**DATABASE MANAGEMENT SYSTEM**

**SUBMITTED BY:**

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**TOPIC:**

* **LIBRARY MANAGEMENT SYSTEM**

**DESCRIPTION:**

The Library Management SQL Database Project makes running a library a breeze. Imagine each book in the library having its own special ID called the ISBN, along with its name, year of publication, language, and category. These categories help us organize books by type, making it easy to find what you're looking for. When you borrow a book, we keep track of who borrowed it, when it was borrowed, and when it's due back, all thanks to the Borrower\_Details table. Our friendly staff members are listed in the Staff\_Details table, so you always know who's helping you out. Students, the heart of our library, are listed in the Student\_Details table, so we know who's a part of our library community.

To keep things organized, we have a Shelf\_Details table that tells us where each book is located. We also have information about authors and publishers in the Author\_Details and Publisher\_Details tables, so you can learn more about the creators of your favorite books. Transactions, like borrowing and returning books, are all recorded in the Transaction\_Details table, so we can keep track of everything happening in the library. And if you want to reserve a book for later, no problem! We've got a Reservation\_Details table just for that.

**Entities and Attributes for Library Management System Database**

1. **Book\_Details Table:**

- \*\*ISBN (Primary Key):\*\* Unique identifier for each book.

- \*\*Title:\*\* Name of the book.

- \*\*Publication\_Year:\*\* Year of publication.

- \*\*Language:\*\* Language in which the book was published.

- \*\*Category\_ID (Foreign Key):\*\* Category ID referencing Category\_Details table.

- \*\*No\_Of\_Copies\_Actual:\*\* Total number of copies initially present.

- \*\*No\_Of\_Copies\_Current:\*\* Total number of copies currently available.

1. **Category\_Details Table:**

- \*\*Category\_ID (Primary Key):\*\* Unique identifier for each category.

- \*\*Category\_Name:\*\* Name of the category.

1. **Borrower\_Details Table:**

- \*\*Borrower\_ID (Primary Key):\*\* Unique ID for each borrower.

- \*\*Book\_ID (Foreign Key):\*\* Book ID lent to the borrower.

- \*\*Borrowed\_Date:\*\* Date when the book was borrowed.

- \*\*Due\_Date:\*\* Due date for returning the book.

- \*\*Returned\_Date:\*\* Date when the book was returned.

- \*\*Issued\_by (Foreign Key):\*\* ID of the librarian who issued the book.

1. **Staff\_Details Table:**

- \*\*Staff\_ID (Primary Key):\*\* Unique ID for each staff member.

- \*\*Name:\*\* Name of the staff member.

- \*\*Is\_Admin:\*\* Flag indicating if the user is an admin.

- \*\*Role:\*\* Role of the staff member in the library.

1. **Student\_Details Table:**

- \*\*Student\_ID (Primary Key):\*\* Unique ID for each student.

- \*\*Name:\*\* Name of the student.

- \*\*Gender:\*\* Gender of the student.

- \*\*Date\_Of\_Birth:\*\* Date of birth of the student.

- \*\*Department:\*\* Department of the student.

- \*\*Contact\_Number:\*\* Contact number of the student.

1. **Shelf\_Details Table:**

- \*\*Shelf\_ID (Primary Key):\*\* Unique identifier for each shelf.

- \*\*Floor:\*\* Floor where the shelf is located.

1. **Author\_Details Table:**

- \*\*Author\_ID (Primary Key):\*\* Unique identifier for each author.

- \*\*Name:\*\* Name of the author.

- \*\*Nationality:\*\* Nationality of the author.

1. **Publisher\_Details Table:**

- \*\*Publisher\_ID (Primary Key):\*\* Unique identifier for each publisher.

- \*\*Name:\*\* Name of the publisher.

- \*\*Location:\*\* Location of the publisher's headquarters.

1. **Transaction\_Details Table:**

- \*\*Transaction\_ID (Primary Key):\*\* Unique identifier for each transaction.

- \*\*Borrower\_ID (Foreign Key):\*\* ID of the borrower involved in the transaction.

- \*\*Book\_ID (Foreign Key):\*\* ID of the book involved in the transaction.

- \*\*Transaction\_Type:\*\* Type of transaction (e.g., borrow, return).

- \*\*Transaction\_Date:\*\* Date of the transaction.

1. **Reservation\_Details Table:**

- \*\*Reservation\_ID (Primary Key):\*\* Unique identifier for each reservation.

- \*\*Borrower\_ID (Foreign Key):\*\* ID of the borrower who made the reservation.

- \*\*Book\_ID (Foreign Key):\*\* ID of the book reserved.

- \*\*Reservation\_Date:\*\* Date when the reservation was made.

- \*\*Status:\*\* Current status of the reservation (e.g., pending, fulfilled).

* These tables form the core structure of the library management system database. The **"is\_active"** column in each table allows for soft deletion by marking records as inactive rather than physically deleting them from the database. This approach retains data integrity while providing the ability to recover or permanently delete records as needed.

**Relationships:**

- \*\*Book\_Details to Category\_Details:\*\* Many-to-One relationship between books and categories.

- \*\*Borrower\_Details to Book\_Details:\*\* Many-to-Many relationship between borrowers and books.

- \*\*Borrower\_Details to Staff\_Details:\*\* Many-to-One relationship between borrowers and staff.

- \*\*Student\_Details to Borrower\_Details:\*\* One-to-Many relationship between students and their borrowing records.

- \*\*Shelf\_Details to Book\_Details:\*\* One-to-Many relationship between shelves and books.

- \*\*Book\_Details to Author\_Details:\*\* Many-to-Many relationship between books and authors.

- \*\*Book\_Details to Publisher\_Details:\*\* Many-to-One relationship between books and publishers.

- \*\*Transaction\_Details to Borrower\_Details:\*\* Many-to-One relationship between transactions and borrowers.

- \*\*Transaction\_Details to Book\_Details:\*\* Many-to-One relationship between transactions and books.

- \*\*Reservation\_Details to Borrower\_Details:\*\* Many-to-One relationship between reservations and borrowers.

- \*\*Reservation\_Details to Book\_Details:\*\* Many-to-One relationship between reservations and books.