Name – **Ravindra Dayaram Bagul**
Roll No - C31105
Batch – T1

Output:

1.Records into the table Library.

```
mysql> create Table Library(B_id int,Title varchar(90),Edition varchar(30),no_of_copies int);
Query OK, 0 rows affected (0.03 sec)

mysql> desc Library;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| B_id         | int         | YES  |     | NULL    |       |
| Title        | varchar(90) | YES  |     | NULL    |       |
| Edition      | varchar(30) | YES  |     | NULL    |       |
| no_of_copies | int         | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)

mysql> Insert into Library values(1,'Wings of Fire','2',5),(2,'Call of Forest','5',5),
       (3,'The Magic Trees','3',5);
Query OK, 3 rows affected (0.01 sec)
Records: 3  Duplicates: 0  Warnings: 0

mysql> select * from Library;
+------+-----------------+---------+--------------+
| B_id | Title           | Edition | no_of_copies |
+------+-----------------+---------+--------------+
|    1 | Wings of Fire   | 2       |            5 |
|    2 | Call of Forest  | 5       |            5 |
|    3 | The Magic Trees | 3       |            5 |
+------+-----------------+---------+--------------+
3 rows in set (0.00 sec)
```

2.Table library_audit.

```
mysql> create table Library_audit(B_id int,Title varchar(90),Edition varchar(30),
       no_of_copies int,date_of_mod date,Operation varchar(30),user varchar(50));
Query OK, 0 rows affected (0.03 sec)

mysql> desc Library_audit;
+--------------+-------------+------+-----+---------+-------+
| Field        | Type        | Null | Key | Default | Extra |
+--------------+-------------+------+-----+---------+-------+
| B_id         | int         | YES  |     | NULL    |       |
| Title        | varchar(90) | YES  |     | NULL    |       |
| Edition      | varchar(30) | YES  |     | NULL    |       |
| no_of_copies | int         | YES  |     | NULL    |       |
| date_of_mod  | date        | YES  |     | NULL    |       |
| Operation    | varchar(30) | YES  |     | NULL    |       |
| user         | varchar(50) | YES  |     | NULL    |       |
+--------------+-------------+------+-----+---------+-------+
7 rows in set (0.00 sec)
```

3.Transaction Table.

```
mysql> create table Transaction(Transaction_id int,B_id int,S_id int,
       Status varchar(10),irno_of_copies int,ir_date date);
Query OK, 0 rows affected (0.03 sec)

mysql> desc Transaction;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| Transaction_id | int         | YES  |     | NULL    |       |
| B_id           | int         | YES  |     | NULL    |       |
| S_id           | int         | YES  |     | NULL    |       |
| Status         | varchar(10) | YES  |     | NULL    |       |
| irno_of_copies | int         | YES  |     | NULL    |       |
| ir_date        | date        | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
6 rows in set (0.00 sec)

mysql> alter table Transaction add primary key(Transaction_id);
Query OK, 0 rows affected (0.07 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

```
mysql> desc Transaction;
+----------------+-------------+------+-----+---------+-------+
| Field          | Type        | Null | Key | Default | Extra |
+----------------+-------------+------+-----+---------+-------+
| Transaction_id | int         | NO   | PRI | NULL    |       |
| B_id           | int         | YES  |     | NULL    |       |
| S_id           | int         | YES  |     | NULL    |       |
| Status         | varchar(10) | YES  |     | NULL    |       |
| irno_of_copies | int         | YES  |     | NULL    |       |
| ir_date        | date        | YES  |     | NULL    |       |
+----------------+-------------+------+-----+---------+-------+
6 rows in set (0.00 sec)

mysql> alter table Transaction modify Transaction_id int Auto_Increment;
Query OK, 0 rows affected (0.05 sec)
Records: 0  Duplicates: 0  Warnings: 0
```

4.Triggers

(i)Trigger for update.

```
mysql> delimiter //
mysql> create trigger tri_update
    -> Before Update
    -> On Library
    -> For Each Row
    -> BEGIN
    -> insert into Library_audit values(old.B_id,old.Title,old.Edition,
       old.no_of_copies,current_date(),'Update',Current_User());
    -> END; //
Query OK, 0 rows affected (0.04 sec)
```

(ii)Trigger for delete

```
mysql> create trigger tri_delete
    -> Before Delete
    -> On Library
    -> For Each Row
    -> BEGIN
    -> insert into Library_audit values(old.B_id,old.Title,old.Edition,
       old.no_of_copies,current_date(),'Delete',Current_User());
    -> END; //
Query OK, 0 rows affected (0.01 sec)

mysql> delimiter ;
```

(iii)Triggers for Number of Copies.

```
mysql> delimiter //
mysql> create trigger tri_copies
    -> Before Insert
    -> On Transaction
    -> For Each Row
    -> Begin
    -> Declare copies int;
    -> select no_of_copies into copies from Library where B_id=New.B_id;
    -> If New.Status='I' and New.irno_of_copies > copies Then set
       New.irno_of_copies=copies;
    -> End If;
    -> End; //
Query OK, 0 rows affected (0.01 sec)

mysql> Delimiter ;
```

(iv)Trigger for updating number of copies.

```
mysql> create trigger tri_update_copies
    -> After Insert
    -> on Transaction
    -> For Each Row
    -> Begin
    -> Declare copies int;
    -> select no_of_copies into copies from Library where B_id=New.B_id;
    -> If New.Status='I' Then update Library
       set no_of_copies=(copies-New.irno_of_copies)
       where B_id=New.B_id;
    -> Else update Library set no_of_copies=(copies+New.irno_of_copies)
       where B_id=New.B_id;
    -> End If;
    -> End; //
Query OK, 0 rows affected (0.01 sec)
```

4.Issuing 3 books of Wings of Fire.

```
mysql> Insert into Transaction (B_id,S_id,Status,irno_of_copies,ir_date)
       values(1,23,'I',3,Current_Date());
Query OK, 1 row affected (0.03 sec)

mysql> select * from Transaction;
+----------------+------+------+--------+----------------+------------+
| Transaction_id | B_id | S_id | Status | irno_of_copies | ir_date    |
+----------------+------+------+--------+----------------+------------+
|              1 |    1 |   23 | I      |              3 | 2023-09-22 |
+----------------+------+------+--------+----------------+------------+
1 row in set (0.00 sec)

mysql> select * from Library;
+------+----------------+---------+-------------+
| B_id | Title          | Edition | no_of_copies |
+------+----------------+---------+-------------+
|    1 | Wings of Fire  | 2       |           2 |
|    2 | Call of Forest | 5       |           5 |
|    3 | The Magic Trees | 3      |           5 |
+------+----------------+---------+-------------+
3 rows in set (0.00 sec)

mysql> select * from Library_audit;
+------+---------------+---------+--------------+-------------+-----------+----------------+
| B_id | Title         | Edition | no_of_copies | date_of_mod | Operation | user           |
+------+---------------+---------+--------------+-------------+-----------+----------------+
|    1 | Wings of Fire | 2       |            5 | 2023-09-22  | Update    | root@localhost |
+------+---------------+---------+--------------+-------------+-----------+----------------+
1 row in set (0.00 sec)
```

5.Issuing 6 books of Call of Forest.

```
mysql> Insert into Transaction (B_id,S_id,Status,irno_of_copies,ir_date)
values(2,43,'I',6,Current_Date());
Query OK, 1 row affected (0.03 sec)

mysql> select * from Transaction;
+----------------+------+------+--------+----------------+------------+
| Transaction_id | B_id | S_id | Status | irno_of_copies | ir_date    |
+----------------+------+------+--------+----------------+------------+
|              1 |    1 |   23 | I      |              3 | 2023-09-22 |
|              2 |    2 |   43 | I      |              5 | 2023-09-22 |
+----------------+------+------+--------+----------------+------------+
2 rows in set (0.00 sec)

mysql> select * from Library;
+------+----------------+---------+-------------+
| B_id | Title          | Edition | no_of_copies |
+------+----------------+---------+-------------+
|    1 | Wings of Fire  | 2       |           2 |
|    2 | Call of Forest | 5       |           0 |
|    3 | The Magic Trees | 3      |           5 |
+------+----------------+---------+-------------+
3 rows in set (0.00 sec)

mysql> select * from Library_audit;
+------+----------------+---------+--------------+-------------+-----------+----------------+
| B_id | Title          | Edition | no_of_copies | date_of_mod | Operation | user           |
+------+----------------+---------+--------------+-------------+-----------+----------------+
|    1 | Wings of Fire  | 2       |            5 | 2023-09-22  | Update    | root@localhost |
|    2 | Call of Forest | 5       |            5 | 2023-09-22  | Update    | root@localhost |
+------+----------------+---------+--------------+-------------+-----------+----------------+
2 rows in set (0.00 sec)
```

6.Returning 3 copies of Wings of Fire.

```
mysql> Insert into Transaction (B_id,S_id,Status,irno_of_copies,ir_date)
       values(1,23,'R',3,'2023-09-28');
Query OK, 1 row affected (0.01 sec)

mysql> select * from Transaction;
+----------------+------+------+--------+----------------+------------+
| Transaction_id | B_id | S_id | Status | irno_of_copies | ir_date    |
+----------------+------+------+--------+----------------+------------+
|              1 |    1 |   23 | I      |              3 | 2023-09-22 |
|              2 |    2 |   43 | I      |              5 | 2023-09-22 |
|              3 |    1 |   23 | R      |              3 | 2023-09-28 |
+----------------+------+------+--------+----------------+------------+
3 rows in set (0.00 sec)
```

```
mysql> select * from Library;
+------+---------------+---------+--------------+
| B_id | Title         | Edition | no_of_copies |
+------+---------------+---------+--------------+
|    1 | Wings of Fire | 2       |            5 |
|    2 | Call of Forest | 5      |            0 |
|    3 | The Magic Trees | 3     |            5 |
+------+---------------+---------+--------------+
3 rows in set (0.00 sec)

mysql> select * from Library_audit;
+------+---------------+---------+--------------+-------------+-----------+----------------+
| B_id | Title         | Edition | no_of_copies | date_of_mod | Operation | user           |
+------+---------------+---------+--------------+-------------+-----------+----------------+
|    1 | Wings of Fire | 2       |            5 | 2023-09-22  | Update    | root@localhost |
|    2 | Call of Forest | 5      |            5 | 2023-09-22  | Update    | root@localhost |
|    1 | Wings of Fire | 2       |            2 | 2023-09-22  | Update    | root@localhost |
+------+---------------+---------+--------------+-------------+-----------+----------------+
3 rows in set (0.00 sec)
```

7.Returning 3 copies of Call of Forest.

```
mysql> Insert into Transaction (B_id,S_id,Status,irno_of_copies,ir_date)
values(2,43,'R',3,'2023-09-28');
Query OK, 1 row affected (0.01 sec)

mysql> select * from Transaction;
+----------------+------+------+--------+----------------+------------+
| Transaction_id | B_id | S_id | Status | irno_of_copies | ir_date    |
+----------------+------+------+--------+----------------+------------+
|              1 |    1 |   23 | I      |              3 | 2023-09-22 |
|              2 |    2 |   43 | I      |              5 | 2023-09-22 |
|              3 |    1 |   23 | R      |              3 | 2023-09-28 |
|              4 |    2 |   43 | R      |              3 | 2023-09-28 |
+----------------+------+------+--------+----------------+------------+
4 rows in set (0.00 sec)

mysql> select * from Library;
+------+---------------+---------+--------------+
| B_id | Title         | Edition | no_of_copies |
+------+---------------+---------+--------------+
|    1 | Wings of Fire | 2       |            5 |
|    2 | Call of Forest | 5      |            3 |
|    3 | The Magic Trees | 3     |            5 |
+------+---------------+---------+--------------+
3 rows in set (0.00 sec)

mysql> select * from Library_audit;
+------+---------------+---------+--------------+-------------+-----------+----------------+
| B_id | Title         | Edition | no_of_copies | date_of_mod | Operation | user           |
+------+---------------+---------+--------------+-------------+-----------+----------------+
|    1 | Wings of Fire | 2       |            5 | 2023-09-22  | Update    | root@localhost |
|    2 | Call of Forest | 5      |            5 | 2023-09-22  | Update    | root@localhost |
|    1 | Wings of Fire | 2       |            2 | 2023-09-22  | Update    | root@localhost |
|    2 | Call of Forest | 5      |            0 | 2023-09-22  | Update    | root@localhost |
+------+---------------+---------+--------------+-------------+-----------+----------------+
4 rows in set (0.00 sec)
```

8.Deleting the book The Magic of the Trees.

```
mysql> Delete from Library where B_id=3;
Query OK, 1 row affected (0.01 sec)

mysql> select * from Library;
+------+---------------+---------+--------------+
| B_id | Title         | Edition | no_of_copies |
+------+---------------+---------+--------------+
|    1 | Wings of Fire | 2       |            5 |
|    2 | Call of Forest | 5      |            3 |
+------+---------------+---------+--------------+
2 rows in set (0.00 sec)

mysql> select * from Library_audit;
+------+---------------+---------+--------------+-------------+-----------+----------------+
| B_id | Title         | Edition | no_of_copies | date_of_mod | Operation | user           |
+------+---------------+---------+--------------+-------------+-----------+----------------+
|    1 | Wings of Fire | 2       |            5 | 2023-09-22  | Update    | root@localhost |
|    2 | Call of Forest | 5      |            5 | 2023-09-22  | Update    | root@localhost |
|    1 | Wings of Fire | 2       |            2 | 2023-09-22  | Update    | root@localhost |
|    2 | Call of Forest | 5      |            0 | 2023-09-22  | Update    | root@localhost |
|    3 | The Magic Trees | 3     |            5 | 2023-09-22  | Delete    | root@localhost |
+------+---------------+---------+--------------+-------------+-----------+----------------+
5 rows in set (0.00 sec)
```