



DATABASE LAB 2



ID	NAME
43	OMAR SHAWKY ABDELSALAM ABDELAAL

1- Login to MySQL workbench and implement the given schema on MySQL using suitable DDL statements.

```
create table BOOK_AUTHORS (  
    Book_id int,  
    Author_name varchar(255) NOT NULL,  
    foreign key (Book_id) REFERENCES Book(Book_id),  
    PRIMARY KEY (Author_name,Book_id)  
);  
  
create table LIBRARY_BRANCH (  
    Branch_id int not null,  
    Branch_name varchar(255),  
    Address varchar(255),  
    PRIMARY KEY (Branch_id)  
);  
  
create table BORROWER (  
    Card_no int not null,  
    Name varchar(255),  
    Address varchar(255),  
    Phone int,  
    PRIMARY KEY (Card_no)  
);  
  
drop schema if exists LIBRARY ;  
/* First Requirement */  
  
create schema LIBRARY ;  
use LIBRARY ;  
  
create table PUBLISHER (  
    Phone int,  
    Name varchar(255) NOT NULL,  
    Address varchar(255),  
    PRIMARY KEY (Name)  
);  
  
create table Book (  
    Book_id int NOT NULL,  
    Title varchar(255),  
    Publisher_name varchar(255),  
    PRIMARY KEY (Book_id),  
    foreign key (Publisher_name) REFERENCES PUBLISHER(Name)  
);  
  
create table BOOK_LOANS (  
    Book_id int,  
    Branch_id int,  
    Card_no int,  
    Date_out date,  
    Due_date date,  
    foreign key (Book_id) REFERENCES Book(Book_id),  
    foreign key (Branch_id) REFERENCES LIBRARY_BRANCH(Branch_id),  
    foreign key (Card_no) REFERENCES BORROWER(Card_no),  
    PRIMARY KEY (Card_no,Branch_id,Book_id)  
);
```

```

create table BOOK_COPIES (
    Book_id int ,
    Branch_id int ,
    No_of_copies int ,
    foreign key (Book_id) REFERENCES Book(Book_id),
    foreign key (Branch_id) REFERENCES LIBRARY_BRANCH(Branch_id),
    PRIMARY KEY (Branch_id,Book_id)
);

```

✓	7	17:05:49	drop schema if exists LIBRARY	2 row(s) affected
✓	8	17:05:50	create schema LIBRARY	1 row(s) affected
✓	9	17:05:50	use LIBRARY	0 row(s) affected
✓	10	17:05:50	create table PUBLISHER (Phone int, Name varchar(255) NOT NULL, Address varchar(255), PRIMA...	0 row(s) affected
✓	11	17:05:50	create table Book (Book_id int NOT NULL, Title varchar(255), Publisher_name varchar(255), PRIMA...	0 row(s) affected
✓	12	17:05:51	create table BOOK_AUTHORS (Book_id int, Author_name varchar(255) NOT NULL, foreign key (Book...	0 row(s) affected
✓	13	17:05:52	create table LIBRARY_BRANCH (Branch_id int not null, Branch_name varchar(255), Address varcha...	0 row(s) affected
✓	14	17:05:54	create table BORROWER (Card_no int not null, Name varchar(255), Address varchar(255), Phone int, PRI...	0 row(s) affected
✓	15	17:05:54	create table BOOK_LOANS (Book_id int, Branch_id int, Card_no int, Date_out date, Due_date dat...	0 row(s) affected
✓	16	17:05:56	create table BOOK_COPIES (Book_id int , Branch_id int , No_of_copies int , foreign key (Book_id) R...	0 row(s) affected

2- Try the INSERT, UPDATE and DELETE statements on the Publisher table

```
/* Second Requirment */
```

```

INSERT INTO publisher (Phone, Name, Address)
VALUES (5425670, 'omar shawky', 'London, 2nd floor');
select * from publisher ;
UPDATE publisher SET Address = 'London, 4th floor' WHERE name = 'omar shawky';
select * from publisher ;
DELETE FROM publisher WHERE name = 'omar shawky';
select * from publisher ;

```

Phone	Name	Address
5425670	omar shawky	London, 2nd floor

#	Time	Action	Message
✓ 38	17:08:14	create table BOOK_LOANS (Book_id int, Branch_id int, Card_no int, Date_out date, Due_date dat...	0 row(s) affected
✓ 39	17:08:15	create table BOOK_COPIES (Book_id int, Branch_id int, No_of_copies int, foreign key (Book_id) R...	0 row(s) affected
✓ 40	17:08:15	INSERT INTO publisher (Phone, Name, Address) VALUES (5425670, 'omar shawky', 'London, 2nd floor)	1 row(s) affected
✓ 41	17:08:16	select * from publisher LIMIT 0, 1000	1 row(s) returned

Phone	Name	Address
5425670	omar shawky	London, 4th floor

#	Time	Action	Message
52	17:09:47	INSERT INTO publisher (Phone, Name, Address) VALUES (5425670, 'omar shawky', 'London, 2nd floor')	1 row(s) affected
53	17:09:47	select * from publisher LIMIT 0, 1000	1 row(s) returned
54	17:09:47	UPDATE publisher SET Address = 'London, 4th floor' WHERE name = 'omar shawky'	1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0
55	17:09:47	select * from publisher LIMIT 0, 1000	1 row(s) returned

Phone	Name	Address
HULL	HULL	HULL

#	Time	Action	Message
68	17:10:29	UPDATE publisher SET Address = 'London, 4th floor' WHERE name = 'omar shawky'	1 row(s) affected Row
69	17:10:30	select * from publisher LIMIT 0, 1000	1 row(s) returned
70	17:10:30	DELETE FROM publisher WHERE name = 'omar shawky'	1 row(s) affected
71	17:10:30	select * from publisher LIMIT 0, 1000	0 row(s) returned

3- Insert a row in the Book table that references a row in the Publisher table. Then try to update and delete the referenced row. Comment on the DBMS response regarding the referential integrity constraints specified in the DDL script.

```

/* Third requirement */
INSERT INTO publisher (Phone, Name, Address)
VALUES (5425670, 'omar shawky', 'London, 2nd floor');
INSERT INTO Book (Book_id, Title, Publisher_name)
VALUES (1, 'Book title', 'omar shawky');
select * from publisher ;
select * from book ;
UPDATE publisher SET Address = 'London, 4th floor' WHERE name = 'omar shawky';
UPDATE publisher SET name = 'mohaned ayman' WHERE name = 'omar shawky';
select * from publisher ;
DELETE FROM publisher WHERE name = 'omar shawky';

```

Comment:

- You can update the contents of referenced row on condition that you don't include any column that's being referenced as a foreign key in another table.
- You can't delete a row that contains a value being referenced as a foreign key in another table.

Result Grid

Phone	Name	Address
5425670	omar shawky	London, 2nd floor
NULL	NULL	NULL

publisher 15 × book 16

Output

Action Output

#	Time	Action	Message
72	17:13:12	INSERT INTO publisher (Phone, Name, Address) VALUES (5425670, 'omar shawky', 'London, 2nd floor')	1 row(s) affected
73	17:13:17	INSERT INTO Book (Book_id, Title, Publisher_name) VALUES (1, 'Book title', 'omar shawky')	1 row(s) affected
74	17:13:22	select * from publisher LIMIT 0, 1000	1 row(s) returned
75	17:13:27	select * from book LIMIT 0, 1000	1 row(s) returned

	Book_id	Title	Publisher_name
▶	1	Book title	omar shawky
•	NULL	NULL	NULL

publisher 15 book 16 ×

Result Grid

Phone	Name	Address
5425670	omar shawky	London, 4th floor
NULL	NULL	NULL

publisher 17 ×

Output

Action Output

#	Time	Action	Message
77	17:13:33	select * from book LIMIT 0, 1000	1 row(s) returned
78	17:18:37	UPDATE publisher SET Address = 'London, 4th floor' WHERE name = 'omar shawky'	1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0
79	17:18:47	select * from publisher LIMIT 0, 1000	1 row(s) returned

publisher 18 ×

Output

Action Output

#	Time	Action	Message
79	17:18:47	select * from publisher LIMIT 0, 1000	
80	17:19:43	UPDATE publisher SET name = 'mohaned ayman' WHERE name = 'omar shawky'	
81	17:19:46	select * from publisher LIMIT 0, 1000	

Result Grid			Filter Rows:	Edits:	Export/Import:	Wrap Cell Content:
Phone	Name	Address				
5425670	omar shawky	London, 4th floor				
NULL	NULL	NULL				

publisher 19 Apply Revert [Context Help](#)

Output

Action Output

#	Time	Action	Message
81	17:19:46	select * from publisher LIMIT 0, 1000	1 row(s) returned
82	17:27:46	DELETE FROM publisher WHERE name = 'omar shawky'	Error Code: 1451. Cannot delete or update a parent row: a foreign key constraint fails ('library'.book', CONST,
83	17:27:49	select * from publisher LIMIT 0, 1000	1 row(s) returned

4- Write SELECT statements to answer the queries of parts (a), (c), (e) and (g) of the problem.

a) How many copies of the book titled The Lost Tribe are owned by the library branch whose name is 'Sharpstown'?

```
SELECT No_of_copies
FROM Book
NATURAL JOIN (BOOK_COPIES NATURAL JOIN library_branch )
where branch_name = 'Sharpstown' and title = 'The Lost Tribe';
```

b) How many copies of the book titled The Lost Tribe are owned by each library branch?

```
select branch_id ,branch_name,no_of_copies
FROM Book NATURAL JOIN (BOOK_COPIES NATURAL JOIN library_branch )
where title = 'The Lost Tribe'
group by branch_id;
```

c) Retrieve the names of all borrowers who do not have any books checked out.

```
SELECT name FROM borrower WHERE NOT EXISTS (
    SELECT 1
    FROM (borrower NATURAL JOIN book_loans)
    WHERE borrower.card_no = book_loans.card_no
);
```


- d) For each book that is loaned out from the Sharpstown branch and whose Due_date is today, retrieve the book title, the borrower's name, and the borrower's address.

```
Select title,name,Address FROM (
  Select * from Book_loans
  NATURAL JOIN (select Branch_id,Branch_name,address as Branch_address from library_branch )
  where branch_name = 'Sharpstown' and due_date= CAST(CURRENT_TIMESTAMP () AS Date ) ) As R1
NATURAL JOIN (BOOK NATURAL JOIN borrower);
```

- e) For each library branch, retrieve the branch name and the total number of books loaned out from that branch.
- f) Retrieve the names, addresses, and number of books checked out for all borrowers who have more than five books checked out.
- g) For each book authored (or coauthored) by Stephen King, retrieve the title and the number of copies owned by the library branch whose name

```
SELECT branch_name,COUNT(book_id) as total_number_of_books
Select * from (
  SELECT name,address,COUNT(book_id) as total_number_of_books
  FROM (borrower natural join book_loans)
  GROUP BY card_no) as R1
where total_number_of_books >=5 ;
```

is Central.

```
(Select title , sum(no_of_copies) as total_number_of_copies
from ((library_branch natural join book_copies) natural join book_authors) natural join book
where author_name = 'Stephen King' and branch_name = 'Central'
group by book_id )
union
#co-authored == publisher
(Select title , sum(no_of_copies) as total_number_of_copies
from (select name as publisher_name,address as publisher_address,phone from publisher) as publisher
natural join (book natural join (library_branch natural join book_copies))
where publisher_name = 'Stephen King' and branch_name = 'Central'
group by book_id );
```