3/6/2023

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SQL

`SQL` is a standard language for storing, manipulating and retrieving data in databases.

MySQL

`MySQL` is a relational database management system that uses SQL.

> **MySQL** is available for Microsoft Windows 64-bit operating systems only. For supported Windows platform information, see https://www.mysql.com/support/supportedplatforms/database.html.

There are different methods to install MySQL on Microsoft Windows.

MySQL Installer Method

The simplest and recommended method is to download `MySQL` Installer (for Windows) and let it install and configure a specific version of `MySQL` Server as follows:

> Download `MySQL Installer` from https://dev.mysql.com/downloads/installer/

MySQL Set Up

Please use this set up by **Amit Thinks (Youtube Channel)**

> Video title: How to install MySQL 8.0.22 Server and Workbench latest version on Windows 10
>
> Video link: https://www.youtube.com/watch?v=OM4aZJW_Ojs

What is SQL?

- `SQL` stands for Structured Query Language
- `SQL` lets you access and manipulate databases
- `SQL` became a standard of the American National Standards Institute (ANSI) in 1986, and of the International Organization for Standardization (ISO) in 1987

What Can SQL do?

- `SQL` can execute queries against a database
- `SQL` can retrieve data from a database
- `SQL` can insert records in a database
- `SQL` can update records in a database
- `SQL` can delete records from a database
- `SQL` can create new databases
- `SQL` can create new tables in a database

- `SQL` can create stored procedures in a database
- `SQL` can create views in a database
- `SQL` can set permissions on tables, procedures, and views

RDBMS

`RDBMS` stands for Relational Database Management System.

`RDBMS` is the basis for `SQL`, and for all modern database systems such as MS SQL Server, IBM DB2, Oracle, MySQL, and Microsoft Access.

The data in `RDBMS` is stored in database objects called tables. A **table** is a collection of related data entries and it consists of columns and rows.

Every **table** is broken up into smaller entities called **fields**

A **field** is a column in a table that is designed to maintain specific information about every **record** in the **table**.

A **record**, also called a **row**, is each individual entry that exists in a **table**. A **record** is a horizontal entity in a **table**.

> Note: Although SQL is an ANSI/ISO standard, there are different versions of the SQL language. However, to be compliant with the ANSI standard, they all support at least the major commands (such as SELECT, UPDATE, DELETE, INSERT, WHERE) in a similar manner

Database

A `database` most often contains one or more **tables**. Each table is identified by a name (e.g. "Customers" or "Orders"). Tables contain records (rows) with data.

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico
4	Around the Horn	Thomas Hardy	120 Hanover Sq.	London	WA1 1DP	UK
5	Berglunds snabbköp	Christina Berglund	Berguvsvägen 8	Luleå	S-958 22	Sweden

The **table** above contains five records (one for each customer) and seven columns (CustomerID, CustomerName, ContactName, Address, City, PostalCode, and Country).

Keep in Mind That... `SQL` keywords are **NOT** case sensitive: `select` is the same as `SELECT`

The most standard format is to write all `SQL` keywords in **upper-case**.

Semicolon after SQL Statements?

Some `database` systems require a semicolon at the end of each SQL statement.

`Semicolon` is the standard way to separate each `SQL` statement in database systems that allow more than one SQL statement to be executed in the same call to the server.

Some of The Most Important SQL Commands

- `SELECT` - extracts data from a database
- `UPDATE` - updates data in a database
- `DELETE` - deletes data from a database
- `INSERT INTO` - inserts new data into a database
- `CREATE DATABASE` - creates a new database
- `ALTER DATABASE` - modifies a database
- `CREATE TABLE` - creates a new table

- `ALTER TABLE` - modifies a table
- `DROP TABLE` - deletes a table
- `CREATE INDEX` - creates an index (search key)
- `DROP INDEX` - deletes an index

Lets create our first database

In [ ]:
```
CREATE DATABASE IF NOT EXISTS manu_sql;
```

We have successfully created database/schema using SQL command.

Show databases

In [ ]:
```
SHOW DATABASES;
```

Choose which database to use when evaluating commands

In [ ]:
```
USE manu_sql;
```

After selecting the database now we can query what tables are in the db

Show Tables

In [ ]:
```
SHOW TABLES;
```

Create a Table

The `CREATE TABLE` statement allows you to create a new table in a database.

Syntax

1. First, you specify the name of the table that you want to create after the `CREATE TABLE` keywords. The table name must be unique within a database.
2. Second, you specify a list of columns of the table in the column_list section, columns are separated by commas.

MySQL CREATE TABLE Example

The following example creates a table called “Persons” that contains five columns: `PersonID`, `LastName`, `FirstName`, `Address`, and `City`:

In [ ]:
```
CREATE TABLE IF NOT EXISTS Persons (
    PersonID int,
    LastName varchar(255),
    FirstName varchar(255),
    Address varchar(255),
    City varchar(255)
);
```

The `PersonID` column is of type `int` and will hold an `integer`.

The `LastName`, `FirstName`, `Address`, and `City` columns are of type `varchar` and will hold `characters`, and the maximum length for these fields is `255` characters.

The empty “Persons” table will now look like this:

PersonID	LastName	FirstName	Address	City

Persons Table

See if table was created

In [ ]:
```
SHOW TABLES;
```

Describe a Table

We will use the `DESCRIBE` command to show the structure of our table, such as column names, constraints on column names, etc. The `DESC` command is a short form of the DESCRIBE command.

In [ ]:
```
{DESCRIBE | DESC} table_name;
```

In [ ]:
```
DESCRIBE persons;
```