1. **Library Management System**

**Tables**

1. Book

|  |  |  |
| --- | --- | --- |
| Attribute | Type | Description |
| book\_id | INT (PK) | Unique identifier for each book |
| title | VARCHAR | Title of the book |
| isbn | VARCHAR | International Standard Book Number |
| publisher | VARCHAR | Publisher name |
| publication\_year | YEAR | Year the book was published |
| copies\_available | INT | Number of available copies |
| category | VARCHAR | Category/Genre (e.g., Fiction, Science) |

1. Author

|  |  |  |
| --- | --- | --- |
| Attribute | Type | Description |
| author\_id | INT (PK) | Unique identifier for each author |
| name | VARCHAR | Full name of the author |
| bio | TEXT | Short biography or description |

1. Member

|  |  |  |
| --- | --- | --- |
| Attribute | Type | Description |
| member\_id | INT (PK) | Unique identifier for each member |
| name | VARCHAR | Full name of the member |
| email | VARCHAR | Email address |
| phone | VARCHAR | Contact number |
| address | TEXT | Residential address |
| membership\_date | DATE | Date the member registered |

1. Loan

|  |  |  |
| --- | --- | --- |
| Attribute | Type | Description |
| loan\_id | INT (PK) | Unique ID for each loan record |
| book\_id | INT (FK) | ID of the borrowed book |
| member\_id | INT (FK) | ID of the borrowing member |
| staff\_id | INT (FK) | ID of the staff managing the loan |
| loan\_date | DATE | Date when the book was borrowed |
| return\_date | DATE | Expected return date |
| actual\_return\_date | DATE | Actual return date (nullable) |
| status | ENUM | e.g., Borrowed, Returned, Overdue |

1. Staff

|  |  |  |
| --- | --- | --- |
| Attribute | Type | Description |
| staff\_id | INT (PK) | Unique ID for each staff member |
| name | VARCHAR | Full name |
| email | VARCHAR | Email address |
| role | VARCHAR | Role (e.g., Admin, Librarian) |
| username | VARCHAR | Login username |
| password | VARCHAR | Hashed password |

**User Roles and Their Activities**

|  |  |  |
| --- | --- | --- |
| Role | Description | Key Activities |
| 🧑‍💼 Staff | Employees or admins managing the library system. | - Add/edit/delete books- Register/edit/delete members- Manage loans (issue/return books)- View loan history- Add authors- View reports (overdue books, most borrowed) |
| 👤 Member | Regular users who borrow books from the library. | - View available books- Search for books by title, author, category- Borrow books (via request or directly)- Return books- View personal borrowing history |
| ✍️ Author | Person who wrote books in the system. (Not an active system user; their info is stored for reference.) | - Author details are managed by staff- No login or actions performed by authors themselves |
| 🌐 Browser/User Interface | The platform (web app or desktop app) used to interact with the system. | - Displays book catalog- Login interface for staff/members- Forms for borrowing, returning, and managing books- Responsive pages for search, book details, profile, and loan info |