

# PROJECT REPORT

**Lab Group :** Lab group 16

**Student ID & name:** 201801244 : Siddhi Patel  
201801245 : Richa Patel  
202012119 : Daya Yadav

**Course:** IT414 Software Project Management

**Professor :** Jayprakash Lalchandani

**Teaching assistance :** Sandhya Kumari



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## **1. Project team details and roles of team members.**

Name	Role
201801244 : Siddhi Patel	Back-End
201801245 : Richa Patel	Front-End
202012119 : Daya Yadav	Back-End

## **2. Project background**

### **a) Purpose of project**

In today's time a lot of technologies are coming up like audiobooks, kindle, digital library etc., but some book readers still are connected with the traditional way of reading a book. Our tool 'Online book rental system' is made with an easy user interface. Users of our tool are both book givers and book renters.

### **b) Scope of project**

'Online book rental system' is an innovative tool to maintain and manage the data of books to rent. It is an online portal to read journals, magazines and novels on a very affordable rent charge. If any user(reader) of this wants to read a book , the user can buy a book or the user can find that book in the library too. The drawback of reading a book from the library is, if I am not able to return the book on time or somehow under unforeseen situations a user returns the book late, he/she will have to pay fine money. It is a waste of money at the end of the day. Our software tool will be able to solve this problem, because users will get notification for the due date of returning a book. These tools will monitor the book database and users can get the idea about when the book will be available for rent. User can check whether the book he is searching for is available or not, it saves a lot of time because you don't have to visit the library. Pros of using a book rental system is book receivers get books at a reasonable price for some amount of time and book givers get rent money.

### **3. Perspectives**

#### **a) Who will use the system?**

The system end users of the system refer to the people who use this application to perform add/update/delete books.

#### **b) Who can provide input about the system?**

Customers add the book and other customers will rent the book.

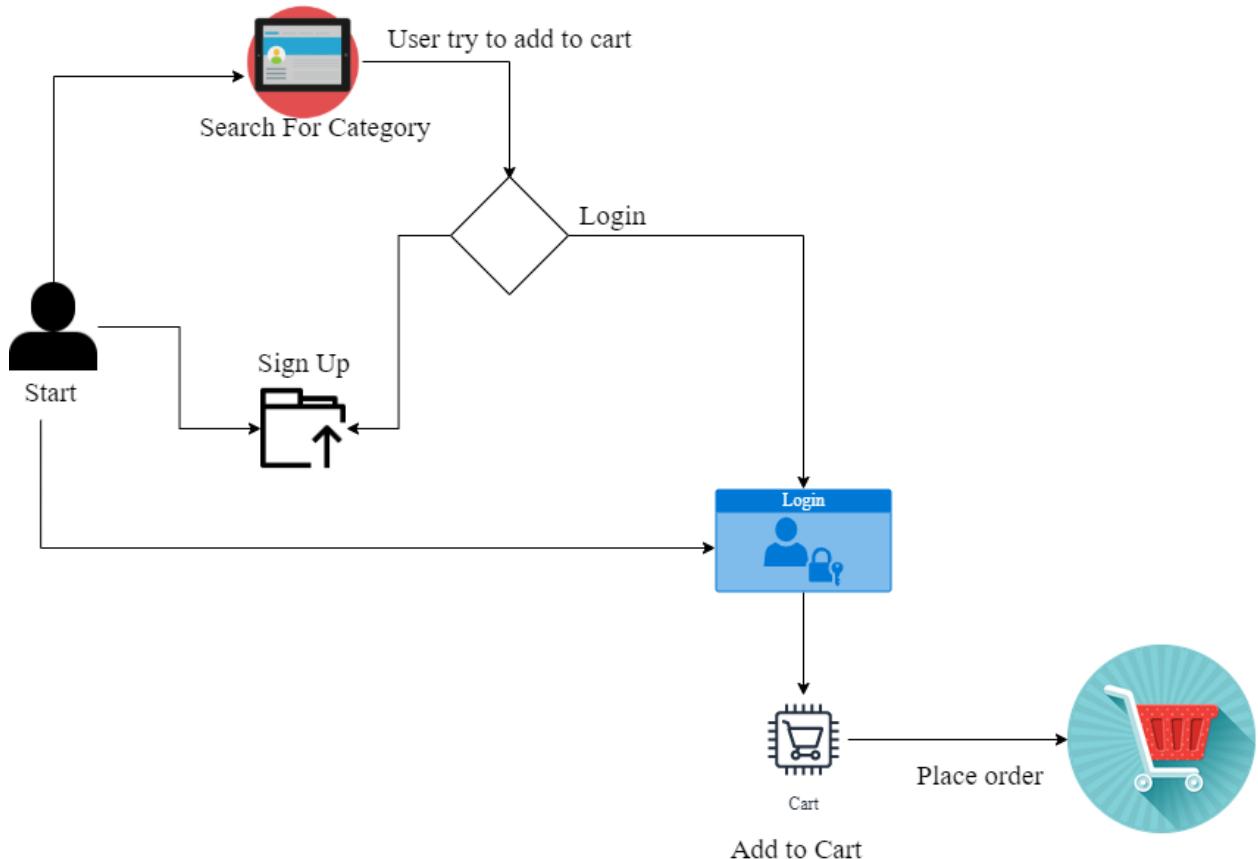
### **4. Project Objectives**

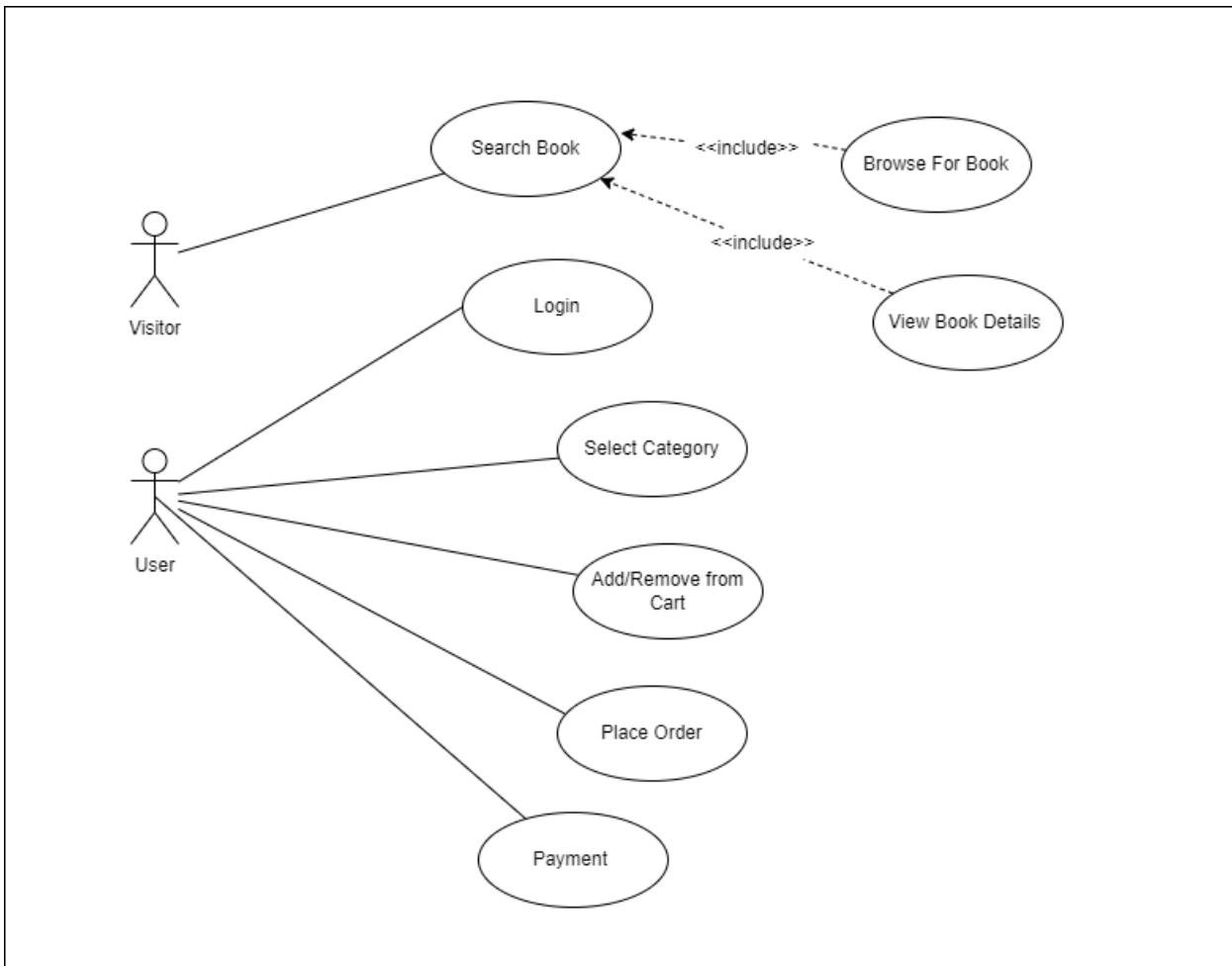
#### **a) Business rules for your system**

- Pricing administration by admin manually, and will be independent of demand supply
- Fairness: First come first serve, no special service for any user.
- Without login, one can't search or rent book
- Privacy: only admin can see any user's rent history
- Admin can restrict or block a user's account if they violate any policy of fair usage.
- Every book will have a sticker QR code showing the item ID, and that will be the only identifier.
- System can recommend new books to users based on their past readings.
- Users can't rent more than 2 books at the same time. This number can be altered by Admins.
- Penalty can be applied in the cases of late return as well as damage to the book.
  - Late return penalty will be generated by the system and can be altered by the admin
  - Damage penalty will be generated by the librarian.

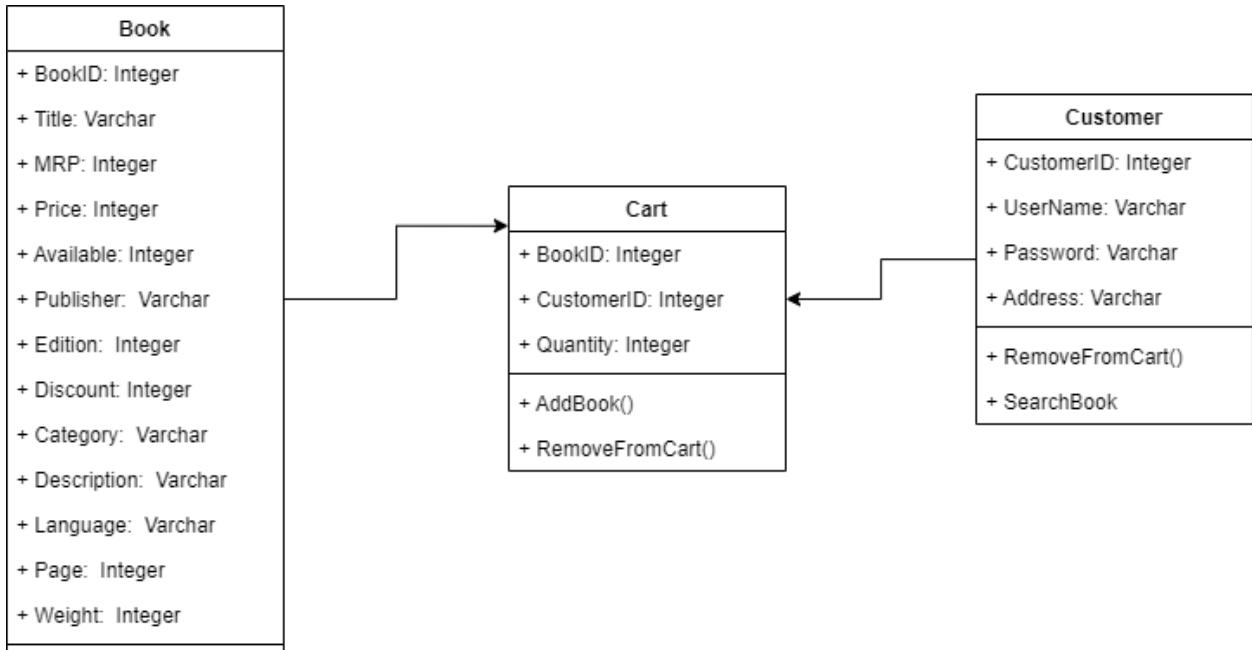
b) System information and/or diagrams(mainly UML Use case, class, and interaction models)

### Critical Path



**Use-Case**

## Class Diagram



**c) Assumptions and dependencies, including time and effort estimates, details on tasks done by specific team members.**

New fields for:

- Assumptions
- Estimated Human Efforts

Jira Software Your work Projects Filters Dashboards People Apps Create

OnlineBookRental Software project

Project settings

Issue types

- Epic
- Bug
- Dev Task
- Story
- Task**
- User Issue
- Subtask
- + Add issue type

You're in a team-managed project Learn more

Projects / OnlineBookRental / Project settings / Issue types

**Task**

Tasks track small, distinct pieces of work.

Description fields

- Summary
- Description
- Assumptions

Context fields

- Status
- Reporter
- Assignee
- Labels
- Sprint
- Original estimate
- Estimated Efforts
- Time tracking
- Due date

HIDE FIELDS BELOW

Fields

Fields capture and display the information people need to carry out your project's work.

CREATE A FIELD

Drag a field type to the left area to create a custom field for your "Task" issues.

Aa Short text	Paragraph	Date
Number	Time stamp	Labels
Dropdown	Checkbox	People
Dependent dropdown		

PREVIOUSLY-CREATED FIELDS

Reuse fields from your other issue types. Or, add a field created by Jira or a third-party app.

Search fields
Start date
Aa Pull Request
Environment
Tester(QA)
Demo Date
Aa Module Name

Edit workflow

Discard Save changes

## Assumptions and dependencies between tasks and estimated effort of human:

Jira Software - Your work - Projects - Filters - Dashboards - People - Apps - Create

Search Save as

Order by createdDate DESC

Projects / OnlineBookRental / Add epic / BOOK-5

**[Design] Identify all the indexes for database**

Attach Add a child issue Link issue

Description  
Indexes based on query patterns

Assumptions  

- All the read queries from the application should be indexed
- A minimum number of indexes are needed.

Linked issues  
is blocked by

+  
BOOK-4 Design schema for database DONE

Activity  
Show: All Comments History Work log Newest first

Add a comment...  
Pro tip: press M to comment

Details

Done ✓ Done

Reporter 2018-01-24 01:24  
Assignee 2018-01-24 01:24  
Labels None  
Sprint None +2  
Original estimate 0m  
Estimated Efforts None  
Time tracking No time logged  
Due date None

Created September 22, 2021, 7:53 AM Updated 2 minutes ago Resolved September 22, 2021, 1:58 PM Configure

Jira Software - Your work - Projects - Filters - Dashboards - People - Apps - Create

Search Save as

Order by createdDate DESC

Projects / OnlineBookRental / Add epic / BOOK-7

**[Backend] Design class and implement Login service**

Attach Add a child issue Link issue

Description  
Login for both user and admin.

Assumptions  

- Auth token-based login
- Email ID and phone number can be unverified.
- OTP-based login will not be supported. Only password-based will be supported.

Linked issues  
relates to

+  
BOOK-17 As a buyer/renter I want to register so I can see my profile DONE

Activity  
Show: All Comments History Work log Newest first

Add a comment...  
Pro tip: press M to comment

Details

Done ✓ Done

Reporter 2018-01-24 01:24  
Assignee 2020-12-11 11:19  
Labels Backend Implementation Login  
Sprint None +2  
Original estimate 0m  
Estimated Efforts None  
Time tracking No time logged  
Due date None

Created September 22, 2021, 8:00 AM Updated September 22, 2021, 1:39 PM Resolved September 22, 2021, 12:04 PM Configure

Jira Software Your work Projects Filters Dashboards People Apps Create

Search Save as

order by created DESC

Projects / OnlineBookRental / Add epic / BOOK-8

[Frontend] Design UI and implement Login page

Done ✓ Done 112 of 118

Details

Reporter 2018-01244

Assignee 2018-01244

Labels Frontend Implementation Login

Sprint None +3

Original estimate 0m

Estimated Efforts 5 In Human Days

Time tracking No time logged

Due date Sep 24, 2021

Created September 22, 2021, 8:02 AM Updated 1 minute ago Configure Resolved September 22, 2021, 8:53 PM

**Assumptions**

- Forgot password is done by contacting Admins.
- Redirect to login page if session is expired or backend gives auth error

**Linked issues** +

is blocked by

BOOK-7 [Backend] Design class and impl...

BOOK-6 Identify all the usecases and desi...

BOOK-5 [Design] Identify all the indexes ...

BOOK-4 Design schema for database

BOOK-2 Write a design doc for core archit...

BOOK-1 Database Creation

**Dependencies**

BOOK-7 [Backend] Design class and implement Login service

DONE

Activity

Show: All Comments History Work log Newest first

Add a comment... Pro tip: press M to comment

1 2 3

## Siddhi's task

Jira Software Your work Projects Filters Dashboards People Apps Create Search

**Search** Save as assignee IN (61485a37a995ad0073ade1a7)

1–12 of 12 Columns

T	Key	Summary	Assignee	Reporter	P	Status	Resolution	Created	Updated	Due
<input checked="" type="checkbox"/>	BOOK-57	Rent-Book Page	2018 01244	202012119	<span style="color: orange;">=</span>	To Do	Unresolved	22/Sep/21	22/Sep/21	...
<input checked="" type="checkbox"/>	BOOK-58	Chat-Box working	2018 01244	202012119	<span style="color: orange;">=</span>	In Progress	Unresolved	22/Sep/21	22/Sep/21	
<input checked="" type="checkbox"/>	BOOK-54	Email Notification	2018 01244	202012119	<span style="color: orange;">=</span>	To Do	Unresolved	22/Sep/21	22/Sep/21	
<input checked="" type="checkbox"/>	BOOK-47	UML	2018 01244	202012119	<span style="color: orange;">=</span>	In Progress	Unresolved	22/Sep/21	20/Dec/21	
<input checked="" type="checkbox"/>	BOOK-40	[QA] Verify all the functionalities for chatting	2018 01244	2018 01244	<span style="color: orange;">=</span>	Done	Done	22/Sep/21	22/Sep/21	
<input checked="" type="checkbox"/>	BOOK-34	[Infra] Implement read and write replica of all the databases in Test and Production environment	2018 01244	2018 01244	<span style="color: orange;">=</span>	Done	Done	22/Sep/21	22/Sep/21	
<input checked="" type="checkbox"/>	BOOK-29	design and implementation of book service	2018 01244	2018 01244	<span style="color: orange;">=</span>	Done	Done	22/Sep/21	22/Sep/21	
<input checked="" type="checkbox"/>	BOOK-12	[Backend] Create APIs and tables for chatting	2018 01244	2018 01244	<span style="color: orange;">=</span>	Done	Done	22/Sep/21	22/Sep/21	
<input checked="" type="checkbox"/>	BOOK-10	[Backend] Design and implement Book service	2018 01244	2018 01244	<span style="color: orange;">=</span>	To Do	Unresolved	22/Sep/21	20/Dec/21	
<input checked="" type="checkbox"/>	BOOK-8	[Frontend] Design UI and implement Login page	2018 01244	2018 01244	<span style="color: orange;">=</span>	Done	Done	22/Sep/21	22/Sep/21	
<input checked="" type="checkbox"/>	BOOK-5	[Design] Identify all the indexes for database	2018 01244	2018 01244	<span style="color: orange;">=</span>	Done	Done	22/Sep/21	20/Dec/21	
<input checked="" type="checkbox"/>	BOOK-4	Design schema for database	2018 01244	2018 01244	<span style="color: orange;">=</span>	Done	Done	22/Sep/21	20/Dec/21	

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## Richa's task

Jira Software Your work Projects Filters Dashboards People Apps Create Search

**Search** Save as assignee IN (6149e76a78b7a1006ab404c4)

1–10 of 10 Columns

T	Key	Summary	Assignee	Reporter	P	Status	Resolution	Created	Updated	Due
<input checked="" type="checkbox"/>	BOOK-58	Booking Confirmation	201801245	202012119	<span style="color: orange;">=</span>	To Do	Unresolved	22/Sep/21	22/Sep/21	...
<input checked="" type="checkbox"/>	BOOK-55	Notification working	201801245	202012119	<span style="color: orange;">=</span>	In Progress	Unresolved	22/Sep/21	22/Sep/21	
<input checked="" type="checkbox"/>	BOOK-50	Chatting UI	201801245	202012119	<span style="color: orange;">=</span>	In Progress	Unresolved	22/Sep/21	22/Sep/21	
<input checked="" type="checkbox"/>	BOOK-49	Login and Signup page	201801245	202012119	<span style="color: orange;">=</span>	In Progress	Unresolved	22/Sep/21	22/Sep/21	
<input checked="" type="checkbox"/>	BOOK-48	ER Diagram	201801245	202012119	<span style="color: orange;">=</span>	In Progress	Unresolved	22/Sep/21	20/Dec/21	30/Sep/21
<input checked="" type="checkbox"/>	BOOK-42	Fix notification order in UI	201801245	2018 01244	<span style="color: orange;">=</span>	Not Applicable	Done	22/Sep/21	13/Oct/21	
<input checked="" type="checkbox"/>	BOOK-39	[Frontend] Implement notification window with sockets	201801245	2018 01244	<span style="color: orange;">=</span>	In Progress	Unresolved	22/Sep/21	22/Sep/21	
<input checked="" type="checkbox"/>	BOOK-38	[Backend] Design and implement notification service with push and pull notifications	201801245	2018 01244	<span style="color: orange;">=</span>	Done	Done	22/Sep/21	22/Sep/21	
<input checked="" type="checkbox"/>	BOOK-37	Determine all the usecases and create usecase diagram	201801245	2018 01244	<span style="color: orange;">=</span>	Done	Done	22/Sep/21	22/Sep/21	
<input checked="" type="checkbox"/>	BOOK-32	[Design] database schema	201801245	2018 01244	<span style="color: orange;">=</span>	Done	Done	22/Sep/21	22/Sep/21	

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## Daya's task

Jira Software Your work Projects Filters Dashboards People Apps Create

Search as

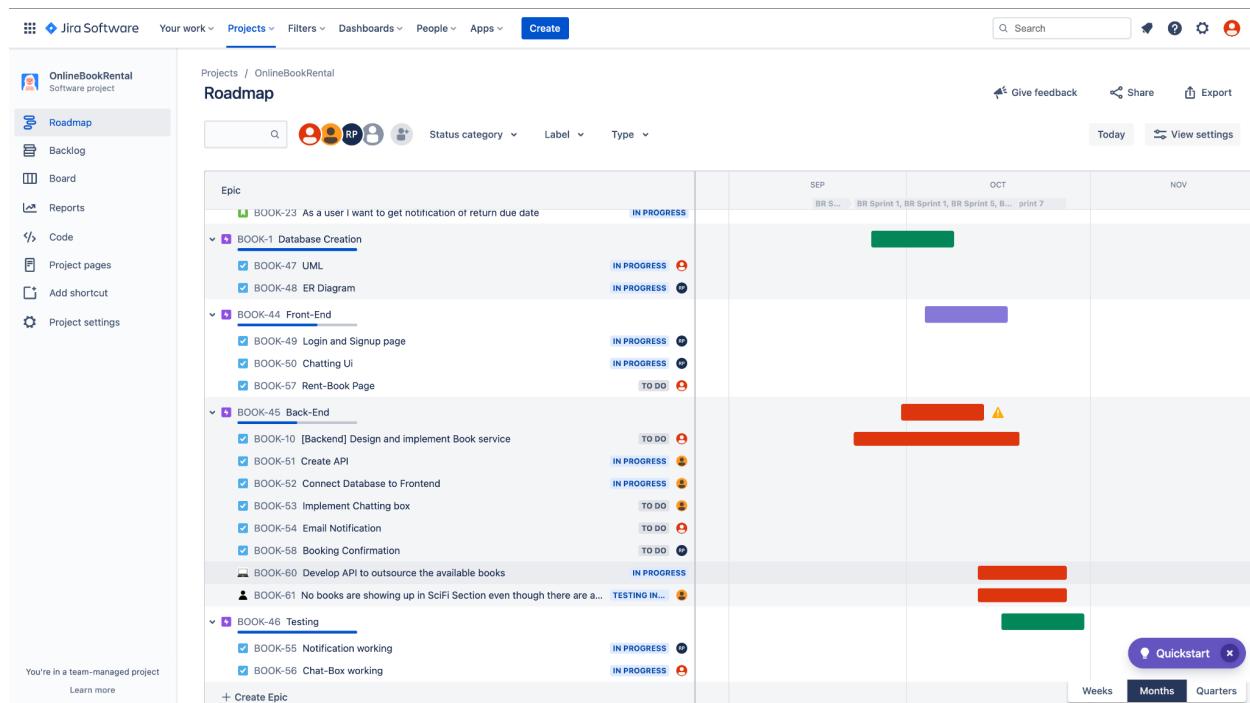
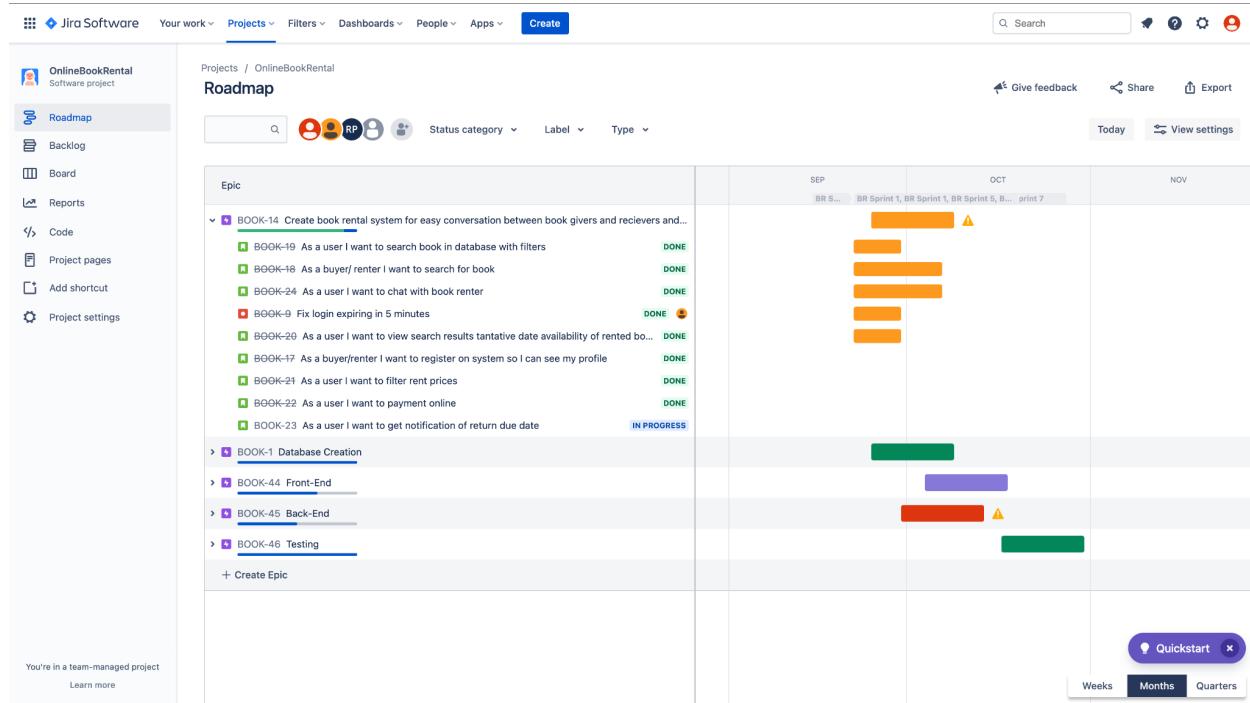
assignee IN (6148301ca995ad0073ab9eb6)

1–16 of 15

T	Key	Summary	Assignee	Reporter	P	Status	Resolution	Created	Updated	Due	...
	BOOK-61	No books are showing up in SciFi Section even though there are available books	202012119	2018 01244	<span style="color: red;">✗</span>	TESTING IN PROG...	Unresolved	12/Oct/21	12/Oct/21		...
	BOOK-59	Add Support for Login with Google and GitHub	202012119	2018 01244	<span style="color: red;">✗</span>	TESTING IN PROG...	Unresolved	12/Oct/21	13/Oct/21	20/Oct/21	
	BOOK-53	Implement Chatting box	202012119	202012119	<span style="color: orange;">■</span>	TO DO	Unresolved	22/Sep/21	22/Sep/21		
	BOOK-52	Connect Database to Frontend	202012119	202012119	<span style="color: orange;">■</span>	IN PROGRESS	Unresolved	22/Sep/21	22/Sep/21		
	BOOK-51	Create API	202012119	202012119	<span style="color: orange;">■</span>	IN PROGRESS	Unresolved	22/Sep/21	22/Sep/21		
	BOOK-41	[QA] Verify all the functionalities for notification [Mobile and Web]	202012119	2018 01244	<span style="color: orange;">■</span>	TESTING IN PROG...	Unresolved	22/Sep/21	13/Oct/21		
	BOOK-38	[Backend] Create API for User and Admin login	202012119	2018 01244	<span style="color: orange;">■</span>	DONE	Done	22/Sep/21	22/Sep/21		
	BOOK-35	Design core architecture	202012119	2018 01244	<span style="color: orange;">■</span>	DONE	Done	22/Sep/21	22/Sep/21		
	BOOK-31	create API and table for chatting	202012119	2018 01244	<span style="color: orange;">■</span>	DONE	Done	22/Sep/21	22/Sep/21		
	BOOK-13	[Frontend] Create UI for chatting	202012119	2018 01244	<span style="color: orange;">■</span>	DONE	Done	22/Sep/21	22/Sep/21		
	BOOK-11	[Frontend] Design UI and implement book search and rental pages	202012119	2018 01244	<span style="color: orange;">■</span>	DONE	Done	22/Sep/21	22/Sep/21		
	BOOK-9	Fix login expiring in 5 minutes	202012119	2018 01244	<span style="color: orange;">■</span>	DONE	Done	22/Sep/21	22/Sep/21		
	BOOK-7	[Backend] Design class and implement Login service	202012119	2018 01244	<span style="color: orange;">■</span>	DONE	Done	22/Sep/21	20/Dec/21		
	BOOK-6	Identify all the usecases and design usecase diagram	202012119	2018 01244	<span style="color: orange;">■</span>	DONE	Done	22/Sep/21	20/Dec/21		
	BOOK-2	Write a design doc for core architecture	202012119	2018 01244	<span style="color: orange;">■</span>	DONE	Done	21/Sep/21	20/Dec/21		

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## d) Project plan based on 4(c) using Gantt charts



### e) Design and implementation constraints

#### Design Constraints

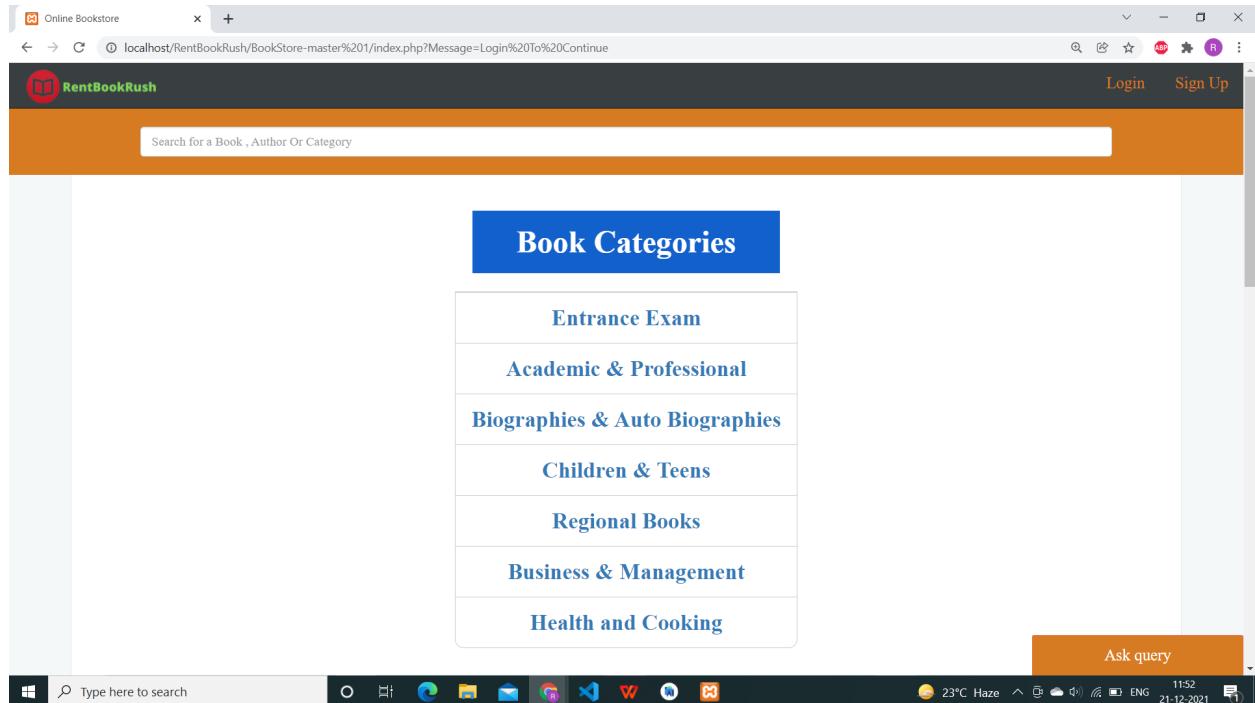
- Time constraints.
- The most important constraint is security. They should not be communicated through unsafe mode. And passwords should be encrypted
- Quality constraint:
- All the backend requests should give the response in 500 milliseconds.
- The UI should not use more than 500 MB of RAM
- UI should be self-adjusting based on device resolution
- Admin should control and alter everything
- Implementation should be modular and extensible
- Implementation should be unit tested and integration tested.
- Code should be reviewed and have at least 3 peer approvals

## 5. Risks associated with your project and its mitigation strategies

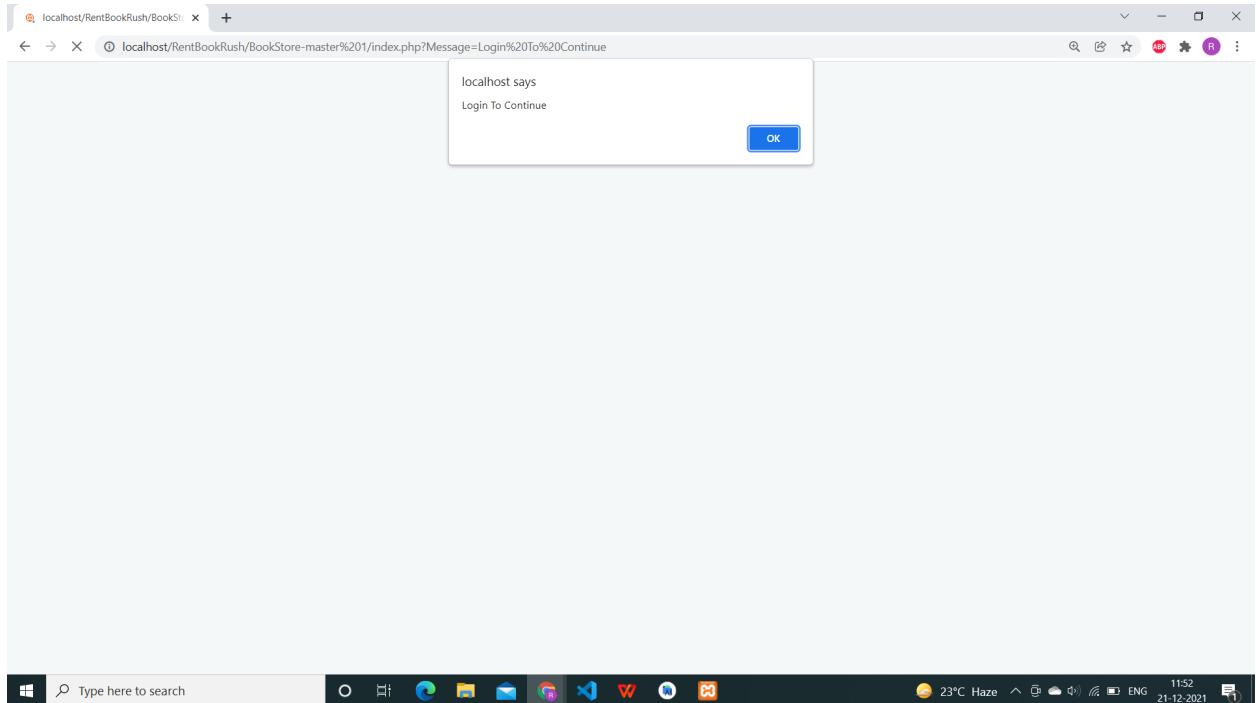
- Handle scenario where same book rented by multiple customer at the same time
- In schedule risk, we may delay any feature delivery. This can be mitigated by proper explanation and associating more people in a task
- Technical risk:
- Technical risks are related to technical failure, performance failure, system outage etc.
- Such risks can be mitigated by having oncall engineers taking care of production issues
- User reported issues:
- Such issues can be reported in our user issues forum or through feedback. Customer support engineers can take them up and fix them with help of oncall engineer

## 6. UI/UX design of the complete system

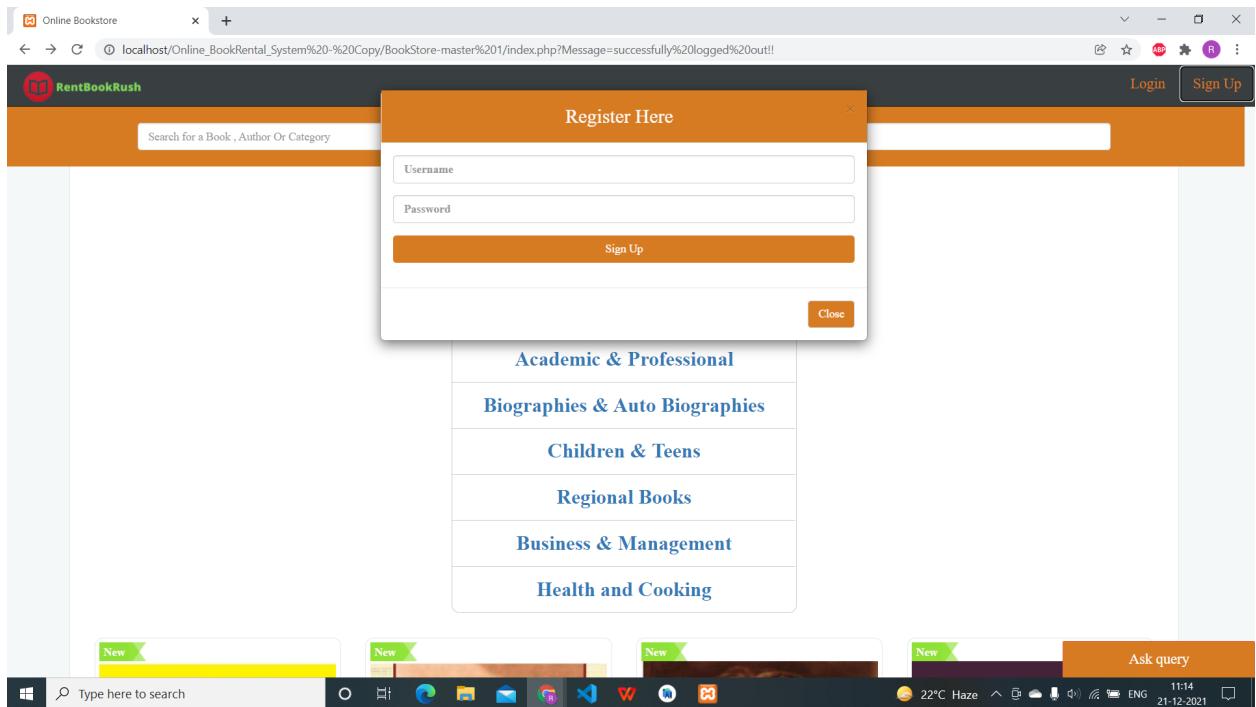
Home Page:



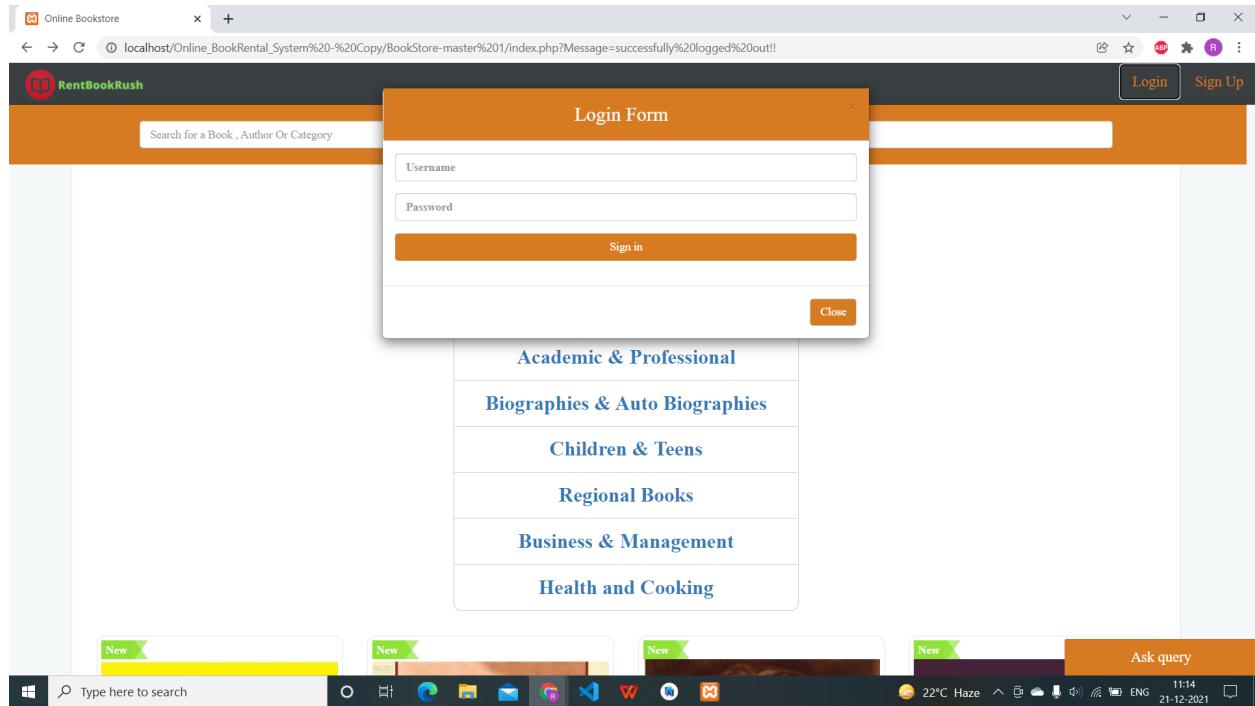
## Warning Message: When User use functionalities without Login/ Register

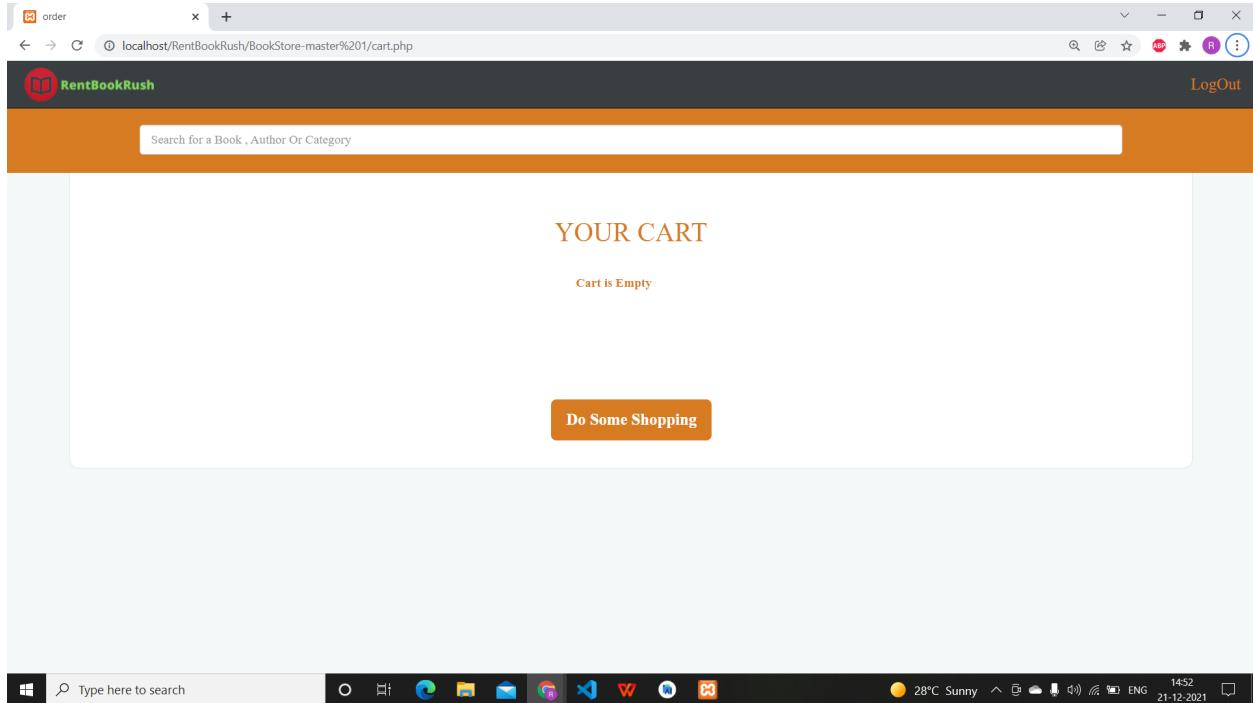


## Register:



## Login :



**Functionalities:****Cart: Empty Cart****Cart : After purchase of the books****CASE 1 : Order of 1 Book**

The screenshot shows a web browser window for 'order' at 'localhost/Online\_BookRental\_System%20-%20Copy/BookStore-master%201/cart.php?remove=NEW-4'. The page title is 'RentBookRush'. A search bar at the top says 'Search for a Book , Author Or Category'. On the right, there's a 'LogOut' link. The main content area is titled 'YOUR CART' and contains a box labeled 'Order 1' with a book thumbnail for 'Getting A Coding Job For Dummies'. Below it, the book details are listed: Title: Getting A Coding Job For Dummies, Code: ACA-1, Author: Nikhil Abraham, Edition: 1, Quantity: 1, Price: 289, Sub Total: 289. A 'Remove' button is at the bottom. To the right is a 'TOTAL' box showing 289. At the bottom are 'Continue Shopping' and 'Place Order' buttons. The taskbar at the bottom shows various application icons.

## CASE 2 : Order of 23 books

The screenshot shows a web browser window for 'order' at 'localhost/Online\_BookRental\_System%20-%20Copy/BookStore-master%201/cart.php?id=NEW-4&quantity=22'. The page title is 'RentBookRush'. A search bar at the top says 'Search for a Book , Author Or Category'. On the right, there's a 'LogOut' link. The main content area is titled 'YOUR CART' and contains two boxes: 'Order 1' and 'Order 2'. 'Order 1' contains the same book as before. 'Order 2' contains a book thumbnail for 'Kiran s SSC Mathematics Chapterwise Solved Papers 1999 To Till Date 7100+ Objective Questions English'. Below it, the book details are listed: Title: Kiran s SSC Mathematics Chapterwise Solved Papers 1999 To Till Date 7100+ Objective Questions English, Code: NEW-4, Author: Kiran Prakashan;Pratyogita Kiran ; KICX, Edition: 2, Quantity: 22, Price: 289, Sub Total: 6358. A 'Remove' button is at the bottom. Between the two orders is a 'TOTAL' box showing 6647. At the bottom are 'Continue Shopping' and 'Place Order' buttons. The taskbar at the bottom shows various application icons.

**Book Description : User can see book description**

**Description**

In-depth Knowledge About The Varied Sections Covered Under The Subject Of General Knowledge Is Mandatory For The Candidates Aspiring To Appear For Various Competitive And Recruitment Examinations Like SSC, Bank Clerk & PO, Railway Recruitment, Etcas The Same Is Asked In Almost Each And Every Recruitment Examination. General Knowledge 2017 Provides A Comprehensive Study Of All The Sections That Are Covered Under The Subject Of General Knowledge. The Book Has Been Divided Into 6 Sections

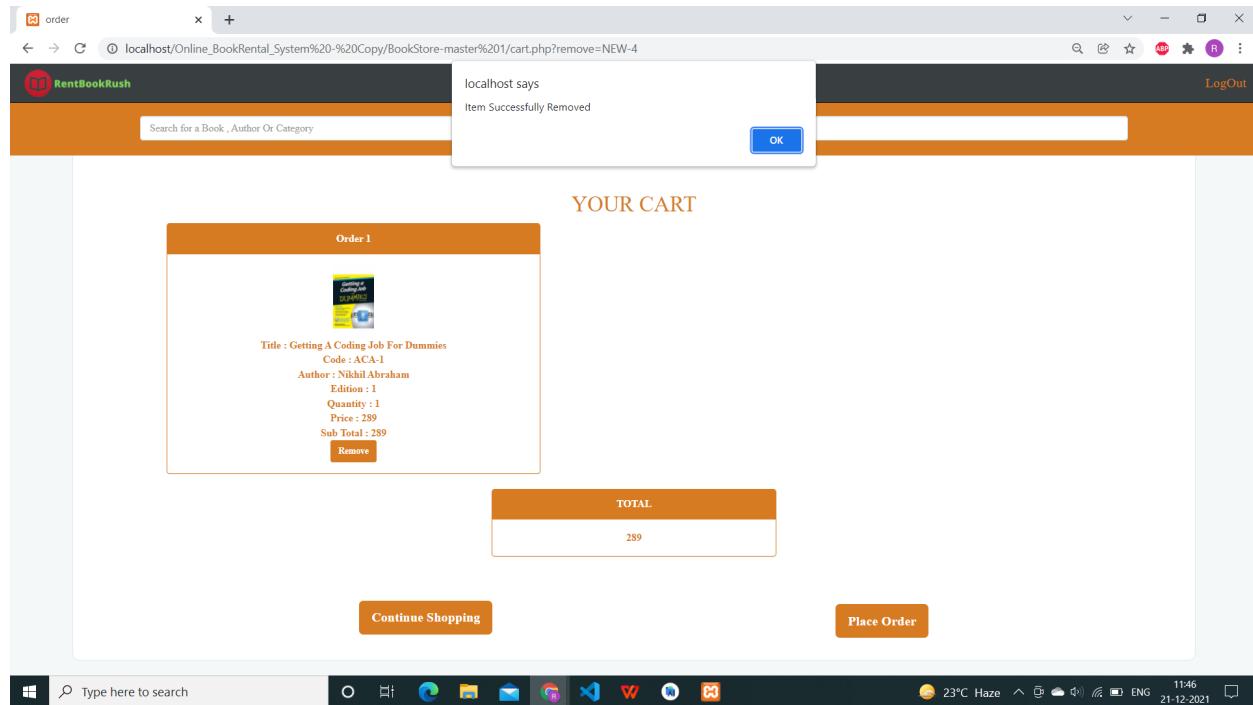
PRODUCT CODE	ENT-2
TITLE	General Knowledge 2017
AUTHOR	Manohar Pandey
AVAILABLE	15
PUBLISHER	Arihant Publication
EDITION	9
LANGUAGE	English
PAGES	320
WEIGHT	500

## Status Token : Book Removed from cart

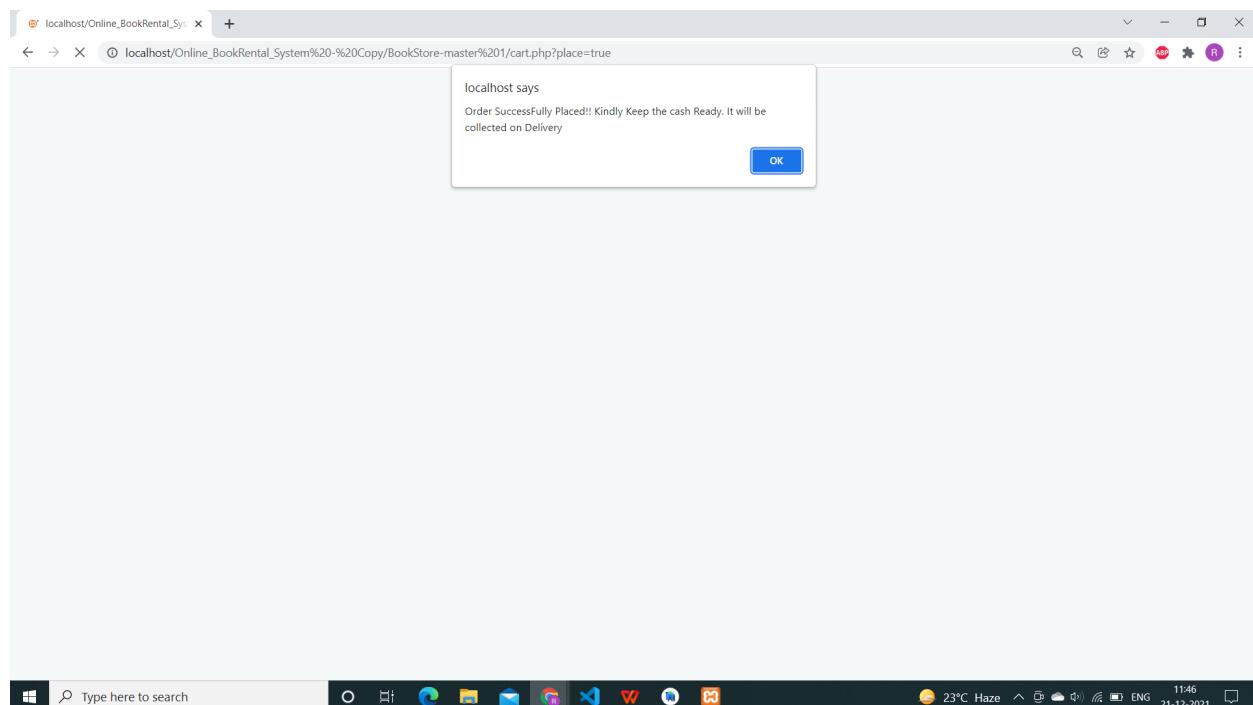
localhost says

Item Successfully Removed

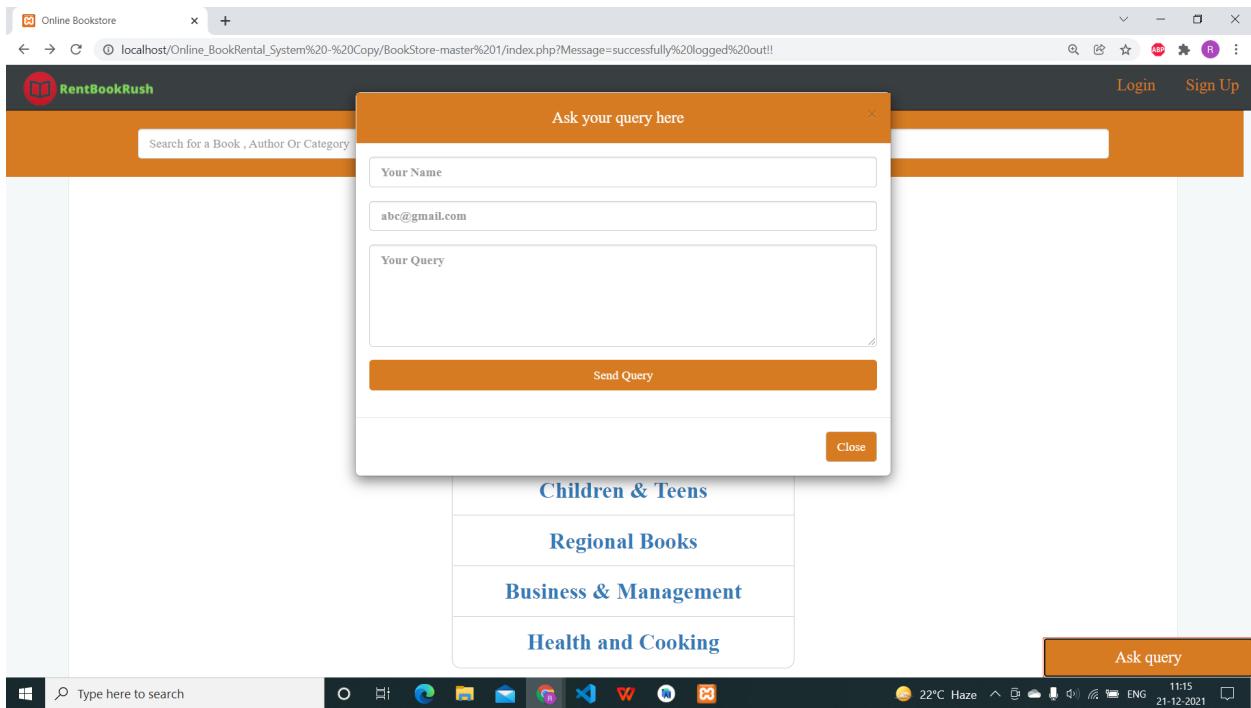
OK



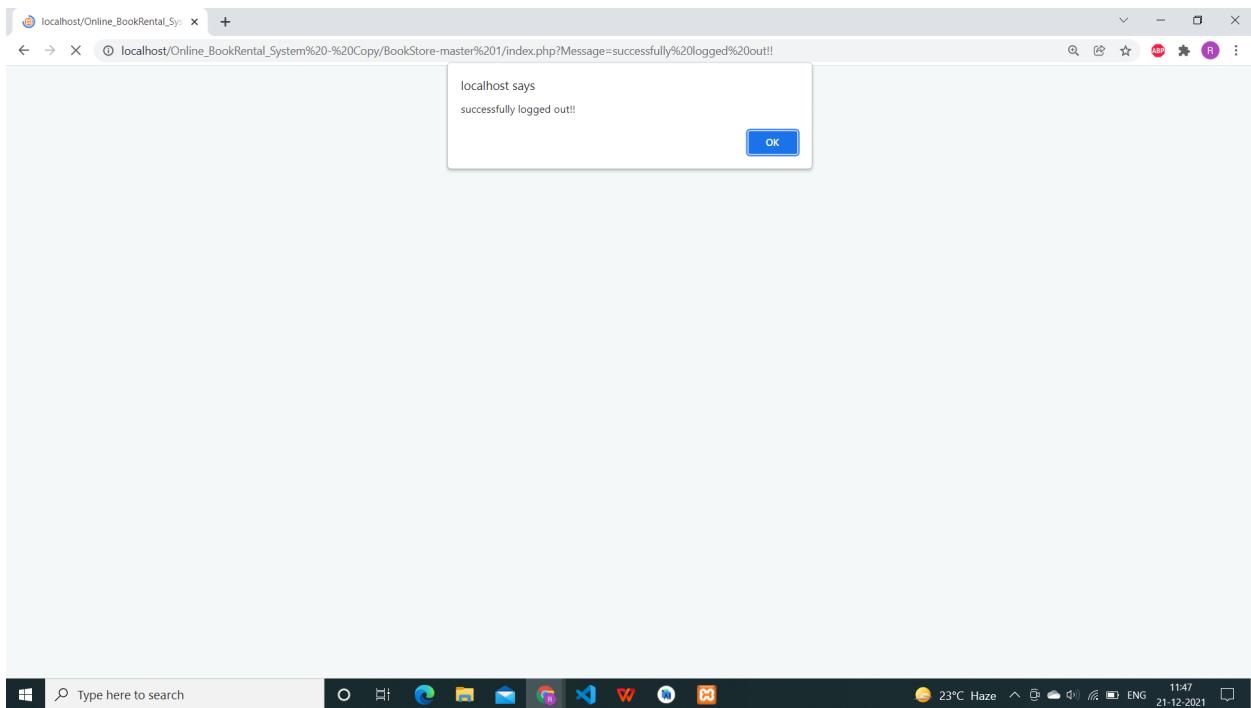
## Status token : Order placed



## Ask Query:

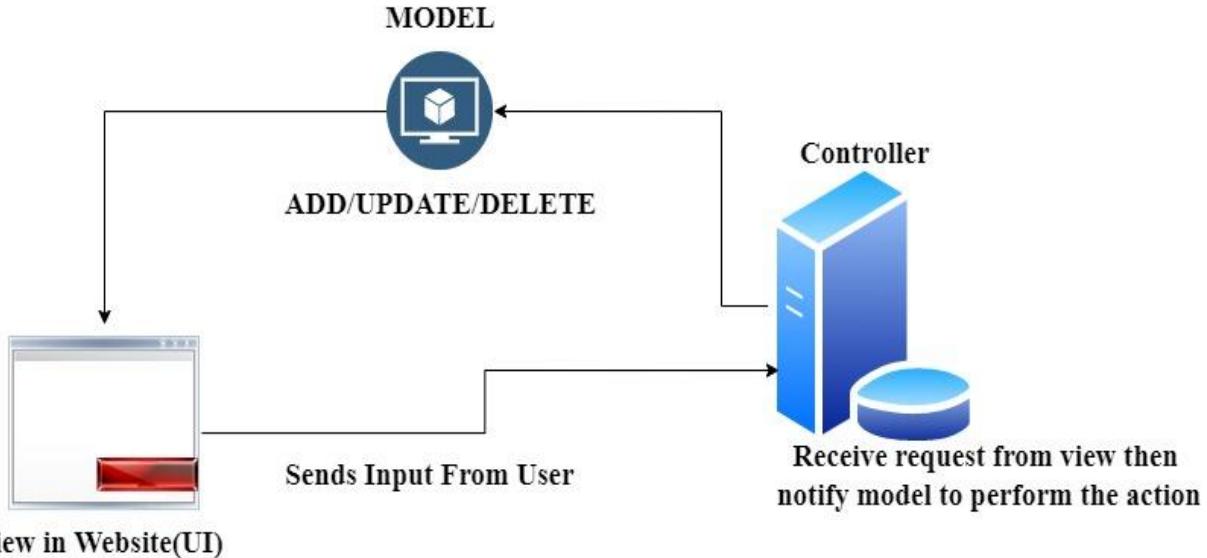


## Logout



## 7. System architecture model (or Implementation model)

Website designed into a MVC (Model View Controller) architecture.



## 8. Implementation Technologies including front-end and back-end decisions

Decisions for back-end:

- It will consist of some multi threaded server connected to the database
- There will be micro services architecture to distribute different tasks between different servers.
- As a server, we can use Java Spring, Node JS or PHP as a framework. For now we will be going with PHP in the backend for its simplicity.
  - All the backend services and business logic will be written in PHP.
- For databases, we can use relational databases to have normalized data. Here we will use MySQL due to its performance as a sql database.
  - MySQL will have 2 replicas. One for reading and one for writing.
  - All the tables will have indexes to make all the application queries fast.
  - We will keep on taking backup every 2 months.

## **9. Details justifying how various team members contributed and their extent of contribution.**

Student ID	Name	Work Domain
201801244	Siddhi Patel	Database Administration, Backend Development
201801245	Richa Patel	Frontend Development, User Experience, Testing
202012119	Daya Yadav	Database Administration, Frontend Development

## **10. Future enhancements to the system.**

- 1) Will Improve UI design
- 2) Implement multiple features like send mail, OTP verification, Feedback and Reviews
- 3) Handle scenario where same book rented by two customer at the same time

**Source Code(Github Link)**

**PPT Link**