

Data Dictionary

Entities Table

Table 1: Entites Table

Entity	Description	Attributes (Description)	Identifier
BOOK	Represents information about a book.	<ul style="list-style-type: none">● Book-ID (Identifier) - Unique identifier for each book.● ISBN - International Standard Book Number.● Title - Title of the book.● Author - Author of the book.● Genre - Genre of the book.● Edition - Edition of the book.● Availability - Availability status of the book.● Publication - Publication date of the book.● Storage Section ID - Identifier of the storage section where the book is located.● Language - Language of the book.	Book-ID

CATALOG	Represents the catalog of books.	<ul style="list-style-type: none"> • Catalog-ID (Identifier) - Unique identifier for each catalog entry. • Book-ID - Identifier of the associated book. • Description - Description of the catalog entry. • Availability - Availability status of the book in the catalog. • Condition - Condition of the book. 	Catalog-ID
STORAGE SECTION	Represents information about storage sections for books.	<ul style="list-style-type: none"> • Storage Section-ID (Identifier) - Unique identifier for each storage section. • Section Name - Name of the storage section. 	Storage Section-ID

LOAN	Represents information about book loans.	<ul style="list-style-type: none"> • Loan-ID (Identifier) - Unique identifier for each loan. • Book-ID - Identifier of the borrowed book. • Patron-ID - Identifier of the patron borrowing the book. • Check-Out Date - Date the book was checked out. • Due Date - Due date for returning the book. • Return Date - Date the book was returned. 	Loan-ID
PATRON	Represents information about patrons.	<ul style="list-style-type: none"> • Patron-ID (Identifier) - Unique identifier for each patron. • Name - Name of the patron. • Phone Number - Phone number of the patron. • Email - Email address of the patron. • Borrowing History - History of books borrowed by the patron. 	Patron-ID

LIBRARY ADMIN-STRATOR	Represents information about administrators.	<ul style="list-style-type: none"> • Admin-ID (Identifier) - Unique identifier for each administrator. • Name - Name of the administrator. • Patron-ID - Identifier of the associated patron (if applicable). 	Admin-ID
RESERVATION	Represents information about book reservations made by patrons.	<ul style="list-style-type: none"> • Reservation-ID (Identifier) - Unique identifier for each reservation. • Patron-ID - Identifier of the patron making the reservation. • Book-ID - Identifier of the reserved book. • Request Date - Date the reservation was requested. • Status - Current status of the reservation. • Reservation Date - Date the reservation was made. 	Reservation-ID

RENEWAL	Represents information about loan renewals.	<ul style="list-style-type: none"> • Renewal-ID (Identifier) - Unique identifier for each renewal. • Loan-ID - Identifier of the associated loan. • New Due Date - New due date after renewal. • Subscription - Subscription information related to the renewal. 	Renewal-ID
LATE FEE	Represents information about late fees for overdue books.	<ul style="list-style-type: none"> • Late Fee-ID (Identifier) - Unique identifier for each late fee. • Amount - Amount of the late fee • Loan-ID - Identifier of the associated loan. • Patron ID - Identifier of the patron with the late fee. 	Late Fee-ID
TRANSACTION	Represents information about transactions.	<ul style="list-style-type: none"> • Patron ID - Identifier of the patron involved in the transaction. • Return Date - Date of the return transaction. • Transaction ID - Unique identifier for each transaction. • Book ID - Identifier of the associated book. 	Transaction ID

Relationships Table

Table 2: Relationships Table

Relationship	Description	Component Entities	Attributes
contains	It associates catalogs with books	<ul style="list-style-type: none"> • Catalog (1,N) • Book (1,N) 	
manages	It associates the library administrator with the catalog and shows which patron modified the book	<ul style="list-style-type: none"> • Catalog (1,N) • Library administrator (1,N) 	It manages the attributes related to the search for Book ID, Catalog ID, and Admin ID in the catalog of available books
is stored	It associates the storage of books in the storage section	<ul style="list-style-type: none"> • Storage Section (1,N) • Book (1,1) 	
is lent	It associates books that are lent as loan	<ul style="list-style-type: none"> • Book (1,N) • Loan (1,1) 	
Borrowed by	It associates books that are borrowed by the patron and loans associated with the borrowed book	<ul style="list-style-type: none"> • Loan (1,1) • Patron (1,N) 	
placed	It associates reservations made by the patron	<ul style="list-style-type: none"> • Patron (1,N) • Reservation (1,1) 	
involves	It involves the transaction done by the patron	<ul style="list-style-type: none"> • Patron (1,N) • Transaction (1,1) 	
is requested	It associates transactions requested by the patron for renewal	<ul style="list-style-type: none"> • Transaction (1,1) • Renewal (1,1) 	

Applies to	It associates late fees that are applicable on a transaction	<ul style="list-style-type: none"> • Late Fee (1,1) 	
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External Constraints

- Protect data by creating frequent backups and an effective recovery procedure in the event of a system crash or data loss.
- Promote resource sharing, increase track options, and think about connecting with outside databases or services to improve compatibility with other library systems.
- To ensure accountability, assist in troubleshooting, and monitor security, keep an audit record of user activities and system modifications.
- Effectively control expenses by selecting equipment carefully and implementing SQL to guarantee reliable database support.

Functional Requirements Satisfaction Check

The system must allow:

1. **Store Information About Books:**
The system must allow the storage of information about books. The catalog should be organized with structured attributes such as title, author, ISBN, genre, and availability status.
2. **Store Detailed Patron Information:**
Patron records should be stored, encompassing attributes like name, contact information, and borrowing history.
3. **Facilitate Book Circulation:**
The system should enable patrons to check out and return books, specifying borrowing periods, tracking due dates, and managing overdue fines and return policies.
4. **Implement Intuitive Search and Retrieval System:**
Readers should be able to search for books using criteria like title, author, genre, or ISBN, facilitated by a user-friendly search interface.
5. **Allow Patrons to Reserve Books:**
A reservation system should be in place, allowing patrons to reserve books that are currently checked out, with notifications when the books become available.
6. **Support Administrative Functions:**
Administrators should be able to manage user accounts, configure system settings, set access permissions, and access reports and analytics assessing library usage and book availability.