

## Lab Program 1: LIBRARY DATABASE

Consider the following schema for a Library Database:

BOOK (Book\_id, Title, Publisher\_Name, Pub\_Year)

BOOK\_AUTHORS (Book\_id, Author\_Name)

PUBLISHER (Name, Address, Phone)

BOOK\_COPIES (Book\_id, Branch\_id, No-of\_Copies)

BOOK\_LENDING (Book\_id, Branch\_id, Card\_No, Date\_Out, Due\_Date)

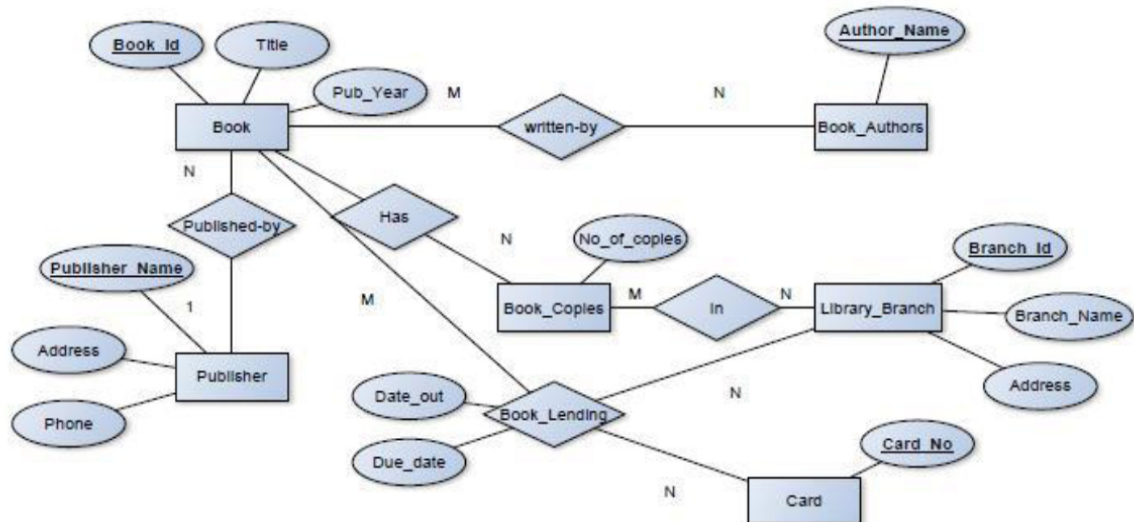
LIBRARY\_BRANCH (Branch\_id, Branch\_Name, Address)

Write SQL queries to

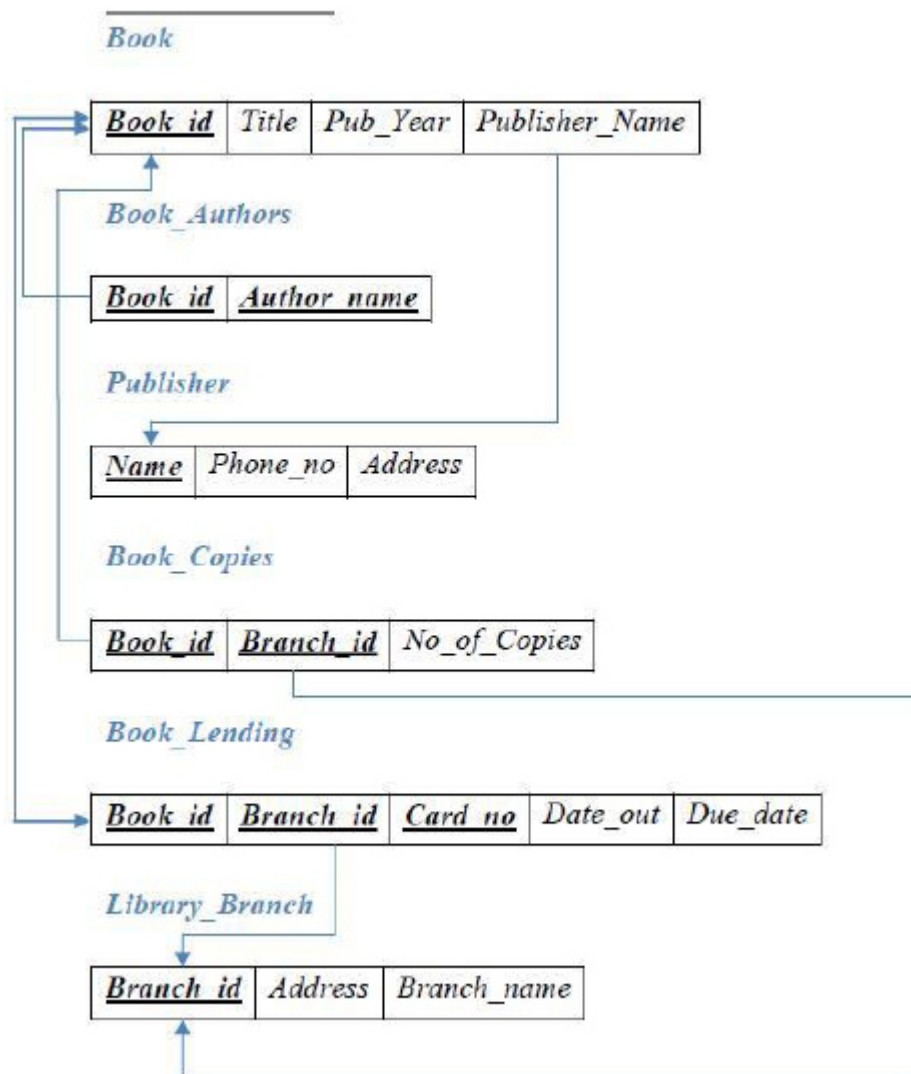
1. Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each branch, etc.
2. Get the particulars of borrowers who have borrowed more than 3 books, but from Jan 2017 to Jun 2017
3. Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation.
4. Partition the BOOK table based on year of publication. Demonstrate its working with a simple query.
5. Create a view of all books and its number of copies that are currently available in the Library.

Solution:

### ER-Diagram:



**SCHEMA:**



**Program:**

```
CREATE TABLE PUBLISHER(  
NAME VARCHAR(18) PRIMARY KEY,  
ADDRESS VARCHAR(10),  
PHONE VARCHAR(10));
```

```
CREATE TABLE BOOK(  
BOOK_ID INTEGER PRIMARY KEY,  
TITLE VARCHAR(20),  
PUBLISHER_NAME VARCHAR(20) REFERENCES PUBLISHER(NAME) ON DELETE  
CASCADE,  
PUB_YEAR NUMBER(4));
```

```
CREATE TABLE BOOK_AUTHORS(  
BOOK_ID INTEGER REFERENCES BOOK(BOOK_ID) ON DELETE CASCADE,  
AUTHOR_NAME VARCHAR(20),  
PRIMARY KEY(BOOK_ID));
```

```
CREATE TABLE LIBRARY_BRANCH(  
BRANCH_ID INTEGER PRIMARY KEY,  
BRANCH_NAME VARCHAR(18),  
ADDRESS VARCHAR(15));
```

```
CREATE TABLE BOOK_COPIES(  
BOOK_ID INTEGER REFERENCES BOOK(BOOK_ID) ON DELETE CASCADE,
```

```
BRANCH_ID INTEGER REFERENCES LIBRARY_BRANCH(BRANCH_ID) ON DELETE  
CASCADE,  
NO_OF_COPIES INTEGER,  
PRIMARY KEY(BOOK_ID,BRANCH_ID));
```

```
CREATE TABLE BOOK_LENDING(  
BOOK_ID INTEGER REFERENCES BOOK(BOOK_ID) ON DELETE CASCADE,  
BRANCH_ID INTEGER REFERENCES LIBRARY_BRANCH(BRANCH_ID) ON DELETE  
CASCADE,  
CARD_NO INTEGER,  
DATE_OUT DATE,  
DUE_DATE DATE,  
PRIMARY KEY(BOOK_ID,BRANCH_ID,CARD_NO));
```

```
INSERT INTO PUBLISHER VALUES('PEARSON','BANGALORE','9875462530');  
INSERT INTO PUBLISHER VALUES('MCGRAW','NEWDELHI','7845691234');  
INSERT INTO PUBLISHER VALUES('SAPNA','BANGALORE','7845963210');
```

```
INSERT INTO BOOK VALUES(1111,'SE','PEARSON',2005);  
INSERT INTO BOOK VALUES(2222,'DBMS','MCGRAW',2004);  
INSERT INTO BOOK VALUES(3333,'ANOTOMY','PEARSON',2010);  
INSERT INTO BOOK VALUES(4444,'ENCYCLOPEDIA','SAPNA',2010);
```

```
INSERT INTO BOOK_AUTHORS VALUES(1111,'SOMMERVILLE');
```

```
INSERT INTO BOOK_AUTHORS VALUES(2222,'NAVATHE');  
INSERT INTO BOOK_AUTHORS VALUES(3333,'HENRY GRAY');  
INSERT INTO BOOK_AUTHORS VALUES(4444,'THOMAS');
```

```
INSERT INTO LIBRARY_BRANCH VALUES(11,'CENTRAL TECHNICAL','MG ROAD');  
INSERT INTO LIBRARY_BRANCH VALUES(22,'MEDICAL','BH ROAD');  
INSERT INTO LIBRARY_BRANCH VALUES(33,'CHILDREN','SS PURAM');  
INSERT INTO LIBRARY_BRANCH VALUES(44,'SECRETARIAT','SIRAGATE');  
INSERT INTO LIBRARY_BRANCH VALUES(55,'GENERAL','JAYANAGAR');
```

```
INSERT INTO BOOK_COPIES VALUES(1111,11,5);  
INSERT INTO BOOK_COPIES VALUES(3333,22,6);  
INSERT INTO BOOK_COPIES VALUES(4444,33,10);  
INSERT INTO BOOK_COPIES VALUES(2222,11,12);  
INSERT INTO BOOK_COPIES VALUES(4444,55,3);
```

```
INSERT INTO BOOK_LENDING VALUES(2222,11,1,'10-JAN-2017','20-AUG-2017');  
INSERT INTO BOOK_LENDING VALUES(3333,22,2,'09-JUL-2017','12-AUG-2017');  
INSERT INTO BOOK_LENDING VALUES(4444,55,1,'11-APR-2017','09-AUG-2017');  
INSERT INTO BOOK_LENDING VALUES(2222,11,5,'09-AUG-2017','19-AUG-2017');  
INSERT INTO BOOK_LENDING VALUES(4444,33,1,'10-JUN-2017','15-AUG-2017');  
INSERT INTO BOOK_LENDING VALUES(1111,11,1,'12-MAY-2017','10-JUN-2017');  
INSERT INTO BOOK_LENDING VALUES(3333,22,1,'10-JUL-2017','15-JUL-2017');
```

```
SELECT * FROM BOOK;
```

SELECT \* FROM BOOK\_AUTHORS;

SELECT \* FROM PUBLISHER;

SELECT \* FROM BOOK\_COPIES;

SELECT \* FROM BOOK\_LENDING;

SELECT \* FROM LIBRARY\_BRANCH;

Queries:

1) Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each branch, etc.

```
SELECT LB.BRANCH_NAME, B.BOOK_ID,TITLE,  
PUBLISHER_NAME,AUTHOR_NAME,  
NO_OF_COPIES  
FROM BOOK B, BOOK_AUTHORS BA, BOOK_COPIES BC, LIBRARY_BRANCH LB  
WHERE B.BOOK_ID = BA.BOOK_ID AND  
BA.BOOK_ID = BC.BOOK_ID AND  
BC.BRANCH_ID = LB.BRANCH_ID  
GROUP BY LB.BRANCH_NAME, B.BOOK_ID, TITLE, PUBLISHER_NAME,  
AUTHOR_NAME, NO_OF_COPIES;
```

2) Get the particulars of borrowers who have borrowed more than 3 books, but from Jan 2017 to Jun 2017.

```
SELECT CARD_NO  
FROM BOOK_LENDING  
WHERE DATE_OUT BETWEEN '01-JAN-2017' AND '30-JUN-2017'  
GROUP BY CARD_NO  
HAVING COUNT(*) > 3;
```

3) Delete a book in BOOK table. Update the contents of other tables to reflect this data manipulation operation.

```
DELETE FROM BOOK  
WHERE BOOK_ID = '3333';
```

SELECT \* FROM BOOK;

```
SELECT * FROM BOOK_COPIES;
```

```
SELECT * FROM BOOK_LENDING;
```

4) Partition the BOOK table based on year of publication. Demonstrate its working with a simple query.

```
SELECT BOOK_ID, TITLE, PUBLISHER_NAME, PUB_YEAR  
FROM BOOK  
GROUP BY PUB_YEAR, BOOK_ID, TITLE, PUBLISHER_NAME;
```

5) Create a view of all books and its number of copies that are currently available in the Library.

```
CREATE VIEW BOOKS_AVAILABLE AS  
SELECT B.BOOK_ID, B.TITLE, C.NO_OF_COPIES  
FROM LIBRARY_BRANCH L, BOOK B, BOOK_COPIES C  
WHERE B.BOOK_ID = C.BOOK_ID AND  
L.BRANCH_ID=C.BRANCH_ID;
```

```
SELECT * FROM BOOKS_AVAILABLE;
```