ULTIMATE MySQL HANDBOOK

CodeWithHarry

Installing MySQL

What is MySQL workbench?

MySQL Workbench is a visual tool for database architects, developers, and DBAs. It provides data modeling, SQL development, and comprehensive administration tools for server configuration, user administration, backup, and much more.

What is a Database Management System (DBMS)?

A Database Management System (DBMS) is software that interacts with end users, applications, and the database itself to capture and analyze data. It allows for the creation, retrieval, updating, and management of data in databases. If you know one DBMS, you can easily transition to another, as they share similar concepts and functionalities.

Windows / macOS Installation

1. Download from: https://dev.mysql.com/downloads/installer/
2. Run the installer and choose **Developer Default**.
3. Set a root password when prompted.
4. Install MySQL Workbench (optional but helpful GUI).

Linux (Ubuntu) Installation

Follow these steps to install MySQL and create a user:

Step 1: Update Package Index

```
sudo apt update
```

Step 2: Install MySQL Server

```
sudo apt install mysql-server
```

Step 3: Secure the Installation

```
sudo mysql_secure_installation
```

Choose your options (yes to most).

Step 4: Create a User `'harry'@'localhost'`

Log into MySQL:

```
sudo mysql
```

Run the following SQL commands:

```
CREATE USER 'harry'@'localhost' IDENTIFIED BY 'password';
GRANT ALL PRIVILEGES ON *.* TO 'harry'@'localhost' WITH GRANT OPTION;
FLUSH PRIVILEGES;
EXIT;
```

Step 5: Test Login

```
mysql -u harry -p
```

Enter the password: `password`

Make sure to replace `'password'` with a secure password of your choice in production environments.

Getting Started with MySQL

What is a Database?

A **database** is a container that stores related data in an organized way. In MySQL, a database holds one or more **tables**.

Think of it like:

- **Folder analogy**:
  - A **database** is like a folder.
  - Each **table** is a file inside that folder.
  - The **rows** in the table are like the content inside each file.
- **Excel analogy**:
  - A **database** is like an Excel workbook.
  - Each **table** is a separate sheet inside that workbook.
  - Each **row** in the table is like a row in Excel.

Step 1: Create a Database

```
CREATE DATABASE startersql;
```

After creating the database, either:

- Right-click it in MySQL Workbench and select “**Set as Default Schema**”, or
- Use this SQL command:

```
USE startersql;
```

Step 2: Create a Table

Now we'll create a simple `users` table:

```
CREATE TABLE users (
    id INT AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(100) NOT NULL,
    email VARCHAR(100) UNIQUE NOT NULL,
    gender ENUM('Male', 'Female', 'Other'),
    date_of_birth DATE,
    created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);
```

This table will store basic user info.

Step 3: Drop the Database

You can delete the entire database (and all its tables) using:

```
DROP DATABASE startersql;
```

> Be careful — this will delete everything in that database.

Data Types Explained

- `INT` : Integer type, used for whole numbers.
- `VARCHAR(100)` : Variable-length string, up to 100 characters.
- `ENUM` : A string object with a value chosen from a list of permitted values. eg. `gender ENUM('Male', 'Female', 'Other')`
- `DATE` : Stores date values. eg `date_of_birth DATE`

- `TIMESTAMP` : Stores date and time, automatically set to the current timestamp when a row is created.
- `BOOLEAN` : Stores TRUE or FALSE values, often used for flags like `is_active` .

- ## `DECIMAL(10, 2)` : Stores exact numeric data values, useful for financial data. The first number is the total number of digits, and the second is the number of digits after the decimal point.

Constraints Explained

- `AUTO_INCREMENT` : Automatically generates a unique number for each row.
- `PRIMARY KEY` : Uniquely identifies each row in the table.
- `NOT NULL` : Ensures a column cannot have a NULL value.
- `UNIQUE` : Ensures all values in a column are different.
- `DEFAULT` : Sets a default value for a column if no value is provided. eg. `created_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP` , `is_active BOOLEAN DEFAULT TRUE`
