Project: Library Management System

Objective:

The goal of this project is to create a system for managing a library. The system should:

- Allow books and members to be added to the library.
- Allow members to borrow and return books.
- Track the status of books (available or borrowed).

Classes and Structure:

1. Book Class

- **Attributes**:
  - `title` (String): The title of the book.
  - `author` (String): The author of the book.
  - `ISBN` (String): A unique identifier for the book.
  - `isAvailable` (boolean): Indicates whether the book is currently available.
- **Actions**:
  - `borrowBook()`: Sets `isAvailable` to false when a book is borrowed.
  - `returnBook()`: Sets `isAvailable` to true when a book is returned.
  - `toString()`: Returns information about the book.

2. Member Class

- **Attributes**:
  - `name` (String): The name of the member.
  - `memberID` (int): A unique identifier for the member.

    - `borrowedBooks` (ArrayList<Book>): A list of books borrowed by the member.
- **Actions**:
    - `borrowBook(Book book)`: Allows the member to borrow a book and adds it to their list.
    - `returnBook(Book book)`: Allows the member to return a book and removes it from their list.
    - `toString()`: Returns information about the member.

3. Library Class

- **Attributes**:
    - `name` (String): The name of the library.
    - `books` (ArrayList<Book>): A list of books in the library.
    - `members` (ArrayList<Member>): A list of registered members in the library.
- **Actions**:
    - `addBook(Book book)`: Adds a new book to the library's collection.
    - `addMember(Member member)`: Adds a new member to the library's registry.
    - `removeBook(String ISBN)`: Removes a book with the specified ISBN from the library's collection.
    - `removeMember(int memberID)`: Removes a member with the specified ID from the library's registry.
    - `listAvailableBooks()`: Lists all books that are currently available in the library.
    - `toString()`: Returns information about the library.

4.Test Class: LocalLibrary

Finally, create a test class that uses these classes:

Goals of This Project

In this project, try to:

1. Design and connect classes properly with clear relationships between them.
2. Use *getter* and *setter* methods where necessary for encapsulation.
3. Test all scenarios in your test class: *adding books*, *adding members*, *borrowing*, and *returning books*.