**Laboratory Activity 2:**

**Laboratory Title:** Creating Tables and Establishing Primary Keys  
**Chapter No. and Topic:** Chapter 1 - Relational Database Concepts  
**Discussions:**  
This activity focuses on creating the main tables for the Library Management System, with primary keys for each table.

**Activity Description:**  
Create tables such as Books, Members, and Transactions for the library system.

**Objectives:**

* Create tables for library management.
* Define primary keys for each table.

**Materials:**

* MySQL Workbench or SQL client

**Procedure:**

1. Open MySQL Workbench and connect to the LibraryManagement database.
2. Create the following tables:

sql

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CREATE TABLE Books (

BookID INT PRIMARY KEY AUTO\_INCREMENT,

Title VARCHAR(100),

Author VARCHAR(100),

ISBN VARCHAR(20),

Genre VARCHAR(50)

);

CREATE TABLE Members (

MemberID INT PRIMARY KEY AUTO\_INCREMENT,

FirstName VARCHAR(50),

LastName VARCHAR(50),

Email VARCHAR(100)

);

CREATE TABLE Transactions (

TransactionID INT PRIMARY KEY AUTO\_INCREMENT,

MemberID INT,

BookID INT,

IssueDate DATE,

ReturnDate DATE,

FOREIGN KEY (MemberID) REFERENCES Members(MemberID),

FOREIGN KEY (BookID) REFERENCES Books(BookID)

);

1. Verify the tables are created by running SHOW TABLES;.

**Result:**  
Three tables (Books, Members, and Transactions) are created.

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**Additional Questions/Discussions:**

* What is the importance of primary keys in a relational database?

Because they allow each record in a table to be uniquely identified, primary keys are crucial for maintaining data integrity and avoiding duplicate entries in relational databases. By creating connections across tables, they facilitate effective data retrieval and uphold referential integrity. Primary keys contribute to database efficiency optimization and consistency by acting as a unique identifier.

* How do foreign keys maintain referential integrity?

By guaranteeing that a foreign key value in one table always corresponds to an existent primary key in another, foreign keys preserve referential integrity by enforcing a legitimate relationship across tables. The correctness and dependability of the database are maintained by preventing invalid or orphaned records, maintaining data consistency, and limiting unwanted deletions or alterations.

**Conclusions:**

Primary keys and foreign keys play critical roles in ensuring the integrity, consistency, and efficiency of a relational database. Primary keys uniquely identify records and create essential links between tables, while foreign keys maintain referential integrity by enforcing valid relationships. Together, they prevent data duplication, maintain accurate connections, and safeguard the reliability and performance of the database.