Midterm Question 1:  
  
**Class-Responsibility-Collaborator (CRC) Analysis for Library System**

**Part 1: Identify Classes**

**1. Book**

* Needed to represent individual books in the library, including their details and availability status.

**2. Member**

* Represents library members who can borrow and return books.

**3. Librarian**

* Manages the library collection by adding and removing books and tracking checked-out books.

**4. Library**

* Serves as a central system to maintain and manage book records, members, and transactions.

**Part 2: Define Responsibilities**

**1. Book**

* Maintain book details (title, author, ISBN, availability status).
* Update availability status when borrowed or returned.

**2. Member**

* Borrow books if within the borrowing limit.
* Return books and update borrowing records.

**3. Librarian**

* Add new books to the library collection.
* Remove outdated or lost books.
* View available books and track checked-out books with borrower details.

**4. Library**

* Maintain the collection of books.
* Manage borrowing and returning transactions.

**Part 3: Identify Collaborators**

**1. Book**

* **Collaborates with:** Member, Librarian, Library
* **Why:** Members borrow and return books; librarians manage book inventory; the library maintains book records.

**2. Member**

* **Collaborates with:** Book, Library
* **Why:** Members interact with books to borrow and return them; the library system tracks their transactions.

**3. Librarian**

* **Collaborates with:** Book, Library
* **Why:** Librarians manage the collection by adding or removing books and tracking borrowed books.

**4. Library**

* **Collaborates with:** Book, Member, Librarian
* **Why:** The library system connects books with members and librarians, ensuring efficient management of records and transactions.