A database is a collection of data stored in a computer system.

A database can consist of one or more  **table.**

A table is made up of columns and rows.

In a Table, column header names are written in lowercase, and there shouldn't be any space in a single name**.**

Q: What is SQL?

A: SQL stands for Structured Query Language and used to communicate with a database.

With SQL, you can access or manipulate data stored in the database.

SQL is not a programming language, but a query language.

SQL is a declarative language, not a procedural language.

With SQL, you can access or manipulate data stored in the database. There are different types of access. These are:

* **Retrieval** of data from the database
* **Insertion** of new data into the database
* **Updating** the data in the database
* **Deletion** of data from the database

**C**reate (Datensatz anlegen, Erstellen)

* **R**ead bzw. **R**etrieve (Datensatz lesen, mancmal auch abfragen )
* **U**pdate (Datensatz aktualisieren)
* **D**elete bzw. **D**estroy (Datensatz löschen)

Besides, you can **create** new databases and tables using SQL.

A **query** is a statement asking for the retrieval of information from the database.

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### **SQL Language Elements**

SQL statement: SELECT, INSERT, UPDATE, DELETE, etc.

SELECT

The SELECT statement is used to select data from a database.

You can retrieve rows from the columns of the table by using this statement.

SELECT statement is used with FROM keyword.

The syntax of the SELECT statement can be seen below.

query :

SELECT column\_name(s) FROM table\_name;

SELECT column1, column2 FROM table1;

SELECT column1, column2, column3 FROM table1;

SELECT \* FROM table1;

**By using the asterisk character “\*”, you can get every column with all of the data in it as a result-set of the query.**

* SQL statements start with a keyword like SELECT, INSERT, UPDATE, DELETE, etc. and all the statements end with a semicolon (;).
* The semicolon at the end indicates that the statement is completed and ready to be executed.
* SQL is also case insensitive, which means you can use both SELECT and select in your query. They mean the same thing for SQL.
* Writing SQL commands in the upper-case is the most common and preferred style. But, you can write the same query in both ways as below:

select column\_name(s) from table\_name;

SELECT COLUMN\_NAME(s) FROM TABLE\_NAME;

* White spaces and empty lines are ignored in SQL. So, the below query is correct by all means.

SELECT column\_name(s)

FROM table\_name;

## **DISTINCT Clause**

**The SELECT DISTINCT is used to return only distinct (different/unique) values to eliminate duplicate rows in a result set.**

**Here is the syntax of the DISTINCT clause:**

SELECT DISTINCT column\_name(s) FROM table\_name;

[No Duplicated Rows](https://lms.clarusway.com/mod/lesson/view.php?id=293&pageid=536)

[Duplicated Rows](https://lms.clarusway.com/mod/lesson/view.php?id=293&pageid=538)

## WHERE & LIMIT Clauses

The WHERE clause is used to filter records.

* It allows you to define a specific search condition for the result set returned by a query.

SELECT column\_name(s) FROM table\_name WHERE condition(s);

| **Operator** | **Description** |
| --- | --- |
| = | Equal to |
| > | Greater than |
| < | Less than |
| >= | Greater than or equal |
| <= | Less than or equal |
| <> | Not equal. This operator may be written as != in some versions of SQL |
| BETWEEN | Test if a value is between a certain range of values |
| LIKE | Determine if a character string matches a predefined pattern |
| IN | Test whether or a value matches any value in a list |

### LIMIT Clause

The LIMIT clause is used to filter records. It constrains the number of rows returned by a query.

SELECT column\_name(s) FROM table\_name LIMIT number\_rows;

Let's select all the columns of the student\_table and return the first 3 rows.

query:

SELECT \* FROM student\_table LIMIT 3;

We can also combine LIMIT with WHERE.

query:

SELECT \* FROM student\_table WHERE grade > 70 LIMIT 2;

### Order By Clause

SELECT statement returns records in an unspecified order. In case you want to retrieve data in alphabetical or numeric order, we use ORDER BY keyword.

The ORDER BY keyword sorts the result-set in descending or ascending order.

SELECT column\_name(s) FROM table\_name ORDER BY column\_name(s) ASC|DESC;

Since ASC is the default order value in case you don't specify any ascending or descending order, both queries will yield the same result.

SELECT column\_name(s) FROM employees ORDER BY first\_name;

SELECT column\_name(s) FROM employees ORDER BY first\_name DESC;

SELECT column\_name(s) FROM table\_name ORDER BY column1 ASC|DESC, column2 ASC|DESC, columnN ASC|DESC;

SELECT column\_name(s) FROM table\_name WHERE condition ORDER BY column\_name(s)s ASC|DESC;

SELECT column\_name(s)

FROM table\_name

WHERE condition

ORDER BY column\_name(s)s ASC|DESC;