

NAME: RAJARSHI GHOSH

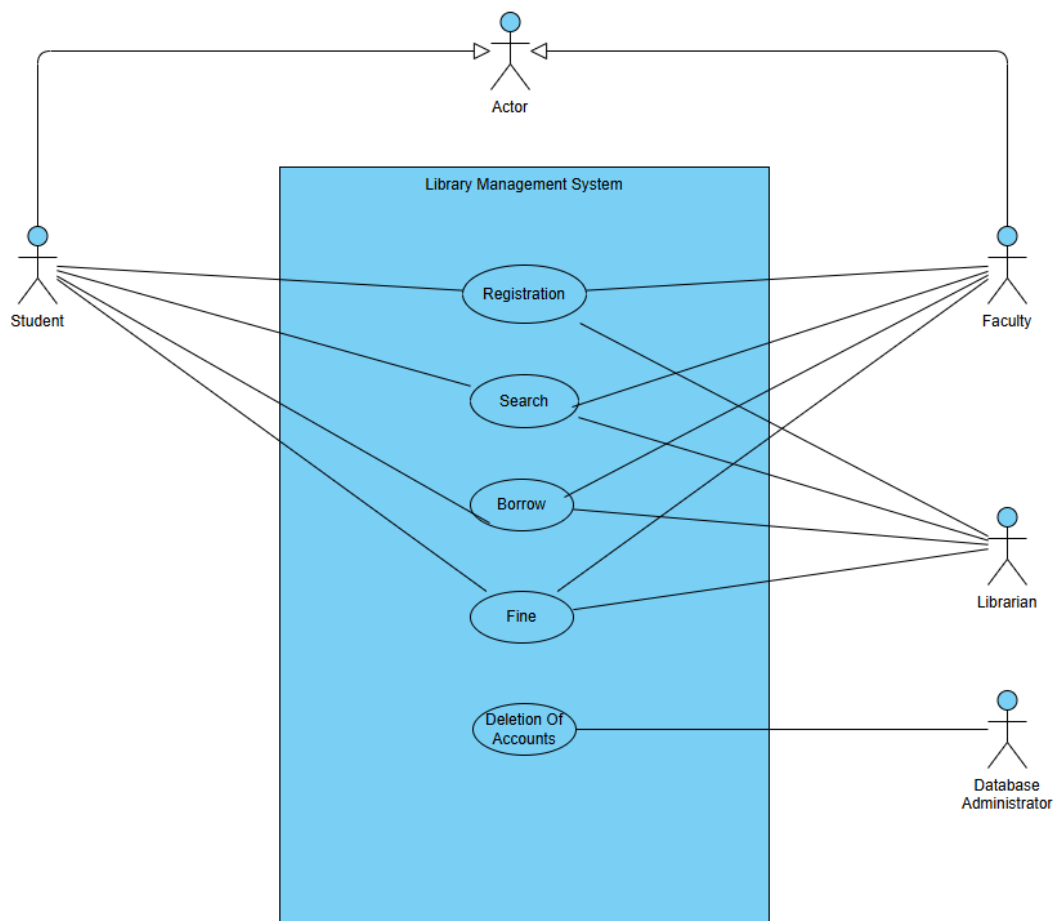
ROLL: 2023000218

Date: 23-07-25

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.

USE_CASE DIAGRAM:



Use Case Specification: University Library System

1. Introduction

This document provides a detailed description of the functionalities of the University Library System. It outlines the actors who interact with the system and the specific use cases they can perform. The primary goal is to define the system's behavior from a user's perspective.

Actors:

- **Student:** A registered member of the university who can borrow, return, and search for books.
 - **Librarian:** An employee of the library responsible for managing the library's collection, users, and overall system operations.
 - **System:** The automated University Library System itself.
-

2. Use Case Descriptions

UC-001: Login

- **Actors:** Student, Librarian
 - **Description:** Allows a user (Student or Librarian) to gain access to the system by providing valid credentials.
 - **Precondition:** The user must have an existing account with the system.
 - **Postcondition:** The user is logged into the system and can access functionalities relevant to their role.
 - **Main Flow:**
 1. The user navigates to the login page.
 2. The user enters their username and password.
 3. The user clicks the "Login" button.
 4. The System authenticates the user credentials. (<<include>> Authenticate User)
 5. The System grants access and displays the main dashboard corresponding to the user's role.
 - **Alternative Flows:**
 - **4a. Invalid Credentials:** If the System determines the credentials are invalid, an error message is displayed. The user remains on the login page.
-

UC-002: Search for a book

- **Actors:** Student, Librarian
 - **Description:** Allows a user to search the library catalog for books based on criteria such as title, author, or ISBN.
 - **Precondition:** The user must be logged into the system.
 - **Postcondition:** A list of books matching the search criteria is displayed to the user.
 - **Main Flow:**
 1. The user selects the "Search" option.
 2. The user enters search criteria (e.g., book title).
 3. The user initiates the search.
 4. The System queries the database and retrieves a list of matching books.
 5. The System displays the results, including book title, author, availability, and location.
 - **Alternative Flows:**
 - **4a. No Books Found:** If no books match the search criteria, the System displays a message indicating that no results were found.
-

UC-003: Borrow a book

- **Actors:** Student
- **Description:** Allows a student to check out a book from the library. This process is facilitated by the Librarian.
- **Precondition:** The Student is logged in, has selected a book, and has no overdue fines or exceeded borrowing limits. The Librarian is logged in.
- **Postcondition:** The book's status is updated to "Borrowed," and the loan is recorded against the student's account with a due date.
- **Main Flow:**
 1. The Student presents the book(s) and their library card to the Librarian.
 2. The Librarian scans the Student's ID to access their account.
 3. The Librarian scans the barcode of the book.
 4. The System verifies the Student's account status (no blocks or fines).
 5. The System verifies the book is available for loan.

6. The System updates the book's status to "Borrowed" and records the transaction in the Student's account.
 7. The System generates a due date for the loan.
- **Alternative Flows:**
 - **4a. Student Account Blocked:** If the student has outstanding fines or other blocks, the system denies the request and shows a notification.
 - **5a. Book Not Available:** If the book is reserved or not for loan, the system denies the request and shows a notification.
-

UC-004: Return a book

- **Actors:** Student
 - **Description:** Allows a student to return a borrowed book. This process is facilitated by the Librarian.
 - **Precondition:** The book was previously borrowed by the student. The Librarian is logged in.
 - **Postcondition:** The book is marked as "Available" in the system. The student's borrowing record is updated. If the return is late, a fine is calculated and applied.
 - **Main Flow:**
 1. The Student gives the borrowed book to the Librarian.
 2. The Librarian scans the book's barcode.
 3. The System identifies the book and the associated loan record.
 4. The System updates the book's status to "Available."
 5. The System checks if the book is overdue. If it is, the system proceeds to the "Pay Fine" use case.
 - **Alternative Flows:**
 - **5a. Book is Overdue:** The System calculates the fine and notifies the Librarian. The student is prompted to pay the fine.
-

UC-005: Pay fine

- **Actors:** Student

- **Description:** Enables a student to pay outstanding fines for overdue books. This is facilitated by the Librarian.
 - **Precondition:** The student has an outstanding fine on their account.
 - **Postcondition:** The fine is marked as paid, and any blocks on the student's account are removed.
 - **Main Flow:**
 1. The Librarian accesses the Student's account and views the outstanding fine.
 2. The Librarian confirms the fine amount with the Student.
 3. The Student pays the amount.
 4. The Librarian records the payment in the system.
 5. The System updates the student's account, clearing the fine and removing any associated blocks.
 - **Alternative Flows:**
 - None.
-

UC-006: Manage Users

- **Actors:** Librarian
- **Description:** Allows the Librarian to add, update, or delete student and other user accounts.
- **Precondition:** The user must be logged in as a Librarian.
- **Postcondition:** The user database is modified as per the Librarian's action.
- **Main Flow (Add User):**
 1. The Librarian selects the "Manage Users" function.
 2. The Librarian chooses to "Add New User."
 3. The Librarian enters the new user's details (Name, ID, User Type, etc.).
 4. The Librarian saves the new user record.
 5. The System creates the new user account and confirms its creation.
- **Alternative Flows:**

- **3a. Incomplete/Invalid Data:** If required fields are missing or data is invalid, the system displays an error and prompts the Librarian to correct the information.
-

UC-007: Manage Books

- **Actors:** Librarian
 - **Description:** Allows the Librarian to add new books to the catalog, update existing book information, or remove books from the collection.
 - **Precondition:** The user must be logged in as a Librarian.
 - **Postcondition:** The library's book catalog is modified.
 - **Main Flow (Add Book):**
 1. The Librarian selects the "Manage Books" function.
 2. The Librarian chooses to "Add New Book."
 3. The Librarian enters the book's details (ISBN, Title, Author, etc.).
 4. The Librarian saves the new book record.
 5. The System adds the book to the catalog and confirms its creation.
 - **Alternative Flows:**
 - **3a. Duplicate ISBN:** If a book with the same ISBN already exists, the system alerts the Librarian.
-

UC-008: Generate Reports

- **Actors:** Librarian
- **Description:** Allows the Librarian to generate various reports, such as lists of borrowed books, overdue items, popular books, or user statistics.
- **Precondition:** The user must be logged in as a Librarian.
- **Postcondition:** A report is generated and displayed to the Librarian, with options to print or export.
- **Main Flow:**
 1. The Librarian navigates to the "Reports" section.
 2. The Librarian selects the type of report to generate (e.g., "Overdue Books").

3. The Librarian specifies any parameters for the report (e.g., date range).
4. The Librarian initiates report generation.
5. The System processes the request, gathers the data, and generates the report.
6. The System displays the report.

- **Alternative Flows:**

- **5a. No Data Available:** If no data matches the report criteria, the system displays a message indicating an empty report.