

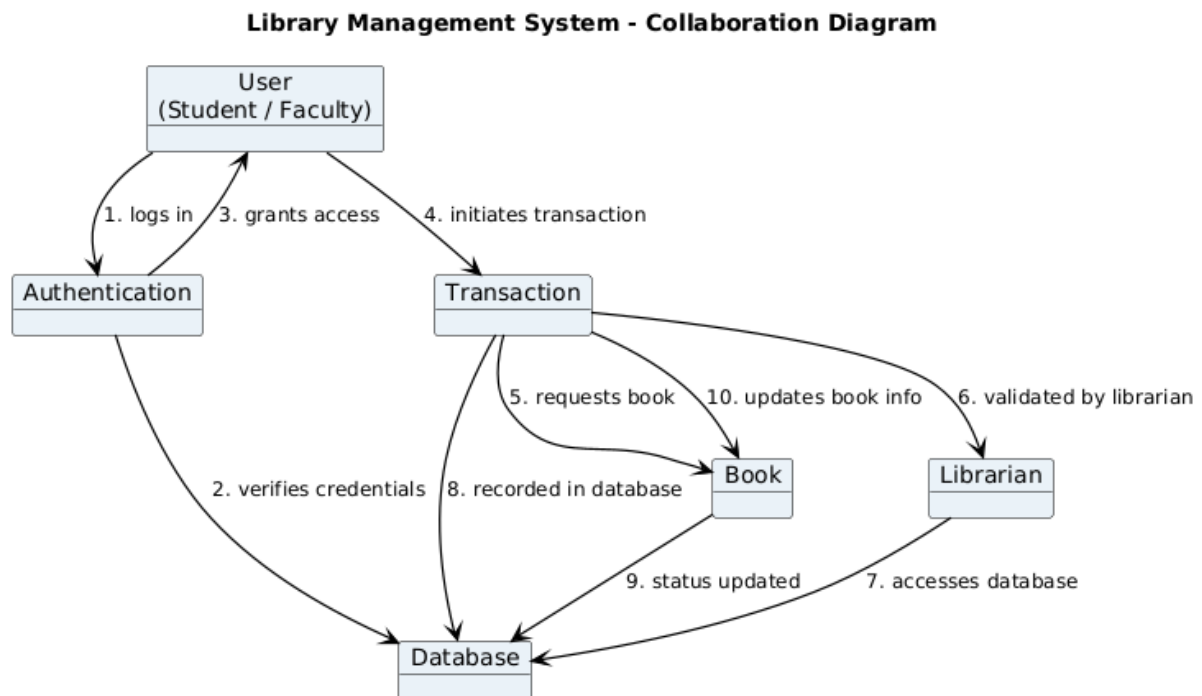
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University Library System (ULS)

This document presents the development plan of the University Library System (ULS) following the **Software Development Lifecycle (SDLC)** methodology. The system is intended to streamline the management of library resources, improve user experience, and support the university's library operations.



Collaboration Diagram Documentation: Library Management System

This document describes the sequence of interactions between objects within the Library Management System for the "Book Borrowing" scenario, as illustrated in the collaboration diagram.

Overview

A collaboration diagram shows how different software objects interact with each other by sending messages to accomplish a specific task. The diagram below details the numbered steps for a user to borrow a book.

Participating Objects

- **User (Student / Faculty):** The actor who initiates the process of borrowing a book.
 - **Authentication:** The object responsible for verifying the user's identity.
 - **Transaction:** An object created to manage the details of the book loan.
 - **Librarian:** The object representing the staff member who validates the transaction.
 - **Book:** The object representing the book being borrowed.
 - **Database:** The central object for storing and retrieving all system data.
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Interaction Sequence

The process unfolds in the following sequence of messages:

1. **logs in:** The **User** sends a login request to the **Authentication** object.
2. **verifies credentials:** The **Authentication** object sends the user's credentials to the **Database** for verification.
3. **grants access:** Upon successful verification, the **Authentication** object grants access back to the **User**.
4. **initiates transaction:** The logged-in **User** starts the borrowing process, creating a **Transaction** object.
5. **requests book:** The **Transaction** object requests the specific **Book** to be borrowed.
6. **validated by librarian:** The **Transaction** is sent to the **Librarian** object for validation and approval.
7. **accesses database:** The **Librarian** accesses the **Database** to confirm the user's status and book availability.
8. **recorded in database:** The **Transaction** object sends the loan details to be recorded permanently in the **Database**.
9. **status updated:** The **Book** object's status is updated in the **Database** to "issued" or "unavailable."
10. **updates book info:** The **Transaction** object updates the **Book** object's information to reflect the successful loan.