LSP Midterm Question 1

### **Part 1: Identify Classes**

1. **Book**
   * Represents individual books in the library.
   * Tracks essential details like title, author, ISBN, and availability status.
   * Needed to manage the collection and facilitate borrowing/returning.
2. **Member**
   * Represents library members who borrow books.
   * Tracks the number of books borrowed and enforces borrowing limits of 3 books at a time.
   * Ensures members follow borrowing policies.
3. **Librarian**
   * Manages the library collection.
   * Can add and remove books as necessary.
   * Provides oversight of borrowed and available books.
4. **LibrarySystem**
   * Manages all interactions within the library.
   * Handles book borrowing, returning, and status tracking.
   * Provides librarians with system-wide views of books and members.

### **Part 2: Define Responsibilities**

1. **Book**
   * Maintain details about the book (title, author, ISBN, status).
   * Update availability status when borrowed or returned.
2. **Member**
   * Borrow books and ensure they do not exceed the borrowing limit.
   * Updates the system accordingly once books are returned
3. **Librarian**
   * Add new books to the collection.
   * Remove outdated or lost books.
   * View a list of available and checked-out books.
4. **LibrarySystem**
   * Track book availability and borrowing status.
   * Process borrow and return requests.
   * Generate reports on available and checked-out books.

### **Part 3: Identify Collaborators**

1. **Book**
   * Collaborates with **Member**: Updates availability when a member borrows/returns.
   * Collaborates with **LibrarySystem**: Keeps book records updated.
2. **Member**
   * Collaborates with **Book**: Requests books for borrowing and returning.
   * Collaborates with **LibrarySystem**: Checks borrowing eligibility and records transactions.
3. **Librarian**
   * Collaborates with **LibrarySystem**: Manages books and checks system records.
   * Collaborates with **Book**: Adds or removes books as necessary.
4. **LibrarySystem**
   * Collaborates with **Book**: Updates records when books are borrowed or returned.
   * Collaborates with **Member**: Ensures borrowing policies are enforced.
   * Collaborates with **Librarian**: Provides information for managing the collection.