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| **Library Management System** |  |

**Library Management System**

**1.Create the database**:

CREATE DATABASE LibraryManagement;

**2.Use the database**:

USE LibraryManagement;

* **We will create three tables: Books, Authors, and BorrowRecords.**
* **Authors Table**

The Authors table will store information about the authors of books.

CREATE TABLE Authors (

AuthorID INT AUTO\_INCREMENT PRIMARY KEY,

FirstName VARCHAR(50),

LastName VARCHAR(50));

**Insert data into the Authors table**:

INSERT INTO Authors (FirstName, LastName) VALUES

('J.K.', 'Rowling'),

('George', 'Orwell'),

('J.R.R.', 'Tolkien');

* **Books Table**

The Books table will store information about books in the library.

CREATE TABLE Books (

BookID INT AUTO\_INCREMENT PRIMARY KEY,

Title VARCHAR(100),

Genre VARCHAR(50),

AuthorID INT,

FOREIGN KEY (AuthorID) REFERENCES Authors(AuthorID));

**Insert data into the Books table**:

INSERT INTO Books (Title, Genre, AuthorID) VALUES

('Harry Potter and the Philosopher\'s Stone', 'Fantasy', 1),

('1984', 'Dystopian', 2),

('The Hobbit', 'Fantasy', 3);

#### ****BorrowRecords Table****

The BorrowRecords table will store records of which books were borrowed by which users.

CREATE TABLE BorrowRecords (

RecordID INT AUTO\_INCREMENT PRIMARY KEY,

BookID INT,

BorrowerName VARCHAR(100),

BorrowDate DATE,

ReturnDate DATE,

FOREIGN KEY (BookID) REFERENCES Books(BookID));

**Insert data into the BorrowRecords table**:

INSERT INTO BorrowRecords (BookID, BorrowerName, BorrowDate, ReturnDate) VALUES

(1, 'John Doe', '2024-09-10', '2024-09-17'),

(2, 'Jane Smith', '2024-09-11', NULL);

**Querying Data**

1. **Select all books in the library:**

SELECT \* FROM Books;

This query retrieves all books in the library.

1. **Find books by a specific author**:

SELECT Books.Title

FROM Books

JOIN Authors ON Books.AuthorID = Authors.AuthorID

WHERE Authors.LastName = 'Rowling';

Ex:- This query retrieves all books written by J.K. Rowling.

**3. List all borrow records and their return status:**

SELECT BorrowRecords.BorrowerName, Books.Title, BorrowRecords.BorrowDate, BorrowRecords.ReturnDate

FROM BorrowRecords

JOIN Books ON BorrowRecords.BookID = Books.BookID;

This query retrieves a list of who borrowed which book and whether it has been returned.

**Updating Data**

**Suppose John Doe has returned his book. We can update the return date.**

UPDATE BorrowRecords

SET ReturnDate = '2024-09-18'

WHERE BorrowerName = 'John Doe' AND BookID = 1;

**Deleting Data**

If we want to remove a borrow record, we can use the DELETE statement.

DELETE FROM BorrowRecords

WHERE RecordID = 2;

**Using Aggregations**

1. Count the number of books in the library:

SELECT COUNT(\*) AS TotalBooks FROM Books;

1. Count the number of books borrowed by each person:

SELECT BorrowerName, COUNT(\*) AS BooksBorrowed

FROM BorrowRecords

GROUP BY BorrowerName;