TOPSTechnologies

SQL Syntax

Presented for :

TOPs Technologies

Presented by :

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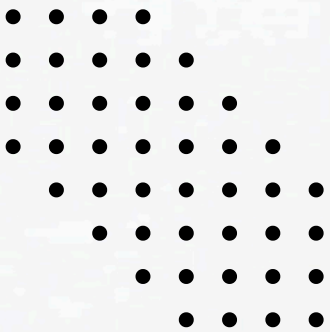

Que 1

Here are the basic components:

1. Keywords

- Reserved words that perform specific functions in SQL, such as:
  - SELECT: Retrieves data from a database.
  - INSERT: Adds new records to a table.
  - UPDATE: Modifies existing records.
  - DELETE: Removes records.
  - CREATE: Creates a database or table.
  - DROP: Deletes a database or table.
  - ALTER: Modifies the structure of a table.

2. Clauses

Keywords that define the conditions for SQL statements:

- WHERE: Filters records based on conditions.
- ORDER BY: Sorts query results.
- GROUP BY: Groups rows sharing a property.
- HAVING: Filters groups defined by GROUP BY.
- LIMIT: Restricts the number of returned rows.

3. Expressions

- Combinations of values, operators, and functions that produce a value.
  - Arithmetic expressions: a + b, a - b, etc.
  - Logical expressions: a > b AND c < d.

4. Identifiers

- Names of database objects such as:
  - Tables: users, orders.
  - Columns: id, name.
  - Aliases: u for users.

5. Operators

- Symbols or keywords for comparisons or calculations:
  - Arithmetic operators: +, -, *, /.
  - Comparison operators: =, !=, <, >, <=, >=.
  - Logical operators: AND, OR, NOT.

6. Functions

- Predefined operations to perform calculations or transformations:
  - Aggregate functions: COUNT(), SUM(), AVG(), MAX(), MIN().
  - String functions: CONCAT(), LENGTH().
  - Date functions: NOW(), DATE().

7. Data Types

- Define the kind of data a column can hold:
  - Numeric: INT, FLOAT.
  - Text: VARCHAR, TEXT.
  - Date/Time: DATE, DATETIME.
  - Boolean: BOOLEAN.

8. Statements

- Complete commands for interacting with the database:
  - Data Query Language (DQL): SELECT.
  - Data Definition Language (DDL): CREATE, DROP, ALTER.
  - Data Manipulation Language (DML): INSERT, UPDATE, DELETE.
  - Data Control Language (DCL): GRANT, REVOKE.
  - Transaction Control Language (TCL): COMMIT, ROLLBACK.

9. Comments

- Notes or annotations within SQL code:
  - Single-line: -- This is a comment.
  - Multi-line: /* This is a multi-line comment */.

Que. 2

Simple Structure of SQL Select Query -->

```
SELECT [DISTINCT] column1, column2, ...
FROM table_name
[WHERE condition]
[GROUP BY column1, column2, ...]
[HAVING condition]
[ORDER BY column1 [ASC|DESC], column2 [ASC|DESC], ...]
[LIMIT number [OFFSET offset]];
```

Explanation :

- SELECT:
- Specifies the columns to retrieve. Use * to select all columns.
- Example: SELECT id, name.
- DISTINCT (Optional):
- Ensures unique rows in the result set by removing duplicates.
- Example: SELECT DISTINCT name.
- FROM:
- Specifies the table(s) from which to retrieve data.
- Example: FROM employees.
- WHERE (Optional):
- Filters rows based on conditions.
- Example: WHERE age > 30.
- GROUP BY (Optional):
- Groups rows that share a common value in specified columns.
- Often used with aggregate functions.
- Example: GROUP BY department_id.

Example Query :

```
SELECT DISTINCT name, department, COUNT(*)
FROM employees
WHERE age > 30 AND department = 'Sales'
GROUP BY department, name
HAVING COUNT(*) > 1
ORDER BY name ASC
LIMIT 10 OFFSET 5;
```

Que. 3

Clauses in SQL play a fundamental role in structuring queries and providing instructions on how data should be retrieved, filtered, grouped, sorted, or modified. Each clause has a specific purpose, and they can be combined to form powerful queries.

Key SQL Clauses and Their Roles

1. SELECT Clause

- Specifies the columns to retrieve from the database.
- Defines the data to include in the query result.
- Example: SELECT name, age FROM employees.

2. FROM Clause

- Identifies the table(s) to query data from.
- Essential for specifying the data source.
- Example: FROM employees.

3. WHERE Clause

- Filters rows based on a specified condition.
- Limits the data retrieved to match certain criteria.
- Example: WHERE age > 30.

4. GROUP BY Clause

- Groups rows that have the same values in specified columns.
- Often used with aggregate functions (e.g., SUM, COUNT, AVG).
- Example: GROUP BY department_id.