Project Idea:

Library Management System

Creating a system for managing books, borrowers, and lending processes.

Functional Components:

1. User Management

2. Book Management

3. Lending Management

4. Search and Reporting

Use Case Diagram:

Actors:

- Librarian

- Borrower

Use Cases:

1. Register User (Librarian)

2. Add Book (Librarian)

3. Borrow Book (Borrower)

4. Return Book (Borrower)

5. Search Books (Librarian, Borrower)

6. Generate Report (Librarian)

Sequence Diagram:

Borrow Book Sequence:

1. Borrower requests to borrow a book.

2. System checks book availability.

3. System updates book status (borrowed).

4. System generates borrowing receipt.

5. Librarian confirms borrowing.

Sequence Diagram:

Return Book Sequence:

1. Borrower requests to return a book.

2. System checks book status (borrowed).

3. System updates book status (available).

4. System generates return receipt.

5. Librarian confirms return.

Class Descriptions for the class diagram.

1. Book: Abstract class with attributes ISBN, title, author, and publicationDate.

2. Textbook: Child class of Book, adding attributes edition and subject.

3. ReferenceBook: Child class of Book, adding attribute publisher.

4. Member: Class with attributes memberID, name, and membershipDate.

5. Borrowing: Class with attributes borrowingDate and returnDate.

6. Fine: Class with attributes fineAmount and fineDate.

\_Relationships:\_

1. Textbook and ReferenceBook inherit from Book.

2. Member is associated with Borrowing (borrows books).

3. Borrowing is associated with Book (specific book borrowed).

4. Borrowing is associated with Fine (fine incurred for late return).

Use Cases:

1. Add/Remove books

2. Register/Unregister members

3. Borrow/Return books

4. Calculate fines

5. Display book/member information

Methods

1. addBook

2. removeBook

3. registerMember

4. unregisterMember

5. borrowBook

6. returnBook

7. calculateFine

8. displayBookInfo

9. displayMemberInfo

Conclusion am creating a library management system to enhance search and discovery

Efficient resource management like reduce manual labour.

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