breaking down large tables into smaller, related tables. The goal of normalization is to reduce anomalies in data, such as update, insertion, and deletion anomalies, and to ensure data integrity.

There are several normal forms, each with specific rules and requirements. The most used normal forms are First Normal Form (1NF), Second Normal Form (2NF), Third Normal Form (3NF), Boyce-Codd Normal Form (BCNF), and Fourth Normal Form (4NF). Let's explore each of them with appropriate examples:

**1. First Normal Form (1NF):**

* A table is in 1NF if it has no repeating groups (arrays or lists) of data and if all entries in a column are atomic (indivisible).

**Example:**

Consider a table with repeating groups:

| **Student\_ID** | **Courses** |
| --- | --- |
| 1 | Math, Physics, Chemistry |
| 2 | English, History |

To bring it to 1NF, you would create a separate table for courses:

| **Student\_ID** | **Course** |
| --- | --- |
| 1 | Math |
| 1 | Physics |
| 1 | Chemistry |
| 2 | English |
| 2 | History |

**2. Second Normal Form (2NF):**

* A table is in 2NF if it is in 1NF and all non-key attributes are fully functionally dependent on the primary key.

**Example:**

Consider a table with a composite primary key:

| **Student\_ID** | **Course** | **Professor** |
| --- | --- | --- |
| 1 | Math | Dr. Smith |
| 1 | Physics | Dr. Johnson |
| 2 | English | Dr. White |

To bring it to 2NF, you would create a separate table for professors:

| **Professor** | **Course** |
| --- | --- |
| Dr. Smith | Math |
| Dr. Johnson | Physics |
| Dr. White | English |

**3. Third Normal Form (3NF):**

* A table is in 3NF if it is in 2NF and all transitive dependencies are removed.

**Example:**

Consider a table with transitive dependencies:

| **Employee\_ID** | **Department** | **Manager** |
| --- | --- | --- |
| 1 | Engineering | Mr. Smith |
| 2 | Marketing | Mr. Johnson |

To bring it to 3NF, you would create a separate table for managers:

| **Manager** | **Department** |
| --- | --- |
| Mr. Smith | Engineering |
| Mr. Johnson | Marketing |

**Boyce-Codd Normal Form (BCNF):**

* A table is in BCNF if it is in 3NF and every determinant is a candidate key.

**Example:**

Consider a table with multiple candidate keys:

| **Student\_ID** | **Course** | **Professor** |
| --- | --- | --- |
| 1 | Math | Dr. Smith |
| 1 | Physics | Dr. Johnson |
| 2 | English | Dr. White |

To bring it to BCNF, you might need to decompose it further based on functional dependencies.

Fourth Normal Form (4NF):

* A table is in 4NF if it is in BCNF and multivalued dependencies are removed.

**Example:**

Consider a table with multivalued dependencies:

| **Student\_ID** | **Course** | **Professor** |
| --- | --- | --- |
| 1 | Math | Dr. Smith |
| 1 | Physics | Dr. Johnson |
| 2 | English | Dr. White |

To bring it to 4NF, you might need to decompose it further based on multivalued dependencies.

Normalization helps in creating well-structured databases that are easier to maintain and less prone to data anomalies. The specific normal forms to achieve depend on the characteristics of the data and the requirements of the application.