

SQL Lessons

Initial Questions:

- Are we all familiar with excel and how it works?

NB: Excel is basic and cannot hold large amounts of data and cannot perform complex calculations. So SQL is used.

Database - Holds the DB tables - several tables make up a database.

Tables - Holds the records (data)

Table is a collection of related data made up of rows and columns.

Table/Entities has properties called fields/columns, ex: customer_id, customer_name, address, phone_number, etc...

NB: Tables names should hold the meaning of what it holds. The names must follow some standard, lowercase and underscore for two or more word name.

Tables are related to each other (each table has a key column/field/property that can related to another table). This is what defines the relationship they have to each other. So this related table organization by a database is what is termed Relational Database.

Non-Relational Databases too exist, but their organization is not as such. Every data is independent and can be referenced in different ways.

Types of DB

- RDBMS (Relational Database Management System) ex:

PostgreSQL,

MySQL,

MS SQL Server,

MS Access,

Oracle, etc...

Databases are installed in servers/computers.

SQL Data Types:

Numbers -

INT - Whole numbers (1, 23, 5234234, -23, -242423, etc...)

NUMERIC - Floats (2.4, 9234.08, 1.1, etc...)

Text -

TEXT - Very long range of text ,

VARCHAR(255) - Variable Character (Can be any length. Length of the character is specified in the brackets)

Date -

DATE - Just date

DATETIME - Date in combination with the time.

TIMESTAMP - Date in combination with the time.

DB Schema

Schema shows a tables design and what tables are included and how the related to each other.

QUERIES -

DDL - Data Definition Language

CREATE

ALTER

TRUNCATE

DROP

DML - Data Manipulation Language

INSERT

UPDATE

DELETE

DQL - Data Query Language

SELECT

Important things to note:

- SQL keywords are not case sensitive.
- Some SQL databases require you to put (;) at the end of each SQL statement, while others do not.

SQL Syntax Framework

The most popular SQL query - SELECT Statement (which is a DQL - Data Query Language)

SELECT - fields to be selected. To select all fields in the table use (*)

DISTINCT - used to select unique records in a field

TOP * - *used to limit the selected results by a specified number of records.

AS - create an alias name for the selected results record ONLY.

FROM - the table you want to query

JOIN - join conditions with other tables

WHERE - filter the results in your query. this is a conditional statement.

GROUP BY - used to aggregate/put together similar data.

HAVING - filter the results of the aggregated data (only used together with WHERE clause)

ORDER BY - used to sort the selected results of the query

LIMIT * - *used to limit the selected results by a specified number of records.

Order of execution:

1 - FROM

2 - SELECT

3 - SORT

Exercises:

- Basic SELECT, FROM
- SELECT with DISTINCT
- SELECT with AS
- SELECT with LIMIT
- WHERE filtering with comparison operators like >, <, >=, <=, =, <>
- WHERE multiple filtering with OR, AND & BETWEEN
- WHERE filtering text with LIKE, NOT LIKE, WHERE IN
- WHERE filtering with NULL or NOT NULL

Aggregate Functions

COUNT() - used to count the number of records with value in a field

COUNT(*) - counts all records in the table

COUNT(field_name) - counts all NON null records in a field