UML Sequence Diagrams: Library Management System

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0.1 Borrow a Book Sequence Diagram

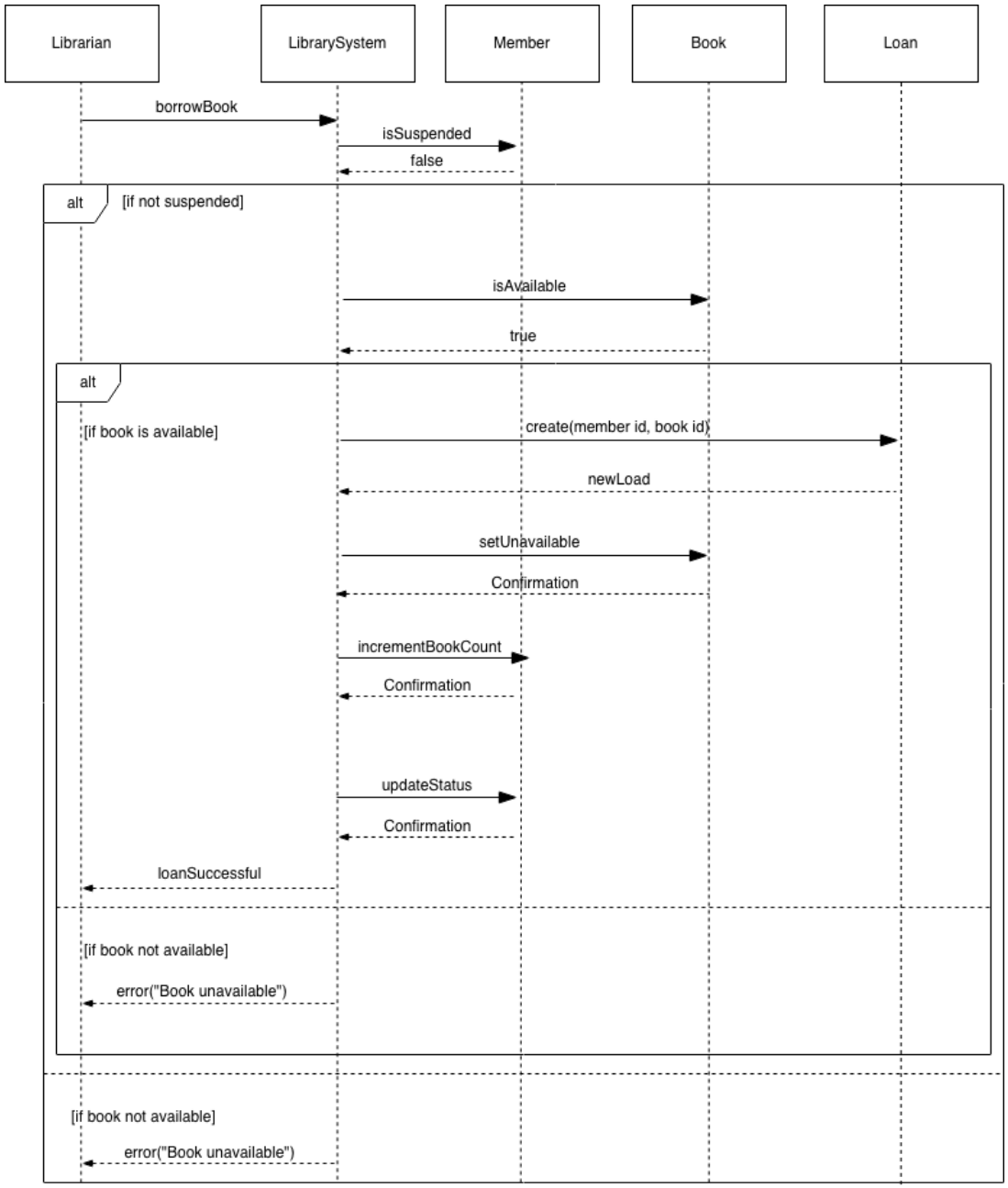

Figure 1: Sequence diagram for borrowing a book

The member goes to the counter, and the librarian selects the borrow functionality in the application. First, the system must check if the member has the right to borrow books by verifying if the member is already suspended and if they can still borrow books. Then it checks if there are any overdue books and updates the member status accordingly. Next, it must verify that the book is available. If everything is fine, a new loan is created with the loan date and return date, associated with the member and the chosen book. The book is marked as unavailable, the number of books borrowed by the member is incremented, and the member's status is updated.

0.2 Check Overdue Sequence Diagram

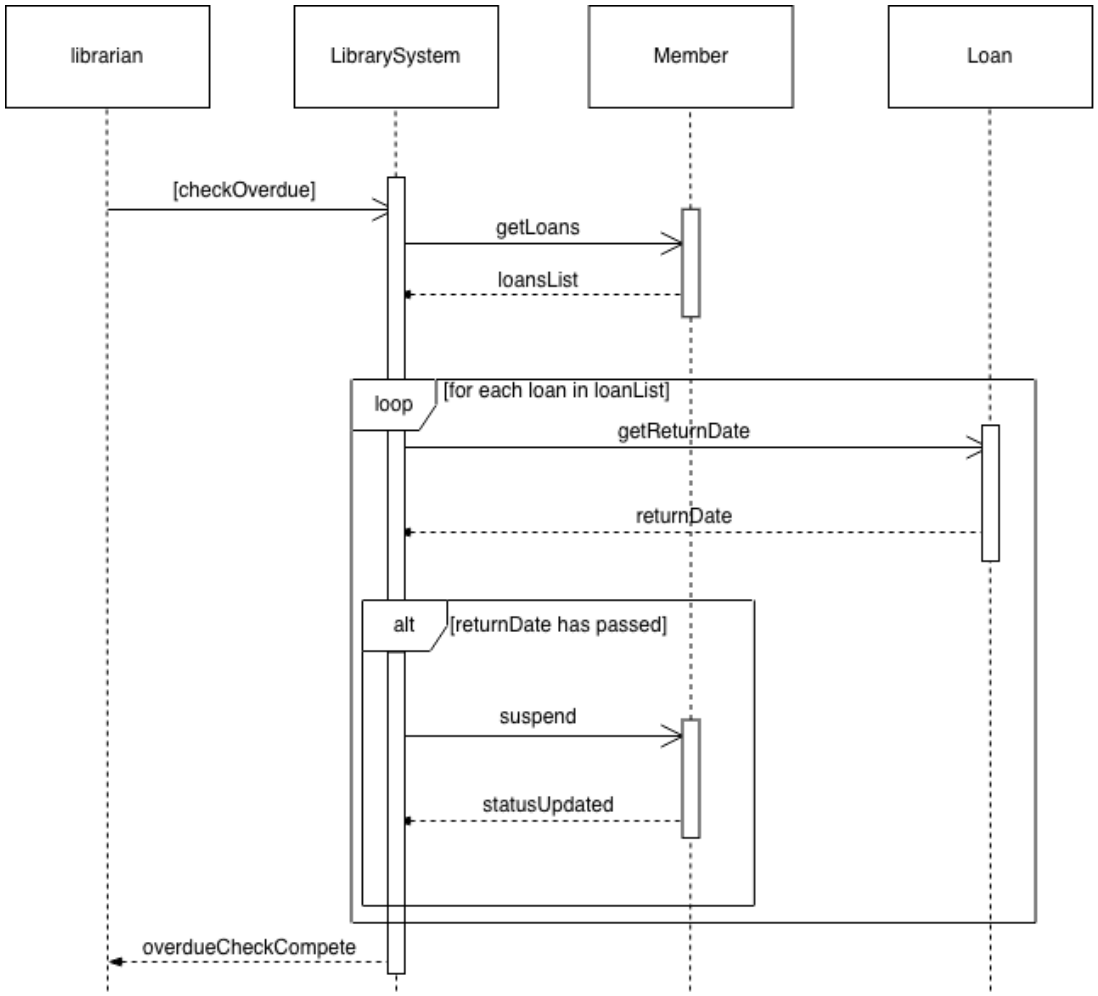

Figure 2: Sequence diagram for checking overdue items

The application checks if there is any overdue in the member's loans by retrieving all the loans of the member. For each loan, it checks if the return date has passed. If a return date has passed, it sets the member's status to suspended.

Conclusion

The sequence diagrams effectively model the key processes of the library management system. The "Borrow a Book" diagram demonstrates a robust validation workflow that integrates multiple checks to ensure system integrity, while the "Check Overdue" diagram shows an automated monitoring process that maintains library policies. Together, these diagrams provide a clear blueprint for implementing a reliable library management system that prevents unauthorized borrowings and efficiently handles overdue items.