Assignment:

Library Management System

Design a basic library systemin Java to manage books and borrowers, focusing on

essential operations such as borrowing and returning books.

Requirements

Key Classes:

1.

Book

Attributes:

bookId (String):Unique identifier for the book.

title (String): Title of the book.

isAvailable (boolean): Whether the book is available for borrowing.

Methods:

getDetails():

Returns a string with the book's details.

markAsLoaned():

Marks the book as not available.

markAsReturned():

Marks the book as available.

2.Borrower

Attributes

borrowerId (String): Unique identifier for the borrower.

name (String): Name of the borrower.

Methods:

borrowBook(Book book): Allows the borrower to borrow a book (if available).

returnBook(Book book): Allows the borrower to return a book.

Library

Attributes:

books (List<Book>):List of all books in the library.

Methods:

addBook(Book book): Adds a new book to the library.

loanBook(String bookId, Borrower borrower): Allows a borrower to borrow a book by ID.

returnBook(String bookId, Borrower borrower): Allows a borrower to return a book by ID.

Tasks:

1.

Design:

Implement the above classes in Java.

Use constructors for initializing class attributes.

Use appropriate access modifiers (e.g., private for attributes).

2.

Functionality

A borrower can borrow only one book at a time.

A book can only be borrowed if it is available.

Ensure that only valid book IDs can be loaned or returned.

3.

Demonstration:

Write aMain class to:

▪ Add some books to the library.

▪ Perform operations like lending and returning books.

▪ Display the current state of the library.