Search / Borrow / Return / Reserve

Reports / Alerts

| User | ← → | Library Management System | ← → | Librarian |

Results / Confirmations / Fines

Approve / Manage Books

D2: User DB

D1: Book DB

Librarian

5.0 Reserve Book

Reservation confirmation

Reserve request

User

Fine payment request

Receipt

6.0 Pay Fine

Update fine record

D3: Transaction DB

Store reservation

D4: Reservation DB

4.0 Manage Users

3.0 Return Book

2.0 Issue Book

1.0 Search Book

User	UserID (PK) Name Email Phone JoinDate

	ResID (PK) ReserveDate ExpiryDate Status
Reservation	

1..* makes

1..* creates

Book	BookID (PK) Title ISBN Author Publisher Category Availability

1 reserved by many

manages

Librarian	LibID (PK) Name Email Phone

1..* involved in

	TransID (PK) IssueDate DueDate ReturnDate Status Fine
Transaction	

authorizes

lookup(query)

BookDB

searchBook(query)

results

User

reserveBook(bookId)

System

createReservation(userId, bookId)

ReservationDB

confirmReservation()

reservationCreated

notifyReservation()

Librarian

```
            ●
            │
            ▼
┌───────────────────────────┐
│  Identify Outstanding Fine │
└───────────────────────────┘
            │
            ▼
┌───────────────────┐
│  Initiate Payment  │
└───────────────────┘
            │
            ▼
         ◇ Process Payment ◇
            │
          Success
            │
            ▼
┌───────────────────┐
│ Update Transaction │
└───────────────────┘
            │                    Failure
            ▼
┌───────────────────┐
│  Generate Receipt  │
└───────────────────┘
            │
            ▼
           ◎
```

```
                    ┌──────────────────────────────────────────┐                                    ┌───────────────────────────────────────────────────────────┐
                    │        - userId: String  │ + register(): void          │         creates        │ - transId: String  │                              │
                    │ User   - name: String    │ + reserveBook(id: String): void │ ───────────────────── Transaction - issueDate: Date │ + calculateFine(): Double │
                    │        - email: String   │                             │                        │ - returnDate: Date │                              │
                    │        - phone: String   │                             │               makes    │ - fine: Double     │                              │
                    └──────────────────────────────────────────┘                                    └───────────────────────────────────────────────────────────┘
```

User
- userId: String
- name: String
- email: String
- phone: String

+ register(): void
+ reserveBook(id: String): void

creates

Transaction
- transId: String
- issueDate: Date
- returnDate: Date
- fine: Double

+ calculateFine(): Double

makes

involved

Book
- bookId: String
- title: String
- author: String
- category: String
- availability: Boolean

+ checkAvailability(): Boolean
+ updateStatus(avail: Boolean): void

manages

reserved for

Reservation
- resId: String
- reserveDate: Date
- expiryDate: Date
- status: String

+ cancel(): void

Librarian
- libId: String
- name: String

+ addBook(b: Book): void
+ approveReservation(resId: String): void

approves