Lab 4 Overview

Group 7

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Our Library Managment Project allows for “books” to be created through a class and then stored into a “Library” that allows for a “Member” to check out a book or search for a book to see if available or within the “Library”. We have multiple getter methods like getAuthor, getTitle, and getAvailability within the Book class. It is also able to add the books into an ArrayList within the Library class with the addBook method in the Library class. Then we also had removeBook to remove a book from the library completely. Some more methods were displayBooks, borrowBooks, and searchBook inside the Library class to tell the user if we have a certain book and then allow them to checkout a book and then mark it as “Checked Out”. We also had a return book method that would check if the book was checked out and returned it if the user had checked that book out. We used multiple ArrayList to keep track of the books within the library and to keep track of who checked out which books. We use encapsulation and different getter methods to access variables within other classes.

**Class Descriptions**

Book Class

* Attributes: title, author, isAvailable
* Methods:
  + getTitle(): Returns book title.
  + getAuthor(): Returns book author.
  + getAvailability(): Returns book availability.
  + borrowBook(): Marks book as borrowed.
  + returnBook(): Marks book as available.

Library Class

* ArrayList of Book objects
* Methods:
  + addBook(): Adds a book to the ArrayList.
  + removeBook(): Removes a book from the ArrayList.
  + displayBooks(): Prints a list of every book in the ArrayList.
  + borrowBook(): Marks book as borrowed.
  + returnBook(): Marks book as available.

Member Class

* Attributes: name
* ArrayList of String objects
* Methods:
  + getName(): Returns member name.
  + borrowBook(): Marks book as borrowed.
  + returnBook(): Marks book as available.

**Test Cases**

|  |  |
| --- | --- |
| Action | Expected Output |
| Add a book | Book added successfully |
| Search a book | Displays all books with that name |
| Borrow a book | Book availability status updated |
| Return a book | Book availability status updated |
| Remove a book | Book successfully removed |

**Challenges and Solutions**

We had an issue where one member could return a book checked out by another member. Now members have an ArrayList of their borrowed books so only they can return those books.

**References**

https://docs.oracle.com/javase/8/docs/api/java/util/ArrayList.html