library management

log in

include

username   password

search books

revers books

Return Books

add/remove books

add/remove student

dent

library

admin

Library Management system

Activity diagram for a library book issue process:

- (Start) → **Request for Book**
- → **Check Availibility**
- Decision:
  - **Available** → **Check Membership**
    - Decision:
      - **Member** → **Issue Book**
      - **Not Member** → **Register Member** → (decision) **Registered** → **Issue Book**
    - **Issue Book** → **Update Book Status** → (End)
  - **Not Available** → **Sorry! Book not Available** → (End)

Library

+String name

+String location

+Book[] books

+Member[] members

+Loan[] loans

+addBook(book: Book)

+removeBook(book: Book)

+registerMember(member: Member)

+unregisterMember(member: Member)

+loanBook(member: Member, book: Book)

+returnBook(member: Member, book: Book)

1   1   1

contains

1   *records*

1   *has*

Member

+String name

+String memberId

+Date membershipDate

+Loan[] currentLoans

+borrowBook(book: Book)

+returnBook(book: Book)

Book

+String title

+String author

+String isbn

+Boolean isAvailable

+loan() : : void

+return() : : void

*

1

1   *borrows*

*

can be found in

1

Loan

+Member member

+Book book

+Date loanDate

+Date dueDate

+Boolean isReturned

+markAsReturned() : : void

0..1

Library System Diagram

Entities (nodes):
- User
- Catalog
- Library System
- Authentication Service
- User Accounts
- Notifications
- Admin
- Book Inventory
- Book
- Reports
- Loan Management
- Loan Details

Relationships (edges):
- Authentication Service → User: Validates User
- User → Catalog: Searches for Book
- Catalog → User: Displays Results
- User → Library System: Registers
- Notifications → User: Sends Alerts
- User Accounts → User: Stores
- User → User Accounts: Updates
- Library System → Authentication Service: Authenticates
- Library System → User Accounts: Manages
- Loan Management → Library System: Oversees
- Authentication Service → Book Inventory: Manages
- User Accounts → Admin: Maintains
- Admin → User Accounts: Manages Users
- Admin → Book Inventory: Manages Books
- User Accounts → Loan Management: Shows Status
- User → Loan Management: Borrows Book
- Loan Management → User: Returns Book
- Notifications → Loan Management: Sends Reminders
- Admin → Reports: Views Reports
- Book Inventory → Reports: Generates Reports
- Book Inventory → Book: Updates Availability
- Loan Management → Book Inventory: Updates Inventory
- Book → Loan Management: Available for Borrowing
- Loan Management → Loan Details: Creates Loan Record

User	Librarian	Catalog	Database	NotificationService

Request to borrow a book

Check book availability

Book available

Book is available, please provide ID

Provides User ID

Update book status to borrowed

Borrowing confirmed

Send confirmation email

Email sent

Confirmation sent, enjoy your book!

Return the book

Check book return status

Book is in return status

Update book status to available

Return confirmed

Send return confirmation email

Email sent

Return confirmed, thank you!

Request for book due date

Fetch user book due date

Due date retrieved

Your due date is [date]

Ask about late fees

Check late fee for user

Late fee calculated

Your late fee is [amount]