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Introduction to SQL

Understanding the Basics of MySQL

What is SQL?

- SQL stands for **Structured Query Language**
- Used to **communicate with relational databases**
- Helps in **creating**, **reading**, **updating**, and **deleting** data (aka CRUD)
- Works with **RDBMS** like MySQL, PostgreSQL, Oracle, etc.

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SQL Data Types

01 > INT

- Whole numbers
- e.g., 1, 100, -5

02 > VARCHAR(n)

- Variable length text
- e.g., names, emails

03 > CHAR(n)

- Fixed text of length ‘n’
- e.g., "MySQL"

04 > DATE

- Calendar Date values
- e.g., '2025-04-16'

05 > FLOAT

- Decimal numbers
- e.g., 3.14, 99.99

06 > BOOLEAN

- Stores TRUE or FALSE
- Logical yes/no values

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01

Creating a Database and Table

The step-by-step process of creating a new database in SQL using the CREATE DATABASE command, and then defining a simple table structure using the CREATE TABLE statement.

02

Inserting Data into the Table

The INSERT INTO command is used to add new rows of data into a table.

It specifies the table name, column names, and the corresponding values to be inserted in the correct order.

Retrieving Data with SELECT

- `SELECT` is used to **fetch data** from a table
- `*` means **all columns**
- You can also fetch specific columns:

Updating Existing Records

- UPDATE changes values in existing records
- SET defines what to change
- WHERE ensures only specific rows are updated
- **Always use WHERE carefully** to avoid changing all rows!

Deleting Records from a Table

- DELETE removes rows from a table
- Use WHERE to specify which row to delete
- Omitting WHERE will delete **all rows** in the table!

Summary & Recap

Database Creation

- `CREATE DATABASE` – Create a new database
- `CREATE TABLE` – Define table structure and columns

Adding and Retrieving Data

- `INSERT INTO` – Add new records to a table
- `SELECT` – View data from a table (use `*` for all columns, or specify columns)

Modifying Data

- `UPDATE` – Change existing records

Removing Data

- `DELETE` – Remove records from a table

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03

Some Project Ideas

Stock Market Data Analysis

Skills: Time-Series SQL, Moving Averages, Lag/Lead

Description:

- Find moving averages (7-day, 30-day)
- Detect "Golden Cross" (short MA crosses long MA)
- Rank stocks by performance weekly

University Database System

Skills: Relational Modeling, Constraints, Triggers, Procedures

Description: Build a complete university DB:

- Students, Courses, Professors, Enrollments
- Auto-calculate GPA using triggers/procedures
- Prerequisite checks, enrollment caps

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Thank you!

Do you have any questions?