COIS 2240H

Assignment 1

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Dikshith Reddy Macherla

Student Id : 0789055

Bachelor Of Computer Science, Trent University

COIS 2240H: Software Design and Modelling

Professor : Alaadin Addas

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Assignment 1 Screenshots

Test 1: Add a new book and display the library

```
Initial Library State:

Title: Java Fundamentals, Author: John Doe, ISBN: 123456789, Available: true
Title: Advanced Java Programming, Author: Jane Smith, ISBN: 987654321, Available: true
File Size: 1.5MB, Format: PDF
Title: Learning Java, Author: Jim Bean, ISBN: 192837465, Available: true
Duration: 10.0 hours, Audio Format: MP3

Test 1: Add a new book and display the library

Expected output: The library should list 'Effective Java' among the books.

Final Library State:

Title: Java Fundamentals, Author: John Doe, ISBN: 123456789, Available: true
Title: Advanced Java Programming, Author: Jane Smith, ISBN: 987654321, Available: true
File Size: 1.5MB, Format: PDF
Title: Learning Java, Author: Jim Bean, ISBN: 192837465, Available: true
Duration: 10.0 hours, Audio Format: MP3
Title: Effective Java, Author: Joshua Bloch, ISBN: 1122334455, Available: true
```

Test 2: Check out an available book and verify its status

```
Initial Library State:

Title: Java Fundamentals, Author: John Doe, ISBN: 123456789, Available: true
Title: Advanced Java Programming, Author: Jane Smith, ISBN: 987654321, Available: true
File Size: 1.5MB, Format: PDF
Title: Learning Java, Author: Jim Bean, ISBN: 192837465, Available: true
Duration: 10.0 hours, Audio Format: MP3
Title: Effective Java, Author: Joshua Bloch, ISBN: 1122334455, Available: true

Test 2: Check out an available book and verify its status
Checking out 'Effective Java'
Effective Java has been checked out.

Expected output: 'Effective Java' should be marked as not available.
Book availability: Not Available

Final Library State:

Title: Java Fundamentals, Author: John Doe, ISBN: 123456789, Available: true
Title: Advanced Java Programming, Author: Jane Smith, ISBN: 987654321, Available: true
File Size: 1.5MB, Format: PDF
Title: Learning Java, Author: Jim Bean, ISBN: 192837465, Available: true
Duration: 10.0 hours, Audio Format: MP3
Title: Effective Java, Author: Joshua Bloch, ISBN: 1122334455, Available: false
Title: Effective Java, Author: Joshua Bloch, ISBN: 1122334455, Available: true
```

Test 3: Return a book that has been checked out

```
Initial Library State:

Title: Java Fundamentals, Author: John Doe, ISBN: 123456789, Available: true
Title: Advanced Java Programming, Author: Jane Smith, ISBN: 987654321, Available: true
File Size: 1.5MB, Format: PDF
Title: Learning Java, Author: Jim Bean, ISBN: 192837465, Available: true
Duration: 10.0 hours, Audio Format: MP3

Effective Java has been checked out.
Test 3: Return a book that has been checked out
Returning 'Effective Java'
Effective Java has been returned.
Expected output: 'Effective Java' should be marked as available after being returned.
Book availability: Available

Final Library State:

Title: Java Fundamentals, Author: John Doe, ISBN: 123456789, Available: true
Title: Advanced Java Programming, Author: Jane Smith, ISBN: 987654321, Available: true
File Size: 1.5MB, Format: PDF
Title: Learning Java, Author: Jim Bean, ISBN: 192837465, Available: true
Duration: 10.0 hours, Audio Format: MP3
Title: Effective Java, Author: Joshua Bloch, ISBN: 1122334455, Available: true
```

Test 4: Attempt to return a book that has never been checked out

```
Initial Library State:

Title: Java Fundamentals, Author: John Doe, ISBN: 123456789, Available: true
Title: Advanced Java Programming, Author: Jane Smith, ISBN: 987654321, Available: true
File Size: 1.5MB, Format: PDF
Title: Learning Java, Author: Jim Bean, ISBN: 192837465, Available: true
Duration: 10.0 hours, Audio Format: MP3

Test 4: Attempt to return a book that has never been checked out
Attempting to return 'Effective Java'
Error in returning book or book not found.
Expected output: The attempt should fail with a message indicating that the book was not checked out.

Final Library State:

Title: Java Fundamentals, Author: John Doe, ISBN: 123456789, Available: true
Title: Advanced Java Programming, Author: Jane Smith, ISBN: 987654321, Available: true
File Size: 1.5MB, Format: PDF
Title: Learning Java, Author: Jim Bean, ISBN: 192837465, Available: true
Duration: 10.0 hours, Audio Format: MP3
Title: Effective Java, Author: Joshua Bloch, ISBN: 1122334455, Available: true
```

The UML diagram

AudioBook

- duration: double: The length of the audiobook in hours.
- audioFormat: String: The format of the audiobook (e.g., MP3, WAV).

+ getDuration(): double
+ setDuration(duration: double): void
+ getAudioFormat(): String
+ setAudioFormat(audioFormat: String): void
+ displayDetails(): void: This method should be overridden to include audiobook-specific details when displaying the book's information.

Book

- title: String: The title of the book.
- author: String: The author's name.
- isbnNumber: String: The ISBN number of the book, a unique identifier.
- isAvailable: boolean: A flag indicating whether the book is available for checkout.

+ getTitle(): String
+ setTitle(title: String): void
+ getAuthor(): String
+ setAuthor(author: String): void
+ getIsbnNumber(): String
+ setIsbnNumber(isbnNumber: String): void
+ isAvailable(): boolean
+ setAvailable(available: boolean): void
+ displayDetails(): void: A method to display the book's details.

AudioBook

- books: ArrayList<Book>: A collection to store various types of books, including EBook and AudioBook instances, leveraging polymorphism.

+ addBook(book: Book): void: Adds a Book (or EBook, AudioBook) to the library collection.
+ checkOutBook(isbnNumber: String): void: Marks a book as checked out (not available).
+ returnBook(isbnNumber: String): void: Marks a book as returned (available).
+ displayBooks(): void: Displays details of all books in the collection, using overridden displayDetails() methods for each book type.

Ebook

- fileSize: double: The size of the eBook file.
- format: String: The format of the eBook (e.g., PDF, ePub).

+ getFileSize(): double
+ setFileSize(fileSize: double): void
+ getFormat(): String
+ setFormat(format: String): void