

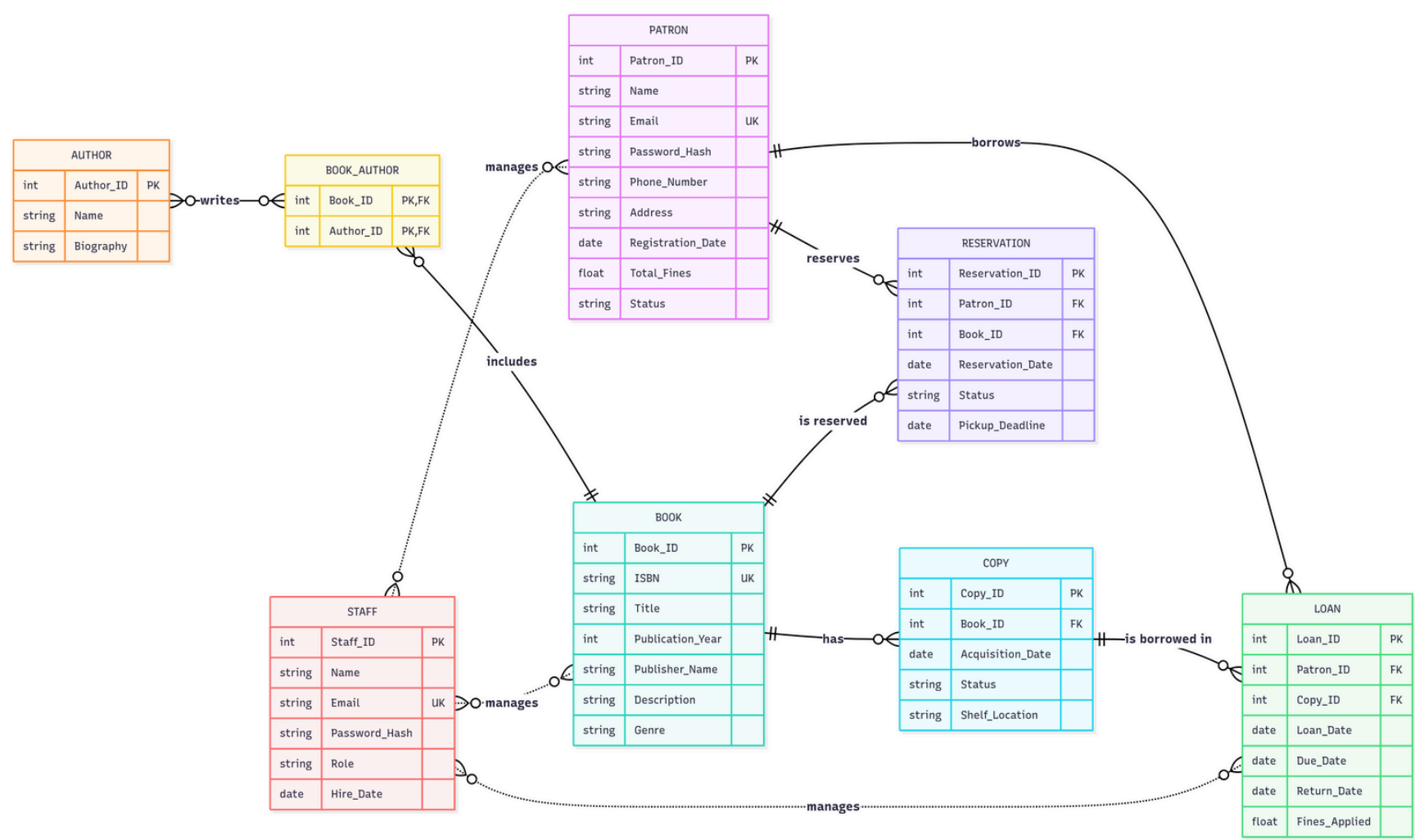
Assignment-2:

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Date: Sept 6, 2025

Entity-Relationship Diagram (ERD) for the Library Management System

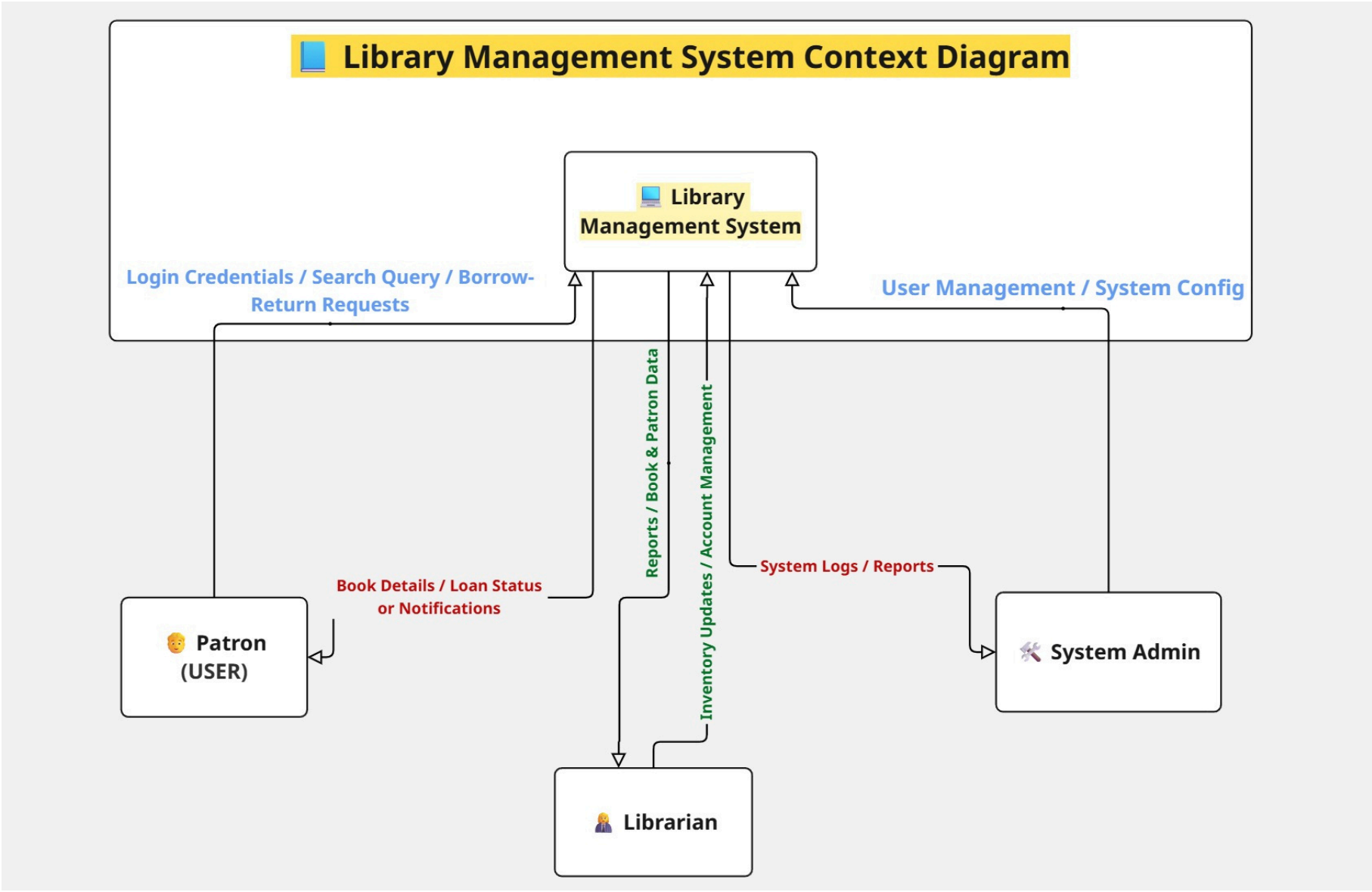
ERD showing the entities, their attributes (including primary keys and foreign keys), and the relationships between them with cardinality (1-M, M-N, 1-1).



Library Management System – Data Flow Diagrams (DFD):

Level-0 (Context Diagram)

- Shows the overall system as a single process.
- External entities: Patron, Librarian, Admin.
- Interactions: Login, Search, Borrow/Return, Reports, and User Management.

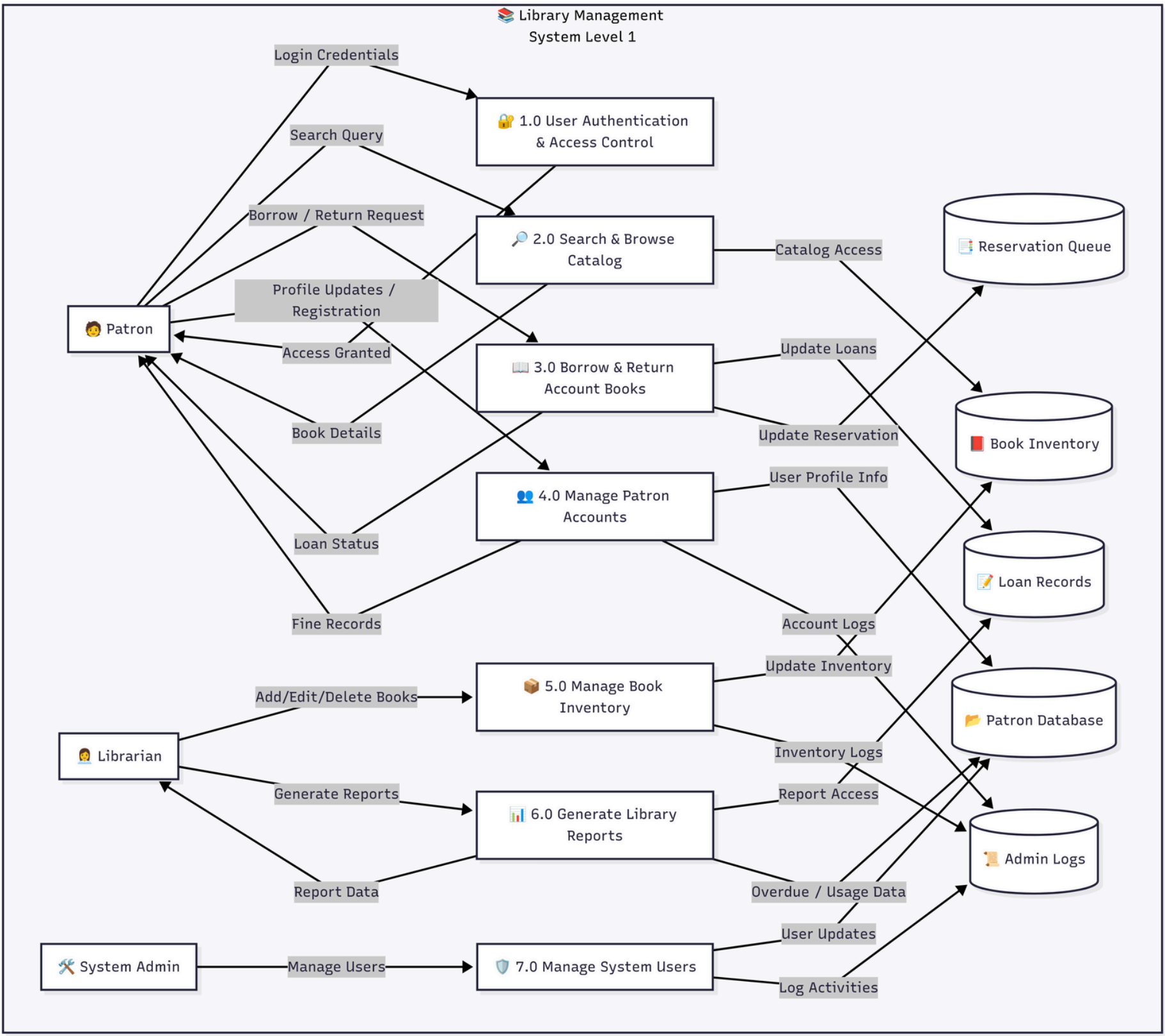


DFD Level-1 diagram for the Library Management System:

Breaks down the system into 7 main processes:

- 1. User Authentication & Access Control
- 2. Search & Browse Catalog
- 3. Borrow & Return Books
- 4. Manage Patron Accounts
- 5. Manage Book Inventory
- 6. Generate Library Reports
- 7. Manage System Users

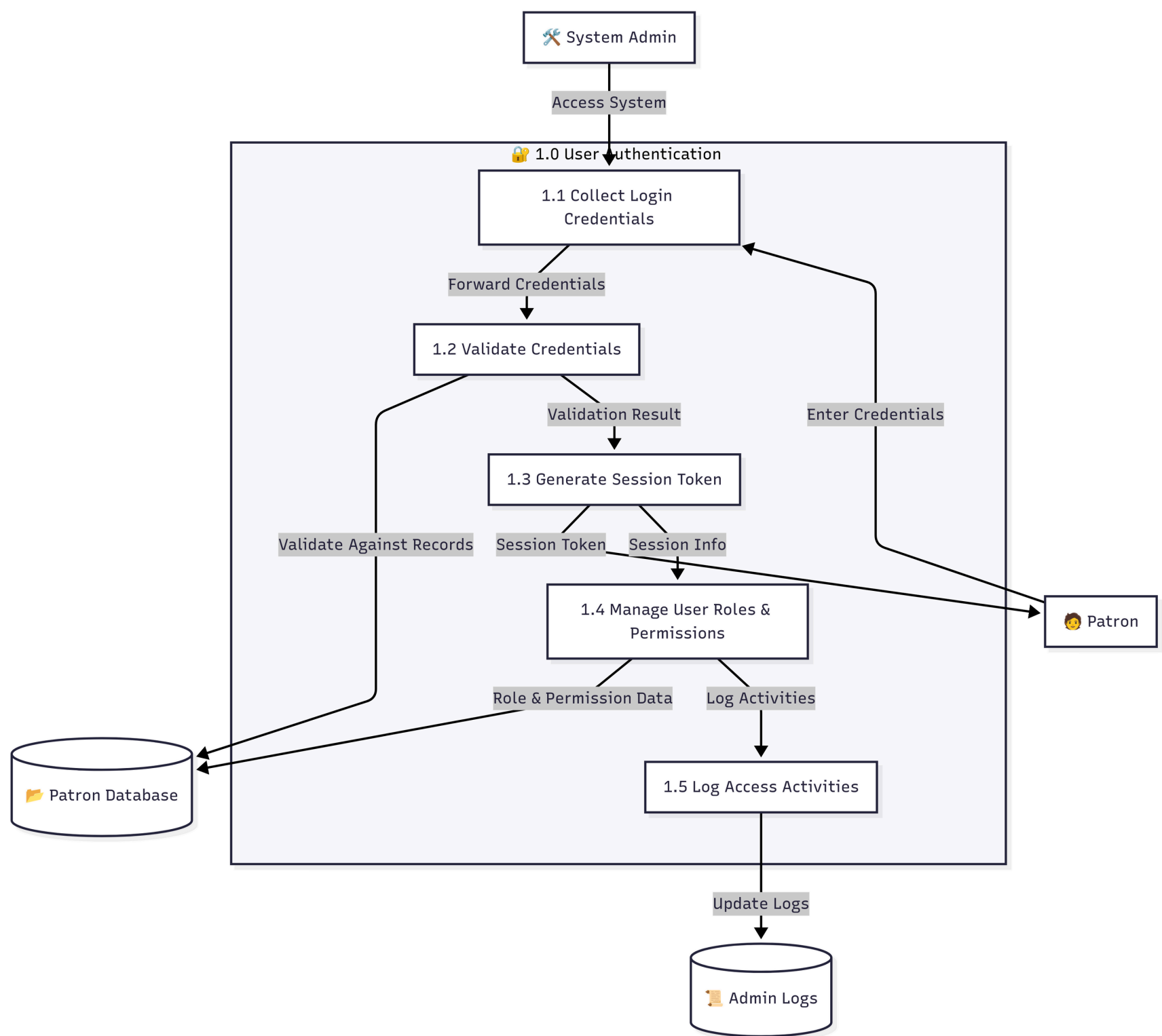
Includes data stores: Book Inventory, Patron Database, Loan Records, Reservation Queue, Admin Logs.



Level-2 DFDs

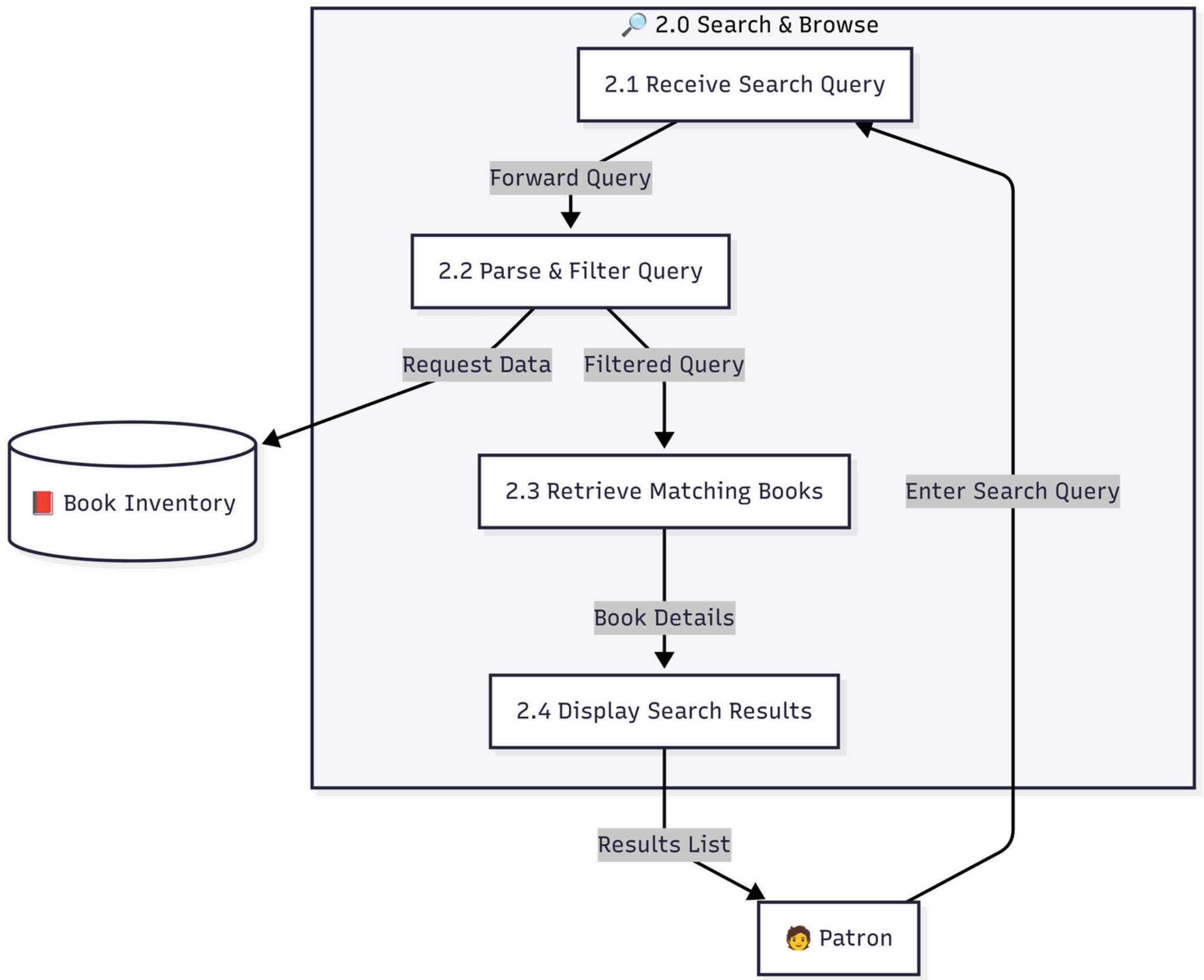
🔑 1.0 User Authentication & Access Control

Covers login, validation, session management, permissions, and activity logging.



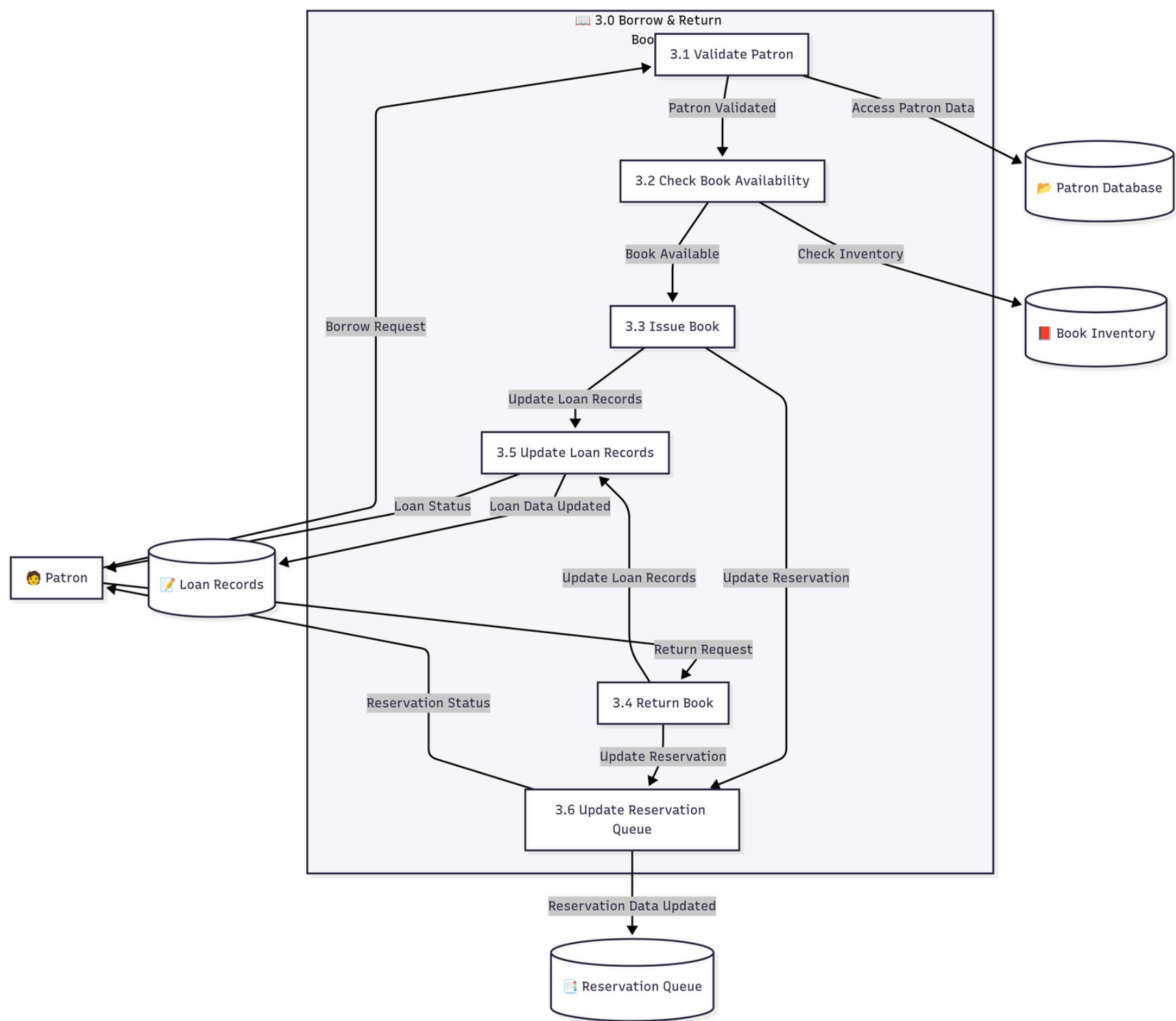
2.0 Search & Browse Catalog

Covers search query input, filtering, retrieving results from Book Inventory, and displaying results.



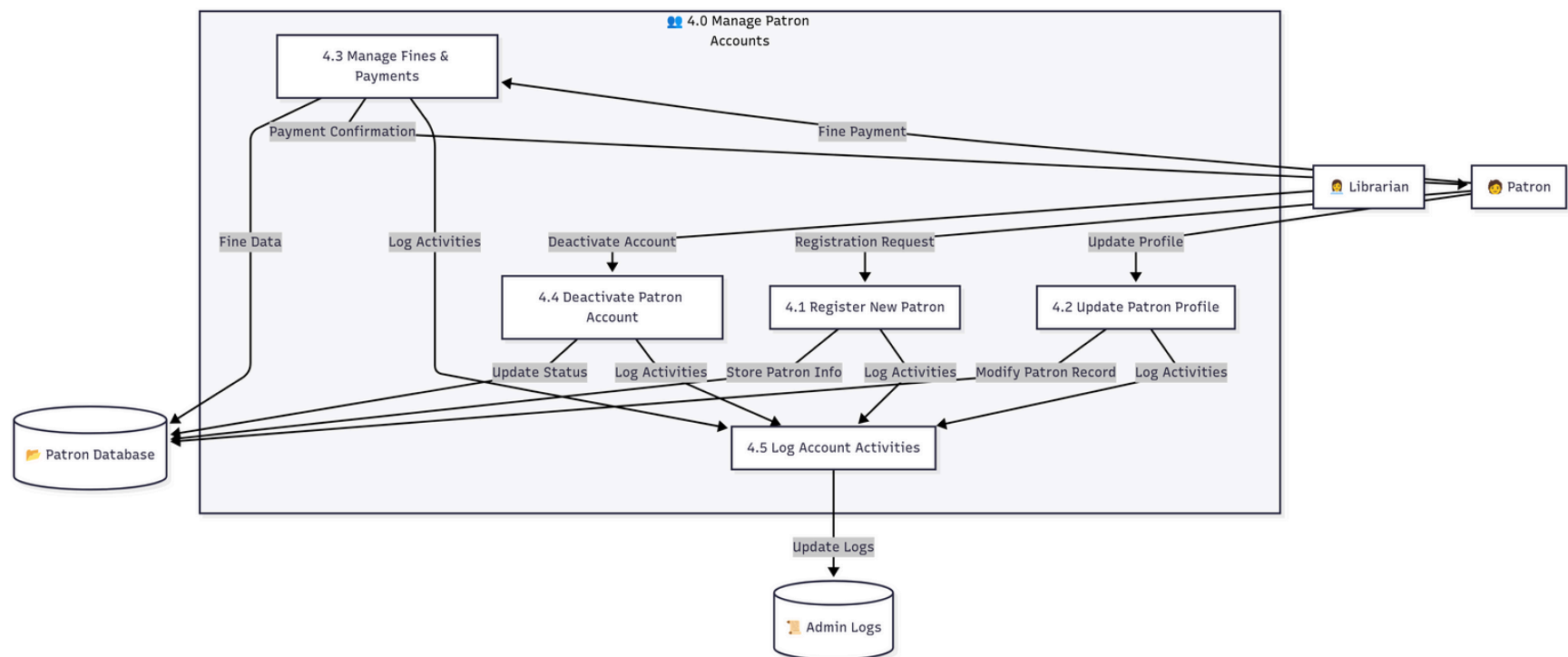
3.0 Borrow & Return Books

Covers patron validation, book availability check, issuing/returning books, updating loan records, and managing reservations.



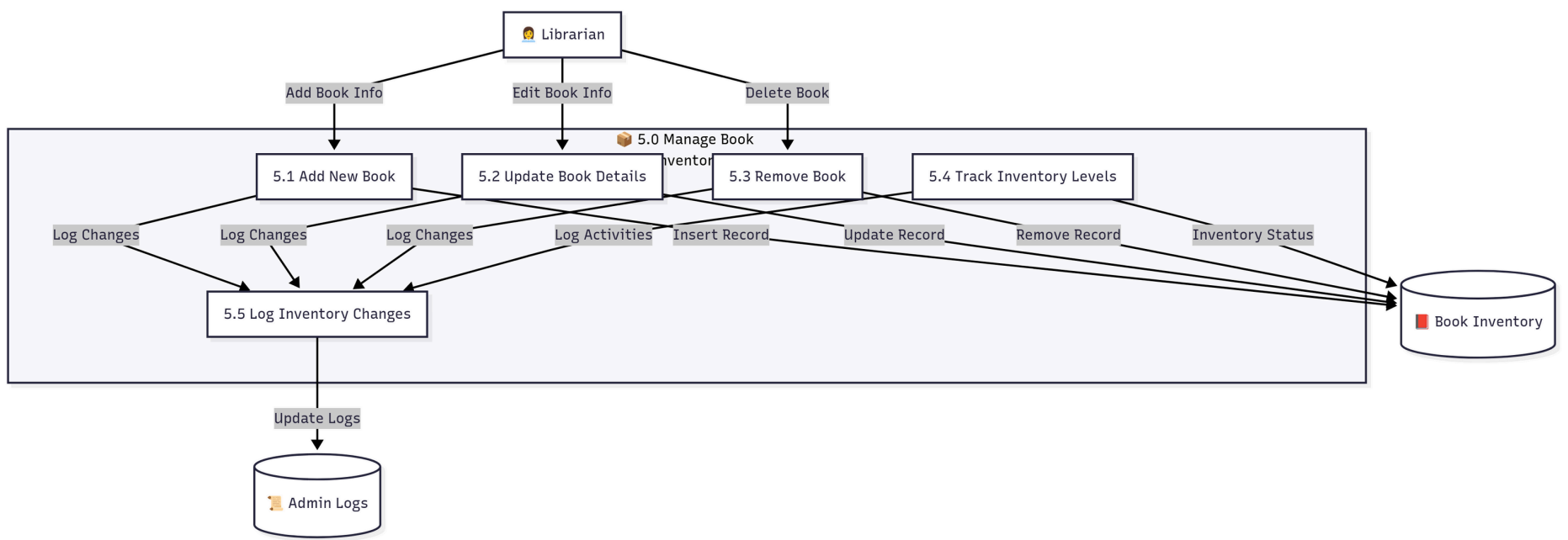
4.0 Manage Patron Accounts

Covers registration, profile updates, fines, account deactivation, and logging account activities.



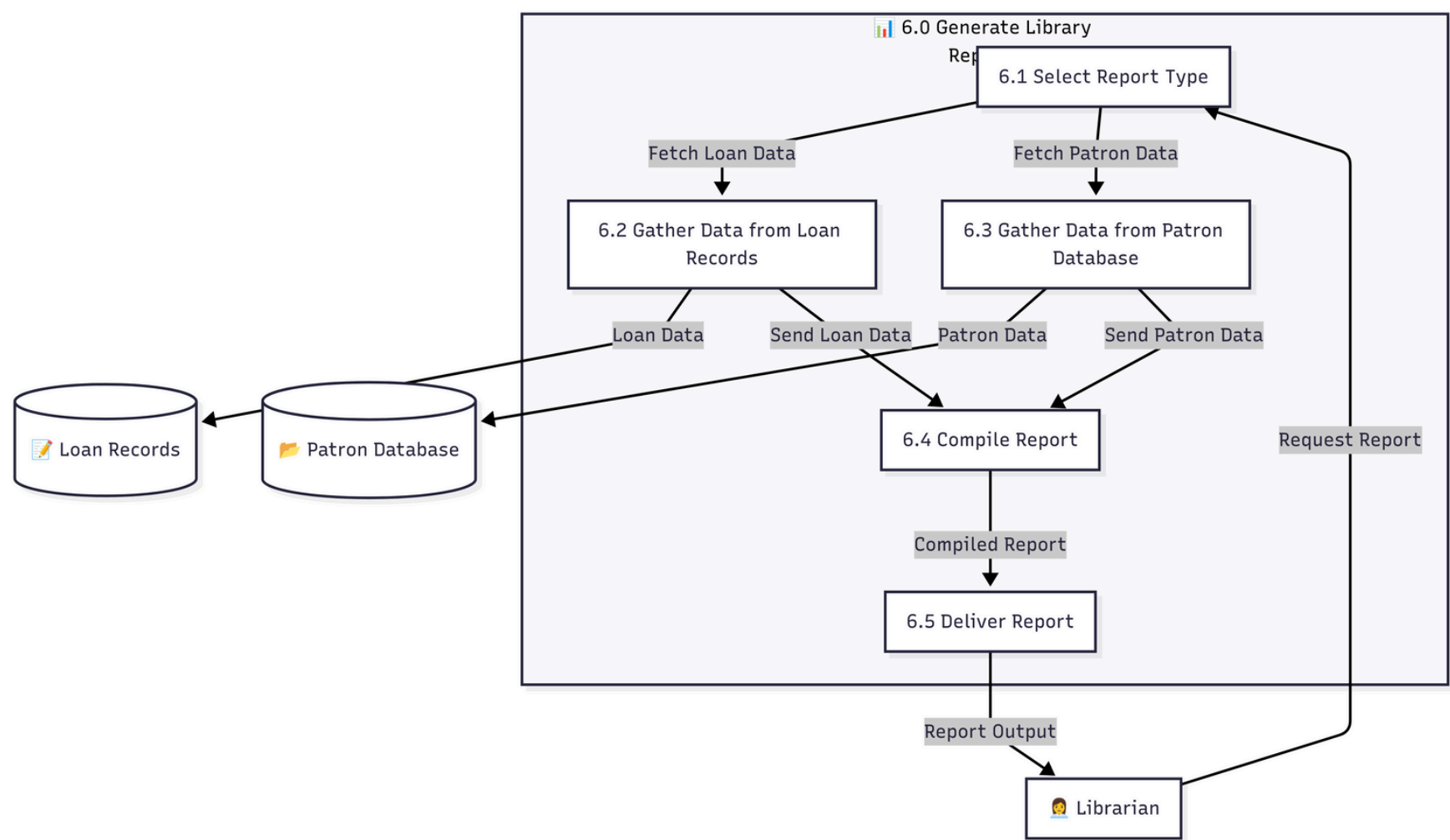
5.0 Manage Book Inventory

Covers adding, updating, deleting books, tracking inventory, and logging changes.



6.0 Generate Library Reports

Covers selecting report types, fetching data from Loan Records and Patron Database, compiling, and delivering reports.



7.0 Manage System Users

Covers adding, updating, assigning roles, removing users, and logging management activities.

