SQL keywords

🔑 1. SELECT

Use: Retrieve data from one or more tables.

Example:

```
SELECT name, age FROM employees;
```

Real-Time Use Case: Used in dashboards to fetch data like employee records, customer orders, etc.

🔑 2. FROM

Use: Specifies the table from which to retrieve data.

Example:

```
SELECT * FROM orders;
```

Real-Time Use Case: Tells the system where to look for the data—like "orders" table in an e-commerce app.

🔑 3. WHERE

Use: Filters records based on specific conditions.

Example:

```
SELECT * FROM customers WHERE city = 'New York';
```

Real-Time Use Case: Filtering users based on location in a CRM or marketing tool.

🔑 4. JOIN (INNER, LEFT, RIGHT, FULL)

Use: Combine rows from two or more tables based on a related column.

Example:

```
SELECT orders.id, customers.name

FROM orders

JOIN customers ON orders.customer_id = customers.id;
```

Real-Time Use Case: Combine customer and order data to generate invoices or analytics reports.

🔑 5. GROUP BY

Use: Groups rows that have the same values into summary rows.

Example:

```
SELECT department, COUNT(*)
FROM employees
GROUP BY department;
```

Real-Time Use Case: Summarize employee count by department, used in HR dashboards.

🔑 6. ORDER BY

Use: Sort the result set by one or more columns.

Example:

```
SELECT * FROM products ORDER BY price DESC;
```

Real-Time Use Case: Display the most expensive products first in an online store.

🔑 7. INSERT INTO

Use: Adds new records into a table.

Example:

```
INSERT INTO users (name, email) VALUES ('Alice', 'alice@example.com');
```

Real-Time Use Case: Registering a new user on a website or app.

🔑 8. UPDATE

Use: Modifies existing records.

Example:

```
UPDATE orders SET status = 'shipped' WHERE id = 101;
```

Real-Time Use Case: Change the status of an order in a logistics app.

🔑 9. DELETE

Use: Removes one or more records.

Example:

```
DELETE FROM users WHERE last_login < '2022-01-01';
```

Real-Time Use Case: Clean up old or inactive accounts from a database.

🔑 10. CREATE TABLE

Use: Defines a new table and its columns.

Example:

```
CREATE TABLE products (
  id INT PRIMARY KEY,
  name VARCHAR(100),
  price DECIMAL(10, 2)
);
```

Real-Time Use Case: Used during database setup for applications like inventory systems.

🔍 11. ALTER TABLE

Use: Modifies an existing table (add/modify/delete columns).

Example:

```
ALTER TABLE users ADD phone_number VARCHAR(15);
```

Real-Time Use Case: Add a new column for additional user details in production.

🔍 12. DROP TABLE

Use: Deletes a table and all its data.

Example:

```
DROP TABLE test_users;
```

Real-Time Use Case: Removing temporary tables created during testing.

🔍 13. HAVING

Use: Filters groups (used with GROUP BY).

Example:

```
SELECT department, COUNT(*)
FROM employees
GROUP BY department
HAVING COUNT(*) > 5;
```

Real-Time Use Case: Find departments with more than 5 employees in reporting tools.

🔍 14. DISTINCT

Use: Removes duplicate values in the result set.

Example:

```
SELECT DISTINCT city FROM customers;
```

Real-Time Use Case: Show unique locations where customers are based.

🔍 15. LIMIT / OFFSET

Use: Restrict number of records returned (for pagination).

Example:

```
SELECT * FROM products LIMIT 10 OFFSET 20;
```

Real-Time Use Case: Load next set of 10 products in a paginated product list.

SQL data types

🔢 1. INT / INTEGER

- **Use:** Stores whole numbers (no decimals)
- **Example:** INT, INTEGER, INT(11)
- **Real-Time Use Case:**
  - Employee ID (employee_id INT)
  - Product quantity (stock INT)
  - User age (age INT)

```
CREATE TABLE employees (
 id INT PRIMARY KEY,
 age INT
);
```

💰 2. DECIMAL(p, s) or NUMERIC(p, s)

- **Use:** Stores exact numeric values with decimals
  - p = precision (total digits), s = scale (digits after decimal)

- **Example:** DECIMAL(10, 2) means max 10 digits, 2 after decimal
- **Real-Time Use Case:**
  - Product prices (price DECIMAL(8, 2))
  - Financial transactions (amount DECIMAL(12, 2))

```
CREATE TABLE products (
 name VARCHAR(100),
 price DECIMAL(10, 2)
);
```

🔤 3. VARCHAR(n)

- **Use:** Variable-length string, max length n
- **Example:** VARCHAR(50)
- **Real-Time Use Case:**
  - Usernames, emails, product names, city names
  - Flexible for fields with varying length

```
CREATE TABLE users (
 username VARCHAR(50),
 email VARCHAR(100)
);
```

🧾 4. CHAR(n)

- **Use:** Fixed-length string, always n characters
- **Example:** CHAR(2) for state codes
- **Real-Time Use Case:**
  - Country codes, gender codes ('M', 'F'), abbreviations

```
CREATE TABLE country_codes (
 code CHAR(2),
 name VARCHAR(100)
);
```

📅 5. DATE

- **Use:** Stores only date (YYYY-MM-DD)
- **Example:** '2025-08-29'
- **Real-Time Use Case:**
  - Employee birth dates
  - Order date, join date, invoice date

```
CREATE TABLE orders (
  order_id INT,
  order_date DATE
);
```

🕒 6. DATETIME

- **Use:** Stores date and time (YYYY-MM-DD HH:MM:SS)
- **Example:** '2025-08-29 14:30:00'
- **Real-Time Use Case:**
  - Timestamp of order placements, logins, messages

```
CREATE TABLE logs (
  user_id INT,
  login_time DATETIME
);
```

⏱️ 7. TIMESTAMP

- **Use:** Similar to DATETIME but with auto-update features in some DBs (e.g., MySQL)
- **Real-Time Use Case:**
  - Auto track record creation or modification time

```
CREATE TABLE activities (
  id INT,
  updated_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);
```

✔ 8. BOOLEAN

- **Use:** Stores true/false or 1/0

- **Real-Time Use Case:**
    - User is_active flag
    - Product is_available flag
    - Email verified or not

```
CREATE TABLE users (
  id INT,
  is_active BOOLEAN
);
```

📝 9. TEXT

- **Use:** Stores long text (no size limit like VARCHAR)
- **Real-Time Use Case:**
    - Product descriptions, reviews, blog content

```
CREATE TABLE reviews (
  review_id INT,
  content TEXT
);
```

🗁 10. BLOB (Binary Large Object)

- **Use:** Stores binary data like images, files, videos
- **Real-Time Use Case:**
    - User profile photos
    - Uploaded documents (e.g., resumes)

```
CREATE TABLE documents (
  id INT,
  file BLOB
);
```

✅ Summary Table

Data Type	**Description**	**Real-Time Use**
INT	Whole numbers	IDs, quantities, counters
DECIMAL	Exact decimals	Prices, financial data
VARCHAR(n)	Variable text	Names, emails, city
CHAR(n)	Fixed text	Gender, country codes
DATE	Only date	Birthdate, order date
DATETIME	Date and time	Logins, transactions
TIMESTAMP	Auto-tracking time	Created/updated times
BOOLEAN	True/false	Status flags (active/inactive)
TEXT	Long text	Reviews, descriptions
BLOB	Binary files	Images, files

▯🏫 **Teaching Tip:**

Encourage students to **choose the right data type** during table design — this leads to better performance and cleaner data. For example:

- Don’t use TEXT for short labels (use VARCHAR)
- Use DECIMAL instead of FLOAT for money
- Prefer BOOLEAN for flags instead of INT(1)

---

some **real-time SQL data type interview questions** that are commonly asked in **MNC interviews** (TCS, Infosys, Accenture, Wipro, Capgemini, Cognizant, etc.), especially when evaluating candidates for **database-related roles**, **backend development**, or **data analysis**.

These questions often test not just theory, but **why and when** to use a particular data type in real-world scenarios.

✅ **Frequently Asked Interview Questions (SQL Data Types)**

---

1. What is the difference between CHAR and VARCHAR?

Interview Focus: Data storage, performance, use cases

Key Answer Points:

- CHAR(n) is **fixed-length**, always uses n bytes.
- VARCHAR(n) is **variable-length**, uses only the space needed (plus 1-2 bytes for length).
- **Use CHAR** when all entries are the same length (e.g., country codes: 'IN', 'US').
- **Use VARCHAR** for fields with varying length (e.g., names, email addresses).

Follow-up:
💬 *"In which scenario would CHAR be better than VARCHAR?"*

---

2. Why should we use DECIMAL instead of FLOAT for storing currency values?

Interview Focus: Precision and data accuracy

Key Answer Points:

- FLOAT is **approximate** and can introduce rounding errors.
- DECIMAL(p, s) is **exact**, preserves precision.
- For money-related fields (e.g., price, salary), use DECIMAL(10,2).

Follow-up:
💬 *"What will happen if we store ₹100.75 in a FLOAT column?"*

---

3. What is the difference between DATE, DATETIME, and TIMESTAMP?

Interview Focus: Time-related data storage and default behavior

Key Answer Points:

- DATE: Only date (e.g., '2025-08-29')
- DATETIME: Date + time (e.g., '2025-08-29 15:30:00')
- TIMESTAMP: Also includes date + time, **auto-updates** in some DBMS (e.g., MySQL)

Real-Time Use Cases:

- DATE: Birthdate
- DATETIME: Appointment time
- TIMESTAMP: Record creation/modification tracking

---

4. What is the maximum size of VARCHAR?

Interview Focus: Limits and best practices

Key Answer Points:

- Depends on DBMS:
    - MySQL: up to 65,535 bytes (shared with row size)

    - PostgreSQL: practically unlimited

- Use appropriate size, e.g., VARCHAR(100) for names.
- Don’t over-allocate; affects indexing and performance.

---

5. What is the difference between TEXT and VARCHAR? When to use TEXT?

Interview Focus: Long string data handling

Key Answer Points:

- TEXT is used for very **long strings** (e.g., articles, reviews).
- VARCHAR is better for **short to medium-length** strings (e.g., name, email).
- TEXT columns are usually stored **outside the table row**, can’t be indexed efficiently.

Use TEXT: product descriptions, blog content.
Avoid TEXT: searchable fields.

---

6. Can you store an image or a PDF file in a SQL table? If yes, which data type would you use?

Interview Focus: BLOB usage and file handling

Key Answer Points:

- Yes, use BLOB (Binary Large Object).
- Stores binary data like images, PDFs, etc.
- Not always recommended for large files — better to store file paths and keep files in storage.

---

7. When would you use BOOLEAN, and how is it stored internally in SQL databases?

Interview Focus: Data representation

Key Answer Points:

- BOOLEAN is for true/false values (e.g., is_active, is_deleted).
- Internally stored as 1 (true) or 0 (false) in most DBMS.
- Useful for flags in tables (e.g., is_email_verified BOOLEAN).

---

8. What’s the default value behavior of TIMESTAMP in MySQL?

Interview Focus: Auto-timestamping

Key Answer Points:

- Can be set to auto-update with DEFAULT CURRENT_TIMESTAMP

- Useful for created_at, updated_at tracking

Example:

updated_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE CURRENT_TIMESTAMP

---

9. What is the difference between NUMERIC and DECIMAL?

Interview Focus: Data type aliasing

Key Answer Points:

- Functionally identical in most DBMS (like PostgreSQL, SQL Server).
- Both are exact numeric types for fixed precision.
- Use them for financial data.

---

10. Why is it important to choose the right data type in real-time projects?

Interview Focus: Design and performance thinking

Key Answer Points:

- Saves **storage space**
- Improves **query performance**
- Prevents **data integrity issues**
- Ensures **accurate indexing and constraints**

📌 Bonus Tip for Students:

"Don't just memorize definitions — think about how that data type affects performance, storage, and accuracy in real apps."

This means:

👉 **Don't just know what a data type is**, but understand **why and when** to use it — based on **how it behaves in real systems**.

✅ **Let’s take 3 key factors:**

1. Performance

2. Storage

3. Accuracy

We'll explain each with **real-world examples** so it's clear.

---

1. 🔄 Performance

How fast queries run, especially with large data

💡 **Example:**

```
CREATE TABLE users (
  phone_number VARCHAR(100)
);
```

This is **functional** but **inefficient**. Why?

- A phone number is always fixed length (e.g., 10 digits).
- If you use VARCHAR(100), the DB has to check how long the string is for each record.
- Instead, use: CHAR(10) → better performance on large tables.

✅ **Better Design:**

```
phone_number CHAR(10)
```

📌 **Takeaway:**
Use fixed-length types (CHAR) when the data is predictable. It helps indexing and searching run faster.

---

2. 💾 Storage

How much space your database uses (and wastes)

💡 **Example:**

```
CREATE TABLE cities (
  name VARCHAR(255)
);
```

Seems okay, right? But if 99% of your city names are under 50 characters, you're **reserving too much space**.

Also, in MySQL:

- VARCHAR(255) needs **up to 256 bytes**

- VARCHAR(50) needs only **51 bytes**

So, on **millions of rows**, this becomes **expensive** in memory.

✅ **Better Design:**

name VARCHAR(50)

📌 **Takeaway:**
Don't blindly use large sizes like VARCHAR(255) unless really needed. Choose the **shortest possible** size that fits your data.

---

3. 🎯 Accuracy

How precisely your data is stored (especially important in numbers)

💡 **Example:**

```
CREATE TABLE transactions (
  amount FLOAT
);
```

But FLOAT is an **approximate type**. It might store:

- ₹99.99 as 99.989999999 or 99.9900001

That's unacceptable for **money**, right?

✅ **Better Design:**

amount DECIMAL(10, 2)

This ensures:

- Always **exact 2 digits** after decimal
- ₹99.99 will stay exactly 99.99

📌 **Takeaway:**
For financial data, **never use FLOAT or REAL** — use **DECIMAL/NUMERIC** for accuracy.

🛠 **Real-Time Project Summary Table:**

Scenario	**Bad Data Type**	**Good Data Type**	**Why? (Issue Solved)**
Phone number	VARCHAR(100)	CHAR(10)	Better performance
City name	VARCHAR(255)	VARCHAR(50)	Saves storage
Salary / price	FLOAT	DECIMAL(10,2)	Keeps precise values

Scenario	Bad Data Type	Good Data Type	Why? (Issue Solved)
True/false field	INT(1)	BOOLEAN	Clear intent, better readability
Product description	VARCHAR(1000)	TEXT	No size limit, suited for long text
Image or PDF file	VARCHAR (path only)	BLOB	Binary data support

---

□ Final Thought:

A good developer doesn't just *make it work*, they make it *work well*.
Choosing the **right data type** is your first step to building clean, fast, and scalable apps.

SQL operators

🔥 Common SQL Operators and Their Uses in Real-Time Projects

1. = (Equal To)

- **Use:** Compares if two values are equal
- **Real-time example:** Find users with a specific email

```
SELECT * FROM users WHERE email = 'user@example.com';
```

---

2. <> or != (Not Equal To)

- **Use:** Filters out records that do not match a value
- **Real-time example:** Find products that are not discontinued

```
SELECT * FROM products WHERE status <> 'discontinued';
```

---

3. > (Greater Than)

- **Use:** Finds values greater than a specified value
- **Real-time example:** Find orders with amount greater than 1000

```
SELECT * FROM orders WHERE amount > 1000;
```

---

4. < (Less Than)

- **Use:** Finds values less than a specified value

- **Real-time example:** Find employees with salary less than 50000

SELECT * FROM employees WHERE salary < 50000;

---

5. >= (Greater Than or Equal To)

- **Use:** Finds values greater than or equal to a specified value
- **Real-time example:** Find products with stock greater than or equal to 10

SELECT * FROM products WHERE stock >= 10;

---

6. <= (Less Than or Equal To)

- **Use:** Finds values less than or equal to a specified value
- **Real-time example:** Find orders placed before or on a specific date

SELECT * FROM orders WHERE order_date <= '2025-08-29';

---

7. BETWEEN ... AND ...

- **Use:** Filters values within a range (inclusive)
- **Real-time example:** Find employees with salary between 30000 and 60000

SELECT * FROM employees WHERE salary BETWEEN 30000 AND 60000;

---

8. LIKE

- **Use:** Pattern matching with wildcards (% and _)
- **Real-time example:** Find customers whose name starts with 'J'

SELECT * FROM customers WHERE name LIKE 'J%';

---

9. IN

- **Use:** Checks if a value matches any value in a list
- **Real-time example:** Find orders from specific customers

SELECT * FROM orders WHERE customer_id IN (101, 102, 103);

---

10. IS NULL and IS NOT NULL

- **Use:** Checks if a value is or isn’t null (missing)
- **Real-time example:** Find users who haven’t set their phone number

```
SELECT * FROM users WHERE phone_number IS NULL;
```

---

11. AND, OR, NOT (Logical Operators)

- **Use:** Combine multiple conditions
- **Real-time example:** Find active customers from a city

```
SELECT * FROM customers WHERE city = 'New York' AND is_active = TRUE;
```

---

12. +, -, *, / (Arithmetic Operators)

- **Use:** Perform calculations on numeric fields
- **Real-time example:** Calculate total price after tax

```
SELECT price, price * 1.10 AS price_with_tax FROM products;
```

---

13. EXISTS

- **Use:** Checks if a subquery returns any rows
- **Real-time example:** Find customers who have placed orders

```
SELECT * FROM customers c WHERE EXISTS (SELECT 1 FROM orders o WHERE o.customer_id = c.id);
```

Summary Table:

Operator	**Use Case**	**Real-Time Example**
=	Equality	Find user by email
<> or !=	Not equal	Find products not discontinued
>	Greater than	Find orders with amount > 1000
<	Less than	Find employees with salary < 50000
>=	Greater or equal	Find products with stock >= 10
<=	Less or equal	Find orders placed before a date
BETWEEN ... AND	Range check	Salary between 30k and 60k
LIKE	Pattern matching	Customers with names starting with 'J'
IN	Multiple values check	Orders from specific customers
IS NULL / IS NOT NULL	Null check	Users without phone number

Operator	Use Case	Real-Time Example
AND, OR, NOT	Logical operators	Active customers from New York
+, -, *, /	Arithmetic calculations	Price calculation with tax
EXISTS	Subquery existence check	Customers who placed orders

🔥 Real-Time SQL Operator Interview Questions (with explanation of what interviewers look for)

---

1. What is the difference between WHERE and HAVING clauses? When do you use each?

- **Focus:** Filtering rows vs filtering groups
- **Real Scenario:** Filtering data after aggregation
- **Answer Tip:**
  - WHERE filters rows *before* aggregation (e.g., before GROUP BY)
  - HAVING filters groups *after* aggregation (e.g., after GROUP BY)

---

2. How does the IN operator differ from multiple OR conditions? Which one is more efficient?

- **Focus:** Query readability and optimization
- **Real Scenario:** Filtering by multiple values
- **Answer Tip:**
  - IN is shorthand for multiple ORs, easier to read
  - Performance depends on the database, but generally both are similar
  - For very large lists, JOIN with temp table or indexed table might be better

---

3. Explain how the LIKE operator works. What are the wildcard characters?

- **Focus:** Pattern matching
- **Real Scenario:** Searching for users with partial input
- **Answer Tip:**
  - % matches zero or more characters
  - _ matches exactly one character

  - LIKE 'a%' matches strings starting with 'a'
  - Explain performance issues with leading % (e.g., LIKE '%abc' can be slow)

---

4. How would you write a query to find records where a column is NULL or empty?

- **Focus:** NULL handling in SQL
- **Real Scenario:** Data cleansing or filtering
- **Answer Tip:**
- WHERE column IS NULL OR column = ''
  - Explain difference between NULL and empty string ''

---

5. What is the difference between = and LIKE when used in WHERE clause?

- **Focus:** Exact vs pattern matching
- **Real Scenario:** Search vs exact match
- **Answer Tip:**
  - = is for exact matches
  - LIKE is for partial or pattern matches

---

6. When would you use the BETWEEN operator? Are the boundaries inclusive or exclusive?

- **Focus:** Range filtering
- **Real Scenario:** Filtering dates, numbers, or ranges
- **Answer Tip:**
  - Use BETWEEN for inclusive ranges
  - Boundaries are **inclusive** (e.g., BETWEEN 10 AND 20 includes 10 and 20)

---

7. Explain the difference between AND and OR operators. What happens if you combine them without parentheses?

- **Focus:** Logical operator precedence
- **Real Scenario:** Complex filtering conditions
- **Answer Tip:**
  - AND has higher precedence than OR
  - Use parentheses to explicitly define order

    - Example: A OR B AND C is A OR (B AND C)

---

8. What is the purpose of the EXISTS operator? How does it differ from IN?

- **Focus:** Subquery usage and performance
- **Real Scenario:** Checking existence of related records
- **Answer Tip:**
    - EXISTS checks if a subquery returns any row (returns TRUE/FALSE)
    - IN compares against a list of values
    - EXISTS can be more efficient with correlated subqueries

---

9. Can you use arithmetic operators in WHERE clause? Give an example.

- **Focus:** Expression evaluation
- **Real Scenario:** Filtering based on calculated columns
- **Answer Tip:**
- WHERE (price * quantity) > 1000
    - Shows understanding of SQL expressions

---

10. What happens if you use NULL in arithmetic operations or comparisons? How do you handle it?

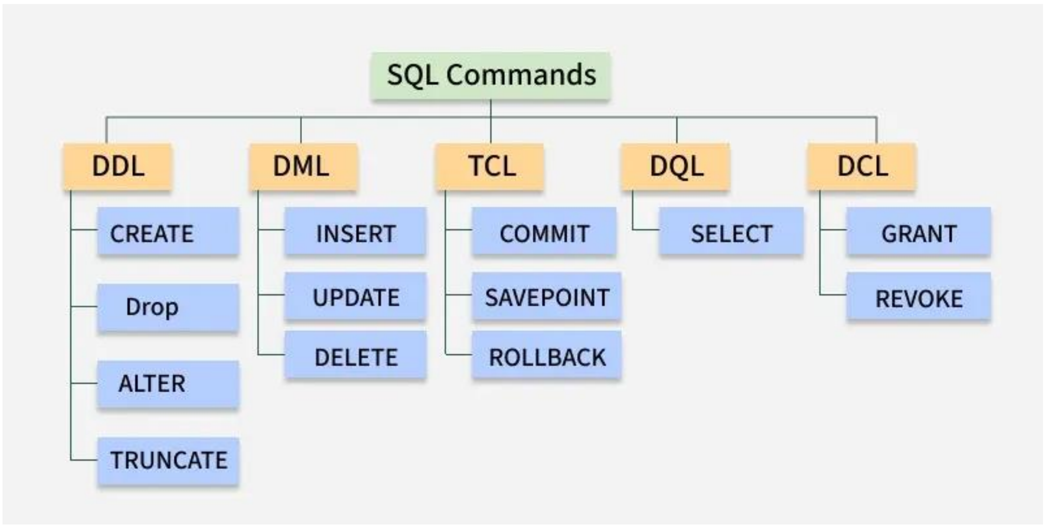
- **Focus:** Null behavior in SQL
- **Real Scenario:** Data calculation and filtering
- **Answer Tip:**
    - Any arithmetic operation with NULL results in NULL
    - Use IS NULL to check for nulls
    - Use COALESCE(column, default_value) to replace nulls in calculations

---

SQL Commands | DDL, DQL, DML, DCL and TCL Commands

SQL commands are fundamental building blocks for communicating with a database management system (DBMS) used to interact with database with some operations. It is also used to perform specific tasks, functions and queries of data. SQL can perform various tasks like creating a table, adding data to tables, dropping the table, modifying the table, set permission for users.

SQL Commands are mainly categorized into five categories:



SQL Commands

1. DDL - Data Definition Language

DDL (Data Definition Language) actually consists of SQL commands that can be used for defining, altering and deleting database structures such as tables, indexes and schemas. It simply deals with descriptions of the database schema and is used to create and modify the structure of database objects in the database

Common DDL Commands

Command	**Description**	**Syntax**
CREATE	Create database or its objects (table, index, function, views, store procedure and triggers)	CREATE TABLE table_name (column1 data_type, column2 data_type, ...);
DROP	Delete objects from the database	DROP TABLE table_name;
ALTER	Alter the structure of the database	ALTER TABLE table_name ADD COLUMN column_name data_type;
TRUNCATE	Remove all records from a table, including all spaces allocated for the records are removed	TRUNCATE TABLE table_name;

Command	Description	Syntax
COMMENT	Add comments to the data dictionary	COMMENT ON TABLE table_name IS 'comment_text';
RENAME	Rename an object existing in the database	RENAME TABLE old_table_name TO new_table_name;

Example:

```
CREATE TABLE employees (
employee_id INT PRIMARY KEY,
first_name VARCHAR(50),
last_name VARCHAR(50),
hire_date DATE
);
```

In this example, a new table called employees is created with columns for employee ID, first name, last name and hire date.

2. DQL - Data Query Language

DQL is used to fetch data from the database. The main command is SELECT, which retrieves records based on the query. The output is returned as a result set (a temporary table) that can be viewed or used in applications.

DQL Command

Command	Description	Syntax
SELECT	It is used to retrieve data from the database	SELECT column1, column2, ...FROM table_name WHERE condition;

FROM	Indicates the **table(s)** from which to retrieve data.	SELECT column1
		FROM table_name;

WHERE	Filters rows **before** any grouping or aggregation	SELECT column1
		FROM table_name
		WHERE condition;

GROUP BY	Groups rows that have the same values in specified columns.	SELECT column1,
		AVG_FUNCTION(column2)

Command	Description	Syntax

		FROM table_name
		GROUP BY column1;

HAVING	Filters the results of GROUP BY	SELECT column1, AVG_FUNCTION(column2)
		FROM table_name
		GROUP BY column1
		HAVING condition;

DISTINCT	Removes **duplicate rows** from the result set	SELECT DISTINCT column1, column2, ...
		FROM table_name;

ORDER BY	Sorts the result set by one or more columns	SELECT column1
		FROM table_name
		ORDER BY column1 [ASC | DESC];

LIMIT	By default, it sorts in **ascending order** unless specified as DESC	SELECT * FROM table_name LIMIT number;

***Note:** DQL has only one command, **SELECT**. Other terms like FROM, WHERE, GROUP BY, HAVING, ORDER BY, DISTINCT and LIMIT are **clauses** of SELECT, not separate commands.*

Example:

SELECT first_name, last_name, hire_date
FROM employees
WHERE department = 'Sales'
ORDER BY hire_date DESC;

This query retrieves employees first and last names, along with their hire dates, from the employees table, specifically for those in the 'Sales' department, sorted by hire date.

3. DML - Data Manipulation Language

DML commands are used to manipulate the data stored in database tables. With DML, you can insert new records, update existing ones, delete unwanted data or retrieve information.

Common DML Commands

Command	Description	Syntax
INSERT	Insert data into a table	INSERT INTO table_name (column1, column2, ...) VALUES (value1, value2, ...);
UPDATE	Update existing data within a table	UPDATE table_name SET column1 = value1, column2 = value2 WHERE condition;
DELETE	Delete records from a database table	DELETE FROM table_name WHERE condition;

Example:

INSERT INTO employees (first_name, last_name, department)
VALUES ('Jane', 'Smith', 'HR');

This query inserts a new record into employees table with first name 'Jane', last name 'Smith' and department 'HR'.

4. DCL - Data Control Language

DCL (Data Control Language) includes commands such as GRANT and REVOKE which mainly deal with the rights, permissions and other controls of the database system. These commands are used to control access to data in the database by granting or revoking permissions.

Common DCL Commands

Command	Description	Syntax
GRANT	Assigns new privileges to a user account, allowing access to specific database objects, actions or functions.	GRANT privilege_type [(column_list)] ON [object_type] object_name TO user [WITH GRANT OPTION];
REVOKE	Removes previously granted privileges from a user account, taking away their access to certain database objects or actions.	REVOKE [GRANT OPTION FOR] privilege_type [(column_list)] ON [object_type] object_name FROM user [CASCADE];

Example:

GRANT SELECT, UPDATE ON employees TO user_name;

This command grants the user user_name the permissions to select and update records in the employees table.

5. TCL - Transaction Control Language

Transactions group a set of tasks into a single execution unit. Each transaction begins with a specific task and ends when all the tasks in the group are successfully completed. If any of the tasks fail, transaction fails. Therefore, a transaction has only two results: success or failure.

Common TCL Commands

Command	**Description**	**Syntax**
BEGIN TRANSACTION	Starts a new transaction	BEGIN TRANSACTION [transaction_name];
COMMIT	Saves all changes made during the transaction	COMMIT;
ROLLBACK	Undoes all changes made during the transaction	ROLLBACK;
SAVEPOINT	Creates a savepoint within the current transaction	SAVEPOINT savepoint_name;

Example:

```
BEGIN TRANSACTION;
UPDATE employees SET department = 'Marketing' WHERE department = 'Sales';
SAVEPOINT before_update;
UPDATE employees SET department = 'IT' WHERE department = 'HR';
ROLLBACK TO SAVEPOINT before_update;
COMMIT;
```