



Bhartiya Vidya Bhavan's
Sardar Patel Institute of Technology
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous College Affiliated to University of Mumbai)

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UID:	2021300016, 2021300005, 2021300002
SUBJECT	DBMS (Database Management System)
EXPERIMENT NO:	Experiment 9
DATE OF PERFORMANCE	17/11/22
DATE OF SUBMISSION:	25/11/22
AIM:	To study triggers.
THEORY:	<p>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.</p> <p>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.</p> <p>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.</p>



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	<p>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.</p> <p>USES OF TRIGGERS:</p> <ul style="list-style-type: none">o Triggers help us to enforce business rules.o Triggers help us to validate data even before they are inserted or updated.o Triggers help us to keep a log of records like maintaining audit trails in tables.o SQL triggers provide an alternative way to check the integrity of data.o Triggers provide an alternative way to run the scheduled task.o Triggers increases the performance of SQL queries because it does not need to compile each time the query is executed.o Triggers reduce the client-side code that saves time and effort.o Triggers help us to scale our application across different platforms.
SQL QUERIES/ COMMANDS:	<p>A] BEFORE INSERT:</p> <p>QUERY: delimiter //</p> <pre>mysql> create trigger trigger1 -> before insert on student for each row -> begin -> if new.marks>100 then set new.marks=100;</pre>



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-> end if;
-> end //

B] AFTER INSERT:

Query: create trigger after_insert

-> after insert on student for each row

-> insert into after_insert
values(new.s_name,new.s_id,new.marks);//

C] BEFORE UPDATE:

QUERY : delimiter //

mysql> create trigger trigger2

-> before update on student

-> for each row

-> begin

-> if new.marks<40 then set new.marks=50;

-> end if;

-> end//;

D] AFTER UPDATE:

QUERY:

create trigger after_update

-> after update on student for each row

-> insert into after_update values (new.s_name,new.s_id);

-> //

E] BEFORE DELETE:



QUERY: create trigger trigger3
-> before delete on student for each row
-> insert into deleted_data
values(old.s_name,old.s_id,old.address);//

F] AFTER DELETE:

QUERY: create trigger after_delete
-> after delete on student for each row
-> insert into after_delete
values(old.s_name,old.s_id,old.address);//

RESULT:

A] BEFORE INSERT:

```
mysql> delimiter //  
mysql> create trigger trigger1  
-> before insert on student for each row  
-> begin  
-> if new.marks>100 then set new.marks=100;  
-> end if;  
-> end //  
Query OK, 0 rows affected (0.01 sec)
```



```
mysql> insert into student values('JETHA','2010','CALIFORNIA','700000****','1','1014','2002-12-12',NULL,'200');//  
Query OK, 1 row affected (0.01 sec)
```

```
mysql> select * from student//
```

S_NAME	S_ID	ADDRESS	CONTACT_NO	field_NO	course_code	date_of_birth	age	marks
DEEP	2001	JAMMU	700606****	1	1011	2003-01-14	NULL	100
DEEPAK	2002	LUDHIANA	990628****	1	1011	2003-02-14	NULL	90
TARAK	2003	GUJRAT	98761****	1	1012	2003-01-18	NULL	89
DHARA	2004	WESTBENGAL	700606****	1	1012	2003-12-05	NULL	99
ANKITA	2005	AMRITSAR	785426****	2	1013	2001-08-16	NULL	60
VASUDHA	2006	RAIGARH	659823****	2	1013	2003-08-08	NULL	50
TOMPER	2007	MUMBAI	983467****	1	1015	2002-06-07	NULL	100
VINEET	2008	KOLABA	981167****	1	1015	2003-12-25	NULL	10
JUSTIN	2009	AMSTERDAM	663467****	1	1014	2002-05-14	NULL	50
JETHA	2010	CALIFORNIA	700000****	1	1014	2002-12-12	NULL	100

```
10 rows in set (0.00 sec)
```

B] AFTER INSERT:

```
mysql> create trigger after_insert  
-> after insert on student for each row  
-> insert into after_insert values(new.s_name,new.s_id,new.marks);//  
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> insert into student values('KARK','2011','ARIZONA','801000****','1','1015','2001-2-12',NULL,'80');//  
Query OK, 1 row affected (0.01 sec)
```

```
mysql> select * from after_insert;  
-> //
```

s_name	s_id	marks
KARK	2011	80

```
1 row in set (0.00 sec)
```

C] BEFORE UPDATE:



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```
mysql> delimiter //
mysql> create trigger trigger2
-> before update on student
-> for each row
-> begin
-> if new.marks<40 then set new.marks=50;
-> end if;
-> end//
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> update student set marks="30" where s_id='2001';
-> //
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0
```

```
mysql> select * from student;
-> //
```

S_NAME	S_ID	ADDRESS	CONTACT_NO	field_NO	course_code	date_of_birth	age	marks
DEEP	2001	JAMMU	700606****	1	1011	2003-01-14	NULL	50
DEEPAK	2002	LUDHIANA	990628****	1	1011	2003-02-14	NULL	90
TARAK	2003	GUJRAT	98761****	1	1012	2003-01-18	NULL	89
DHARA	2004	WESTBENGAL	700606****	1	1012	2003-12-05	NULL	99
ANKITA	2005	AMRITSAR	785426****	2	1013	2001-08-16	NULL	60
VASUDHA	2006	RAIGARH	659823****	2	1013	2003-08-08	NULL	50
TOMPER	2007	MUMBAI	983467****	1	1015	2002-06-07	NULL	100
VINEET	2008	KOLABA	981167****	1	1015	2003-12-25	NULL	10
JUSTIN	2009	AMSTERDAM	663467****	1	1014	2002-05-14	NULL	50
JETHA	2010	CALIFORNIA	700000****	1	1014	2002-12-12	NULL	100

10 rows in set (0.00 sec)

D] AFTER UPDATE:

```
mysql> create trigger after_update
-> after update on student for each row
-> insert into after_update values (new.s_name,new.s_id);
-> //
Query OK, 0 rows affected (0.01 sec)

mysql> update student set marks="89" where s_id='2002';
-> //
Query OK, 1 row affected (0.01 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> select * from after_update;
-> //
+-----+-----+
| s_name | s_id |
+-----+-----+
| DEEPAK | 2002 |
+-----+-----+
1 row in set (0.00 sec)
```



E] BEFORE DELETE:

```
mysql> create trigger trigger3
-> before delete on student for each row
-> insert into deleted_data values(old.s_name,old.s_id,old.address);//
Query OK, 0 rows affected (0.01 sec)
```

```
mysql> delete from student where s_id='2011';//
Query OK, 1 row affected (0.01 sec)
```

```
mysql> select * from deleted_data;//
```

```
+-----+-----+-----+
| s_name | s_id | address |
+-----+-----+-----+
| KARK   | 2011 | ARIZONA |
+-----+-----+-----+
1 row in set (0.00 sec)
```

F] AFTER DELETE:

```
mysql> create trigger after_delete
-> after delete on student for each row
-> insert into after_delete values(old.s_name,old.s_id,old.address);//
Query OK, 0 rows affected (0.01 sec)
```



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```
mysql> delete from student where s_id='2010';//
Query OK, 1 row affected (0.01 sec)

mysql> select * from deleted_data;//
+-----+-----+-----+
| s_name | s_id | address  |
+-----+-----+-----+
| KARK   | 2011 | ARIZONA  |
| JETHA  | 2010 | CALIFORNIA |
+-----+-----+-----+
2 rows in set (0.00 sec)

mysql> select * from after_delete;
-> //
+-----+-----+-----+
| s_name | s_id | address  |
+-----+-----+-----+
| JETHA  | 2010 | CALIFORNIA |
+-----+-----+-----+
1 row in set (0.00 sec)
```

CONCLUSION:

Learnt in detail about what are triggers and different types of triggers and also learnt how to implement different triggers and the uses of triggers in real life.