

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

“JnanaSangama”, Belgaum -590014, Karnataka.



LAB REPORT on

Object Oriented Analysis and Design (20CS6PCOMD)

Submitted by

**PranavKumar
1BM19CS114**

in partial fulfillment for the award of the degree of
BACHELOR OF ENGINEERING
in
COMPUTER SCIENCE AND ENGINEERING



B.M.S. COLLEGE OF ENGINEERING
(Autonomous Institution under VTU)
BENGALURU-560019

April-2022 to July-2022

**B. M. S. College of Engineering,
Bull Temple Road, Bangalore 560019**
(Affiliated To Visvesvaraya Technological University, Belgaum)
Department of Computer Science and Engineering



CERTIFICATE

This is to certify that the Lab work entitled “Object-Oriented Analysis and Design ” carried out by **Pranav Kumar(1BM19CS114)**, who is bonafide student of **B. M. S. College of Engineering**. It is in partial fulfillment for the award of **Bachelor of Engineering in Computer Science and Engineering** of the Visvesvaraya Technological University, Belgaum during the academic year 2021-2022. The Lab report has been approved as it satisfies the academic requirements in respect of a - **Object Oriented Analysis and Design (20CS6PCOMD)** work prescribed for the said degree.

Dr. Nandhini Vineeth
Assistant Professor
Department of CSE
BMSCE, Bengaluru

Dr. Jyothi S Nayak
Professor and Head
Department of CSE
BMSCE, Bengaluru

Index Sheet

Sl. No.	Experiment Title	Page No.
1	College Information System	4
2	Hostel Management System	15
3	Stock Maintenance System	26
4	Coffee Vending Machine	37
5	Online Shopping System	48
6	Railway reservation system	59
7	Graphics Editor	70

Course Outcome

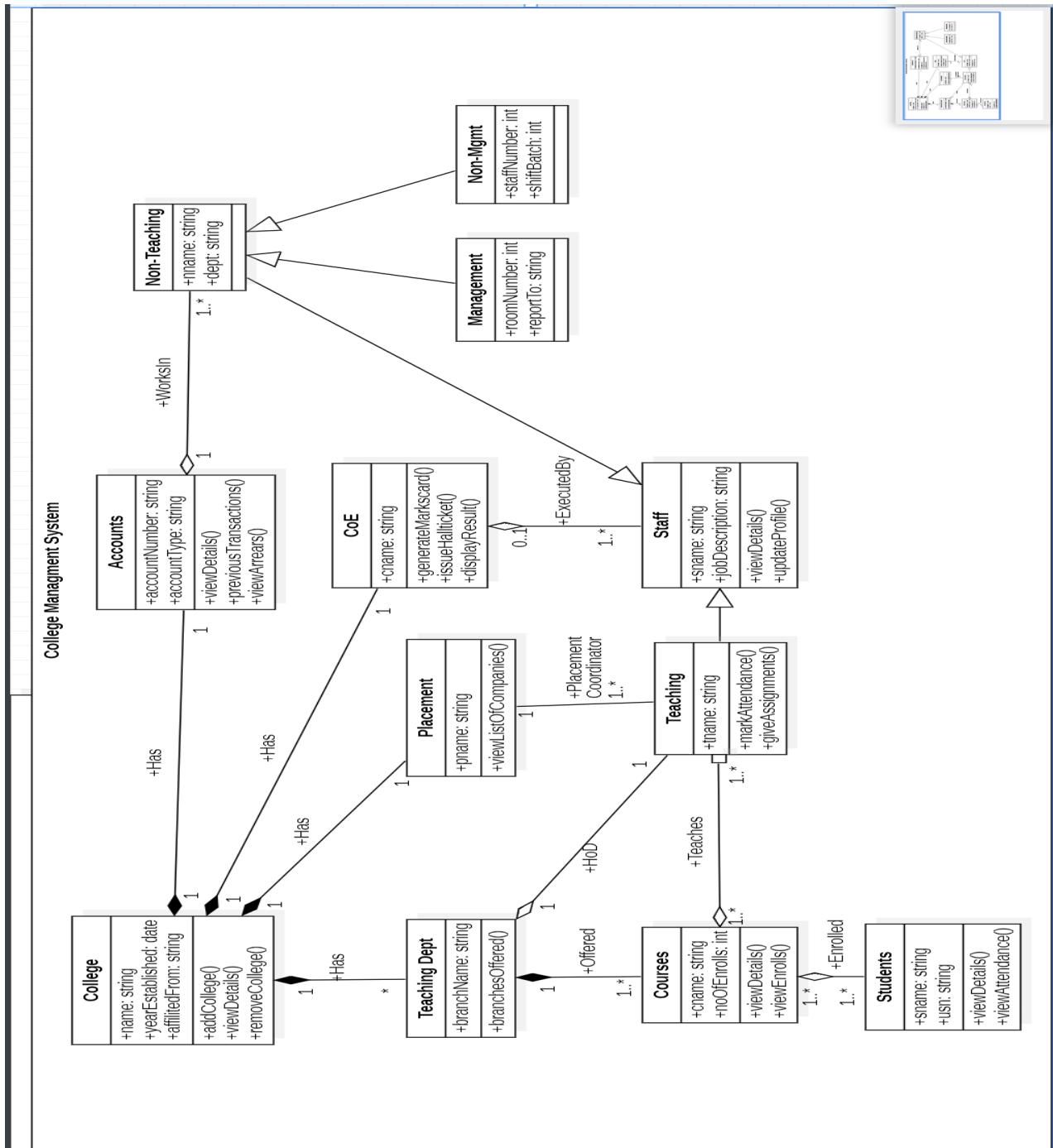
CO4	Ability to conduct practical experiment to solve a given problem using Unified Modeling language.
-----	---

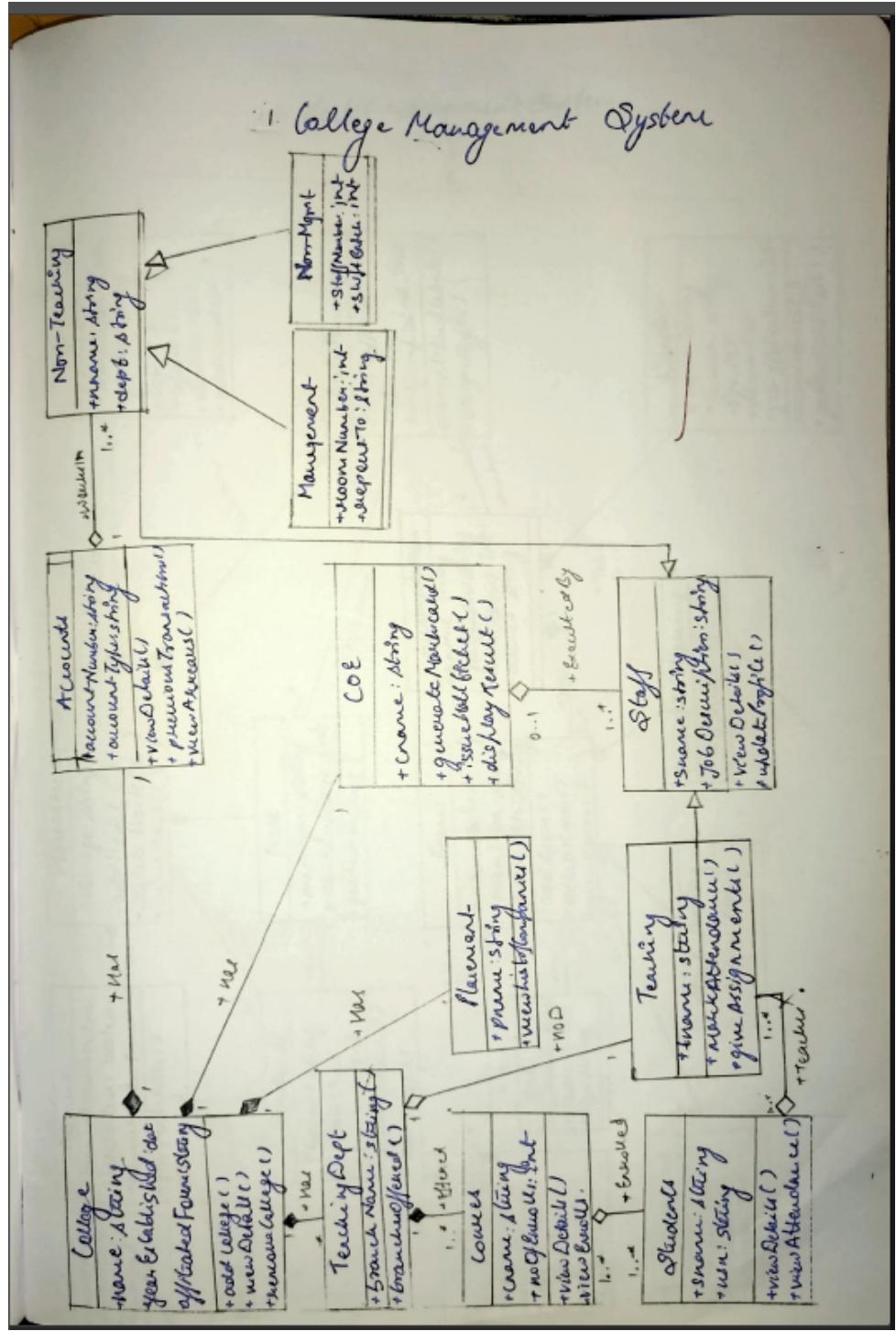
1.COLLEGE INFORMATION SYSTEM

Software Requirement Specification

- College information system has admin who manages the staff ,student and department.
- Admin can view and modify the student's records like student's profile, attendance, fee, results, and details of teachers and other employees in college, their personal information and their attendance for their salaries.
- In this system, user authentication will be done by login by user name and password and classified by user type.
- Staff in college teach more than one course to many students and the staff who are teachers conduct examinations for students of the college
- The students of the college register themselves in the department and for the courses they are interested in and join the college by taking admission and following all the admission procedures.
- There are different types of examination conducted by the college for the students. Internals and semester end examination are two of them.
- Every course has a name and its unique name. Every course has different subjects and every subject has its own unique name.
- Department will provide the details about departments within a college with their name and every department have its Department name.

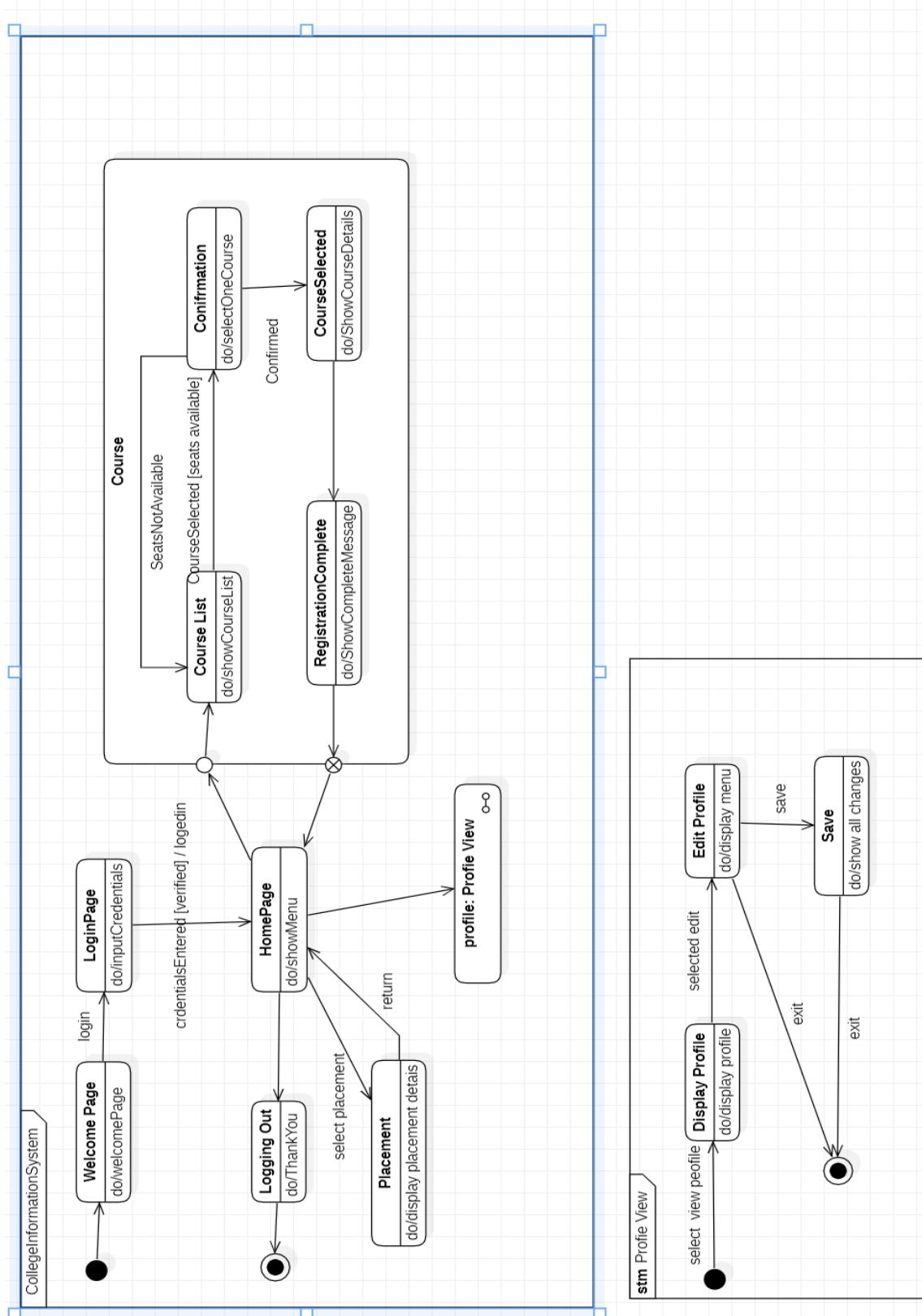
Advance Class Diagram :

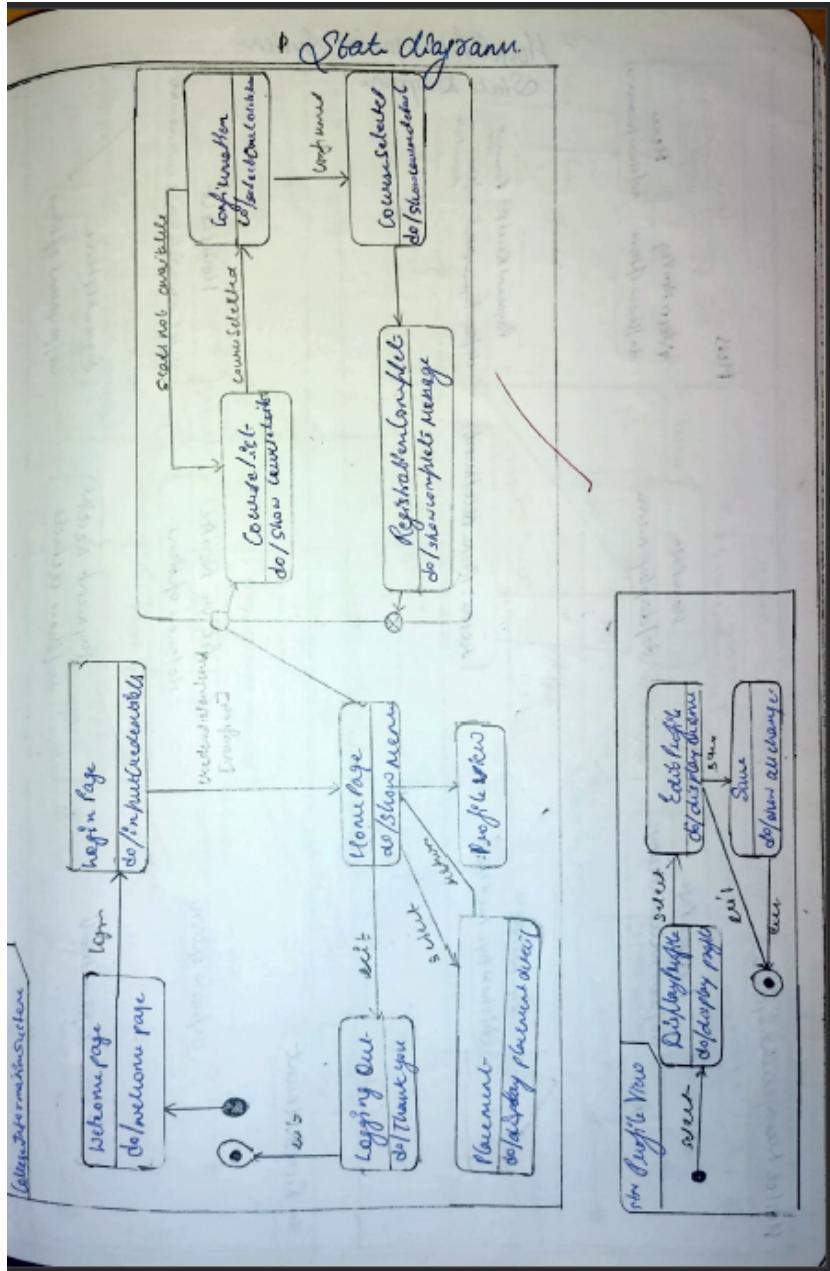




College consists of departments such as Accounts, CoE, Placements, Teaching. Students are assigned to some courses. Teaching department handles courses. The students of the college register themselves in the department and examination and for the courses they are interested in and join the college by taking admission and following all the admission procedures. College conducts Internals and semester end examination for students. Student enquires placement department for placement related queries.

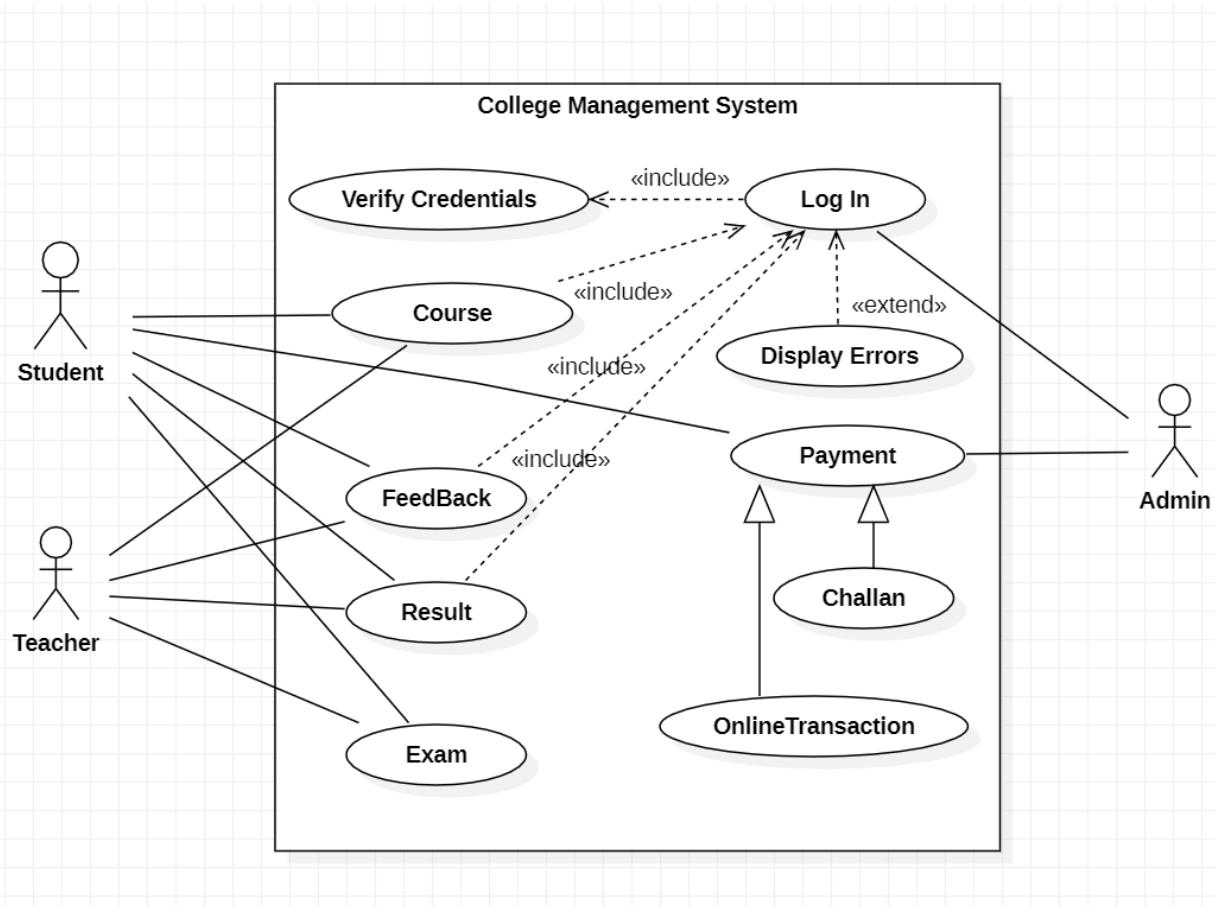
Advance State Diagram :

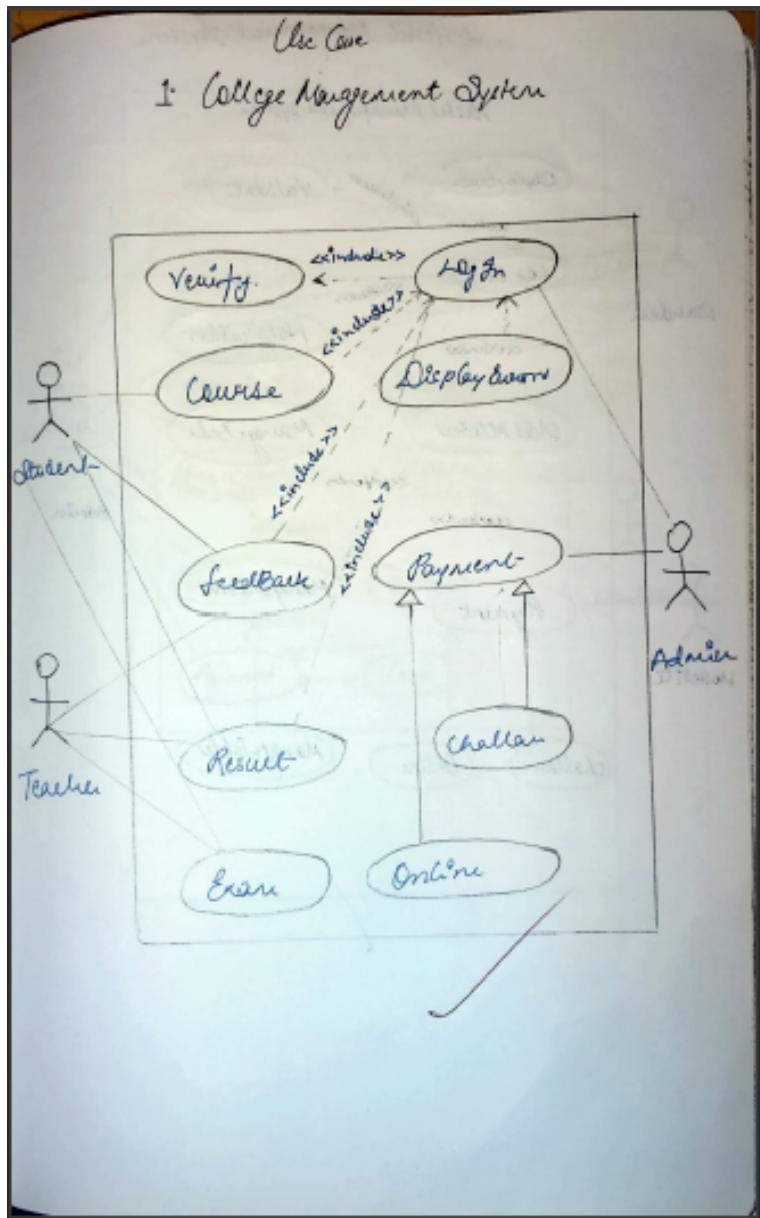




The above state diagram describes the states the student goes through in selection of courses. The student first needs to login which then leads to the validate state, where the login id and password are validated. If invalid it then goes back to the login state or goes to the get information state. Upon receiving the correct information it goes to the homepage and then student gets a number of options. Student can also view and edit their profile. Student can also view notification regarding placements. changes. Student selects the course pay for it and redirected to homepage and logout from the system.

Advanced Use Case Diagram :





Actors:

Student :-Person who will uses the system.

Admin :The person who manages everything

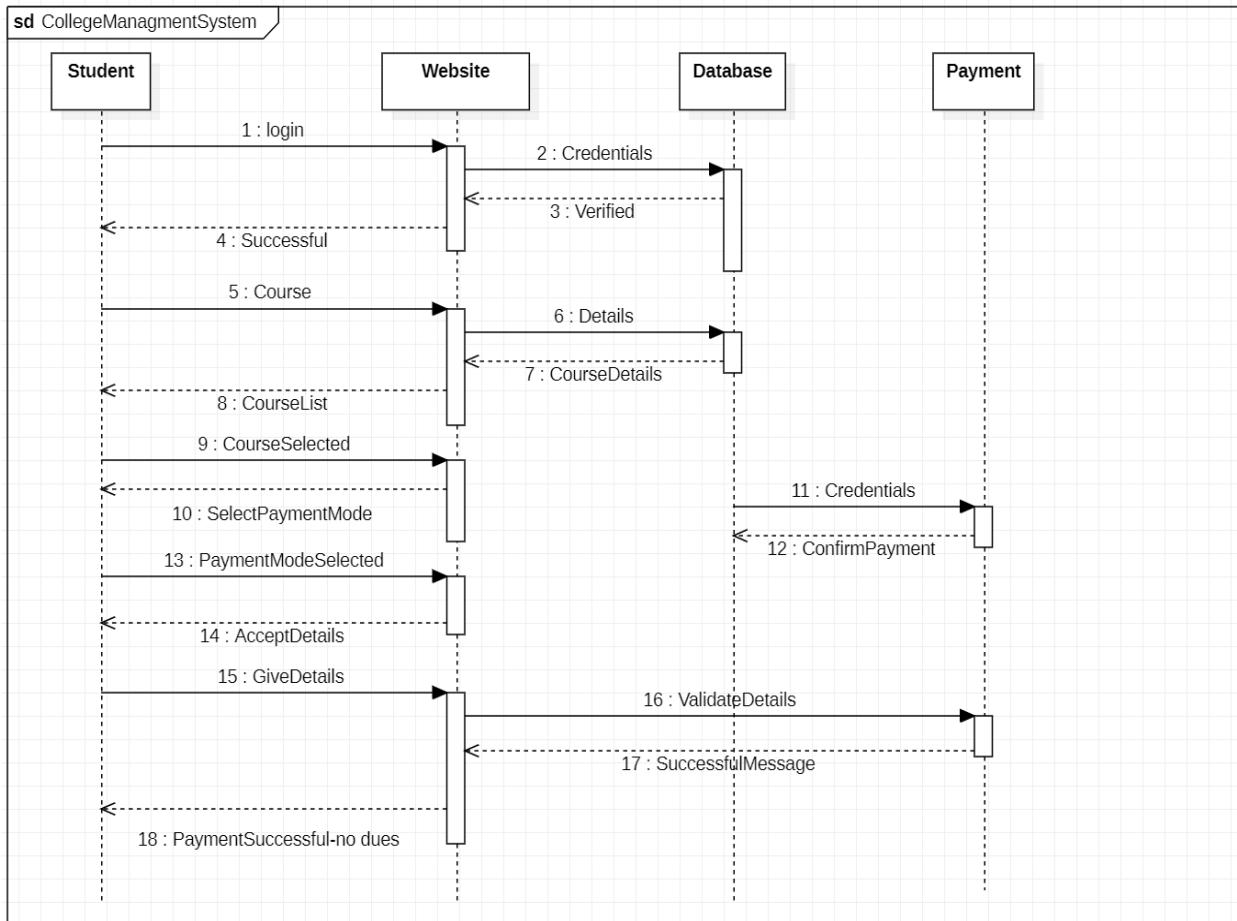
Teacher: A person who is responsible for teaching courses and evaluating sheets.

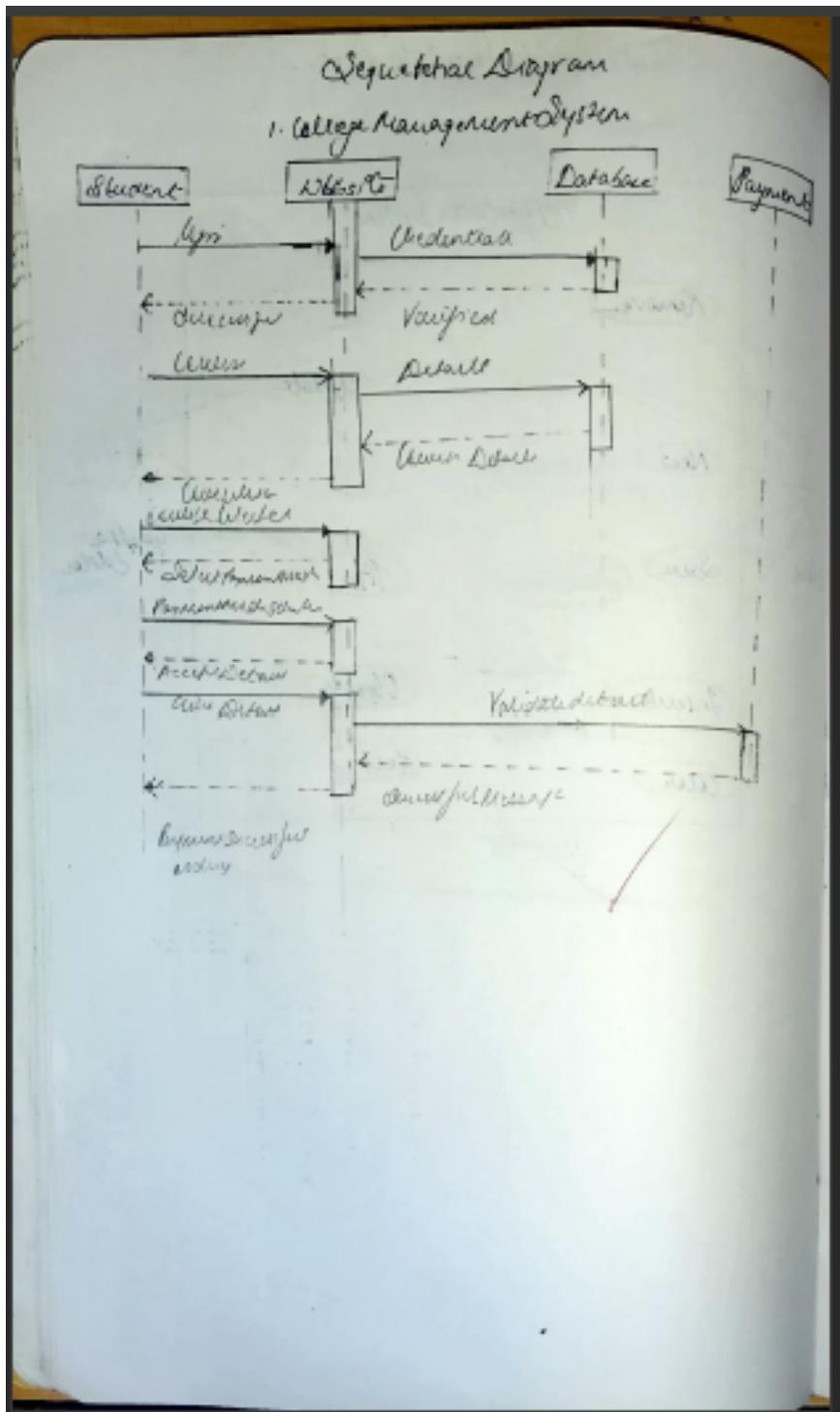
Use Cases:

Payment: Direct to payment portal for various activities.

Courses: Student can select courses.

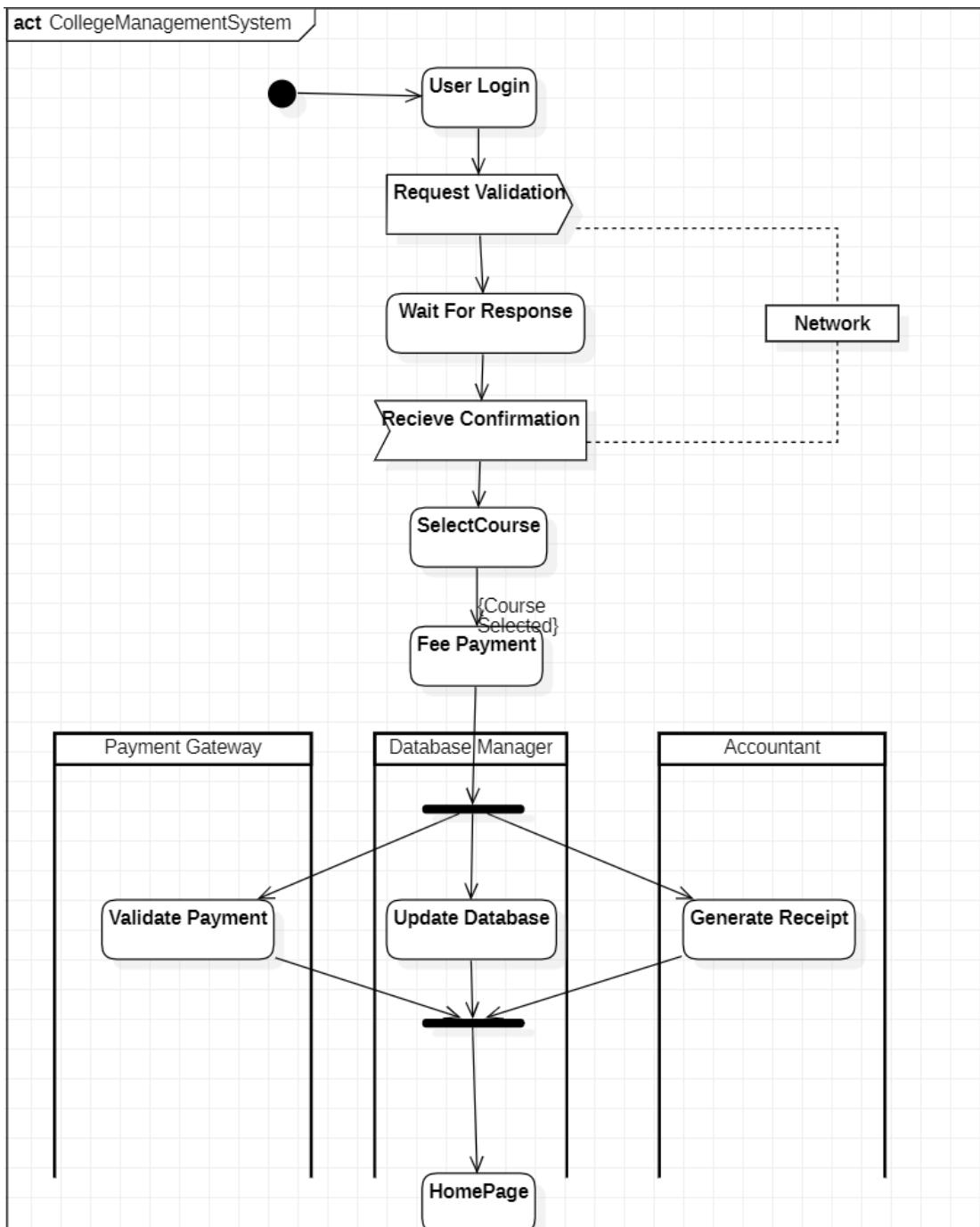
Advanced Sequence Diagram :



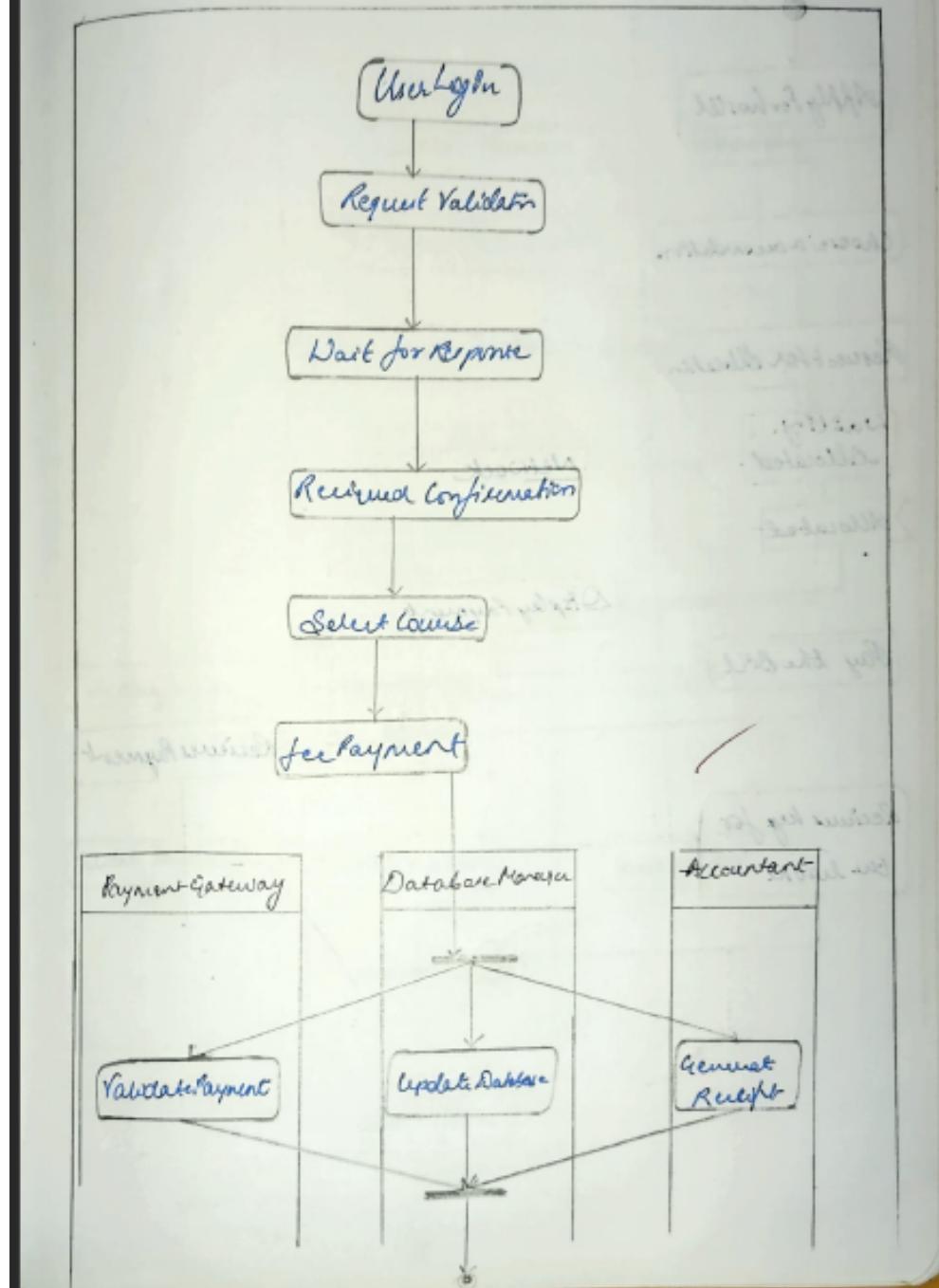


The above sequence diagram gives the interaction between objects while a user is logging into a system. The user enters login information in the website which sends to the server, where the information is validated and the appropriate reply message is displayed to the user.

Advanced Activity Diagram :



Activity Diagram
1. College Management System



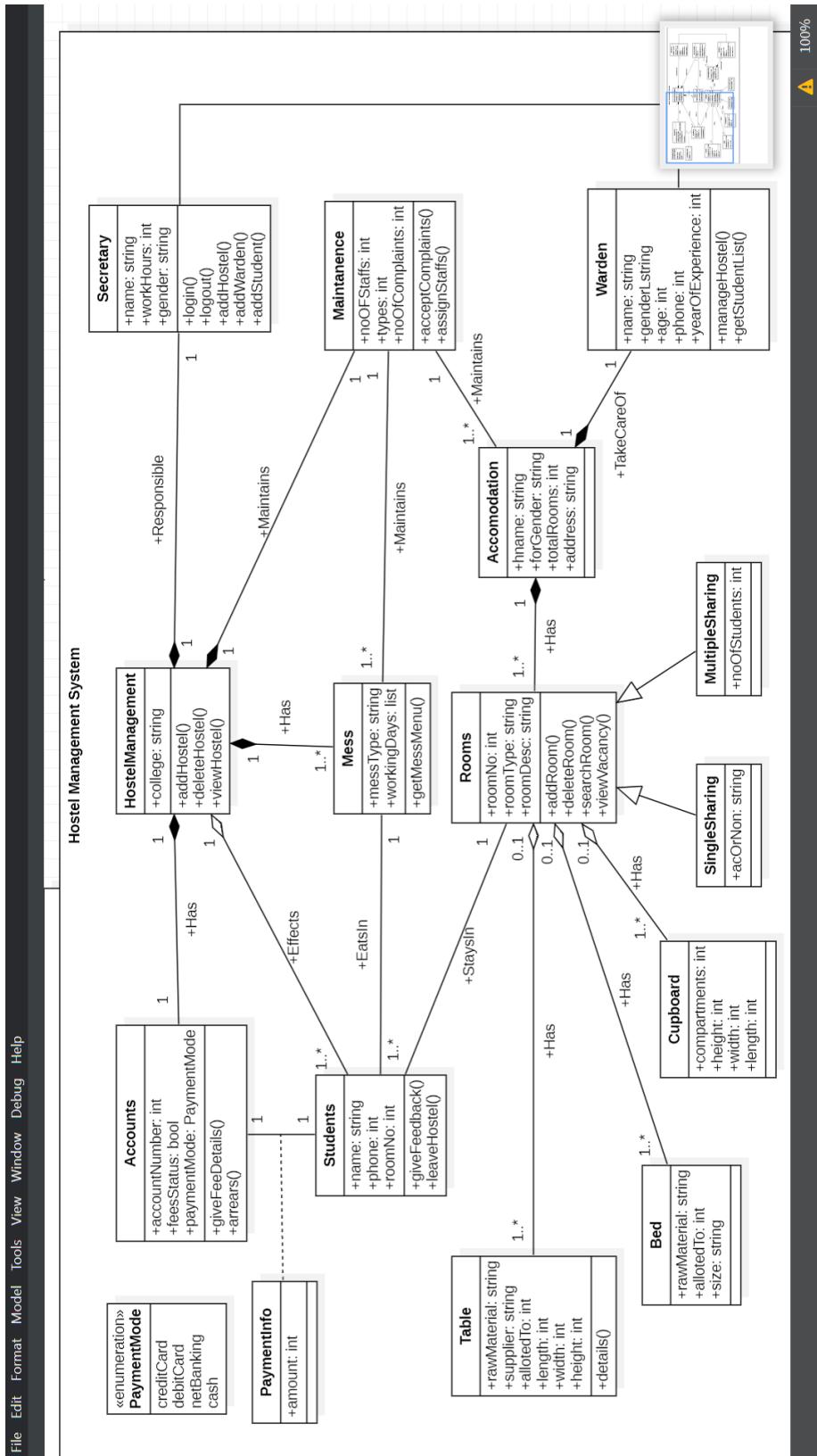
The above activity diagram has three swimlanes mainly payment gateway, database and accountant. Student can login ,select a course and pay the fees. The database verifies the login information and update the information.

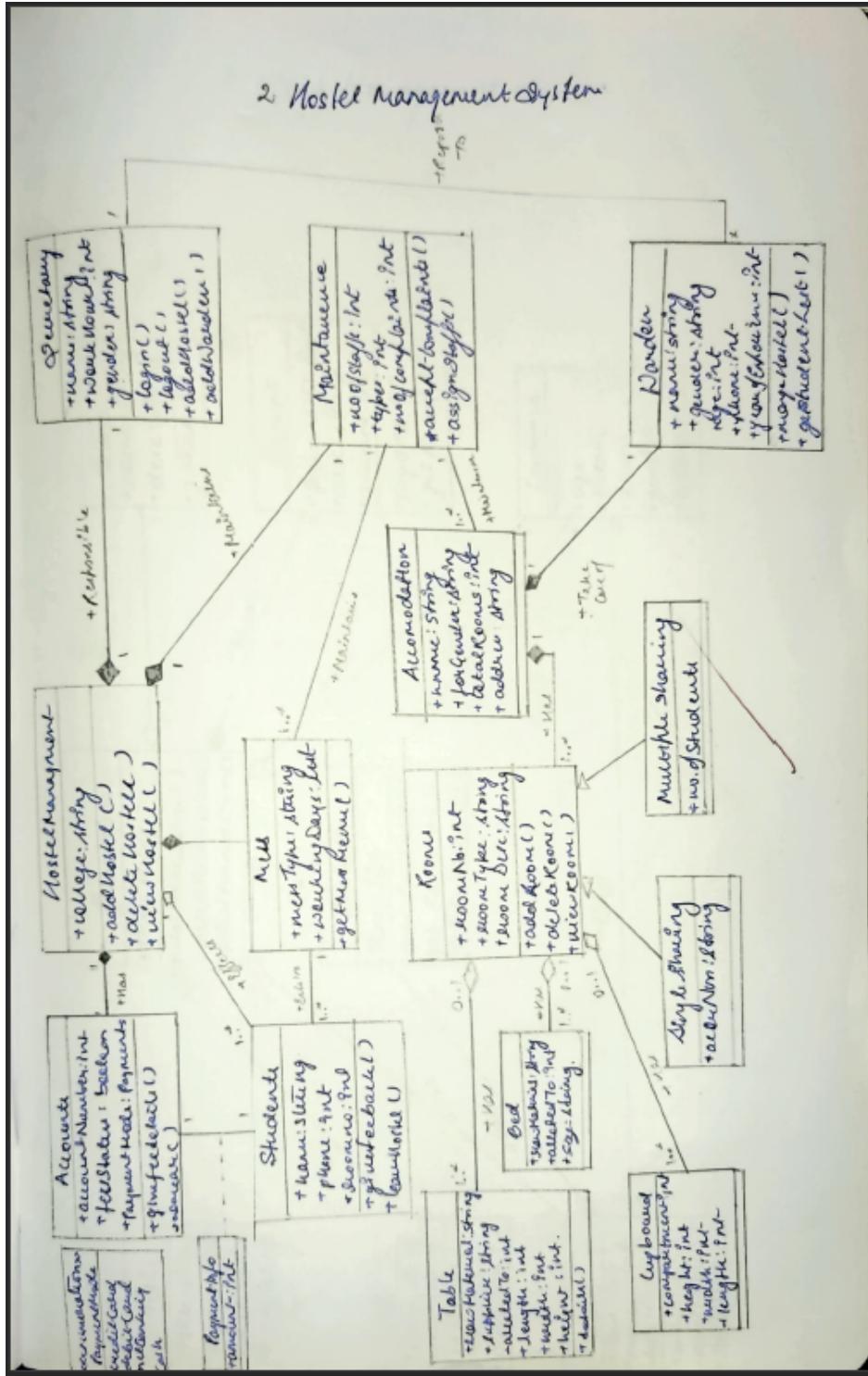
2.HOSTEL MANAGEMENT SYSTEM

Software Requirement Specification

- Hostel management system has admin who manages the hostel, allot-es and payment methods. The admin will allocate a room to student according to the section or class. The admin will also keep track of the payment made by the student/allot-es .
- As the student's course is over they will vacate their rooms. So it is required for the administrator to remove their records from the database tables.
- The allot-es makes payment according to the bill generated which have the attributes bill number, type and date.
- The details of the students staying in the hostels like name, place, address, contact details is maintained in the database.
- The hostel is categorized into two types I.e boys and girls hostel. Each hostel type has different costs , warden and name.
- A hostel is made up of mess and rooms. A mess account will also generate. This account having the mess status of the whole month. On the base of this account monthly charges of mess of a student will be defined.
- The hostel management system will allow renewing the student's registration every year. the rooms of hostel are composed of table and beds, where a count of the same is maintained and the allot-es can use them as they wish.

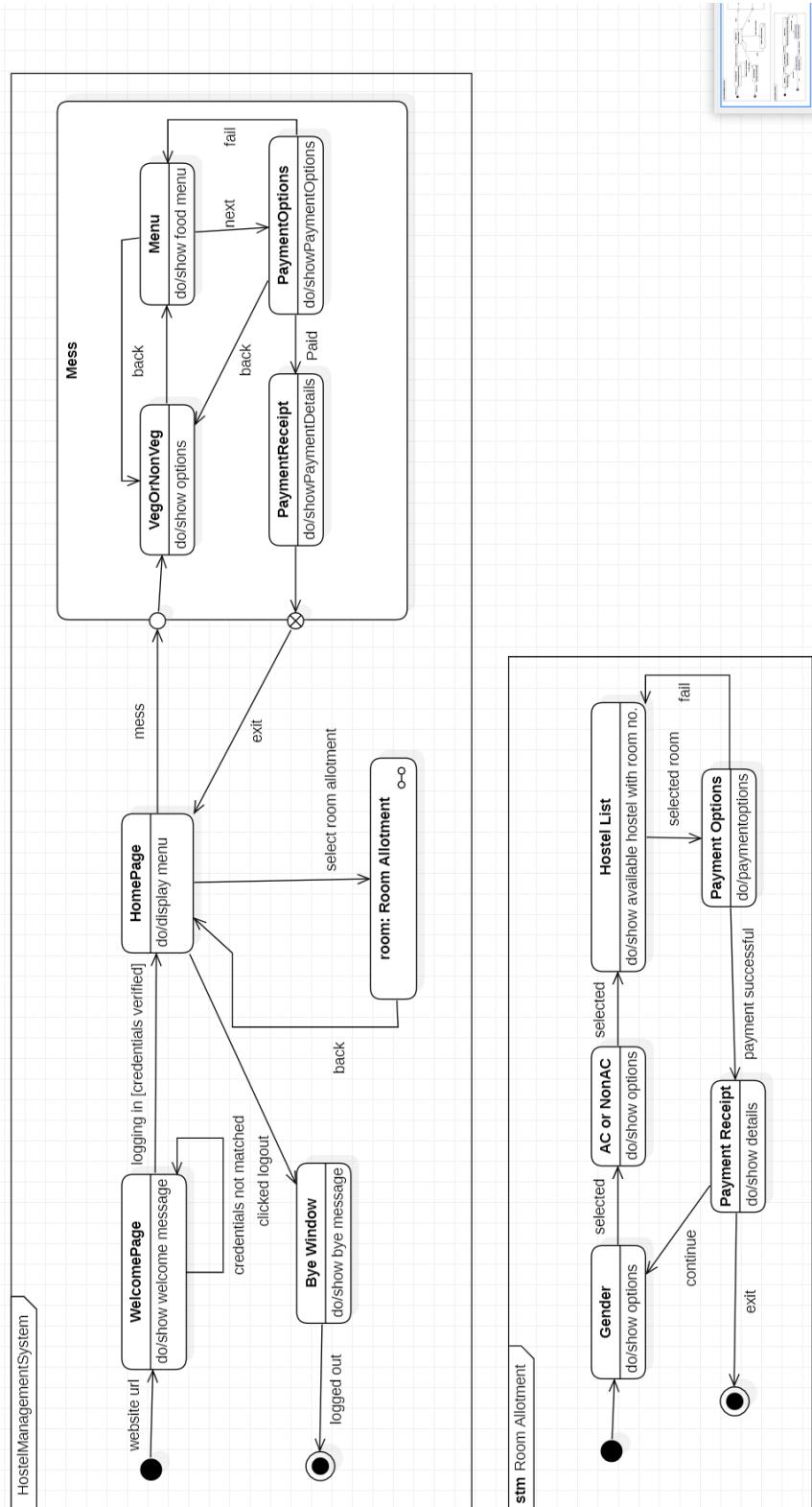
Advance Class Diagram :

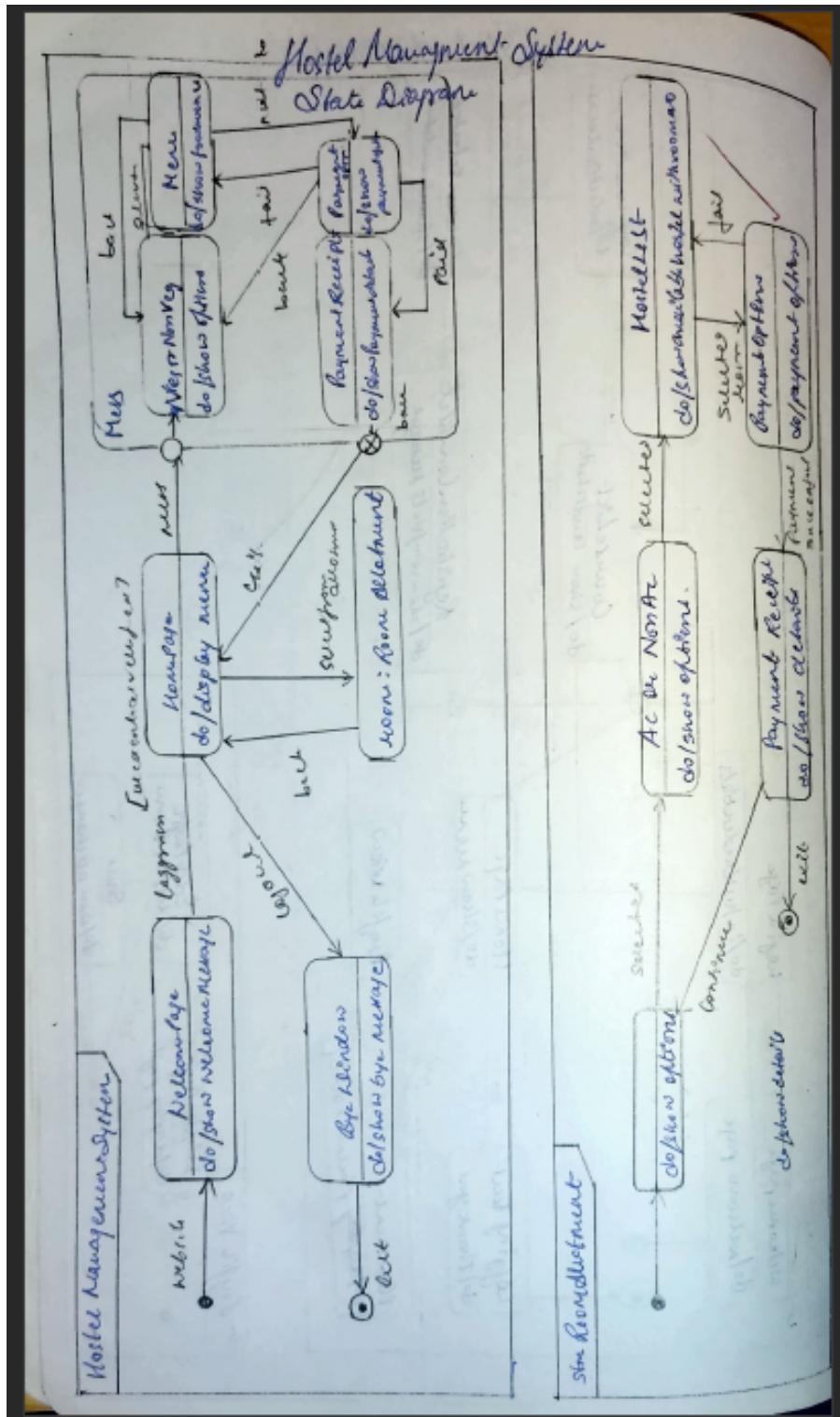




Hostel management system has secretary who manages the hostel, allot-es and payment methods. Student can request for accommodation. The allot-es makes payment according to the bill generated which have the attributes bill number, type and date.. A hostel is made up of mess and rooms. Rooms are categorized into two types single sharing and multiple sharingA mess account will also generate. This account having the mess type and status of the whole month.

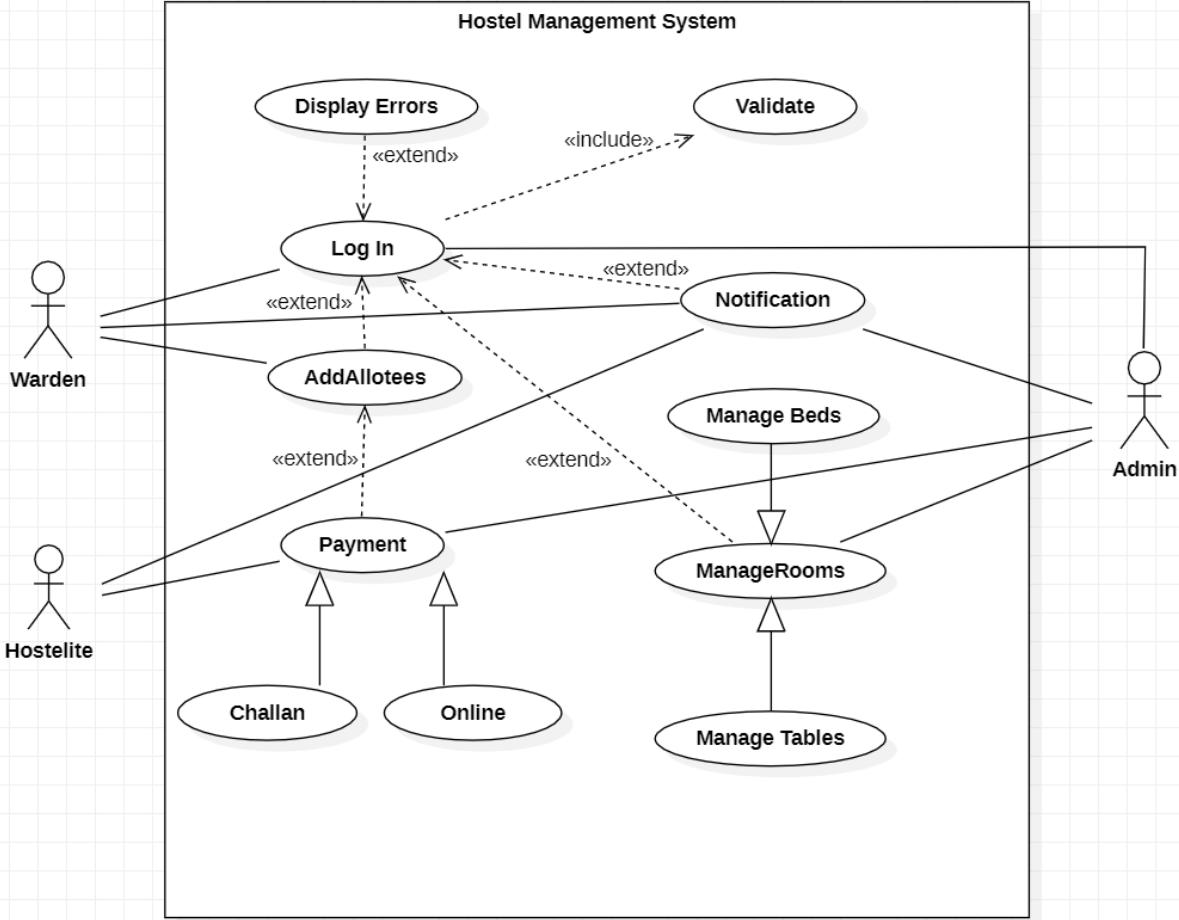
Advance State Diagram :

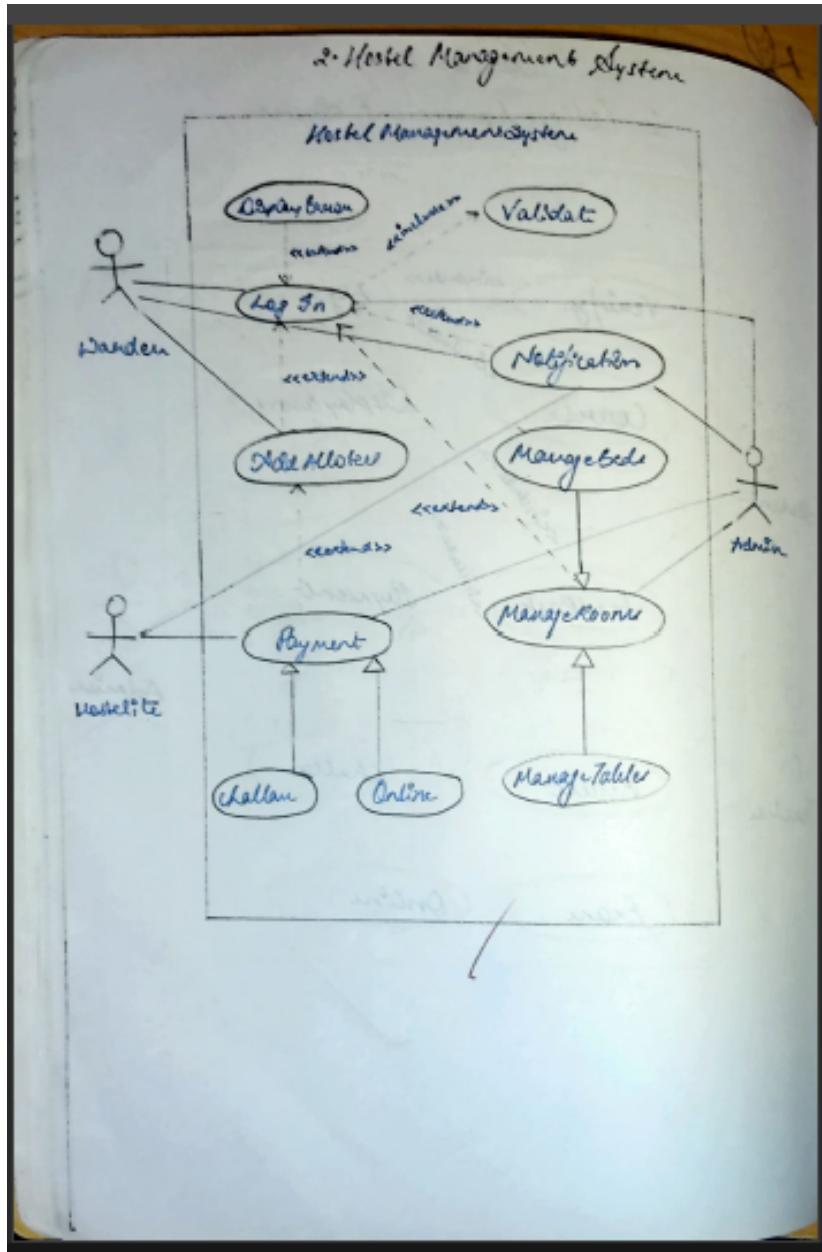




Student can visit the welcome page and log in .After log in he can visit the room allotment and select mess.After selecting the mess he needs to pay the fees.When done with successful payment he will be allocated that room.

Advance Use Case Diagram :





Actors:

Admin: the person who manages the whole system

Warden : the person who manages the allottees Student : the person who uses the hostel system

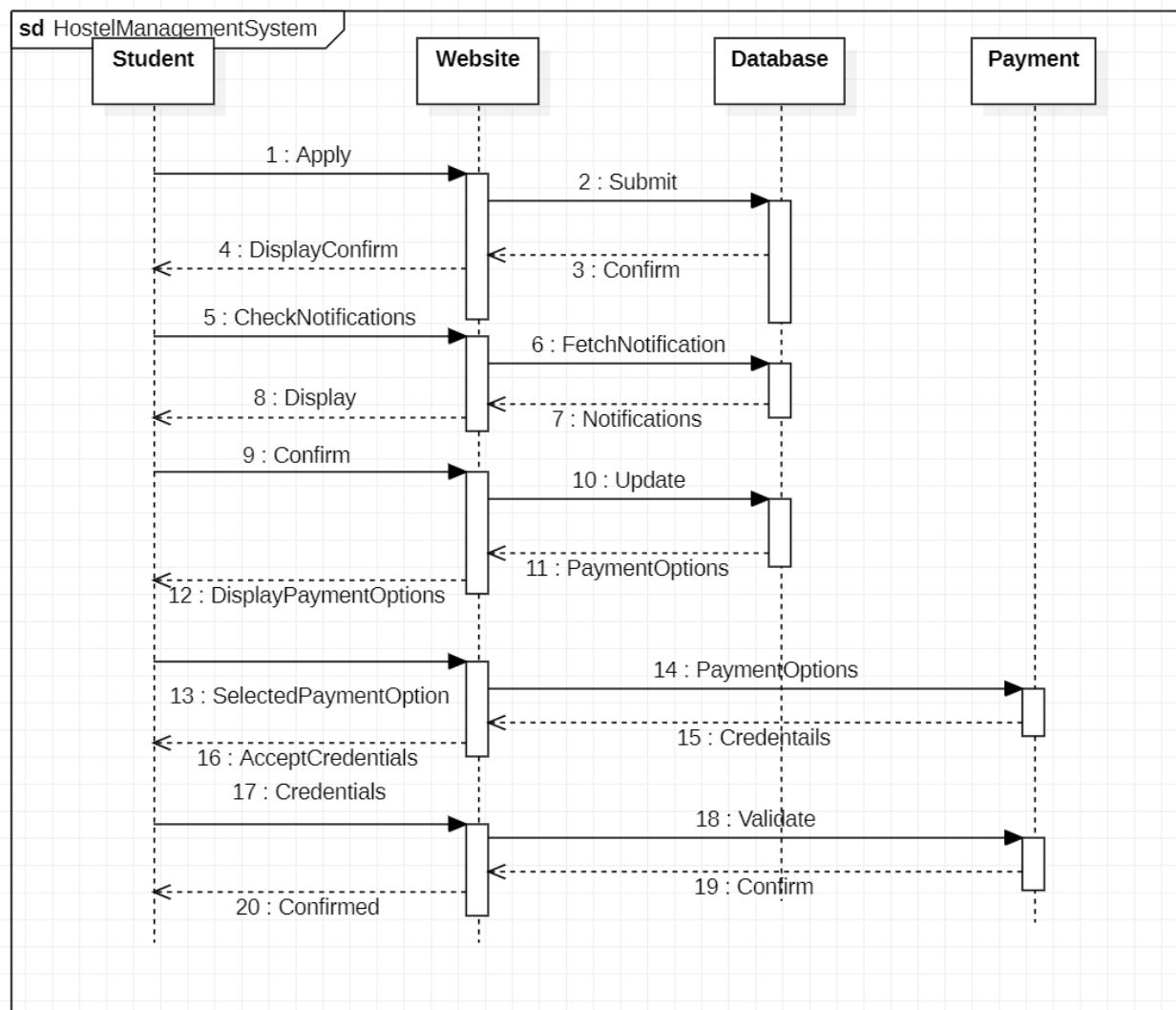
Website: Accept request and payment.

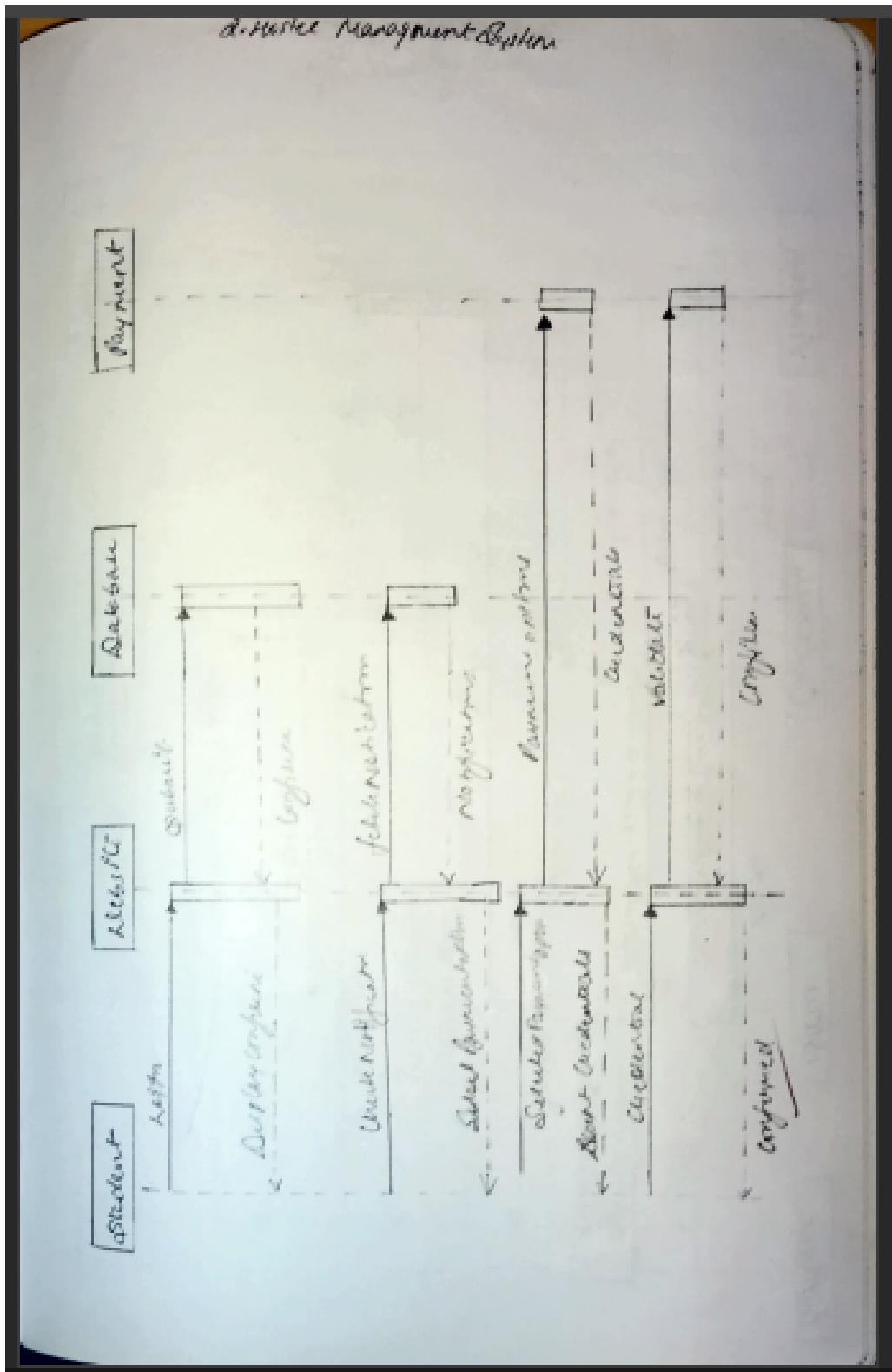
Use Cases:

Add allottee: the students are allotted hostel rooms

Payment:Accept payment either in challan or online.Redirect to payment portal.

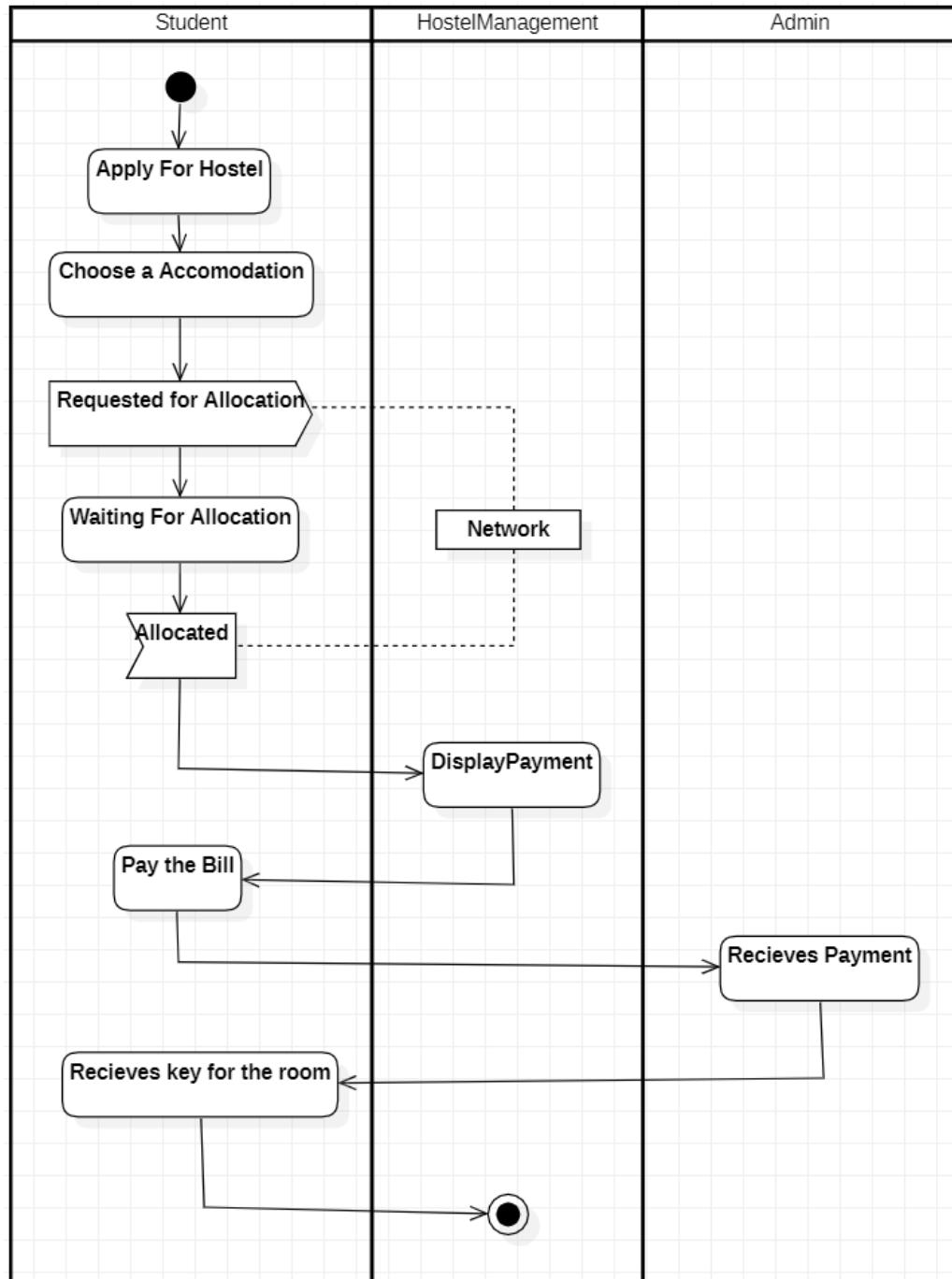
Advance Sequence Diagram :

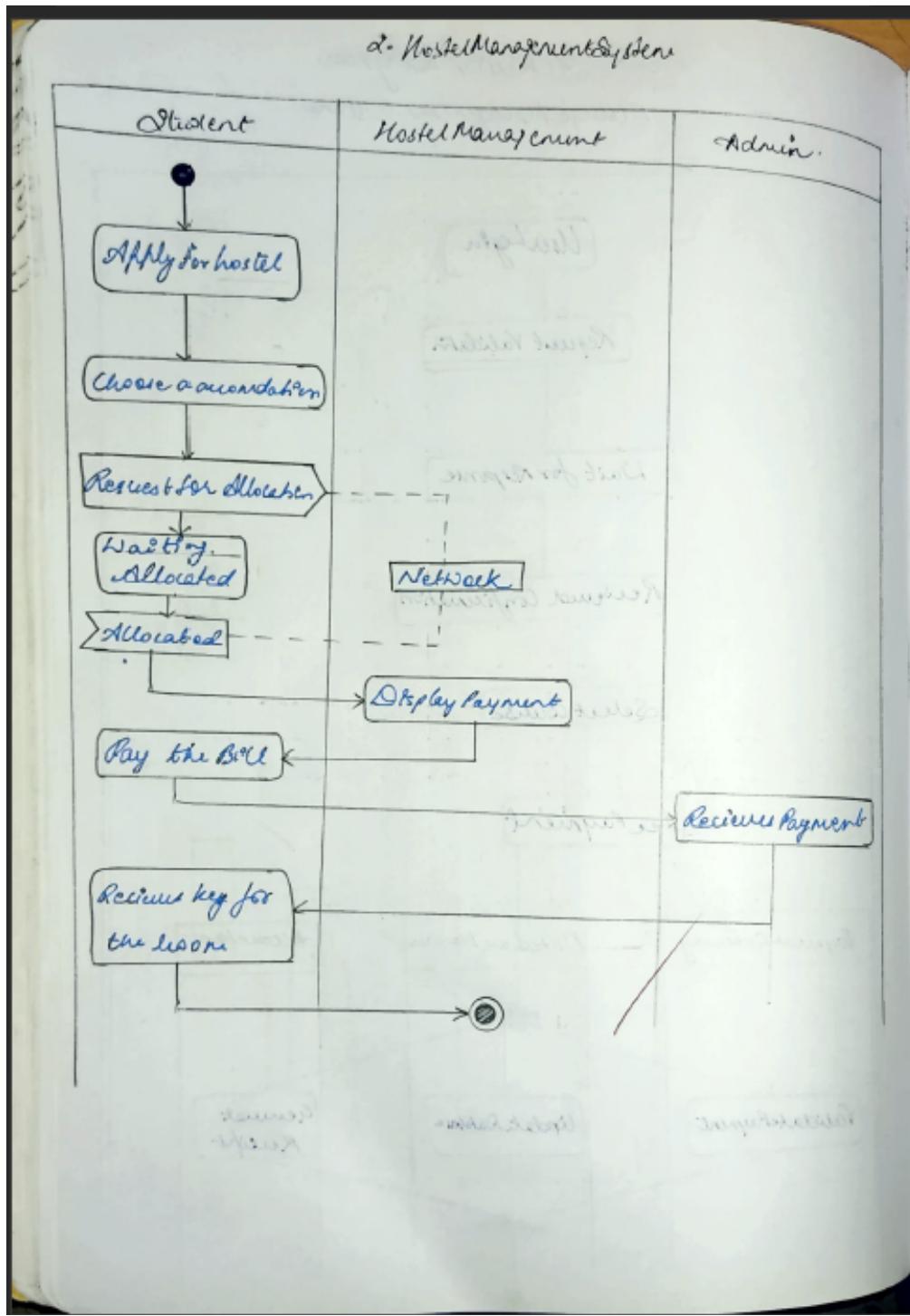




The above sequence diagram give the steps involved in a student logging in, booking a room, which is verified in the database and the payment for the same is made by the student.

Advance Activity Diagram:





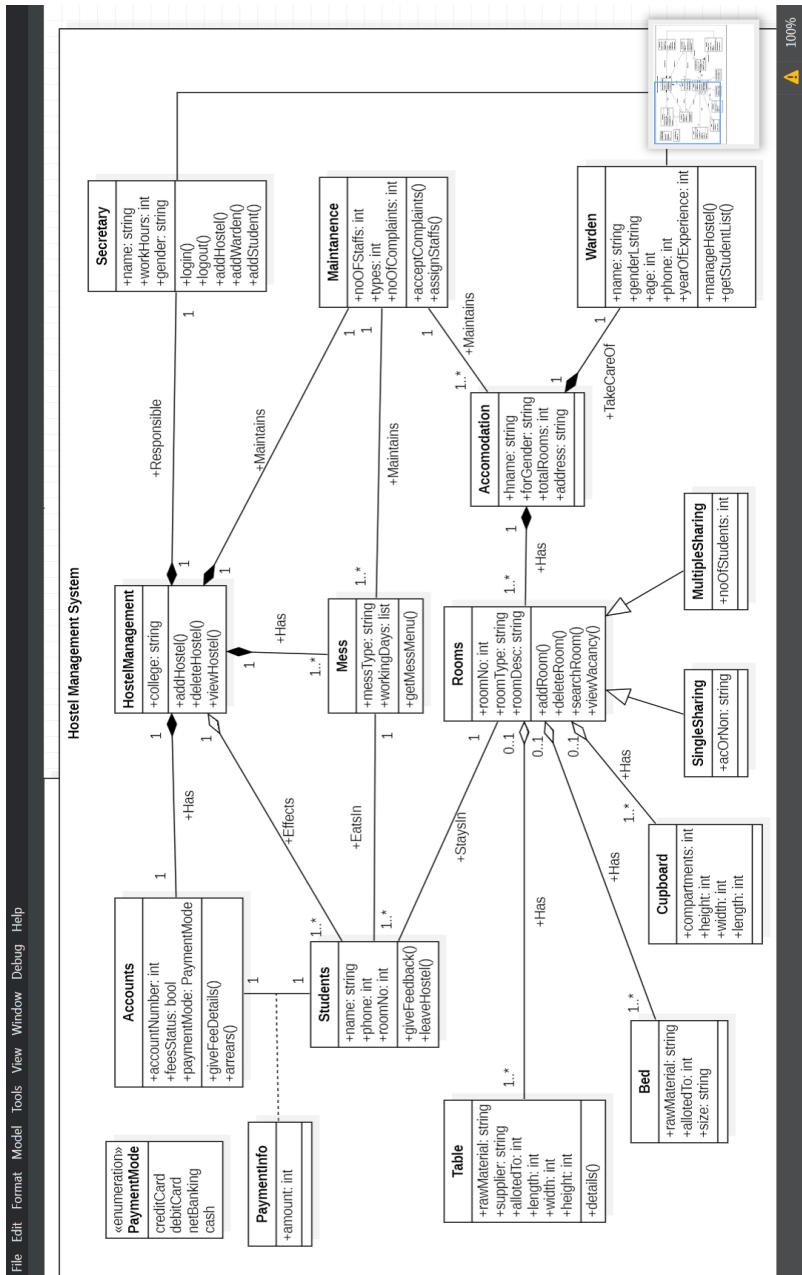
The activity diagram tells about the activities involved in applying for accomodation. The student first needs to login and then pay fees for both hostel and mess and finally receive key for the room..

3 STOCK MAINTENANCE SYSTEM

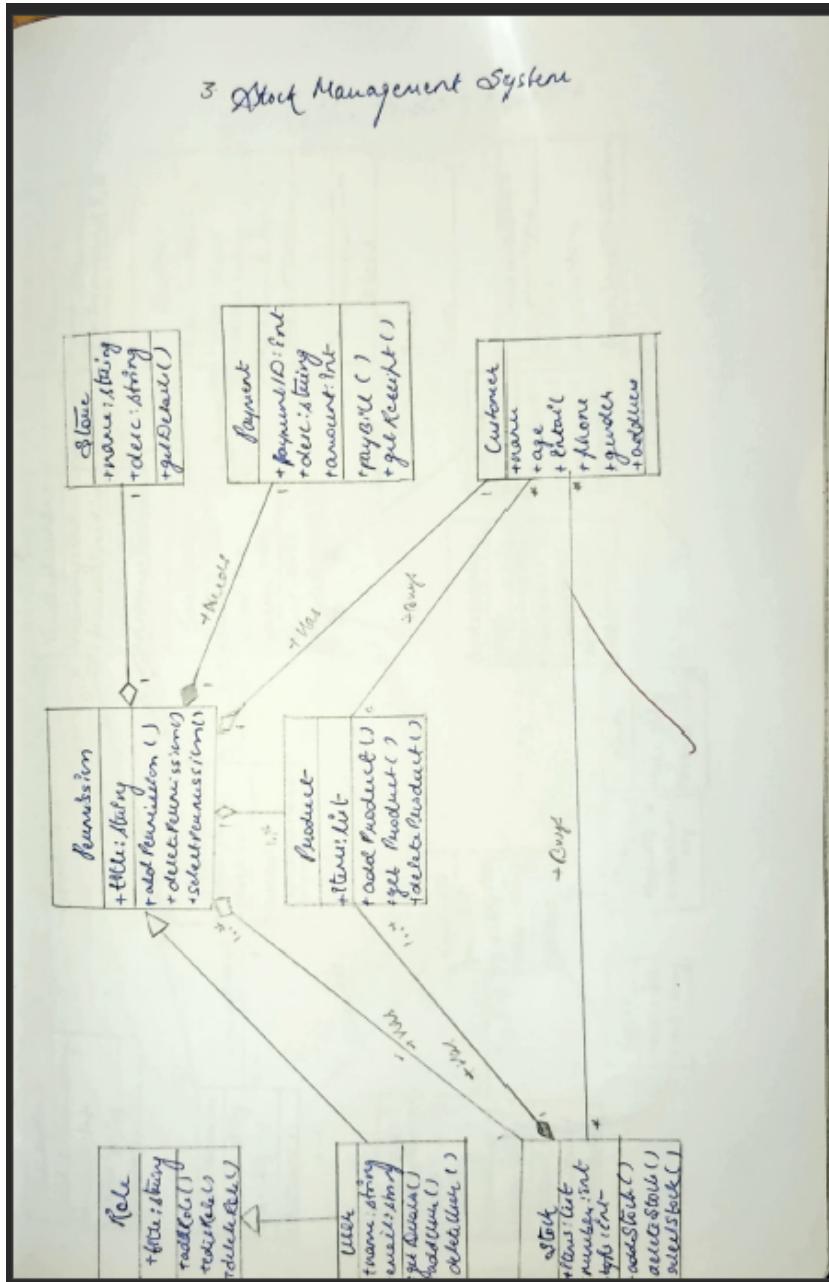
Software Requirement Specification

- The customer can purchase one or more product on any day, which will have a code price and quantity.
- The customer will need to pay the bill for the products he or she has purchased. the bill number, type description and customer who is paying the bill is maintained.
- The stock of the products is maintained separately. The stock deals with information about the details of the product that the concern handling.
- Stock consist of details such as the name of the product, id generated, quantity, cost, etc. This information is retrieved during the sales and purchase of a product.
- The vendor deals with the information about the details of the suppliers giving product to the organization.
- Vendor consist of details such as vendor name, address, email id, sales tax number etc. This information is retrieved when a Purchase is done
- The products are displayed in stores across the city or world. All the information regarding the store such as store id, name, address and type are used to locate any product. The stores can be of many types. Some of them are departmental stores, super markets and ware houses where the products are kept for display.

Advance Class Diagram :

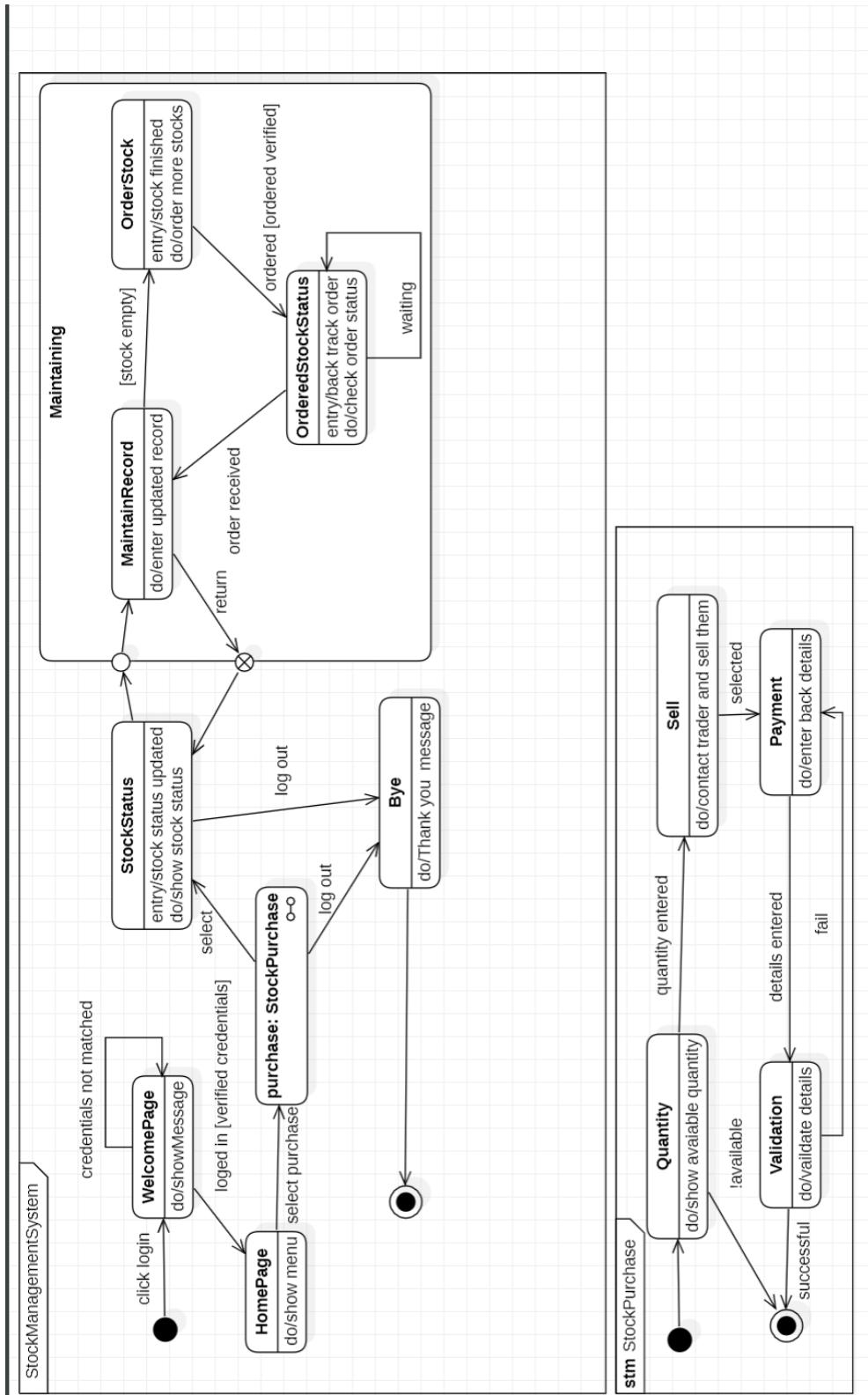


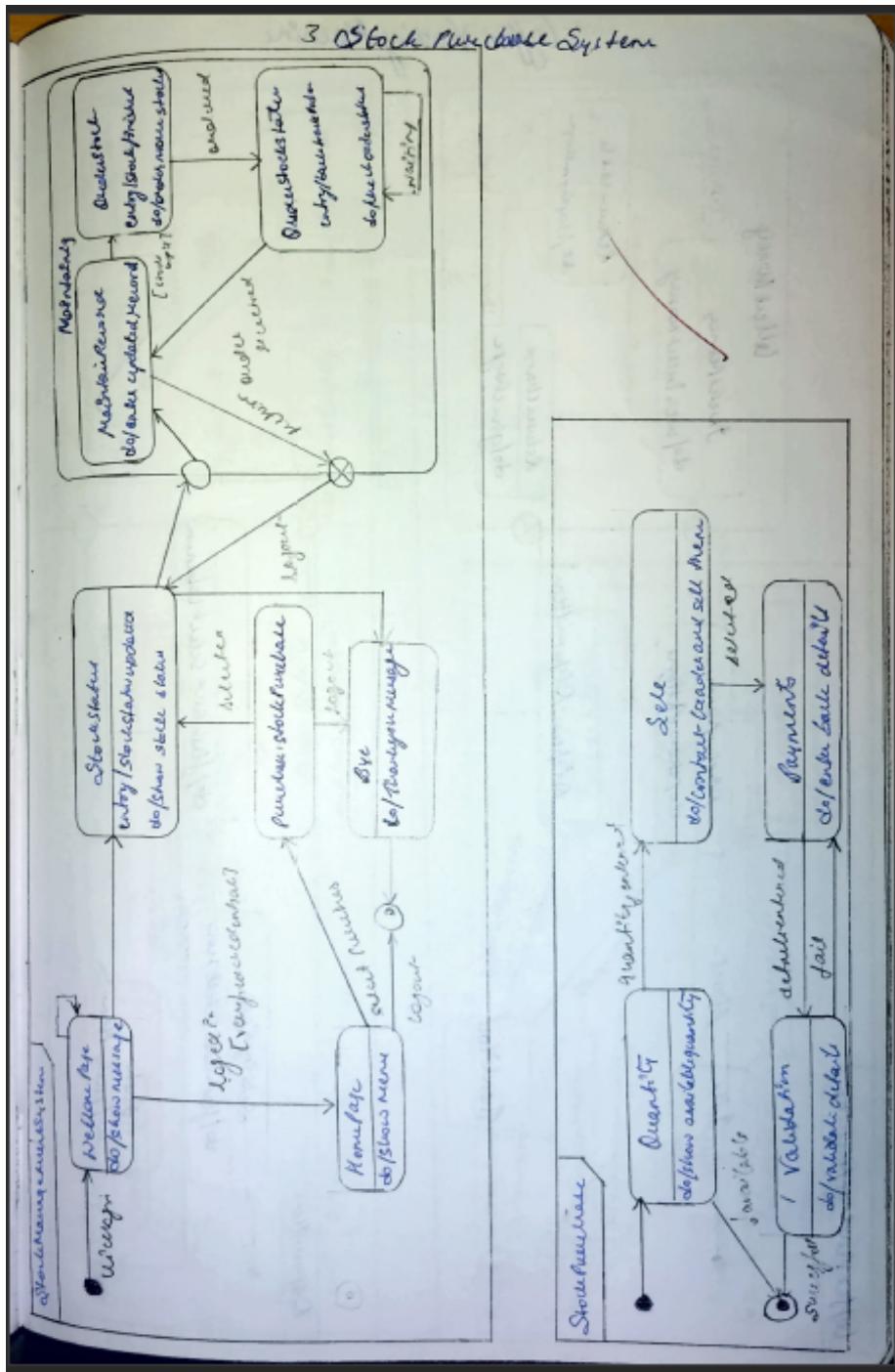
A 100%



The products are displayed in stores across the city or world. All the information regarding the store are used to locate any product. The stores can be of many types. Some of them are departmental stores, super markets and ware houses where the products are kept for display. The vendor deals with the information about the details of the suppliers giving product to the organization. The stock of the products is maintained separately. The stock deals with information about the details of the product that the concern handling.

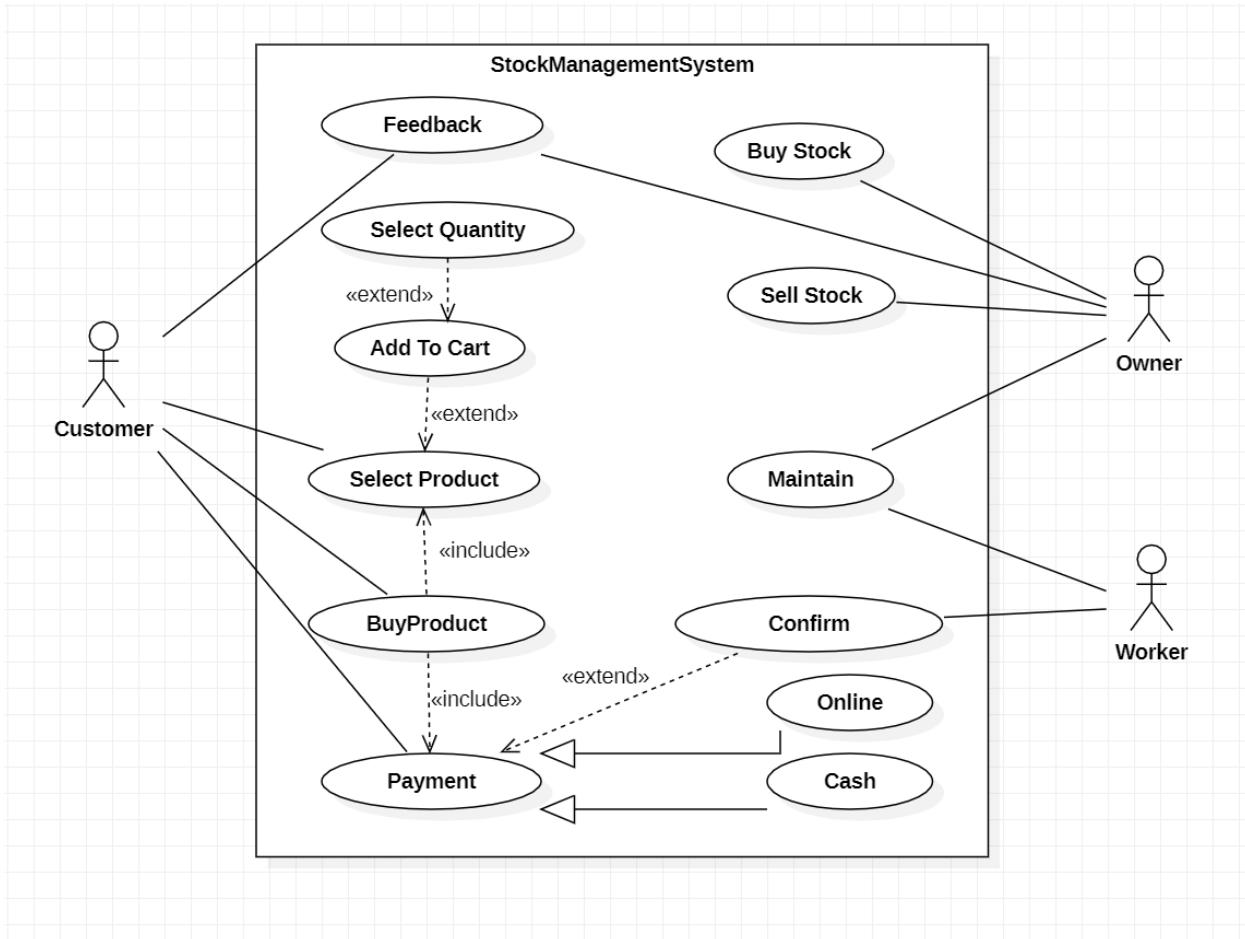
Advance State Diagram :

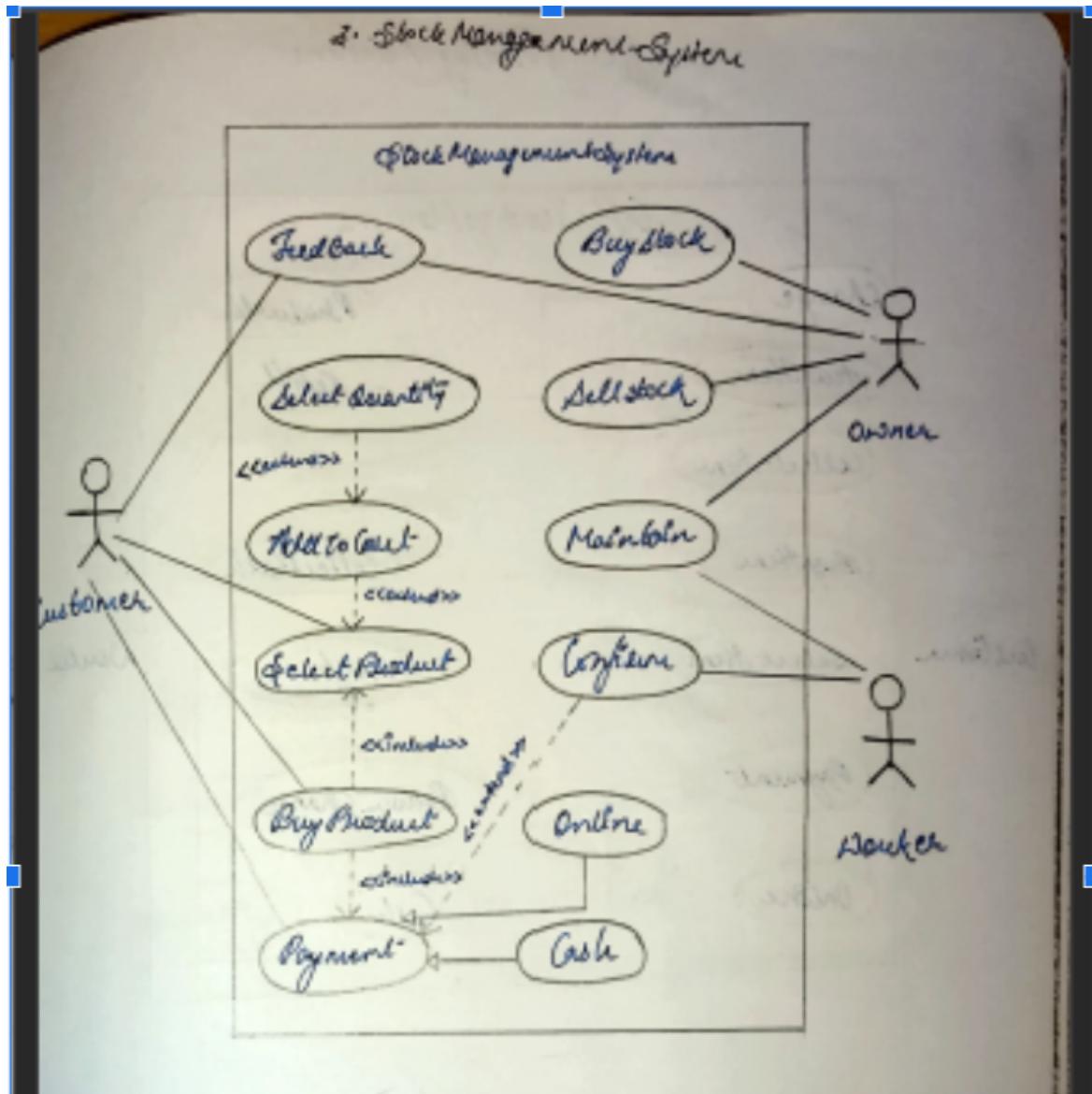




The state diagram above gives us the states involved in purchasing a product and placing the order for the same. There is first an inventory check ,where is stock of products is noted and if the stock is less than minimum an order is placed by first searching for suitable trader . if a suitable trader is found , the order is placed and verified by the accountant. After the accountant has verified a payment is made for the products purchased.

Advance Use Case Diagram :





Actors:

Customer: a person who purchases the products

Owner: a person who keeps check of the stock

Worker: a person who dispatches the products

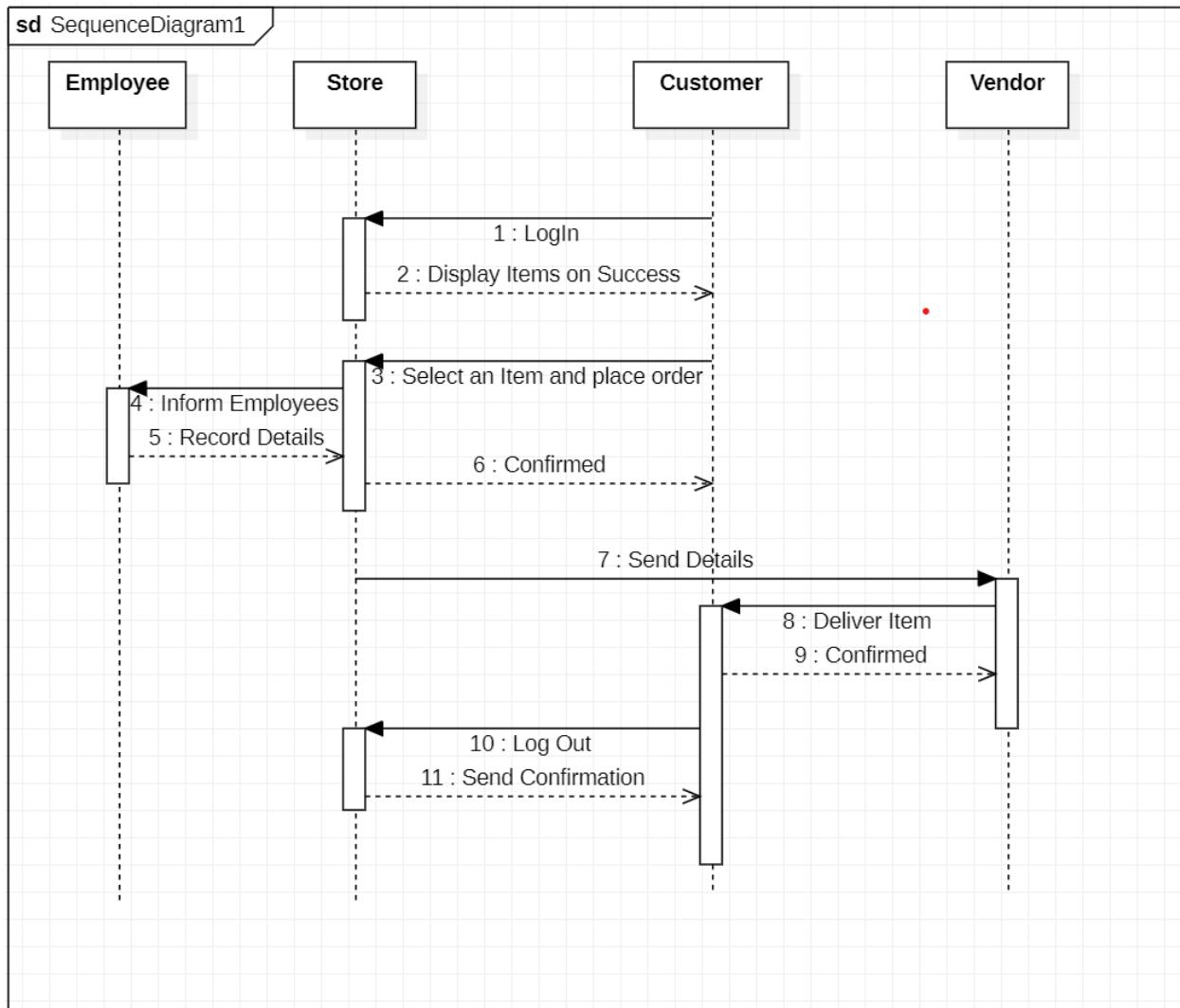
Use Cases:

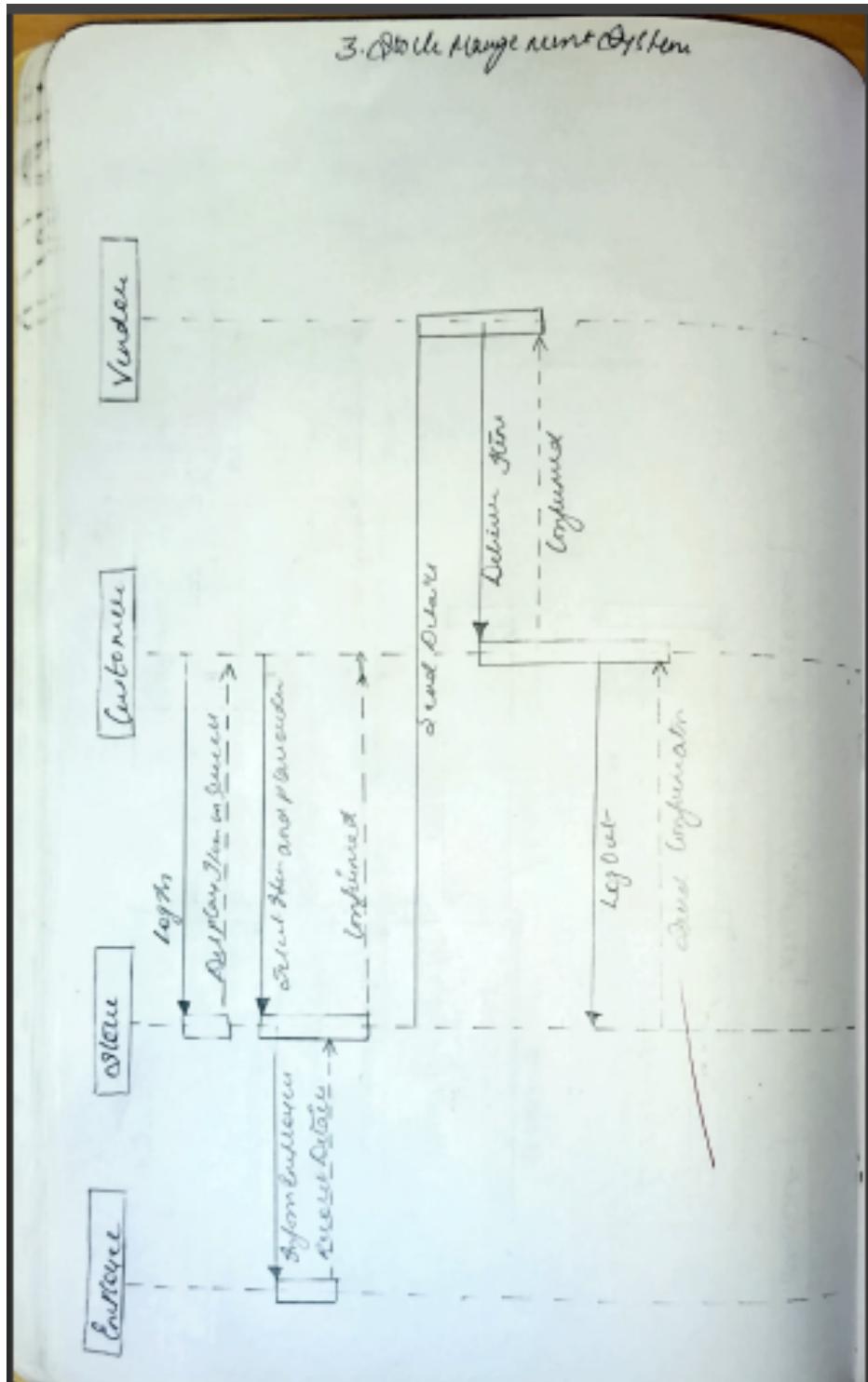
Purchase item: allows a user to purchase any product
 Make payment: accepts the payment

Sell stock: keeps track of the stock supplied
 Find traders: provides a list of traders

Buy stock: the stock list is updated by the stock person
 Order goods: the products coming to an end are ordered
 Prepare bill: a bill for products purchased is made

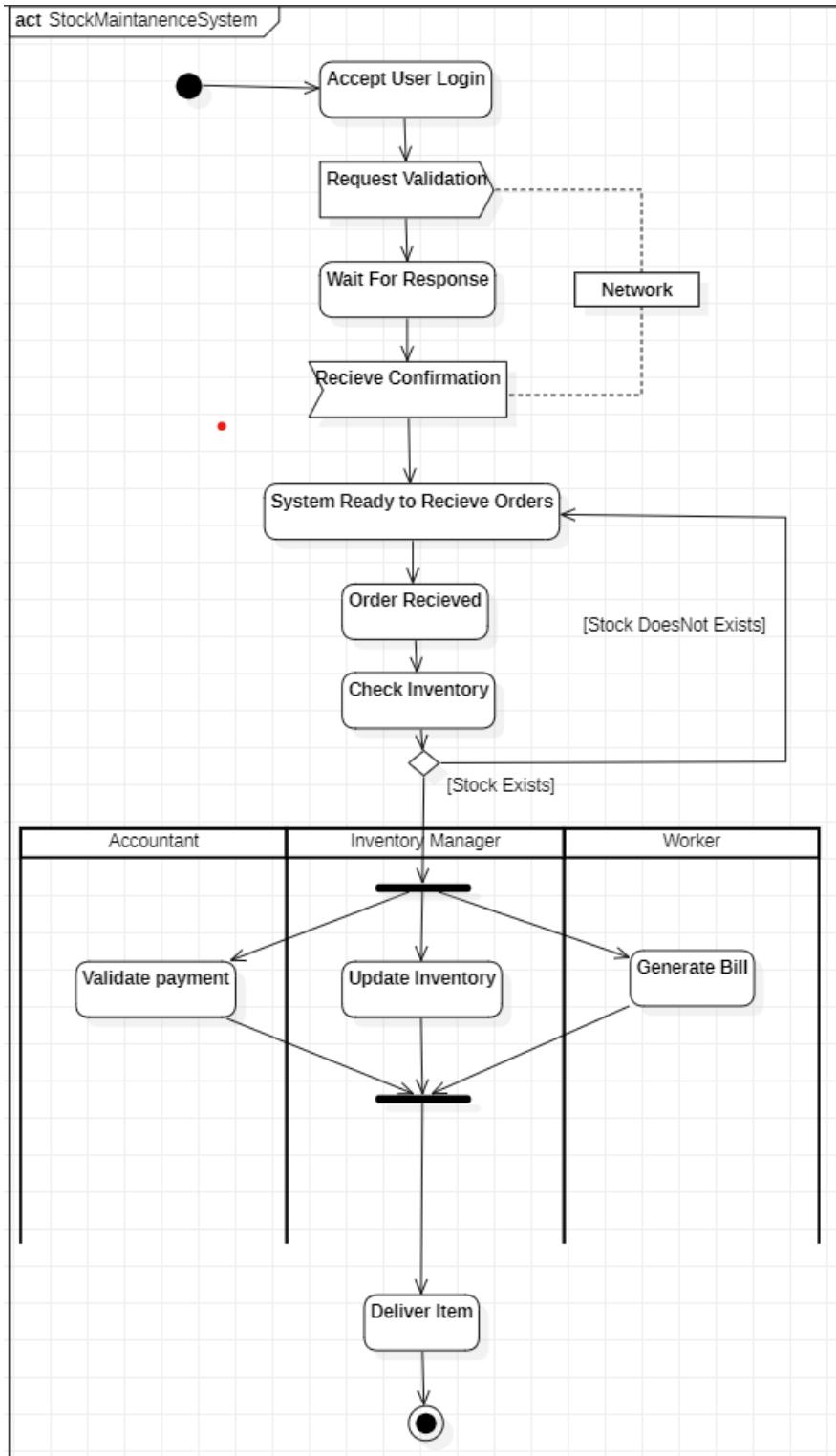
Advance Sequence Diagram :

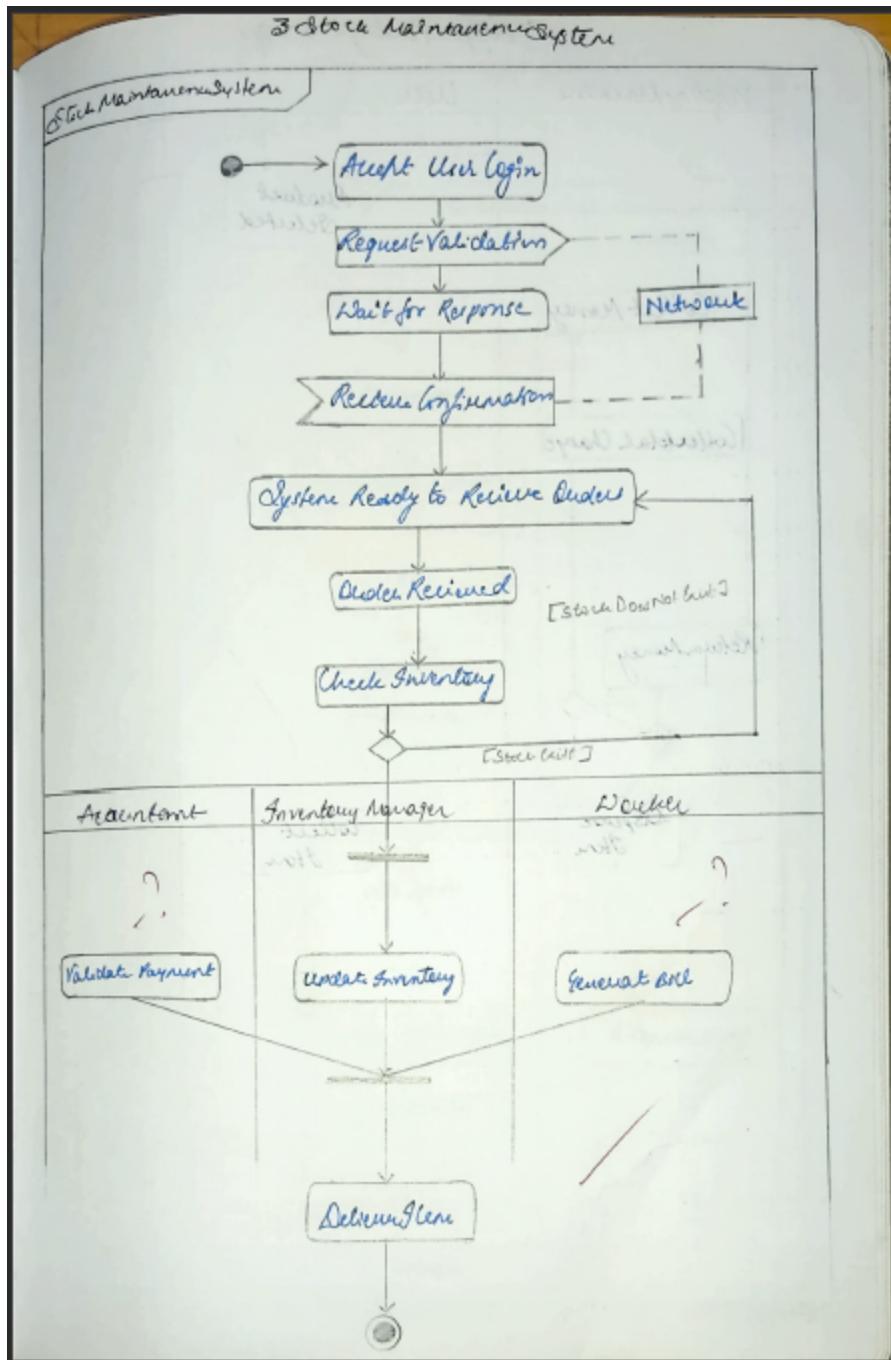




This present scenario of placing and order and receiving details regarding the delivery .

Advance Activity Diagram:





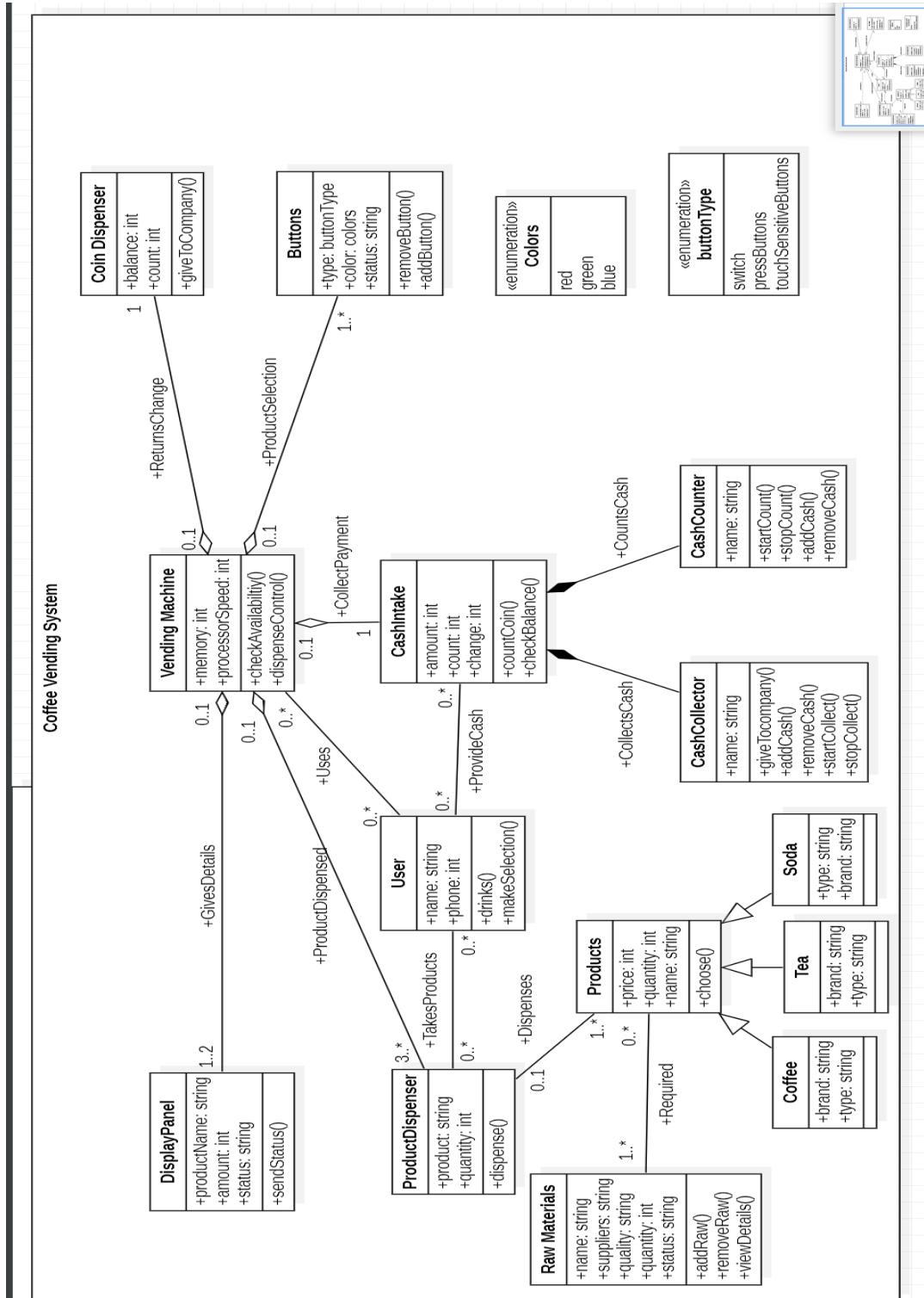
The customer log in and system receives the order. When order is placed, inventory is checked. After credentials are entered payment is initialised and bill is generated and inventory is updated.

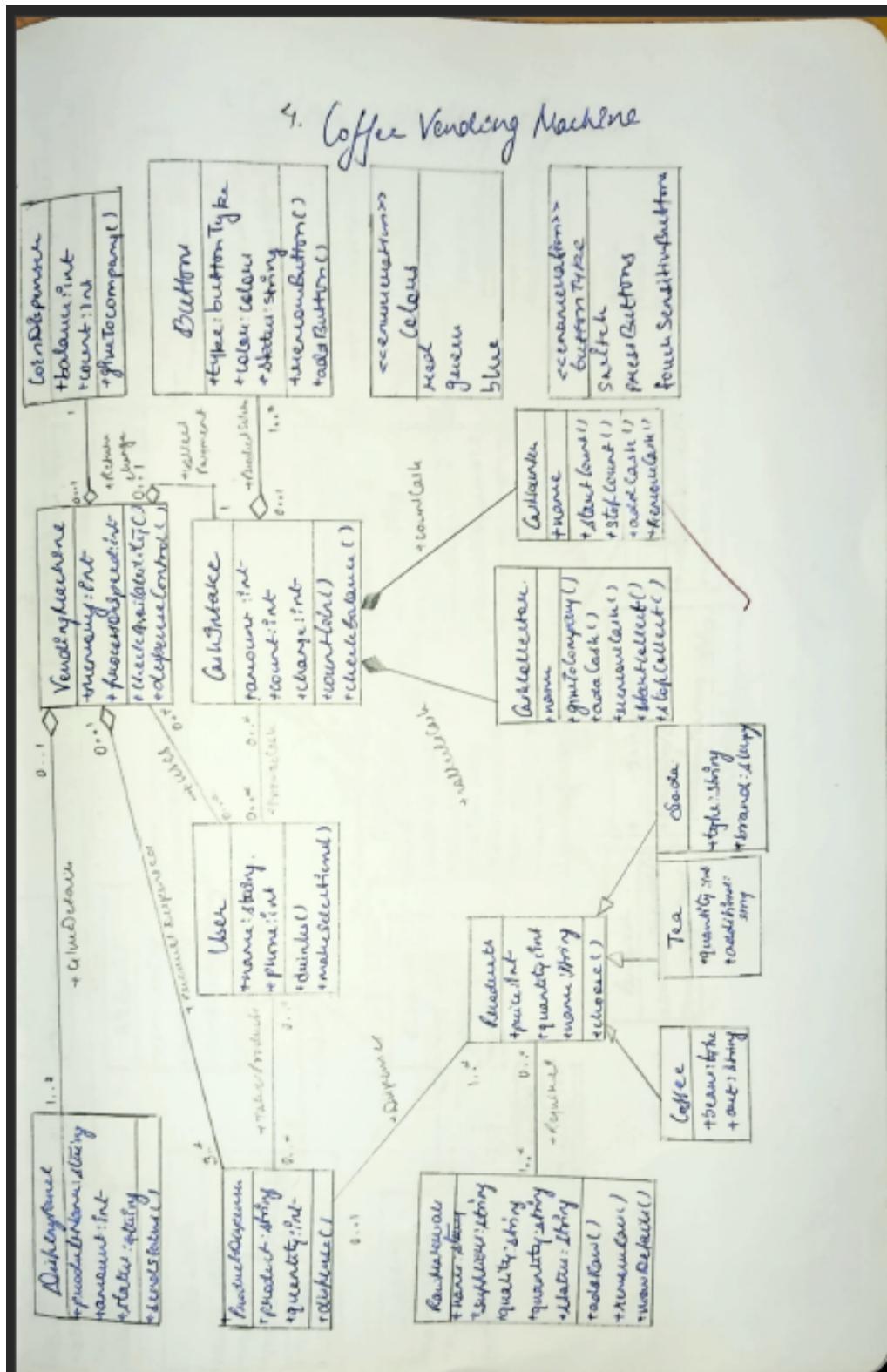
4.COFFEE VENDING MACHINE

Software Requirement Specification

- The vending machine must have money box, coin slot, display screen and products i.e coffee for the machine to be used.
- The user on selecting a coffee ,the coffee machine must be able to dispense the selected coffee to the user.
- The user shall get empty cup placed right below the filter.The user shall be able to choose his preferred beverage from the list of options(buttons).
- There must be buttons(start,pause,stop,coffee,tea,milk) for user to interact with the system.
- The user shall be able to purchase one kind of available drink at a time and get back the exact changes if he has put extra money. The user shall be able to quit the dispense of any beverage at any time during the dispensing.
- The system(machine) shall check for properly inserted coins.
- The system shall be able to dispense coffee(or selected beverage) after a coin has been inserted.
- The system must accept coins of different amount and the system must compare the item cost with entered coin.
- The system must check the validity of coins.
- The system shall be able to detect the low amount of ingredients and low number of cups and indicate with an indicator(small LED).

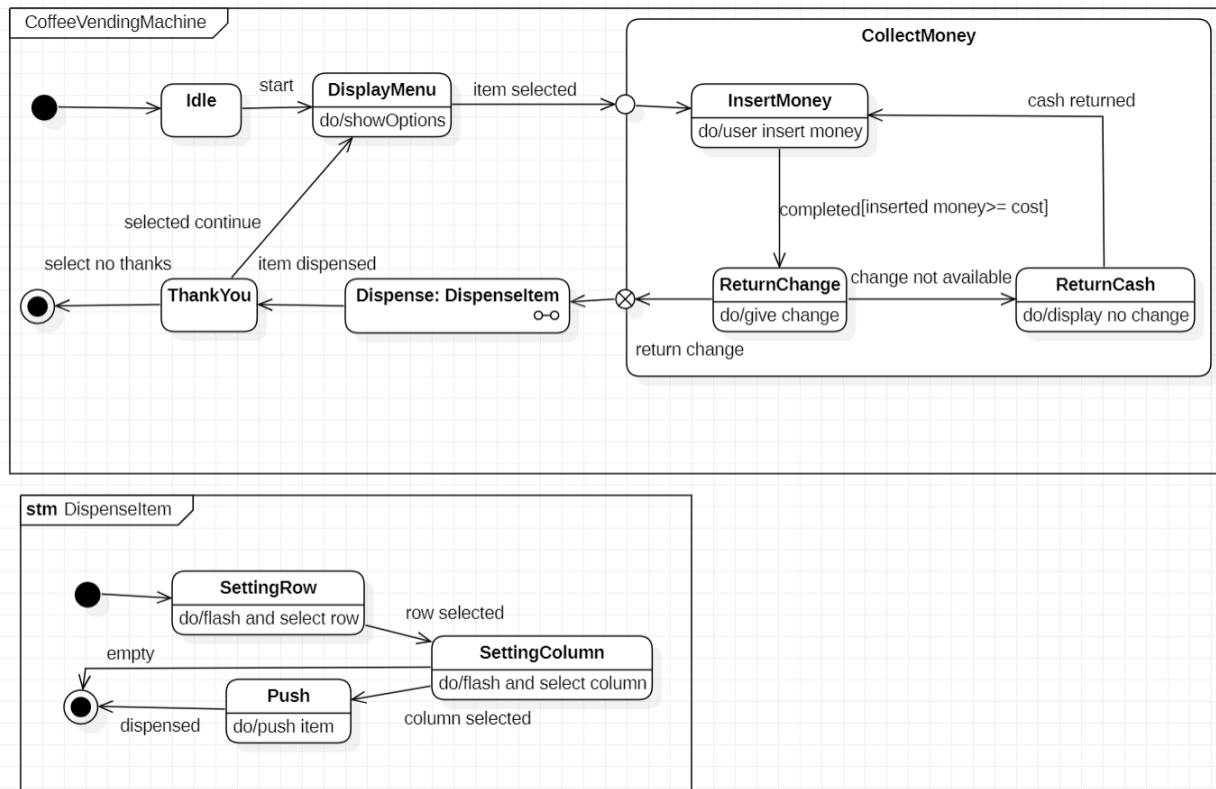
Advance Class Diagram :

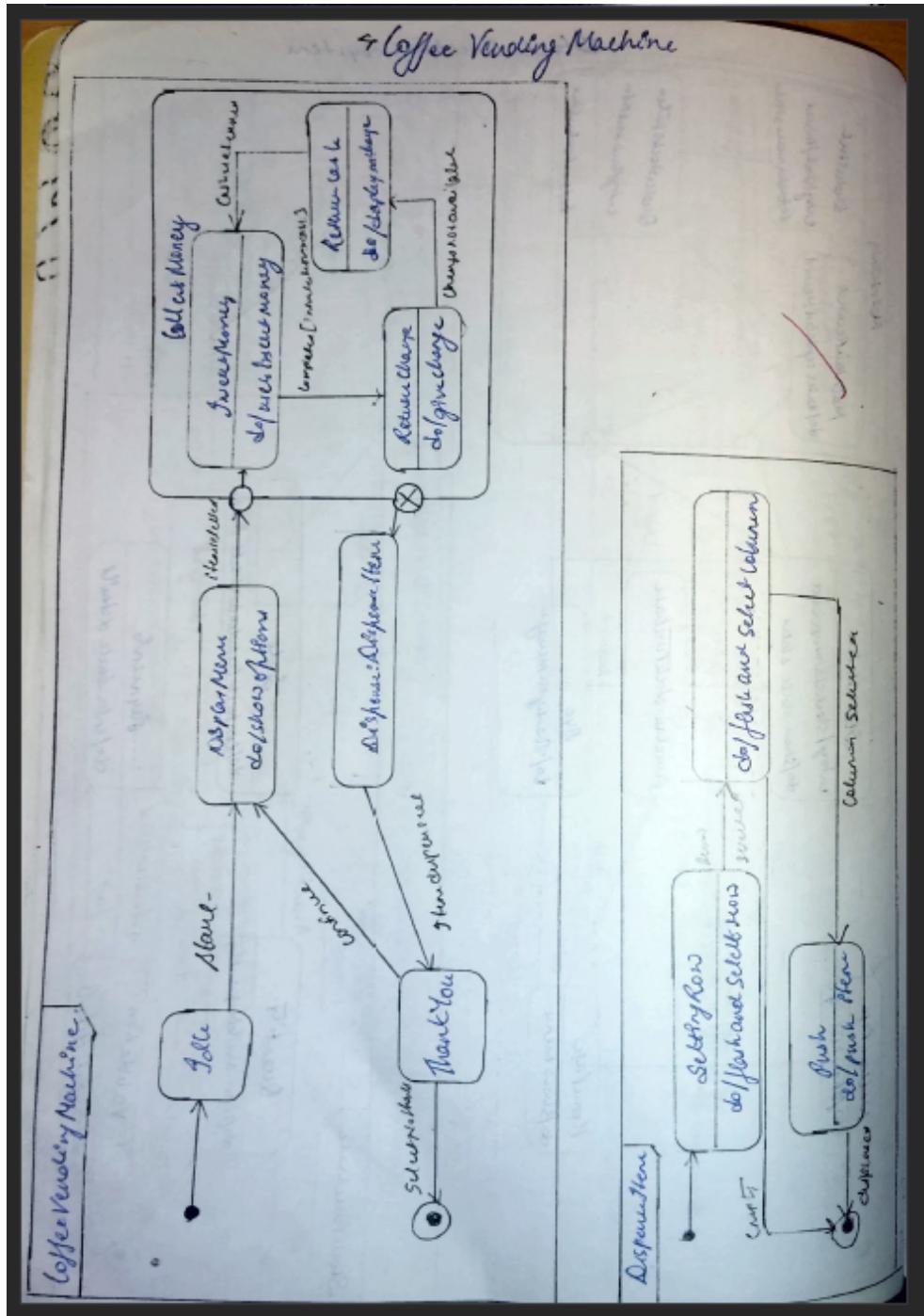




User can select products. Several buttons are there. Cash intake includes cash collector and cash counter. If calculate change is available the product is dispensed.

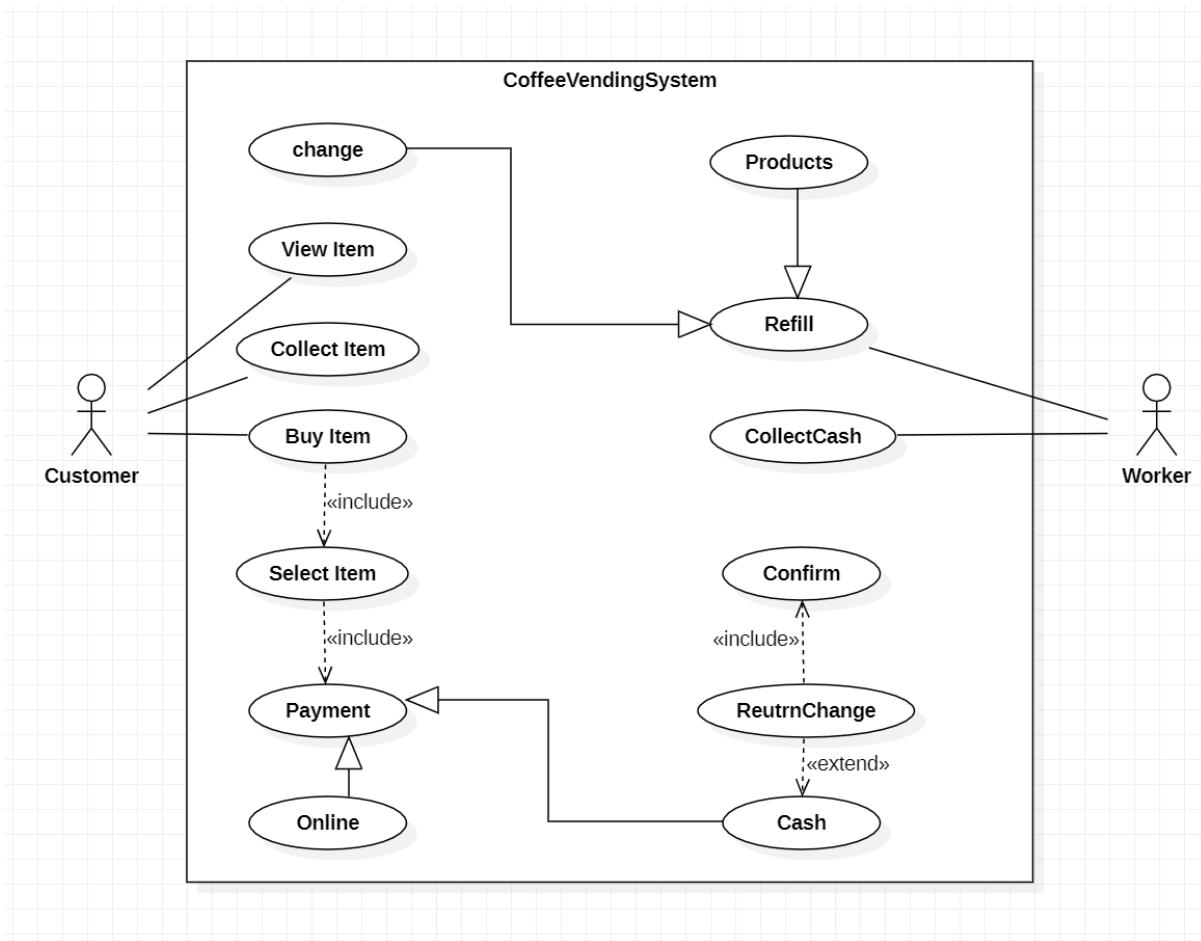
Advance State Diagram :

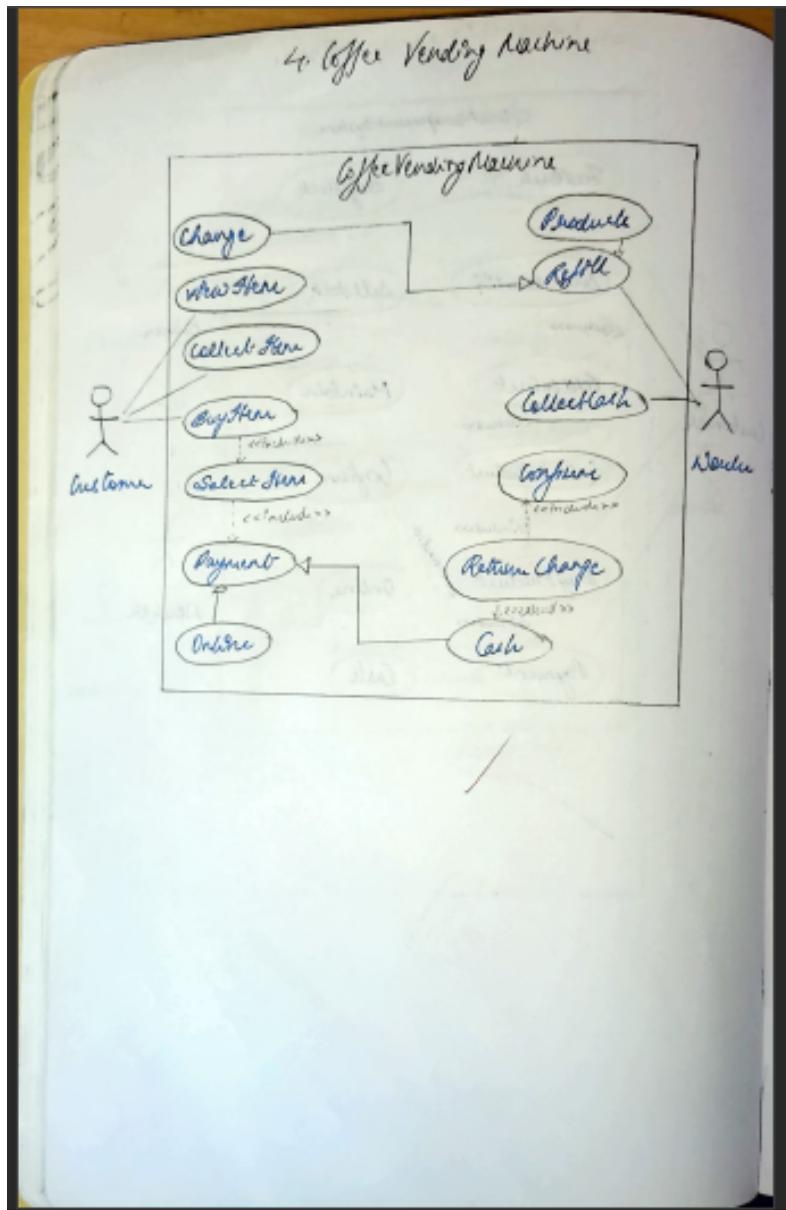




Initially The vending machine is in the waiting state. The machine displays the selected item selected by the user. When the person inserts a coin the machine adds the amount to he cumulative balance,calculate change. A person can select any item. If item is empty or balance is insufficient, the machine waits for another selection. Otherwise the machine dispense the item and returns the appropriate change.

Advance Use Case Diagram :





Actors:

Customer :a person who uses the coffee vending machine Stock clerk : a person who maintains the stock

Worker: a person who maintains the machine

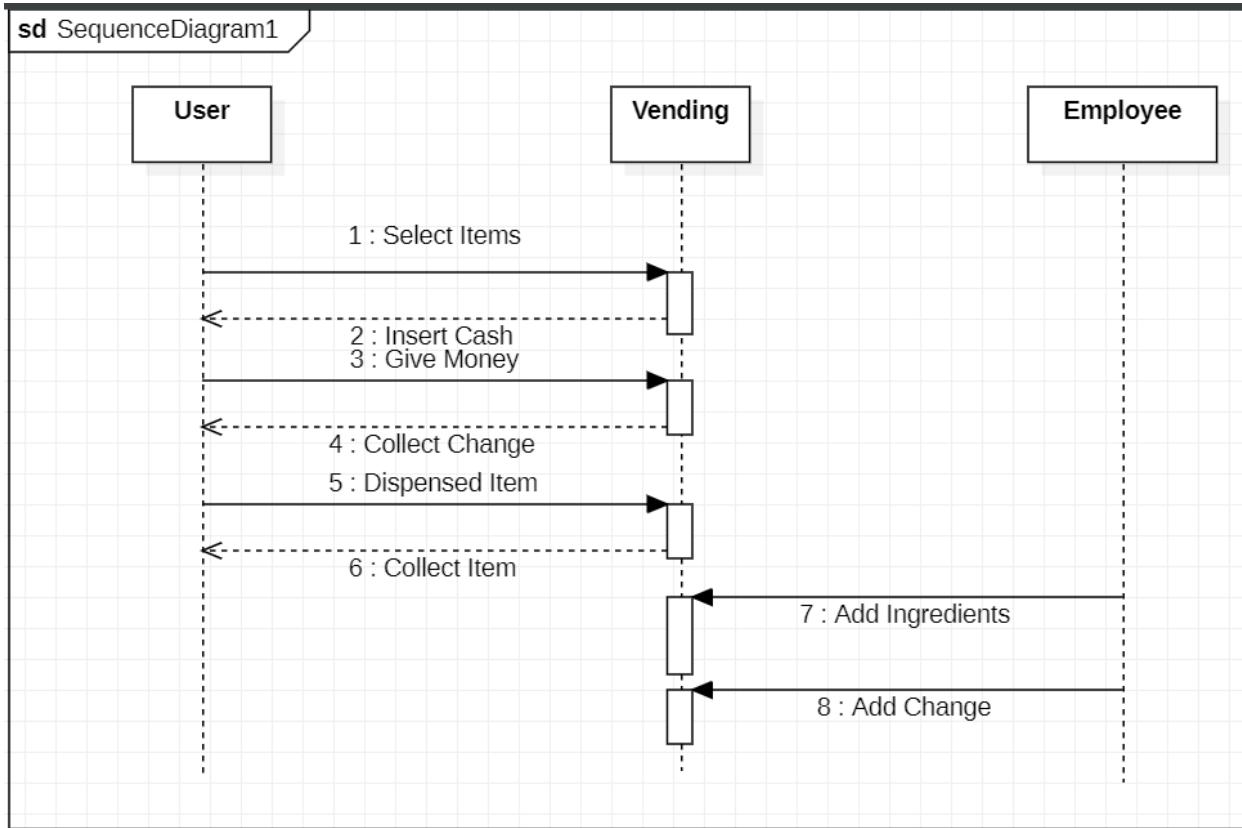
Use Case:

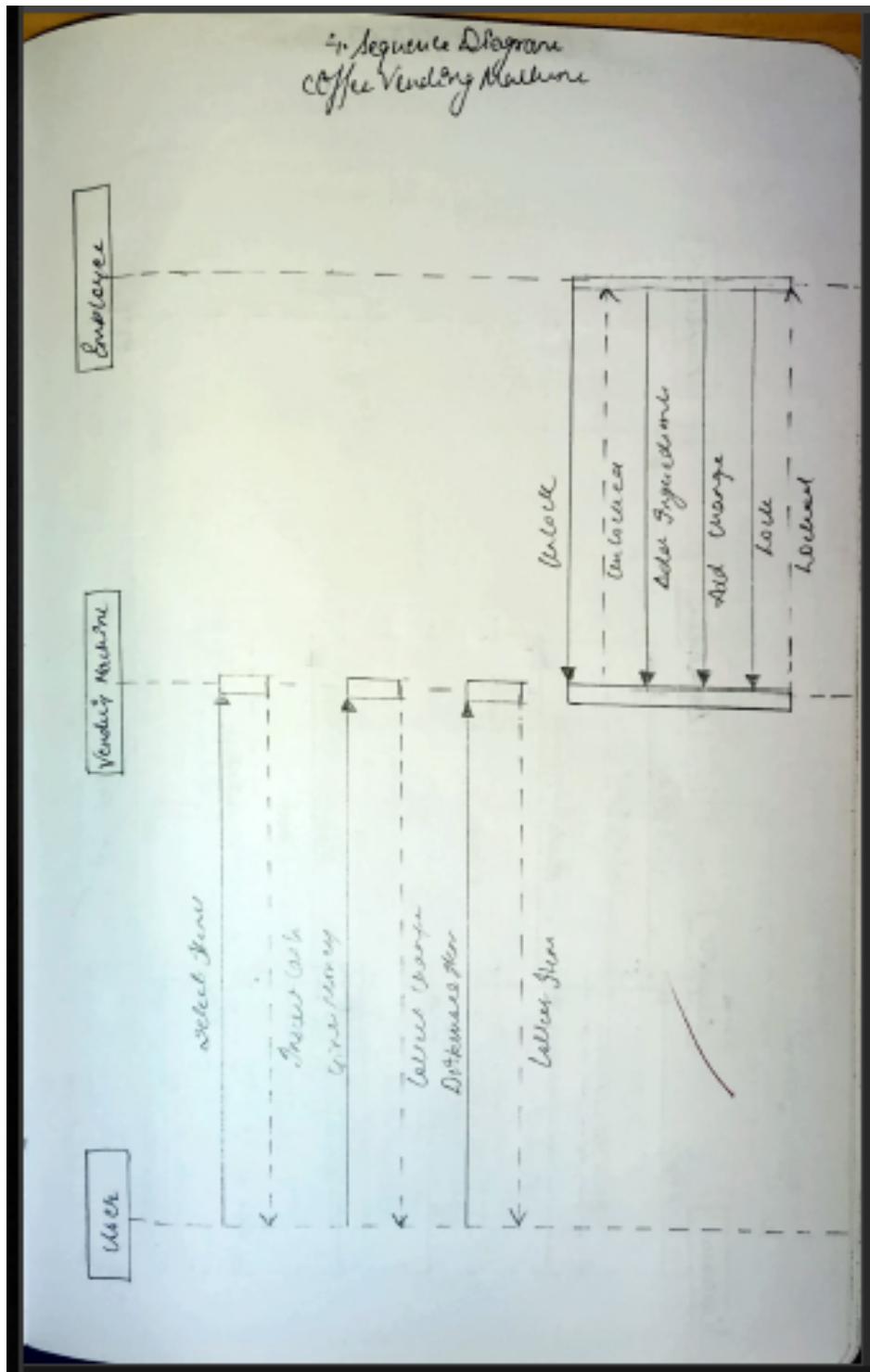
Payment modes:Online and Cash

Collect Cash: User insert cash

Refill: is the use case where the operator fills the machine with ingredients.

Advance Sequence Diagram :

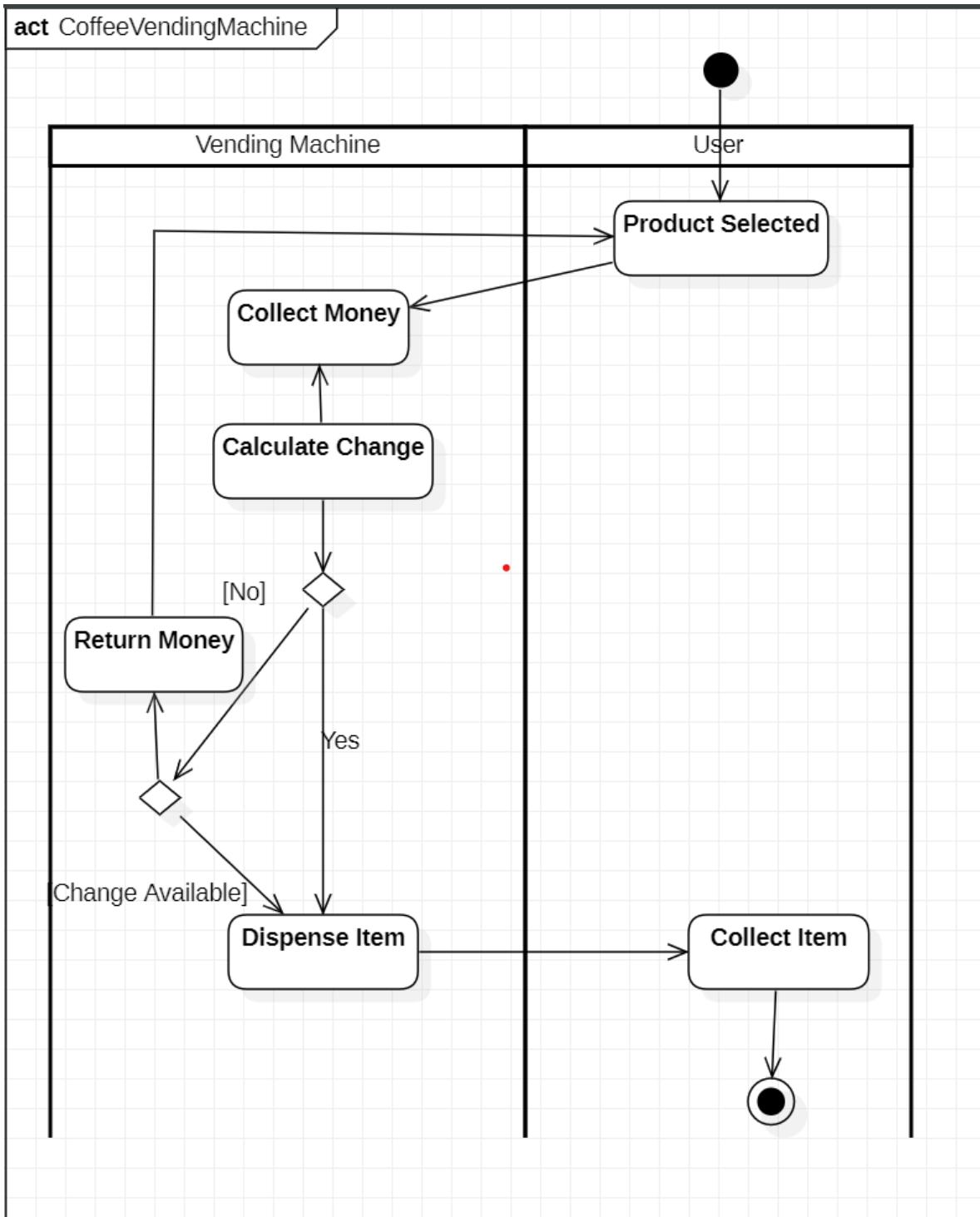


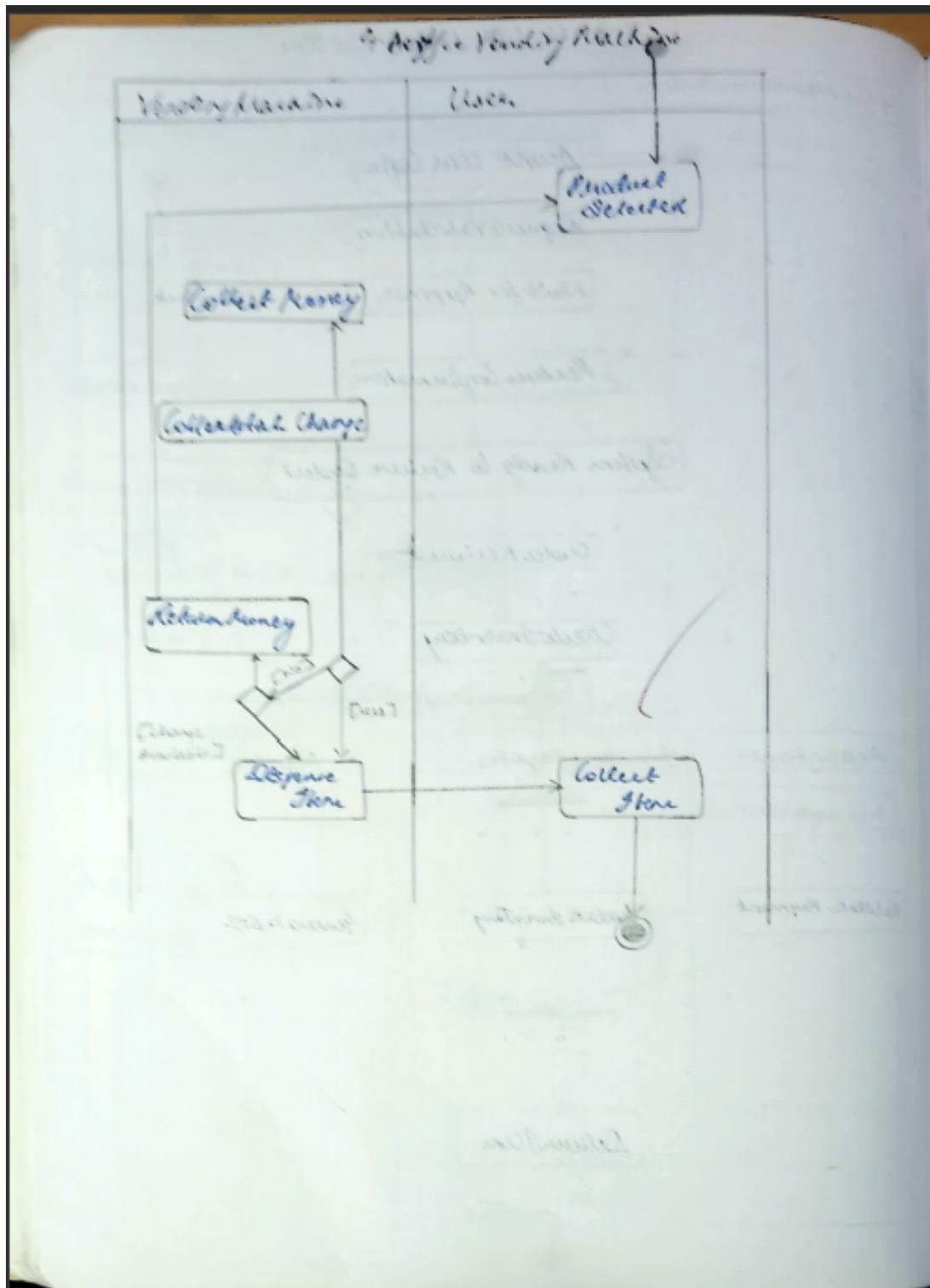


The above sequence diagram gives us the steps involved in dispensing a product from the coffee machine. First an enquiry for the product is made and if available the coins are inserted and calculated ,if correct change is available, the product is dispensed.

Employee enters the key and unlock vending machine and after tefilling it again locks it.

Advance Activity Diagram:





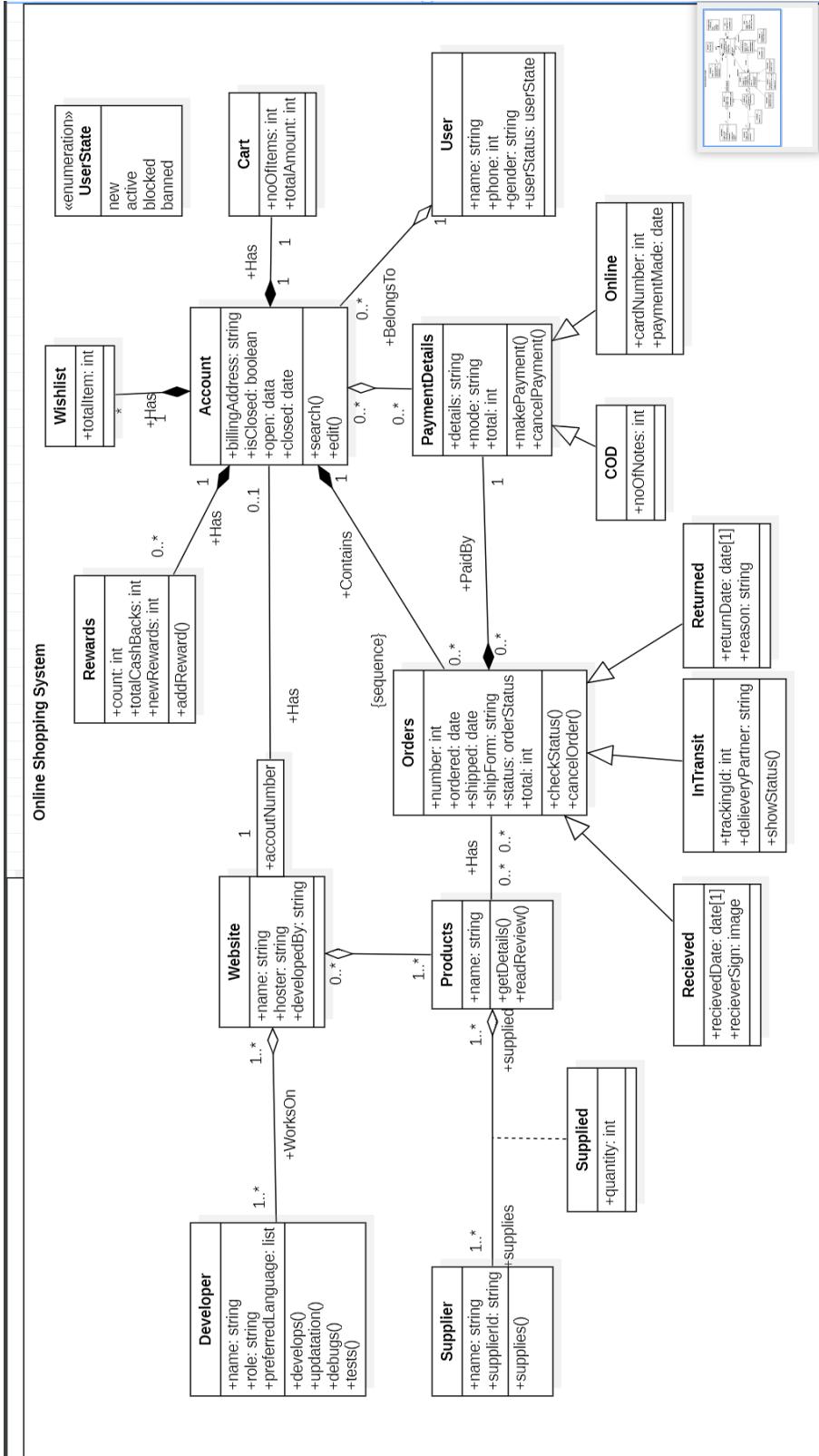
The activity diagram above shows user selects a product and inserts money, calculates changes and returns money. If calculated changes are present, the item is dispensed, and then the item is collected.

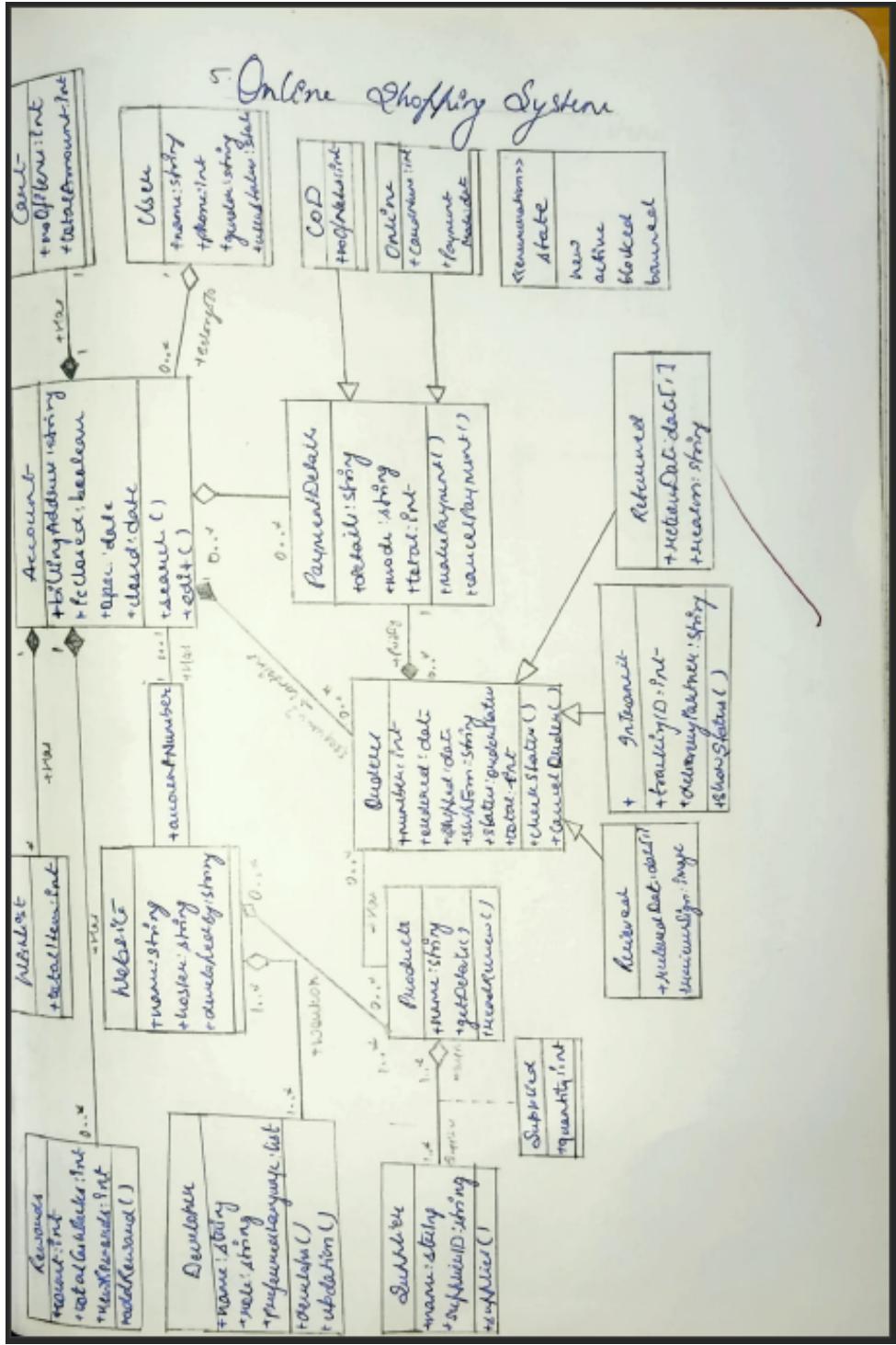
5.ONLINE SHOPPING SYSTEM

Software Requirement Specification

- The customer must have an account in the online website where he/she can purchase products.
- If customer wants to buy the product then he/she must be registered, unregistered user can't go to the shopping cart.
- Customer login to the system by entering valid user id and password for the shopping.
- Changes to cart means the customer after login or registration can make order or cancel order of the product from the shopping cart.
- The products sold for customers are sold for various categories like men,women,kids and home products.
- Customers can view all available products ,compare them and make a choice for purchasing the products.
- For customer there are many type of secure billing will be prepaid as debit or credit card, post paid as after shipping, check or bank draft. The security will provide by the third party like Pay-Pal etc.
- After the payment or surf the product the customer will logged out.

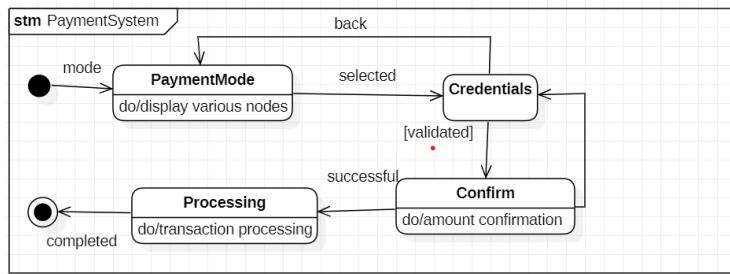
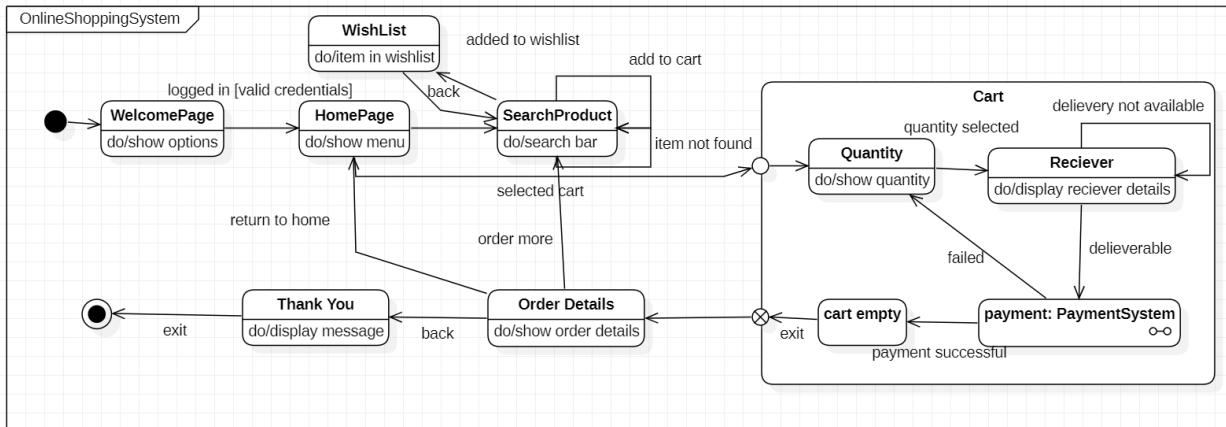
Advance Class Diagram :

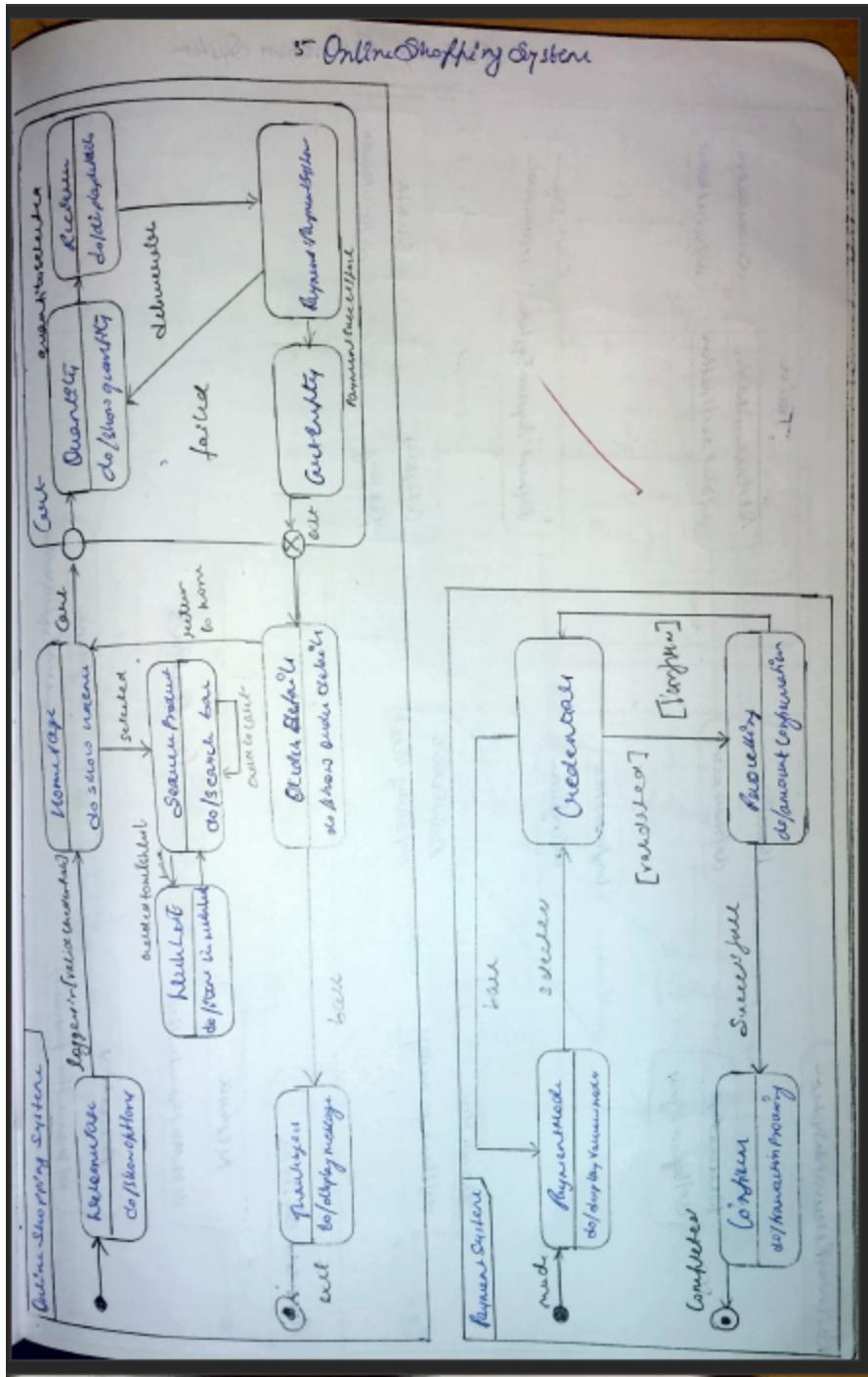




The online shopping system has customers who must have an account in the online website where he/she can purchase products. If customer wants to buy the product then he/she must be registered, unregistered user can't go to the shopping cart. Customer login to the system by entering valid user id and password for the shopping. The products sold for customers are sold for various categories like men, women, kids and home products. After the payment or surf the product the customer will logged out.

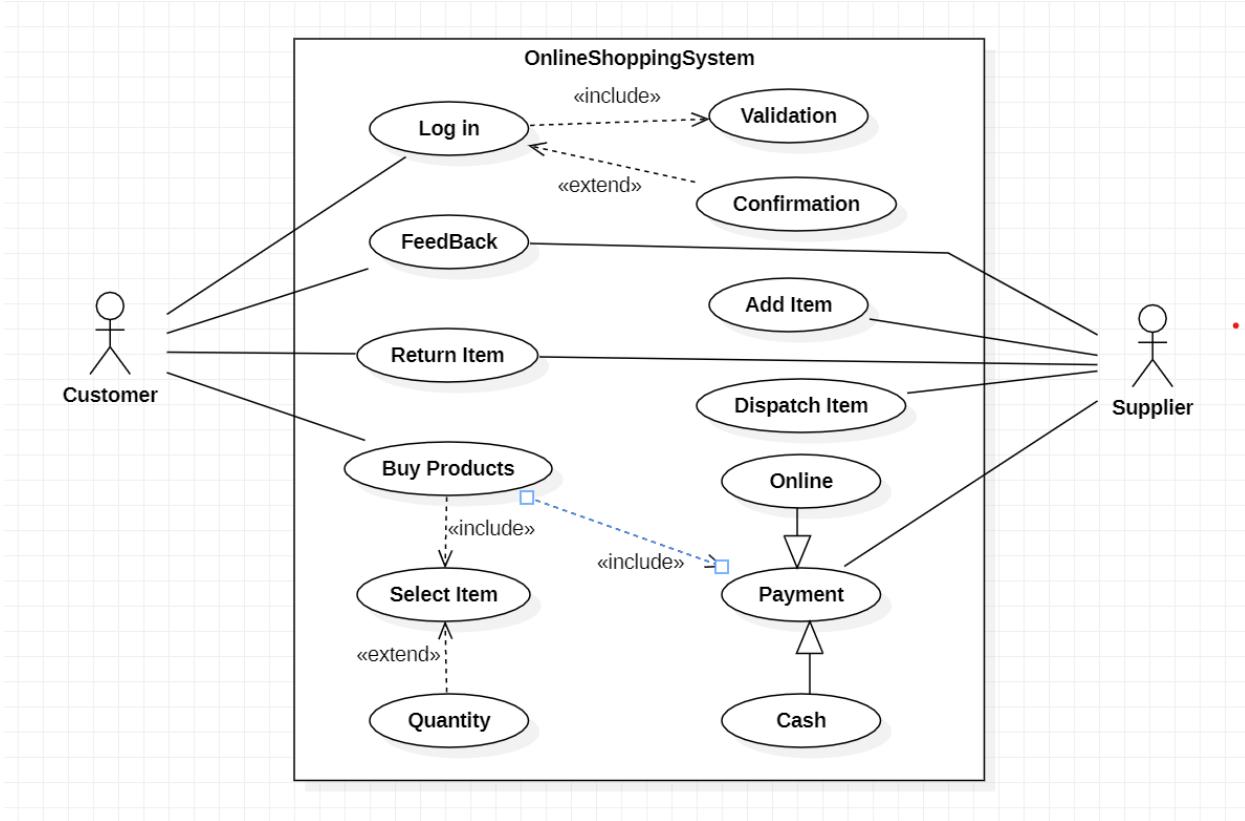
Advance State Diagram :





Customer first log in to website .He/she can't purchase anything without logging in.Then customer can search for products and add them into cart.There they can select quantity of each product.And after successful payment ,user receives a confirmation email and item cart goes empty.

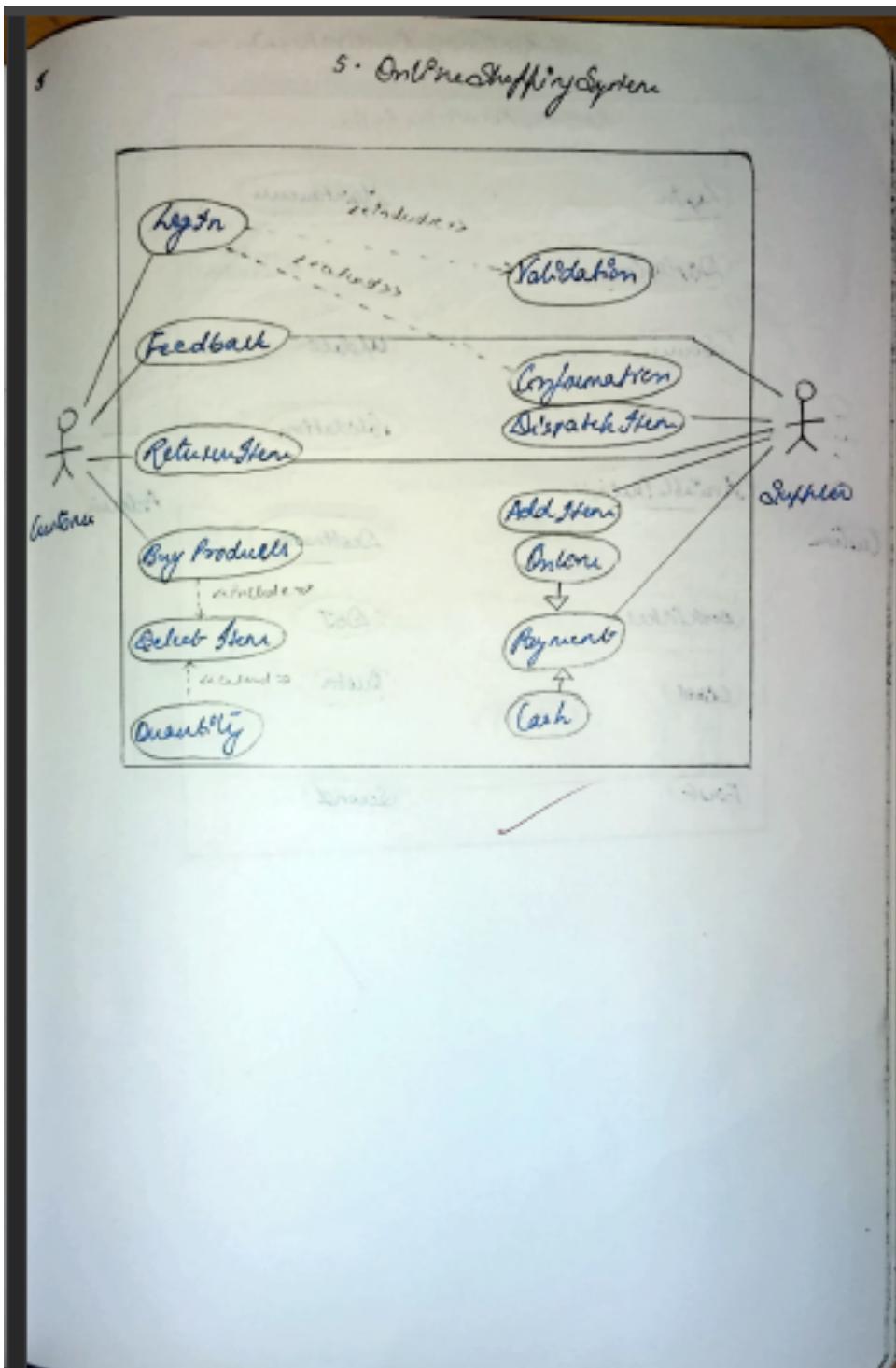
Advance Use Case Diagram :



Actors:

Customer: a person who uses the online shopping system

Supplier : person who supplies products

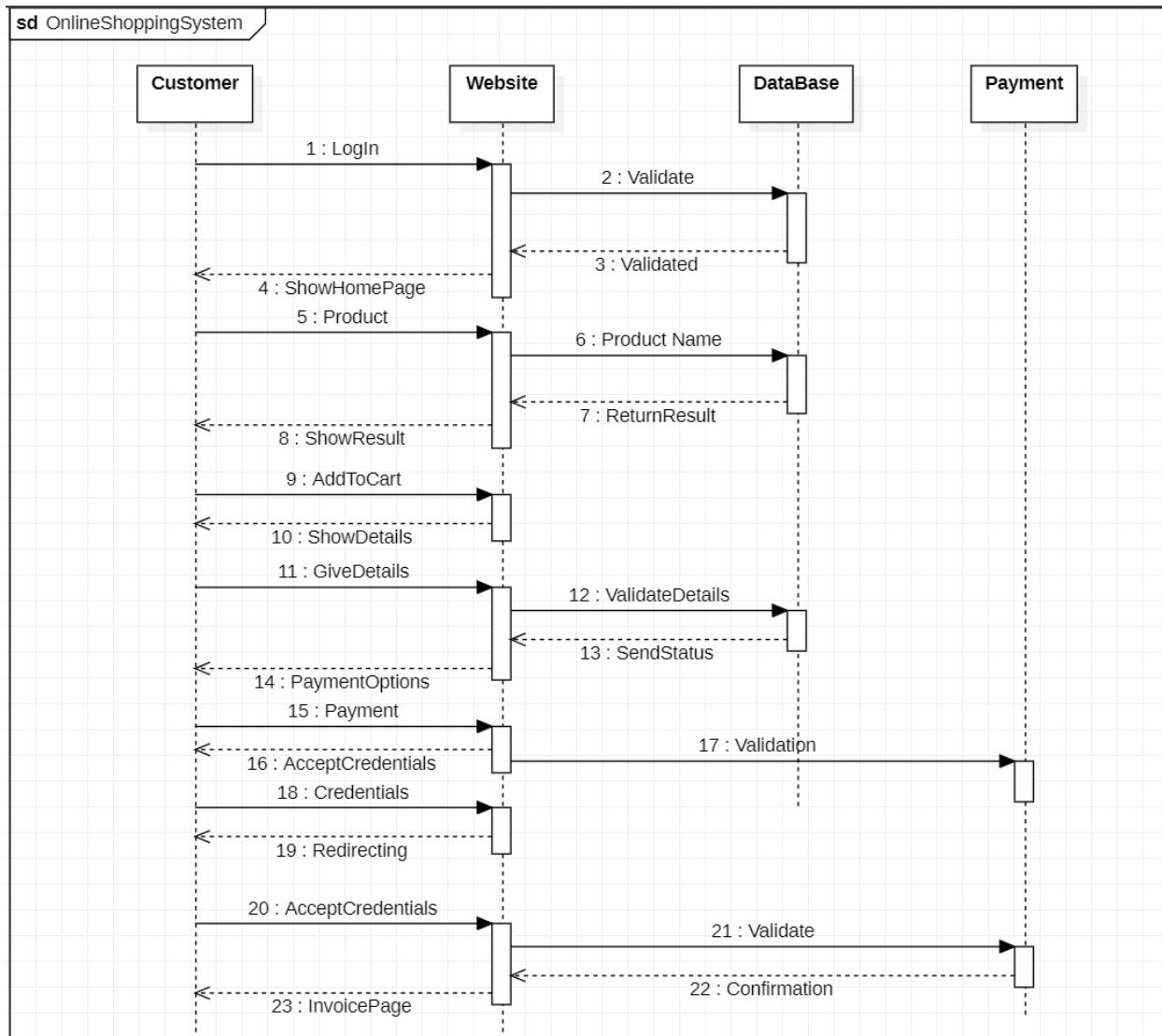


Use Case:

Add item: add item to cart

Buy Product: order the items present in the car.

Advance Sequence Diagram :



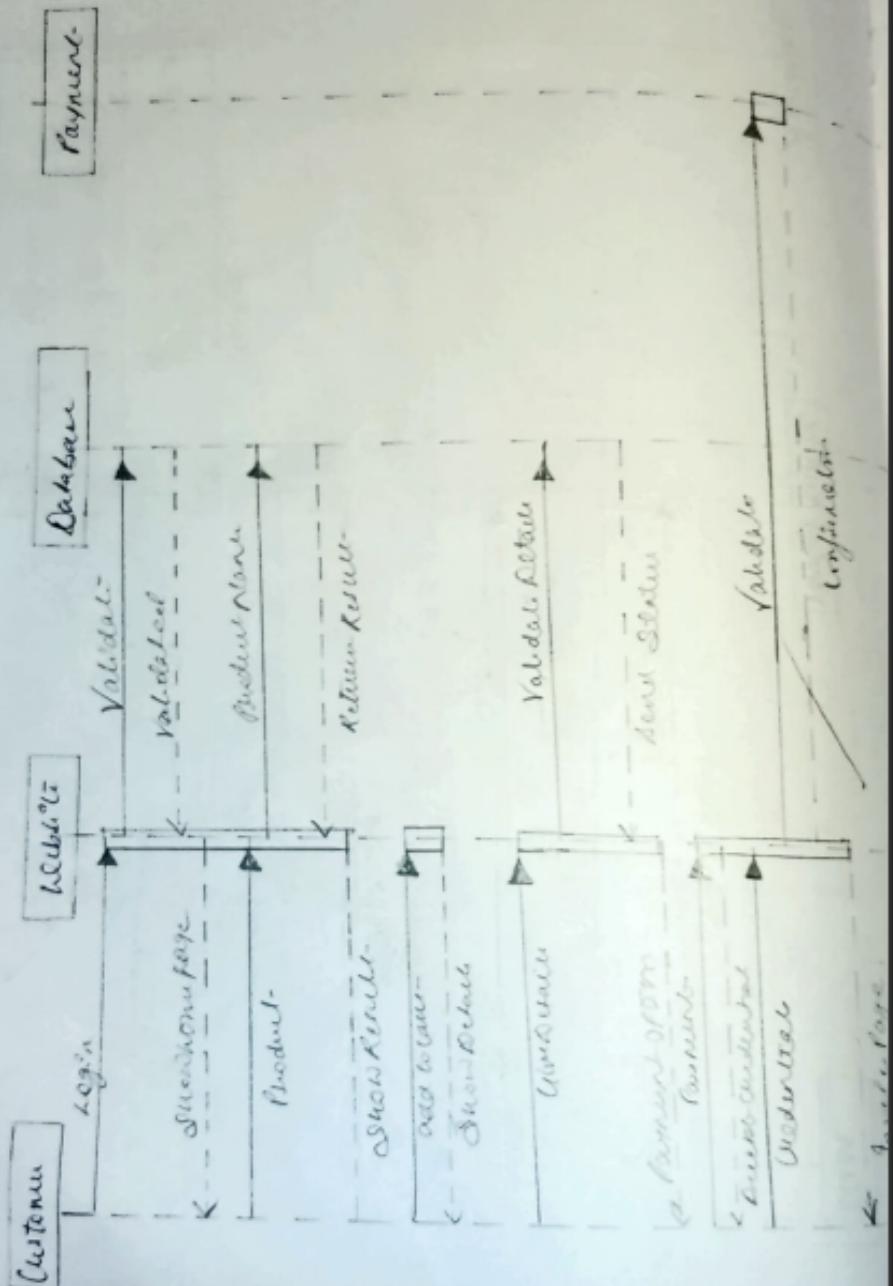
The customer logins into the online interface and searches for some item.

The items are displayed.The customer adds items into cart and reply from interface is sent. The customer places the order and fill details required like delivery address .

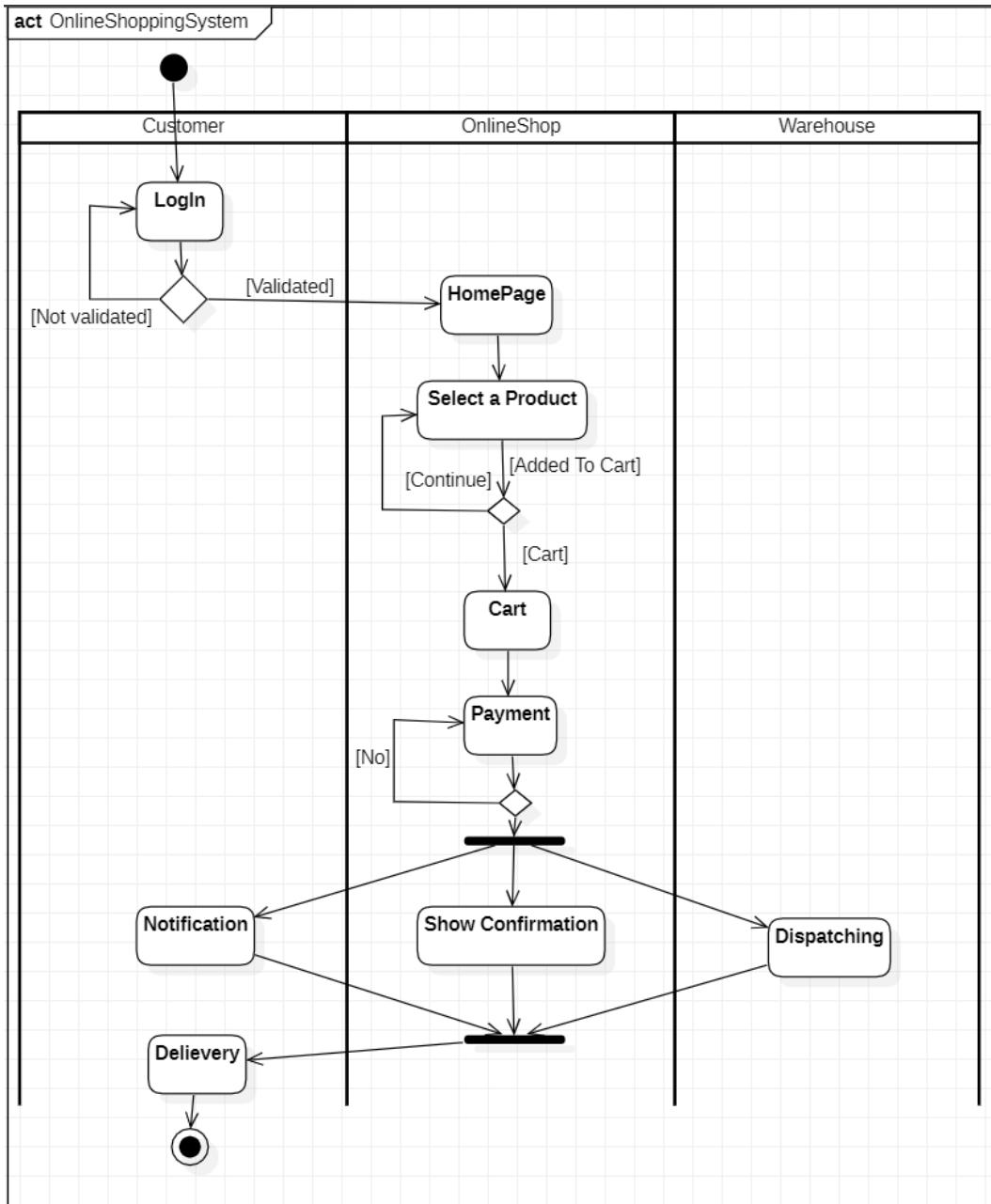
The online interface requests for payment.The customer provides details and confirmation is sent
The customer logs out.

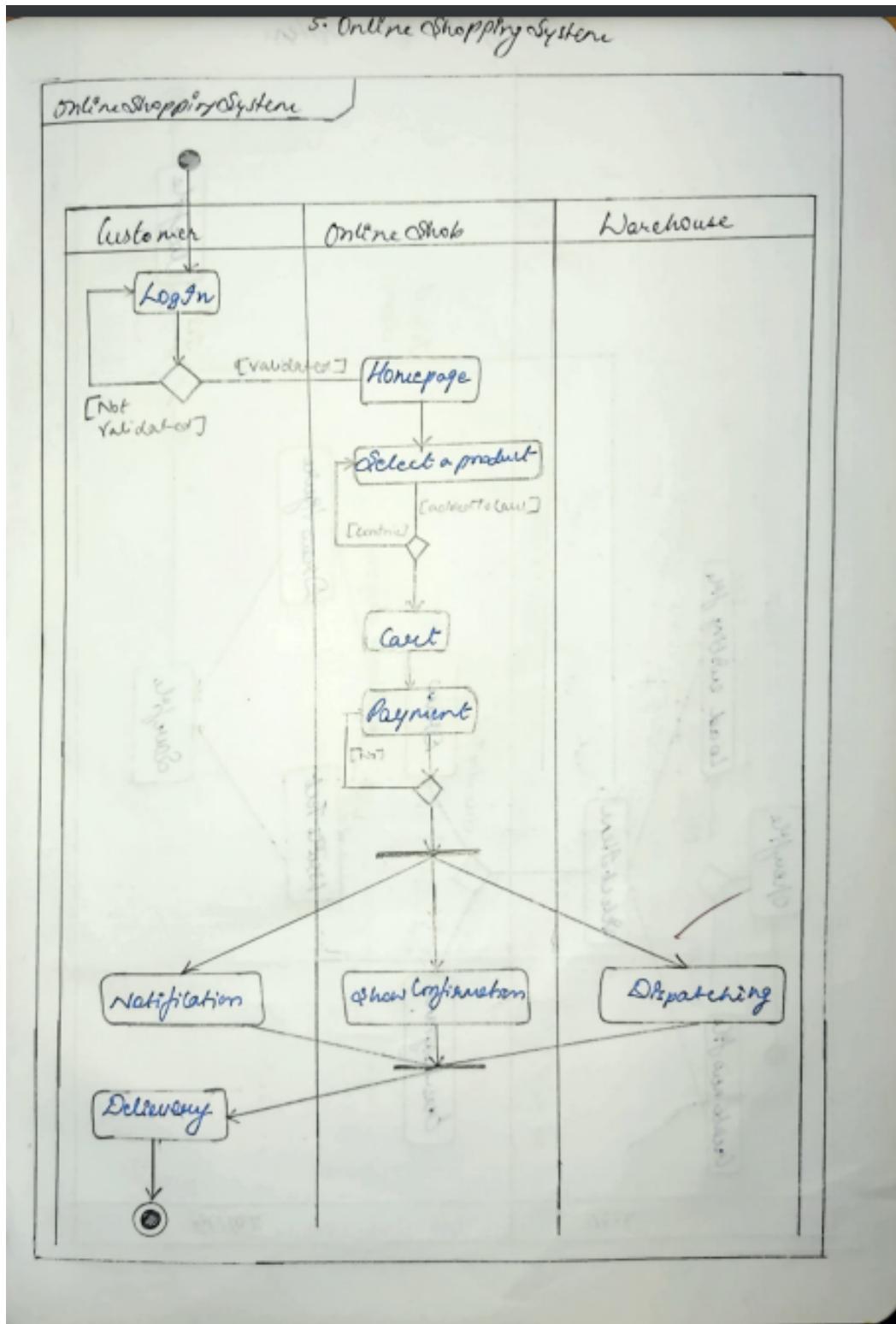
The logout confirmation is sent to the customer.

5. Online Shopping System



Advance Activity Diagram:





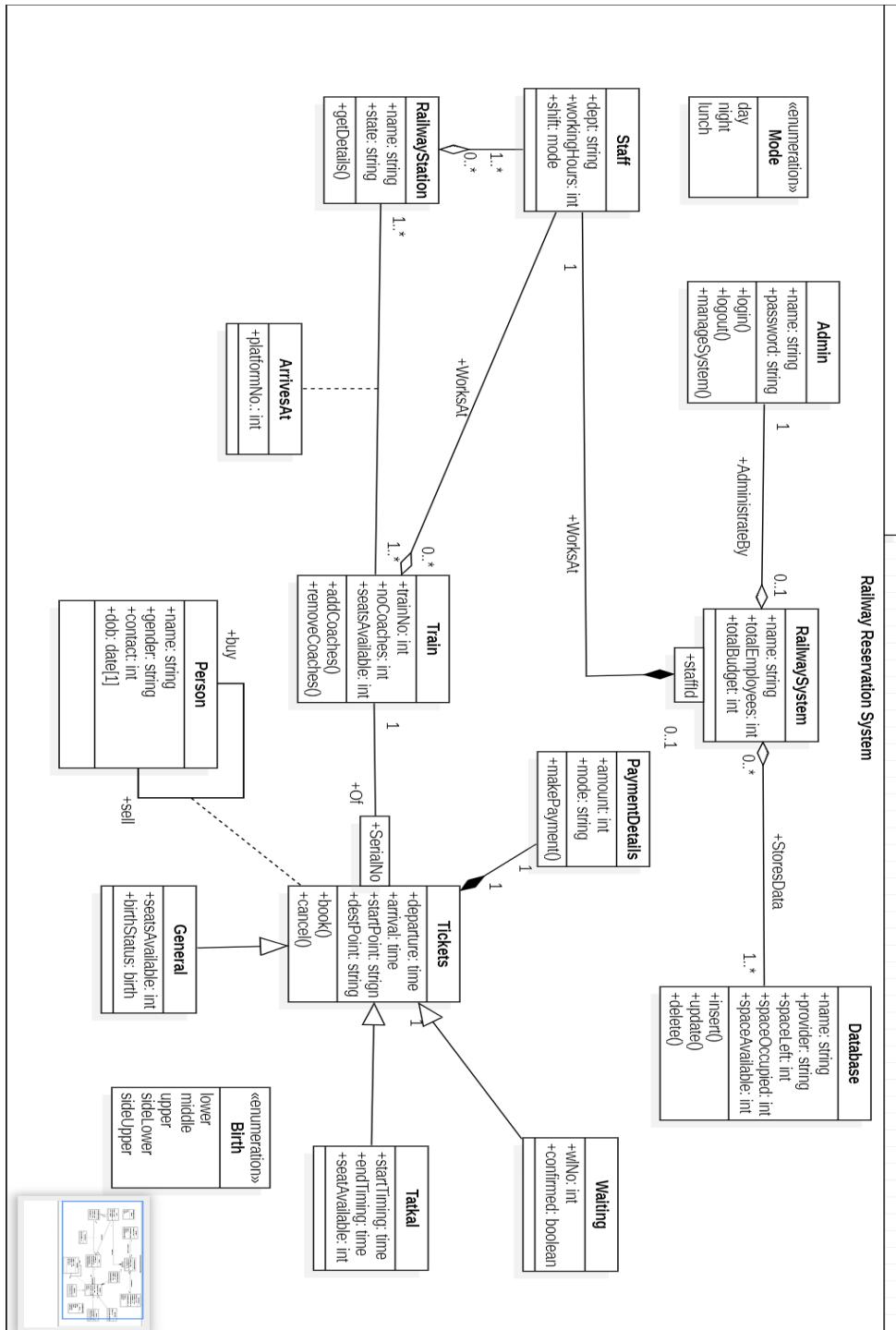
The advanced activity diagram has three swim lanes i.e customer ,warehouse and online shop. The customer can select a product, add to cart and make payment. The online shop can checkout the products,deliver,process payment and send confirmation to customer.

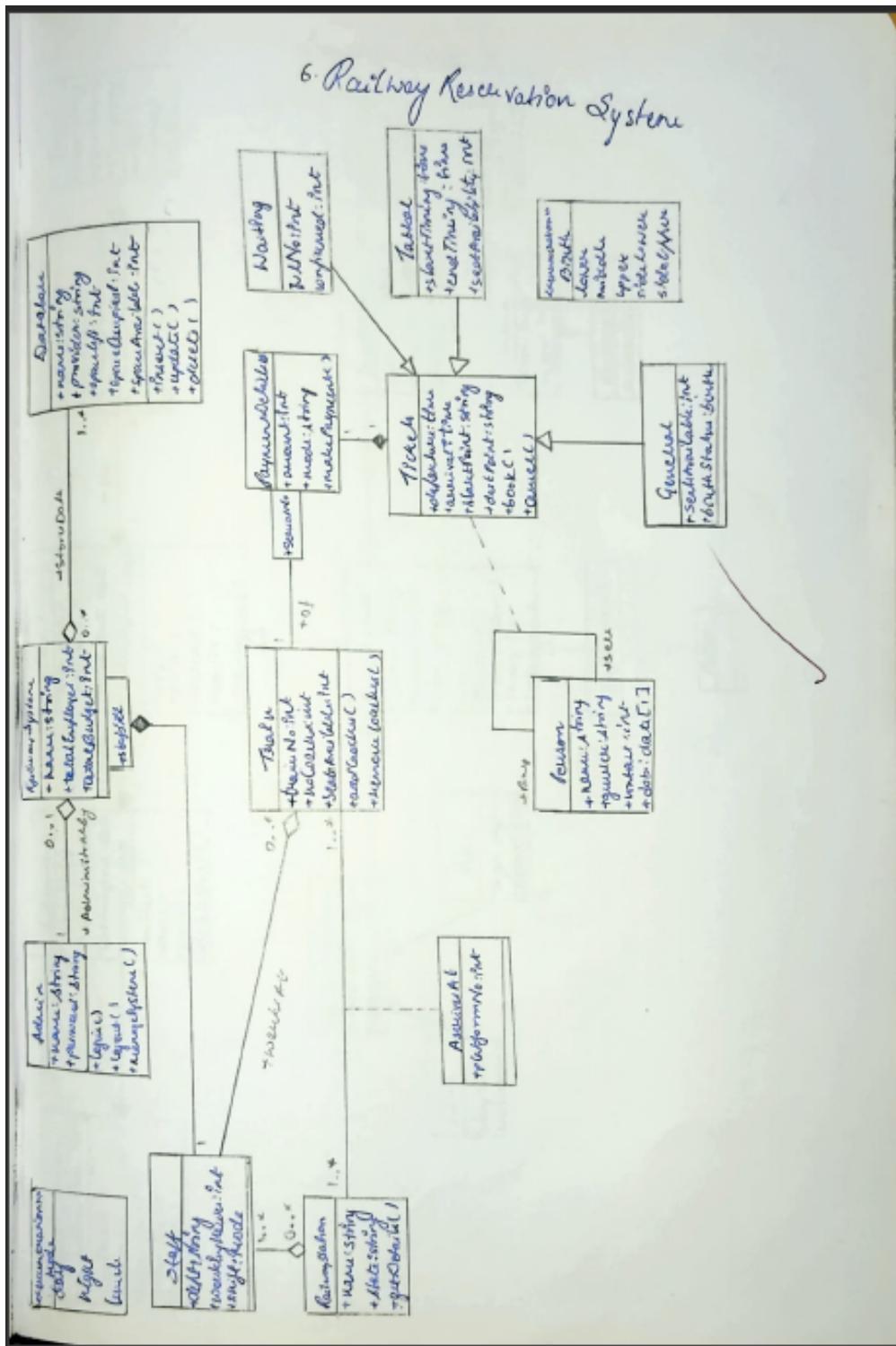
6.RAILWAY RESERVATION SYSTEM

Software Requirement Specification

- Each user should have a user id and a password. Record of the users of the system should be kept in the log file. Provision should be made for full backup of the system.
- The customers can view the trains available at any day, the cost and number of tickets available for any train.
- Customer can book a ticket only if the tickets are available. Customer searches for the availability of tickets then if the tickets are available he books the tickets by initially filling details in a form.
- Tickets can be booked in two ways by i-ticket or by e-ticket booking.
- In case of i-ticket booking customer can book the tickets online and the tickets are couriered to Particular customer at their address. But in case of e-ticket booking and canceling tickets are booked and canceled online sitting at the home and customer himself has to take print of the ticket but in both the cases amount for tickets are deducted from customers account.
- For cancellation of ticket the customer has to go at reservation office than fill cancellation form and ask the clerk to cancel the ticket than the refund is transferred to customer account.
- After booking ticket the customer has to checkout by paying fare amount to clerk.
- The system displays the details of train of which user enter the name. The information is saved and the corresponding updating take place in the database.

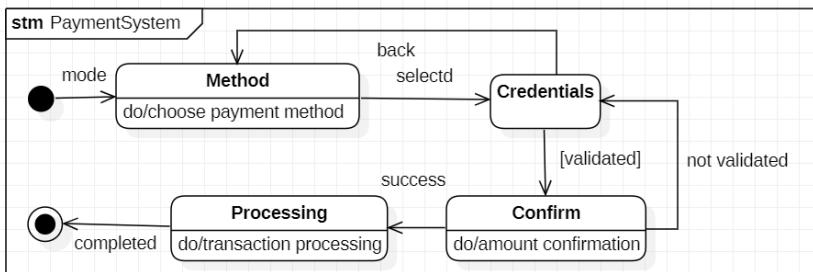
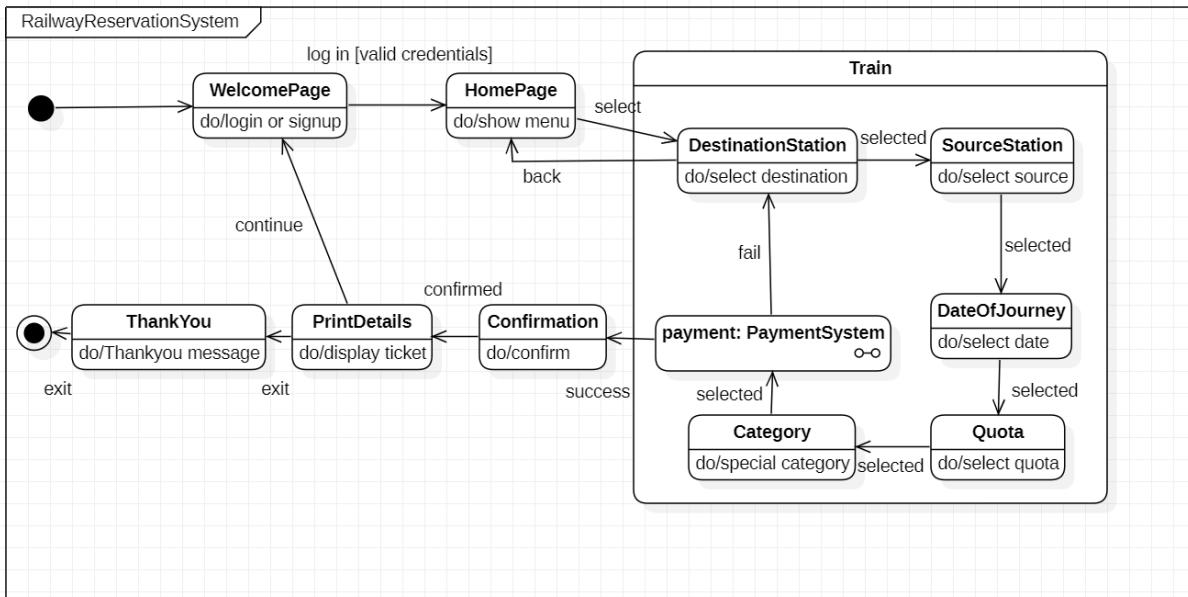
Advance Class Diagram :

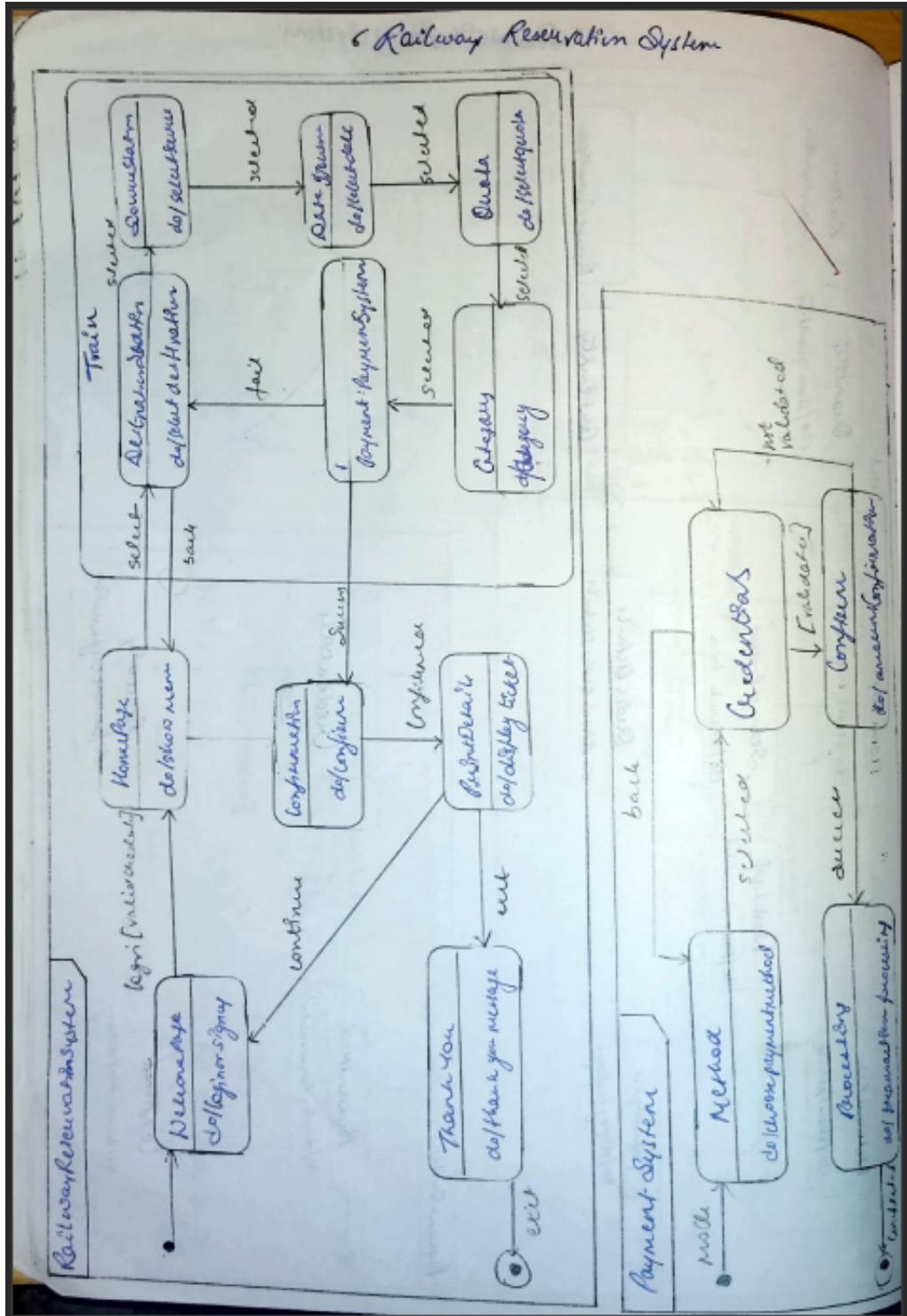




The admin manages the trains and reservation related to railway reservation system. There are three types of reservation, I.e Tatkal, Waiting and General. The passengers with a reservation goes to one or the other reservation. Details of train at different station and train is provided. A passenger pays for the ticket booked. Staff maintains and works at railway station.

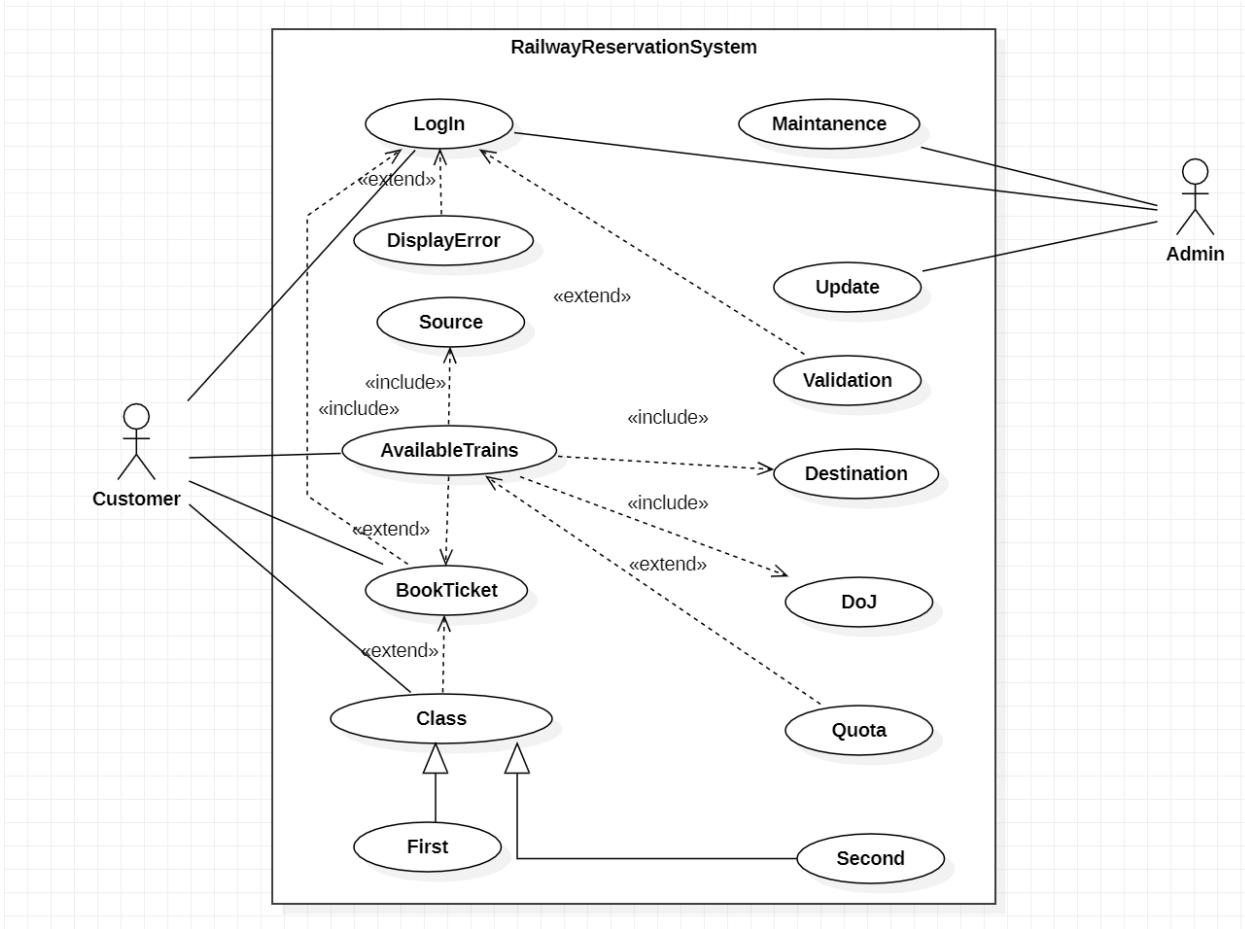
Advance State Diagram :

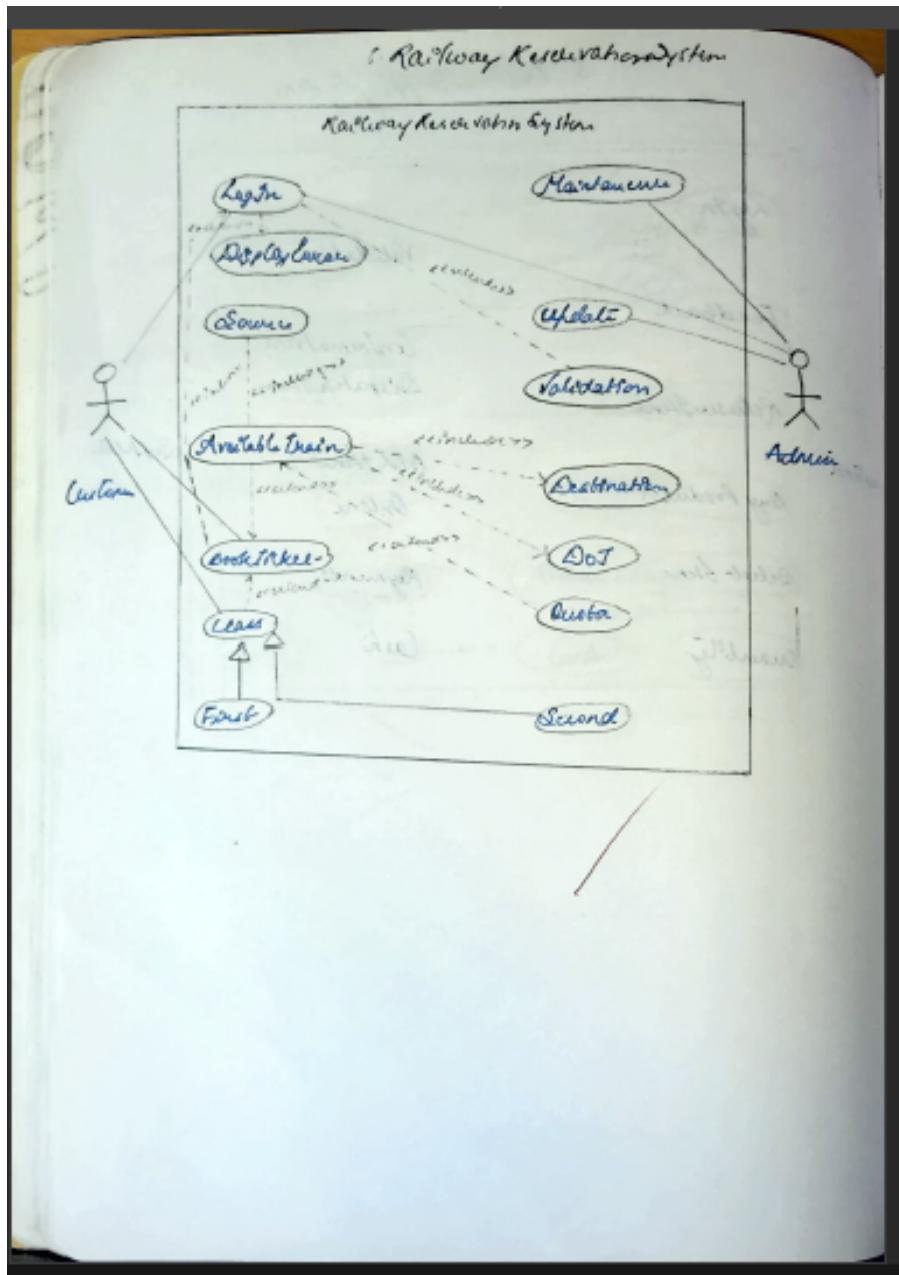




The advanced state diagram has states for booking the ticket. User has to log in and select destination ,source and date of journey and if any quota applied then quota,category.After filling all these details user can make payment.After successful payment he will get confirmation and can print ticket provided.

Advance Use Case Diagram :





Actors:

Customer: uses the railway reservation system.

Admin: manages all information

System: used for train ticket reservation.

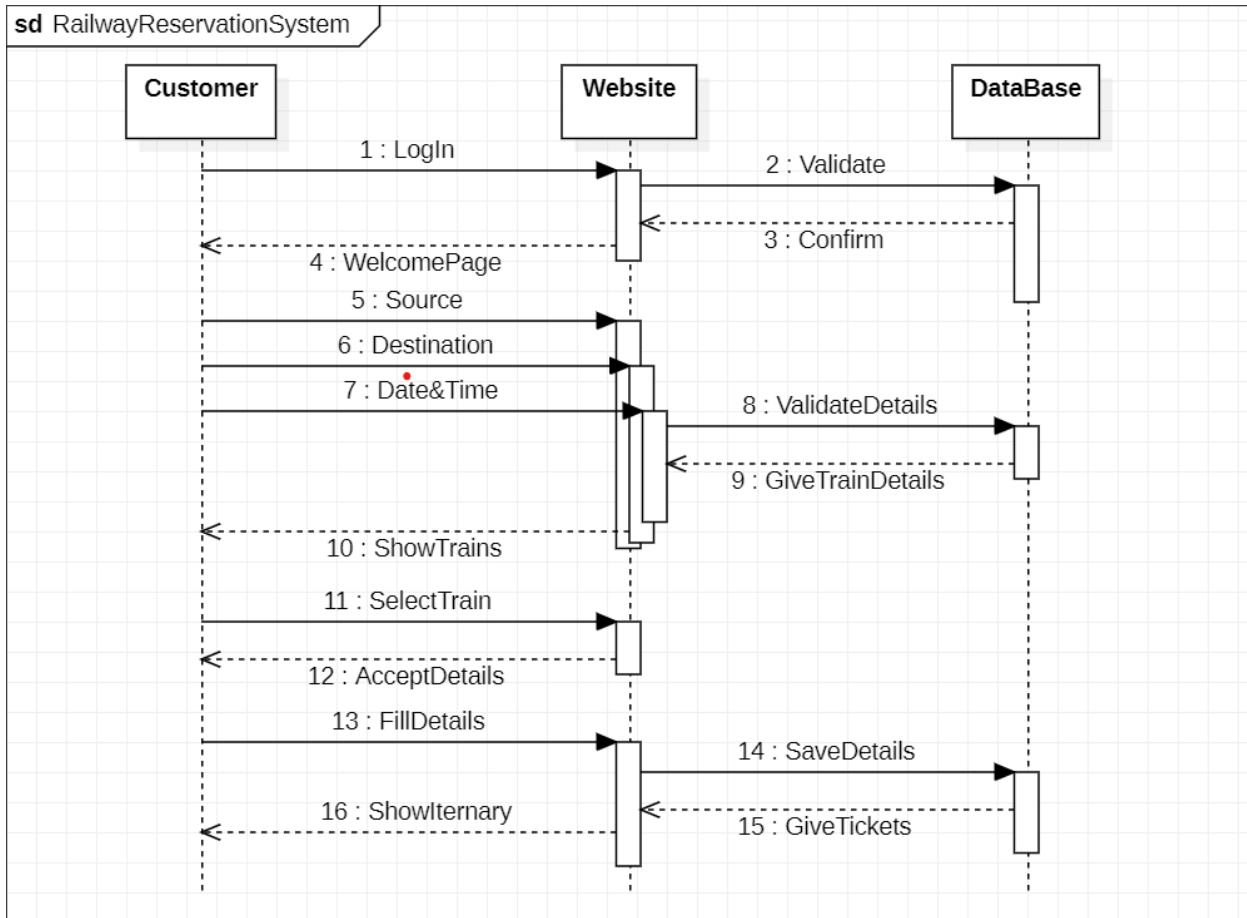
Use Case:

LogIn: The first time user has to log in into railway system.

Book Ticket: User can select the type of coach and no of seats and book the ticket.

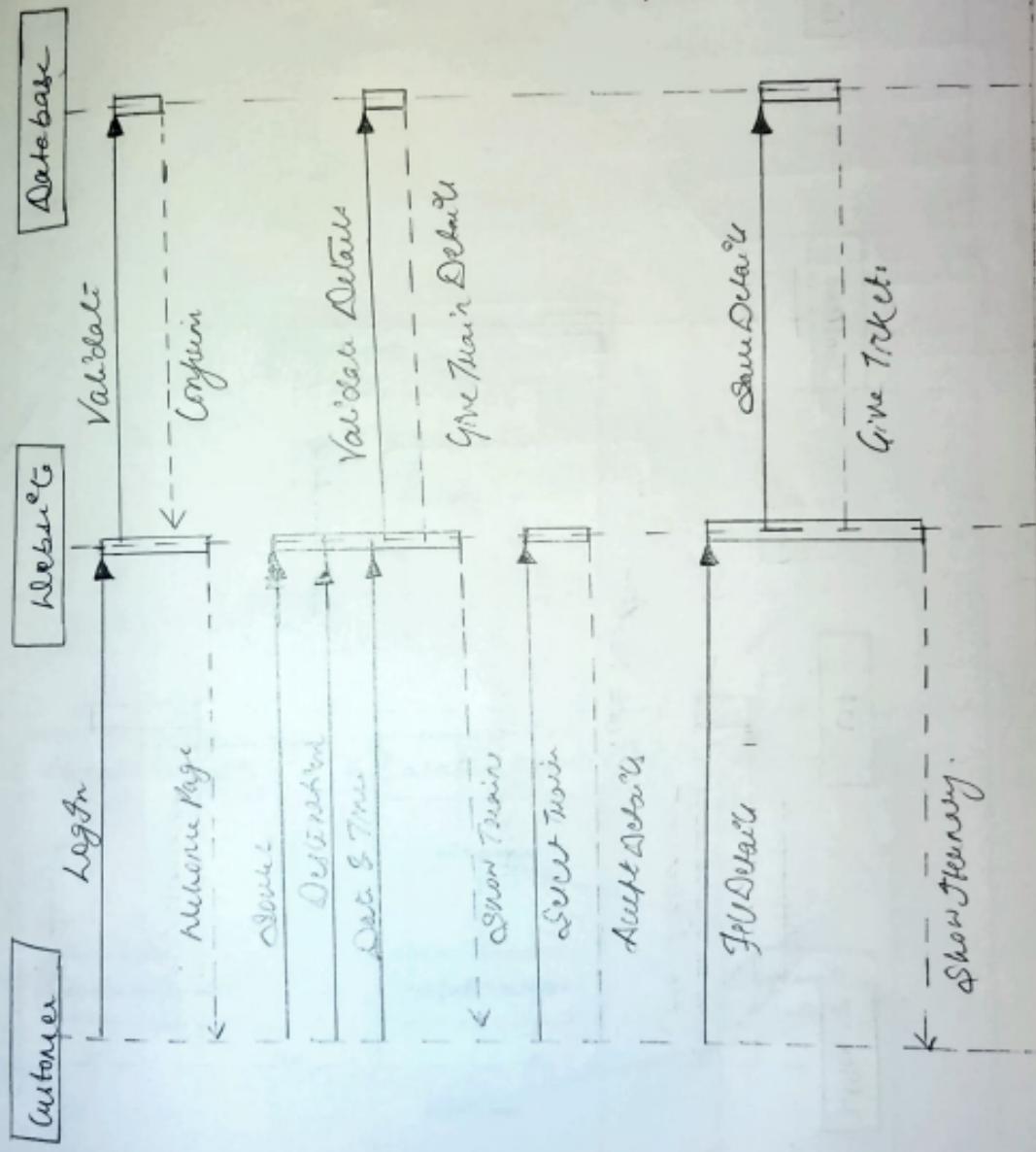
Available Train: System provides list of train available train between source and destination.

Advance Sequence Diagram :

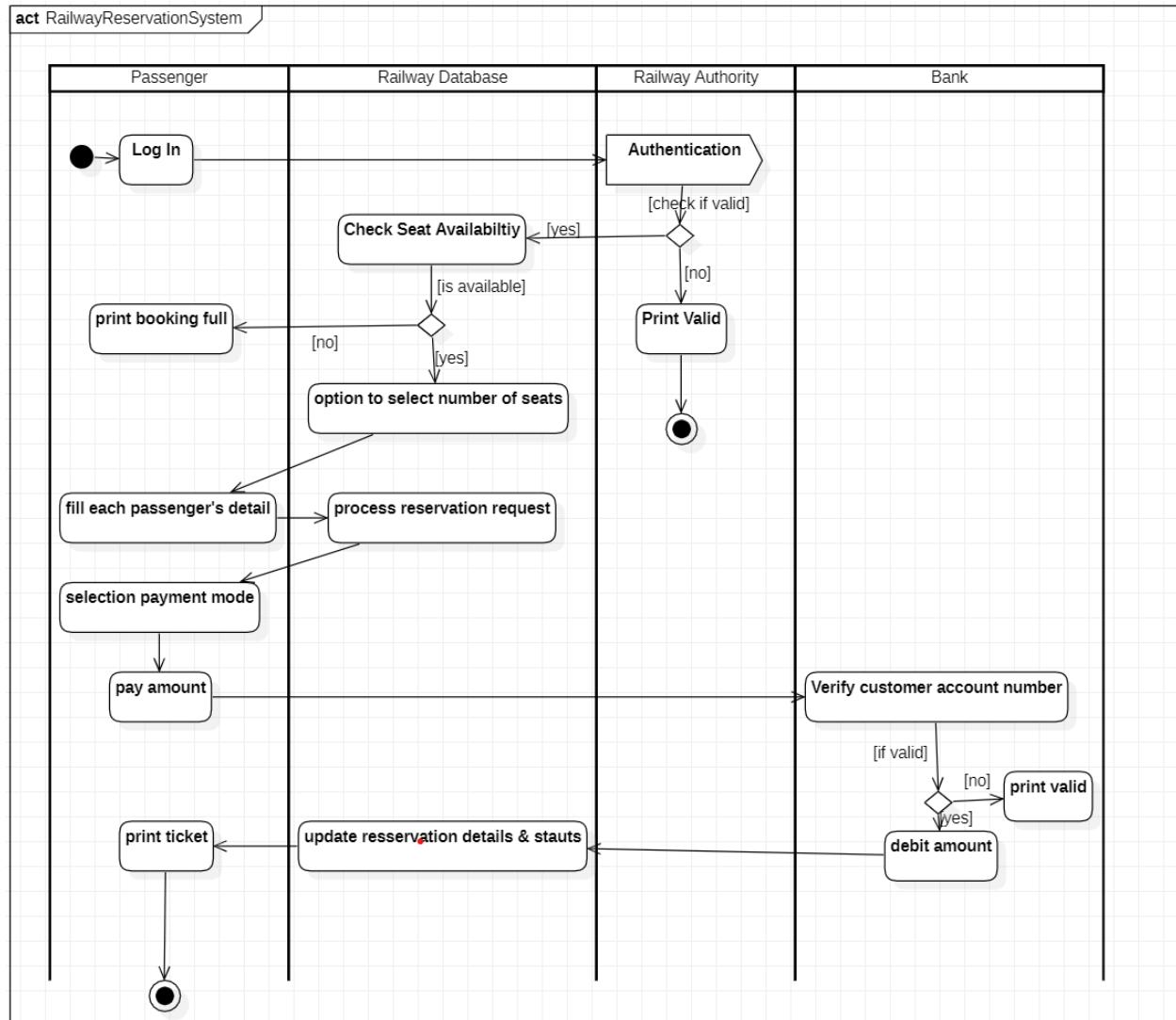


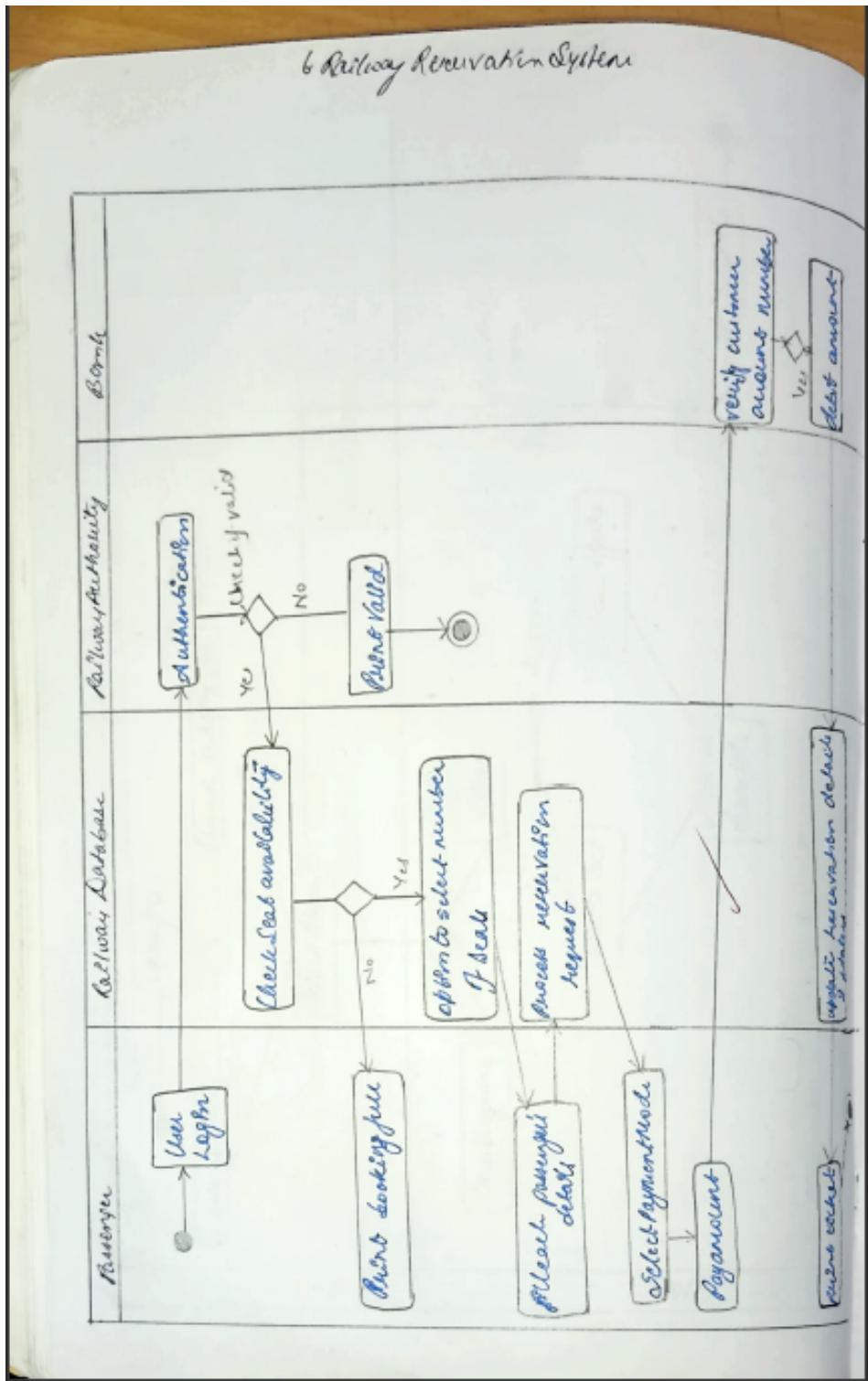
User logs into the railway reservation system. Admin verifies the login details. User enters source, destination and date of journey and other information if applicable. User can check for availability of trains. System displays the train details. User selects the train. User books tickets. System displays payment details. User makes the payment. System issues the e-ticket.

6. Railway Reservation System



Advance Activity Diagram:





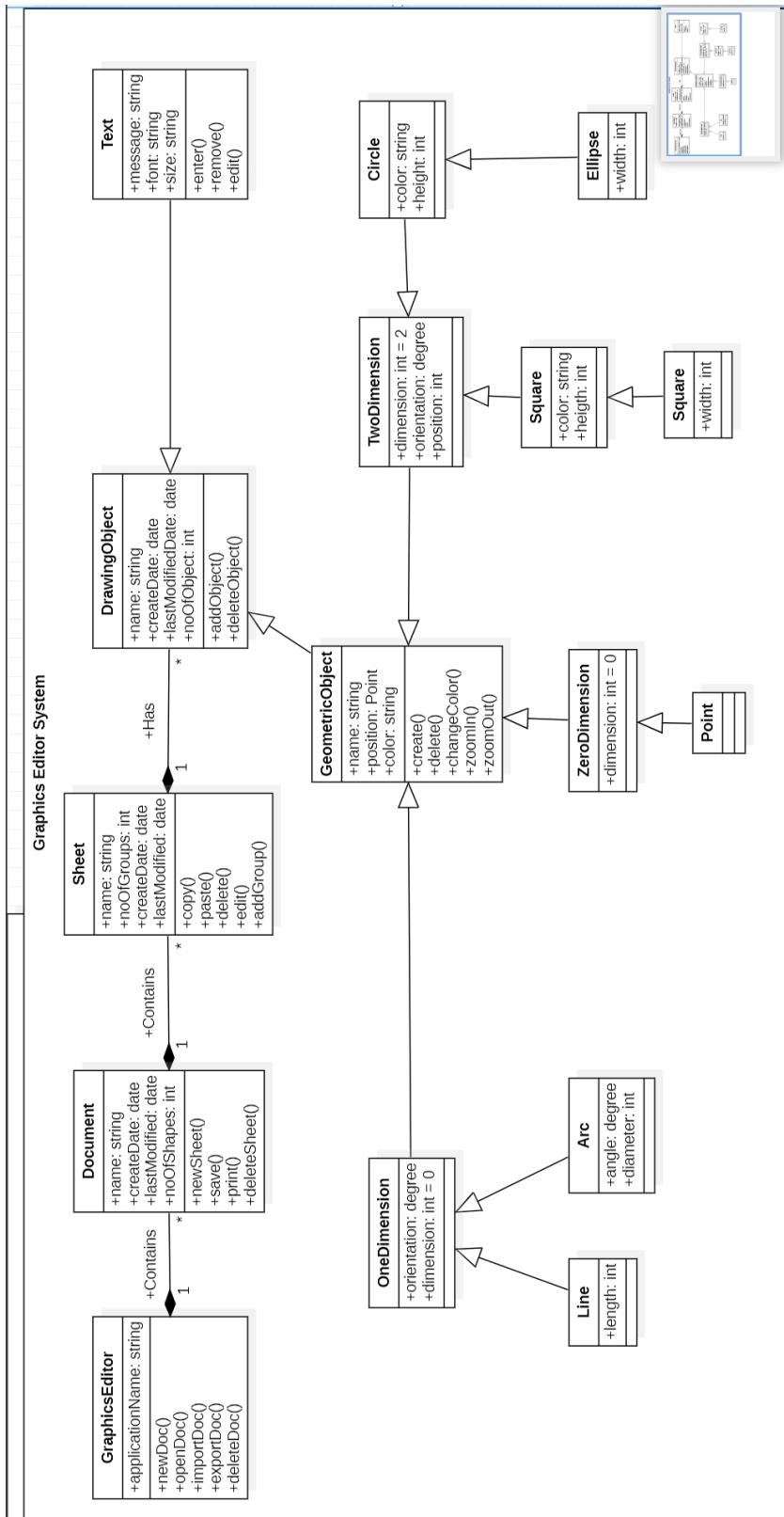
The activity diagram tells about the steps happening while booking a ticket. The user first needs to log in and select his source and destination and check seat availability and if available ,selects seats and make payment and receives the ticket.

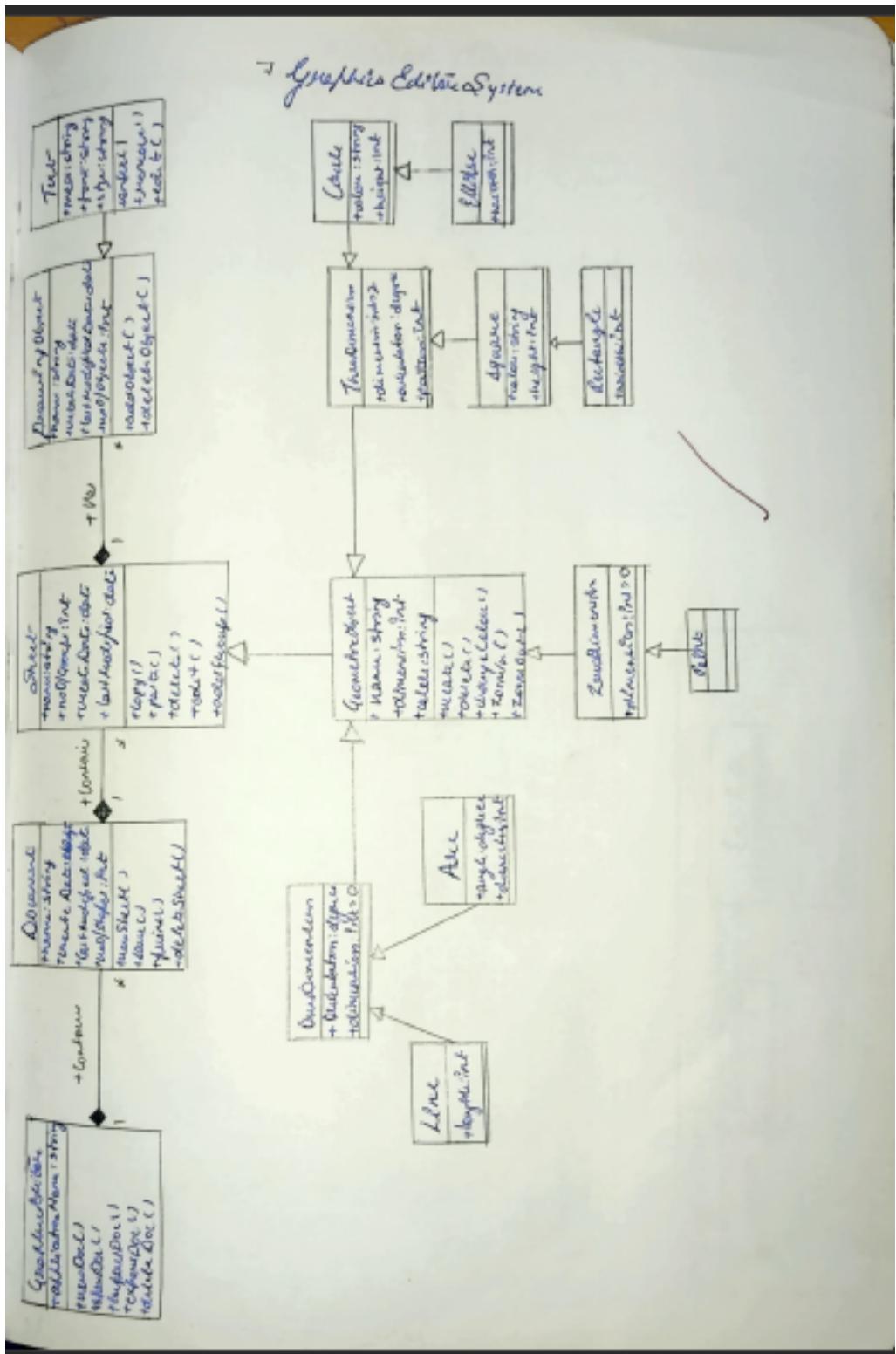
7.GRAPHICS EDITOR

Software Requirement Specification

- The graphical editor consists of a graphical document editor which can be used to create new document, delete document, update or view the document.
- The graphical document editor consists of many documents, where each document can be saved, opened, printed or create a new one.
- A document is made up of many sheets which can have graphics included in them.
- Sheets have multiple number of drawing objects, which can be created, grouped or formatted.
- The programmer must provide implementations of functions that draw objects and their connections, as well as functions that add and remove connections. The latter function will be handled by a specific event listener. Any changes made in real-time to the underlying model will also be updated in the diagram through a separate event listener.
- The user can also add and remove connections between these objects as needed using the palette supplied, thus modifying the underlying model.
- Each sheet contains drawing objects, including text, geometrical objects and groups. A group is simply a set of drawing objects.
- A geometrical object includes circle, ellipse, rectangles, lines and squares, trapeziums which are identified by their respective constraints.

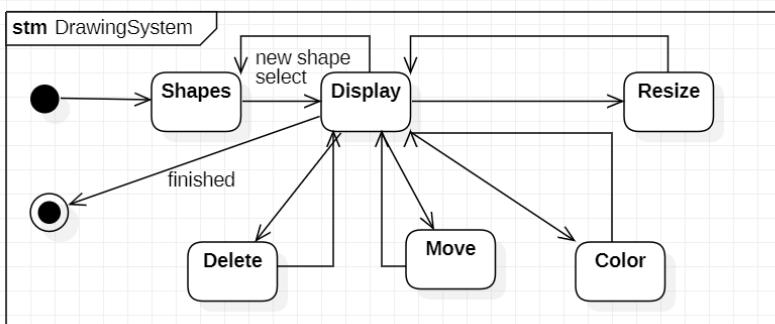
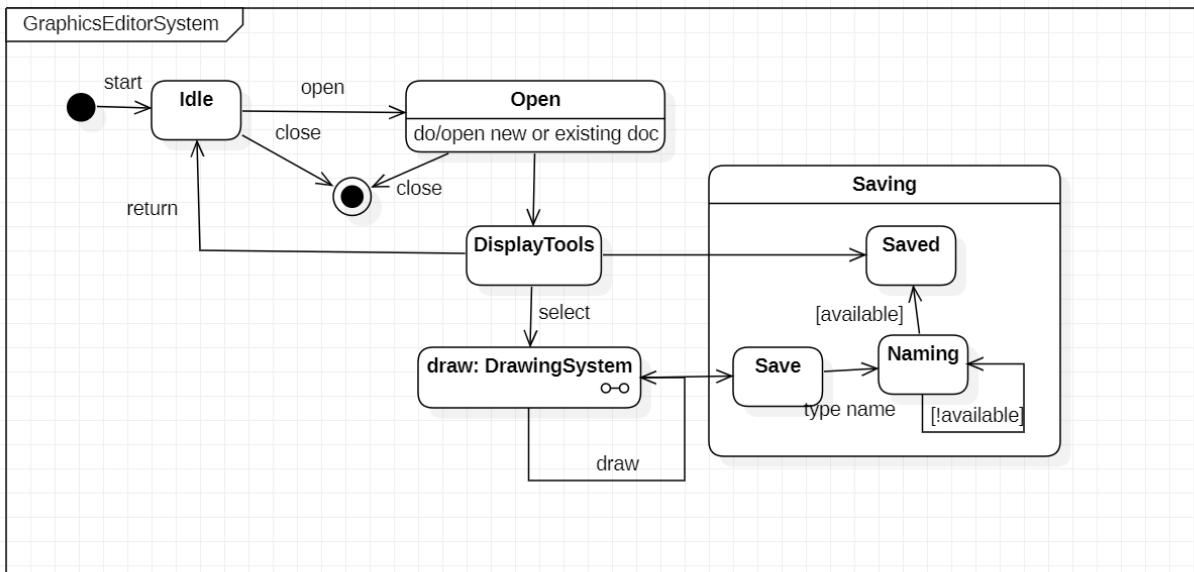
Advance Class Diagram :

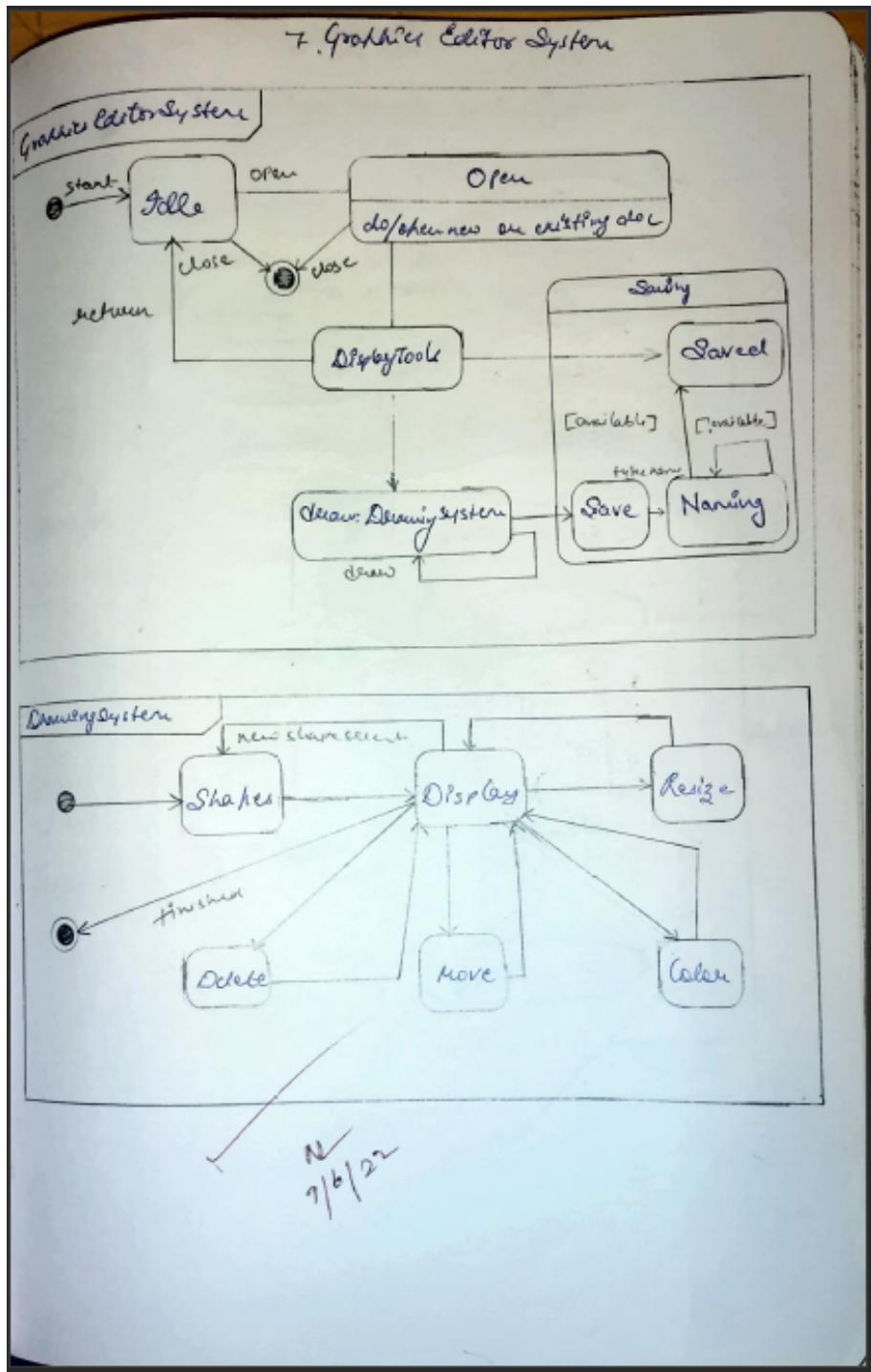




The graphical editor has documents consisting of several sheets. Each sheet contains drawing objects, including text, geometrical objects and groups. A group is simply a set of drawing objects. A geometrical object includes circle, ellipse, rectangles, lines and squares.

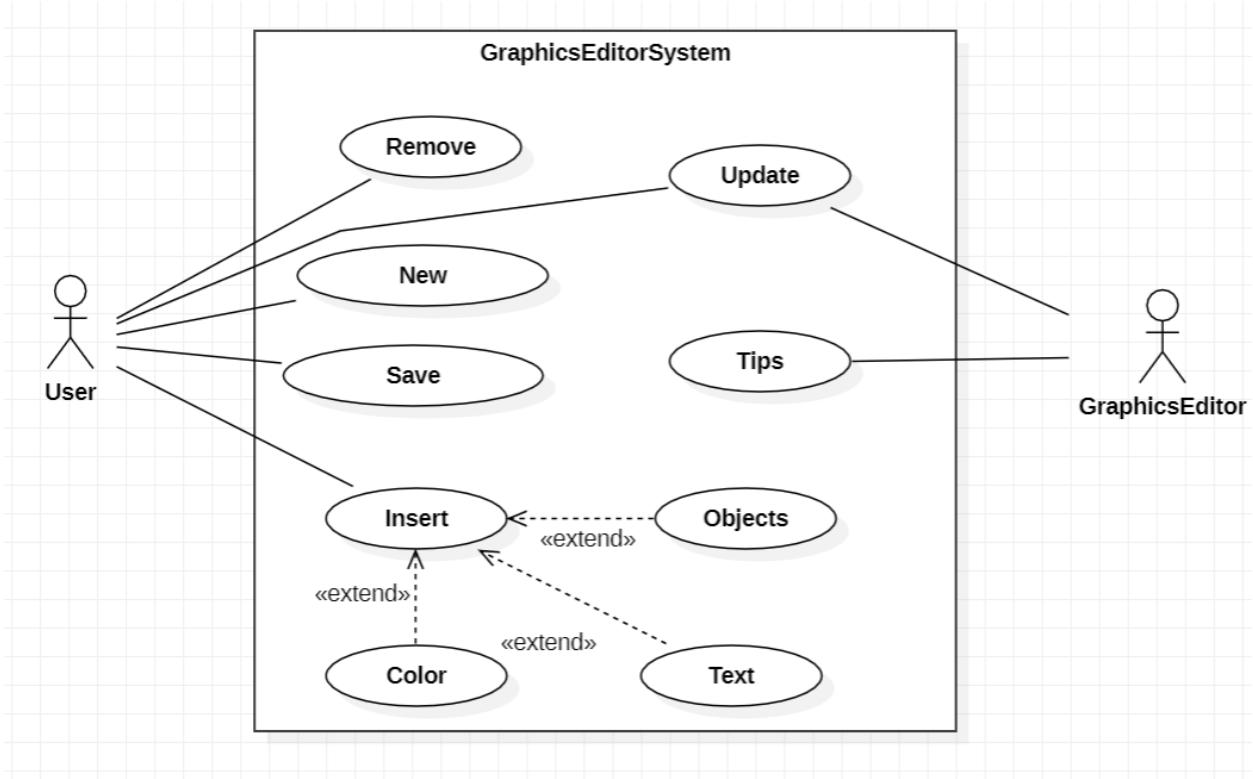
Advance State Diagram :





The advanced state diagram gives the states involved in making and saving a graphic file. first the user selects a new document and draws graphics. If there is a mistake he can erase and select a color from the color palet. He can then save the file created. The advanced state diagram had a composite state called saving where the user can save the file in their desired location.

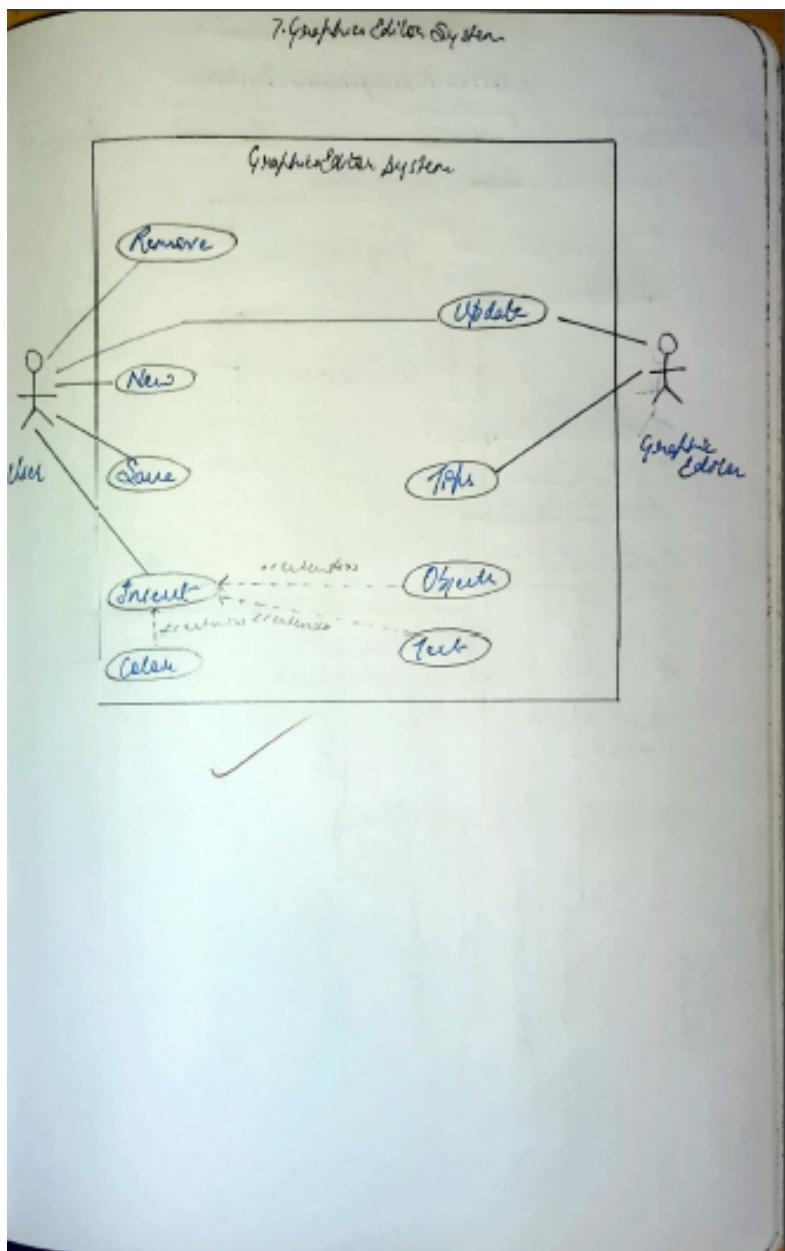
Advance Use Case Diagram :



Actors :

User: the person who uses the graphic system

Graphics system: manages the system



Use case:

Create document : performs creation of new document

Edit document: performs editing of document

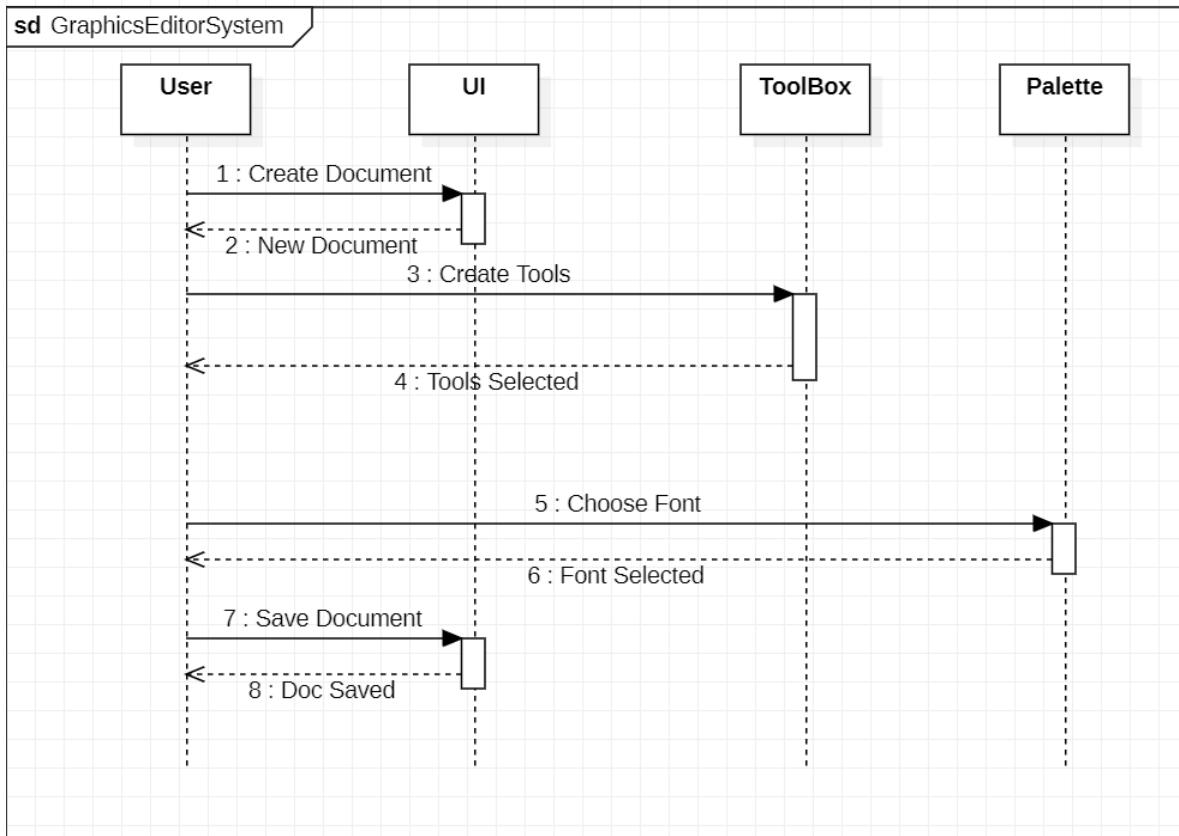
Display toolbox: displays the available tools

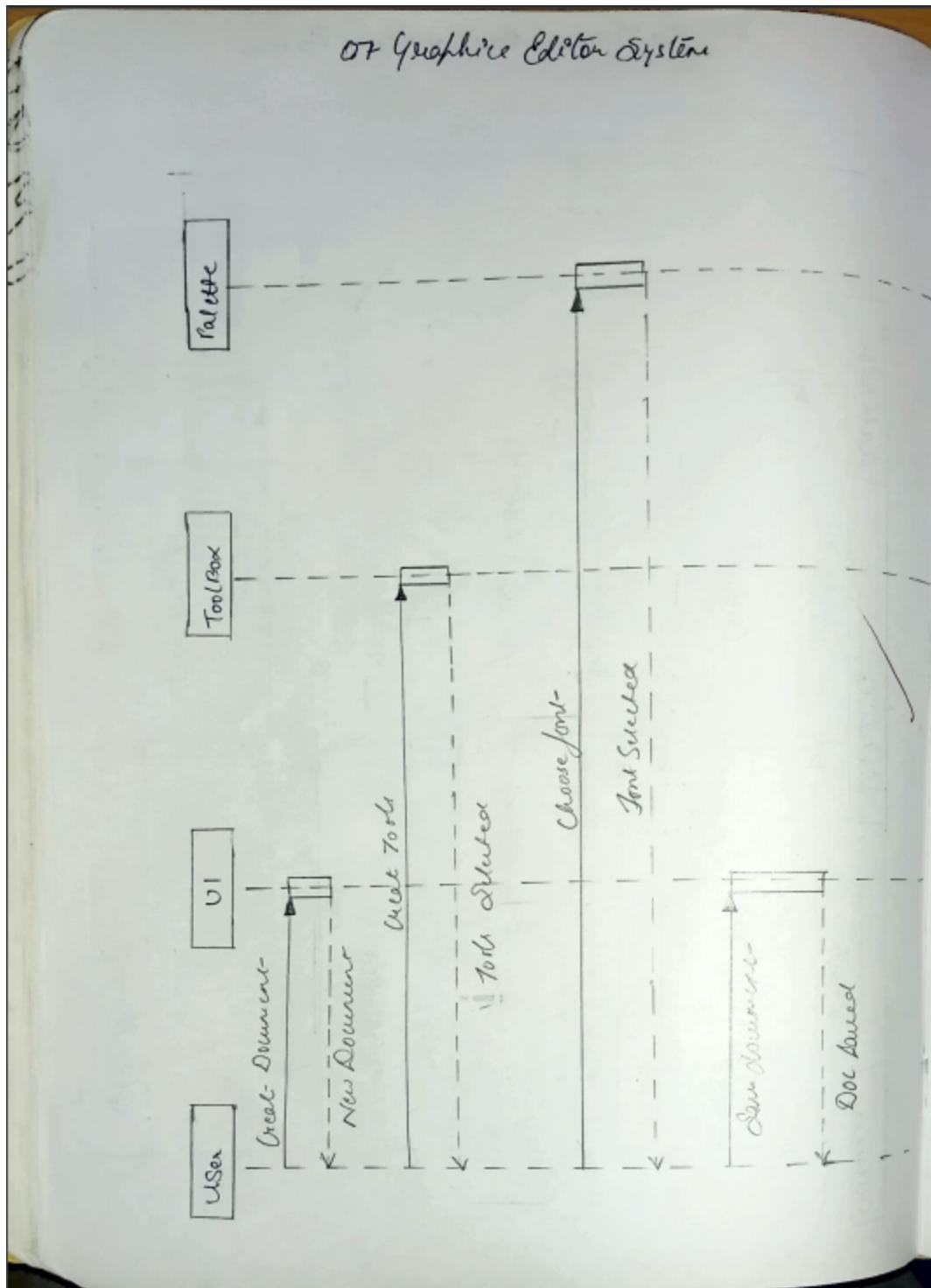
Add graphic object : insert a new graphic object

Choose tools from toolbox : allows user to choose tools

Delete document : Permanently deletes the document

Advance Sequence Diagram :





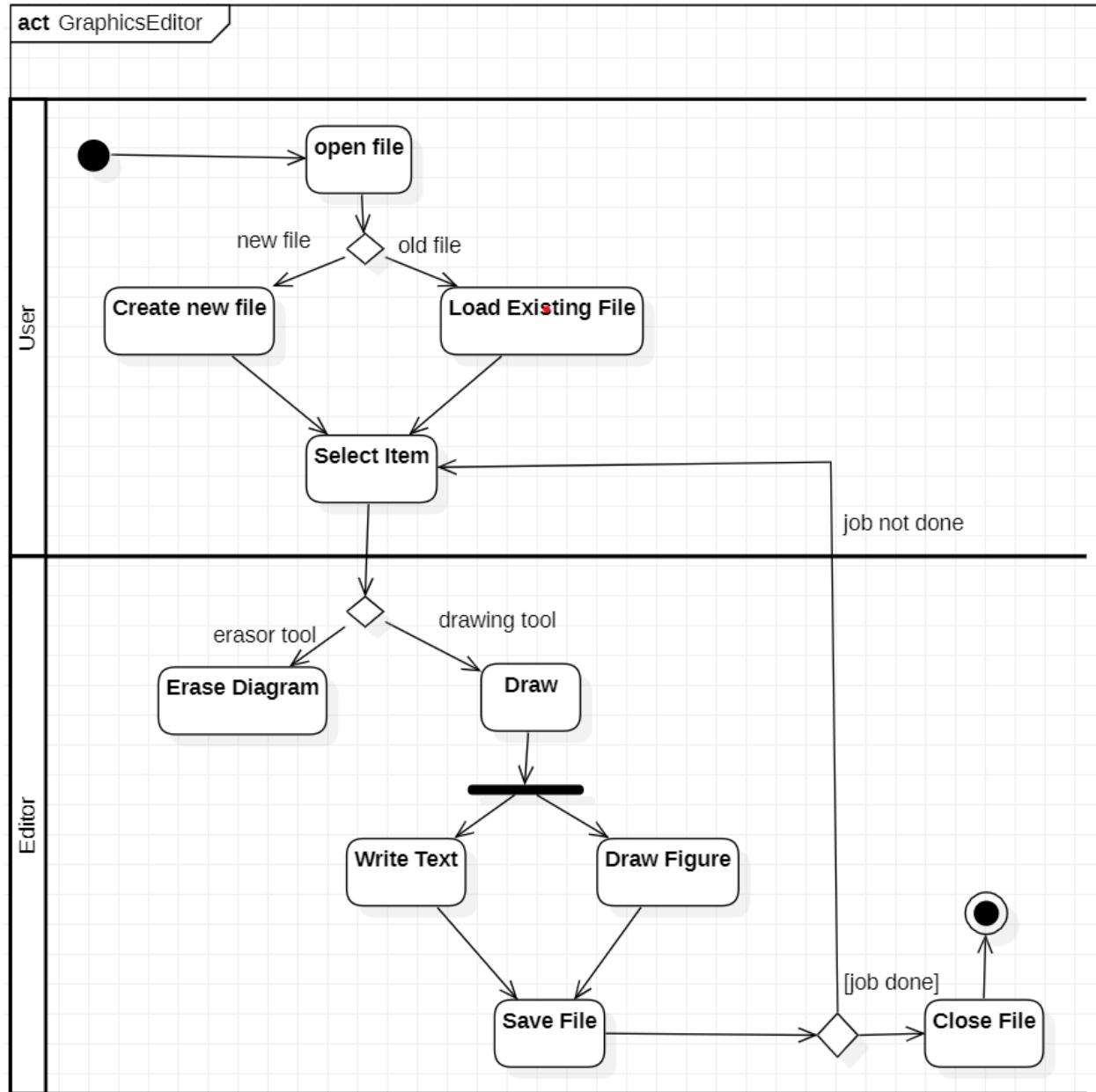
Scenario:

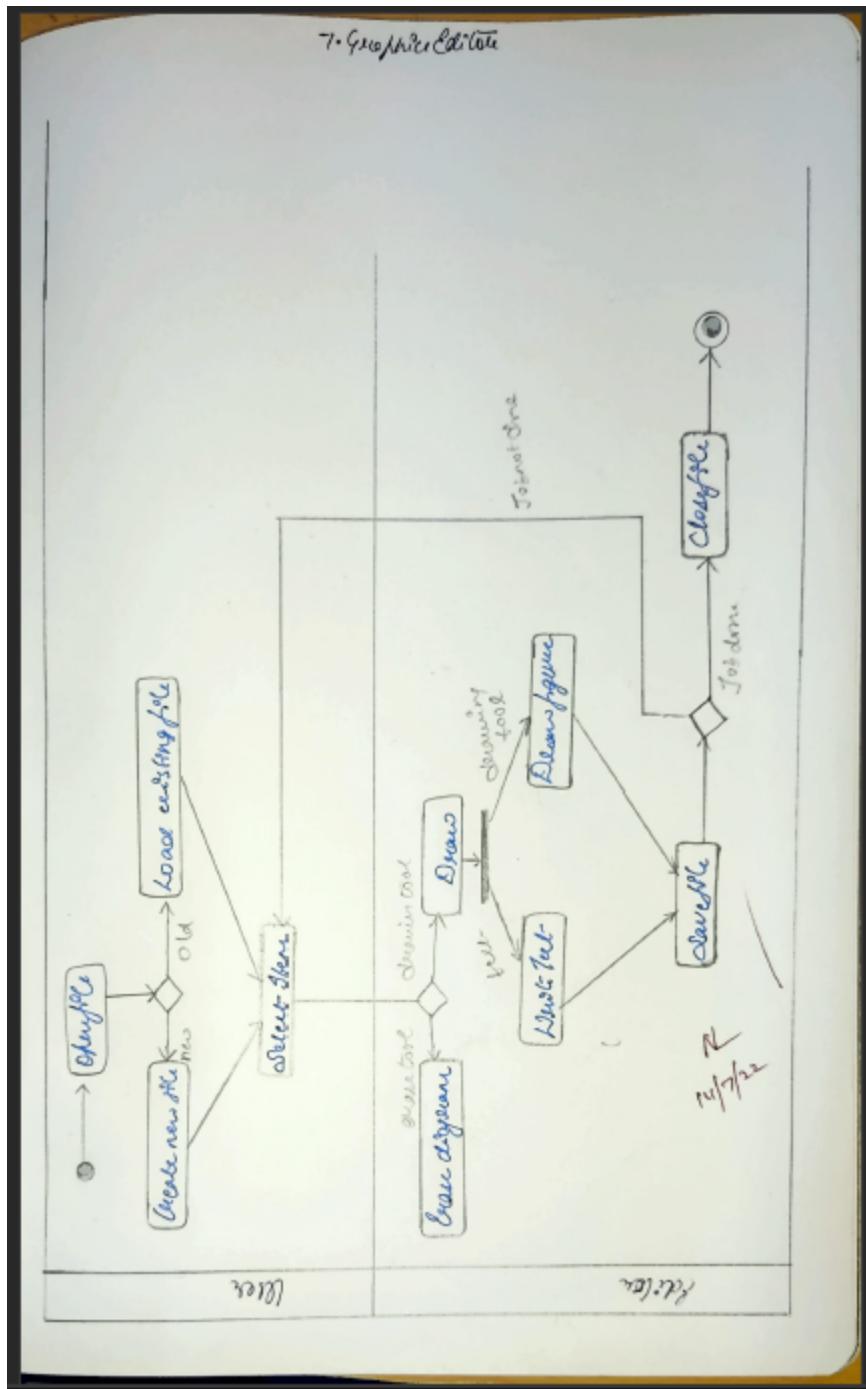
the graphics editor displays options to user The user selects an option

The graphics editor displays shapes The user selects a shape Parameters are asked by the editor

User enters all the required parameter The graphics editor displays the diagram

Advance Activity Diagram:





The advanced activity diagram gives the states involved in making and saving a graphic file. The user selects a new document and draws graphics, saves the file and closes it.