

## MySQL Operations

2. MySQL has a wealth of operations to help database architects and engineers deal with data and structure within a SQL database. These operations are broken up into three categories: DDL (data definition language), DML (data manipulation language), and DCL (data control language). DDL operations help to define the structure or schema in a database, DML helps deal with the management and manipulation of the data within that database, and DCL controls permissions granted within that database. Interestingly, DML and DCL commands can be undone, but DDL commands are permanent.<sup>1</sup>

### DDL Operations

**CREATE** – The CREATE command is used to create tables in SQL. On use, one can specify the names of the columns in the table, declare the data types of each column, and even declare primary keys and foreign keys.

**ALTER** – The ALTER command is used on an existing table and can change qualities of the table. You can use it to declare primary or foreign keys after the fact, add columns, or even change the data types of existing columns.

**DROP** – The DROP command is used to drop columns from existing tables, or to drop tables from existing schemas. When you drop a table, you completely delete the data contained in the table. If you'd rather delete all the data and keep the table, you can use the TRUNCATE command.

### DML Operations

**SELECT** – The SELECT command can be used to retrieve data FROM a table. When used in conjunction with the WHERE command, select can pull data that matches certain criteria, whether that is where a primary key = 6487, where a first\_name starts with the letter 'B', or where a purchase happened in the month of October, 1987.

**DELETE** – The DELETE command can be used to delete data from a table. Like the SELECT command, DELETE can be used in conjunction with WHERE to delete data that matches certain criteria.

**JOIN** – The JOIN command can be used if you need related data from two or more tables. This is usually done by SELECTing columns from multiple tables and JOINing them by matching related primary and foreign keys.<sup>2</sup>

### DCL Operations

**GRANT and REVOKE** – The GRANT and REVOKE commands are used to grant or revoke permissions, commands, and rights within a database. For instance, if I were run the command

```
REVOKE SELECT, UPDATE ON Users TO CODY;
```

It would revoke my ability to use the SELECT and UPDATE commands on the table Users.

## JDBC

4. JDBC, or Java Database Connective, is an adapter layer that connects a java application to a database. This means that it can connect the application to the database and allow it to control and manipulate the data and structure of that database. It does this by establishing and maintaining communication between the application and the database through the use of a connection string.<sup>3</sup>

Once you've correctly configured the connection and drivers, you can start programming queries into your java code. Most JDBC's come with a number of pre-fabricated PreparedStatements and CallableStatements (or stored procedures) that let you do a lot with your database without having to write thousands of lines of code to do so.

JDBC's also handle transactions, which can help to preserve data consistency. You don't want your application to try to commit a change before the previous change has completed. Transactions allow for this level of control, to tell your application to hold off on committing the next change until the current transaction is complete.<sup>4</sup>

1 <https://www.scaler.com/topics/ddl-dml-dcl/>

2 <https://www.w3schools.com/sql/default.asp>

3 <https://www.inforworld.com/article/3388036/what-is-jdbc-introduction-to-java-database-connectivity.html>

4 <https://www.baeldung.com/java-jdbc/>