

Mini Project One - Library System

Brief Design

Zhipeng Zhou, Sen Li, Li Huang, Run Yan
2014/8/12

Requirements:

Mini Project - Books Library

Develop a Java GUI application using Java Swing and Collections API to maintain a books library.

As this application does not use a permanent storage database, all your data would be stored in the form of collection objects at the run time and will be destroyed when you exit the application.

You can as well think of forming the basic data objects (java objects) for books, customers and transactions into permanent storage like files, so that every time the application loads, you can read these objects from files and load the respective object to populate the data in the application.

System Features:

The system must have the following basic features:

- (1) *- Adding, Updating and Deleting of Books
- (2) *- Adding, Updating and Deleting of customers
- (3) *- Customer to view the list of books available and take it on rental basis. There is no rental fee charged but the book must be returned by due date. If not, a penalty amount per day must be paid. This renting of a book is called as transaction.
- (4) *- Customer should be able to view his current books taken from library and mark for returning
- (5) *- Admin to notify all the customers when a new book arrives to library
- (6) *- Different categories of books can be created so that each category can have many books
- (7) *- Customer can opt for notifications about new books arrivals category-wise
- (8) *- An image of book can as well be displayed when the customer is browsing the list of books available.
- (9)*- Admin to view the following reports:

- List of customers
- List of books/category
- List of books rented out
- List of books which are yet to be rented out
- List of books overdue from customers

User Interface:

(1-1) Main Frame

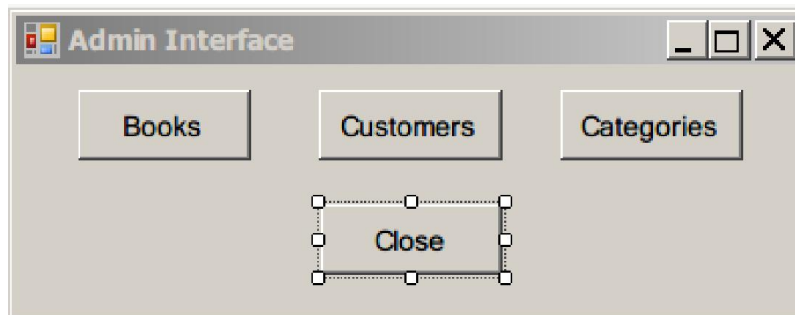


Administrator:

(2-1) Login



(2-2) Admin Interface



(2-3)Manage Books

The 'Manage Books' window contains a table on the left and a 'Book Info' section on the right.

| | ISBN | Name |
|---|------|------|
| * | | |

The 'Book Info' section includes a book cover image for 'if i stay' by Gayle Forman. Below the image are the following fields:

- Status: A dropdown menu currently showing 'Available / Rented Out'.
- ISBN: A text input field.
- Name: A text input field.
- Author: A text input field.
- Category: A dropdown menu.

At the bottom of the window are four buttons: 'Add', 'Update', 'Delete', and 'Rent Book Report'. The 'Rent Book Report' button is highlighted with a dashed rectangular border, and a 'Close' button is also visible next to it.

If admin clicks "Add" button, the "Add Book" Frame will show.

(2-3-1)

Add Book

Choose
Picture...

ISBN

Name

Author

Category

Add
Close

(2-4)Manage Users

Manage Users

| | ID | Name |
|---|----|------|
| * | | |

User Info

User Type

ID

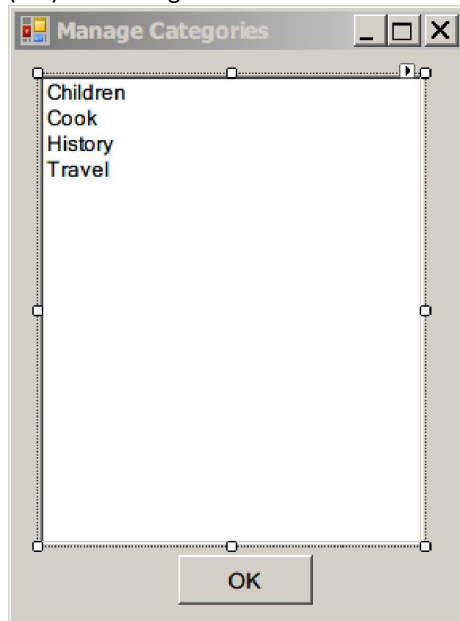
Name

Password

Address

Add
Update
Delete
Close

(2-5)View Categories



(2-6)View Rent Books

It is triggered by "Manage Books" frame.

- List of books rented out
- List of books which are yet to be rented out
- List of books overdue from customers

The 'Rent Books Report' window is shown. It has a title bar with a minimize button, a maximize button, and a close button. The window is divided into two main sections. The left section contains a table with columns 'ISBN' and 'Name'. The table has a header row and one data row with an asterisk in the first column. Below the table is a 'Close' button. The right section is titled 'Book Info' and contains a book cover image for 'if i stay' by Gayle Forman. Below the image are fields for 'Status' (a dropdown menu showing 'Available / Rented Out'), 'ISBN', 'Name', 'Author', and 'Category' (a dropdown menu).

| | ISBN | Name |
|---|------|------|
| * | | |

Customer:

(3-1)Login

Customer Login

Username

zhouzhipeng

Password

passwd

Login

Close

(3-2)Customer Interface

Customer Interface

Borrow Book

Return Book

Close

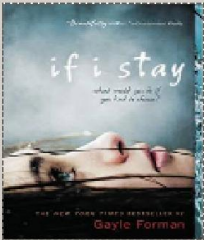
(3-3)View/Return rented books

Return Book

Rented Books

| | ISBN | Name |
|---|------|------|
| * | | |

Book Info



ISBN

Name

Author

Category

Return

Close

Customer select a book to return from the “Rented Books” list. In the right part of the form, this book’s information will be shown.
Then customer clicks “Return” button if he or she wants to return the selected book. The “Return Book Finish” Dialog box will show.

(3-3-1) Return Book Finish (Dialog)



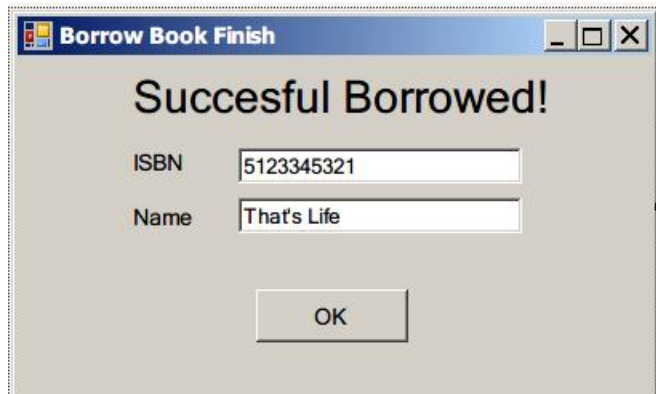
(3-4) Borrow books/View new books notifications

A form titled "Borrow Book" with a gray header bar. The form is divided into several sections:

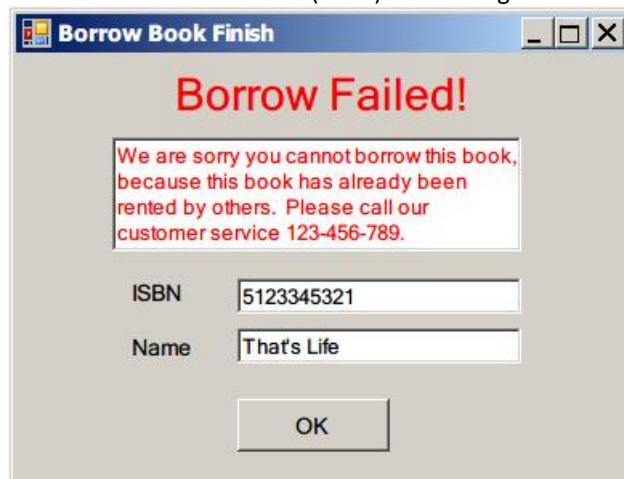
- Books**: A section with three radio buttons labeled "New", "Available", and "All", followed by a "view" button.
- New Books Subscribed Category**: A section with four checkboxes: "Children", "Cooking" (checked), "History" (checked), and "Travel".
- Table**: A table with two columns: "ISBN" and "Name". The first row has an asterisk (*) in the "ISBN" column and is followed by a large gray rectangular area.
- Book Info**: A section containing a book cover image for "if i stay" by Gayle Forman, and five input fields: "Status" (a dropdown menu showing "Available / Rented Out"), "ISBN", "Name", "Author", and "Category" (a dropdown menu).
- Buttons**: At the bottom right, there are two buttons: "Borrow" and "Close".

If this book is not “available”, then the “Borrow” button will be disable(Gray).
If Customer click “Borrow” button, then the “Book Borrow Message” Dialog will show.

(3-4-1) Borrow Book Finish (Dialog)

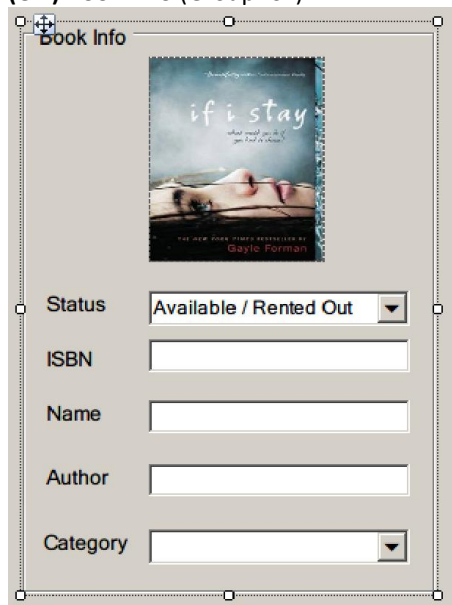


If book cannot be borrowed(error). This dialog below shows.



Common Controls:

(C-1) Book Info (GroupBox):



We can make a common "Book Info" GroupBox or Panel, for commonly used in other frames.

Methods needed:

Load(Book book) - Load the book information from object, and fill the attributes in this panel.

Save(Book book) - Write back the information to the book object from the panel

“Status” attribute item could be invisible depends on needs.

Use Cases:

integration tests must pass all these use cases below:

Admin Use Cases

(1-1)Book Management

View list of books

View book information

View list of book categories

Adding, Updating and Deleting of Books

(1-2)Customer Management

View List of customers

Adding, Updating and Deleting of customers

(1-3)View Books Rent Report

View List of books rented out

View List of books which are yet to be rented out

View List of books overdue from customers

Customers Use Cases

(2-1)Borrow Book:

View new arrival books.

View the list of books available.

View book information

Rent a book from the available book list

(2-2)Return Book:

View borrowed book list.

Return a book

Files:

users.dat - Store all the users
books.dat - Store all the books

Book's image files:
All the book image files put into the folder "booking/"
booking/12345.jpg
stands for the image of the book which has ISBN=12345

Class Diagram:

Brief Design

User (Customer)

id
name
password
....
rentBook()
returnBook()

Book

isbn
name
category
...
isRented
lastRentDate
addedDate

Library (Admin)

users
books
rentedBooks
unrentedBooks
...
...
String getBookImageFileName(isbn)

LoadUsers()
SaveUsers()
LoadBooks()

SaveBooks()
Load()
Save()

