

DBMSL ASSIGNMENT – 7

Roll No: 31446

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.

1) CREATION OF TABLES

```
CREATE TABLE Library (  
    BookID INT PRIMARY KEY AUTO_INCREMENT,  
    Title VARCHAR(255),  
    Author VARCHAR(255),  
    PublishedYear INT,  
    Genre VARCHAR(100)  
);
```

```
DESC Library;
```

Field	Type	Null	Key	Default	Extra
BookID	int(11)	NO	PRI	NULL	auto_increment
Title	varchar(255)	YES		NULL	
Author	varchar(255)	YES		NULL	
PublishedYear	int(11)	YES		NULL	
Genre	varchar(100)	YES		NULL	

```
CREATE TABLE Library_Audit (  
    AuditID INT PRIMARY KEY AUTO_INCREMENT,  
    BookID INT,  
    Title VARCHAR(255),  
    Author VARCHAR(255),  
    PublishedYear INT,  
    Genre VARCHAR(100),  
    Operation VARCHAR(10),  
    OperationTime DATETIME  
);
```

```
DESC Library_Audit;
```

Field	Type	Null	Key	Default	Extra
AuditID	int(11)	NO	PRI	NULL	auto_increment
BookID	int(11)	YES		NULL	
Title	varchar(255)	YES		NULL	
Author	varchar(255)	YES		NULL	
PublishedYear	int(11)	YES		NULL	
Genre	varchar(100)	YES		NULL	
Operation	varchar(10)	YES		NULL	
OperationTime	datetime	YES		NULL	

8 rows in set (1.54 sec)

```
CREATE TABLE Library_Log (  
    LogID INT PRIMARY KEY AUTO_INCREMENT,  
    TriggerName VARCHAR(50),  
    Operation VARCHAR(10),  
    EventTime DATETIME,  
    UserHost VARCHAR(100),  
    Info VARCHAR(255)  
);
```

```
DESC Library_Log;
```

```
+-----+-----+-----+-----+-----+-----+
| Field      | Type          | Null | Key | Default | Extra          |
+-----+-----+-----+-----+-----+-----+
| LogID       | int(11)       | NO   | PRI | NULL    | auto_increment |
| TriggerName | varchar(50)   | YES  |     | NULL    |                |
| Operation   | varchar(10)   | YES  |     | NULL    |                |
| EventTime   | datetime      | YES  |     | NULL    |                |
| UserHost    | varchar(100)  | YES  |     | NULL    |                |
| Info        | varchar(255)  | YES  |     | NULL    |                |
+-----+-----+-----+-----+-----+-----+
6 rows in set (0.00 sec)
```

2) INSERT SAMPLE RECORDS

```
INSERT INTO Library(Title, Author, PublishedYear, Genre) VALUES
('The Great Gatsby', 'F. Scott Fitzgerald', 1925, 'Fiction'),
('To Kill a Mockingbird', 'Harper Lee', 1960, 'Fiction'),
('1984', 'George Orwell', 1949, 'Dystopian');
```

```
SELECT * FROM Library;
```

```
+-----+-----+-----+-----+-----+
| BookID | Title                | Author                | PublishedYear | Genre    |
+-----+-----+-----+-----+-----+
| 1      | The Great Gatsby    | F. Scott Fitzgerald  | 1925         | Fiction  |
| 2      | To Kill a Mockingbird | Harper Lee           | 1960         | Fiction  |
| 3      | 1984                | George Orwell        | 1949         | Dystopian |
+-----+-----+-----+-----+-----+
```

3) CREATE TRIGGERS

```
DELIMITER $$
```

```
CREATE TRIGGER trg_before_update_library
BEFORE UPDATE ON Library
FOR EACH ROW
BEGIN
    INSERT INTO Library_Audit(BookID, Title, Author, PublishedYear,
    Genre, Operation, OperationTime)
    VALUES(OLD.BookID, OLD.Title, OLD.Author, OLD.PublishedYear,
    OLD.Genre, 'UPDATE', NOW());
END $$
```

```
CREATE TRIGGER trg_before_delete_library
BEFORE DELETE ON Library
FOR EACH ROW
BEGIN
    INSERT INTO Library_Audit(BookID, Title, Author, PublishedYear,
    Genre, Operation, OperationTime)
    VALUES(OLD.BookID, OLD.Title, OLD.Author, OLD.PublishedYear,
    OLD.Genre, 'DELETE', NOW());
END $$
```

```
CREATE TRIGGER trg_after_update_library
AFTER UPDATE ON Library
FOR EACH ROW
BEGIN
    INSERT INTO Library_Log(TriggerName, Operation, EventTime,
        UserHost, Info)
    VALUES('trg_after_update_library', 'UPDATE', NOW(), USER(),
        CONCAT('Updated BookID: ', NEW.BookID));
END $$
```

```
CREATE TRIGGER trg_after_delete_library
AFTER DELETE ON Library
FOR EACH ROW
BEGIN
    INSERT INTO Library_Log(TriggerName, Operation, EventTime,
        UserHost, Info)
    VALUES('trg_after_delete_library', 'DELETE', NOW(), USER(),
        CONCAT('Deleted BookID: ', OLD.BookID));
END $$
```

4) TEST TRIGGERS

UPDATE A RECORD:

```
UPDATE Library SET Title = 'The Great Gatsby (Updated)' WHERE BookID = 1;
```

DELETE A RECORD:

```
DELETE FROM Library WHERE BookID = 3;
```

```
SELECT * FROM Library;
```

BookID	Title	Author	PublishedYear	Genre
1	The Great Gatsby (Updated)	F. Scott Fitzgerald	1925	Fiction
2	To Kill a Mockingbird	Harper Lee	1960	Fiction

```
SELECT * FROM Library_Audit;
```

AuditID	BookID	Title	Author	PublishedYear	Genre	Operation	OperationTime
1	1	The Great Gatsby	F. Scott Fitzgerald	1925	Fiction	UPDATE	2025-09-25 10:39:29
2	3	1984	George Orwell	1949	Dystopian	DELETE	2025-09-25 10:40:05

```
SELECT * FROM Library_Log;
```

LogID	TriggerName	Operation	EventTime	UserHost	Info
1	trg_after_update_library	UPDATE	2025-09-25 10:39:29	te31446@10.10.13.45	Updated BookID: 1
2	trg_after_delete_library	DELETE	2025-09-25 10:40:05	te31446@10.10.13.45	Deleted BookID: 3