

BASIC SQL NOTES

1. Simple Database Schema

Definition:

A schema defines the structure of a database tables, fields, and how they are connected.

Example:

```
CREATE TABLE Students (  
    StudentID INT PRIMARY KEY,  
    Name VARCHAR(100),  
    Age INT,  
    Department VARCHAR(50)  
);
```

Resulting Table Structure:

StudentID	Name	Age	Department
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2. Data Types in SQL

Data Type	Description	Example
INT	Whole numbers	5, 100, -20
FLOAT/DECIMAL	Decimal numbers	99.99, 10.5
VARCHAR(n)	Variable-length strings	'Alice'
CHAR(n)	Fixed-length strings	'M', 'Y '
DATE	Date values (YYYY-MM-DD)	'2025-07-03'
TIME	Time values (HH:MM:SS)	'12:30:00'
BOOLEAN	True or False	TRUE, FALSE

3. Table Definitions

a. CREATE TABLE

```
CREATE TABLE Employees (  
    EmpID INT PRIMARY KEY,
```

BASIC SQL NOTES

Name VARCHAR(100),

Salary FLOAT,

HireDate DATE

);

Initial Table:

EmpID	Name	Salary	HireDate
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b. ALTER TABLE

Before:

EmpID	Name	Salary	HireDate
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Command 1:

```
ALTER TABLE Employees ADD Department VARCHAR(50);
```

After Adding Department Column:

EmpID	Name	Salary	HireDate	Department
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Command 2:

```
ALTER TABLE Employees MODIFY Salary DECIMAL(10,2);
```

Changes the data type of Salary to DECIMAL(10,2) (more precise).

Command 3:

```
ALTER TABLE Employees DROP COLUMN Department;
```

After Dropping Department:

EmpID	Name	Salary	HireDate
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4. DML Operations (Insert, Delete, Update)

a. INSERT

```
INSERT INTO Employees (EmpID, Name, Salary, HireDate)
```

```
VALUES (1, 'Alice', 55000.50, '2023-06-01');
```

Table After INSERT:

EmpID	Name	Salary	HireDate
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BASIC SQL NOTES

1	Alice	55000.50	2023-06-01
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b. DELETE

DELETE FROM Employees WHERE EmpID = 1;

Table After DELETE:

EmpID	Name	Salary	HireDate
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c. UPDATE

INSERT INTO Employees (EmpID, Name, Salary, HireDate)

VALUES (2, 'Bob', 45000.00, '2022-01-10');

UPDATE Employees SET Salary = 50000 WHERE EmpID = 2;

Table After UPDATE:

EmpID	Name	Salary	HireDate
2	Bob	50000	2022-01-10

5. SELECT and PROJECT

a. SELECT All Columns

SELECT * FROM Employees;

Result:

EmpID	Name	Salary	HireDate
2	Bob	50000	2022-01-10

b. PROJECT (Specific Columns)

SELECT Name, Salary FROM Employees;

Result:

Name	Salary
Bob	50000

6. WHERE Clause

BASIC SQL NOTES

SELECT * FROM Employees WHERE Salary > 45000;

Result:

EmpID	Name	Salary	HireDate
2	Bob	50000	2022-01-10

Note: You can combine multiple conditions using AND, OR, NOT.

SELECT * FROM Employees

WHERE Salary > 45000 AND Name = 'Bob';