

CT5210 Lab Work - Assignment 1

Library Book Borrowing System using Java

Objective:

During Lab, you will work in pairs to develop a simple console-based Library Book Borrowing System in Java. This assignment introduces **pair programming**, **SOLID principles**, and **Clean Architecture**.

System Features:

- Add a new book
- Register a library member
- Borrow a book
- Return a book
- View all available books

Project Rules:

- No database is required (use ArrayLists).
- No UML diagrams are required.
- No unit testing is required.
- Your code must follow the given folder structure.

Required Clean Architecture Folder Structure:

```
src/  
  entities/  
  usecases/  
  adapters/  
  frameworks/  
  main/
```

Week 1 Tasks:

- Create Entity classes: Book, Member, BorrowRecord
- Create Use Case classes: AddBookUseCase, RegisterMemberUseCase, BorrowBookUseCase, ReturnBookUseCase, ListBooksUseCase
- Create a Repository interface (LibraryRepository) used by all Use Cases

Week 2 Tasks:

- Implement InMemoryLibraryRepository using ArrayLists
- Create a simple Console Menu and Controller that calls the use cases
- Add ONE additional feature (search book OR borrowing limit, etc.)

Week 3 Task:

Prepare following Deliverables in a single file with 4 sections and upload on Canvas:

All uploads should be in 1 pdf file.

- **Section 1:** Paste Java source code (with separate classes and Clean Architecture folder structure) in MS Word file.
- **Section 2:** Take screenshots of Clean Architecture folder structure and output and paste them after the code. Output will also be verified in Lab by GTA/Lecturer.
- **Section 3:** Create a section **README** (in the same pdf) explaining where and how SOLID principles are applied? It will also include a reflection on your code.
- **Section 4:** Create a section **Clean Architecture mapping** and map each code component in a table

Submission Notes:

The project must be compiled and run from the console. Focus on clean design and separation of responsibilities.