**Introduction to Library Management System Database**

Our project is a library management system designed to streamline the operations of a library, including managing books, readers, staff, reports, and reservations/returns. The system aims to automate various tasks involved in library management, such as book issuance, return, staff management, and reader registration.

**Problem Statement:**

Traditional library management systems often rely on manual processes, leading to inefficiencies and errors. There's a need for a modern, automated system that can efficiently handle various library operations, improve user experience, and ensure smooth functioning of the library.

**Methodology:**

MySQL: For database management.

Database Schema:

Created tables for Books, Readers, Publishers, Auth\_System, Reports, Staff, Staff Reader, Staff Reports, Staff Books, and Reserve Return.

Established relationships between tables using foreign key constraints to ensure data integrity.

**Results and Conclusion:**

**Testing:** We extensively tested the functionalities of our library management system, including book issuance, return, user registration, and reporting. The system performed reliably and efficiently in handling these tasks.

**Evaluating Model:** The implementation of foreign key constraints ensured data integrity and consistency in the database. The user-friendly interface enhanced the overall user experience.

**Remarks:** Our project successfully addresses the challenges faced by traditional library management systems by automating processes and providing a robust system for managing library resources. Further enhancements could include advanced search functionalities, personalized recommendations, and integration with external APIs for additional features.

This methodology allowed us to develop a scalable and efficient library management system that meets the needs of modern libraries and enhances the overall library experience for both staff and users.

**Tables and Relationships**

**Book:**

**Attributes:**

ISBN (Primary Key): ISBN of the book.

AuthNo: Author number.

Title: Title of the book.

Edition: Edition of the book.

Category: Category of the book.

Price: Price of the book.

PublisherID (Foreign Key): Publisher ID of the book.

**Description:** Stores information about books available in the library, including ISBN, title, author, edition, category, price, and publisher.

**Reader:**

**Attributes:**

UserID (Primary Key): User ID of the reader.

Email: Email address of the reader.

Address: Address of the reader.

FirstName: First name of the reader.

LastName: Last name of the reader.

PhoneNo: Phone number of the reader.

**Description:** Contains details of library readers, including user ID, contact information, and address.

**Publisher:**

**Attributes:**

PublisherID (Primary Key): Publisher ID.

YearOfPublication: Year of publication.

publisher\_Name: Name of the publisher.

**Description:** Stores information about publishers, including their ID, year of publication, and name.

**Auth\_System:**

**Attributes:**

LoginID (Primary Key): Login ID.

Password: Password for authentication.

**Description:** Stores authentication credentials for users.

**Reports:**

**Attributes:**

RegNo (Primary Key): Registration number of the report.

UserID (Foreign Key): User ID of the reader.

BookISBN (Foreign Key): ISBN of the book.

IssueDate: Date of issue.

ReturnDate: Date of return.

Description: Records reports of books issued and returned by readers.

**Staff:**

**Attributes:**

StaffID (Primary Key): Staff ID.

Name: Name of the staff member.

**Description:** Stores information about library staff members.

**Staff\_Reader:**

**Attributes:**

StaffID (Foreign Key): Staff ID.

UserID (Foreign Key): User ID of the reader.

Description: Establishes a relationship between staff members and readers.

**Staff\_Reports:**

**Attributes:**

StaffID (Foreign Key): Staff ID.

RegNo (Foreign Key): Registration number of the report.

**Description**: Associates staff members with book reports.

**Staff\_Books:**

**Attributes:**

StaffID (Foreign Key): Staff ID.

ISBN (Foreign Key): ISBN of the book.

Description: Links staff members to books.

**Reserve\_Return:**

**Attributes:**

ReserveDate: Date of reservation.

DueDate: Due date for return.

ReturnDate: Date of return.

UserID (Foreign Key): User ID of the reader.

ISBN (Foreign Key): ISBN of the book.

**Description:** Tracks reservations and returns of books by readers.

NOTE: All tables detailed implementation is on other file along with test cases and procedures.