

## **QUESTION 1**

### **1. Book**

- Represents a book in the library.
- Attributes: title, author, ISBN, availabilityStatus.
- Responsibilities
  - Store book details: Maintain information about the book, including its title, author, ISBN, and availability status.
  - Track availability status: Ensure that books can be marked as available or borrowed when a member checks out or returns them.
- Collaborators
  - Library : manages book records and interacts with the Book class when a book is added, removed, or borrowed.
  - Member : interacts with books when borrowing or returning them.

### **2. Member**

- Represents a library member who can borrow books.
- Attributes: name, memberID, borrowedBooks (list of books).
- Responsibilities
  - Borrow/return books: Allows a member to check out a book if they have fewer than three books borrowed.
  - Track borrowed books: Updates the availability status of a book when returned.
- Collaborators
  - Book : provides book objects that a member can borrow.
  - Library : ensures members comply with borrowing limits and updates records accordingly.

### **3. Librarian**

- Manages the library collection.
- Attributes: name, employeeID.
- Responsibilities
  - Add/remove books
  - Manage book availability : Provides access to lists of available books and books currently checked out.
- Collaborators
  - Book : managed by the librarian to ensure the collection is up to date.
  - Library : system is used to view, add, or remove books.

### **4. Library**

- Manages overall operations.
- Attributes: bookCollection (list of books), memberList (list of members).
- Responsibilities

- Maintain book collection : Maintains a list of all books and their availability status.
- Manage members : Keeps track of registered members and their borrowing history.
- Collaborators
  - Book : stored within the Library, and its availability is updated through transactions.
  - Member : interacts with the Library when borrowing or returning books.
  - Librarian : uses the Library system to manage books and enforce policies.