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CS312 Assignment 1 Solution

Fall 2026

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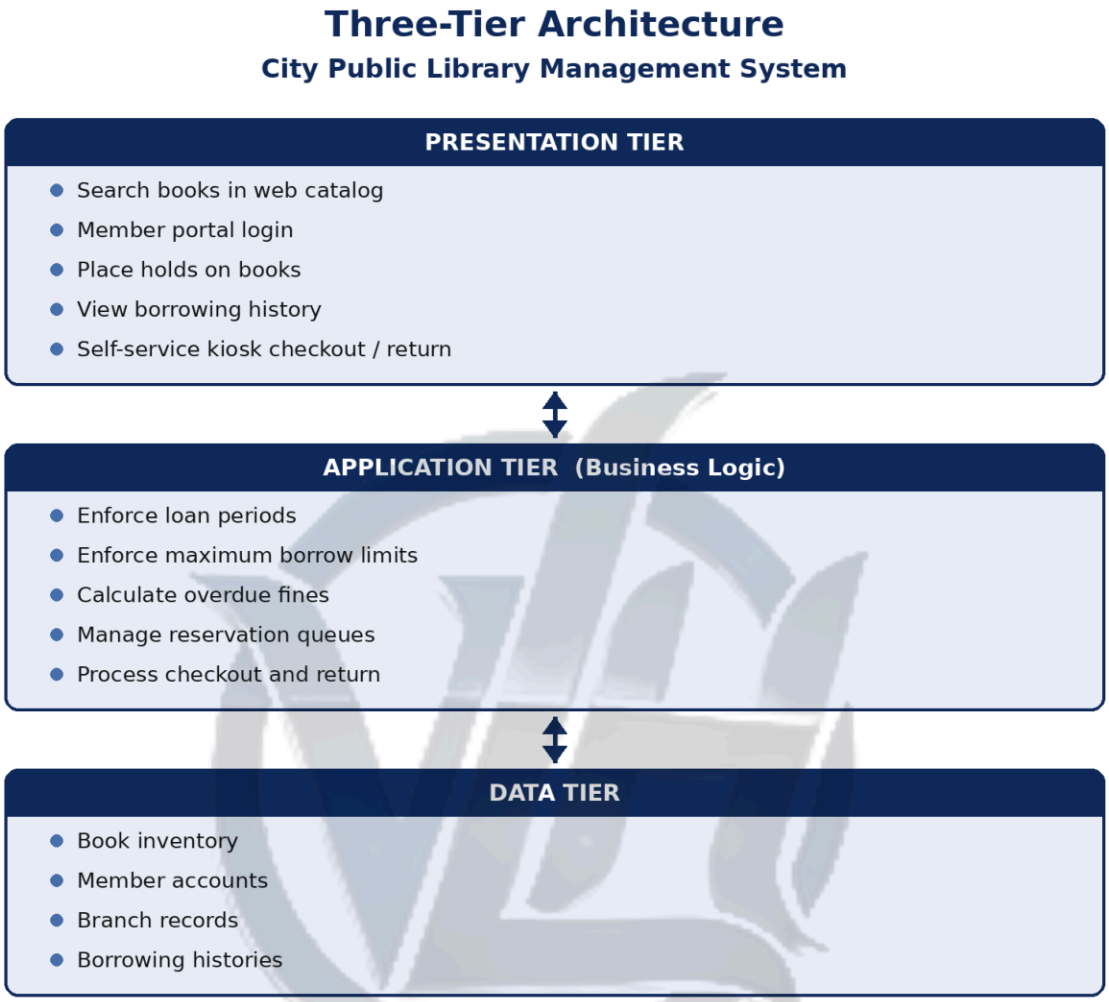
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CS312 — Database Modeling and Design

Assignment No. 1 — Fall 2026 | Sample Solution

Task 1: Three-Tier Architecture Diagram



Task 2: Functional Requirements

1. The system shall allow members to search the book catalog by title, author, ISBN, or subject, and view the availability of each book at every branch.

2. The system shall allow members to place a hold on a book that is currently on loan and join its reservation queue.

3. The system shall enforce lending rules: it shall apply the loan period for each book, check the member’s maximum borrow limit at checkout, and calculate overdue fines on late returns.

Task 3: Layer Independence

The case involves presentation-layer independence. The kiosk app is a new presentation layer (a new front end) that uses the same application layer (core business logic) and the same data layer (centralized database) without changing them. Because the layers are independent, adding a new client does not require any change in the lending rules or in the stored data; only a new presentation layer is added on top of the existing application and data layers.