LAB EXPERIMENTS

PART A: SQL PROGRAMMING

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1. **Consider the following schema for a Library Database:**

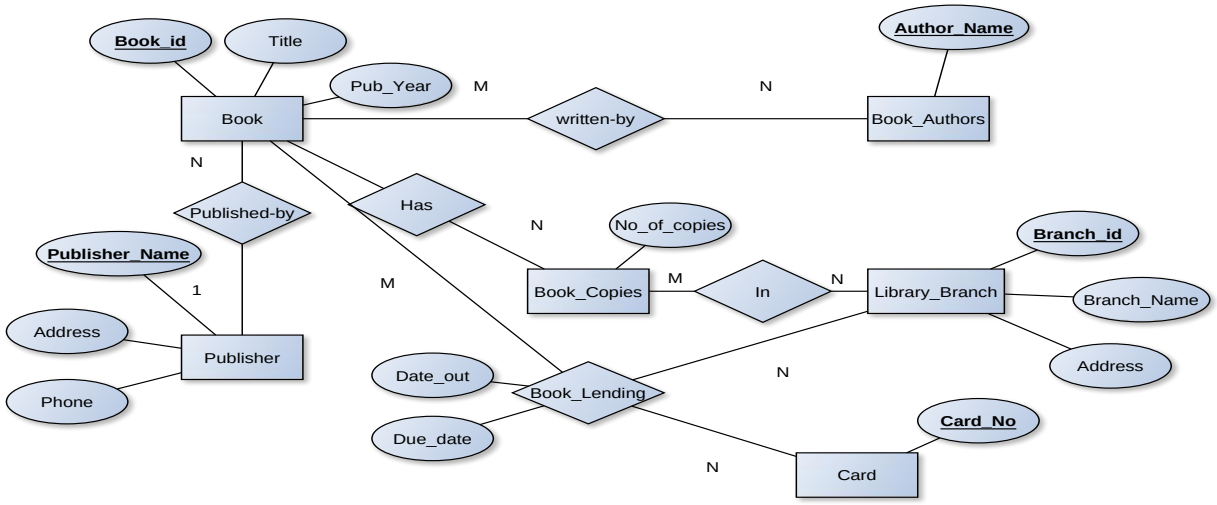
BOOK (*Book_id, Title, Publisher_Name, Pub_Year*)
BOOK_AUTHORS (Book_id, Author_*Name*)
PUBLISHER (*Name, Address, Phone*)
BOOK_COPIES (*Book_id, Programme_id, No-of_Copies*)
BOOK_LENDING (*Book_id, Programme _id, Card_No, Date_Out, Due_Date*)
LIBRARY_PROGRAMME (*Programme _id, Programme _Name, Address*)

Write SQL queries to

1. **Retrieve details of all books in the library – id, title, name of publisher, authors, number of copies in each Programme, 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:

Entity-Relationship Diagram



Schema Diagram

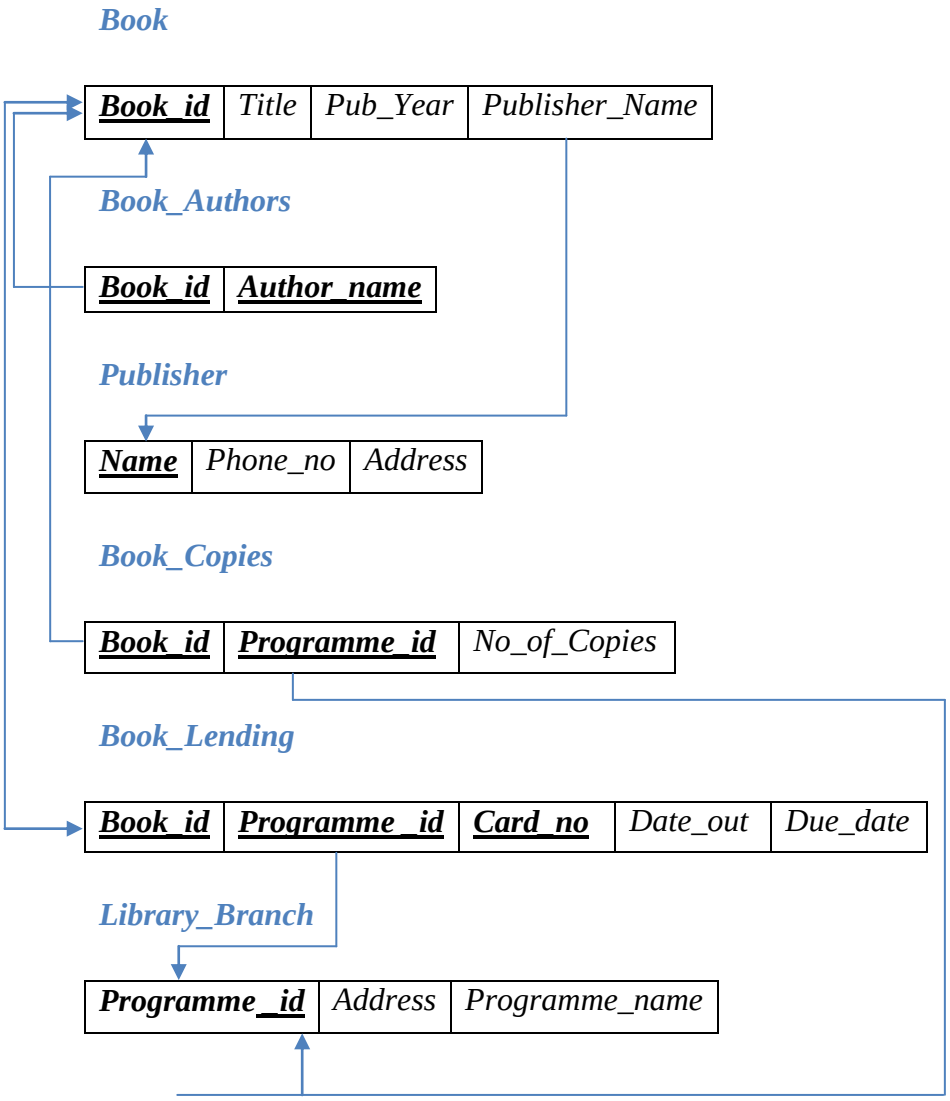


Table Creation

CREATE TABLE PUBLISHER
(NAME VARCHAR(20) PRIMARY KEY, PHONE INT, ADDRESS VARCHAR(20));

CREATE TABLE BOOK
(BOOK_ID INT PRIMARY KEY, TITLE VARCHAR(20), PUB_YEAR VARCHAR(20),
PUBLISHER_NAME VARCHAR(20), FOREIGN KEY(PUBLISHER_NAME) REFERENCES
PUBLISHER(NAME) ON DELETE CASCADE);

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

CREATE TABLE LIBRARY_PROGRAMME
(PROGRAMME_ID INT PRIMARY KEY, PROGRAMME_NAME VARCHAR(20), ADDRESS VARCHAR(50));

CREATE TABLE BOOK_COPIES
(NO_OF_COPIES INT, BOOK_ID INT, PROGRAMME_ID INT, FOREIGN KEY(BOOK_ID) REFERENCES BOOK (BOOK_ID) ON DELETE CASCADE, FOREIGN KEY(PROGRAMME_ID) REFERENCES LIBRARY_PROGRAMME (PROGRAMME_ID) ON DELETE CASCADE, PRIMARY KEY (BOOK_ID, PROGRAMME_ID));

CREATE TABLE CARD
(CARD_NO INT PRIMARY KEY);

CREATE TABLE BOOK_LENDING
(DATE_OUT DATE, DUE_DATE DATE, BOOK_ID INT, PROGRAMME_ID INT, CARD_NO INT, FOREIGN KEY(BOOK_ID) REFERENCES BOOK (BOOK_ID) ON DELETE CASCADE, FOREIGN KEY(PROGRAMME_ID) REFERENCES LIBRARY_PROGRAMME (PROGRAMME_ID) ON DELETE CASCADE, FOREIGN KEY(CARD_NO) REFERENCES CARD (CARD_NO) ON DELETE CASCADE,
PRIMARY KEY (BOOK_ID, PROGRAMME_ID, CARD_NO));
```

Insertion of Values to Tables

PUBLISHER TABLE

```
INSERT INTO PUBLISHER VALUES ('MCGRAW-HILL', 9989076587, 'BANGALORE');
INSERT INTO PUBLISHER VALUES ('PEARSON', 9889076565, 'NEWDELHI');
INSERT INTO PUBLISHER VALUES ('RANDOM HOUSE', 7455679345, 'HYDRABAD');
INSERT INTO PUBLISHER VALUES ('HACHETTE LIVRE', 8970862340, 'CHENAI');
INSERT INTO PUBLISHER VALUES ('GRUPO PLANETA', 7756120238, 'BANGALORE');

SELECT * FROM PUBLISHER;
```

BOOK TABLE

```
INSERT INTO BOOK VALUES (1, 'DBMS', 'JAN-2017', 'MCGRAW-HILL');
INSERT INTO BOOK VALUES (2, 'ADBMS', 'JUN-2016', 'MCGRAW-HILL');
```

INSERT INTO BOOK VALUES (3, ‘CN’, ‘SEP-2016’, ‘PEARSON’);
INSERT INTO BOOK VALUES (4, ‘CG’, ‘SEP-2015’, ‘GRUPO PLANETA’);
INSERT INTO BOOK VALUES (5, ‘OS’, ‘MAY-2016’, ‘PEARSON’);

SELECT * FROM BOOK;

BOOK_AUTHORS

INSERT INTO BOOK_AUTHORS VALUES (‘NAVATHE’, 1);
INSERT INTO BOOK_AUTHORS VALUES (‘NAVATHE’, 2);
INSERT INTO BOOK_AUTHORS VALUES (‘TANENBAUM’, 3);
INSERT INTO BOOK_AUTHORS VALUES (‘EDWARD ANGEL’, 4);
INSERT INTO BOOK_AUTHORS VALUES (‘GALVIN’, 5);

SELECT * FROM BOOK_AUTHORS;

LIBRARY_PROGRAMME

INSERT INTO LIBRARY_PROGRAMME VALUES (10, ‘RR NAGAR’, ‘BANGALORE’);
INSERT INTO LIBRARY_PROGRAMME VALUES (11, ‘RNSIT’, ‘BANGALORE’);
INSERT INTO LIBRARY_PROGRAMME VALUES (12, ‘RAJAJI NAGAR’, ‘BANGALORE’);
INSERT INTO LIBRARY_PROGRAMME VALUES (13, ‘NITTE’, ‘MANGALORE’);
INSERT INTO LIBRARY_PROGRAMME VALUES (14, ‘MANIPAL’, ‘UDUPI’);

SELECT * FROM LIBRARY_PROGRAMME;

BOOK_COPIES

INSERT INTO BOOK_COPIES VALUES (10, 1, 10);
INSERT INTO BOOK_COPIES VALUES (5, 1, 11);
INSERT INTO BOOK_COPIES VALUES (2, 2, 12);
INSERT INTO BOOK_COPIES VALUES (5, 2, 13);
INSERT INTO BOOK_COPIES VALUES (7, 3, 14);
INSERT INTO BOOK_COPIES VALUES (1, 5, 10);
INSERT INTO BOOK_COPIES VALUES (3, 4, 11);

SELECT * FROM BOOK_COPIES;

CARD

INSERT INTO CARD VALUES (100);
INSERT INTO CARD VALUES (101);
INSERT INTO CARD VALUES (102);

INSERT INTO CARD VALUES (103);
INSERT INTO CARD VALUES (104);

SELECT * FROM CARD;

BOOK_LENDING

INSERT INTO BOOK_LENDING VALUES ('2017-01-01', '2017-06-01', 1, 10, 101);
INSERT INTO BOOK_LENDING VALUES ('2017-01-11', '2017-03-11', 3, 14, 101);
INSERT INTO BOOK_LENDING VALUES ('2017-02-21', '2017-04-21', 2, 13, 101);
INSERT INTO BOOK_LENDING VALUES ('2017-03-15', '2017-07-15', 4, 11, 101);
INSERT INTO BOOK_LENDING VALUES ('2017-04-12', '2017-05-12', 1, 11, 104);

SELECT * FROM BOOK_LENDING;

Queries:

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

   SELECT B.BOOK_ID, B.TITLE, B.PUBLISHER_NAME, A.AUTHOR_NAME, C.NO_OF_COPIES, L.PROGRAMME_ID FROM BOOK B, BOOK_AUTHORS A, BOOK_COPIES C, LIBRARY_PROGRAMME L WHERE B.BOOK_ID=A.BOOK_ID AND B.BOOK_ID=C.BOOK_ID AND L.PROGRAMME_ID=C.PROGRAMME_ID;

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 '2017-01-01' AND '2017-06-30' 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=3;

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

   CREATE VIEW V_PUBLICATION AS SELECT PUB_YEAR FROM BOOK;

   SELECT * FROM V_PUBLICATION;

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

   CREATE VIEW V_BOOKS AS SELECT B.BOOK_ID, B.TITLE, C.NO_OF_COPIES FROM BOOK B, BOOK_COPIES C, LIBRARY_PROGRAMME L WHERE B.BOOK_ID=C.BOOK_ID AND C.PROGRAMME_ID=L.PROGRAMME_ID;

   SELECT * FROM V_BOOKS;
