

CHAPTER 3 — SQL BASICS

3.1 Introduction to SQL

SQL (Structured Query Language) is a standard language used to communicate with relational databases.

3.2 Categories of SQL Commands

- DDL (Data Definition Language): CREATE, DROP, ALTER
- DML (Data Manipulation Language): SELECT, INSERT, UPDATE, DELETE
- DCL (Data Control Language): GRANT, REVOKE
- TCL (Transaction Control Language): COMMIT, ROLLBACK

3.3 Creating Tables

Example:

```
CREATE TABLE Students (
    StudentID INT PRIMARY KEY,
    Name VARCHAR(50),
    Major VARCHAR(30)
);
```

3.4 Inserting Data

```
INSERT INTO Students VALUES (1, 'Alice', 'CS');
```

3.5 Retrieving Data

```
SELECT * FROM Students;
SELECT Name FROM Students WHERE Major = 'CS';
```

3.6 Updating Data

```
UPDATE Students SET Major = 'Data Science' WHERE StudentID = 1;
```

3.7 Deleting Data

```
DELETE FROM Students WHERE StudentID = 1;
```

3.8 Joins

- INNER JOIN
- LEFT JOIN
- RIGHT JOIN
- FULL OUTER JOIN

Example:

```
SELECT Students.Name, Courses.Title  
FROM Students  
INNER JOIN Enrolls ON Students.StudentID = Enrolls.StudentID  
INNER JOIN Courses ON Enrolls.CourseID = Courses.CourseID;
```

3.9 Sorting and Limiting

ORDER BY, LIMIT clauses to refine output.

3.10 Summary

SQL provides powerful tools to manage and query data in relational databases.