SQL: Structured query language

* **Data Definition Language (DDL)** - These SQL commands are used for creating, modifying, and dropping the structure of database objects. The commands are CREATE, ALTER, DROP, RENAME, and TRUNCATE.
* **Data Manipulation Language (DML)** - These SQL commands are used for storing, retrieving, modifying, and deleting data.  
  These Data Manipulation Language commands are: [SELECT](https://beginner-sql-tutorial.com/sql-select-statement.htm), [INSERT](https://beginner-sql-tutorial.com/sql-insert-statement.htm), [UPDATE](https://beginner-sql-tutorial.com/sql-update-statement.htm), and [DELETE](https://beginner-sql-tutorial.com/sql-delete-statement.htm).
* **Transaction Control Language (TCL)** - These SQL commands are used for managing changes affecting the data. These commands are COMMIT, ROLLBACK, and SAVEPOINT.
* **Data Control Language (DCL)** - These SQL commands are used for providing security to database objects. These commands are GRANT and REVOKE.

**SQL CREATE TABLE Statement**

The CREATE TABLE Statement is used to create tables to store data. Integrity Constraints like primary key, unique key, foreign key can be defined for the columns while creating the table. The integrity constraints can be defined at column level or table level. The implementation and the syntax of the CREATE Statements differs for different RDBMS.

The Syntax for the CREATE TABLE Statement is:

CREATE TABLE table\_name

(column\_name1 datatype,

column\_name2 datatype,

... column\_nameN datatype

);

table\_name - is the name of the table.

column\_name1, column\_name2.... - is the name of the columns

datatype - is the datatype for the column like char, date, number etc.

For Example: If you want to create the employee table, the statement would be like,

CREATE TABLE employee

( id number(5),

name char(20),

dept char(10),

age number(2),

salary number(10),

location char(10)

);

**SQL ALTER TABLE Statement**

The SQL ALTER TABLE command is used to modify the definition (structure) of a table by modifying the definition of its columns. The ALTER command is used to perform the following functions.

1) Add, drop, modify table columns

2) Add and drop constraints

3) Enable and Disable constraints

Syntax to add a column

ALTER TABLE table\_name ADD column\_name datatype;

For Example: To add a column "experience" to the employee table, the query would be like

ALTER TABLE employee ADD experience number(3);

Syntax to drop a column

ALTER TABLE table\_name DROP column\_name;

For Example: To drop the column "location" from the employee table, the query would be like

ALTER TABLE employee DROP location;

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SQL INSERT Statement

The INSERT Statement is used to add new rows of data to a table.

We can insert data to a table in two ways,

1) Inserting the data directly to a table.

Syntax for SQL INSERT is:

INSERT INTO TABLE\_NAME

[ (col1, col2, col3,...colN)]

VALUES (value1, value2, value3,...valueN);

col1, col2,...colN -- the names of the columns in the table into which you want to insert data.

While inserting a row, if you are adding value for all the columns of the table you need not specify the column(s) name in the sql query. But you need to make sure the order of the values is in the same order as the columns in the table. The sql insert query will be as follows

INSERT INTO TABLE\_NAME

VALUES (value1, value2, value3,...valueN);

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SQL Delete Statement

The DELETE Statement is used to delete rows from a table.

Syntax of a SQL DELETE Statement

DELETE FROM table\_name [WHERE condition];

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SQL TRUNCATE Statement Example

To delete all the rows from employee table, the query would be like,

TRUNCATE TABLE employee;

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SQL DROP Statement:

The SQL DROP command is used to remove an object from the database. If you drop a table, all the rows in the table is deleted and the table structure is removed from the database. Once a table is dropped we cannot get it back, so be careful while using DROP command. When a table is dropped all the references to the table will not be valid.

Syntax to drop a sql table structure:

DROP TABLE table\_name;

SQL DROP Statement Example

To drop the table employee, the query would be like

DROP TABLE employee;

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SQL ORDER BY

The ORDER BY clause is used in a SELECT statement to sort results either in ascending or descending order. Oracle sorts query results in ascending order by default.

Syntax for using SQL ORDER BY clause to sort data is:

SELECT column-list

FROM table\_name [WHERE condition]

[ORDER BY column1 [, column2, .. columnN] [DESC]];

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SQL HAVING Clause

Having clause is used to filter data based on the group functions. This is similar to WHERE condition but is used with group functions. Group functions cannot be used in WHERE Clause but can be used in HAVING clause.

SQL HAVING Clause Example

If you want to select the department that has total salary paid for its employees more than 25000, the sql query would be like;

SELECT dept, SUM (salary)

FROM employee

GROUP BY dept

HAVING SUM (salary) > 25000

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SQL Logical Operators

There are three Logical Operators namely, AND, OR, and NOT. These operators compare two conditions at a time to determine whether a row can be selected for the output.

Logical Operators Description

OR For the row to be selected at least one of the conditions must be true.

AND For a row to be selected all the specified conditions must be true.

NOT For a row to be selected the specified condition must be false.

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Comparison Operators:

Comparison operators are used to compare the column data with specific values in a condition.

Comparison Operators are also used along with the SELECT statement to filter data based on specific conditions.

The below table describes each comparison operator.

Comparison Operators Description

= equal to

<>, != is not equal to

< less than

> greater than

>= greater than or equal to

<= less than or equal to

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SQL Comparison Keywords

There are other comparison keywords available in sql which are used to enhance the search capabilities of a sql query. They are "IN", "BETWEEN...AND", "IS NULL", "LIKE".

Comparision Operators Description

LIKE column value is similar to specified character(s).

IN column value is equal to any one of a specified set of values.

BETWEEN...AND column value is between two values, including the end values specified in the range.

IS NULL column value does not exist.

SQL LIKE Operator

The LIKE operator is used to list all rows in a table whose column values match a specified pattern. It is useful when you want to search rows to match a specific pattern, or when you do not know the entire value. For this purpose we use a wildcard character '%'.

For example: To select all the students whose name begins with 'S'

SELECT first\_name, last\_name

FROM student\_details

WHERE first\_name LIKE 'S%';

The output would be similar to:

first\_name last\_name

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Stephen Fleming

Shekar Gowda

The above select statement searches for all the rows where the first letter of the column first\_name is 'S' and rest of the letters in the name can be any character.

There is another wildcard character you can use with LIKE operator. It is the underscore character, ' \_ ' . In a search string, the underscore signifies a single character.

For example: to display all the names with 'a' second character,

SELECT first\_name, last\_name

FROM student\_details

WHERE first\_name LIKE '\_a%';

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SQL IN Operator:

The IN operator is used when you want to compare a column with more than one value. It is similar to an OR condition.

For example: If you want to find the names of students who are studying either Maths or Science, the query would be like,

SELECT first\_name, last\_name, subject

FROM student\_details

WHERE subject IN ('Maths', 'Science');

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SQL IS NULL Operator

A column value is NULL if it does not exist. The IS NULL operator is used to display all the rows for columns that do not have a value.

For Example: If you want to find the names of students who do not participate in any games, the query would be as given below

SELECT first\_name, last\_name

FROM student\_details

WHERE games IS NULL

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SQL GROUP Functions

Group functions are built-in SQL functions that operate on groups of rows and return one value for the entire group. These functions are: COUNT, MAX, MIN, AVG, SUM, DISTINCT

SQL COUNT (): This function returns the number of rows in the table that satisfies the condition specified in the WHERE condition. If the WHERE condition is not specified, then the query returns the total number of rows in the table.

For Example: If you want the number of employees in a particular department, the query would be:

SELECT COUNT (\*) FROM employee

WHERE dept = 'Electronics';

The output would be '2' rows.

If you want the total number of employees in all the department, the query would take the form:

SELECT COUNT (\*) FROM employee;

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SQL DISTINCT(): This function is used to select the distinct rows.

For Example: If you want to select all distinct department names from employee table, the query would be:

SELECT DISTINCT dept FROM employee;

To get the count of employees with unique name, the query would be:

SELECT COUNT (DISTINCT name) FROM employee;

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