



Ingeniería en Sistemas  
Computacionales



INSTITUTO TECNOLÓGICO SUPERIOR DE JEREZ  
JEREZ DE GARCÍA SALINAS A 15 DE NOVIEMBRE DEL 2019

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CARRERA:  
INGENIERÍA EN SISTEMAS COMPUTACIONALES

NOMBRE DE LA MATERIA:  
TALLER DE BASES DE DATOS

QUINTO SEMESTRE

TEMA 5 - SQL PROCEDURAL

**“ACTIVIDAD 2 - PRACTICA TRIGGERS”**

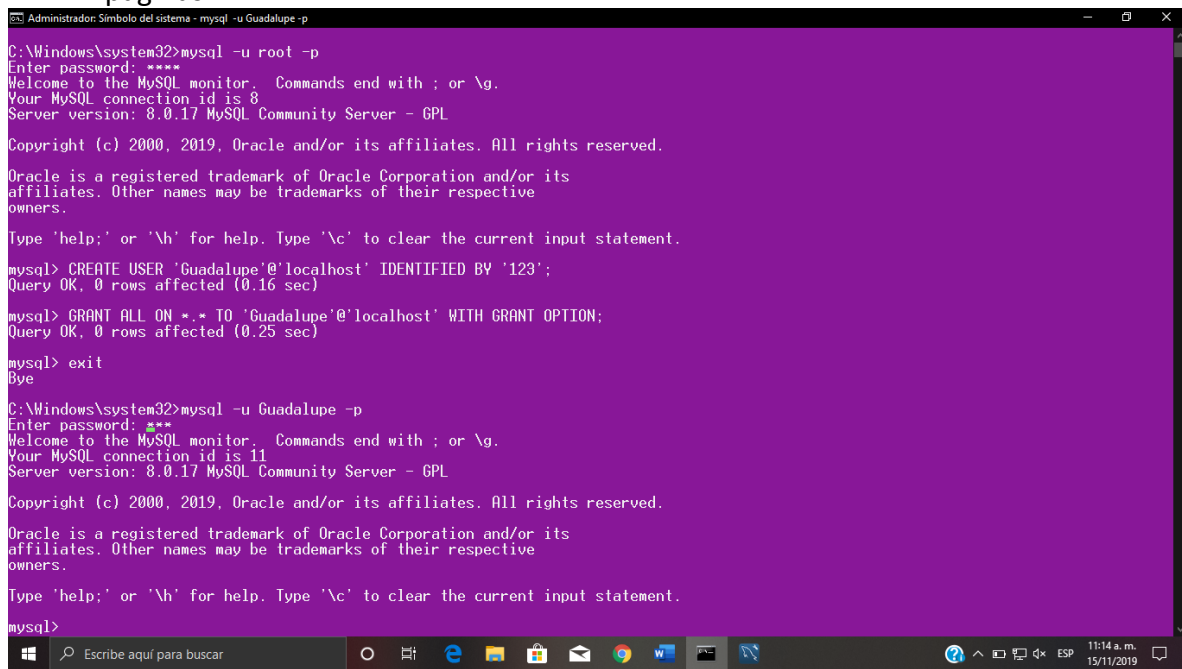
DOCENTE:  
SALVADOR ACEVEDO SANDOVAL

## Practica TRIGGERS

Realizar las practicas que se muestran en los siguientes enlaces:

1. <https://www.neoguias.com/como-crear-y-utilizar-triggers-en-mysql/>
2. <https://examples.javacodegeeks.com/core-java/sql/mysql-triggers-tutorial/>
3. <https://www.geeksforgeeks.org/different-types-of-mysql-triggers-with-examples/>

- Para evidenciar correctamente la práctica, deberán crear un usuario con su nombre en MySQL, entrar con dicho usuario y posteriormente realizar los tutoriales de las páginas.



```
Administrador: Símbolo del sistema - mysql -u Guadalupe -p
C:\Windows\system32>mysql -u root -p
Enter password: ****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.17 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE USER 'Guadalupe'@'localhost' IDENTIFIED BY '123';
Query OK, 0 rows affected (0.16 sec)

mysql> GRANT ALL ON *.* TO 'Guadalupe'@'localhost' WITH GRANT OPTION;
Query OK, 0 rows affected (0.25 sec)

mysql> exit
Bye

C:\Windows\system32>mysql -u Guadalupe -p
Enter password: ***
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 11
Server version: 8.0.17 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```

- Deberá ser en l alinea de comandos.
- Las capturas de pantalla deberán contener en la parte superior el nombre de usuario que crearon.

1. <https://www.neoguias.com/como-crear-y-utilizar-triggers-en-mysql/>  
Crear base de datos, tabla e insertar registros

```
Administrador: Símbolo del sistema - mysql -u Guadalupe -p

mysql> CREATE DATABASE base_ejemplo;
Query OK, 1 row affected (0.13 sec)

mysql> USE base_ejemplo;
Database changed

mysql> CREATE TABLE productos ( id INT NOT NULL AUTO_INCREMENT,nombre VARCHAR(20) NOT NULL,coste FLOAT NOT NULL DEFAULT 0.0,precio FLOAT NOT NULL DEFAULT 0.0,PRIMARY KEY(id));
Query OK, 0 rows affected (1.05 sec)

mysql> INSERT INTO productos (nombre, coste, precio) VALUES ('Producto A', 4, 8), ('Producto B', 2, 4), ('Producto C', 40, 80);
Query OK, 3 rows affected (0.38 sec)
Records: 3 Duplicates: 0 Warnings: 0

mysql>
```

## Crear el trigger

```
Administrador: Símbolo del sistema - mysql -u Guadalupe -p

mysql> DELIMITER $$
mysql> CREATE TRIGGER actualizarPrecioProducto BEFORE UPDATE ON productos FOR EACH ROW
-> BEGIN
-> IF NEW.coste <> OLD.coste
-> THEN
-> SET NEW.precio = NEW.coste*2;
-> END IF;
-> END$$
Query OK, 0 rows affected (0.29 sec)

mysql> DELIMITER;
-> DELIMITER ;
->
```

## Usar el trigger

```
Simbolo del sistema - mysql -u Guadalupe -p
mysql> UPDATE productos SET coste = 5 WHERE id = 1;
Query OK, 1 row affected (0.28 sec)
Rows matched: 1 Changed: 1 Warnings: 0

mysql> SELECT * FROM productos;
+----+-----+-----+-----+
| id | nombre | coste | precio |
+----+-----+-----+-----+
| 1  | Producto A | 5     | 10     |
| 2  | Producto B | 2     | 4      |
| 3  | Producto C | 40    | 80     |
+----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql>
```

## Eliminar trigger

```
Simbolo del sistema - mysql -u Guadalupe -p
+----+-----+-----+-----+
| id | nombre | coste | precio |
+----+-----+-----+-----+
| 1  | Producto A | 5     | 10     |
| 2  | Producto B | 2     | 4      |
| 3  | Producto C | 40    | 80     |
+----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql> DROP TRIGGER actualizarPrecioProducto;
Query OK, 0 rows affected (0.25 sec)

mysql>
```

## 2. <https://examples.javacodegeeks.com/core-java/sql/mysql-triggers-tutorial/>

### Crear base de datos y tablas

```
Simbolo del sistema - MySQL -u Guadalupe -p
mysql> CREATE DATABASE jcg_schema;
Query OK, 1 row affected (0.20 sec)

mysql> CREATE TABLE Author (id INT PRIMARY KEY, name VARCHAR(50) NOT NULL, post_count INT NOT NULL);
ERROR 1046 (3D000): No database selected
mysql> use jcg_schema;
Database changed
mysql> CREATE TABLE Author (id INT PRIMARY KEY, name VARCHAR(50) NOT NULL, post_count INT NOT NULL);
Query OK, 0 rows affected (0.68 sec)

mysql> CREATE TABLE author_audit (id INT AUTO INCREMENT PRIMARY KEY, authorId INT NOT NULL, name VARCHAR(50) NOT NULL, changedate DATETIME DEFAULT NULL, action VARCHAR(50) DEFAULT NULL);
Query OK, 0 rows affected (0.74 sec)
```

## Crear el trigger

```
Simbolo del sistema - MYSQL -u Guadalupe -p
E DEFAULT NULL,action VARCHAR(50) DEFAULT NULL);
Query OK, 0 rows affected (0.74 sec)

mysql> DELIMITER $$
mysql> CREATE TRIGGER after_author_added
-> AFTER INSERT ON Author
-> FOR EACH ROW
-> BEGIN
->     INSERT INTO author_audit
->     SET action = 'insert',
->         authorId = NEW.id,
->         name = NEW.name,
->         changedate = NOW();
-> END$$
Query OK, 0 rows affected (0.23 sec)

mysql> DELIMITER ;
```

## Se uso el trigger

```
Simbolo del sistema - MYSQL -u Guadalupe -p
-> FOR EACH ROW
-> BEGIN
->     INSERT INTO author_audit
->     SET action = 'insert',
->         authorId = NEW.id,
->         name = NEW.name,
->         changedate = NOW();
-> END$$
Query OK, 0 rows affected (0.23 sec)

mysql> DELIMITER ;
mysql> INSERT INTO Author (id, name, post_count) VALUES (7, 'Vyom', 27);
Query OK, 1 row affected (0.16 sec)

mysql> SELECT * FROM author_audit;
+-----+-----+-----+-----+-----+
| id | authorId | name | changedate | action |
+-----+-----+-----+-----+-----+
| 1 | 7 | Vyom | 2019-11-15 12:01:44 | insert |
+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql>
```

3. <https://www.geeksforgeeks.org/different-types-of-mysql-triggers-with-examples/>

1. Before Update Trigger:

```
Simbolo del sistema - MYSQL -u Guadalupe -p
1 row in set (0.00 sec)

mysql> CREATE DATABASE bd_ejemplo;
Query OK, 1 row affected (0.21 sec)

mysql> use bd_ejemplo;
Database changed
mysql> create table customer (acc_no integer primary key,
->                             cust_name varchar(20),
->                             avail_balance decimal);
Query OK, 0 rows affected (0.64 sec)

mysql> create table mini_statement (acc_no integer,
->                                  avail_balance decimal,
->                                  foreign key(acc_no) references customer(acc_no) on delete cascade);
Query OK, 0 rows affected (0.70 sec)

mysql> insert into customer values (1000, "Fanny", 7000);
Query OK, 1 row affected (0.09 sec)

mysql> insert into customer values (1001, "Peter", 12000);
Query OK, 1 row affected (0.22 sec)

mysql> DELIMITER $$
mysql> CREATE TRIGGER update_cus
-> BEFORE update on customer
-> FOR EACH ROW
-> BEGIN
-> INSERT INTO mini_statement VALUES (OLD.acc_no, OLD.avail_balance);
-> END$$
Query OK, 0 rows affected (0.25 sec)

mysql> DELIMITER ;
mysql> update customer set avail_balance = avail_balance + 3000 where acc_no = 1001;
Query OK, 1 row affected (0.27 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> update customer set avail_balance = avail_balance + 3000 where acc_no = 1000;
Query OK, 1 row affected (0.27 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select *from mini_statement;
+-----+-----+
| acc_no | avail_balance |
+-----+-----+
| 1001   | 12000         |
| 1000   | 7000          |
+-----+-----+
2 rows in set (0.00 sec)

mysql>
```

## 2. After Update Trigger:

```
Simbolo del sistema - MYSQL -u Guadalupe -p

mysql> create table micro_statement (acc_no integer,
->                                avail_balance decimal,
->                                foreign key(acc_no) references customer(acc_no) on delete cascade);
Query OK, 0 rows affected (1.67 sec)

mysql> insert into customer values (1002, "Janitor", 4500);
Query OK, 1 row affected (0.20 sec)

mysql> DELIMITER $$
mysql> CREATE TRIGGER update_after
-> AFTER UPDATE ON customer
-> FOR EACH ROW
-> BEGIN
-> INSERT INTO micro_statement VALUES(NEW.acc_no,NEW.avail_balance);
-> END$$
Query OK, 0 rows affected (0.84 sec)

mysql> DELIMITER ;
mysql> update customer set avail_balance = avail_balance + 1500 where acc_no = 1002;
Query OK, 1 row affected (0.22 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select *from micro_statement;
+-----+-----+
| acc_no | avail_balance |
+-----+-----+
| 1002   | 6000         |
+-----+-----+
1 row in set (0.00 sec)

mysql> _
```

### 3. Before Insert Trigger

```
Simbolo del sistema - MYSQL -u Guadalupe -p

mysql> CREATE TABLE contacts (contact_id INT (11) NOT NULL AUTO_INCREMENT,last_name VARCHAR(30) NOT NULL, first_date VARCHAR(25),birth
day DATE, created_date DATE, created_by VARCHAR(30),CONSTRAINT contacts_pk PRIMARY KEY(contact_id));
Query OK, 0 rows affected, 1 warning (0.72 sec)
```

```
Simbolo del sistema - MYSQL -u Guadalupe -p

mysql> DELIMITER $$
mysql> CREATE TRIGGER contacts_before_insert
-> BEFORE INSERT ON contacts FOR EACH ROW
-> BEGIN
-> DECLARE vUser VARCHAR(50);
-> SELECT USER() into vUser;
-> SET NEW.created_date=SYSDATE();
-> SET NEW.created_by=vUser;
-> END$$
Query OK, 0 rows affected (0.49 sec)

mysql> DELIMITER ;
mysql> insert into contacts values (1, "Newton", "Enigma",
->                                str_to_date ("19-08-1999", "%d-%m-%Y"),
->                                str_to_date ("17-03-2018", "%d-%m-%Y"), "xyz");
Query OK, 1 row affected (0.09 sec)

mysql> select *from contacts;
+-----+-----+-----+-----+-----+-----+
| contact_id | last_name | first_date | birthday | created_date | created_by |
+-----+-----+-----+-----+-----+-----+
| 1          | Newton   | Enigma    | 1999-08-19 | 2019-11-15   | Guadalupe@localhost |
+-----+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql>
```

### 4. After Insert Trigger

```
Simbolo del sistema - MYSQL -u Guadalupe -p
1 row in set (0.00 sec)

mysql> create table contacts (contact_id int (11) NOT NULL AUTO_INCREMENT,
->                                last_name VARCHAR(30) NOT NULL,
->                                first_name VARCHAR(25), birthday DATE,
->                                CONSTRAINT contacts_pk PRIMARY KEY (contact_id));
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right
syntax to use near '->CONSTRAINT contacts_pk PRIMARY KEY (contact_id))' at line 4
mysql> create table contacts_audit (contact_id integer,
->                                created_date date,
->                                created_by varchar (30));
Query OK, 0 rows affected (0.47 sec)

mysql>
```

```
Simbolo del sistema - MYSQL -u Guadalupe -p

mysql> create table contacts (contact_id int (11) NOT NULL AUTO_INCREMENT,
->                                last_name VARCHAR(30) NOT NULL,
->                                first_name VARCHAR(25), birthday DATE,
->                                CONSTRAINT contacts_pk PRIMARY KEY (contact_id));
Query OK, 0 rows affected, 1 warning (0.59 sec)

mysql>
```



```
mysql> DELIMITER $$
mysql> CREATE TRIGGER contact_after_insert
-> AFTER INSERT
-> ON contacts FOR EACH ROW
-> BEGIN
-> DECLARE vUser VARCHAR(50);
-> SELECT USER() INTO vUser;
-> INSERT INTO contacts_audit
-> (contact_id,created_date,created_by)
-> VALUES
-> (NEW.contact_id,SYSDATE(),vUser);
-> END$$
Query OK, 0 rows affected (0.28 sec)

mysql> DELIMITER ;
mysql>
```

```
mysql>
-> DECLARE vUser VARCHAR(50);
-> SELECT USER() INTO vUser;
-> INSERT INTO contacts_audit
-> (contact_id,created_date,created_by)
-> VALUES
-> (NEW.contact_id,SYSDATE(),vUser);
-> END$$
Query OK, 0 rows affected (0.28 sec)

mysql> DELIMITER ;
mysql> insert into contacts values (1, "Kumar", "Rupesh",
->                                str_to_date("20-06-1999", "%d-%m-%Y"));
Query OK, 1 row affected (0.18 sec)

mysql> select *from contacts_audit;
+-----+-----+-----+
| contact_id | created_date | created_by |
+-----+-----+-----+
|          1 | 2019-11-15  | Guadalupe@localhost |
+-----+-----+-----+
1 row in set (0.00 sec)

mysql>
```

## 5. Before Delete Trigger

```
Simbolo del sistema - mysql -u Guadalupe -p
Query OK, 0 rows affected (0.72 sec)

mysql> create table contacts (contact_id int (11) NOT NULL AUTO INCREMENT,
->                                last_name VARCHAR (30) NOT NULL, first_name VARCHAR (25),
->                                birthday DATE, created_date DATE, created_by VARCHAR(30),
->                                CONSTRAINT contacts_pk PRIMARY KEY (contact_id));
Query OK, 0 rows affected, 1 warning (0.60 sec)

mysql> create table contacts_audit (contact_id integer, deleted_date date, deleted_by varchar(20));
Query OK, 0 rows affected (0.72 sec)

mysql>

Simbolo del sistema - mysql -u Guadalupe -p
mysql> DELIMITER $$
mysql> CREATE TRIGGER contacts_before_delete
-> BEFORE DELETE
-> ON contacts FOR EACH ROW
-> BEGIN
-> DECLARE vUser VARCHAR(50);
-> SELECT USER() INTO vUser;
-> INSERT INTO contacts_audit
-> (contact_id,deleted_date,deleted_by)
-> VALUES
-> (OLD.contact_id,SYSDATE(),vUser);
-> END$$
Query OK, 0 rows affected (0.29 sec)

mysql> DELIMITER ;
mysql> insert into contacts values (1, "Bond", "Ruskin",
->                                str_to_date ("19-08-1995", "%d-%m-%Y"),
->                                str_to_date ("27-04-2018", "%d-%m-%Y"), "xyz");
Query OK, 1 row affected (0.07 sec)

mysql> delete from contacts where last_name="Bond";
Query OK, 1 row affected (0.37 sec)

mysql> select *from contacts_audit;
+-----+-----+-----+
| contact_id | deleted_date | deleted_by |
+-----+-----+-----+
|          1 | 2019-11-15  | Guadalupe@localhost |
+-----+-----+-----+
1 row in set (0.00 sec)

mysql>
```

## 6. After Delete Trigger

```
mysql> DELIMITER $$
mysql> CREATE TRIGGER contacts_after_delete
-> after delete
-> ON contacts FOR EACH ROW
-> BEGIN
-> DECLARE vUser VARCHAR(50);
-> SELECT USER() INTO vUser;
-> INSERT INTO contacts_audit
-> (contact_id,deleted_date,deleted_by)
-> VALUES
-> (OLD.contact_id,SYSDATE(),vUser);
-> END$$
Query OK, 0 rows affected (0.32 sec)

mysql> DELIMITER ;
mysql> insert into contacts values (1, "Newton", "Isaac",
->                                str_to_date ("19-08-1985", "%d-%m-%Y"),
->                                str_to_date ("29-07-2018", "%d-%m-%Y"), "xyz");
Query OK, 1 row affected (0.18 sec)

mysql> delete from contacts where first_name="Isaac";
Query OK, 1 row affected (0.27 sec)

mysql> select *from contacts_audit;
+-----+-----+-----+
| contact_id | deleted_date | deleted_by |
+-----+-----+-----+
|          1 | 2019-11-15   | Guadalupe@localhost |
|          1 | 2019-11-15   | Guadalupe@localhost |
+-----+-----+-----+
2 rows in set (0.00 sec)

mysql>
```