Assignment No 8

Problem Statement:

Database Trigger (All Types: Row level and Statement level triggers, Before and After Triggers). Write a database trigger on Library table. The System should keep track of the records that are being updated or deleted. The old value of updated or deleted records should be added in Library_Audit table.Frame the problem statement for writing Database Triggers of all types, in-line with above statement. The problem statement should clearly state the requirements.

Input:

```
CREATE TABLE Library (
    book_id INT PRIMARY KEY,
    title VARCHAR(100),
    author VARCHAR(100),
    genre VARCHAR(50),
    quantity INT
);
CREATE TABLE Library_Audit (
    audit_id INT AUTO_INCREMENT PRIMARY KEY,
    book_id INT,
    old_title VARCHAR(100),
    old_author VARCHAR(100),
    old_genre VARCHAR(50),
    old_quantity INT,
    operation_type VARCHAR(10),
    operation_timestamp TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    user_name VARCHAR(50)
);
DELIMITER //

CREATE TRIGGER before_update_library
BEFORE UPDATE ON Library
FOR EACH ROW
BEGIN
    INSERT INTO Library_Audit (book_id, old_title, old_author, old_genre, old_quantity, operation_type,
user_name)
    VALUES (OLD.book_id, OLD.title, OLD.author, OLD.genre, OLD.quantity, 'UPDATE', USER());
END; //

DELIMITER ;
DELIMITER //

CREATE TRIGGER before_delete_library
BEFORE DELETE ON Library
FOR EACH ROW
BEGIN
    INSERT INTO Library_Audit (book_id, old_title, old_author, old_genre, old_quantity, operation_type,
user_name)
    VALUES (OLD.book_id, OLD.title, OLD.author, OLD.genre, OLD.quantity, 'DELETE', USER());
END; //
```

```
DELIMITER ;
DELIMITER //

CREATE TRIGGER after_update_statement
AFTER UPDATE ON Library
FOR EACH ROW
BEGIN
   INSERT INTO Library_Audit (operation_type, operation_timestamp, user_name)
   VALUES ('UPDATE', CURRENT_TIMESTAMP, USER());
END; //

DELIMITER ;
DELIMITER //

CREATE TRIGGER after_delete_statement
AFTER DELETE ON Library
FOR EACH ROW
BEGIN
   INSERT INTO Library_Audit (operation_type, operation_timestamp, user_name)
   VALUES ('DELETE', CURRENT_TIMESTAMP, USER());
END; //

DELIMITER ;

INSERT INTO Library (book_id, title, author, genre, quantity)
VALUES (1, 'The Great Gatsby', 'F. Scott Fitzgerald', 'Fiction', 10);
UPDATE Library SET quantity = 5 WHERE book_id = 1;
DELETE FROM Library WHERE book_id = 1;
SELECT * FROM Library_Audit;
```

Output:

```
+----------+---------+-----------------+---------------------+-----------+--------------+----------------+---------------------+----------------+
| audit_id | book_id | old_title       | old_author          | old_genre | old_quantity | operation_type | operation_timestamp | user_name      |
+----------+---------+-----------------+---------------------+-----------+--------------+----------------+---------------------+----------------+
|        1 |       1 | The Great Gatsby| F. Scott Fitzgerald | Fiction   |           10 | UPDATE         | 2024-10-22 20:47:32 | root@localhost |
|        2 |    NULL | NULL            | NULL                | NULL      |         NULL | UPDATE         | 2024-10-22 20:47:32 | root@localhost |
|        3 |    NULL | NULL            | NULL                | NULL      |         NULL | DELETE         | 2024-10-22 20:47:43 | root@localhost |
+----------+---------+-----------------+---------------------+-----------+--------------+----------------+---------------------+----------------+
3 rows in set (0.00 sec)
```