

# The Lab Report

#### 1. The MySQL Code:

```
-- implementation of the Library schema using DDL statements.
5 •
       create schema Library;
       use Library;
6 •
7 • ⊖ Create Table Publisher (
8
       publisher_name Varchar(50) not null,
       address Varchar (100),
10
       phone int(13),
       Primary Key (publisher name)
11
12
13 • ⊖ create table Book(
       book id varchar(5) primary key not null,
15
       title varchar(100) not null,
       publisher_name_varchar(50),
17
       constraint fk foreign key(publisher_name) references Publisher(publisher_name) ON DELETE CASCADE ON UPDATE CASCADE
18
19
20 • Create Table BookAuthors (
21
       book id varchar(5) not null,
       auther_name Varchar(50) not null,
22
       Primary Key(book id, auther name),
23
       Constraint BookAuthorsFK Foreign Key (book_id) references Book (book_id) ON DELETE CASCADE ON UPDATE CASCADE
24
25
      );
26
27 • ⊝ Create Table LibraryBranch(
       branch_name Varchar (50) not null,
28
       branch id varchar(5) Primary Key not null,
29
        address varchar (100) not null
30
31
32
33 • ⊝ Create Table BookCopies (
       book_id varchar(5) not null,
34
       branch_id varchar(5) not null,
35
       no_of_copies int(6) default 0,
36
       Primary Key (book_id, branch_id),
37
       Constraint bookFK Foreign key card_no (book_id) references Book (book_id) ON DELETE CASCADE ON UPDATE RESTRICT,
38
39
       Constraint branchFK Foreign Key (branch_id) references LibraryBranch (branch_id)ON DELETE CASCADE ON UPDATE CASCADE
40
       );
41
42 • ○ Create Table Borrower (
43
       borrower_name varchar(50) not null,
       address varchar(100),
44
       phone varchar(12),
45
       card_no varchar(5) primary key not null
46
47
48
```

```
49 • ○ Create Table BookLoans (
50
       book_id varchar(5) not null,
51
       branch_id varchar(5) not null,
       card_no varchar(5) not null,
52
53
       date_out date not null,
54
       due_date date not null,
       primary key (book_id, branch_id, card_no),
55
       Constraint LoansBookFK Foreign Key (book_id) references Book(book_id) ON DELETE CASCADE ON UPDATE RESTRICT,
56
57
       Constraint LoansBranchFK Foreign Key (branch_id) references LibraryBranch(branch_id) ON DELETE CASCADE ON UPDATE RESTRICT,
       Constraint cardFK Foreign Key (card_no) references Borrower(card_no) ON DELETE RESTRICT ON UPDATE RESTRICT
58
59
       );
60
61
63
       -- a try of the INSERT, UPDATE and DELETE statements on the Publisher table.
64
       -- ----insert-----:
65
66 •
       insert into Publisher values
       ('ASMAA GAMAL', '21 the sea Street-Agami', '01124542122');
67
68
69 •
       insert into Publisher values
       ('ABO OBIEDA', '23 Sea Street Palastine','01015010473');
70
71
 72 •
        insert into Publisher values
        ('Occupaied Palastine', 'South West of Palastine', '01000000000');
 73
 74
        -- -----update----:
 75
 76 •
        UPDATE Publisher
 77
        SET publisher name = 'ASMAA GAMAL NAGY'
 78
        WHERE publisher name = 'ASMAA GAMAL';
        -- -----delete----:
 79
 80 •
        DELETE FROM Publisher
        WHERE publisher_name = 'Occupaied Palastine';
 81
 82
 83
        -- Insert a row in the Book table that references a row in the Publisher table.
 84
 85
        -- -----insert----:
 86
        insert into Book values('1A111', 'History of palastine', 'ABO OBIEDA');
 87 •
 88
        -- -----update----:
        UPDATE Publisher
 89 •
        SET publisher_name = 'ABO OBIEDA##'
 90
        WHERE publisher_name = 'ABO OBIEDA';
 91
 92
        -- -----delete----:
        DELETE FROM Publisher
 93 •
 94
        WHERE publisher_name = 'ABO OBIEDA##';
```

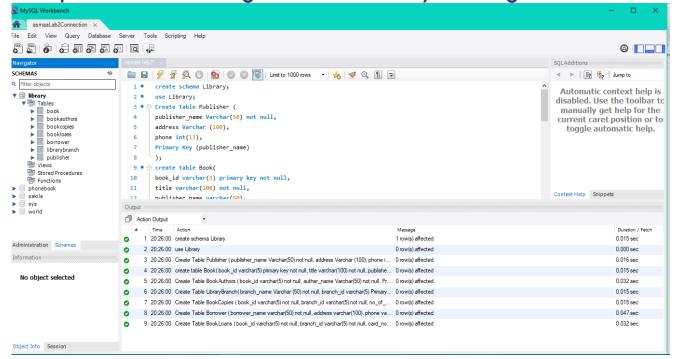
```
96
 97
        -- Inserting some random data into the library DB
 98
        ______
99 •
        insert into Borrower values
        ('Asmaa','12 St. Saad Zaghloul','01047332254','12345'),
100
101
        ('Gamal','26 St.Zaki Ragab Rogdi','01001701988','12346'),
        ('Abdel-Halem','33 St. Mohamed Ali','0113377521','12347'),
102
        ('Nagy','50 St. Salah EL-Din','01001234671','12348');
103
104
105 •
        insert into LibraryBranch values
        ('Sharpstown','15342', '11 Downing Street'),
106
        ('Central','91234', '45 Hude Park, NYC');
107
108
109 •
        insert into Publisher values
        ('Pearson', 'Palastine', 35778912);
110
111
112 •
        insert into Book values
        ('10921', 'The Lost Tribe', 'Pearson'),
113
114
        ('36243', 'Tail of Two Cities', 'Pearson'),
        ('34444', 'Oliver Twist', 'Pearson');
115
116
117 •
        insert into BookAuthors values
118
        ('10921', 'Naguib Mahfouz'),
        ('10921', 'Stephen King'),
119
        ('36243', 'Taha Hussein'),
120
121
         ('34444', 'Stephen King'),
         ('34444', 'Charles Dickens');
122
123
124 •
         insert into BookCopies values
125
         ('10921', '15342', 6),
         ('10921', '91234', 10),
126
         ('36243', '15342', 5),
127
128
         ('34444', '91234', 12);
129
         insert into BookLoans values
130 •
         ('10921','15342','12345',date'2023-01-01',date'2023-01-08'),
131
         ('36243','15342', '12348',date'2023-11-20',date'2023-11-28'),
132
         ('34444','91234','12347',date'2023-10-01',date'2023-10-13'),
133
         ('34444','15342','12347', date'2023-10-01',date'2023-10-17'),
134
135
         ('10921','91234','12347',date'2023-10-02',date'2023-10-16'),
136
         ('36243','15342','12347',date'2023-10-03',date'2023-10-15'),
137
         ('36243','91234','12347',date'2023-10-04', date'2023-10-14'),
         ('10921','15342','12347',date'2023-10-05',date'2023-10-13');
138
139
```

140

```
141
142
         -- ----answering the question after creating the dummy database----
143
144
         -- a):
145 •
         SELECT no_of_copies
         FROM (Book NATURAL JOIN BookCopies) NATURAL JOIN LibraryBranch
146
147
         WHERE title = 'The Lost Tribe' AND branch_name = 'Sharpstown';
148
149
         -- b):
150 •
         SELECT branch_name, no_of_copies
151
         FROM (Book NATURAL JOIN BookCopies) NATURAL JOIN LibraryBranch
152
         WHERE title = 'The Lost Tribe';
153
154
         -- c):
155 •
         SELECT borrower_name
156
         FROM Borrower AS Bname
157
      FROM BookLoans AS Loans
158
159
         WHERE Bname.card_no = Loans.card_no);
160
         -- d):
161
162 •
         SELECT title, borrower_name, Borrower.address
         FROM ((Book NATURAL JOIN BookLoans) NATURAL JOIN LibraryBranch)
163
         JOIN Borrower ON BookLoans.Card_no = Borrower.Card_no
164
165
        WHERE Branch name = 'Sharpstown' AND Due date = '2023-11-28';
166
167
        -- e):
        Select branch_name, branch_id, count(*) as total_loaned_books
168 •
        from LibraryBranch natural join BookLoans
169
        group by branch id;
170
171
172
        -- f):
173 •
        select borrower name, address, count(*) as total Checked out books
174
        from Borrower natural join BookLoans
175
        group by Card no
176
        having count(*) > 5;
177
178
179
        -- g):
180 •
        select title, no_of_copies
181
        from Book natural join BookCopies
182
     183
        from BookAuthors
        where Book.book_id = book_id and auther_name = 'Stephen King')
184
185
     from LibraryBranch
186
187
        where BookCopies.branch id = branch id and branch name =
188
        'Central');
```

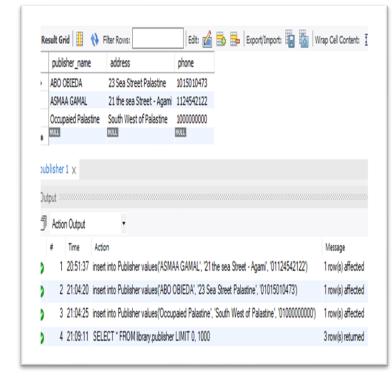
## 2. Screenshots of the output:

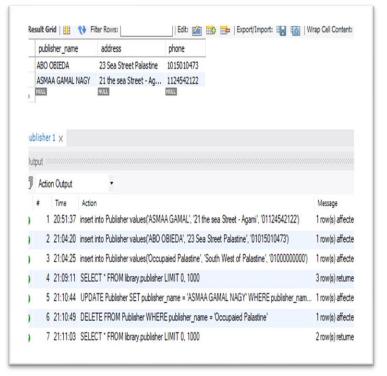
• Implementation of the given schema on MySQL using suitable DDL statements:



Trying the INSERT, UPDATE and DELETE statements on the Publisher table:
 After insertion:

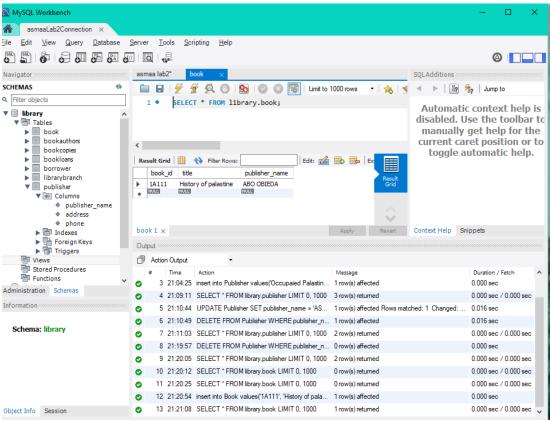
After update and delete:



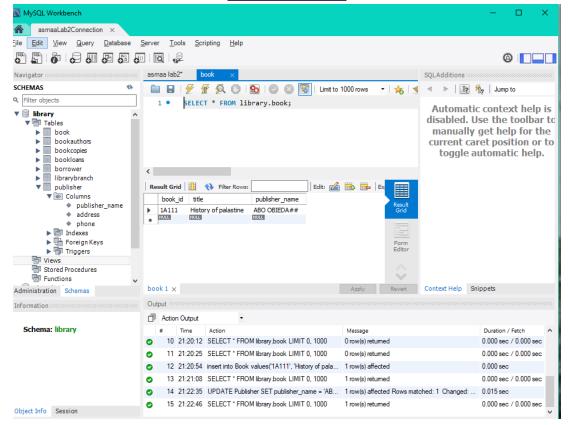


Insert a row in the Book table that references a row in the Publisher table. Then
try to update and delete the referenced row. Comment on the DBMS response
regarding the referential integrity constraints specified in the DDL script.

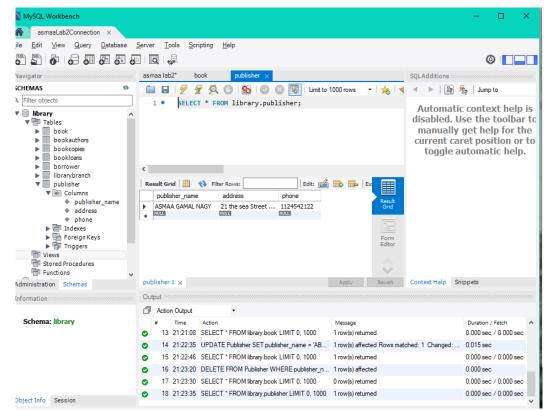
After insertion:



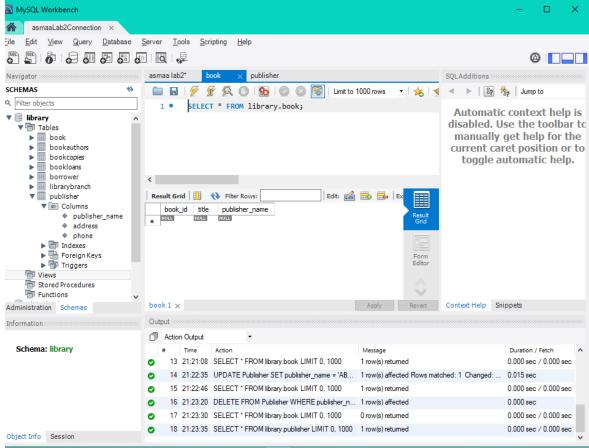
After update:



#### after delete publisher reference row:

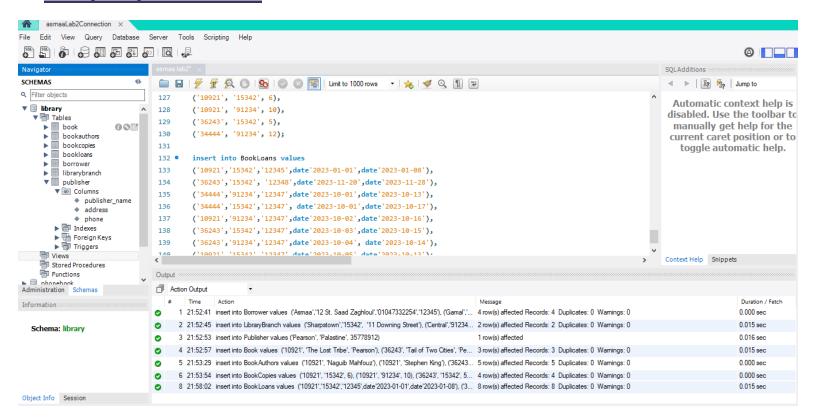


after cascaded deleting the book too with its publisher:



SELECT \* FROM library.book;
SELECT \* FROM library.publisher;

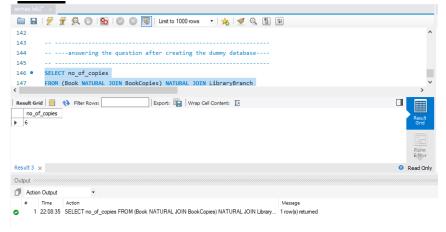
3. <u>Inserting dummy data and the current Database state created</u> for query retrieval:



## 4. Querying the DB:

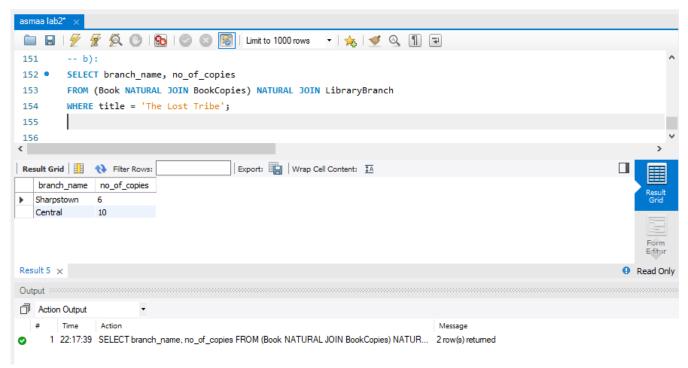
A. How many copies of the book titled The Lost Tribe are owned by the library branch whose name is 'Sharpstown'?





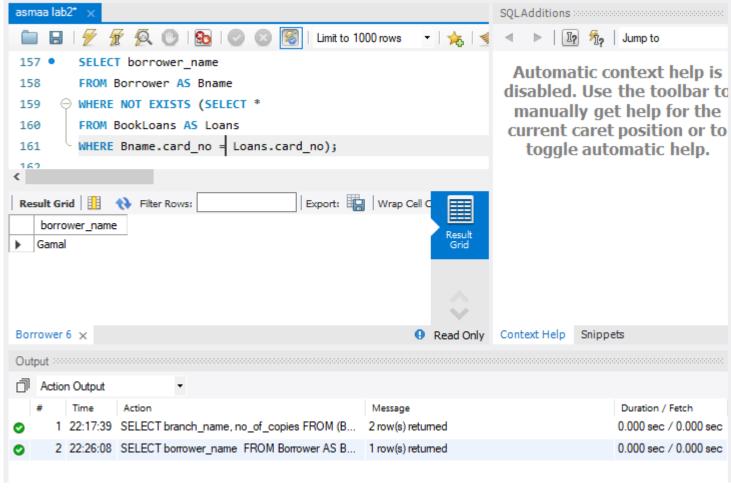
B. How many copies of the book titled The Lost Tribe are owned by each library branch?

## Ans:



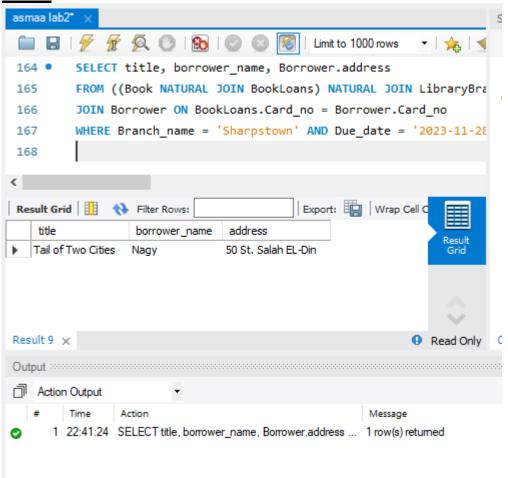
**C.** Retrieve the names of all borrowers who do not have any books checked out.

Ans: Gamal.



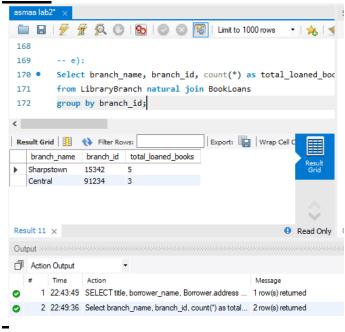
D. For each book that is loaned out from the Sharpstown branch and whose Due date is today, retrieve the book title, the borrower's name, and the borrower's address.

#### Ans:



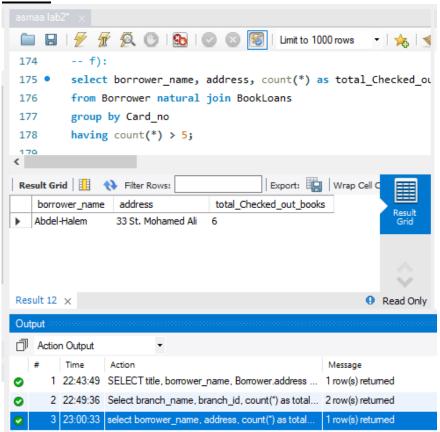
E. For each library branch, retrieve the branch name and the total number of books loaned out from that branch.

### Ans:



F. Retrieve the names, addresses, and number of books checked out for all borrowers who have more than five books checked out.

#### ANS:



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.



