# Day2 CRUD Expressions, filter and Having

## What is CRUD?

CRUD stands for Create, Read, Update, and Delete — the four basic operations that can be performed on a database table.  
  
- CREATE: Insert new records into a table.  
- READ: Retrieve (select) data from a table.  
- UPDATE: Modify existing records.  
- DELETE: Remove records from a table.

## CRUD Operations for Schoolbus Table

### 1. CREATE (Insert)

SQL Command:  
INSERT INTO Schoolbus (BusID, DriverName, Capacity) VALUES (8, 'Suresh Kumar', 48);

Sample Output: A new row with BusID = 8 is added to the Schoolbus table.

### 2. READ (Select)

SQL Command:  
SELECT \* FROM Schoolbus;

Sample Output:  
BusID | DriverName | Capacity  
1 | Ramesh Kumar | 40  
2 | Anita Sharma | 50  
3 | Sunil Yadav | 55 (after update)  
...  
8 | Suresh Kumar | 48

### 3. UPDATE

SQL Command:  
UPDATE Schoolbus SET Capacity = 55 WHERE BusID = 3;

Sample Output: BusID = 3 now has Capacity = 55.

### 4. DELETE

SQL Command:  
DELETE FROM Schoolbus WHERE BusID = 5;

Sample Output: The row with BusID = 5 is removed from the Schoolbus table.

## CRUD Operations for HospitalRecords Table

### 1. CREATE (Insert)

SQL Command:  
INSERT INTO HospitalRecords (PatientID, PatientName, Age, Gender, Disease, AdmissionDate, DoctorName)   
VALUES (108, 'Rahul Desai', 29, 'Male', 'Allergy', '2025-08-01', 'Dr. Sharma');

Sample Output: A new row with PatientID = 108 is added to HospitalRecords.

### 2. READ (Select)

SQL Command:  
SELECT \* FROM HospitalRecords;

Sample Output:  
PatientID | PatientName | Age | Gender | Disease | AdmissionDate | DoctorName  
101 | Amit Verma | 45 | Male | Diabetes | 2025-01-10 | Dr. Mehra  
102 | Sneha Kapoor | 30 | Female | Asthma | 2025-02-05 | Dr. Rathi  
104 | Pooja Nair | 28 | Female | Recovered | 2025-04-20 | Dr. Menon (after update)  
...  
108 | Rahul Desai | 29 | Male | Allergy | 2025-08-01 | Dr. Sharma

### 3. UPDATE

SQL Command:  
UPDATE HospitalRecords SET Disease = 'Recovered' WHERE PatientID = 104;

Sample Output: PatientID = 104 now shows Disease = 'Recovered'.

### 4. DELETE

SQL Command:  
DELETE FROM HospitalRecords WHERE PatientID = 107;

Sample Output: The row with PatientID = 107 is removed from the HospitalRecords table.

**Filtering and Sorting in SQL**

**Filtering (WHERE Clause)**

-- Schoolbus

SELECT \* FROM Schoolbus WHERE Capacity > 40;

-- HospitalRecords

SELECT \* FROM HospitalRecords WHERE Gender = 'Female' AND Age < 35;

**Sorting (ORDER BY Clause)**

-- Schoolbus

SELECT \* FROM Schoolbus ORDER BY Capacity DESC;

-- HospitalRecords

SELECT \* FROM HospitalRecords ORDER BY AdmissionDate ASC;

**⚠ Dropping Tables**

The DROP command removes an entire table and its data permanently.

DROP TABLE Schoolbus;

DROP TABLE HospitalRecords;

⚠ Once dropped, all data is lost and cannot be recovered.

Grouping Data with GROUP BY

The **GROUP BY** clause groups rows that have the same values into summary rows. It is usually used with aggregate functions like COUNT(), SUM(), AVG(), MIN(), MAX()

**For School bus Table:**

**Find how many buses exist for each capacity:**

SELECT Capacity, COUNT(\*) AS TotalBuses

FROM Schoolbus

GROUP BY Capacity;

**HospitalRecords**

**Find how many patients each doctor is treating**

SELECT DoctorName, COUNT(\*) AS PatientCount

FROM HospitalRecords

GROUP BY DoctorName;

**iltering Groups with HAVING**

The **HAVING** clause is like WHERE, but it applies to groups instead of individual rows.

**Example 1: Schoolbus**

👉 Show only those capacities that have more than 1 bus:

SELECT Capacity, COUNT(\*) AS TotalBuses

FROM Schoolbus

GROUP BY Capacity

HAVING COUNT(\*) > 1;

**Example 2: HospitalRecords**

👉 Show doctors treating more than 2 patients:

SELECT DoctorName, COUNT(\*) AS PatientCount

FROM HospitalRecords

GROUP BY DoctorName

HAVING COUNT(\*) > 2;

⚡ **Tip:**

* Use WHERE to filter **before grouping**.
* Use HAVING to filter **after grouping**.