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**CST2101 BUSINESS INTELLIGENCE PROGRAMMING**

**ASSIGNMENT 1**

**Objective:**

Create a Library Management System where users can borrow and return books. The system should manage the availability of books and track which books are borrowed by which users.

**Requirements:**

1. Book Class:

Attributes:

title: The title of the book.

author: The author of the book.

isbn: Unique identifier for each book (ISBN number).

available: Boolean to indicate if the book is available for borrowing.

Methods:

\_\_str\_\_(): Return a string representation of the book (title, author, ISBN, availability status).

2. User Class:

Attributes:

name: Name of the user.

user\_id: Unique ID for each user.

borrowed\_books: List to keep track of books the user has borrowed.

Methods:

borrow\_book(book): Allows a user to borrow a book if it's available.

return\_book(book): Allows the user to return a borrowed book.

\_\_str\_\_(): Return a string representation of the user and their borrowed books.

3. Library Class:

Attributes:

books: List to hold all books in the library.

users: List to hold all registered users.

Methods:

add\_book(book): Adds a new book to the library's collection.

add\_user(user): Registers a new user.

borrow\_book(user\_id, isbn): Allows a user to borrow a book by ISBN.

return\_book(user\_id, isbn): Allows a user to return a borrowed book by ISBN.

display\_books(): Display all books in the library.

display\_users(): Display all users registered in the library.

**Additional Requirements:**

* Implement inheritance by creating a subclass PremiumUser that inherits from User. Premium users can borrow up to 5 books at a time, while regular users can only borrow 3.
* Use polymorphism by overriding the borrow\_book() method in the PremiumUser class to allow the extra borrowing capacity.
* Handle file input/output by saving the list of books and users to a file and reading them back in the beginning. This ensures that the library retains its state between executions.

**Bonus:**

* Add a due date for borrowed books and notify users if they are overdue when returning.

**Submission Guidelines:**

* Submit the .pynb file with proper comments explaining the code.
* Save the file as Lastname\_Firstname\_Assign1.
* Plagiarism will be strictly monitored.
* Total Marks: 20

*All the best*