LIBRARY MANAGEMENT SYSTEM

TEAM

Tauseef Indikar

Nicolas Neitzel

Gaurav Shukla

Sanketh Shetty

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1 PROJECT SUMMARY

We will be building a website which serves as a Library Management System. The UI will be designed using HTML, JavaScript and CSS. The Server-side-scripting will be done using an MVC framework based on C#. MS SQL Server will be used to store the database.

There will be three types of users i.e. Administrator, Librarian and Student. An Administrator will have access to add/modify the books in the database as well as add/modify Librarian accounts. Students will be able to search the database for books based on three criteria ISBN, Title or Author and request a book. Librarians will be able to search the database for books and checkout requested books for the Student after the system verifies availability of the book.

We aim to showcase the MVC design model as well object oriented concepts which are useful for reuse and extension of the Library Management System.

2 PROJECT REQUIREMENTS

2.1 BUSINESS REQUIREMENTS

ID	*Requirement*	*Topic Area*	*User*	*Priority*
BR-01	All signups should be through students '@colorado.edu' email-id	*Signup *Authentication	Student	Critical
BR-02	Only Administrator can add/modify a Librarians account	*Librarian Signup	Administrator	Medium
BR-03	Only Administrator can add/modify books in the database	*Books Database	Administrator	Medium
BR-04	Students can at most checkout 3 books at any given time	*Request Book	Student	High
BR-05	Due date to be set for 2 months from Checkout Date	*Checkout	System	Critical

2.2 USER REQUIREMENTS

ID	*User*	*Description*	*Priority*
US-01	Administrator	I want to be able to add, delete and update books in the database.	Medium
US-02	Administrator	I need to be able to add, delete and update the Librarian profiles.	Medium
US-03	Librarian	I need to see a dashboard with all requests that are current.	High
US-04	Librarian	I want to be able to easily search and locate a book.	Low
US-05	Student	I need to be able to search for a book based on multiple criteria.	Medium
US-06	Student	I need to be able to request a book for today or a day in the future.	High

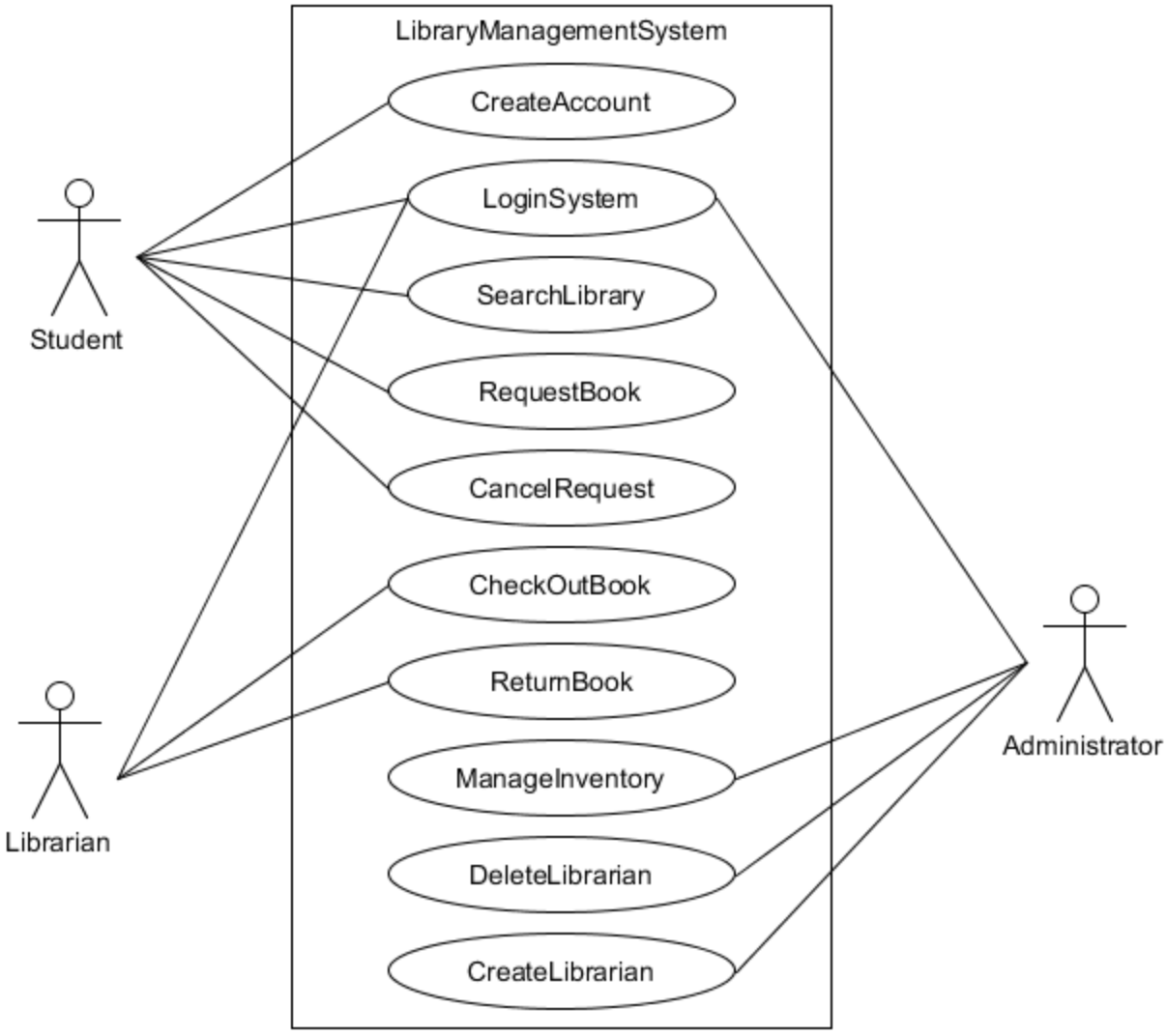
2.3 FUNCTIONAL REQUIREMENTS

ID	*User*	*Description*	*Priority*
FR-01	Librarian	Landing page should show all current requests.	High
FR-02	Librarian	After checkout take back to landing page with success message.	Medium
FR-03	Administrator	While creating librarian account mail librarian with a random temp password.	Medium
FR-02	Student	Landing page should show selection of books w.r.t topic.	High
FR-03	Student	Requests for a book should populate request date with today's date.	High

2.4 Non-Functional Requirements

ID	Description	Priority
NFR-01	*Security*: All passwords must be hashed before saving in database.	Critical
NFR-02	*Platform Constraints*: All basic functionality for librarian and user must be supported across browsers (Firefox, Chrome, Opera, IE and Safari).	High
NFR-03	*Usability*: The search feature should work even without specifying criteria by searching across all parameters.	Nice-to-have

3 Users and Tasks (Use Cases)



Use case name	**CreateAccount**
Participating Actors	Initiated by **Student**
Flow of Events	1. Student selects sign up tab
	2. **Student** inputs information to create account
Entry Condition	N/A
Quality Requirements	System verifies **Student** has @colorado.edu email

Use case name	**CreateBook**
Participating Actors	Initiated by **Administrator**
Flow of Events	1. **Administrator** selects option to add book to library
	2. **Administrator** enters book information onto screen
	3. **Administrator** submits information
Entry Condition	**Administrator** is logged into Library Management System
Quality Requirements	**Administrator** is informed of successful addition

Use case Name	**CreateLibrarian**
Participating actors	Initiated by **Administrator**
Flow of Events	1. **Administrator** pulls up Create Librarian screen
	2. **Administrator** enters email id and password for new user
Entry Conditions	**Administrator** is logged into Library Management System
Exit Condition	**Librarian** account created succesfully
Quality Requirements	**Administrator** receives confirmation of created account

Use Case name	**RequestBook**
Paticipating actors	Initiated by **Student**
Flow of Events	1. **Student** logs into the System
	2. **Student** searches for book by category
	2a. Search by Title
	2b. Search by Author
	2c. Search by ISBN
	3.**Student** request a book from the search results
Entry Conditions	**Student** is logged into **LibraryManagementSystem**
Quality Conditions	**Student** is informed of Request status

Use case name	**ReturnBook**
Participating Actors	Initiated by **Librarian**
Flow of Events	1. **Librarian** receives returned book
	2. **Librarian** selects return book option
	3. **Librarian** enters ISBN and student ID
	4. **Librarian** receives confirmation book was returned succesfully
Entry Condition	**Librarian** is logged into **Library Management System**
Exit Condition	**Librarian** receives confirmation of return
Quality Conditions	Success message is displayed for proper return

Use Case Name	**DeleteLibrarian**
Participating Actors	Initiated by **Administrator**
Flow of Events	1. **Administrator** selects delete librarian tab
	2. **Administrator** selects librarian to delete
	3. **Administrator** submits request
Entry Condition	**Administrator** is logged into **LibraryManagementSystem**
Quality Requirements	**Administrator** receives confirmation of operation

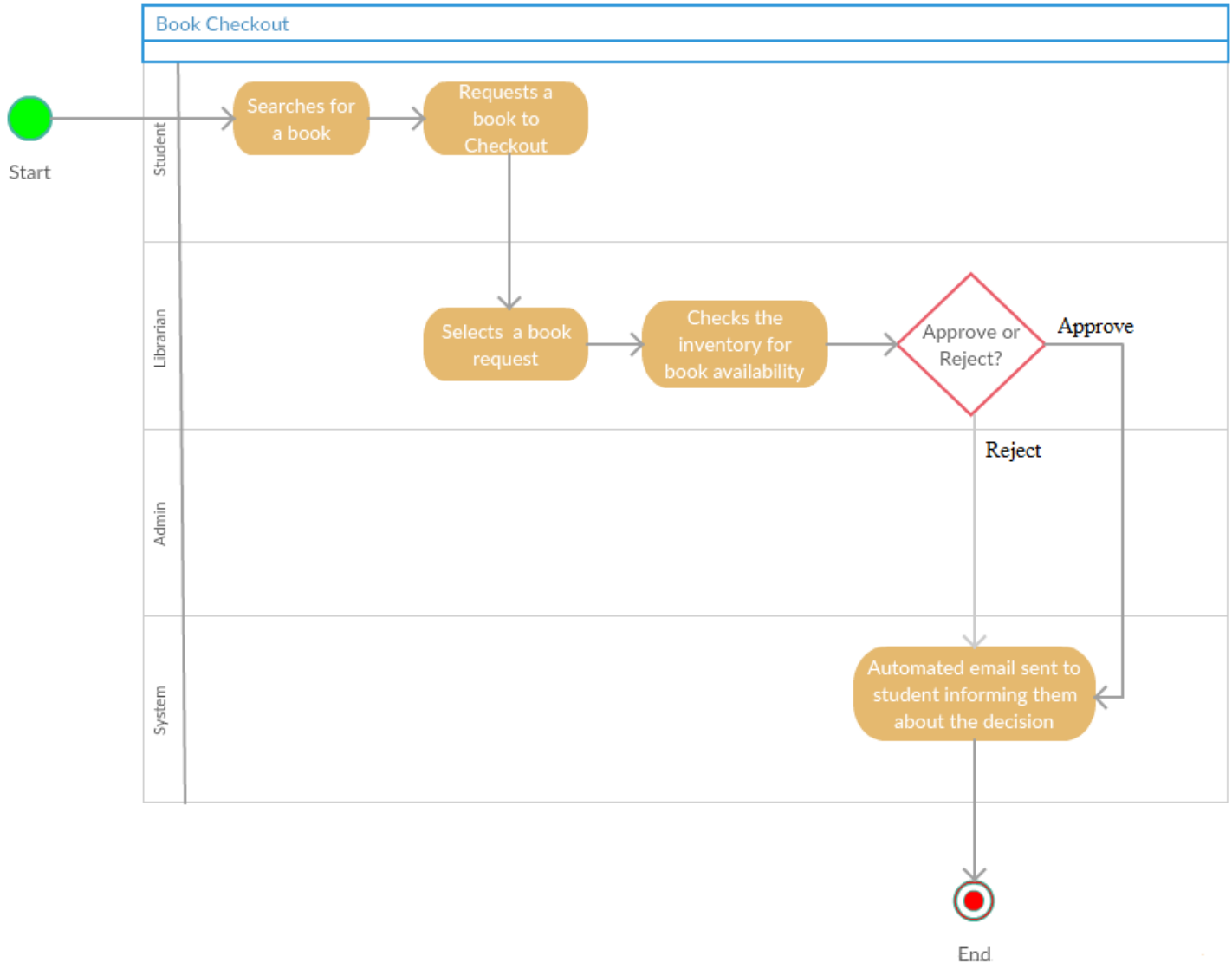
Use case name	**CancelRequest**
Participating Actors	Initiated by **Student**
Flow of Events	1. **Student** selects cancel request tab
	2. **Student** selects book request to be cancelled
	3. **Student** submits request
Entry Conditions	**Student** is logged into **LibraryManagement System**

Use case name	**SearchLibrary**
Participating actors	Initiated by **Student**
Flow of Events	1. **Student** selects search tab
	2. **Student** selects category to perform search
	3. **Student** enters text to search
	4. **Student** hits search button
Entry Conditions	**Student** is logged into **LibraryManagementSystem**
Quality Requirements	Query can be performed on database

Use case name	**LoginSystem**
Participating actors	Initiated by **Librarian/Administrator/Student**
Flow of events	1. **User** enters login information
	2. **User** hits submit button
Entry Conditions	N/A

Use case name	**Add/RemoveCopiesofBooks**
Participating Actors	**Administrator**
Flow of Events	1. **Administrator** selects remove/add tab
	2. **Administrator** increments/decrements numbers of book in library
Entry Conditions	**Administrator** is logged into **LibraryManagement System**

4 ACTIVITY DIAGRAM



5 DATA STORAGE

We are using MS SQL Server database to store tables. Data storage transactions will be performed through ***Library*** Class in Model.

The following will be the primary tables:

5.1 USER CREDENTIALS TABLE

This table contains login credentials and details of the user which include Name, Email, Password Hash, Login Type etc.

Sr.No.	First Name	Last Name	Email ID	Password Hash	Login Type	Books Allowed	Books Borrowed
1	Tauseef	Indikar	tain5575@colorado.edu	XXXXXXX	Admin		
2	Gaurav	Shukla	gash7618@colorado.edu	XXXXXXX	Student	3	2

Example Credentials Table

5.2 INVENTORY TABLE

This table contains book details. Additional columns might be added later.

Sr.No.	ISBN	Title	Author	Category	Quantity Available	Quantity Checked Out	Location
1	XXX-XX-XX	Hacking	Daniel Regalado	Computer Science	3	1	Aisle 1 Shelf A1
2	XXX-XX-XX	Harry Potter	J.K. Rowling	Novel	1	0	Aisle 10 Shelf A1

Example Inventory Table

5.3 REQUEST TABLE

This table contains requests for a book made by a student

Sr.No.	Email ID	ISBN	Request Date
1	gash7618@colorado.edu	XXXXXXX	2015-10-18

Example Request Table

5.4 CHECKOUT TABLE

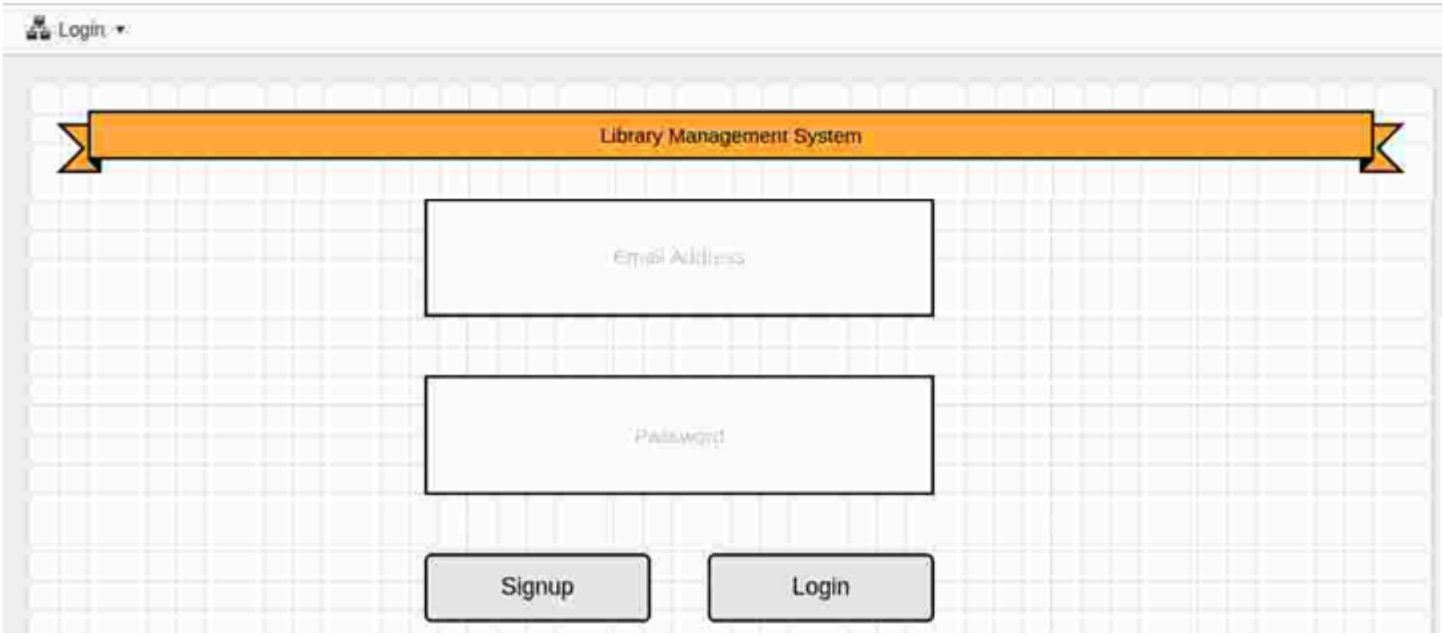
This table contains books currently checked out.

Sr.No.	Email ID	ISBN	Checkout Date	Due Date
1	gash7618@colorado.edu	XXXXXXX	2015-10-18	2015-12-18

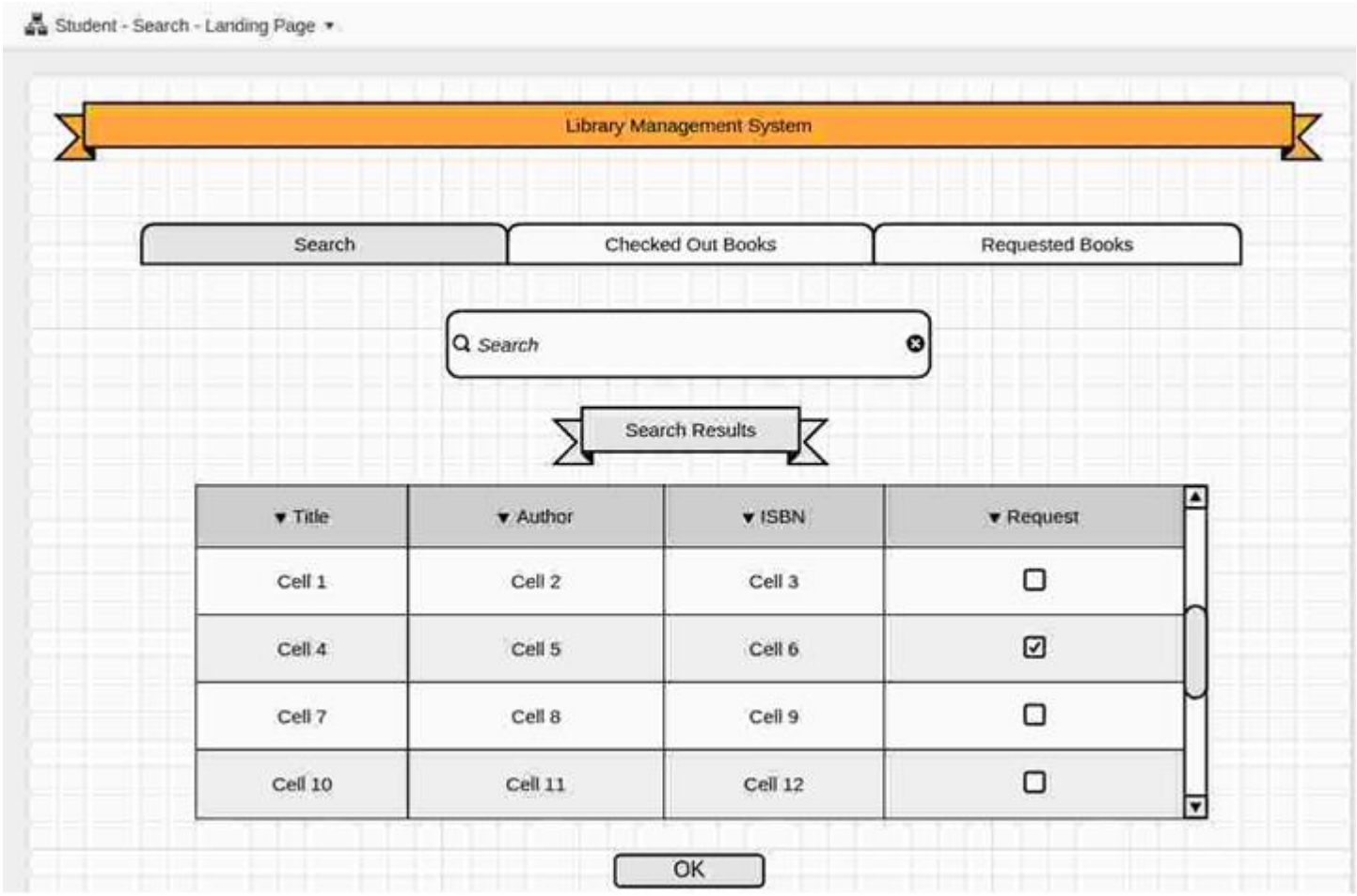
Example Checkout Table

6 UI MOCKUPS

6.1 LOGIN UI



6.2 STUDENT UI



Student - Checked Out Books

Library Management System

Search | Checked Out Books | Requested Books

Checked Out Books

▼ Title	▼ Author	▼ ISBN
Cell 1	Cell 2	Cell 3
Cell 4	Cell 5	Cell 6
Cell 7	Cell 8	Cell 9
Cell 10	Cell 11	Cell 12
Cell 10	Cell 11	Cell 12
Cell 10	Cell 11	Cell 12

Student - Requested Books

Library Management System

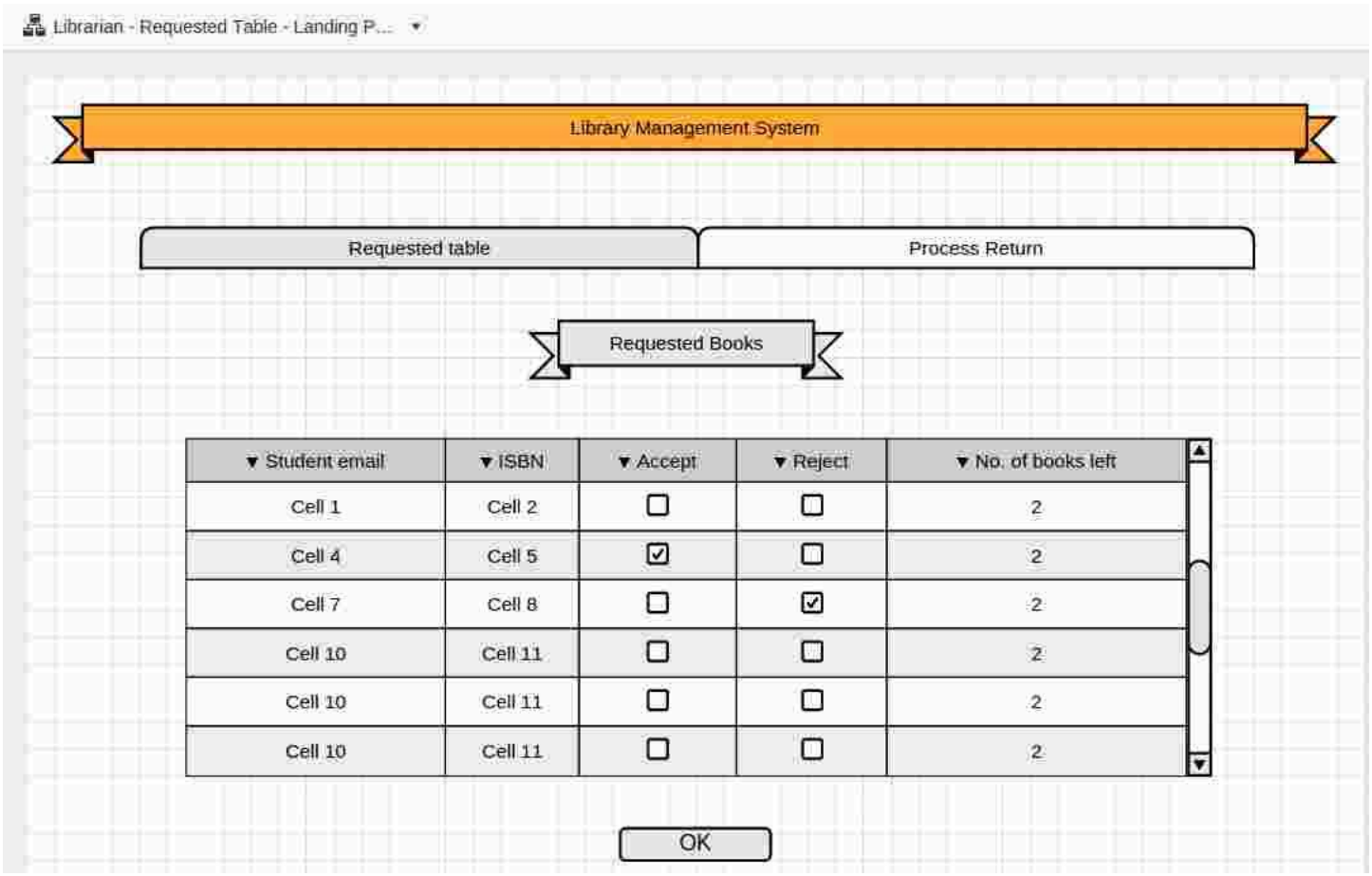
Search | Checked Out Books | Requested Books

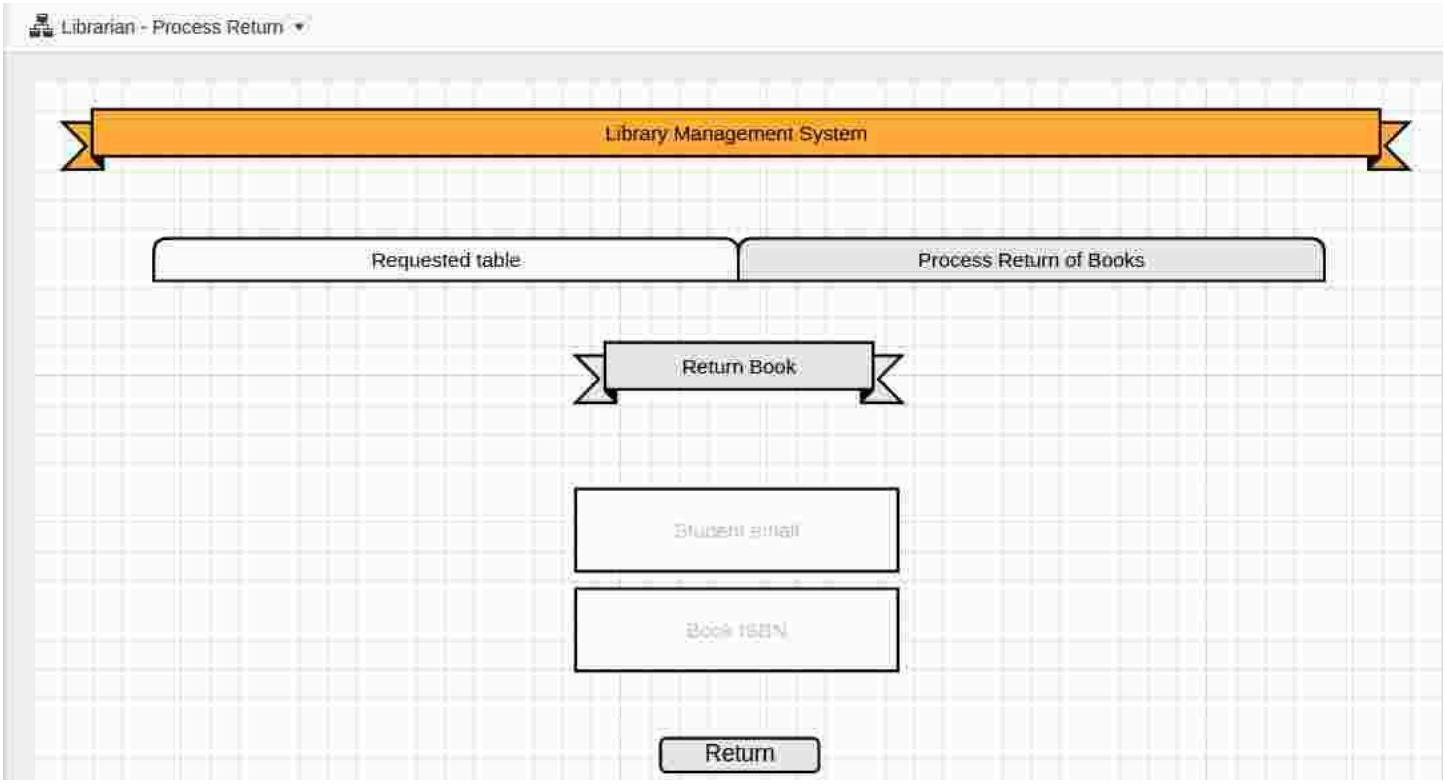
Requested Books

▼ Title	▼ Author	▼ ISBN	▼ Cancel Request
Cell 1	Cell 2	Cell 3	☐
Cell 4	Cell 5	Cell 6	☐
Cell 7	Cell 8	Cell 9	☑
Cell 10	Cell 11	Cell 12	☐
Cell 10	Cell 11	Cell 12	☐
Cell 10	Cell 11	Cell 12	☐

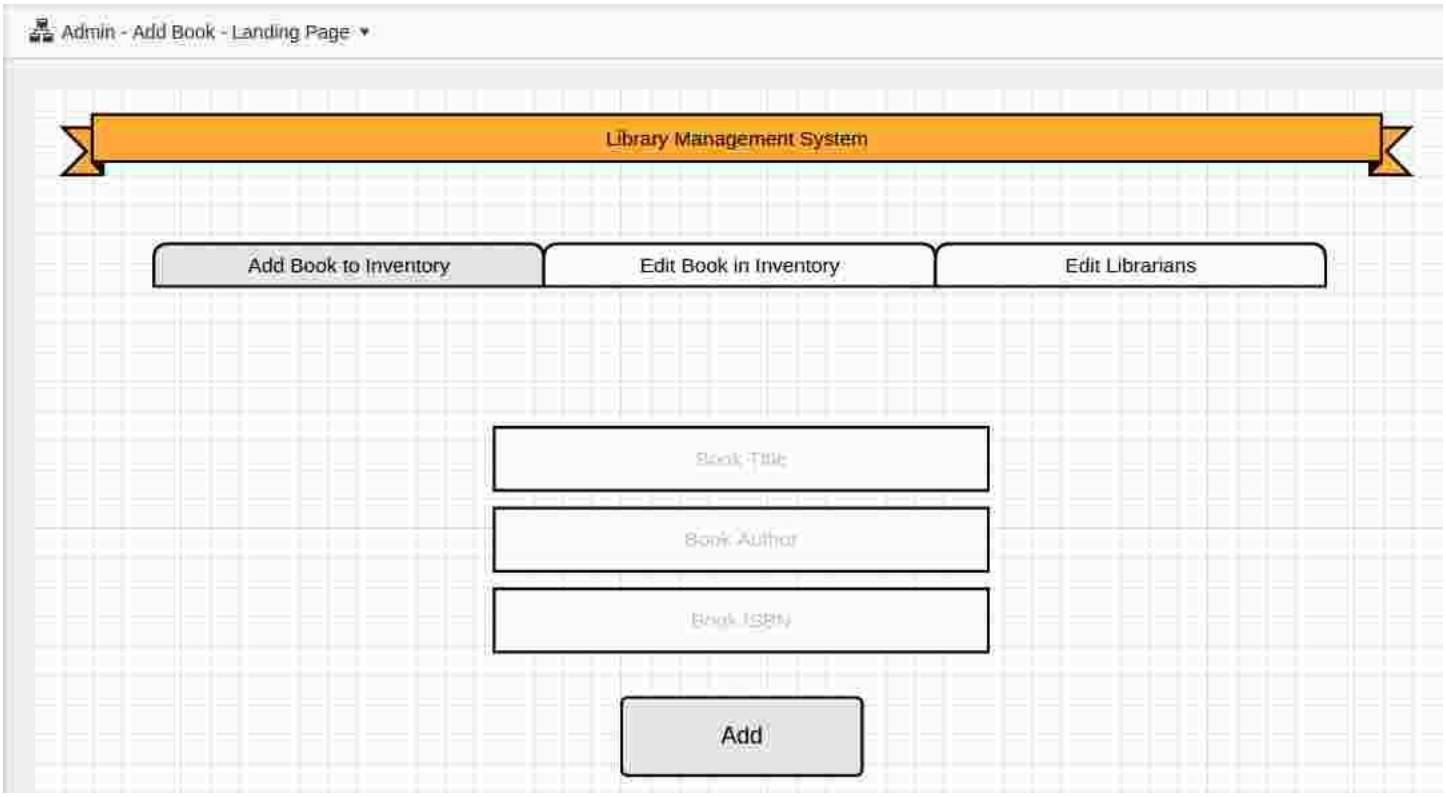
OK

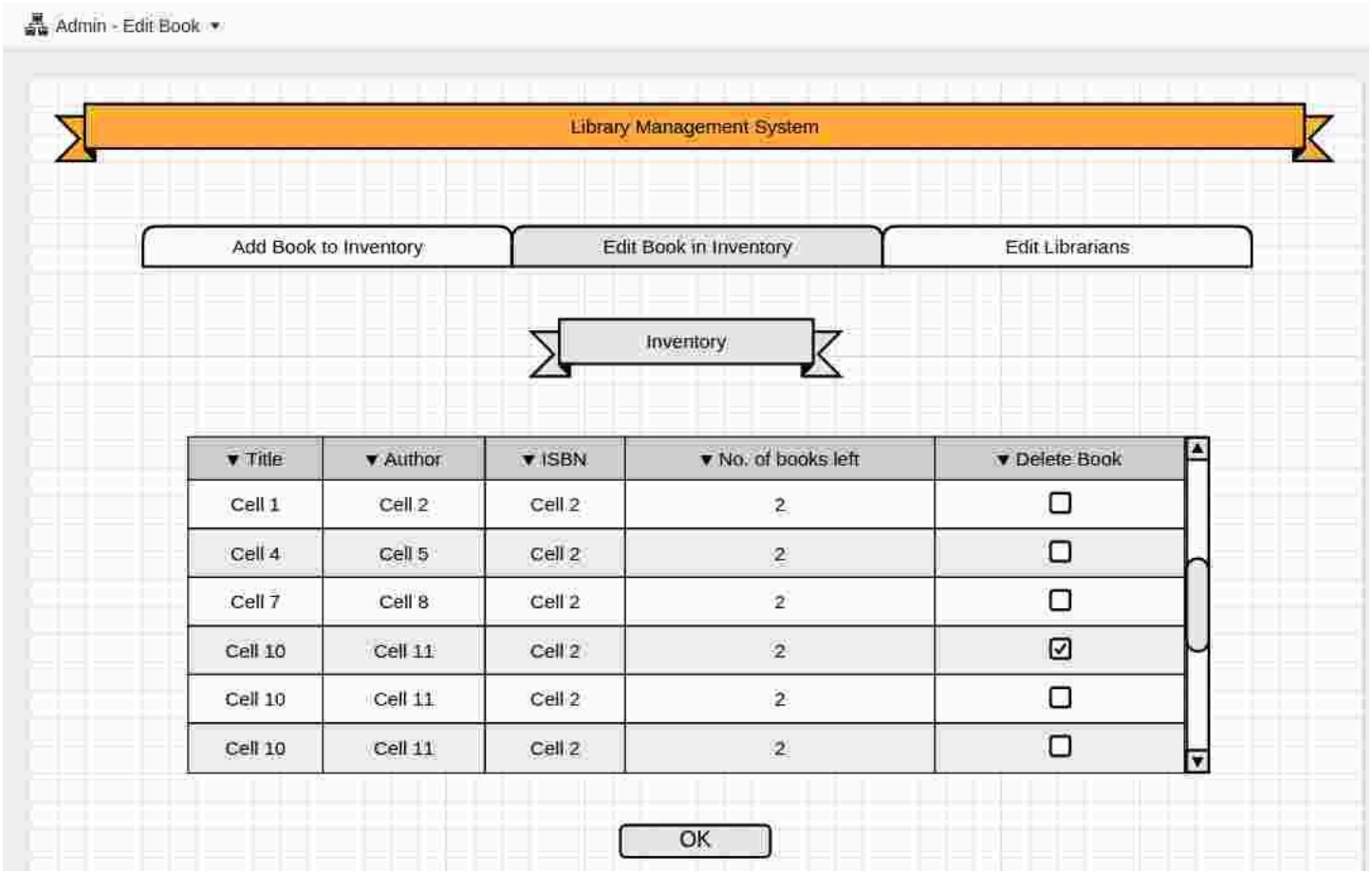
6.3 LIBRARIAN UI

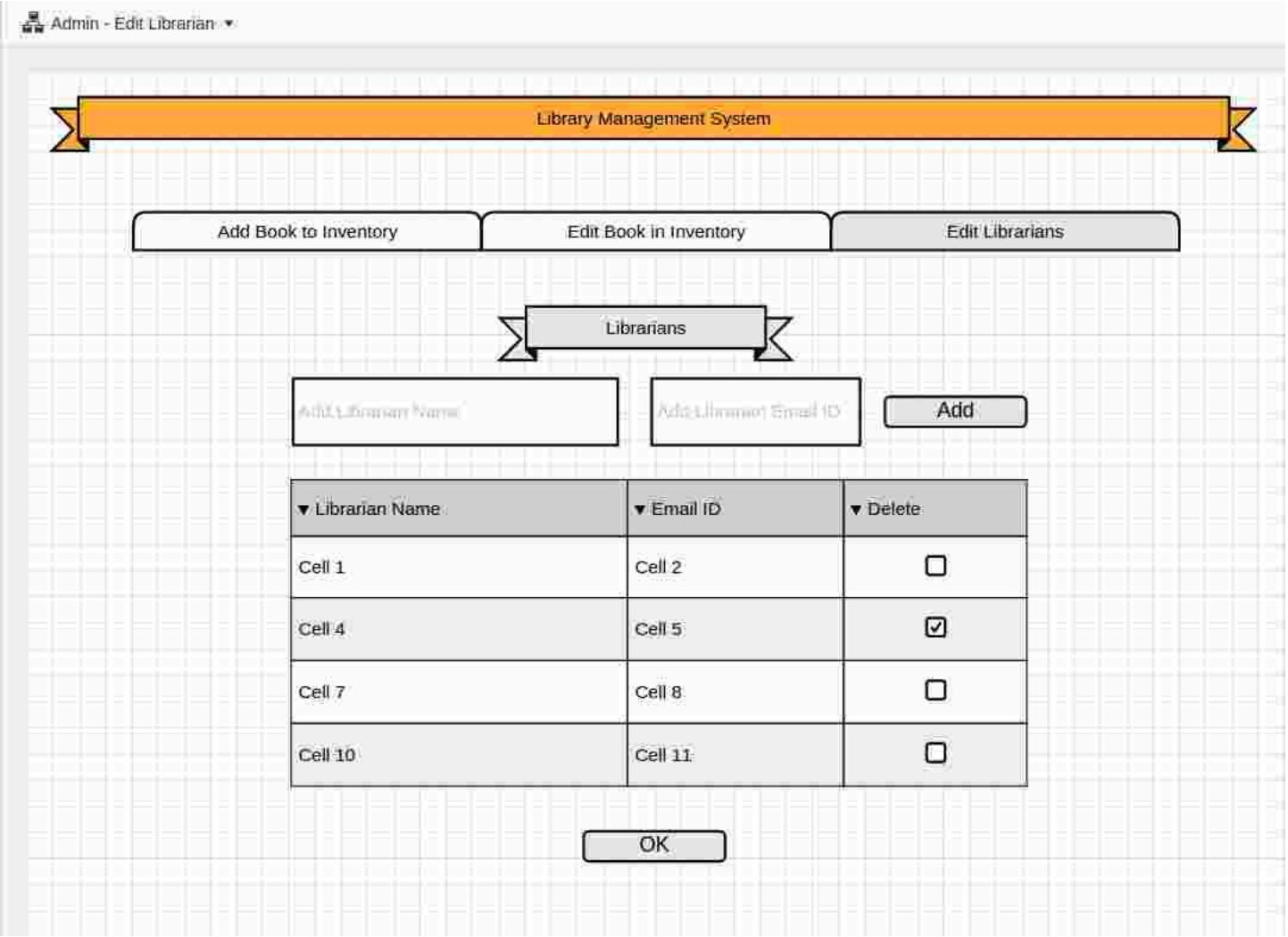




6.4 ADMIN UI

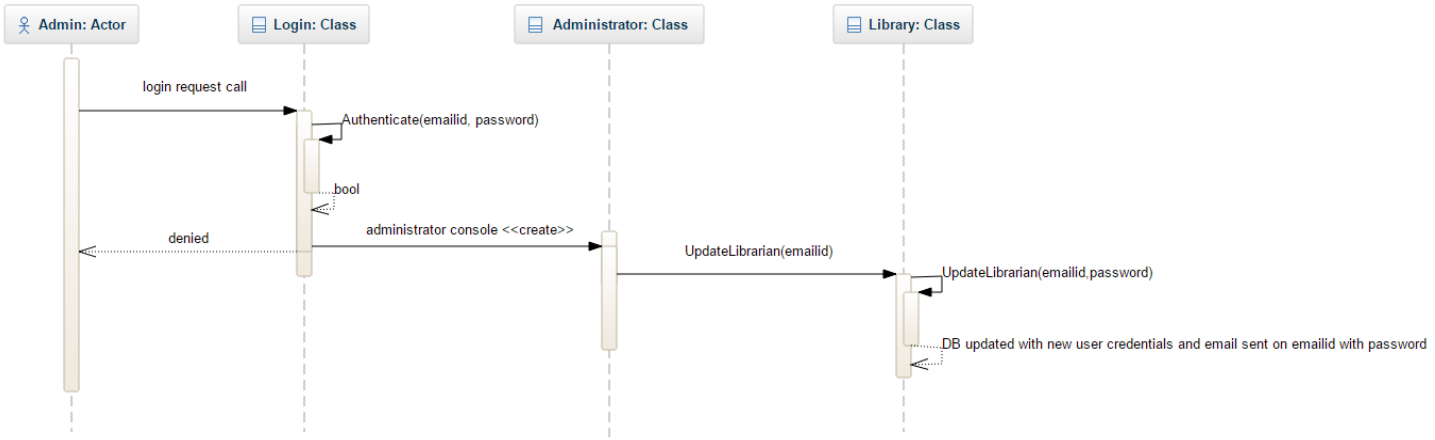

Admin - Add Book - Landing Page
Library Management System
Add Book to Inventory
Edit Book in Inventory
Edit Librarians
Book Title
Book Author
Book ISBN
Add


Admin - Edit Book
Library Management System
Add Book to Inventory
Edit Book in Inventory
Edit Librarians
Inventory
▼ Title
▼ Author
▼ ISBN
▼ No. of books left
▼ Delete Book
Cell 1
Cell 2
Cell 2
2
Cell 4
Cell 5
Cell 2
2
Cell 7
Cell 8
Cell 2
2
Cell 10
Cell 11
Cell 2
2
Cell 10
Cell 11
Cell 2
2
Cell 10
Cell 11
Cell 2
2
OK



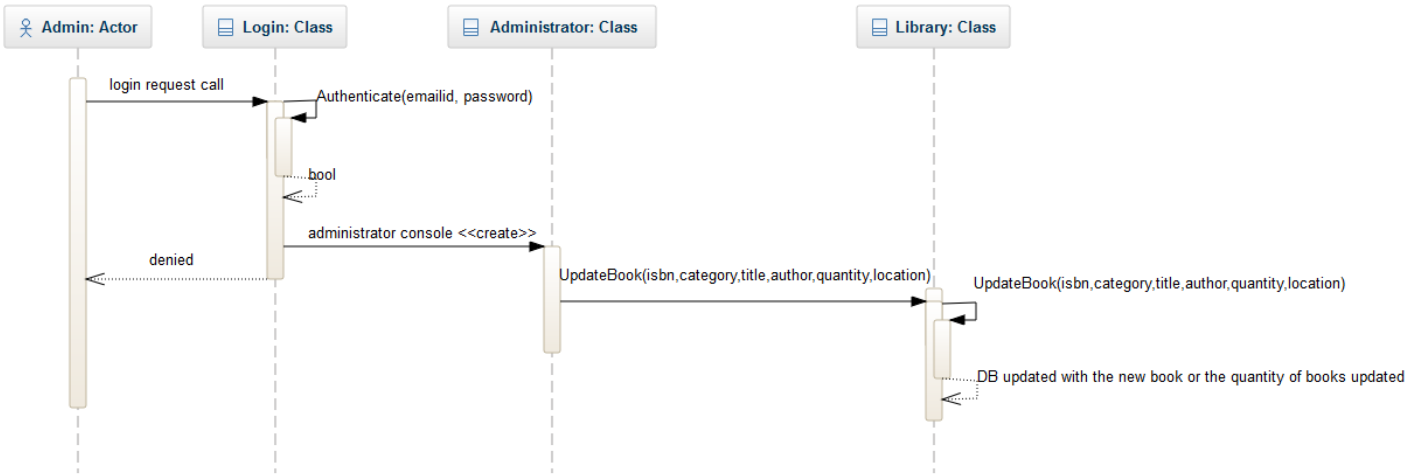
7 User Interactions

7.1 Sequence Diagram: Admin adding/updating a Librarian



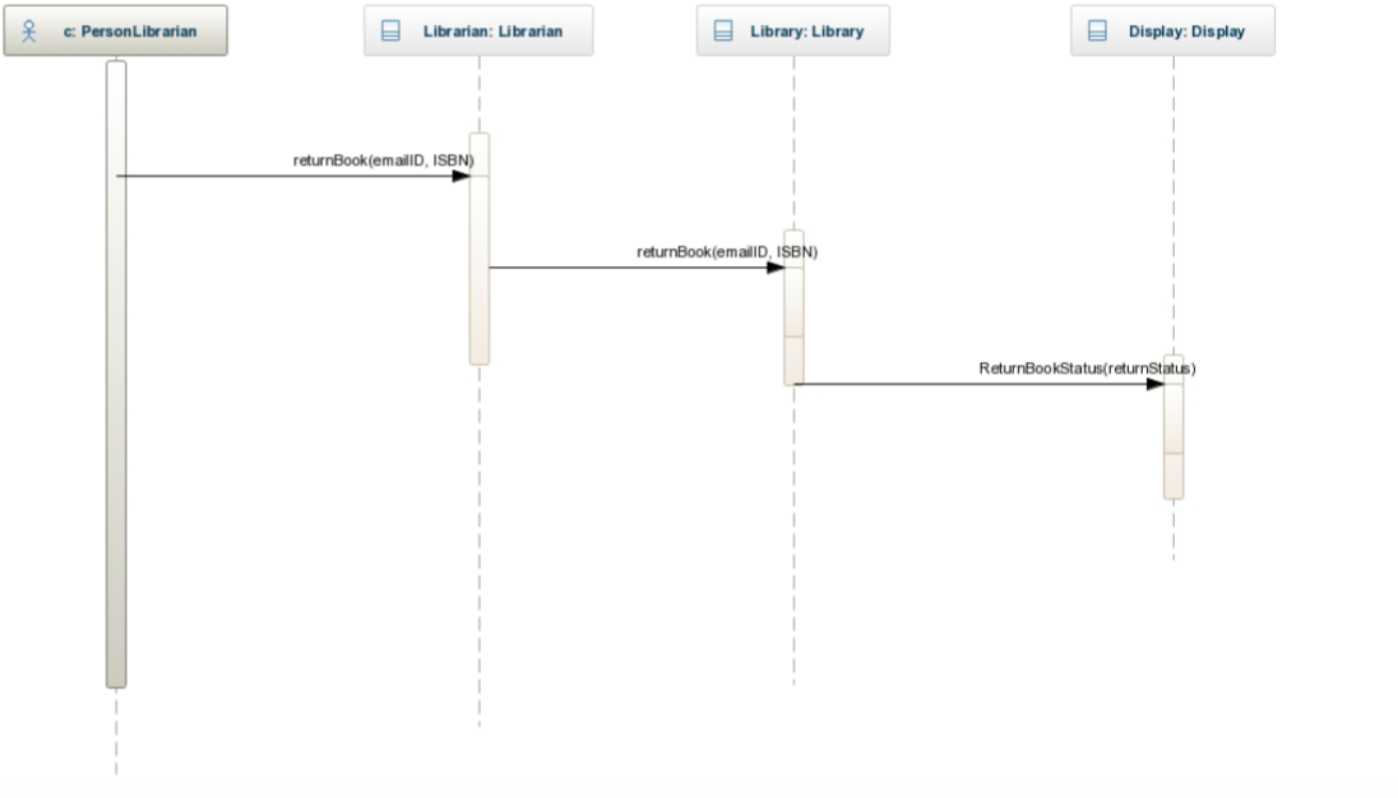
Admin adding a librarian

7.2 SEQUENCE DIAGRAM: ADMIN ADDING/UPDATING A BOOK



Admin adding a book

7.3 SEQUENCE DIAGRAM: LIBRARIAN CHECKING OUT A BOOK



Librarian checking out a book

8 CLASS DIAGRAMS