Library Management System

Introduction

The library management system app is one of the most useful online applications for students and organizations. This application provides a virtual showcase to deal with different users (admin and student), actions (borrow, return, search and edit) for books and users, so this system will reduce time and cost for the users and organizations.

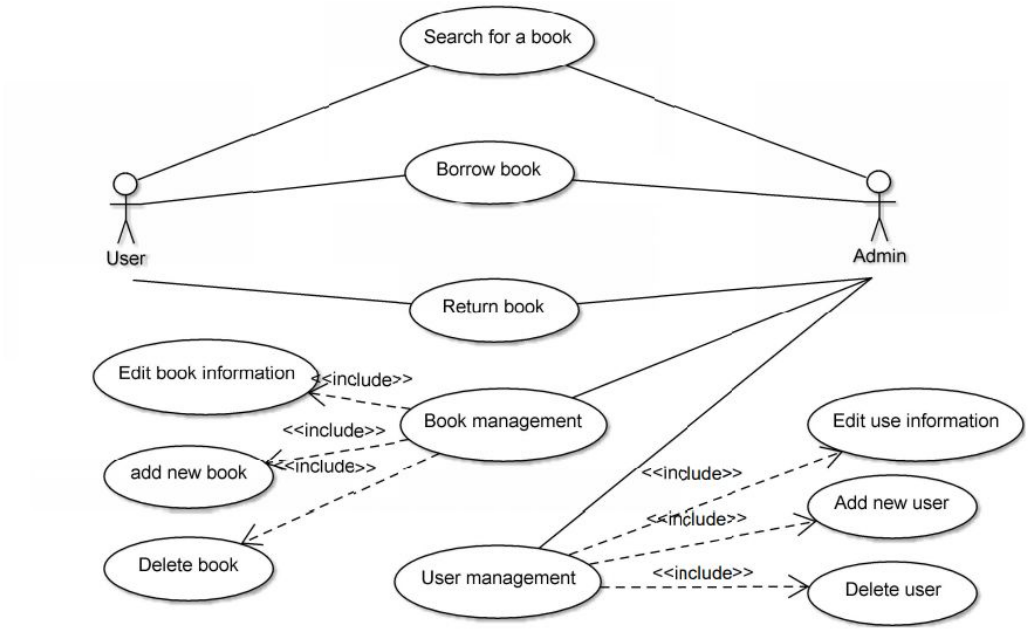
The main functions provided by library management system project

1- Provides many searching options as books details, borrow books, return books and buy books.
2- Shows the information and description for book details and issue books.
3- Provide the administrator the ability to add, delete, modify member and book details.
4- Monitoring the information and transactions.

System Requirements

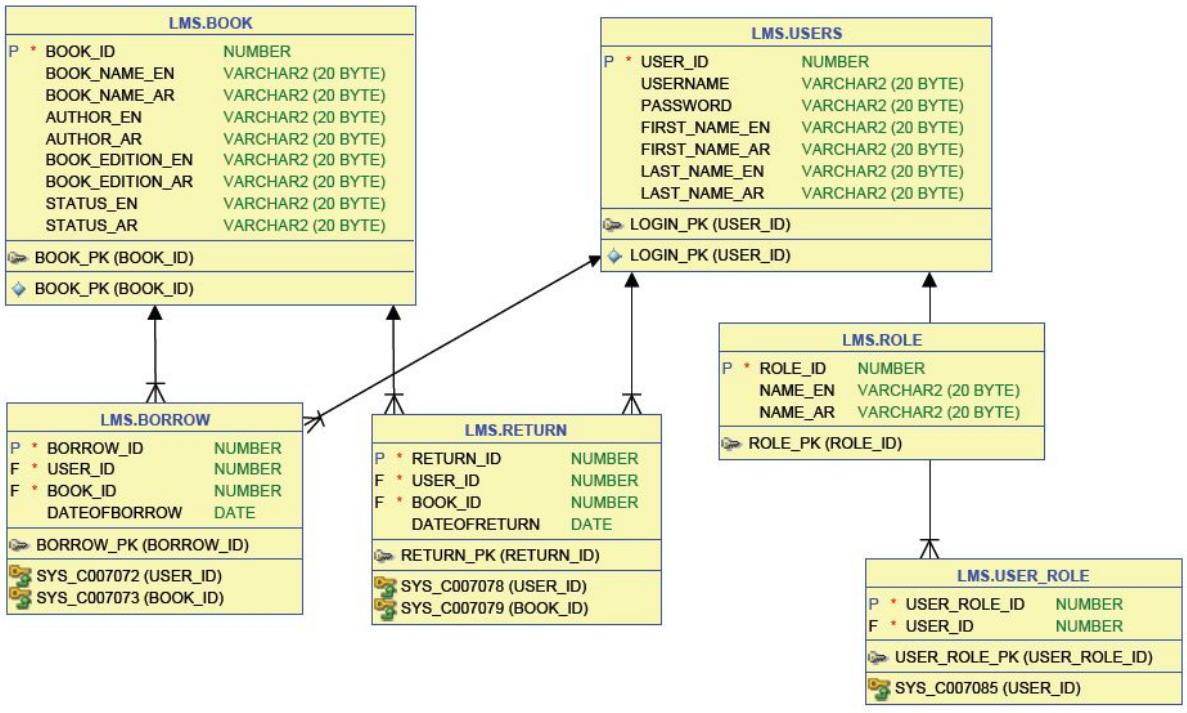
To run and execute the program, you will need the below requirements:
1- Java EE
2- NetBeans
3- Oracle database

Use Case Diagram



In the library management system there are two actors: the user and admin, also there are five main actions: search for a book, borrow a book, return a book, book management, and finally user management. the admin can do all action but the user can do the first four actions except the user management.

ER Diagram



In the library management system we have six tables for the user management such as USERS, USER_ROLE and ROLE these tables for the user authentication and authorization for example the USERS table includes the user information as below:

USER_ID	USERNAME	PASSWORD	FIRST_NA...	FIRST_NA...	LAST_NA...	LAST_NA...
1	AMR	P@ssw0rd	amr	عمرو	zrigat	زريقات
2	saja	saja	saja	سجى	jaber	جابر
3	haya	haya	haya	هيا	khaled	خالد

Then the ROLE table includes the user id and the role of the user such as student , instructor and admin as shown below:

ROLE_ID	NAME_EN	NAME_AR
1	admin	مدير
2	instructor	استاذ
3	student	طالب

The USER_ROLE table includes the user id and the user role id that represent the authorization given for each user as shown below

USER_ROLE_ID	USER_ID
1	1
2	1
3	1
1	2
3	3

For the book management there are three tables : BOOK , BORROW and RETURN. BOOK table includes book information as book name , author, edition and book status as shown below:

BOOK_ID	BOOK_NAME_EN	BOOK_NAME_AR	AUTHOR_EN	AUTHOR_AR	BOOK_EDITION_EN	BOOK_EDITION_AR	STATUS_EN	STATUS_AR
1	book 1	كتاب 1	author 1	كاتب 1	edition 1	النسخة 1	available	متوفر
2	book 2	كتاب 2	author 2	كاتب 2	edition 2	النسخة2	borrowed	مستعار
3	book 3	كتاب 3	author 3	كاتب3	edition 3	النسخة3	not available	غير متوفر

BORROW table includes information about the borrowed books as user id , book id and borrow date as below:

BORROW_ID	USER_ID	BOOK_ID	DATEOFBORROW
1	1	2	31/05/20
2	3	1	08/06/20
3	3	3	21/07/20

RETURN table includes information about the returned books as user id , book id and return date as below:

RETURN_ID	USER_ID	BOOK_ID	DATEOFRETURN
1	1	2	31/05/20
2	3	1	16/06/20
3	2	3	28/05/20

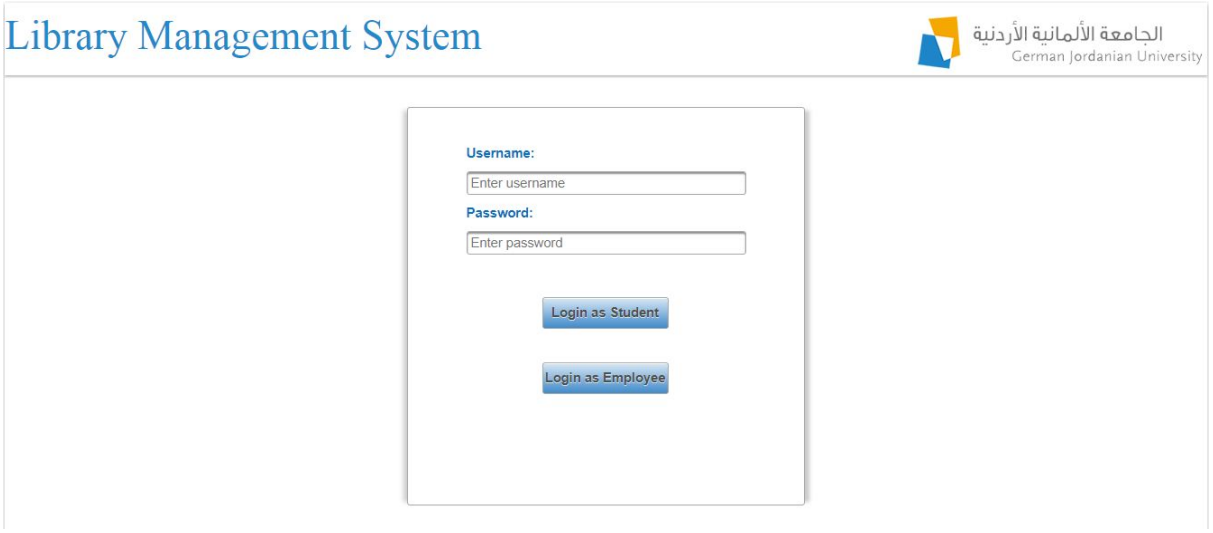
The code includes the following parts

- Login page
- Admin Menu page
    - Book management page
    - User management page

- User Menu page
    - Search Book page
    - Borrow Book page
    - Return book page

Login page:

This part of code enables the admin and the user to enter the information (username and password) to login, if the admin login the program moved to admin menu but if the user login the program moves to the user menu as shown below:

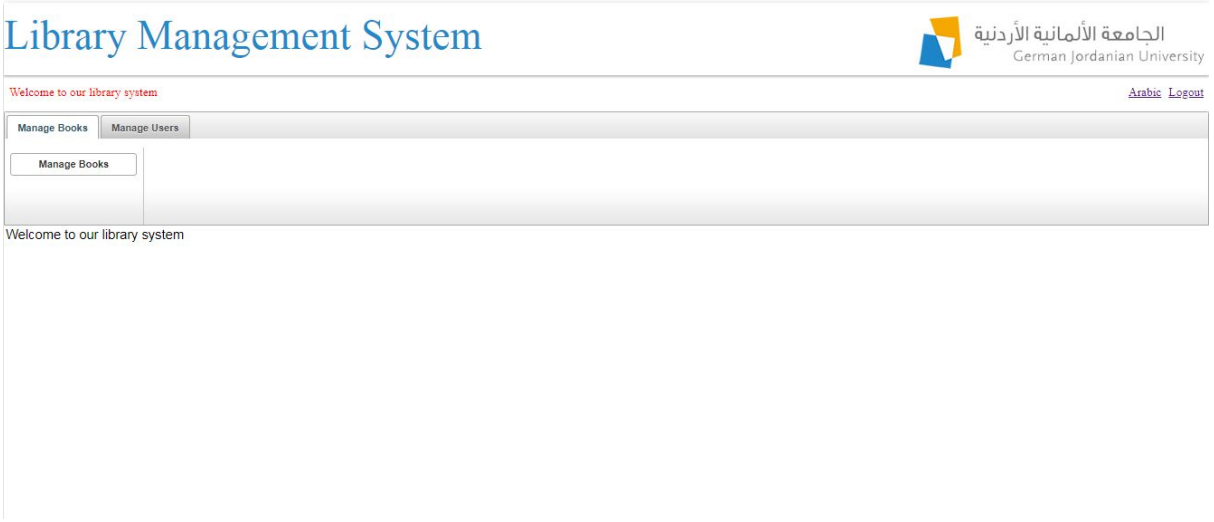


the JSF components that be used in the login page are two inputText which are the Username and Password also there are two commandButton the first one is Login as Student which navigate to the user menu ,the second one is Login as Employee that navigate to Admin menu. All these components are included in panelGrid.

Admin Menu page

This part of code shows the details of users and books.in the user page the admin can review the users, add and delete users. In the book management page the admin can review the books, add and delete books, so the admin can view the current users and add new users as shown below:

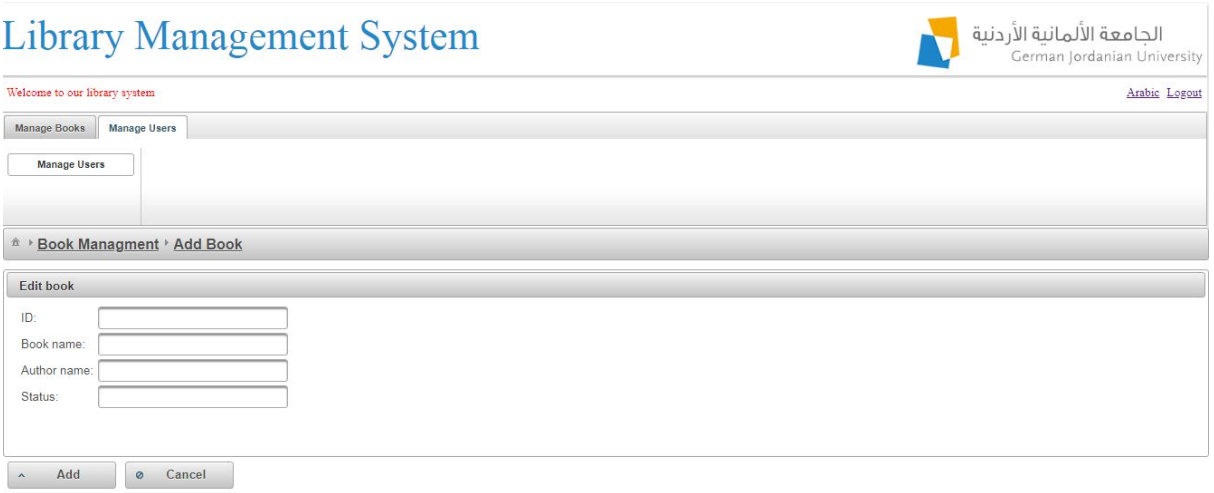
Admin user management page



The JSF components that are used in this page are ribbonGroup that includes two commandButton, the first commandButton is the Manage User and the second one is the Manage Book. Once the Manage Book commandButton is pressed it navigates to Manage book dataTable that includes some information about books such as Book ID , Book name , Author name and book status. For data filtering we used the contain filter for all columns. There is an Add commandButton that navigates to the add book page as shown below.

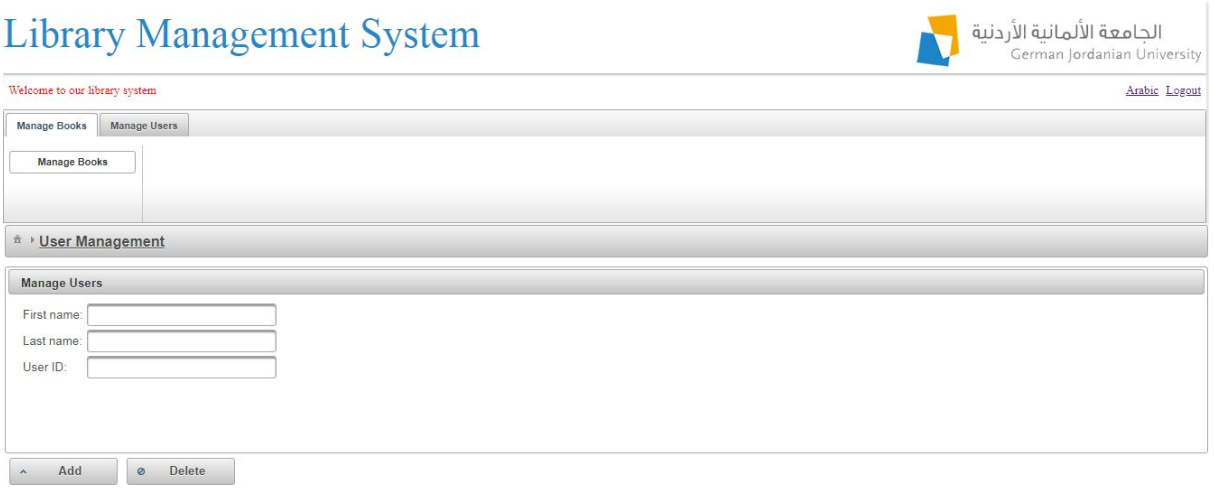
Admin book management page

Admin Add book page



The JSF components that are used in this page are bread crumbs, Add commandButton,Cancel commandButton and some inputText such as ID, Book name , Author name and status.

Admin Add/Delete user page

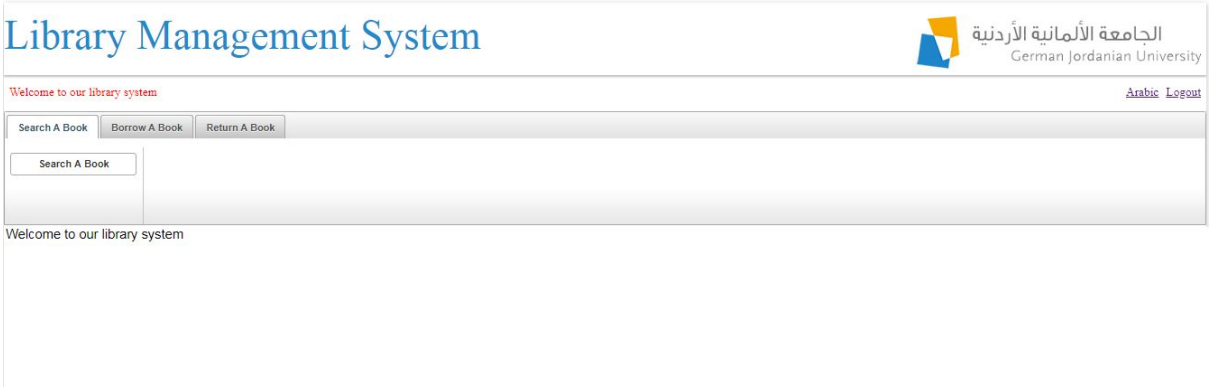


The JSF components that are used in the Add/Delete user page bread crumbs, Add commandButton,Delete commandButton and some inputText such as First name, Last name and User ID.

User management page

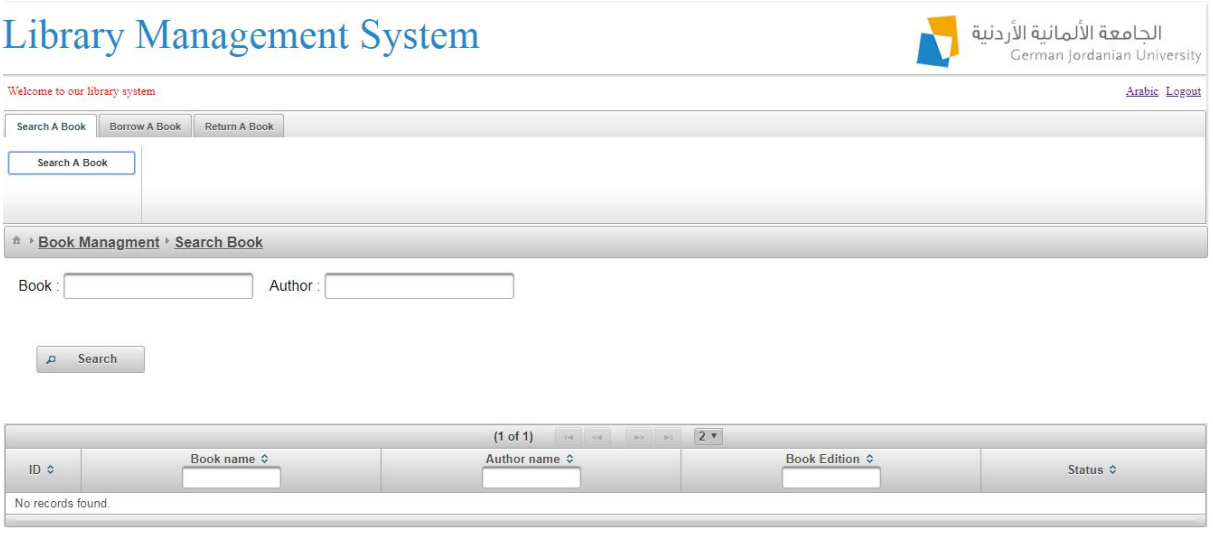
The User Menu is designed to show details of all the books present in the library and the actions can be done by the user such as search , borrow and return books as shown below:

User management page

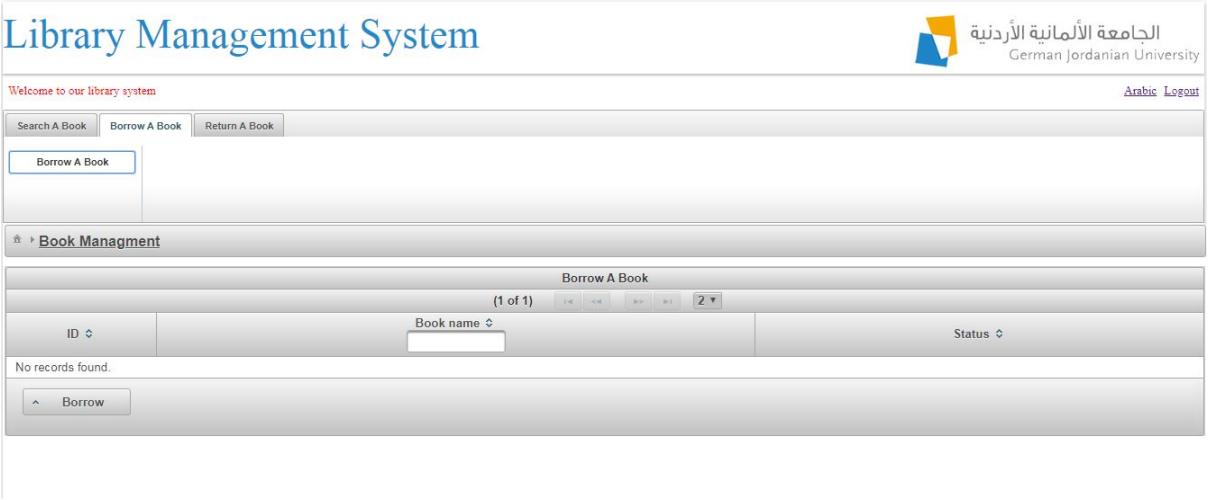


The JSF components that are used in this page are toolbarGroup that includes a three commandButton, the first commandButton is the Search A Book , the second one is the Borrow A Book and the third one is Return A Book . Once the Search A book commandButton is pressed it navigates to the Search book page that includes a dataTable which consists of some information about books such as Book ID , Book name , Author name and book status. For data filtering we used the contain filter for all columns. There is a Search commandButton filter the data upon the entered data to the inputText such as Book and Author, all these components are included in panelGrid as shown below.

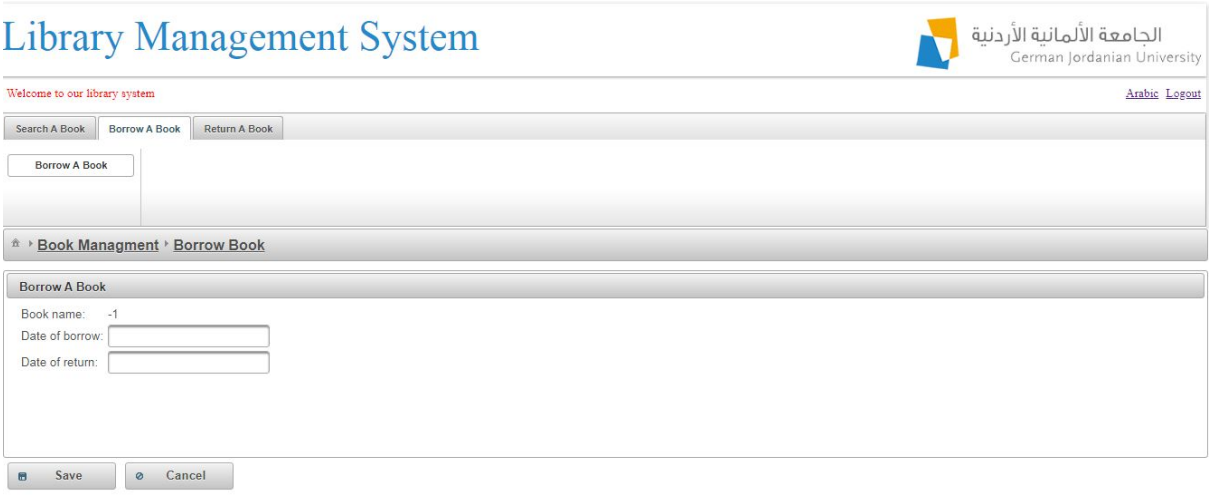
User Search book page



User Borrow book page

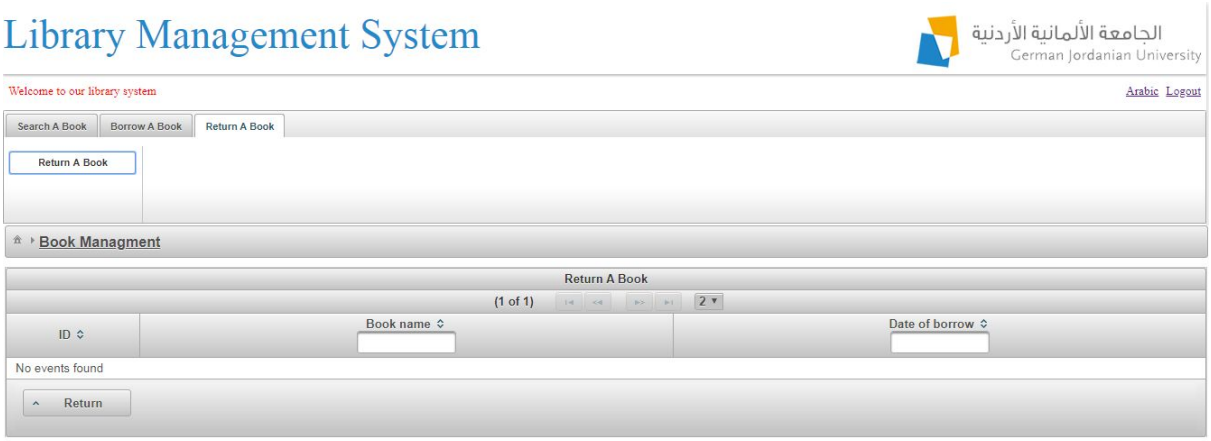


In the Borrow book page , the JSF component are dataTable which consists of some information about books such as Book ID , Book name and book status , also the is a Borrow commandButton that navigates to Borrow page as shown below:

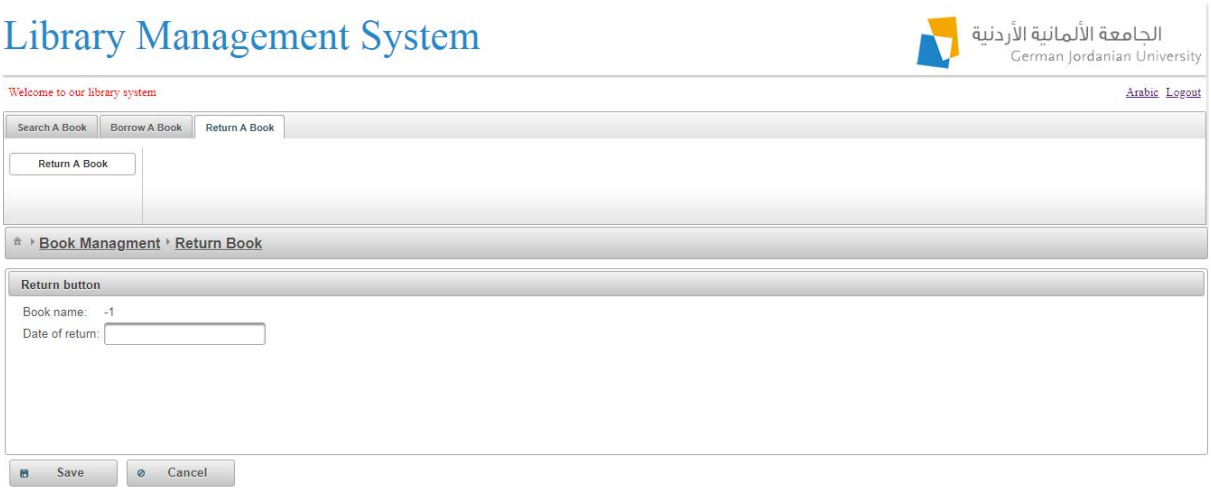


The Borrow page includes a panelGrid that consists of inputText such as Book name, Date of Return and Date of Borrow . Also there are two commandButton : the Save and Cancel which save commandButton save the entered data from inputText to the database and the cancel commandButton used to cancel the borrow operation.

User Return book page



In the Return book page , the JSF component are dataTable which consists of some information about books such as Book ID , Book name and data of return , also the is a Return commandButton that navigates to Return page as shown below:



The Return page includes a panelGrid that consists of inputText such as Book name and Date of Return . Also there are two commandButton : the Save and Cancel which save commandButton save the entered data from inputText to the database and the cancel commandButton used to cancel the return operation.

Conclusion

The library management system designed to be accessed by multiple users admin or user, also allows the user to review the available books, borrow books and return books which reduces the time and costs, also permit the admin to review the users and do some actions such as add / delete users. besides the actions that can be done for books as add/delete books.