| Use Case ID | UC1 |
| --- | --- |
| Actor | User |
| User Requirement | Search for Books |
| User Story | As a user, I want to search for books, so that I can find the materials I need. |
| Precondition | User must be logged into the library system. |
| Post-condition | Search results are displayed, showing available books. |
| Basic Process | (User) 1. The User logs into the library management system. (System) 2. The system presents the search interface. (User) 3. The User enters search criteria. (System) 4. The system processes the search query. (System) 5. The system displays the search results. (User) 6. The User browses through the results. |
| Extended Process | (Exception Handling) \*a. System failure during search: 1. The User logs back into the system. 2. The system restores the last saved search criteria. |

| Use Case ID | UC2 |
| --- | --- |
| Actor | User |
| User Requirement | View Book History |
| User Story | As a user, I want to view the history of books I have borrowed, so that I can keep track of my reading activity. |
| Precondition | User must be logged into the library system. |
| Post-condition | Book borrowing history is displayed to the user. |
| Basic Process | (User) 1. The User logs into the library management system. (System) 2. The System displays the user dashboard. (User) 3. The User selects the option to view book history. (System) 4. The System retrieves the user's borrowing history. (System) 5. The System displays the book history to the user. |
| Extended Process | (Exception Handling) \*a. System failure during history retrieval: 1. The User logs back into the system. 2. The System attempts to restore the borrowing history data. |

| Use Case ID | UC3 |
| --- | --- |
| Actor | User |
| User Requirement | Make Book Reservation |
| User Story | As a user, I want to reserve a book, so that I can ensure its availability for pickup. |
| Precondition | User must be logged into the library system. |
| Post-condition | Book is reserved for the user and a confirmation is sent. |
| Basic Process | (User) 1. The User logs into the library management system. (System) 2. The System presents the book catalog. (User) 3. The User selects a book to reserve. (System) 4. The System checks the book's availability. (System) 5. The System reserves the book for the user. (System) 6. The System sends a reservation confirmation to the user. |
| Extended Process | (Exception Handling) \*a. System failure during reservation: 1. The User logs back into the system. 2. The System attempts to reprocess the reservation. |

| Use Case ID | UC4 |
| --- | --- |
| Actor | User |
| User Requirement | Recommend Books |
| User Story | As a user, I want to recommend books to the library, so that they can be considered for acquisition. |
| Precondition | User must be logged into the library system. |
| Post-condition | Book recommendation is submitted and logged for review. |
| Basic Process | (User) 1. The User logs into the library management system. (System) 2. The System presents the recommendation interface. (User) 3. The User enters the book recommendation details. (System) 4. The System records the recommendation. (System) 5. The System sends a confirmation to the user. (System) 6. The System logs the recommendation for review by the library staff. |
| Extended Process | (Exception Handling) \*a. System failure during recommendation: 1. The User logs back into the system. 2. The System attempts to restore the recommendation details. |

| Use Case ID | UC5 |
| --- | --- |
| Actor | User |
| User Requirement | Cancel Book Reservation |
| User Story | As a user, I want to cancel a book reservation, so that the book is available for others. |
| Precondition | User must be logged into the library system. |
| Post-condition | Book reservation is canceled, and the book is made available for other users. |
| Basic Process | (User) 1. The User logs into the library management system. (System) 2. The System displays the user's active reservations. (User) 3. The User selects the reservation to cancel. (System) 4. The System processes the cancellation request. (System) 5. The System confirms the cancellation and updates the book's status. (System) 6. The System notifies the user of the successful cancellation. |
| Extended Process | (Exception Handling) \*a. System failure during cancellation: 1. The User logs back into the system. 2. The System attempts to reprocess the cancellation. |

| Use Case ID | UC6 |
| --- | --- |
| Actor | Administrator |
| User Requirement | Manage User Information |
| User Story | As an administrator, I want to manage user information, so that I can ensure records are up to date. |
| Precondition | Administrator must be logged into the library system. |
| Post-condition | User information is accurately entered, modified, or deleted. |
| Basic Process | (User) 1. The Administrator logs into the library management system. (System) 2. The System presents the user management interface. (User) 3. The Administrator selects a user management action (enter, modify, delete, inquire). (System) 4. The System processes the selected action. (System) 5. The System updates the user information accordingly. (System) 6. The System confirms the completed action to the Administrator. |
| Extended Process | (Exception Handling) \*a. System failure during user management: 1. The Administrator logs back into the system. 2. The System restores the last saved state of user information. |

| Use Case ID | UC7 |
| --- | --- |
| Actor | Administrator |
| User Requirement | Manage Book Information |
| User Story | As an administrator, I want to manage book information, so that the catalog is accurate and up-to-date. |
| Precondition | Administrator must be logged into the library management system. |
| Post-condition | Book information is accurately entered, modified, or deleted in the system. |
| Basic Process | (User) 1. The Administrator logs into the library management system. (System) 2. The System displays the book management interface. (User) 3. The Administrator selects a book management action (enter, modify, delete, inquire). (System) 4. The System processes the selected action. (System) 5. The System updates the book information accordingly. (System) 6. The System confirms the completed action to the Administrator. |
| Extended Process | (Exception Handling) \*a. System failure during book management: 1. The Administrator logs back into the system. 2. The System attempts to recover the last saved state of book information. |

| Use Case ID | UC8 |
| --- | --- |
| Actor | Administrator |
| User Requirement | Manage Subject Information |
| User Story | As an administrator, I want to manage subject information, so that the catalog remains accurate and organized. |
| Precondition | Administrator must be logged into the library management system. |
| Post-condition | Subject information is accurately entered, modified, or deleted in the system. |
| Basic Process | (User) 1. The Administrator logs into the library management system. (System) 2. The System displays the subject management interface. (User) 3. The Administrator selects a subject management action (enter, modify, delete, inquire). (System) 4. The System processes the selected action. (System) 5. The System updates the subject information accordingly. (System) 6. The System confirms the completed action to the Administrator. |
| Extended Process | (Exception Handling) \*a. System failure during subject management: 1. The Administrator logs back into the system. 2. The System attempts to recover the last saved state of subject information. |

| Use Case ID | UC9 |
| --- | --- |
| Actor | Administrator |
| User Requirement | Manage Book Copy Information |
| User Story | As an administrator, I want to manage book copy information, so that the inventory is accurate and up-to-date. |
| Precondition | Administrator must be logged into the library management system. |
| Post-condition | Book copy information is accurately entered, modified, or deleted in the system. |
| Basic Process | (User) 1. The Administrator logs into the library management system. (System) 2. The System displays the book copy management interface. (User) 3. The Administrator selects a book copy management action (enter, modify, delete, inquire). (System) 4. The System processes the selected action. (System) 5. The System updates the book copy information accordingly. (System) 6. The System confirms the completed action to the Administrator. |
| Extended Process | (Exception Handling) \*a. System failure during book copy management: 1. The Administrator logs back into the system. 2. The System attempts to recover the last saved state of book copy information. |

| Use Case ID | UC10 |
| --- | --- |
| Actor | Administrator |
| User Requirement | Manage Librarian Information |
| User Story | As an administrator, I want to manage librarian information, so that staff records are accurate and up-to-date. |
| Precondition | Administrator must be logged into the library management system. |
| Post-condition | Librarian information is accurately entered, modified, or deleted in the system. |
| Basic Process | (User) 1. The Administrator logs into the library management system. (System) 2. The System displays the librarian management interface. (User) 3. The Administrator selects a librarian management action (enter, modify, delete, inquire). (System) 4. The System processes the selected action. (System) 5. The System updates the librarian information accordingly. (System) 6. The System confirms the completed action to the Administrator. |
| Extended Process | (Exception Handling) \*a. System failure during librarian management: 1. The Administrator logs back into the system. 2. The System attempts to recover the last saved state of librarian information. |

| Use Case ID | UC11 |
| --- | --- |
| Actor | Administrator |
| User Requirement | View Recommended Books |
| User Story | As an administrator, I want to view books recommended by users, so that I can consider them for acquisition. |
| Precondition | Administrator must be logged into the library management system. |
| Post-condition | Recommended books are displayed for review. |
| Basic Process | (User) 1. The Administrator logs into the library management system. (System) 2. The System displays the dashboard. (User) 3. The Administrator selects the recommended books view. (System) 4. The System retrieves the list of recommended books. (System) 5. The System displays the recommended books to the Administrator. |
| Extended Process | (Exception Handling) \*a. System failure during retrieval: 1. The Administrator logs back into the system. 2. The System attempts to restore the last saved state of the recommended books list. |

| Use Case ID | UC12 |
| --- | --- |
| Actor | Librarian |
| User Requirement | Borrow a Book |
| User Story | As a librarian, I want to process book borrowings, so that users can take books home for reading. |
| Precondition | Librarian must be logged into the library system. The user requesting the book must have a valid library account. |
| Post-condition | The book is checked out and the borrowing record is updated in the system. |
| Basic Process | (User) 1. The Librarian logs into the library management system. (System) 2. The System displays the borrowing interface. (User) 3. The Librarian scans the book barcode. (System) 4. The System verifies the book's availability. (User) 5. The Librarian processes the user's library card. (System) 6. The System updates the book status to checked out and records the transaction. (System) 7. The System confirms the borrowing to the Librarian. |
| Extended Process | (Exception Handling) \*a. System failure during borrowing: 1. The Librarian logs back into the system. 2. The System attempts to restore the last saved transaction details. |

| Use Case ID | UC13 |
| --- | --- |
| Actor | Librarian |
| User Requirement | Renew a Book |
| User Story | As a librarian, I want to renew borrowed books, so that users can extend their borrowing period. |
| Precondition | Librarian must be logged into the library system. The user must have the book physically present or provide details for renewal. |
| Post-condition | The book's due date is updated, and the renewal is logged. |
| Basic Process | (User) 1. The Librarian logs into the library management system. (System) 2. The System displays the renewal interface. (User) 3. The Librarian enters or scans the book information. (System) 4. The System checks the book's renewal eligibility. (User) 5. If eligible, the Librarian confirms the renewal. (System) 6. The System updates the book's due date and records the renewal. (System) 7. The System confirms the renewal to the Librarian. |
| Extended Process | (Exception Handling) \*a. System failure during renewal: 1. The Librarian logs back into the system. 2. The System attempts to restore the last transaction state. |

| Use Case ID | UC14 |
| --- | --- |
| Actor | Librarian |
| User Requirement | Process Overdue Fee Payment |
| User Story | As a librarian, I want to process overdue fee payments, so that users can clear their dues and continue borrowing books. |
| Precondition | Librarian must be logged into the library system. The user must be present to pay the overdue fees. |
| Post-condition | Overdue fee is paid, and the payment is recorded in the system. |
| Basic Process | (User) 1. The Librarian logs into the library management system. (System) 2. The System displays the fee payment interface. (User) 3. The Librarian enters the user's account information. (System) 4. The System calculates the total overdue fees. (User) 5. The Librarian confirms and processes the payment. (System) 6. The System records the payment and updates the user's account status. (System) 7. The System confirms the payment to the Librarian. |
| Extended Process | (Exception Handling) \*a. System failure during payment processing: 1. The Librarian logs back into the system. 2. The System attempts to restore the last transaction state. |

| Use Case ID | UC15 |
| --- | --- |
| Actor | Librarian |
| User Requirement | Process Book Return |
| User Story | As a librarian, I want to process book returns, so that the inventory is updated and fees are cleared. |
| Precondition | Librarian must be logged into the library system. |
| Post-condition | The book is marked as returned, and the inventory is updated. Any overdue fees are calculated. |
| Basic Process | (User) 1. The Librarian logs into the library management system. (System) 2. The System displays the return interface. (User) 3. The Librarian scans the returned book. (System) 4. The System updates the inventory and checks for overdue fees. (User) 5. The Librarian informs the user of any fees. (System) 6. The System records the return transaction. |
| Extended Process | (Exception Handling) \*a. System failure during return: 1. The Librarian logs back into the system. 2. The System attempts to restore the last transaction state. |

| Use Case ID | UC16 |
| --- | --- |
| Actor | Scheduler |
| User Requirement | Check and Compute Overdue Fees |
| User Story | As a scheduler, I want to automate the process of checking overdue items and calculating fees, so that users are billed accurately. |
| Precondition | The system must have access to all loan records. |
| Post-condition | Overdue items are identified, and corresponding fees are calculated and logged. |
| Basic Process | (User) 1. The Scheduler initiates the overdue check process. (System) 2. The System reviews all active loans. (System) 3. The System identifies overdue items. (System) 4. The System calculates the overdue fee for each item. (System) 5. The System updates the user accounts with the calculated fees. (System) 6. The System logs the completed fee calculation. |
| Extended Process | (Exception Handling) \*a. System failure during processing: 1. The Scheduler logs back into the system. 2. The System attempts to resume the process from the last successful operation. |

| Use Case ID | UC17 |
| --- | --- |
| Actor | Scheduler |
| User Requirement | Due Soon Notification |
| User Story | As a scheduler, I want to notify users about books due soon, so they can return them on time. |
| Precondition | The system must have current loan records and user contact information. |
| Post-condition | Users are notified of items due soon via their preferred contact method. |
| Basic Process | (System) 1. The Scheduler initiates the due soon notification process. (System) 2. The System reviews all active loans to identify items due soon. (System) 3. The System compiles a list of users with items due soon. (System) 4. The System sends notifications to these users. (System) 5. The System logs the notification process. |
| Extended Process | (Exception Handling) \*a. System failure during notification: 1. The Scheduler logs back into the system. 2. The System attempts to continue from the last successful notification. |

| Use Case ID | UC18 |
| --- | --- |
| Actor | Scheduler |
| User Requirement | Countdown Suspension Day |
| User Story | As a scheduler, I want to count down suspension days for users with overdue items, so that they are informed of their suspension status. |
| Precondition | The system must have access to user accounts and item due dates. |
| Post-condition | The suspension countdown is updated for each applicable user. |
| Basic Process | (System) 1. The Scheduler initiates the suspension countdown process. (System) 2. The System identifies users with overdue items. (System) 3. The System calculates remaining suspension days for each user. (System) 4. The System updates user accounts with the new suspension countdown. (System) 5. The System logs the countdown updates. |
| Extended Process | (Exception Handling) \*a. System failure during countdown: 1. The Scheduler logs back into the system. 2. The System attempts to resume the countdown process from the last successful operation. |

| Use Case ID | UC19 |
| --- | --- |
| Actor | ThirdPartSystem |
| User Requirement | Send Notification Email |
| User Story | As a third-party system, I want to send notification emails to users, so that they are informed about their library status. |
| Precondition | The system must have access to user contact information and notification triggers. |
| Post-condition | Notification emails are sent to users effectively. |
| Basic Process | (System) 1. The ThirdPartSystem receives notification triggers. (System) 2. The System retrieves user contact information. (System) 3. The System compiles the notification content. (System) 4. The System sends the email notifications to users. (System) 5. The System logs the notification emails sent. |
| Extended Process | (Exception Handling) \*a. System failure during email sending: 1. The ThirdPartSystem retries sending the email. 2. The System logs any failed attempts. |