

Date
30/9/23

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LAB - 1

Software Requirement Specification

1) Introduction:

1.1) Purpose: To establish a working credit card based online payment system.

1.2) Scope: Authenticate an existing user or create a new user in order to facilitate a secure online payment.

1.3) Overview: An automated secure payment gateway system primarily used by the users to pay using their credit cards.

2) General description:

The functioning of the credit card based online payment gateway system must enable a user to not only pay using credit cards but also receive certain benefits such as tokens or cashback bonuses which will increases user engagement. It will and must provide an all in one user experience to encourage new users to register.

3) Functional Requirements:

1) Credit Card Management:

A user must be allowed to maintain and manage all their credit cards. (including addition and deletion)

2) Authentication:

A new user registration must be verified and authenticated and each returning user must verify themselves before using the system.

3) Transactional Concurrency:

The amount of money to be debited must be the same as the amount of money credited, therefore maintaining transactional concurrency.

No conflict must occur.

4) Interface Requirements:

1) Web Interface:

A website which is compatible on all devices. The frontend interacts with

the user and the backend consists of a database which stores all previous transactions and details of the user.

5) Performance Requirements:

→ Speed: Transactions must be completed quickly and mustn't take a lot of time.

→ Availability: Huge number of transactions must not cause the website server to crash.

6) Design Constraints:

The entire website must be made by adhering to the given RBI guidelines of the online payments and the software to be used for the same must be implemented using the MEAN stack.

7) Non-Functional Attributes:

- 1) Security: to keep data safe!
- 2) Compatibility

- Data Integrity
- Scalable
- Improvable
- Upgradable
- Portable.

8) Preliminary Schedule and Budget:

	T1	T2	T3	T4	T5	T6	T7
Task A	Start	In Progress	Completed	In Progress	Completed	In Progress	Completed
Task B	Completed	In Progress	Completed	In Progress	Completed	In Progress	Completed
Task C	Completed	In Progress	Completed	In Progress	Completed	In Progress	Completed
Task D	Completed	In Progress	Completed	In Progress	Completed	In Progress	Completed
Task E	Completed	In Progress	Completed	In Progress	Completed	In Progress	Completed
Task F	Completed	In Progress	Completed	In Progress	Completed	In Progress	Completed
Task G	Completed	In Progress	Completed	In Progress	Completed	In Progress	Completed

Timeline: 1st week: 1.1.2023 - 7.1.2023
 2nd week: 8.1.2023 - 14.1.2023
 3rd week: 15.1.2023 - 21.1.2023
 4th week: 22.1.2023 - 28.1.2023
 5th week: 29.1.2023 - 4.2.2023
 6th week: 5.2.2023 - 11.2.2023
 7th week: 12.2.2023 - 18.2.2023
 8th week: 19.2.2023 - 25.2.2023
 9th week: 26.2.2023 - 3.3.2023
 10th week: 4.3.2023 - 10.3.2023

The entire workload is divided onto 7 tasks and each task has to be completed as per the schedule given above.

A total of 5 milestones must be achieved to be met.

In total, the entire project must be completed at the end of 10 weeks.

Budget: \$120,000.00

Total Lines of code: 220,000, to be written for the system.

Organization average productivity: \$120/hr.

$$\text{Cost per Line of code} = \frac{220000}{220} = 1000$$

$$\text{Total cost} = 1000 \times 220 = 220000$$

$$\text{Total cost} = 220000 \times 120 = 26400000$$

~~$$= 220000 \times 5500$$~~

~~$$= 103333333.3$$~~

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Hotel Management System:

1) Introduction:

1.1) Purpose: To establish the functional and non-functional requirements for a Hotel Management System.

1.2) Scope: The hotel management system will automate the hotel booking process, managing customer details, and billing related to the clients.

1.3) Overview: The hotel management system will automate the entire booking system and management. The system will be quick and responsive for optimal user interaction.

2) General Description:

The automated system for Hotel management is a standalone model which allows the user to login and verify themselves at the first step after which the main functionalities are given to the user.

The system features are as follows:

→ Room Booking System: Allows customers to book rooms online or via staff entry.

→ Check-in/Check-out System: Track guest arrivals and departures.

→ Staff Management: Manage employee data, roles and schedules.

→ Billing System: Automate invoice generation and payment processing.

3) Functional Requirements:

1) User Registration: The system enables a new user to register themselves and create a profile and on the other hand also enables an existing user to login to the system.

2) Check-in/Check-out System: A functionality which allows a user to check-in/check-out of from their respective rooms. This will also enable the staff with the same functionality to clean and maintain rooms.

3) Billing and reporting: The overall bill payment and management of different bills must require a different functionality.

4) Interface Requirements:

1) User-System Interface:

The user interface shall provide an intuitive navigation for booking, checking-in/out, and managing rooms.

2) Hardware Interface:

The system must consist of barcode scanners for check-in/out.

5) Performance Requirements:

1) Speed: The system must be quick to respond to user inputs.

2) Memory: The system requires 1TB memory in order to function efficiently.

6) Design Constraints: The software must consist of a frontend developed by using HTML, CSS, JavaScript. The backend must consist of technologies like Node.js or Python.

7) Non-Functional Requirements:

→ Portability: The system must be accessible through any device thus making it portable.

→ Reliability: The system must be reliable in the sense that it must not crash due to huge traffic of users.

8) Preliminary Schedule and Budget:

Phase	(Weeks)
Project Initiation	2
Requirements Gathering	4
System Design	3
Development	10
Testing	3
Deployment	2

Budget Breakdown: First Year

	Estimated cost (L)
Personnel cost	200,000
Software & Licenses	10,000
Infrastructure	15,000
Security	10,000
Training	7500
Marketing	2500

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Estimated Budget: Infrastructure (L)

1. Form a team with 10 students
 2. Purchase infrastructure equipment
 3. Marketing & promotion

1. Purchase equipment with 10 students
 2. Purchase equipment with 10 students

3. Purchase equipment with 10 students

1. Purchase equipment with 10 students

Estimated Budget: Marketing (L)

1. Purchase equipment with 10 students
 2. Purchase equipment with 10 students

3. Purchase equipment with 10 students

1. Purchase equipment with 10 students

2. Purchase equipment with 10 students

3. Purchase equipment with 10 students

1. Purchase equipment with 10 students

2. Purchase equipment with 10 students

3. Purchase equipment with 10 students

LIBRARY MANAGEMENT SYSTEM:

1) Introduction:

1.1) Purpose: To establish the functional and non-functional requirements for a library management system.

1.2) Scope: To create an automated system to manage the smooth functioning of all library operations, including cataloging, book lending, and member management.

1.3) Overview:

An independent system that manages all functions related to running a library. This system will allow users to search for books, borrow and return them, and maintain records of borrowing activities.

2) General description: The Library system automates key functions like catalogue, borrowing, returning books and managing member records. It serves both staff and members, making

library operates more efficient. Key features include an intuitive book catalog management system that allows librarians to add, update and categorize books efficiently. Users can search for books by title, author, or genre and reserve them if unavailable.

3) Functional Requirements:

a) Book catalog management:

- Ability to add, update, or remove books from the system.
- categorization of books by genre, author, publication date etc.

b) User Management:

- Users can register and manage their profiles, while librarians handle user records, borrowing history and overdue fines.

c) Reservation System:

- Users can reserve unavailable books, and the system notifies them when the books are ready for pick-up.

•) Search functionality:

- Users can reserve unavailable books by title, author, genre or ISBN to quickly locate what they need.

4) Interface Requirements:

a) user interface:

The Library Management System will feature a web-based GUI built with modern front-end tech, for ex. HTML5, CSS3, JavaScript, that enables users to perform operations such as browsing, searching, and borrowing books.

b) Software Interface:

The System will integrate with a relational database management system (RDBMS), utilizing SQL for efficient storage and retrieval of book and user data.

5) Performance Requirements:

a) Response Time:

- The system must ensure optimal performance with a response time under 3 seconds for user queries.

•) Scalability:

The Library Management System should scale effectively to support up to 10,000 books and 10,000 users, ensuring no significant performance degradation as the database grows.

•) Error Rate:

The system must maintain high reliability, with an error rate of less than 0.1% for critical operations, such as book inventory management, ensuring data integrity and accurate transactions.

b) Design Constraints:

•) Database Requirements:

The system will utilize a relational database (RDBMS) like MySQL or PostgreSQL for robust storage and management.

•) Platform Requirements:

The Library System will be developed as a web-application, ensuring compatibility with all major browsers (including Chrome, Safari, etc.).

7) Non-Functional Requirements:

•) Security:

The system should ensure that user data, including passwords, is stored in an encrypted format. Only authorized user (librarians) can modify book or user records.

•) Portability:

The system should be compatible across different operating systems, including Windows, macOS, and Linux.

•) Reliability:

The system should have an uptime of 99.9%.

8) Preliminary Schedule and Budget:

•) Schedule:

The system will be developed in three phases: Inception, Development, and Deployment.

-) Inception Project Inspection: Initial phase where the project scope and goal are defined.

•) Requirements gathering:

Collection of functional and non-functional requirements from stakeholders.

•) System Design: Structuring the system

→ Ch. Architecture and detailed design for implementation

→ Ch. Coding & Testing of system

•) Development: Actual implementation

Actual coding & building of the system based on design specifications.

Schedule:

Purification (weeks):

Project Inspection	2 weeks
Requirements Gathering	4 weeks
System Design	3 weeks
Development	10 weeks
Testing	3 weeks
Deployment	2 weeks

Budget:

cost (\$):

Category	Cost (\$)
Personnel cost	200,000
Software licenses	10,000
Infrastructure	15,000
Security	10,000
Training	7,500
Marketing	2500
Equipment	2500

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Personnel cost	200,000
Software licenses	10,000
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Personnel cost	200,000
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Personnel cost	200,000
Software licenses	10,000
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Personnel cost	200,000
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Personnel cost	200,000
Software licenses	10,000
Infrastructure	15,000
Security	10,000
Training	7,500
Marketing	2500
Equipment	2500

STOCK MAINTENANCE SYSTEM

1) Introduction:

1.1) Purpose:

The System aims to automate the management of stock inventory for businesses.

1.2) Scope:

The System will allow businesses to manage stock records, monitor level of inventory, automate the reordering process and generate reports on stock transactions.

1.3) Overview:

The System is designed to automate stock tracking and inventory management for businesses.

2) General Description:

The System will provide businesses with real-time stock information and automate key stock management processes such as reorder alerts, stock level tracking, and report generation.

3) Functional Requirements:

a) User Management:

The system will allow administrators to create, update and manage user accounts with different access levels.

b) Stock Management:

The system will allow users to add, update, delete stock items and also view current stock levels.

c) Reorder Alerts:

The system will automatically generate and send notifications when stock levels fall below the reorder threshold.

d) Reporting:

The system will generate reports on stock movements, including stock received, issued and current stock levels.

e) Interface Requirements:

a) User Interface:

The system will provide a web-based GUI for users to

manage stock, view reports and set reorder thresholds.

f) Software Interface:

The system will integrate with a relational database (e.g., MySQL) to store stock & user data.

5) Performance Requirements:

a) Response Time:

The system should respond to user queries, such as stock searches, within 2 seconds under normal conditions.

b) Scalability:

The system should be able to handle up to 5000 stock items and 5000 users without performance degradation.

c) Error Rate:

The system should maintain an error rate of less than 0.05% for stock inventory operations.

d) Design Constraints:

a) Database Selection:

The system will use a relational database to store all staff and user data.

1) Platform Requirements:

The system will be a web application compatible with major browsers, including chrome, Firefox, etc.

2) Non-Functional Requirements:

a) Security:

The system will store credentials and sensitive data in encrypted format (e.g. AES-256).

b) Portability:

The system will be compatible across different operating systems, including Windows, macOS and Linux.

c) Usability:

The system should have an uptime of 99.9%.

3) Functional requirements:

Staff management

8) Preliminary Schedule & Budget:

Schedule:

Phase	Duration(weeks)
Project Inception	2
Requirements Gathering	4
System Design	3
Development	10
Testing	3
Deployment	2

Budget:

Category	Estimated Cost(\$)
Personnel costs	150,000
Software licenses	10,000
Infrastructure	12,000
Security equipment	8,000
Training	5,000

Non-functional requirements

- Scalability: able to handle large volumes of users without significant performance degradation.
- Reliability: ensure high availability and low downtime.
- Customization: provide flexibility to adapt to specific organizational needs.
- Integration: ability to interface with existing systems and databases.
- Mobile access: support mobile devices for remote staff management.
- Reporting: generate detailed reports for management and compliance purposes.
- Compliance: ensure adherence to relevant data protection and security regulations.
- Support: provide robust support for users and stakeholders.

PASSPORT AUTOMATION SYSTEM

1) Introduction:

1.1) Purpose:

The purpose of this document is to describe the Software Requirements Specification (SRS) for the system.

1.2) Scope:

The system is designed to handle the entire lifecycle of passport processing, from online application submission to passport issuance.

1.3) Overview:

This document outlines the requirements for the Passport Automation System. It describes the system's functionality, performance requirements etc..

2) General Description:

The system is a web-based platform that simplifies the passport application process. It allows users to apply for passports, submit documents, schedule appointments and so much more.

3) Functional Requirements:

a) User Registration and login:

Applicants can create accounts, log in, and reset passwords if needed.

b) Passport Application:

Users can fill out the application form, upload required docs, and submit them online.

c) Appointment Scheduling:

Applicants can schedule appointments for document verification or biometric data collection.

d) Application Status Tracking:

Users can track their application status in real-time.

4) Interface Requirements:

a) User Interface:

A user-friendly interface for applicants to submit applications, track status and schedule appointments.

b) Admin Interface:

Integration with external govt. databases for identity verification.

5) Performance Requirements:

a) Response Time:

The system should respond to user requests within 3 seconds.

b) Error Rate:

The system should maintain an error rate of less than 0.1%.

6) Design Constraints:

a) Database Selection:

A relational database will be used to store applicant information, documents uploads etc..

b) Platform Requirements:

The system will be developed as a web application, compatible across multiple browsers.

7) Non-functional Requirements:

a) Security:

User data, including personal information, must be securely encrypted.

b) Usability:

The system should offer a simple, intuitive user interface for both

applicants and administrators.

8) Preliminary Schedule and Budget:

Phase	Start Date	End Date	Duration (Weeks)
Project Initiation	2023-01-01	2023-01-05	2
Requirement Gathering	2023-01-06	2023-01-10	4
System Design	2023-01-11	2023-01-15	3
Development	2023-01-16	2023-02-10	10
Testing	2023-02-11	2023-02-15	3
Deployment	2023-02-16	2023-02-18	2

Budget:

Category	Cost (\$)
Personnel cost	200,000
Software licenses	10,000
Infrastructure	15,000
Security	10,000
Training	7,500
Marketing	2,500

Personnel cost

Software licenses

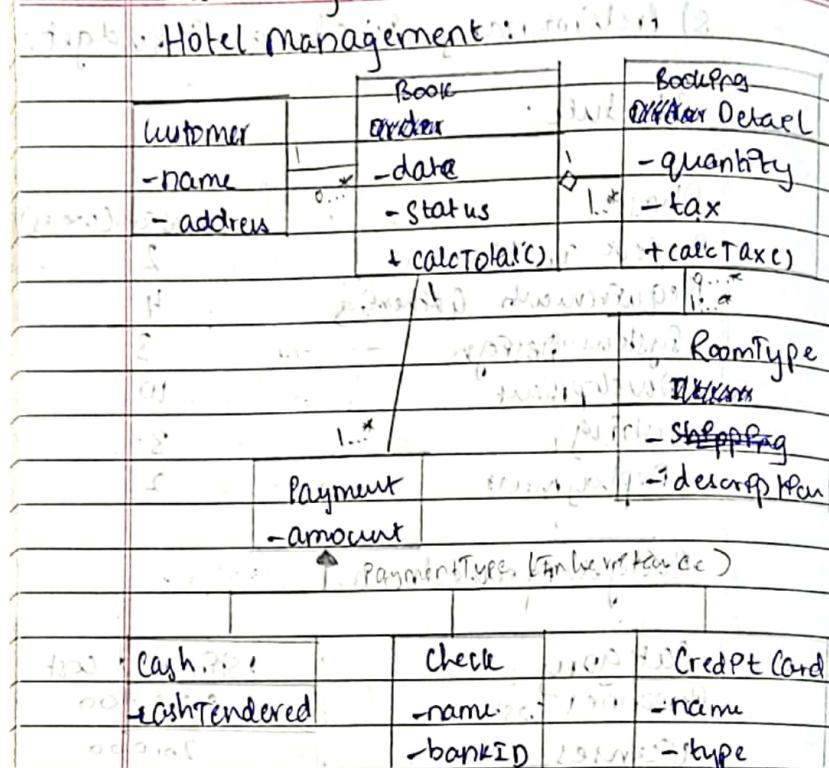
Infrastructure

Security

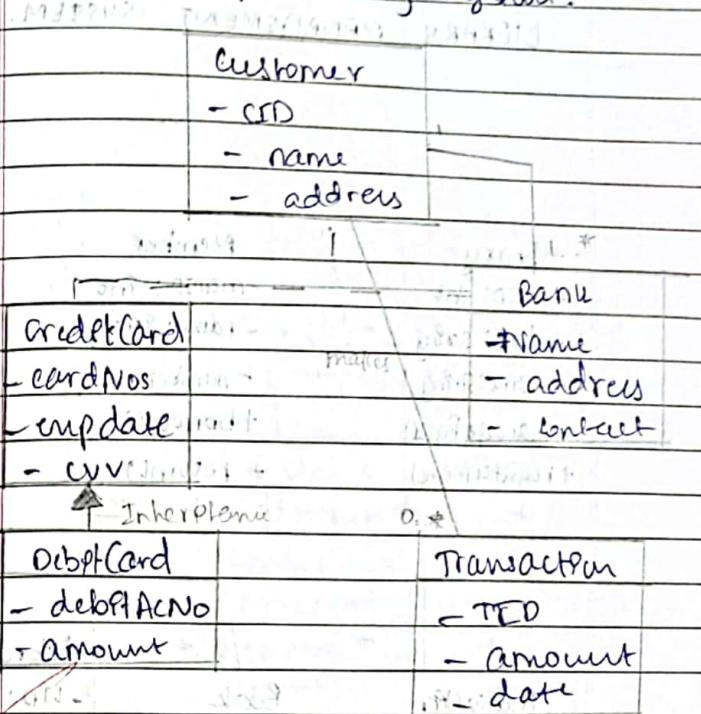
Training

Marketing

Class Diagram:



Credit Card Processing System:



LAB - A

LIBRARY MANAGEMENT SYSTEM.

Library		Member	
- IPBID: Int		- MEMID: Int	
- loc: string	0..*	- name: string	0..*
- name: string		- member: string	
+ manageBook()		+ borrowBook()	
+ registerMem()		+ returnBook()	

Transaction	Book	Librarian
- TID: Int	- bookID: Int	- LID: Int
- dateIssue: date	- title: string	- name: string
- dueDate: date	- author: string	+ addBook()
+ issueBook()	+ checkout()	+ removeBook()
+ returnBook()	+ return()	

STOCK MANAGEMENT SYSTEM.

Warehouse		Supplier
- WID: Int		- SID: Int
- loc: string		- name: string
+ storeProduct()		- contact: string
+ checkInv()		+ supply()

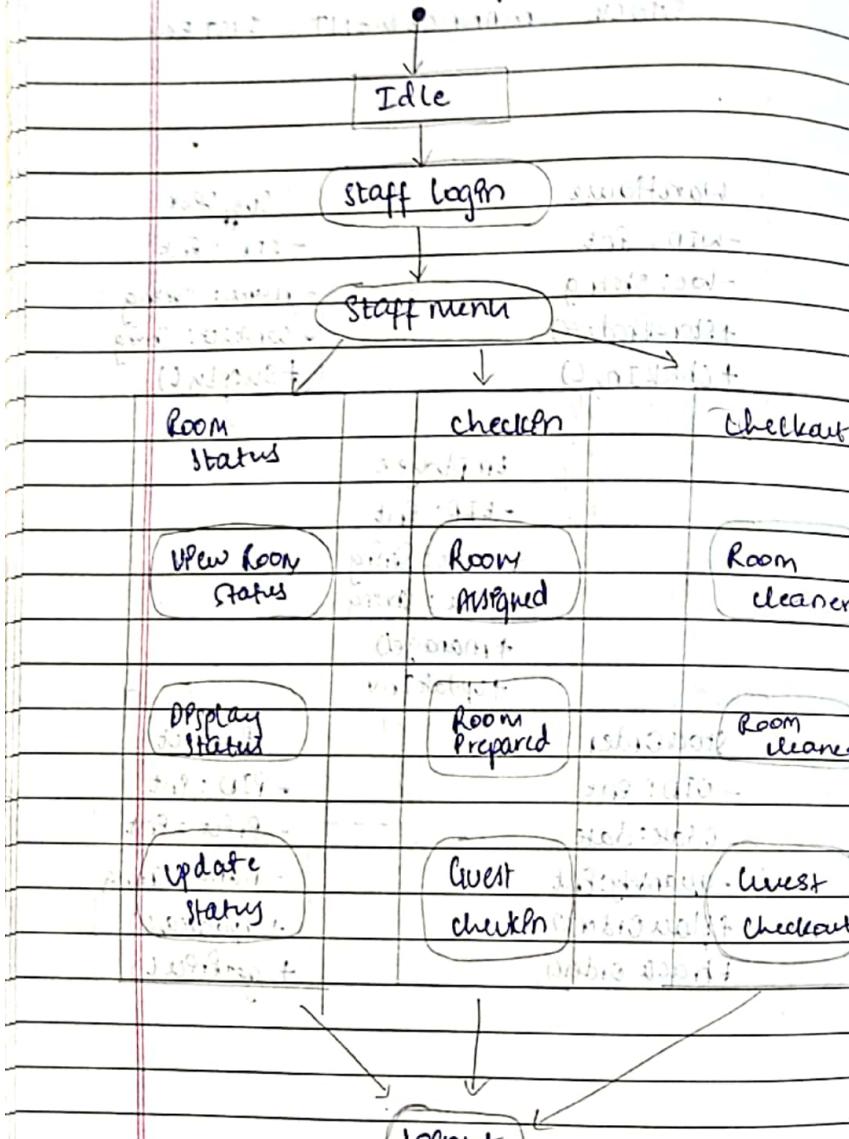
Employee		Customer
- EID: Int		- CID: Int
- name: string		- name: string
- role: string		- address: string
+ manage()		+ buyBook()
+ updateInv()		

StockOrder		Product
- OID: Int		- PID: Int
- Odate: date		- price: Int
- quantity: Int		- name: string
+ placeOrder()		+ update()
+ trackOrder()		+ getPrice()

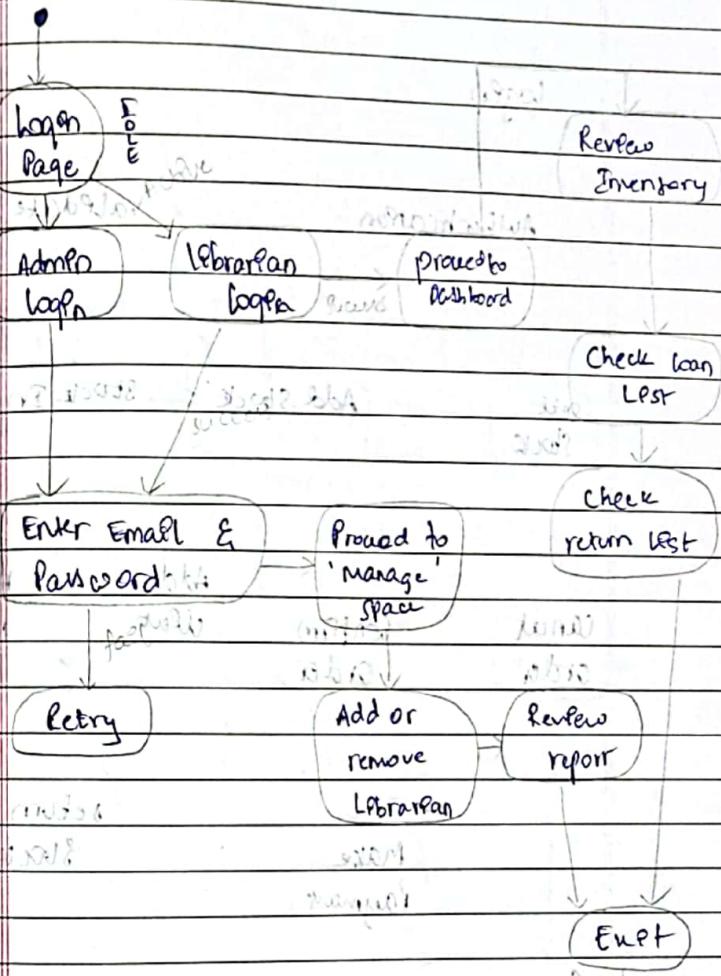
LAB

STATE DIAGRAMS

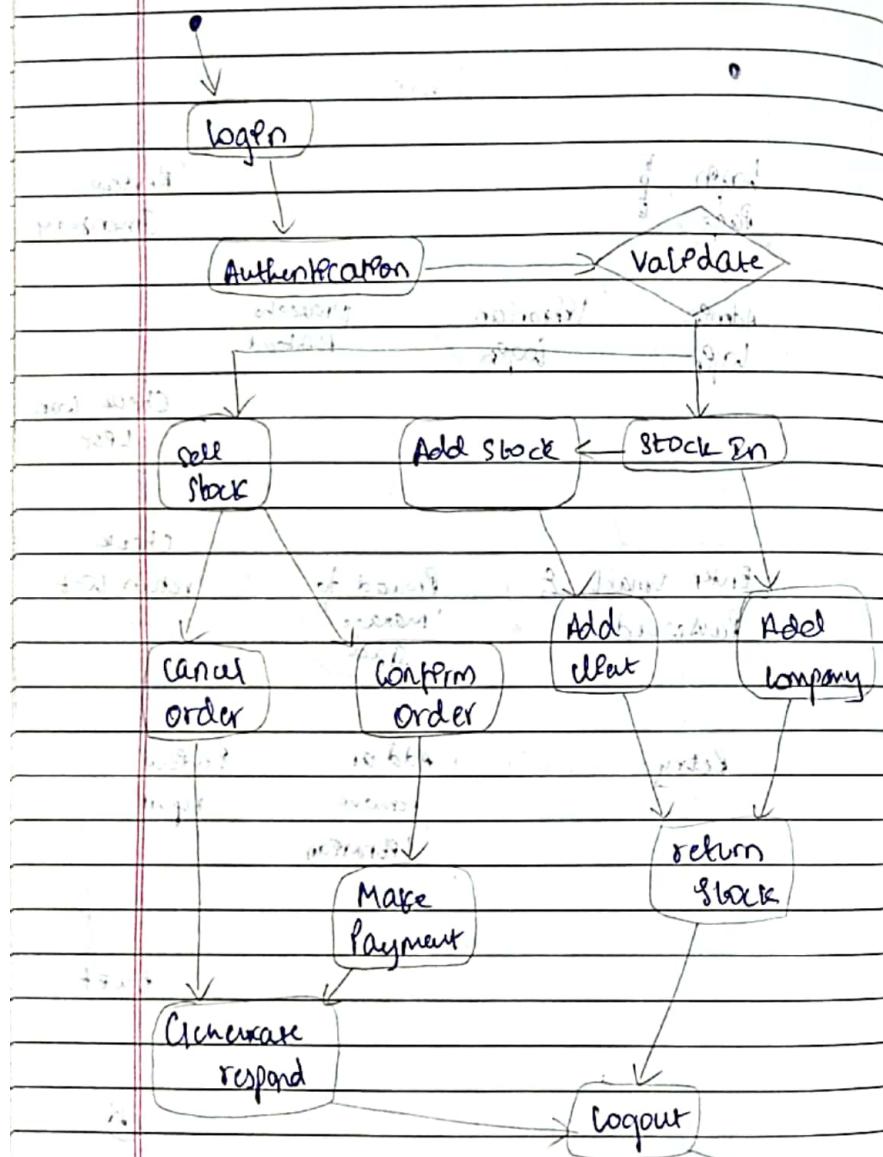
Hotel Management System.



LIBRARY Management SYSTEM



Stock Management System.



Passport Automation System

Login → Register Pan

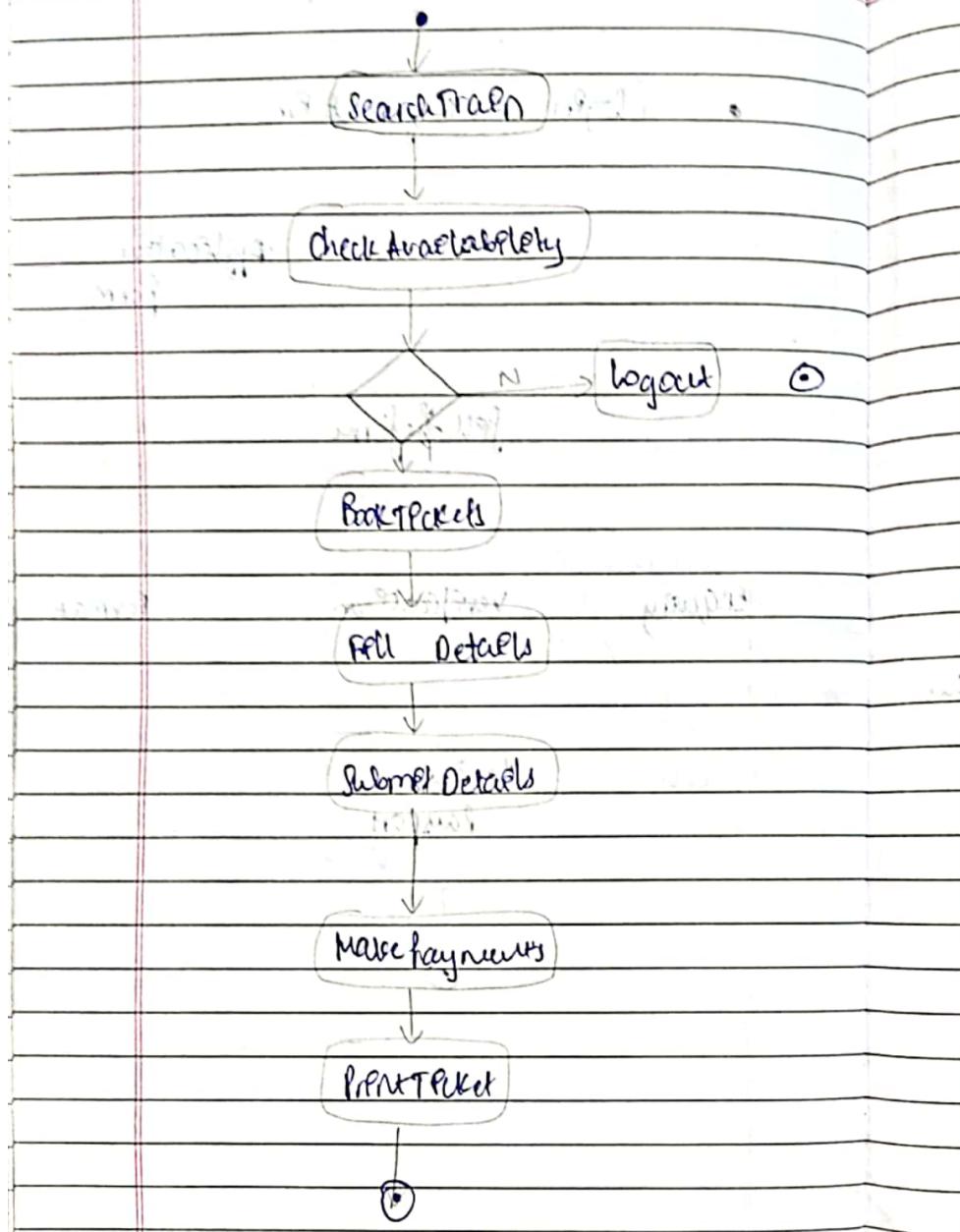
Application form

fill the form

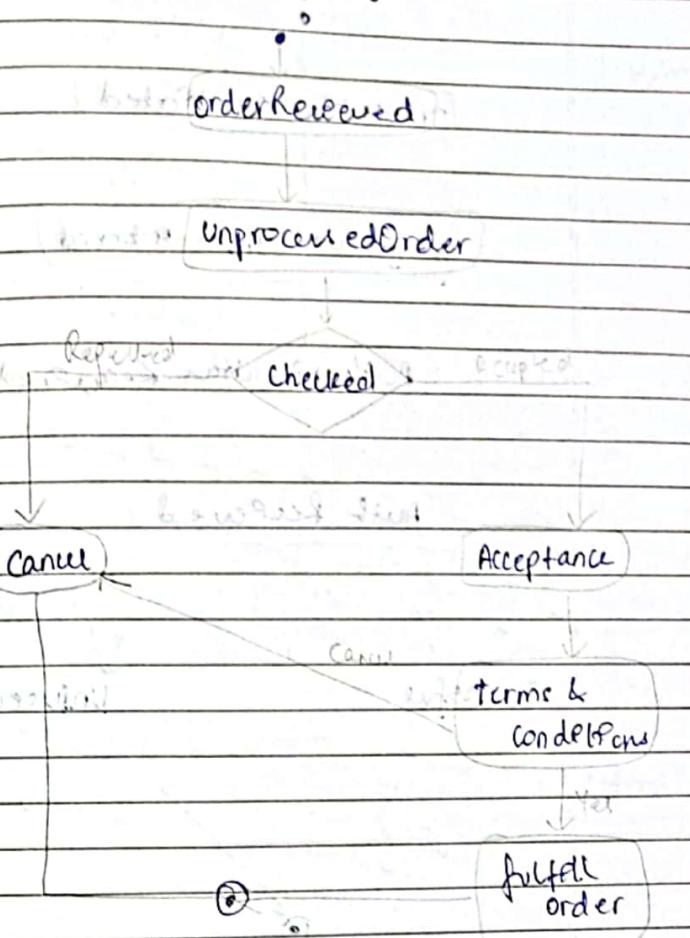
Enquiry → Verification

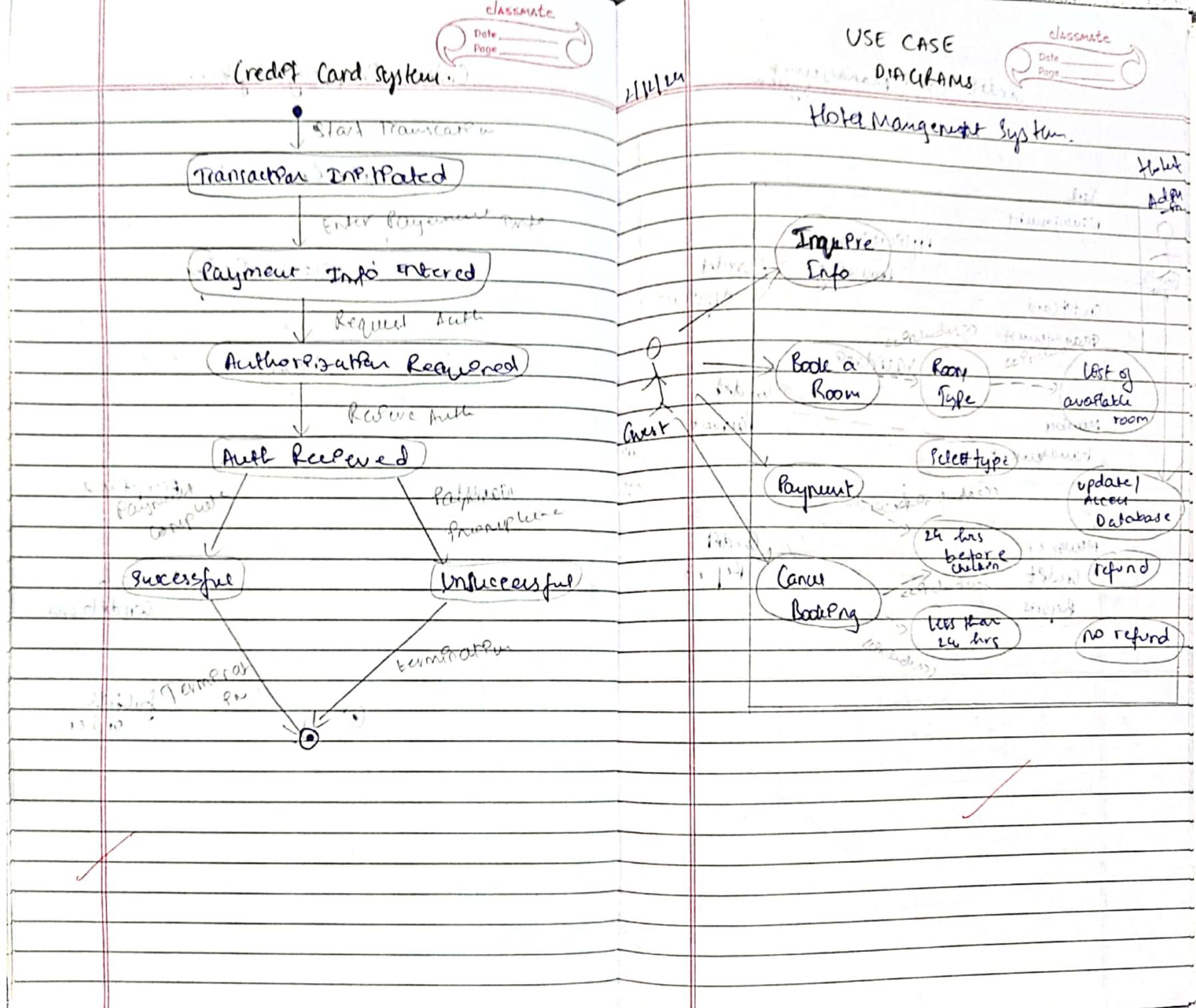
Reissue Passport

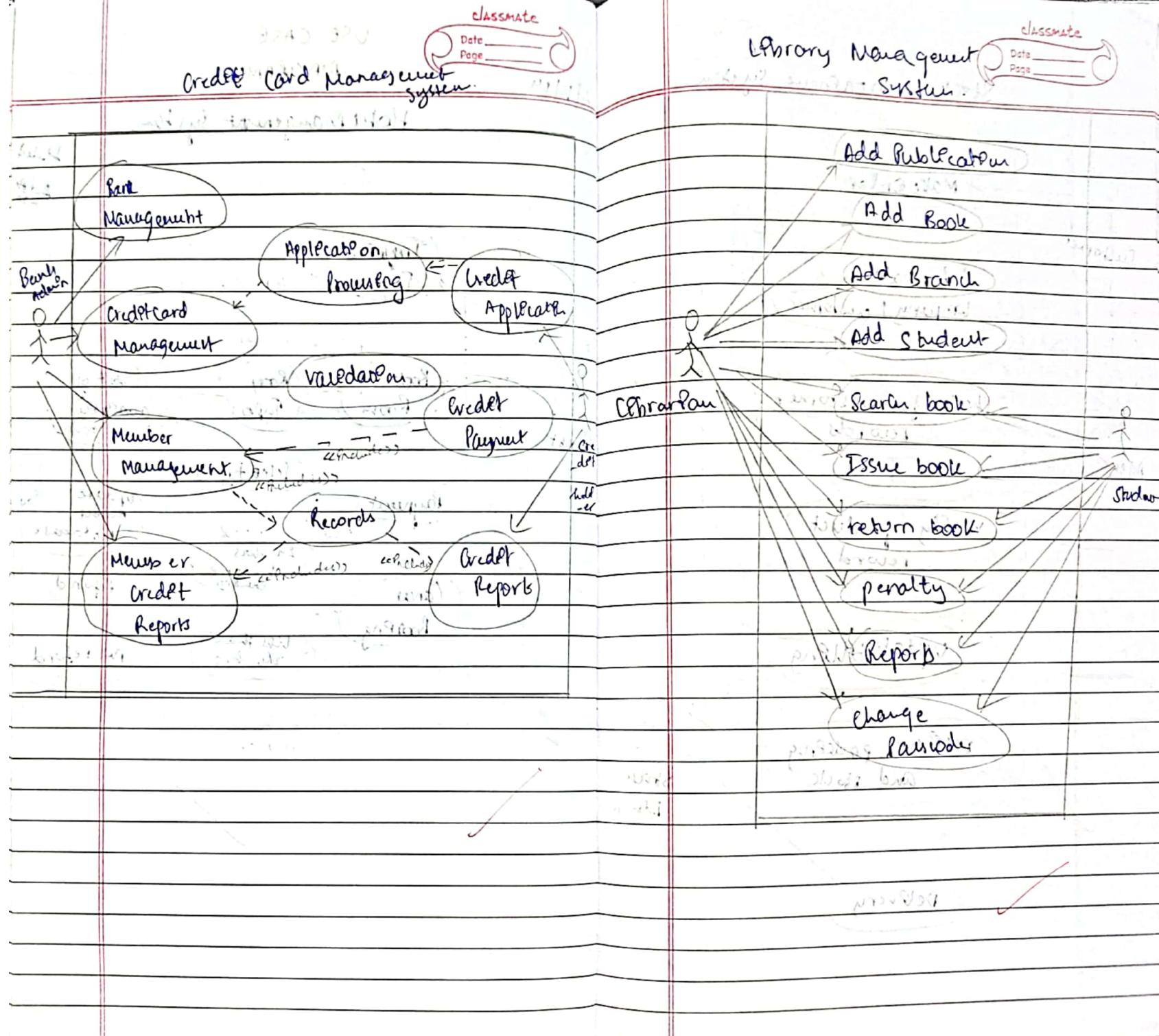
Railway Reservation System



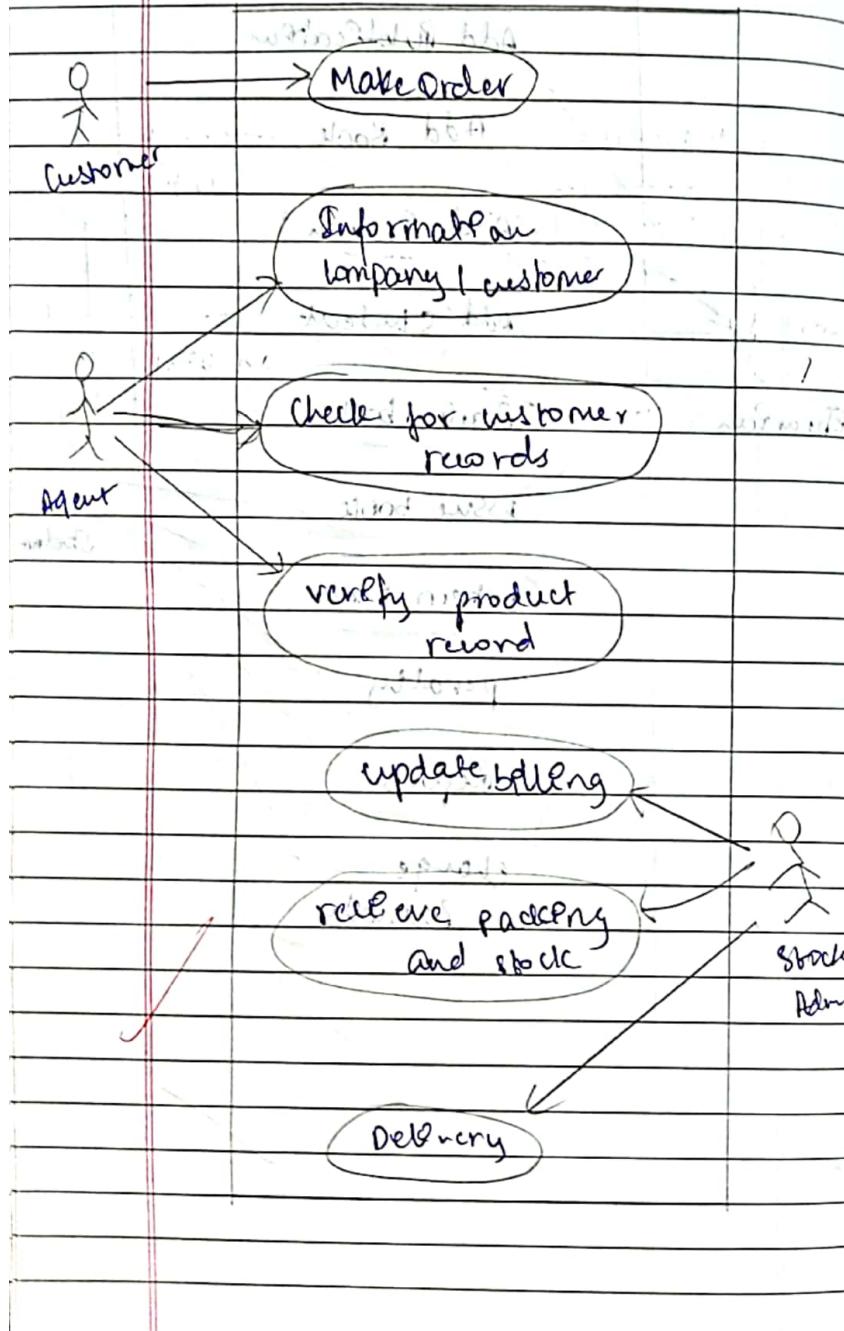
Online Shopping System







Stock Maintenance System.



Warehouse Management System.

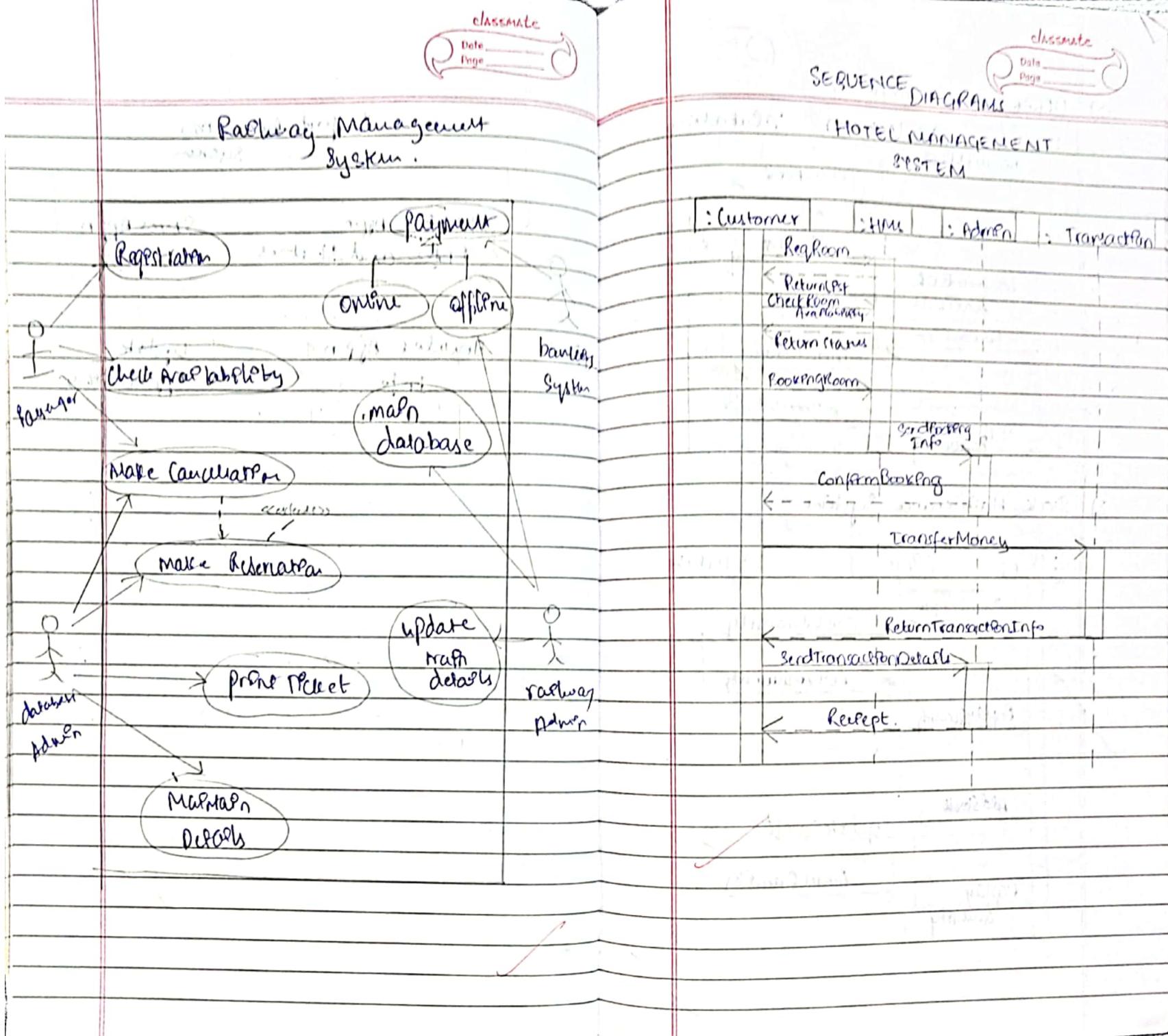
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Date _____
Page _____

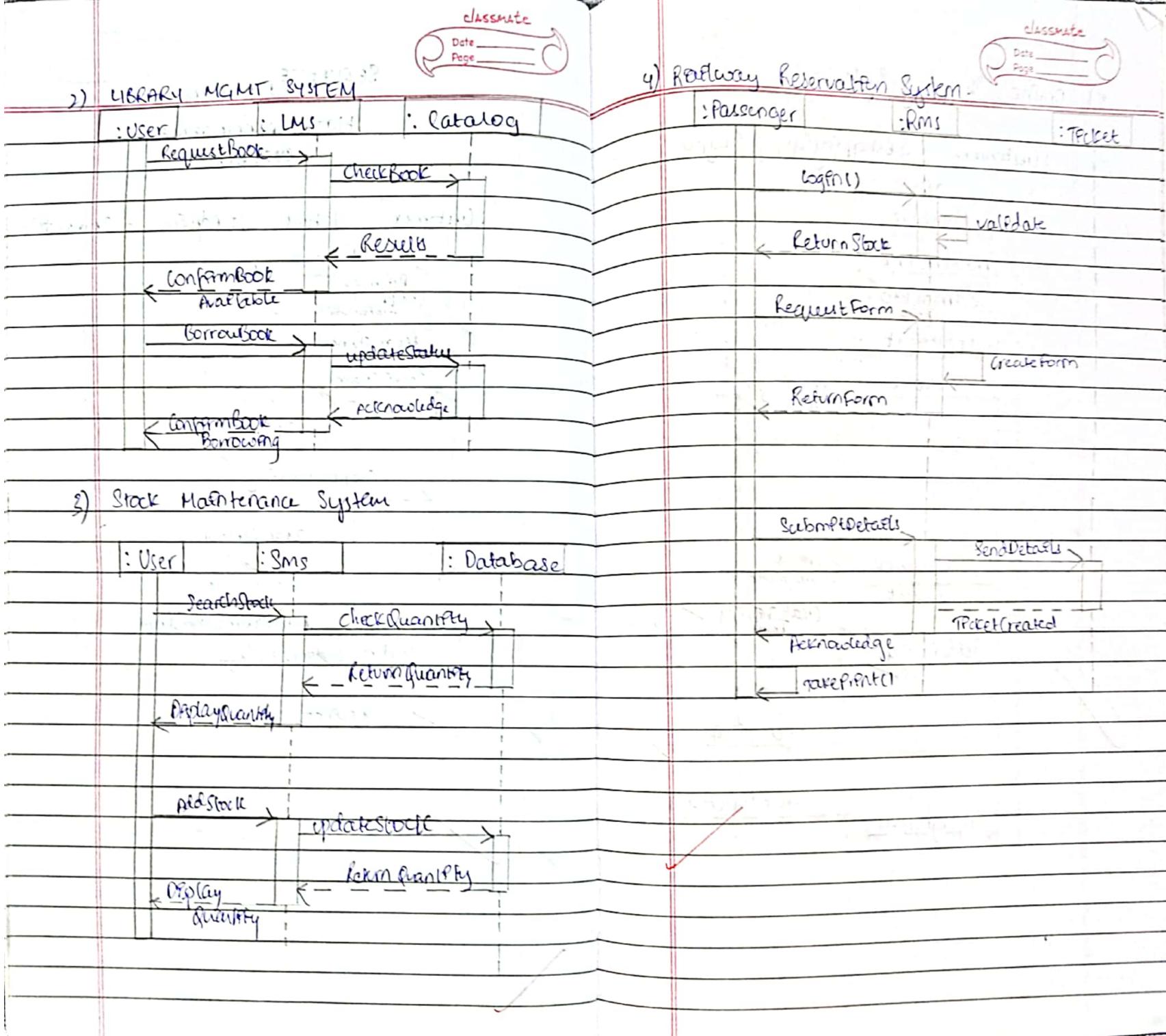
Manage, Appr
Prfo and status

Admin → Endes App n
Info

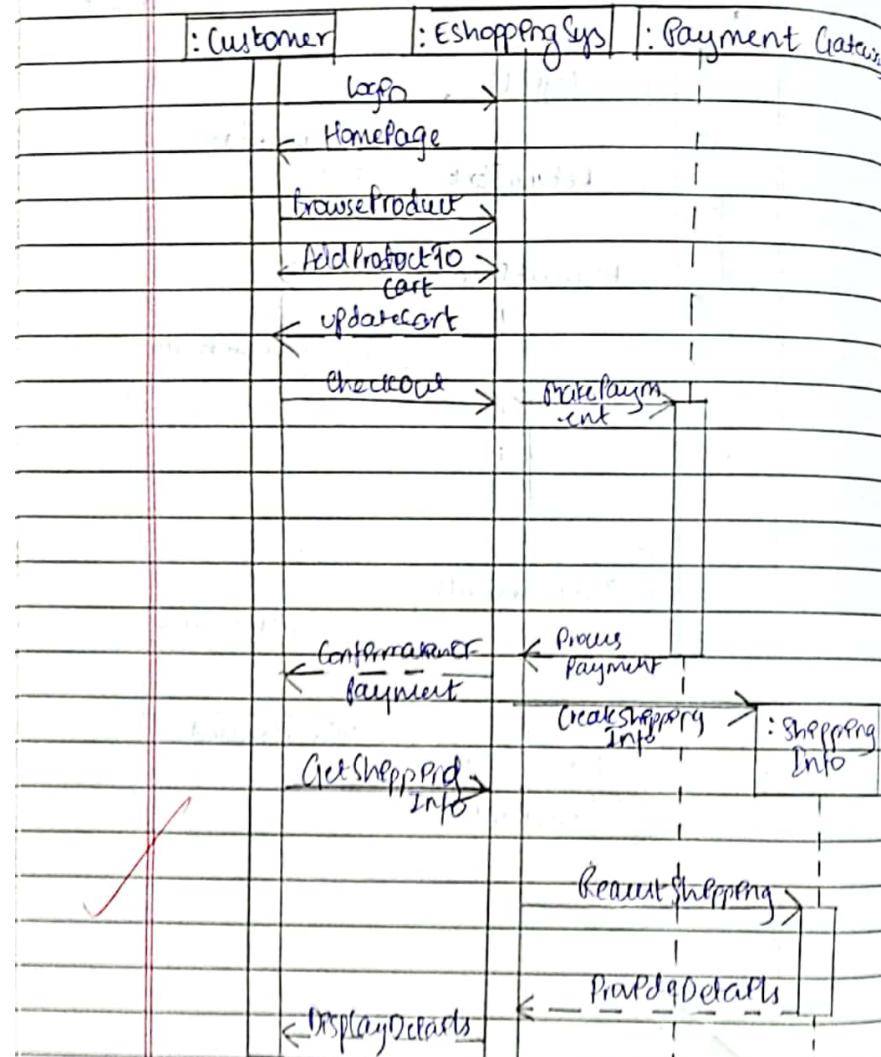
Save Appn
Info

update
Applicatn



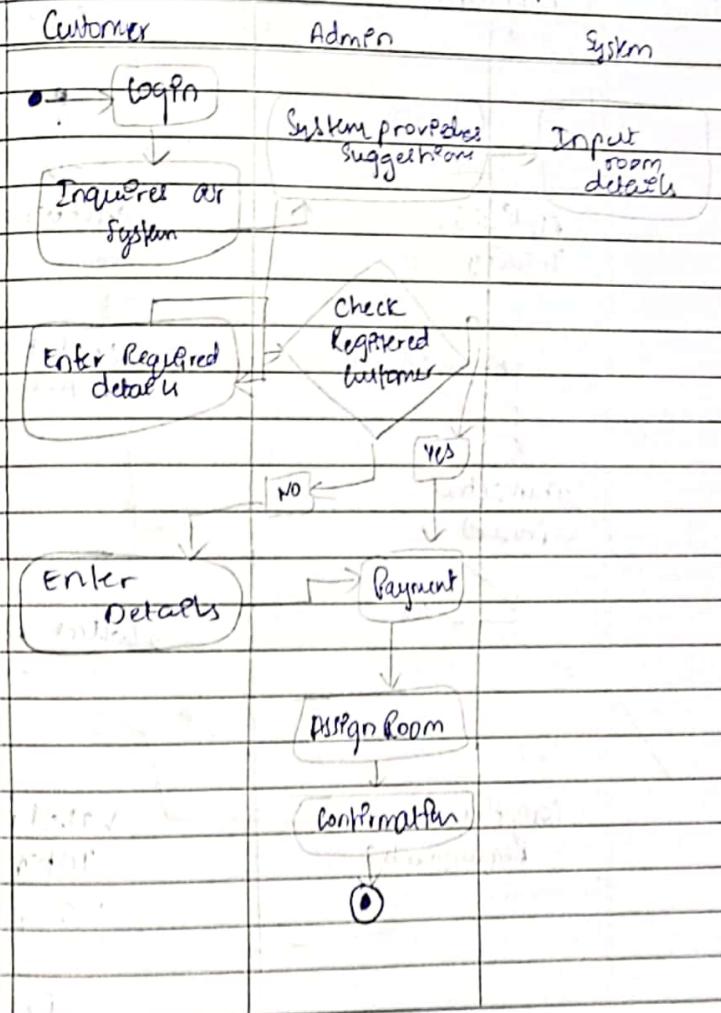


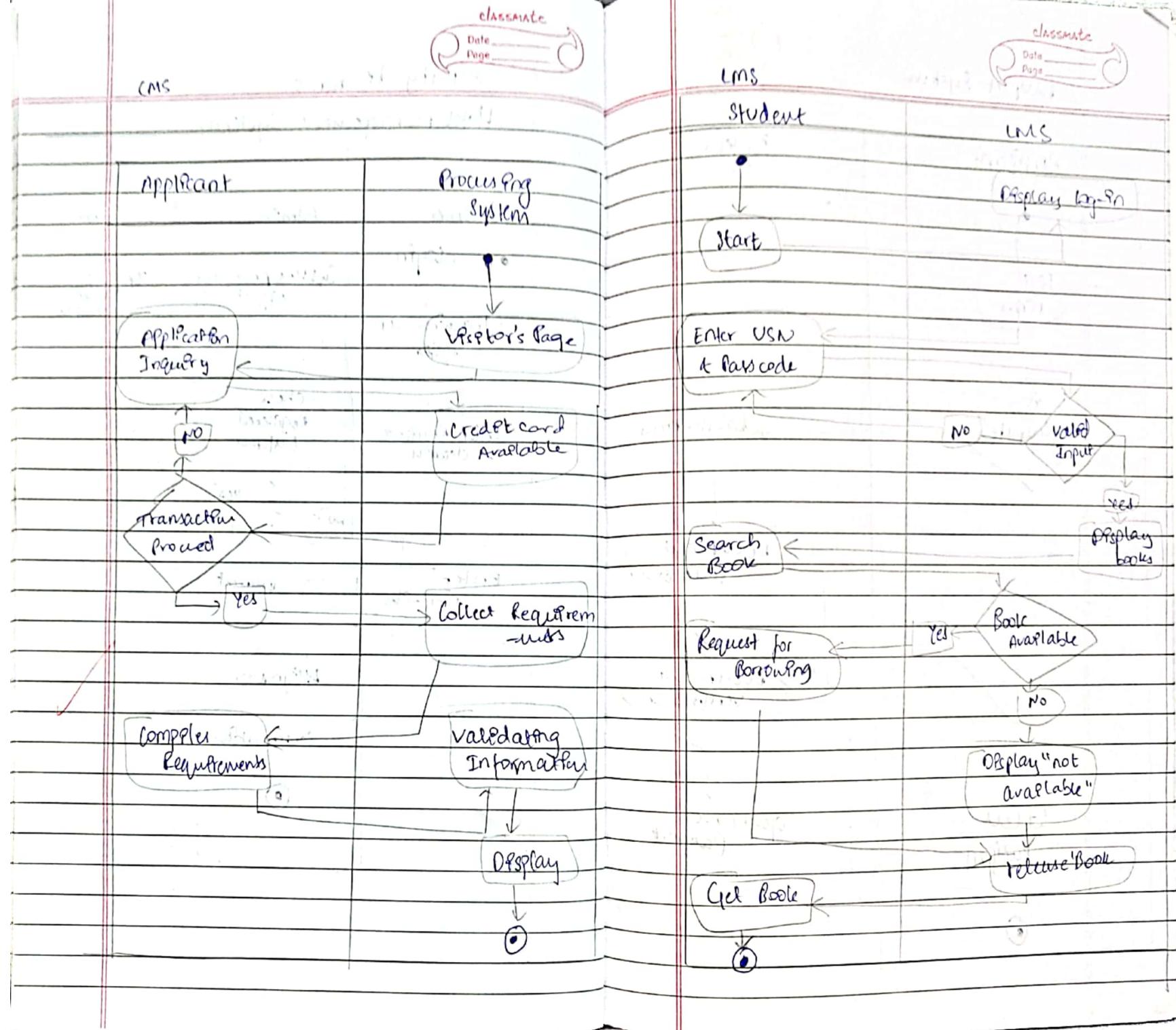
5) Online Shopping System.



Activity programs:

Hotel Management System.





Passport System

classmate

Date _____
Page _____

Applicant

System

Fill form

Is
Complete?

Biometrics

Document
Collection

NO
Document
verifiable?

Yes

Print
Passport

Generate
Passport

Stock System

classmate

Date _____
Page _____

Enter Product ID

Error
message

Enter Product
Details

Enter
Product
Name

Enter
Amount

Enter
Price

Print
Passport