**ASSIGNMENT NO : 8**

**----------------------------------------------------------------------------------------**

**PROBLEM STATEMENTS:** DATABASE TRIGGER (AN TYPES:ROW LEVEL AND STATEMENT LEVEL TRIGGER,BEFORE AND AFTER TRIGGER). 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 BE LIBRARY\_AUDIT TABLE.

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\***

mysql> CREATE DATABASE LIBRARY;

Query OK, 1 row affected (0.00 sec)

mysql> USE LIBRARY;

Database changed

mysql> CREATE TABLE BORROWER(ROLLNO INT(10),NAME VARCHAR(11),DATEOFISSUE DATE,NAMEOFBOOK VARCHAR(10),STATUS CHAR(10));

Query OK, 0 rows affected (0.09 sec)

mysql> DESC BORROWER;

+-------------+-------------+------+-----+---------+-------+

| Field | Type | Null | Key | Default | Extra |

+-------------+-------------+------+-----+---------+-------+

| ROLLNO | int(10) | YES | | NULL | |

| NAME | varchar(11) | YES | | NULL | |

| DATEOFISSUE | date | YES | | NULL | |

| NAMEOFBOOK | varchar(10) | YES | | NULL | |

| STATUS | char(10) | YES | | NULL | |

+-------------+-------------+------+-----+---------+-------+

5 rows in set (0.00 sec)

mysql> INSERT INTO BORROWER(ROLLNO,NAME,DATEOFISSUE,NAMEOFBOOK,STATUS)

-> VALUES

-> ('101','RAM','2017-06-17','DBMS','R'),

-> ('102','SHAM','2017-07-20','ISEE','I'),

-> ('103','SITA','2017-07-15','SE','R'),

-> ('104','MITA','2017-08-26','TOC','I');

Query OK, 4 rows affected (0.05 sec)

Records: 4 Duplicates: 0 Warnings: 0

mysql> SELECT \*FROM BORROWER;

+--------+------+-------------+------------+--------+

| ROLLNO | NAME | DATEOFISSUE | NAMEOFBOOK | STATUS |

+--------+------+-------------+------------+--------+

| 101 | RAM | 2017-06-17 | DBMS | R |

| 102 | SHAM | 2017-07-20 | ISEE | I |

| 103 | SITA | 2017-07-15 | SE | R |

| 104 | MITA | 2017-08-26 | TOC | I |

+--------+------+-------------+------------+--------+

4 rows in set (0.00 sec)

mysql> CREATE TABLE LIBRARY\_AUDIT(ROLLNO INT(10) PRIMARY KEY,NAME VARCHAR(10),DATEOFISSUE DATE,NAMEOFBOOK VARCHAR(10),STATUS CHAR(2),TS TIMESTAMP);

Query OK, 0 rows affected (0.10 sec)

mysql> DESC LIBRARY\_AUDIT;

+-------------+-------------+------+-----+-------------------+-----------------------------+

| Field | Type | Null | Key | Default | Extra |

+-------------+-------------+------+-----+-------------------+-----------------------------+

| ROLLNO | int(10) | PRI | | NULL | |

| NAME | varchar(10) | YES | | NULL | |

| DATEOFISSUE | date | YES | | NULL | |

| NAMEOFBOOK | varchar(10) | YES | | NULL | |

| STATUS | char(2) | YES | | NULL | |

| TS | timestamp | NO | | CURRENT\_TIMESTAMP | on update CURRENT\_TIMESTAMP |

+-------------+-------------+------+-----+-------------------+-----------------------------+

6 rows in set (0.00 sec)

mysql> DELIMITER //

mysql> CREATE TRIGGER AFTER\_TRIGGER AFTER INSERT ON BORROWER FOR EACH ROW

BEGIN

INSERT INTO LIBRARY\_AUDIT VALUES(NEW.ROLLNO,NEW.NAME,NEW.DATEOFISSUE,NEW.NAMEOFBOOK,NEW.STATUS,CURRENT\_TIMESTAMP);

END; //

Query OK, 0 rows affected (0.11 sec)

mysql> SELECT \*FROM LIBRARY\_AUDIT; //

Empty set (0.00 sec)

mysql> INSERT INTO BORROWER VALUES('106','GITA','2017-08-27','DBMS','I'); //

Query OK, 1 row affected (0.03 sec)

mysql> SELECT \*FROM BORROWER; //

+--------+------+-------------+------------+--------+

| ROLLNO | NAME | DATEOFISSUE | NAMEOFBOOK | STATUS |

+--------+------+-------------+------------+--------+

| 101 | RAM | 2017-06-17 | DBMS | R |

| 102 | SHAM | 2017-07-20 | ISEE | I |

| 103 | SITA | 2017-07-15 | SE | R |

| 104 | MITA | 2017-08-26 | TOC | I |

| 106 | GITA | 2017-08-27 | DBMS | I |

+--------+------+-------------+------------+--------+

5 rows in set (0.00 sec)

mysql> SELECT \*FROM LIBRARY\_AUDIT; //

+--------+------+-------------+------------+--------+---------------------+

| ROLLNO | NAME | DATEOFISSUE | NAMEOFBOOK | STATUS | TS |

+--------+------+-------------+------------+--------+---------------------+

| 106 | GITA | 2017-08-27 | DBMS | I | 2017-09-07 19:37:32 |

+--------+------+-------------+------------+--------+---------------------+

1 row in set (0.00 sec)

mysql> CREATE TRIGGER AFTER\_DELETE AFTER DELETE ON BORROWER FOR EACH ROW

BEGIN

INSERT INTO LIBRARY\_AUDIT VALUES(OLD.ROLLNO,OLD.NAME,OLD.DATEOFISSUE,OLD.NAMEOFBOOK,OLD.STATUS,CURRENT\_TIMESTAMP);

END; //

Query OK, 0 rows affected (0.07 sec)

mysql> DELETE FROM BORROWER WHERE ROLLNO=104; //

Query OK, 1 row affected (0.05 sec)

mysql> SELECT \*FROM LIBRARY\_AUDIT; //

+--------+------+-------------+------------+--------+---------------------+

| ROLLNO | NAME | DATEOFISSUE | NAMEOFBOOK | STATUS | TS |

+--------+------+-------------+------------+--------+---------------------+

| 106 | GITA | 2017-08-27 | DBMS | I | 2017-09-07 19:37:32 |

| 104 | MITA | 2017-08-26 | TOC | I | 2017-09-07 19:43:39 |

+--------+------+-------------+------------+--------+---------------------+

2 rows in set (0.01 sec)

mysql> CREATE TRIGGER AFTER\_UPDATE AFTER UPDATE ON BORROWER FOR EACH ROW

BEGIN

INSERT INTO LIBRARY\_AUDIT VALUES(NEW.ROLLNO,NEW.NAME,NEW.DATEOFISSUE,NEW.NAMEOFBOOK,NEW.STATUS,CURRENT\_TIMESTAMP);

END; //

Query OK, 0 rows affected (0.12 sec)

mysql> UPDATE BORROWER SET STATUS='R' WHERE BORROWER.ROLLNO='102'; //

Query OK, 1 row affected (0.07 sec)

Rows matched: 1 Changed: 1 Warnings: 0

mysql> SELECT \*FROM LIBRARY\_AUDIT; //

+--------+------+-------------+------------+--------+---------------------+

| ROLLNO | NAME | DATEOFISSUE | NAMEOFBOOK | STATUS | TS |

+--------+------+-------------+------------+--------+---------------------+

| 106 | GITA | 2017-08-27 | DBMS | I | 2017-09-07 19:37:32 |

| 104 | MITA | 2017-08-26 | TOC | I | 2017-09-07 19:43:39 |

| 102 | SHAM | 2017-07-20 | ISEE | R | 2017-09-07 19:47:03 |

+--------+------+-------------+------------+--------+---------------------+

3 rows in set (0.00 sec)

mysql> DELIMITER //

mysql> CREATE TRIGGER BEFORE\_INSERT BEFORE INSERT ON BORROWER FOR EACH ROW

BEGIN

INSERT INTO LIBRARY\_AUDIT VALUES(NEW.ROLLNO,NEW.NAME,NEW.DATEOFISSUE,NEW.NAMEOFBOOK,NEW.STATUS,CURRENT\_TIMESTAMP);

END; //

Query OK, 0 rows affected (0.11 sec)

mysql> INSERT INTO BORROWER VALUES('107','DEV','2017--09-17','TOC','R'); //

Query OK, 1 row affected (0.10 sec)

mysql> SELECT \*FROM BORROWER; //

+--------+------+-------------+------------+--------+

| ROLLNO | NAME | DATEOFISSUE | NAMEOFBOOK | STATUS |

+--------+------+-------------+------------+--------+

| 101 | RAM | 2017-06-17 | DBMS | R |

| 102 | SHAM | 2017-07-20 | ISEE | R |

| 103 | SITA | 2017-07-15 | SE | R |

| 106 | GITA | 2017-08-27 | DBMS | I |

| 107 | DEV | 2017-09-17 | TOC | R |

+--------+------+-------------+------------+--------+

5 rows in set (0.00 sec)

mysql> SELECT \*FROM LIBRARY\_AUDIT; //

+--------+------+-------------+------------+--------+---------------------+

| ROLLNO | NAME | DATEOFISSUE | NAMEOFBOOK | STATUS | TS |

+--------+------+-------------+------------+--------+---------------------+

| 106 | GITA | 2017-08-27 | DBMS | I | 2017-09-07 19:37:32 |

| 104 | MITA | 2017-08-26 | TOC | I | 2017-09-07 19:43:39 |

| 102 | SHAM | 2017-07-20 | ISEE | R | 2017-09-07 19:47:03 |

| 107 | DEV | 2017-09-17 | TOC | R | 2017-09-07 19:48:16 |

| 107 | DEV | 2017-09-17 | TOC | R | 2017-09-07 19:48:16 |

+--------+------+-------------+------------+--------+---------------------+

5 rows in set (0.00 sec)

mysql> CREATE TRIGGER BEFORE\_DELETE BEFORE DELETE ON BORROWER FOR EACH ROW

BEGIN

INSERT INTO LIBRARY\_AUDIT VALUES(OLD.ROLLNO,OLD.NAME,OLD.DATEOFISSUE,OLD.NAMEOFBOOK,OLD.STATUS,CURRENT\_TIMESTAMP);

END; //

Query OK, 0 rows affected (0.08 sec)

mysql> DELETE FROM BORROWER WHERE ROLLNO=103; //

Query OK, 1 row affected (0.05 sec)

mysql> SELECT \*FROM BORROWER; //

+--------+------+-------------+------------+--------+

| ROLLNO | NAME | DATEOFISSUE | NAMEOFBOOK | STATUS |

+--------+------+-------------+------------+--------+

| 101 | RAM | 2017-06-17 | DBMS | R |

| 102 | SHAM | 2017-07-20 | ISEE | R |

| 106 | GITA | 2017-08-27 | DBMS | I |

| 107 | DEV | 2017-09-17 | TOC | R |

+--------+------+-------------+------------+--------+

4 rows in set (0.00 sec)

mysql> SELECT \*FROM LIBRARY\_AUDIT; //

+--------+------+-------------+------------+--------+---------------------+

| ROLLNO | NAME | DATEOFISSUE | NAMEOFBOOK | STATUS | TS |

+--------+------+-------------+------------+--------+---------------------+

| 106 | GITA | 2017-08-27 | DBMS | I | 2017-09-07 19:37:32 |

| 104 | MITA | 2017-08-26 | TOC | I | 2017-09-07 19:43:39 |

| 102 | SHAM | 2017-07-20 | ISEE | R | 2017-09-07 19:47:03 |

| 107 | DEV | 2017-09-17 | TOC | R | 2017-09-07 19:48:16 |

| 107 | DEV | 2017-09-17 | TOC | R | 2017-09-07 19:48:16 |

| 103 | SITA | 2017-07-15 | SE | R | 2017-09-07 19:51:03 |

| 103 | SITA | 2017-07-15 | SE | R | 2017-09-07 19:51:03 |

+--------+------+-------------+------------+--------+---------------------+

7 rows in set (0.00 sec)

mysql> CREATE TRIGGER BEFORE\_UPDATE BEFORE UPDATE ON BORROWER FOR EACH ROW

BEGIN

INSERT INTO LIBRARY\_AUDIT VALUES(NEW.ROLLNO,NEW.NAME,NEW.DATEOFISSUE,NEW.NAMEOFBOOK,NEW.STATUS,CURRENT\_TIMESTAMP);

END; //

Query OK, 0 rows affected (0.07 sec)

mysql> UPDATE BORROWER SET STATUS='R' WHERE BORROWER.ROLLNO='106'; //

Query OK, 1 row affected (0.04 sec)

Rows matched: 1 Changed: 1 Warnings: 0

mysql> SELECT \*FROM BORROWER; //

+--------+------+-------------+------------+--------+

| ROLLNO | NAME | DATEOFISSUE | NAMEOFBOOK | STATUS |

+--------+------+-------------+------------+--------+

| 101 | RAM | 2017-06-17 | DBMS | R |

| 102 | SHAM | 2017-07-20 | ISEE | R |

| 106 | GITA | 2017-08-27 | DBMS | R |

| 107 | DEV | 2017-09-17 | TOC | R |

+--------+------+-------------+------------+--------+

4 rows in set (0.00 sec)

mysql> SELECT \*FROM LIBRARY\_AUDIT; //

+--------+------+-------------+------------+--------+---------------------+

| ROLLNO | NAME | DATEOFISSUE | NAMEOFBOOK | STATUS | TS |

+--------+------+-------------+------------+--------+---------------------+

| 106 | GITA | 2017-08-27 | DBMS | I | 2017-09-07 19:37:32 |

| 104 | MITA | 2017-08-26 | TOC | I | 2017-09-07 19:43:39 |

| 102 | SHAM | 2017-07-20 | ISEE | R | 2017-09-07 19:47:03 |

| 107 | DEV | 2017-09-17 | TOC | R | 2017-09-07 19:48:16 |

| 107 | DEV | 2017-09-17 | TOC | R | 2017-09-07 19:48:16 |

| 103 | SITA | 2017-07-15 | SE | R | 2017-09-07 19:51:03 |

| 103 | SITA | 2017-07-15 | SE | R | 2017-09-07 19:51:03 |

| 106 | GITA | 2017-08-27 | DBMS | R | 2017-09-07 19:53:25 |

| 106 | GITA | 2017-08-27 | DBMS | R | 2017-09-07 19:53:25 |

+--------+------+-------------+------------+--------+---------------------+

9 rows in set (0.00 sec)

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