

# Online Library Management System

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Course: Web Programming Languages (CS 6314.001)

Designed and developed by:

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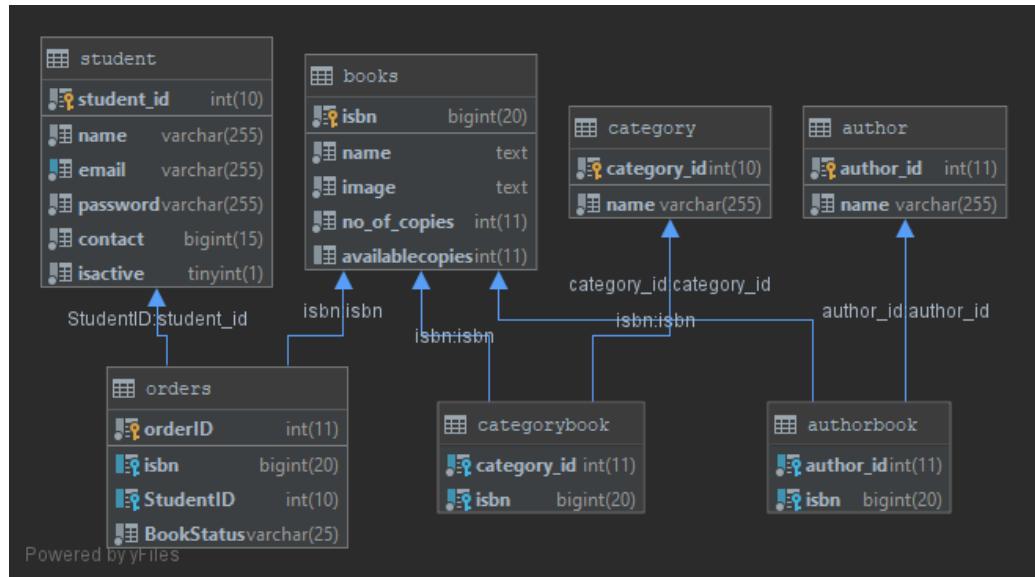
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# Project Description

- **Project Title:** Online Library Management System
- **Description:** Much of the functioning of a library could be automated using the available technologies. Instead of dealing with files (papers) the use of a good Database together with a proper front end would not only reduce the operating cost but also make the task of the Librarian easier. The most important thing is that an automated system of this sort can be customized to suit the needs of the users and provide good service to them. Aim of the project is to develop software which would automate the functioning of a library over a network.
- **Assumptions:** Here, we have assumed that there are two types of users, Admin and Students. Another assumption is that a user can only check out only single copy of book at a time. Also, students will need Admin's (here the Librarian's) permission to get the book issued. Student will seek the permission for issuing the book and Admin will decide if he/she wants to issue the book to the particular student or not. In addition to this, Admin will also approve or deny the user registration requests. Admin will also be able to insert, update, delete books, categories and authors.

# Database Design

- **Database used:** MySQL – open source relational database management system.
- **Server version:** 5.7.23 - MySQL Community Server (GPL)
- **Database Design:**
  - Database Name: library
  - Tables: author, book, category, orders, student, authorbook, categorybook
  - Database Design:



- Database Design Queries:

Following queries were used to create the database and tables in MySQL.

```
-- Database: `library`
-- Table structure for table `author`
CREATE TABLE `author`
(
    `author_id` int(11)      NOT NULL,
    `name`      varchar(255) NOT NULL
) ENGINE = InnoDB
DEFAULT CHARSET = utf8;

-- Table structure for table `authorbook`

CREATE TABLE `authorbook`
(
    `author_id` int(11)      NOT NULL,
    `isbn`      bigint(20)   NOT NULL
) ENGINE = InnoDB
DEFAULT CHARSET = utf8;

-- Table structure for table `books`

CREATE TABLE `books`
(
    `isbn`          bigint(20) NOT NULL,
    `name`          text      NOT NULL,
    `image`         text      NOT NULL,
    `no_of_copies` int(11)   NOT NULL,
    `availablecopies` int(11) DEFAULT NULL
) ENGINE = InnoDB
DEFAULT CHARSET = utf8;
```

```
-- Table structure for table `category`
--

CREATE TABLE `category`
(
    `category_id` int(10)      NOT NULL,
    `name`        varchar(255) NOT NULL
) ENGINE = InnoDB
DEFAULT CHARSET = utf8;

-- Table structure for table `categorybook`
--

CREATE TABLE `categorybook`
(
    `category_id` int(11)      NOT NULL,
    `isbn`        bigint(20)   NOT NULL
) ENGINE = InnoDB
DEFAULT CHARSET = utf8;

-- Table structure for table `orders`
--

CREATE TABLE `orders`
(
    `isbn`        bigint(20)  DEFAULT NULL,
    `StudentID`  int(10)     DEFAULT NULL,
    `BookStatus` varchar(25) NOT NULL,
    `orderID`    int(11)     NOT NULL
) ENGINE = InnoDB
DEFAULT CHARSET = utf8;

-- Table structure for table `student`
--

CREATE TABLE `student`
(
    `name`        varchar(255) NOT NULL,
    `email`       varchar(255) NOT NULL,
    `password`   varchar(255) NOT NULL,
    `student_id` int(10)      NOT NULL,
    `contact`    bigint(15)   NOT NULL,
    `isactive`   tinyint(1)   NOT NULL DEFAULT '0'
) ENGINE = InnoDB
DEFAULT CHARSET = utf8;

-- Indexes for dumped tables
--

-- Indexes for table `author`
--
ALTER TABLE `author`
    ADD PRIMARY KEY (`author_id`);

-- Indexes for table `authorbook`
--
```

```
ALTER TABLE `authorbook`
    ADD UNIQUE KEY `authorbook` (`isbn`, `author_id`),
    ADD KEY `author_id` (`author_id`);

-- 
-- Indexes for table `books`
--
ALTER TABLE `books`
    ADD PRIMARY KEY (`isbn`);

-- 
-- Indexes for table `category`
--
ALTER TABLE `category`
    ADD PRIMARY KEY (`category_id`);

-- 
-- Indexes for table `categorybook`
--
ALTER TABLE `categorybook`
    ADD UNIQUE KEY `category_id` (`category_id`, `isbn`),
    ADD KEY `isbn` (`isbn`);

-- 
-- Indexes for table `orders`
--
ALTER TABLE `orders`
    ADD PRIMARY KEY (`orderID`),
    ADD KEY `isbn` (`isbn`),
    ADD KEY `StudentID` (`StudentID`);

-- 
-- Indexes for table `student`
--
ALTER TABLE `student`
    ADD PRIMARY KEY (`student_id`),
    ADD UNIQUE KEY `email` (`email`);

-- 
-- AUTO_INCREMENT for dumped tables
--

-- 
-- AUTO_INCREMENT for table `author`
--
ALTER TABLE `author`
    MODIFY `author_id` int(11) NOT NULL AUTO_INCREMENT,
    AUTO_INCREMENT = 166;

-- 
-- AUTO_INCREMENT for table `books`
--
ALTER TABLE `books`
    MODIFY `isbn` bigint(20) NOT NULL AUTO_INCREMENT,
    AUTO_INCREMENT = 2147483647;

-- 
-- AUTO_INCREMENT for table `category`
--
```

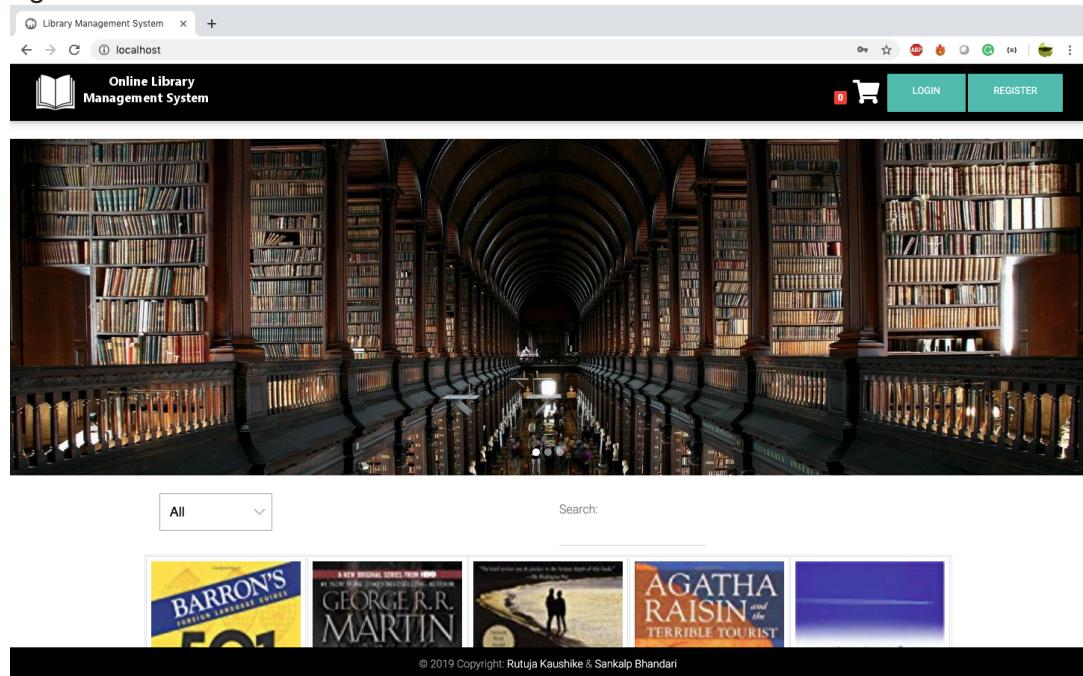
```
--  
ALTER TABLE `category`  
    MODIFY `category_id` int(10) NOT NULL AUTO_INCREMENT,  
    AUTO_INCREMENT = 34;  
  
--  
-- AUTO_INCREMENT for table `orders`  
--  
ALTER TABLE `orders`  
    MODIFY `orderID` int(11) NOT NULL AUTO_INCREMENT,  
    AUTO_INCREMENT = 6;  
  
--  
-- AUTO_INCREMENT for table `student`  
--  
ALTER TABLE `student`  
    MODIFY `student_id` int(10) NOT NULL AUTO_INCREMENT,  
    AUTO_INCREMENT = 1002;  
  
--  
-- Constraints for dumped tables  
--  
  
--  
-- Constraints for table `authorbook`  
--  
ALTER TABLE `authorbook`  
    ADD CONSTRAINT `authorbook_ibfk_1` FOREIGN KEY (`author_id`)  
REFERENCES `author`(`author_id`),  
    ADD CONSTRAINT `authorbook_ibfk_2` FOREIGN KEY (`isbn`)  
REFERENCES `books`(`isbn`);  
  
--  
-- Constraints for table `categorybook`  
--  
ALTER TABLE `categorybook`  
    ADD CONSTRAINT `categorybook_ibfk_1` FOREIGN KEY (`category_id`)  
REFERENCES `category`(`category_id`),  
    ADD CONSTRAINT `categorybook_ibfk_2` FOREIGN KEY (`isbn`)  
REFERENCES `books`(`isbn`);  
  
--  
-- Constraints for table `orders`  
--  
ALTER TABLE `orders`  
    ADD CONSTRAINT `orders_ibfk_1` FOREIGN KEY (`isbn`) REFERENCES  
`books`(`isbn`),  
    ADD CONSTRAINT `orders_ibfk_2` FOREIGN KEY (`StudentID`)  
REFERENCES `student`(`student_id`);  
COMMIT;
```

# Technologies Used

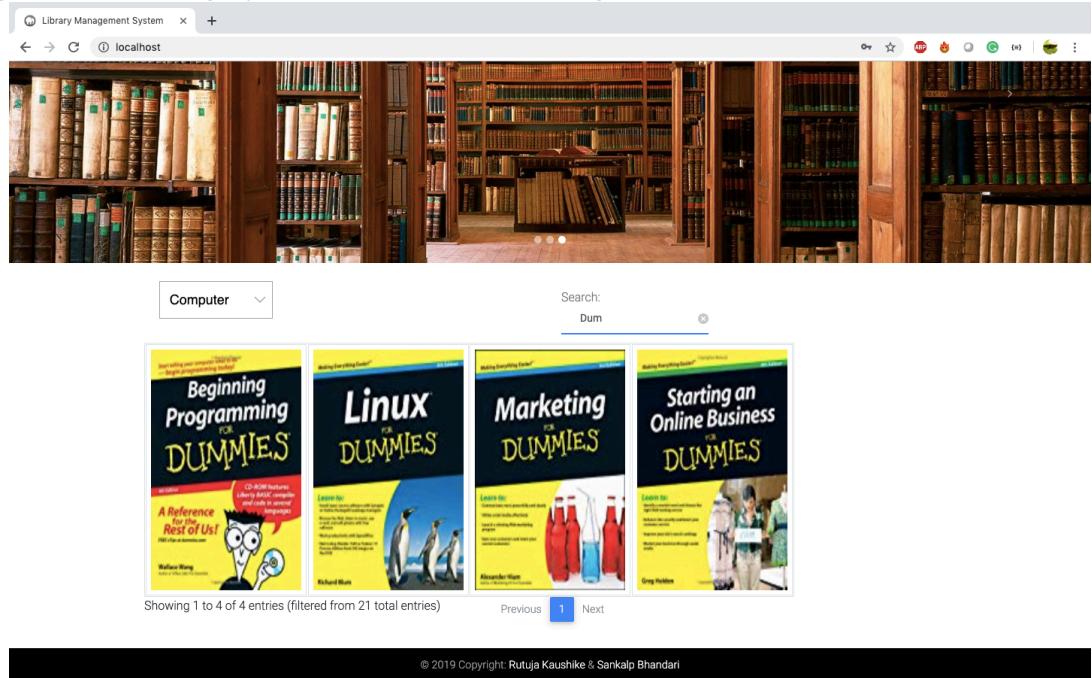
- Server-side: PHP
- Client-side: JavaScript
- Front-end: HTML, CSS, Material Design for Bootstrap 4
- Back-end: MySQL
- Solution Stack: MAMP

## Screenshots for main functionalities

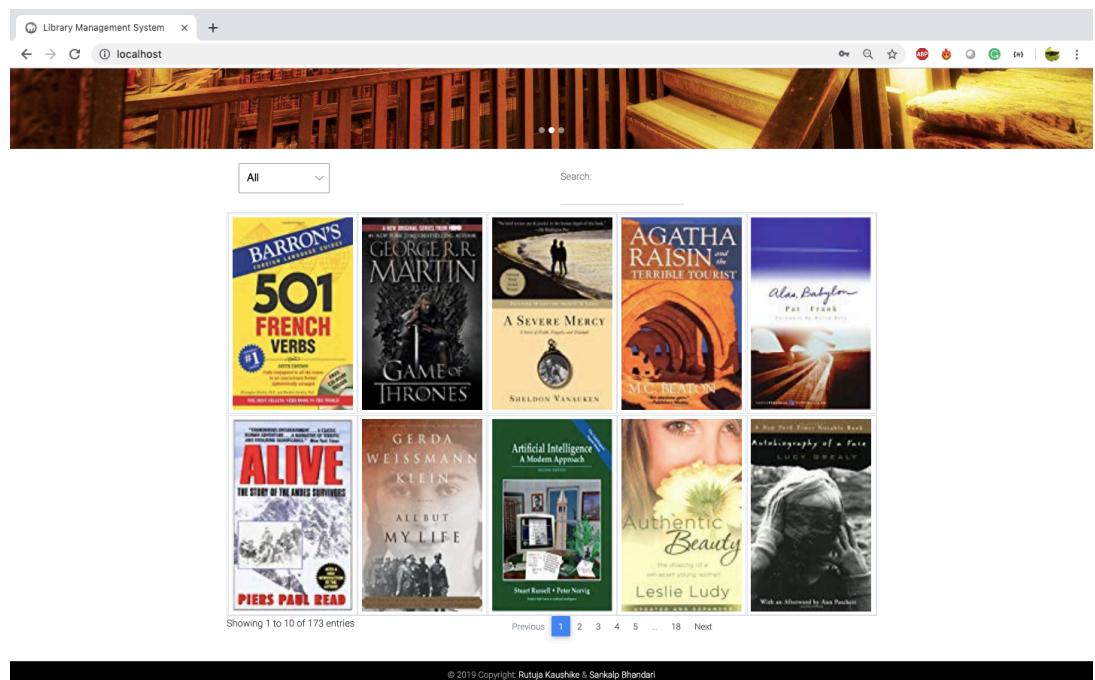
- Home Page



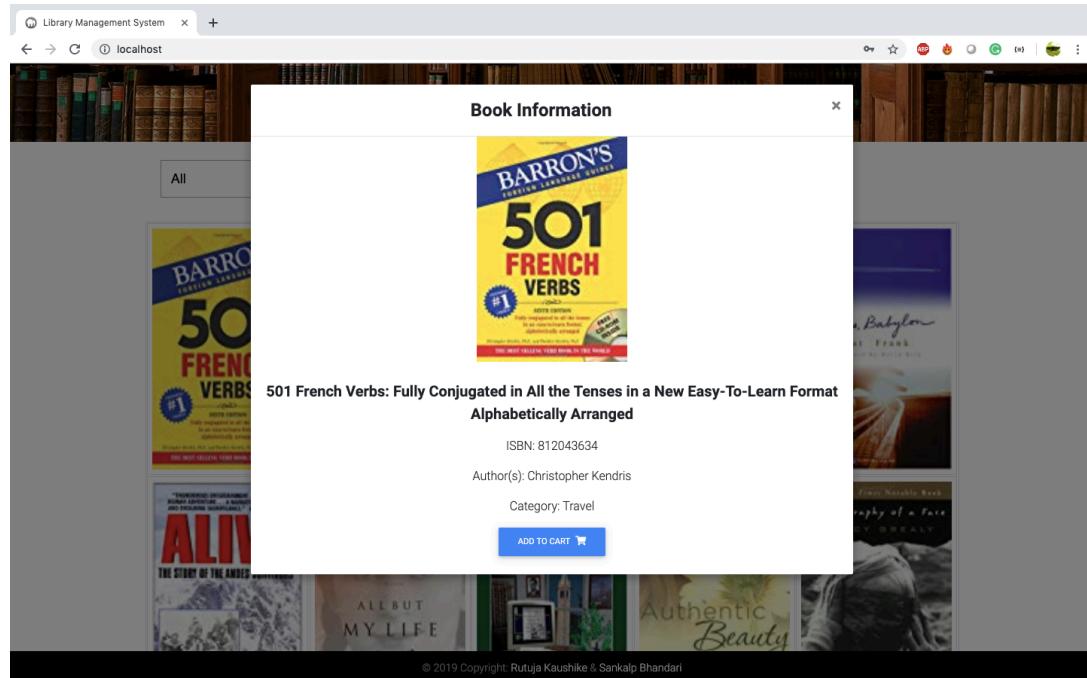
- Filtering based on category = computer and searching for term ‘Dum’



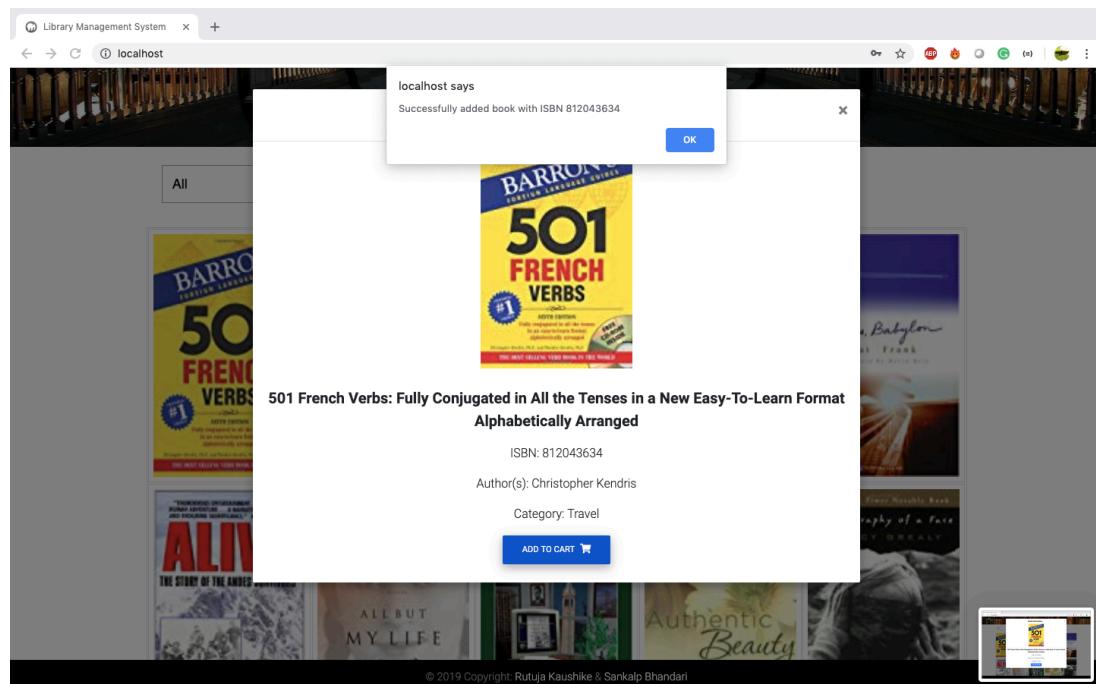
- Implementation of Pagination



- Book information shown as a user clicks on the book



- Adding book to the cart.



- Displaying books in a cart

The screenshot shows a web browser window for the "Library Management System" at the URL `localhost/cart.php`. The title bar says "Library Management System". The main content area is titled "Your Cart". A table lists one item: "501 French Verbs: Fully Conjugated in All the Tenses in a New Easy-To-Learn Format Alphabetically Arranged". Below the table is a green "CHECKOUT" button. At the top right of the page are "LOGIN" and "REGISTER" buttons, along with a shopping cart icon showing "1" item.

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- If attempted checking out without logging in, login link pops up

The screenshot shows a web browser window for the "Library Management System" at the URL `localhost/cart.php`. A modal dialog box titled "Sign in" is displayed over the cart page. It contains fields for "Your email" (with the value `rutu@utdallas.edu`) and "Your password" (with the value `*****`). Below these fields is a "LOGIN" button. At the bottom of the dialog, there are links for "Not a member? [Sign Up](#)" and "Forgot [Password?](#)". The background of the page is dimmed to indicate the modal is active.

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- Cart after logging in

The screenshot shows a web browser window for 'Library Management System' at 'localhost/cart.php'. The title bar says 'Library Management System' and the address bar says 'localhost/cart.php'. The header includes the 'Online Library Management System' logo and a shopping cart icon with '1' item. A 'HI RUTUJA KAUSHIKE' dropdown menu is visible. The main content is a 'Your Cart' section with a table:

No.	Name	
1	501 French Verbs: Fully Conjugated in All the Tenses in a New Easy-To-Learn Format Alphabetically Arranged	<span style="color: red;">×</span> REMOVE

Below the table is a green 'CHECKOUT' button. At the bottom of the page is a black footer bar with the text '© 2019 Copyright: Rutuja Kaushike & Sankalp Bhandari'.

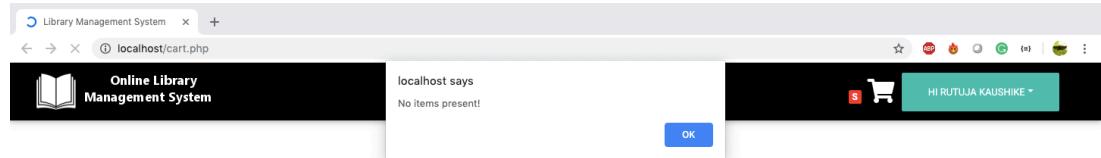
- After checking out, all the orders go to the Librarian for approval

The screenshot shows a web browser window for 'localhost/cart.php'. The title bar says 'localhost/cart.php'. The header includes the 'Online Library Management System' logo and a shopping cart icon with '1' item. A 'HI RUTUJA KAUSHIKE' dropdown menu is visible. A modal dialog box appears with the text 'localhost says' and 'Please collect the book from librarian'. Below the dialog is the 'Your Cart' section with the same table as before:

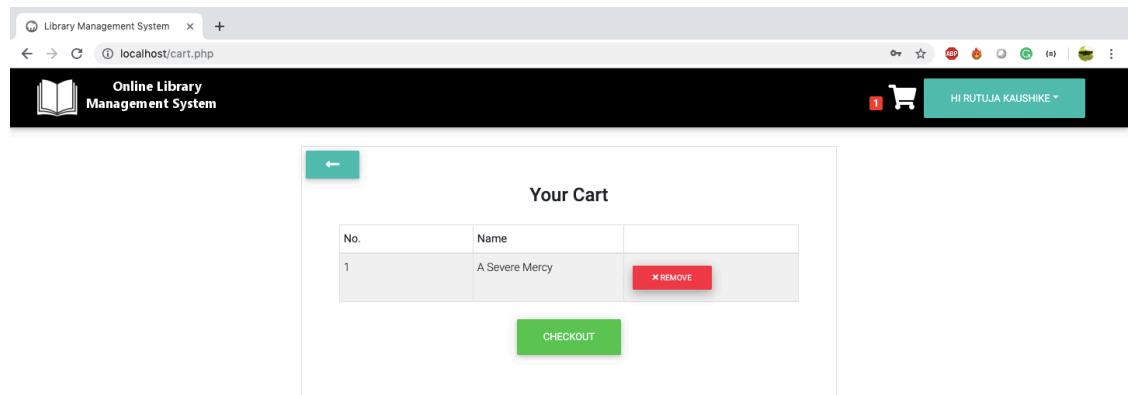
No.	Name	
1	501 French Verbs: Fully Conjugated in All the Tenses in a New Easy-To-Learn Format Alphabetically Arranged	<span style="color: red;">×</span> REMOVE

Below the table is a green 'CHECKOUT' button. At the bottom of the page is a black footer bar with the text '© 2019 Copyright: Rutuja Kaushike & Sankalp Bhandari'.

- If you click Cart which is empty, this will be the result



- Cart before removing a book



- Cart after removing an element

The screenshot shows a web browser window for 'Library Management System' at 'localhost/cart.php'. A modal dialog box in the center says 'localhost says Book with ISBN 60688246 has been removed from cart' with 'OK' and 'cancel' buttons. Below the modal is a 'Your Cart' section. It contains a table with one item: 'No.' (1), 'Name' (A Severe Mercy), and a red 'X REMOVE' button. At the bottom is a green 'CHECKOUT' button. The top right of the page shows a shopping cart icon with '1' and 'HI RUTUJA KAUSHIKI'. The footer of the page includes a copyright notice: '© 2019 Copyright: Rutuja Kaushik & Sankalp Bhandari'.

- Order history of a student

The screenshot shows a web browser window for 'Library Management System' at 'localhost/manage-order.php'. The title bar says 'Your Order History'. It features a search bar and a dropdown for 'Show 10 entries'. Below is a table of order history:

Book Name	Status
501 French Verbs: Fully Conjugated in All the Tenses in a New Easy-To-Learn Format Alphabetically Arranged	Issue Requested
A Game of Thrones	Issue Requested
A Severe Mercy	Returned
All But My Life	Returned
Autobiography of a Face	Denied
Rutuja Kaushik's Autobiography	Return Requested
Rutuja Kaushik's Autobiography	Issue Requested
Starting an Online Business For Dummies (For Dummies (Computer/Tech))	Denied

At the bottom, it says 'Showing 1 to 8 of 8 entries' with 'Previous' and 'Next' buttons. The top right shows a shopping cart icon with '1' and 'HI RUTUJA KAUSHIKI'. The footer includes the copyright notice: '© 2019 Copyright: Rutuja Kaushik & Sankalp Bhandari'.

- Searching enabled in Orders page

The screenshot shows a web browser window for the 'Online Library Management System'. The title bar says 'Library Management System' and the address bar shows 'localhost/manage-order.php'. The main content area is titled 'Your Order History'. It features a search bar with the placeholder 'Search:' and a text input containing 'Gam'. Below the search bar is a table with columns 'Book Name' and 'Status'. A single row is visible: 'A Game of Thrones' under Book Name and 'Issue Requested' under Status. At the bottom, it says 'Showing 1 to 1 of 1 entries (filtered from 8 total entries)' and has 'Previous' and 'Next' buttons. The status bar at the bottom of the browser window displays the copyright notice '© 2019 Copyright: Rutuja Kaushik & Sankalp Bhandari'.

- Admin Dashboard

The screenshot shows a web browser window for the 'Online Library Management System'. The title bar says 'Library Management System' and the address bar shows 'localhost/dashboard.php'. The main content area is the 'Admin Dashboard' with a dark header bar showing 'HI ADMIN'. Below the header are six cards with statistics:

- Books Listed: 166
- Book Issue/ Return Requests: 4
- Account Activate Requests: 2
- Registered Users: 6
- Authors Listed: 166
- Categories Listed: 13

The status bar at the bottom of the browser window displays the copyright notice '© 2019 Copyright: Rutuja Kaushik & Sankalp Bhandari'.

- Books are managed by Admin

Manage Books

ISBN	Book Name	Image	No of Copies
60523808	Who Says Elephants Can't Dance? Inside IBM's Historic Turnaround		6
6055971	I Never Had It Made: An Autobiography of Jackie Robinson		7
60688246	A Severe Mercy		5
60741872	Alas		6
60746378	Mayo Clinic Guide to a Healthy Pregnancy		10

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- Searching enabled in Books

Manage Books

ISBN	Book Name	Image	No of Copies
1234567890	Rutuja Kaushik's Autobiography		1

Showing 1 to 1 of 1 entries (filtered from 173 total entries)

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- Adding a book

Online Library Management System

Add Book

ISBN of Book: 1234567899

Name of Book: How to train your dragon

No. of copies: 3

Upload Book Cover

Select Author(s): Rutuja Kaushik

Select Category(s): History

© 2019 Copyright: Rutuja Kaushik & Sankalp Bhandari

- Book added successfully

Success! The book has been successfully added

Online Library Management System

Add Book

ISBN of Book: 1234567899

Name of Book: How to train your dragon

No. of copies: 3

Upload Book Cover

Select Author(s): Agatha Christie

Select Category(s): All

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- Book issue approval portal

The screenshot shows a table titled "Active Issue/ Return Requests" with the following data:

Student Name	Book Name	Status	Action
Rutuja Kaushik	Rutuja Kaushik's Autobiography	Return Requested	
Rutuja Kaushik	A Game of Thrones	Issue Requested	 
Rutuja Kaushik	Rutuja Kaushik's Autobiography	Issue Requested	 
Rutuja Kaushik	501 French Verbs: Fully Conjugated in All the Tenses in a New Easy-To-Learn Format Alphabetically Arranged	Issue Requested	 

Below the table, it says "Showing 1 to 4 of 4 entries" and has "Previous" and "Next" buttons. At the bottom right, there is a copyright notice: "© 2019 Copyright: Rutuja Kaushik & Sankalp Bhandari".

- Registration of new students

The screenshot shows a "Sign up" form with the following fields:

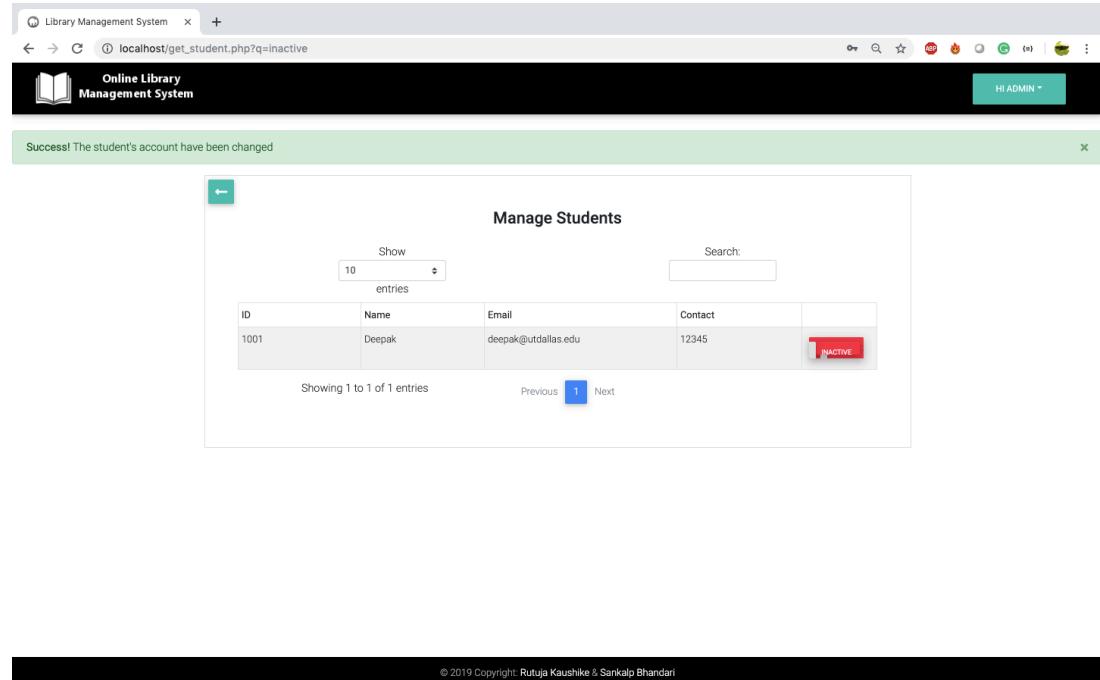
- Your name
- Your email
- Your password
- Confirm password
- Your Contact

At the bottom of the form, there is a "SIGN UP" button and a link "Already a member? [Sign In](#)".

At the top of the page, there is a navigation bar with "LOGIN" and "REGISTER" buttons. Below the sign-up form, there is a search bar and a grid of book covers.

At the very bottom, there is a copyright notice: "© 2019 Copyright: Rutuja Kaushik & Sankalp Bhandari".

- Approving registered users

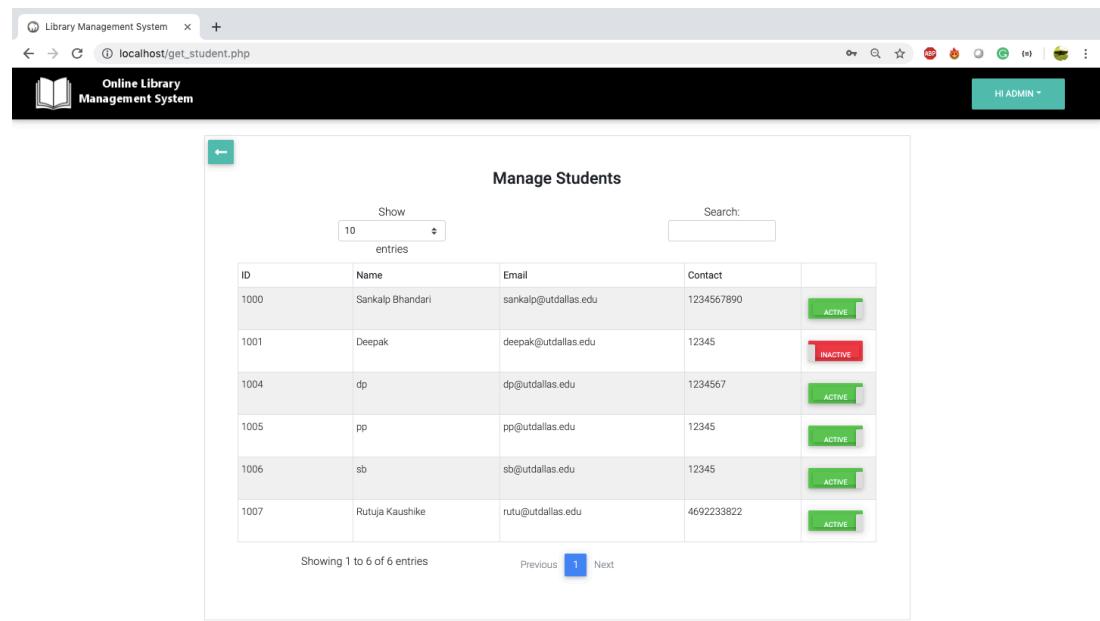


The screenshot shows a web browser window for the 'Library Management System'. The title bar says 'localhost/get\_student.php?q=inactive'. The main content area is titled 'Manage Students'. It displays a table with one row of data:

ID	Name	Email	Contact	Status
1001	Deepak	deepak@utdallas.edu	12345	<span style="background-color: red; color: white; padding: 2px;">INACTIVE</span>

Below the table, it says 'Showing 1 to 1 of 1 entries'. There is a 'Search:' input field and a 'Previous' button.

- Registered student directory



The screenshot shows a web browser window for the 'Library Management System'. The title bar says 'localhost/get\_student.php'. The main content area is titled 'Manage Students'. It displays a table with six rows of data:

ID	Name	Email	Contact	Status
1000	Sankalp Bhandari	sankalp@utdallas.edu	1234567890	<span style="background-color: green; color: white; padding: 2px;">ACTIVE</span>
1001	Deepak	deepak@utdallas.edu	12345	<span style="background-color: red; color: white; padding: 2px;">INACTIVE</span>
1004	dp	dp@utdallas.edu	1234567	<span style="background-color: green; color: white; padding: 2px;">ACTIVE</span>
1005	pp	pp@utdallas.edu	12345	<span style="background-color: green; color: white; padding: 2px;">ACTIVE</span>
1006	sb	sb@utdallas.edu	12345	<span style="background-color: green; color: white; padding: 2px;">ACTIVE</span>
1007	Rutuja Kaushik	rutu@utdallas.edu	4692233822	<span style="background-color: green; color: white; padding: 2px;">ACTIVE</span>

Below the table, it says 'Showing 1 to 6 of 6 entries'. There is a 'Search:' input field and a 'Previous' button.

- Manage Authors page having similar functionality as of Managing Books

The screenshot shows a web browser window titled "Library Management System" with the URL "localhost/manage-authors.php". The page has a dark header with the "Online Library Management System" logo and a "HI ADMIN" button. Below the header is a search bar and a "Show" dropdown set to "10 entries". A table lists nine authors with their IDs and names, each with a checkbox for selection. At the bottom right of the table is a copyright notice: "© 2019 Copyright: Rutuja Kaushik & Sankalp Bhandari".

Author ID	Author Name	Action
1	Ernest Hemingway	<input type="checkbox"/>
2	Daniel Quinn	<input type="checkbox"/>
3	Barack Obama	<input type="checkbox"/>
4	Franz Kafka	<input type="checkbox"/>
5	Bill Bryson	<input type="checkbox"/>
6	Caroline B. Cooney	<input type="checkbox"/>
7	James Herriot	<input type="checkbox"/>
8	Thomas Kempis	<input type="checkbox"/>
9	Ann Rule	<input type="checkbox"/>

- Manage Categories page having similar functionality as of Managing Books

The screenshot shows a web browser window titled "Library Management System" with the URL "localhost/manage-categories.php". The page has a dark header with the "Online Library Management System" logo and a "HI ADMIN" button. Below the header is a search bar and a "Show" dropdown set to "10 entries". A table lists nine categories with their IDs and names, each with a checkbox for selection. At the bottom right of the table is a copyright notice: "© 2019 Copyright: Rutuja Kaushik & Sankalp Bhandari".

Category ID	Category Name	Action
1	Business	<input type="checkbox"/>
2	Computer	<input type="checkbox"/>
3	Education	<input type="checkbox"/>
4	Health	<input type="checkbox"/>
5	Kids	<input type="checkbox"/>
6	Literature	<input type="checkbox"/>
7	Romance	<input type="checkbox"/>
8	Science	<input type="checkbox"/>
9	Sports	<input type="checkbox"/>

## Work Division

- Work was divided equally among both team members. Both the members designed the database together and normalized it. After that, the work was divided equally and implemented individually. At the end, the pages created were integrated as a project giving the complete project flow. The individual task assignments are as follows:

No.	Name	Tasks
1	Rutuja Kaushik	Designing and implementing the front-end and back-end of the user & Cart module, designing the index page, header and footer pages
2	Sankalp Bhandari	Designing and implementing the front-end and back-end of the Admin module, implementing pagination on Index page

## Project Link

<https://github.com/sankalpbhandari/LibraryMgmtSystem>