



Home



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SQLite

Cassandra

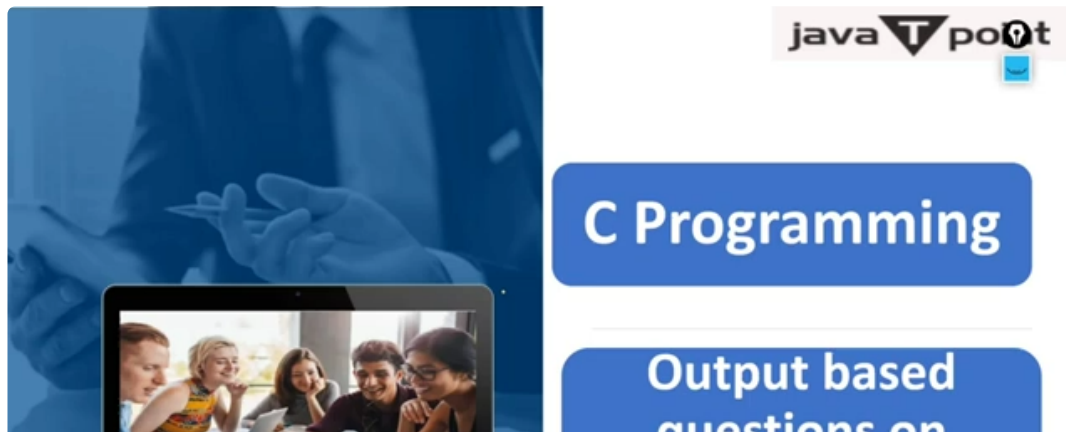
# MySQL Trigger

A trigger in MySQL is a set of SQL statements that reside in a system catalog. **It is a special type of stored procedure that is invoked automatically in response to an event.** Each trigger is associated with a table, which is activated on any DML statement such as **INSERT, UPDATE, or DELETE.**

A trigger is called a special procedure because it cannot be called directly like a stored procedure. The main difference between the trigger and procedure is that a trigger is called automatically when a data modification event is made against a table. In contrast, a stored procedure must be called explicitly.

Generally, **triggers are of two types** according to the **SQL** standard: row-level triggers and statement-level triggers.

**Row-Level Trigger:** It is a trigger, which is activated for each row by a triggering statement such as insert, update, or delete. For example, if a table has inserted, updated, or deleted multiple rows, the row trigger is fired automatically for each row affected by the **insert, update, or delete statement.**





**Statement-Level Trigger:** It is a trigger, which is fired once for each event that occurs on a table regardless of how many rows are inserted, updated, or deleted.

NOTE: We should know that MySQL doesn't support statement-level triggers. It provides supports for row-level triggers only.

## Why we need/use triggers in MySQL?

We need/use triggers in MySQL due to the following features:

- Triggers help us to enforce business rules.
- Triggers help us to validate data even before they are inserted or updated.
- Triggers help us to keep a log of records like maintaining audit trails in tables.
- SQL triggers provide an alternative way to check the integrity of data.
- Triggers provide an alternative way to run the scheduled task.
- Triggers increases the performance of SQL queries because it does not need to compile each time the query is executed.
- Triggers reduce the client-side code that saves time and effort.
- Triggers help us to scale our application across different platforms.

- Triggers are easy to maintain.

## Limitations of Using Triggers in MySQL

- MySQL triggers do not allow to use of all validations; they only provide extended validations. **For example**, we can use the NOT NULL, UNIQUE, CHECK and FOREIGN KEY constraints for simple validations.
- Triggers are invoked and executed invisibly from the client application. Therefore, it isn't easy to troubleshoot what happens in the database layer.
- Triggers may increase the overhead of the database server.

## Types of Triggers in MySQL?

We can define the maximum six types of actions or events in the form of triggers:

1. **Before Insert:** It is activated before the insertion of data into the table.
2. **After Insert:** It is activated after the insertion of data into the table.
3. **Before Update:** It is activated before the update of data in the table.
4. **After Update:** It is activated after the update of the data in the table.
5. **Before Delete:** It is activated before the data is removed from the table.
6. **After Delete:** It is activated after the deletion of data from the table.

When we use a statement that does not use INSERT, UPDATE or DELETE query to change the data in a table, the triggers associated with the trigger will not be invoked.

## Naming Conventions

Naming conventions are the set of rules that we follow to give appropriate unique names. It saves our time to keep the work organize and understandable. Therefore, **we must use a unique name for each trigger associated with a table**. However, it is a good practice to have the same trigger name defined for different tables.

The following naming convention should be used to name the trigger in **MySQL**:

```
(BEFOR | AFTER) table_name (INSERT | UPDATE | DELETE)
```

Thus,

**Trigger Activation Time:** BEFORE | AFTER

**Trigger Event:** INSERT | UPDATE | DELETE

## How to create triggers in MySQL?

We can use the **CREATE TRIGGER** statement for creating a new trigger in MySQL. Below is the syntax of creating a trigger in MySQL:

```
CREATE TRIGGER trigger_name  
(AFTER | BEFORE) (INSERT | UPDATE | DELETE)  
  ON table_name FOR EACH ROW  
  BEGIN  
    --variable declarations  
    --trigger code  
  END;
```

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