Programming Assignment

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1 Digital Library

This is a programming assignment to learn about object-oriented programming using Java.

SKKU plans to construct an online system for several digital libraries. You are the software developer for this system. Each library offers many books to rent. Students can see the list of available books, borrow books and return the borrowed books. The library manager for each library can add books and delete the added books.

1.1 Implementing Classes

For this system, you need to create classes: `Book` and `Library`.

1.1.1 Book

You need a class called `Book` to model books. This class defines methods to get the ID of a book (`int`), get the title of a book (`String`), get the author of a book (`String`), get the year of a book (`int`), check whether a book is available (`boolean`), borrow a book, and return a book.

1.1.2 Library

You need a class called `Library` to model libraries. This class defines methods to get the name of a library (`String`), add a book to a library, and delete a book from a library. In each library, every book has a unique ID.

1.2 Implementing GUI

You need to provide your own GUI to perform the following tasks on `Book` and `Library`.

- (T1) We can create a library with its name.
- (T2) We can add a book with its name, author, and year to a library. A book can be added even when the same book already exists in the library. In this case, we have multiple records for the same book. However, they have different IDs.
- (T3) We can delete a book with its ID from a library.

- (T4) We can see the list of all books available (i.e., those books that were not borrowed) at a library. The list of those books is sorted in ascending order of their IDs. The book information is displayed with its title, author, and year.
- (T5) We can borrow a book from the list of all books available at a library.
- (T6) We can return a book with its ID to the library holding the book.

1.3 Notes

- By default, you need to create two libraries ("Samsung Library" and "Central Library") and add five different books to each library, respectively. That is, when we run the program, each library holds five different books.
- You will be judged with the correct implementation of the tasks (T1–T6) in 1.2 on `Book` and `Library`. Your GUI implementation should be straightforward and intuitive.
- You need to provide proper *error messages* for unacceptable user requests (e.g., deleting a book when there is no book at a library).
- The maximum number of books at each library is 10. The maximum number of libraries is 3.
- Please test your code extensively with several situations if possible, so you are sure it works correctly.
- Please upload your source code (java files), and a document to explain how your program works for the tasks (T1–T6) in 1.2 to iCampus. You can use Korean for your document.
- **Your assignments must be your own original work.** We will use a tool to check for plagiarism in assignments.