Database Lab 2

عمر اشرف قطب محمد 18011111

أحمد طارق محمد أحمد 18010147

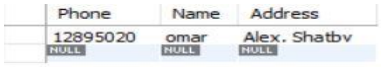
1- Login to MySQL workbench and implement the given schema on MySQL using suitable DDL statements

```
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
);

create table BOOK_AUTHORS (
    Book_id int,
    Author_name varchar(255) NOT NULL,
    foreign key (Book_id) REFERENCES Book(Bc
    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)
);
create table BOOK_LOANS (
    Book_id int,
    Branch_id int,
    Card_no int,
```

```
41      Card_no int,
42      Date_out date,
43      Due_date date,
44      foreign key (Book_id) REFERENCES Book(Book_id),
45      foreign key (Branch_id) REFERENCES LIBRARY_BRANCH(Branch_id),
46      foreign key (Card_no) REFERENCES BORROWER(Card_no),
47      PRIMARY KEY (Card_no,Branch_id,Book_id)
48  );
49
50  create table BOOK_COPIES (
51      Book_id int ,
52      Branch_id int ,
53      No_of_copies int ,
54      foreign key (Book_id) REFERENCES Book(Book_id),
55      foreign key (Branch_id) REFERENCES LIBRARY_BRANCH(Branch_id),
56      PRIMARY KEY (Branch_id,Book_id)
57  );
```

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

```
58  INSERT INTO publisher (Phone, Name, Address)
59  VALUES (12895020, 'omar', 'Alex, Shatby');
60  select * from publisher ;
61  UPDATE publisher SET Address = 'Cairo' WHERE name = 'omar';
62  select * from publisher ;
63  DELETE FROM publisher WHERE  name = 'omar';
64  select * from publisher ;
```



Phone	Name	Address
12895020	omar	Alex. Shatbv
NULL	NULL	NULL

publisher 9 × | publisher 10 | publisher 11

Phone	Name	Address
12895020	omar	Cairo
NULL	NULL	NULL

publisher 9 | publisher 10 × | publisher 11

Phone	Name	Address
NULL	NULL	NULL

publisher 9 | publisher 10 | publisher 11 ×

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.

```
66 •  INSERT INTO publisher (Phone, Name, Address)
67    VALUES (5425670, 'omar', 'Alex, Shatby');
68 •  INSERT INTO Book (Book_id, Title, Publisher_name)
69    VALUES (1, 'Book', 'omar');
70 •  select * from publisher ;
71 •  select * from book ;
72 •  UPDATE publisher SET Address = 'Cairo' WHERE name = 'om
73 •  select * from publisher ;
74    #UPDATE publisher SET name = 'ahmed' WHERE name = 'omar
75 •  select * from publisher ;
76    #DELETE FROM publisher WHERE  name = 'omar';
77 •  select * from publisher ;
```

Comment:

Update: We can not change a tuple value if the attribute of this tuble is referenced as a foriegn key in another table.
Delete: We can not delete a row if the attribute of this tuble is referenced as a foriegn key in another table.

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

Insertion of Complete Data to get accurate results:

```
105     # Insert complete specific data to the Library schema to solve the question 4 accurately
106
107 •   INSERT INTO PUBLISHER VALUES (01113077857, 'ahmed', 'alexandria');
108 •   INSERT INTO PUBLISHER VALUES (01113077888, 'omar', 'cairo');
109 •   INSERT INTO PUBLISHER VALUES (01003077888, 'moaz', 'giza');
110 •   INSERT INTO BOOK VALUES (1, 'The Lost Tribe', 'ahmed');
111 •   INSERT INTO BOOK VALUES (2, 'kalila w demna', 'omar');
112 •   INSERT INTO BOOK VALUES (3, 'the art of giving shit' ,'moaz');
113 •   INSERT INTO BOOK_AUTHORS VALUES (1, 'Stephen King');
114 •   INSERT INTO BOOK_AUTHORS VALUES (2, 'Ahmed Mousa');
115 •   INSERT INTO BOOK_AUTHORS VALUES (3, 'Stephen King');
116 •   INSERT INTO LIBRARY_BRANCH VALUES (100, 'Central', 'cairo');
117 •   INSERT INTO LIBRARY_BRANCH VALUES (200, 'Sharpstown', 'paris');
118 •   INSERT INTO LIBRARY_BRANCH VALUES (300, 'Gleem', 'alexandria');
119 •   INSERT INTO BORROWER VALUES (1000, 'Messi', 'france', 01000000000);
120 •   INSERT INTO BORROWER VALUES (2000, 'Inesta', 'japan', 01111111111);
121 •   INSERT INTO BORROWER VALUES (3000, 'Xavi', 'spain', 01222222222);
122 •   INSERT INTO BORROWER VALUES (4000, 'Alves', 'spain', 01322222222);
123 •   INSERT INTO BORROWER VALUES (5000, 'Neymar', 'spain', 01422222222);
124 •   INSERT INTO BORROWER VALUES (6000, 'Pique', 'spain', 01522222222);
125 •   INSERT INTO BOOK_LOANS VALUES (1, 100, 1000, '2020-10-10', '2021-12-10');
126 •   INSERT INTO BOOK_LOANS VALUES (2, 200, 2000, '2020-10-10', '2021-12-10');
127 •   INSERT INTO BOOK_LOANS VALUES (3, 300, 3000, '2020-10-10', '2021-12-10');
128 •   INSERT INTO BOOK_COPIES VALUES (1, 100, 11);
129 •   INSERT INTO BOOK_COPIES VALUES (1, 200, 22);
130 •   INSERT INTO BOOK_COPIES VALUES (2, 200, 33);
131 •   INSERT INTO BOOK_COPIES VALUES (3, 300, 44);
```

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

```
#Q (a)
select No_of_copies from BOOK
join BOOK_COPIES ON BOOK.Book_id = BOOK_COPIES.Book_id
join LIBRARY_BRANCH ON LIBRARY_BRANCH.Branch_id = BOOK_COPIES.Branch_id
where Title = 'The Lost Tribe' AND Branch_name ='Sharpstown' ;
```

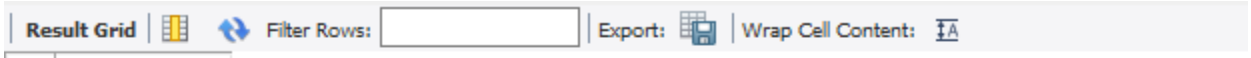
Result:

No_of_copies
22

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

```
142    SELECT borrowerName FROM Borrower as B
143        LEFT OUTER JOIN Book_Loans as BL
144         on B.Card_NO LIKE BL.Card_NO
145         WHERE BL.Card_NO is NULL;
146
```

Result:

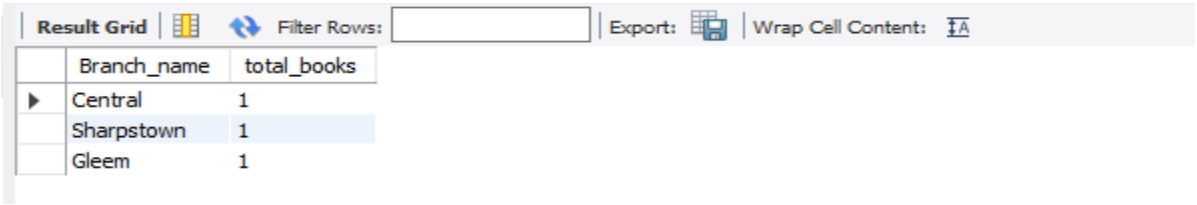


borrowerName
Alves
Neymar
Pique

e) For each library branch, retrieve the branch name and the total number of books loaned out from that branch.

```
85  #Q (e)
86  select Branch_name,count(Book_id) as total_books
87   from LIBRARY_BRANCH
88  join BOOK_LOANS on  LIBRARY_BRANCH.Branch_id = BOOK_LOANS.Branch_id
89  group by LIBRARY_BRANCH.Branch_id ;
90
```

Result:



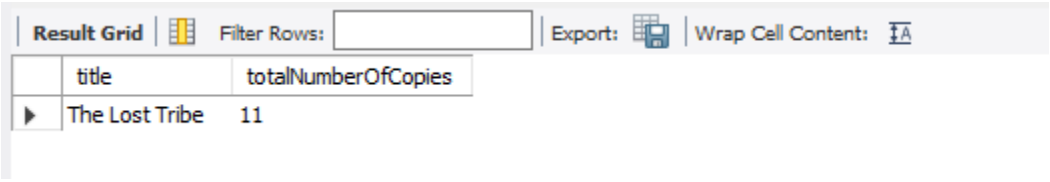
Result Grid | Filter Rows: | Export: | Wrap Cell Content:

Branch_name	total_books
Central	1
Sharpstown	1
Gleem	1

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 is Central.

```
156  (Select title , sum(no_of_copies) as totalNumberOfCopies
157  from ((library_branch natural join book_copies) natural join book_authors) natural join  book
158  where author_name = 'Stephen King' and branch_name = 'Central'
159  group by book_id)
160  UNION
161  (Select title , sum(no_of_copies) as totalNumberOfCopies
162  from (select name as publisher_name, address as publisher_address, phone from publisher) as publisher
163  natural join (book  natural join (library_branch natural join book_copies))
164  where publisher_name = 'Stephen King' and branch_name = 'Central'
165  group by book_id);
166
```

Result:



Result Grid | Filter Rows: | Export: | Wrap Cell Content:

title	totalNumberOfCopies
The Lost Tribe	11