Global Academy of Technology
Growing Ahead Of Time....
Autonomous Institute, Affiliated To VTU

Department of Artificial Intelligence & Machine Learning

22AML43

Database Management System Laboratory

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Exercise-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, Branch_id, No-of_Copies)

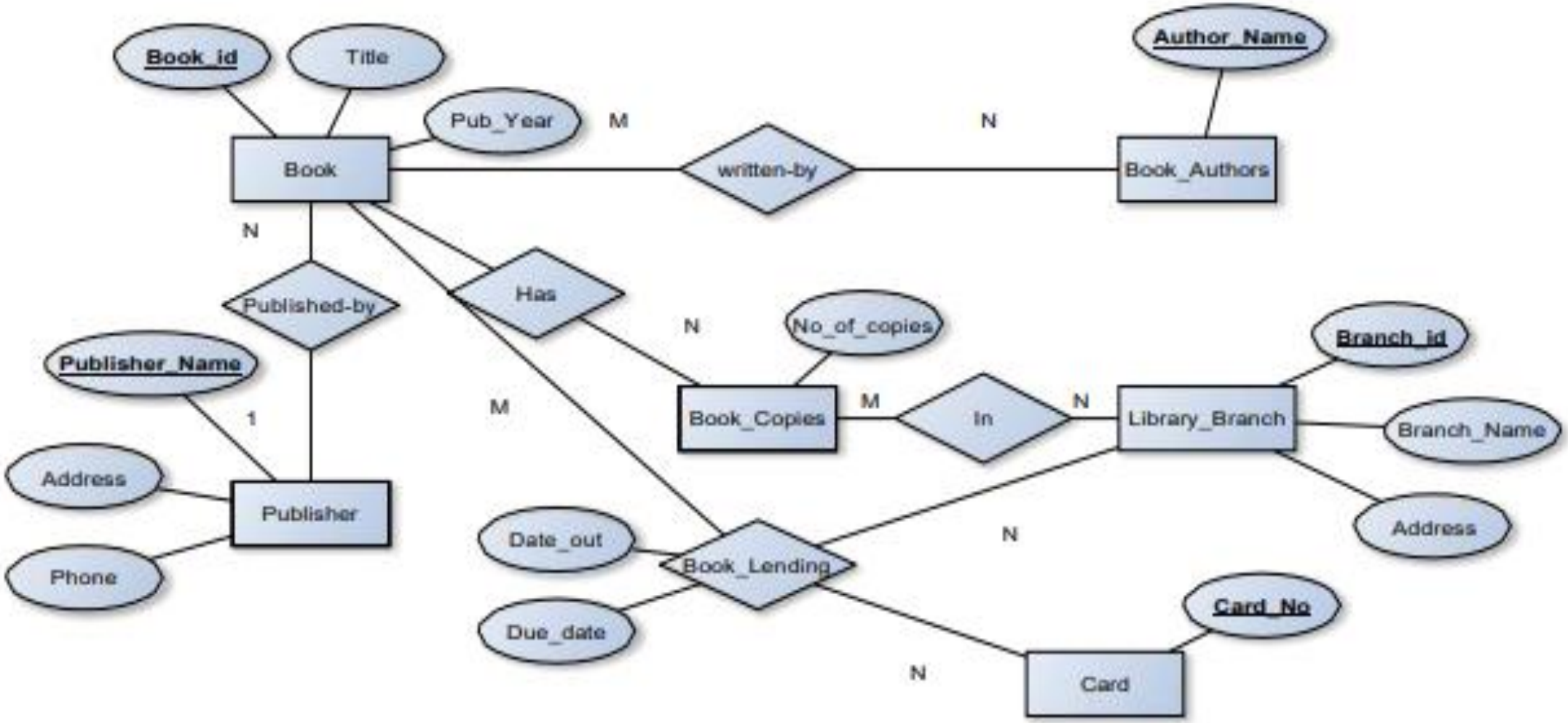
BOOK_LENDING(Book_id, Branch_id, Card_No, Date_Out, Due_Date)

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 2021 to Aug 2021.**
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 the number of copies that are currently available in the Library.**

Entity-Relationship Diagram



Schema Diagram

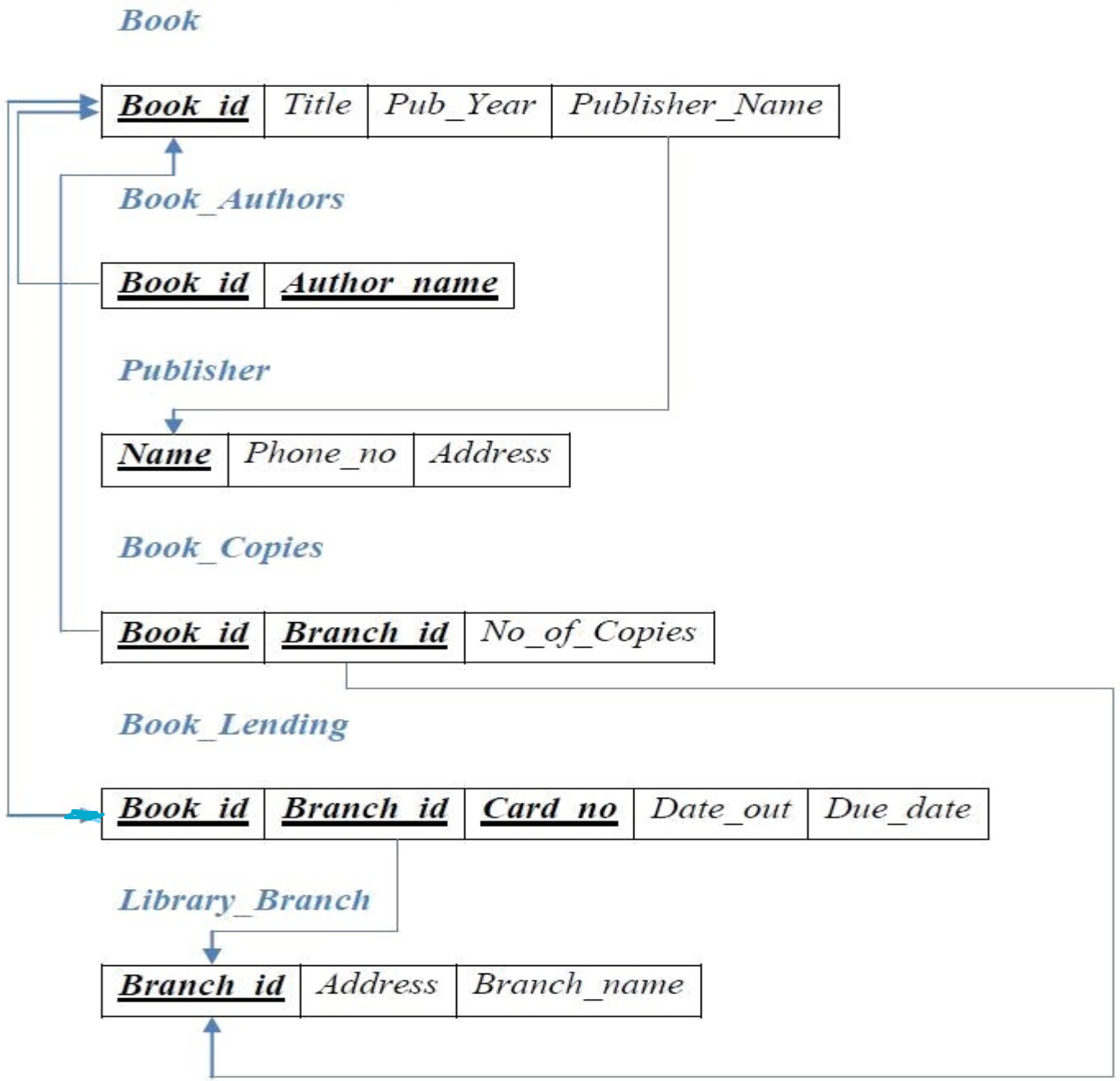


Table Creation

1. CREATE TABLE PUBLISHER (NAME VARCHAR (20) PRIMARY KEY, PHONE VARCHAR(15), ADDRESS VARCHAR (20));

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

3. CREATE TABLE BOOK_AUTHORS (AUTHOR_NAME VARCHAR (20), BOOK_ID INTEGER, FOREIGN KEY(BOOK_ID) REFERENCES BOOK (BOOK_ID) ON DELETE CASCADE,

   PRIMARY KEY (BOOK_ID, AUTHOR_NAME));

Table Creation

3. CREATE TABLE LIBRARY_BRANCH (BRANCH_ID INTEGER PRIMARY KEY, BRANCH_NAME VARCHAR (50), ADDRESS VARCHAR (50));

4. CREATE TABLE BOOK_COPIES (NO_OF_COPIES INTEGER,

BOOK_ID INTEGER, FOREIGN KEY(BOOK_ID) REFERENCES BOOK (BOOK_ID) ON DELETE CASCADE,

BRANCH_ID INTEGER, FOREIGN KEY(BRANCH_ID) REFERENCES LIBRARY_BRANCH (BRANCH_ID) ON DELETE CASCADE,

PRIMARY KEY (BOOK_ID, BRANCH_ID));

Table Creation

5. CREATE TABLE CARD (CARD_NO INTEGER PRIMARY KEY);

6. CREATE TABLE BOOK_LENDING (DATE_OUT DATE, DUE_DATE DATE, BOOK_ID INTEGER, FOREIGN KEY(BOOK_ID) REFERENCES BOOK (BOOK_ID) ON DELETE CASCADE,

   BRANCH_ID INTEGER, FOREIGN KEY(BRANCH_ID) REFERENCES LIBRARY_BRANCH (BRANCH_ID) ON DELETE CASCADE,

   CARD_NO INTEGER, FOREIGN KET(CARD_NO) REFERENCES CARD (CARD_NO) ON DELETE CASCADE,

   PRIMARY KEY (BOOK_ID, BRANCH_ID, CARD_NO));

Table Description

- DESC PUBLISHER;
- DESC BOOK;
- DESC BOOK_AUTHORS;
- DESC LIBRARY_BRANCH;
- DESC BOOK_COPIES;
- DESC CARD;
- DESC BOOK_LENDING;

Insertion of Values to Tables

1. *INSERT INTO PUBLISHER TABLE:*

- INSERT INTO PUBLISHER VALUES('MCGRAWHILL',9191919191,'BANGALORE');
- INSERT INTO PUBLISHER VALUES('PEARSON',8181818181,'NEWDELHI');
- INSERT INTO PUBLISHER VALUES('RANDOMHOUSE',7171717171,'HYDERABAD');
- INSERT INTO PUBLISHER VALUES('LIVRE',6161616161,'CHENNAI');
- INSERT INTO PUBLISHER VALUES('PLANETA',5151515151,'BANGALORE');

- SELECT * FROM PUBLISHER;

Insertion of Values to Tables

2. INSERT INTO BOOK TABLE:

- INSERT INTO BOOK VALUES(1,'DBMS','JAN-2017','MCGRAWHILL');
- INSERT INTO BOOK VALUES(2,'ADBMS','JUN-2016','MCGRAWHILL');
- INSERT INTO BOOK VALUES(3,'CN','SEP-2016','PEARSON');
- INSERT INTO BOOK VALUES(4,'CG','SEP-2015','PLANETA');
- INSERT INTO BOOK VALUES(5,'OS','MAY-2016','PEARSON');

- SELECT * FROM BOOK;

Insertion of Values to Tables

3. INSERT INTO BOOK_AUTHORS TABLE:

- 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;

Insertion of Values to Tables

3. INSERT INTO LIBRARY_BRANCH TABLE:

- INSERT INTO LIBRARY_BRANCH VALUES (10, 'RR NAGAR', 'BANGALORE');
- INSERT INTO LIBRARY_BRANCH VALUES (11, 'KENGERI', 'BANGALORE');
- INSERT INTO LIBRARY_BRANCH VALUES (12, 'RAJAJI NAGAR', 'BANGALORE');
- INSERT INTO LIBRARY_BRANCH VALUES (13, 'NITTE', 'MANGALORE');
- INSERT INTO LIBRARY_BRANCH VALUES (14, 'MANIPAL', 'UDUPI');

- SELECT *FROM LIBRARY_BRANCH;

Insertion of Values to Tables

4. INSERT INTO BOOK_COPIES TABLE:

- 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;

Insertion of Values to Tables

5. *INSERT INTO CARD TABLE:*

- 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 ;

Insertion of Values to Tables

5. *INSERT INTO BOOK_LENDING TABLE*:

- INSERT INTO BOOK_LENDING VALUES ('2021-06-01', '2021-07-01', 1, 10, 101);
- INSERT INTO BOOK_LENDING VALUES ('2021-01-05', '2021-02-05', 3, 14, 101);
- INSERT INTO BOOK_LENDING VALUES ('2021-07-03', '2021-08-03', 2, 13, 101);
- INSERT INTO BOOK_LENDING VALUES ('2021-12-11', '2022-01-11', 4, 11, 101);
- INSERT INTO BOOK_LENDING VALUES ('2021-10-01', '2021-11-01', 1, 11, 104);

- SELECT *FROM BOOK_LENDING;

Query-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.BRANCH_ID
FROM BOOK B, BOOK_AUTHORS A, BOOK_COPIES C, LIBRARY_BRANCH L
WHERE
B.BOOK_ID=A.BOOK_ID  AND B.BOOK_ID=C.BOOK_ID  AND
L.BRANCH_ID=C.BRANCH_ID;
```

Query-2

Get the particulars of borrowers who have borrowed more than 3 books, but from Jan 2021 to Aug 2021

```
SELECT CARD_NO FROM BOOK_LENDING
WHERE DATE_OUT BETWEEN '2021-01-01' AND '2021-08-01'
GROUP BY CARD_NO
HAVING COUNT(*)>3;
```

Query-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;

(Note: Check BOOK_COPIES and BOOK_LENDING tables to see whether the deletion of record with BOOK_ID = 3, has been reflected)

Query-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;

Query-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_BRANCH L
WHERE B.BOOK_ID=C.BOOK_ID AND C.BRANCH_ID=L.BRANCH_ID;
```