# OOP Exam

You have been tasked with developing a simple Library Management System using C#. The system will manage a collection of books, handle user memberships, and allow for book borrowing and returning.

**Create the following classes:**

- **Book**: Represents a book in the library.
- **Member**: Represents a library member.
- **Library**: Manages the collection of books and members.

**Class Book should have the following properties:**

- BookID (int)
- Title (string)
- Author (string)
- ISBN (string)
- IsBorrowed (bool)

**Class Member should have the following properties:**

- MemberID (int)
- Name (string)
- Email (string)
- BorrowedBooks (List<Book>)

**Class Library should have the following properties:**

- Books (List<Book>)
- Members (List<Member>)

Ensure the classes are properly encapsulated, with private fields and public properties where appropriate.

**In the Library class, implement the following methods:**

- AddBook(Book book): Adds a new book to the library's collection.
- AddMember(Member member): Adds a new member to the library.
- BorrowBook(int memberId, int bookId): Allows a member to borrow a book, updating the IsBorrowed status of the book and adding it to the member's BorrowedBooks list. If the book is already borrowed, return an appropriate message.
- ReturnBook(int memberId, int bookId): Allows a member to return a borrowed book, updating the IsBorrowed status of the book and removing it from the member's BorrowedBooks list. If the member did not borrow the book, return an appropriate message.

Ensure that the BorrowBook and ReturnBook methods handle edge cases such as invalid member or book IDs, books that are already borrowed, or members trying to return books they haven't borrowed.

**Create a subclass of Member called PremiumMember. This class should have additional properties:**

- MonthlyFee (decimal)
- DiscountRate (double)

**Override the BorrowBook method in PremiumMember to allow premium members to borrow books with a discount on late fees (assume the discount logic is already implemented elsewhere).**

**Demonstrate polymorphism by creating a list of Member objects containing both regular and premium members, and showing that the correct BorrowBook method is called for each type of member.**

**Create an interface called INotification with a method SendNotification(string message).**

**Implement this interface in the Member class to send notifications to members (e.g., when they borrow or return a book). For simplicity, the SendNotification method can just print the message to the console.**

**Ensure that both regular and premium members can send notifications.**