

# Software Structured Design & Architecture

## Assignment 3

(20 Points)

You are responsible to develop the following system by implementing design patterns. In this assignment, TWO students need to form a group (pair) to jointly complete the assignment. The score of each student on this assignment will be determined with the group performance by considering individual contribution to the work.

**DEADLINE: 11:59pm on (Friday) January 27, 2019**

### System Overview

One university intends to develop an information system for its library. The system is required to provide the functionalities such as the search and management of the information of literature (books), user management, online literature reading and so on. The users of the system are composed of teachers (lecturers), students, and administrators, with their different permissions. For example, teachers and students are eligible to borrow books from the library, but with distinct access to book categories, maximum numbers and borrowing periods. You need to develop the essential functions as below:

**Component 1:** Develop different borrowing methods for different user objects e.g., teacher, undergraduate, and graduate, which are able to accommodate new (temporary) methods or adjustments in needed.

**Component 2:** In the initial design, library administrators can edit literature (book) information, maintain and manage user's information (e.g., teachers and students), such as generating report of borrowing records and overdue penalty payments and etc. In the future design, more user types can be added and administrators can grant the certain permission of user information management (e.g., creating or searching user info) to other departments or schools.

**Component 3:** Design the component of online literature reading that supports different document formats (e.g., Word, PDF, EPUB ...), each of which needs a dedicated document reader.

**Component 4:** Users have the permission to edit and update their personal information, administrators can receive the automatic notification once a user's info is updated.

Develop a library information system with the above components by applying the appropriate design patterns.

### **Assignment Deliverables**

- The system design specification with class diagrams for the design of the above components, indicating the design patterns applied for each component and elaborating the rationale for your choices. (10 points)
- The prototype of an executable library management system implementing the design. (8 points)
- Individual remark by each student in a pair: the summary of your own contribution plus the description of your personal experiences from this assignment (2 points each student)

The assignment deliverables should be in ZIP package that consists of an executable prototype, the source code, and an assignment report (with design specification), and submitted by ONLY one student of each pair. The size of the submitted package should be no more than 20MB. Each report contains about no more than 6 pages (A4 size) including a cover page that clearly indicates the students' names and IDs.