

VISVESVARAYATECHNOLOGICALUNIVERSITY

“JnanaSangama”, Belgaum -590014, Karnataka.



LAB REPORT

on

Object Oriented Modelling and Design

Submitted by

P PREM SAI (1BM19CS109)

in partial fulfillment for the award of the degree of

BACHELOROFENGINEERING

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 Modelling and Design**" carried out by **P PREM SAI (1BM19CS109)**, who is a 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 Modelling and Design(20CS6PCOMD)** work prescribed for the said degree.

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Course Outcome

CO4	Ability to conduct practical experiment to solve a given problem using Unified Modelling language.
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1. College Information System

a) SRS:

Problem Statement :

The existing system which we are using in the college is traditional process, we were using paper and pen. As admissions and information is increasing day by day it is difficult to maintain in using pen and paper.

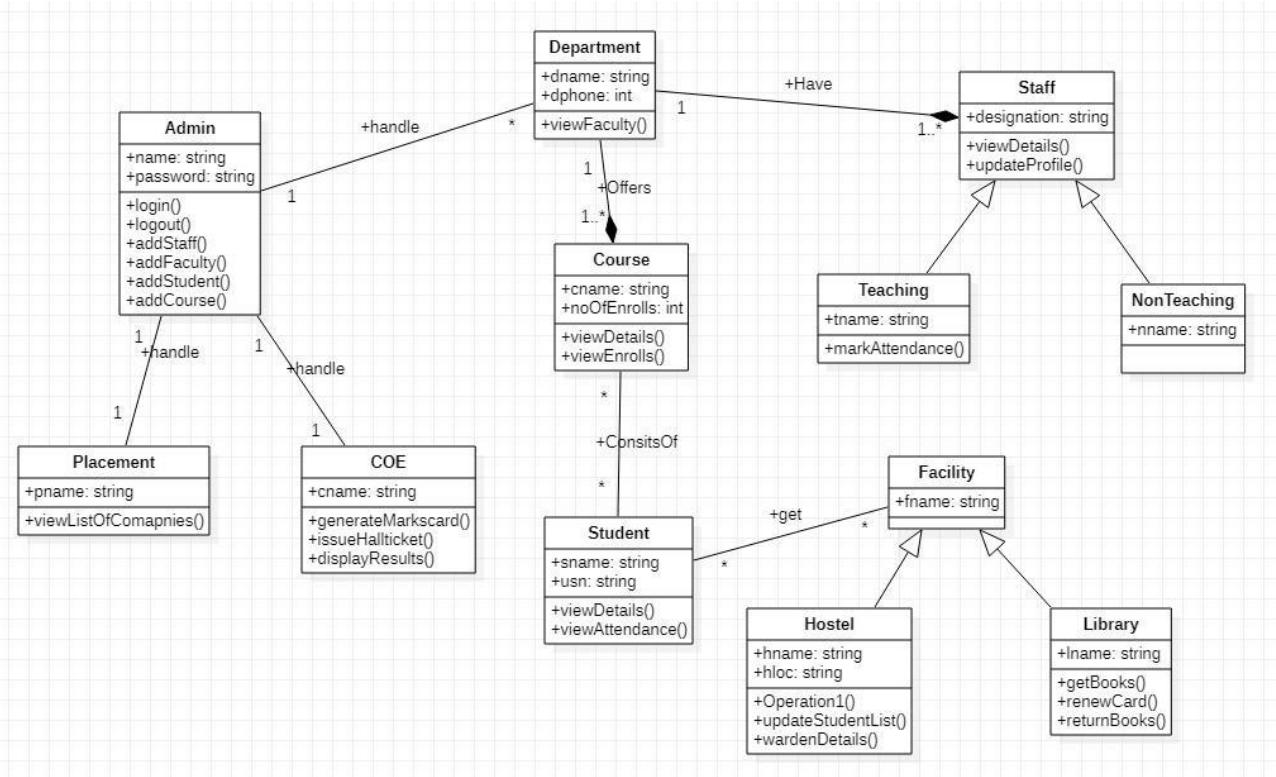
SRS :

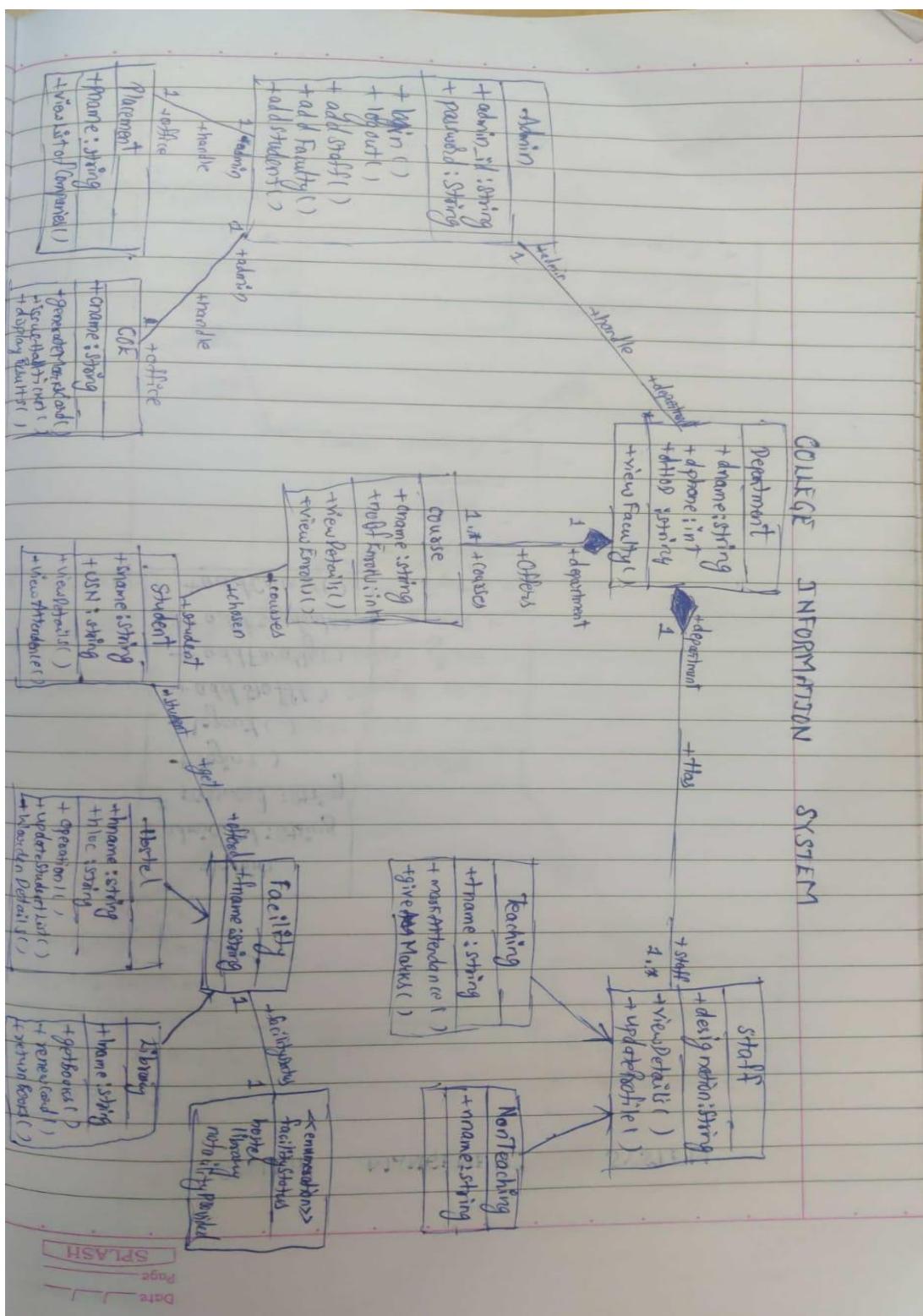
We maintain day to day information, updates of students and employees. We also manage information of books and question papers which helps in quick and easy access.

- Educational institutions should be able to add, edit and view student personal details like name, age, gender, email, phone number, address and academic details.
- Faculty should be able to view all student personal details and should be able to view and edit internal evaluation marks and attendance of students.
- COE office should be able to view all student details and view and edit internal and external examination marks and publish results.

- Placement section should be able to view all student details and add companies coming to campus for placements.
- Management section should be able to view, add and edit teaching and non-teaching staff details.
- Students should not be allowed to edit their personal and academic details.
- The system should be convenient and easy to use by students, management and faculty.
- The system should be reliable source of information viewing for students, COE and faculty.

b) Advance Class Diagram:

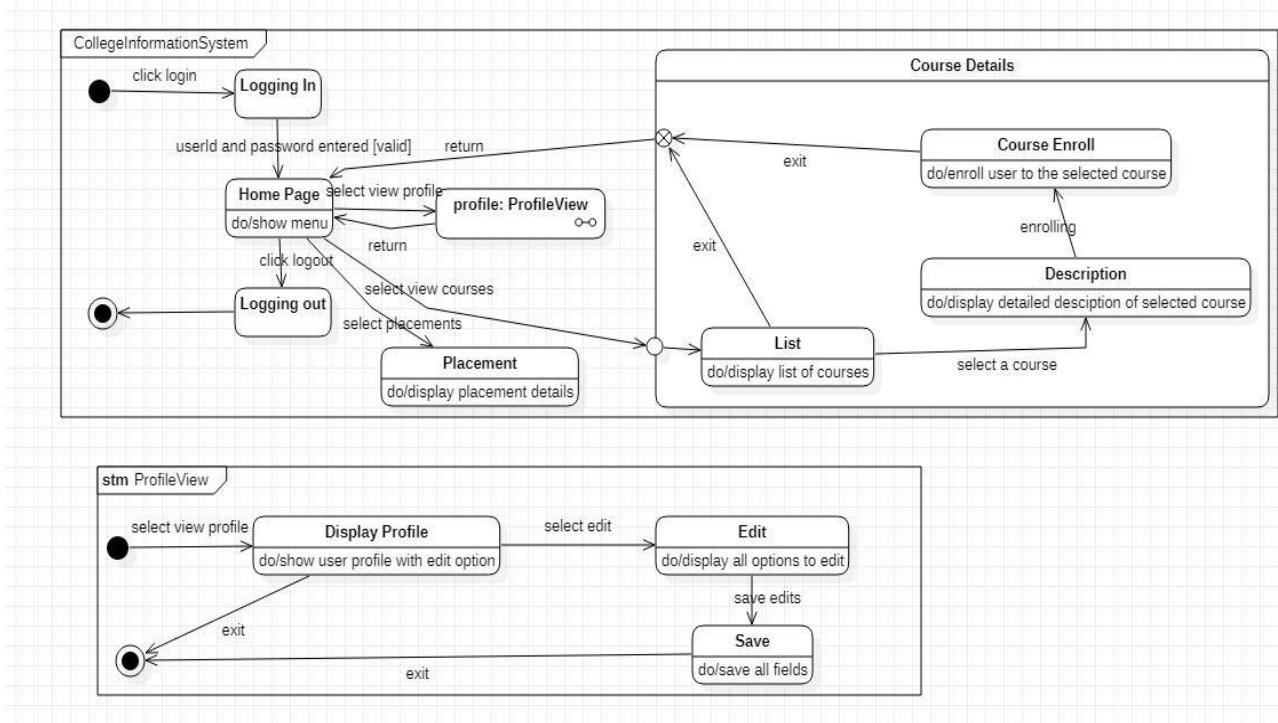


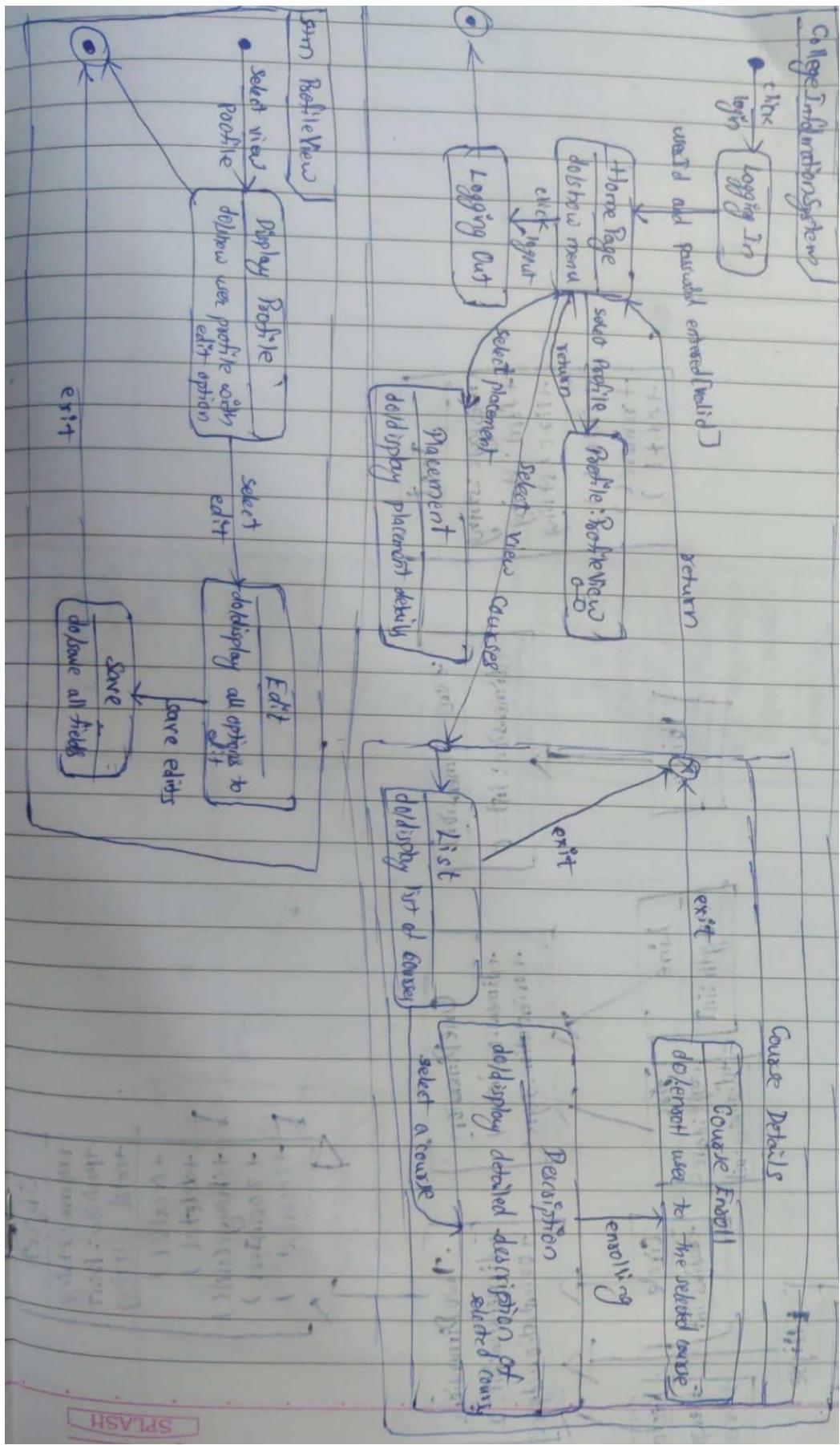


Justification: The above state diagram mentions the states the admin goes through in updating details of all three categories namely- student, staff and department. Initially the admin needs to login which redirects to the validate state, there the login id and password are going to be cross-checked. If the credentials turn out to be invalid it redirects to the login state or goes to the get information state. When

validated successfully it redirects to the upload state and then to commit state to save all changes. The admin first needs to login and be cleared of their permissions. The admin can then oversee and maintain information related to the student, teacher, or department. On any modifications, the admin can update the information and logout from the system.

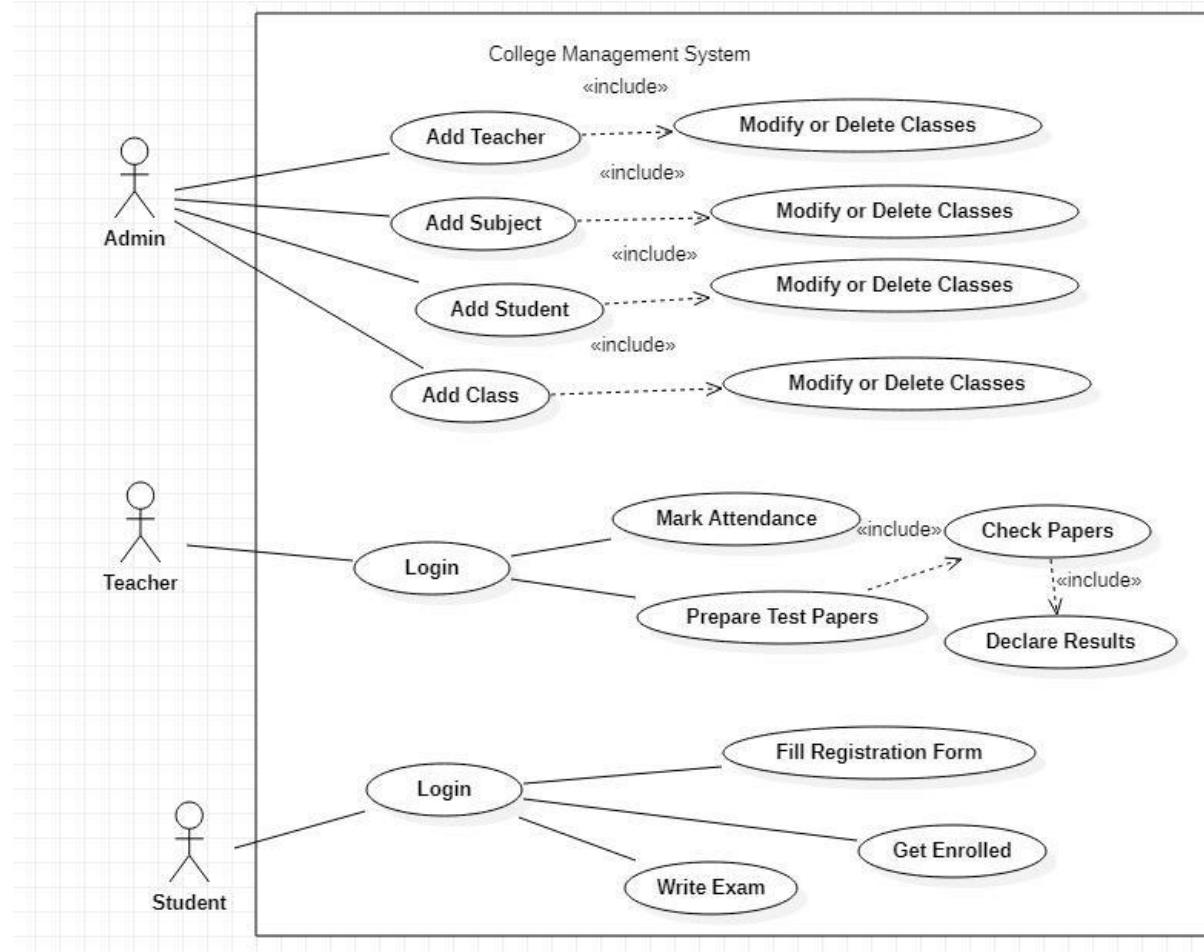
c) Advance State Diagram:

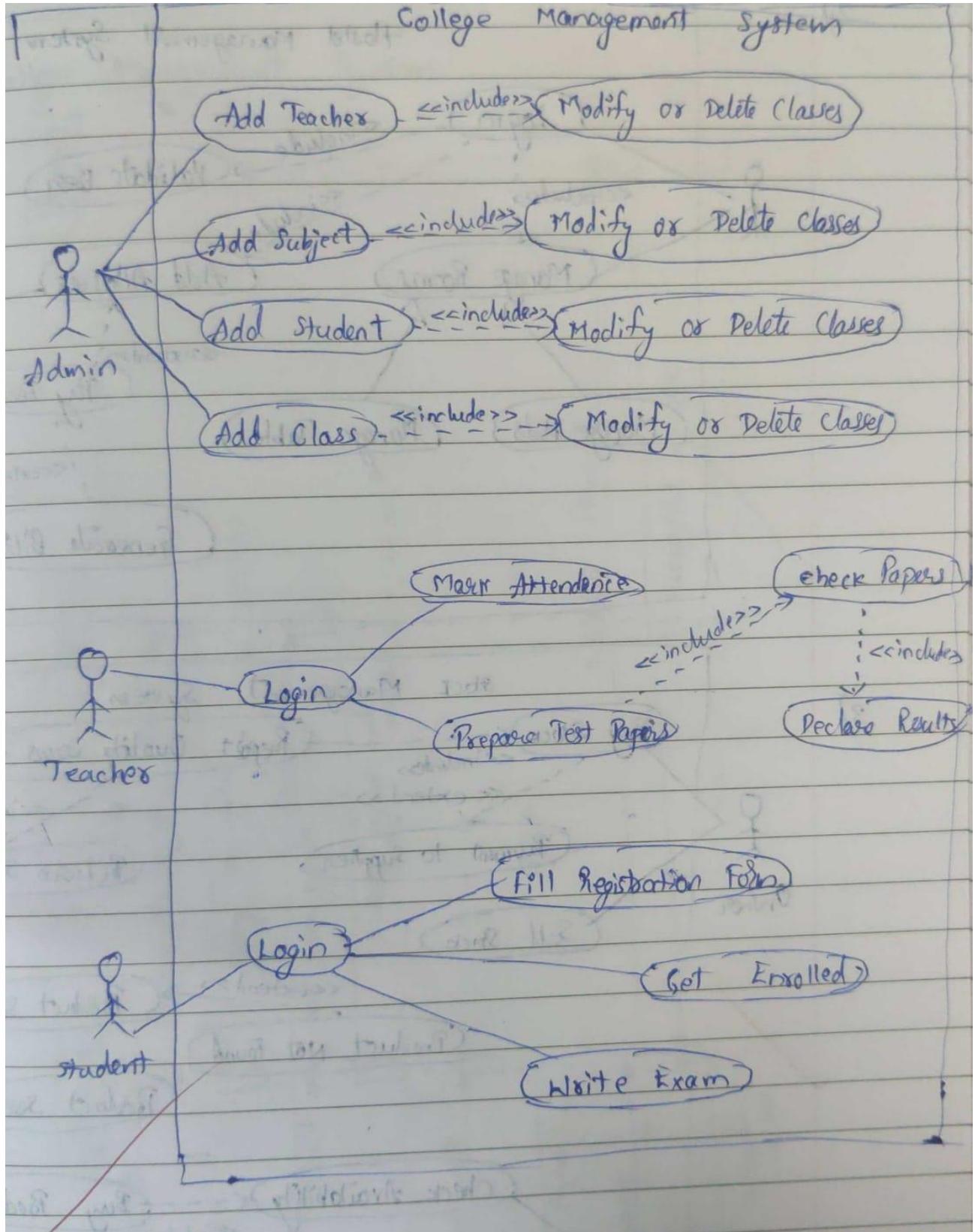




Justification: The given state diagram explains the various states present in the case and gives a detailed description of course details and view profile in the form of a sub state machine and composite machine. All the respective details of transitions are mentioned

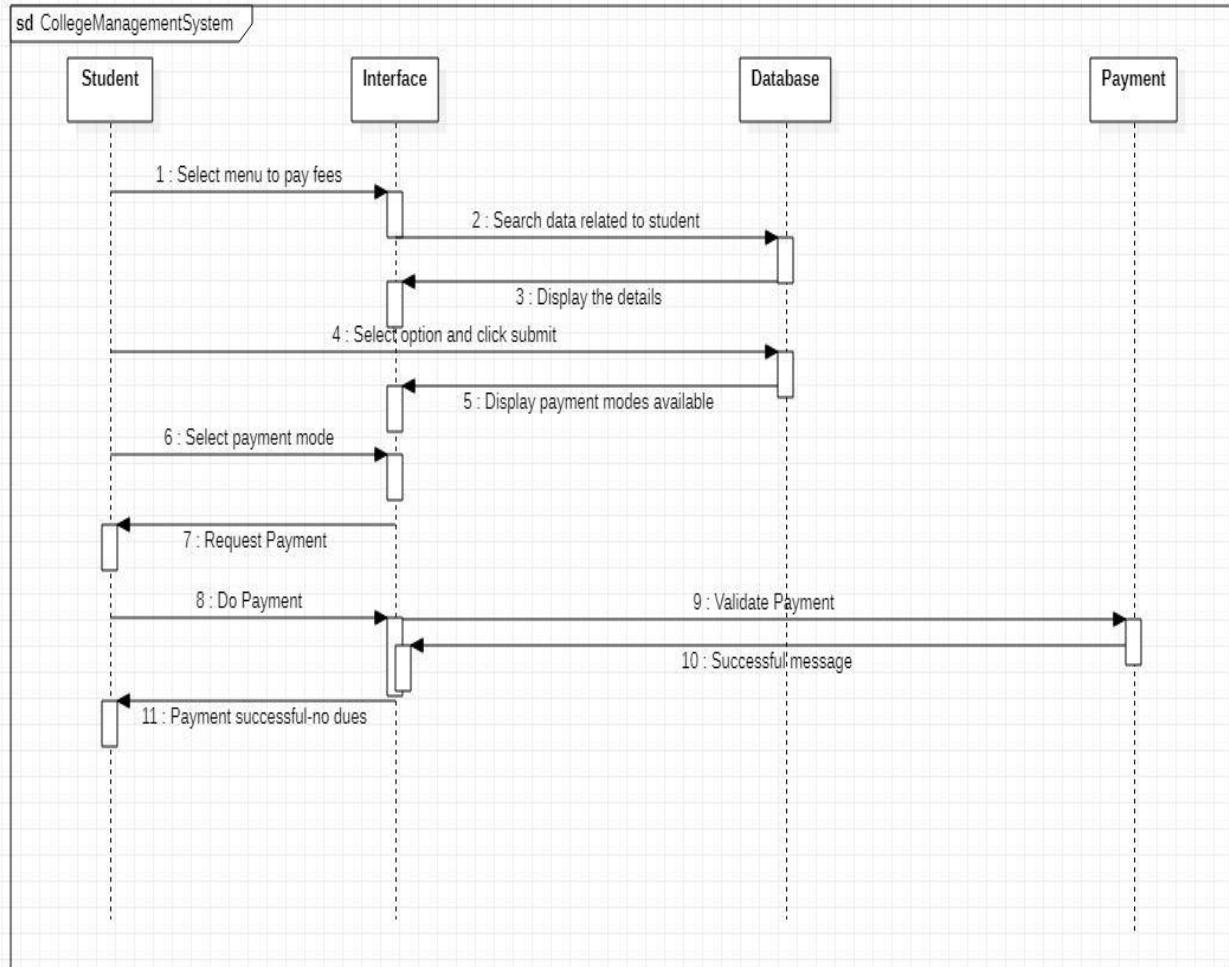
d) Advance Use Case Diagram:

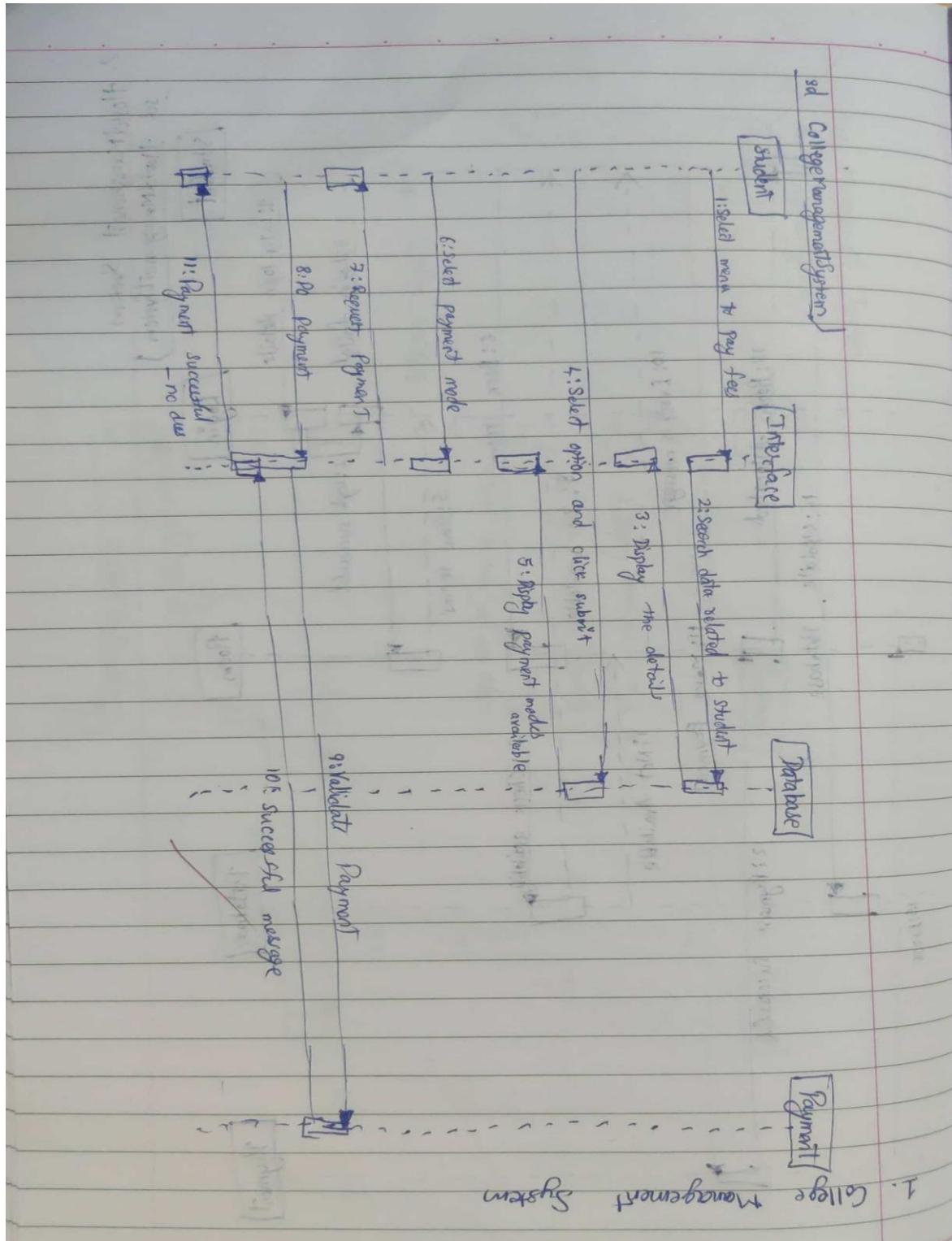




Justification: All the functionalities are mentioned in the given figure and all actors are involved in the system like student, faculty, admin, librarian and event manager. Their relations are clearly indicated in the given diagram.

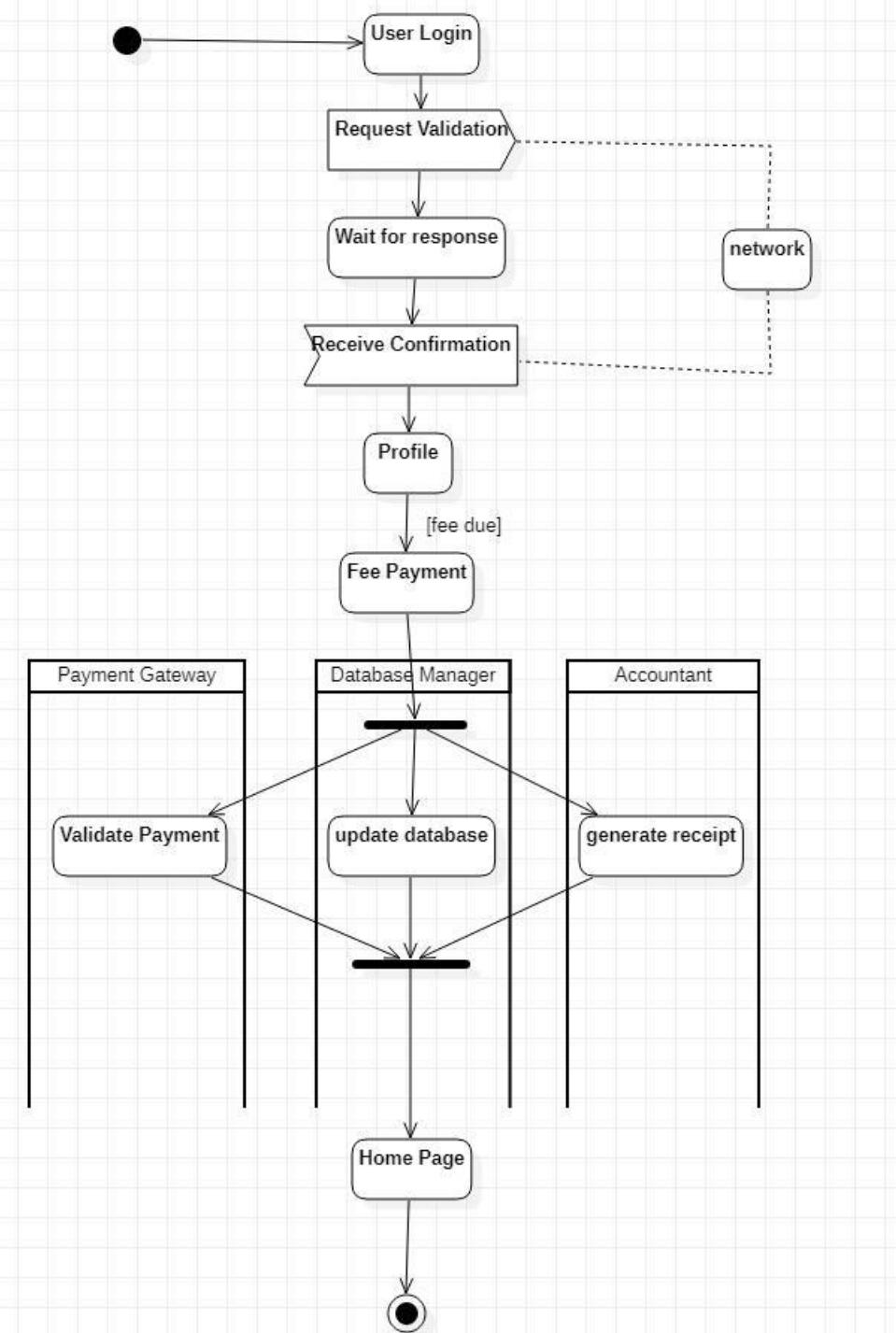
e) Sequence Diagram:



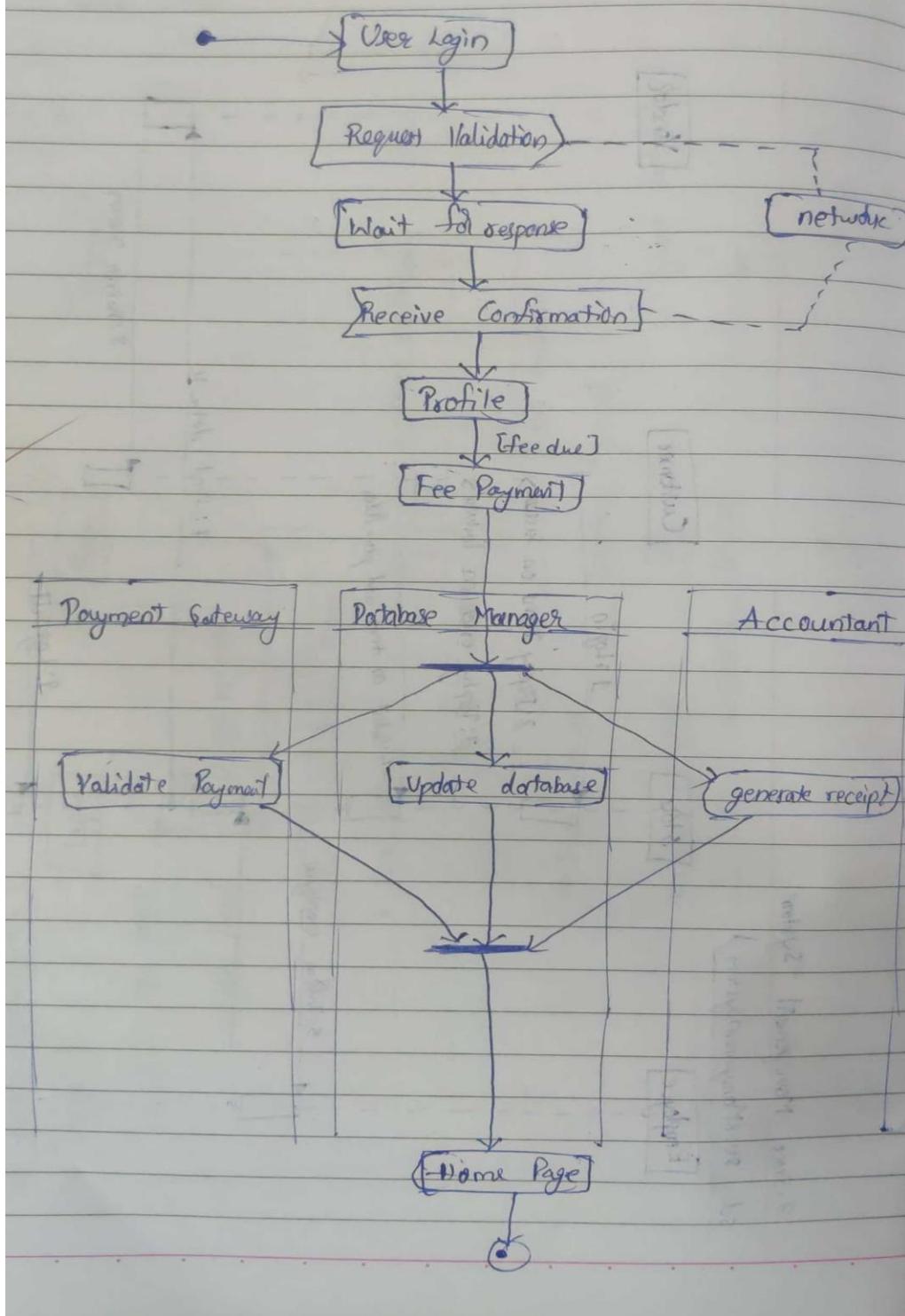


Justification: The given sequence diagram shows the complete order of all the interactions taking place between the user and user interface, database, payments and shows detailed information of payment, search and display in the system.

f) Activity Diagram:



College Management System.



Justification: The given diagram explains the complete working of the system from start, login to end of the session, and depicts various activities in the given application and shows the registration process of the system.

2. Hostel Management System

a) SRS:

HOSTEL MANAGEMENT SYSTEM

Problem Statement :

The hostel management system is to provide college students accommodation more efficiently than the existing system. The existing system uses pen and paper and it is hard to manage hostel systems.

SRS :

The purpose of Hostel management system is to carry out different operations of a hostel. This system will provide ease, comfort of use to staff of hostel by performing all work on computer. It helps to manage student and staff records.

- Admin can login using credentials provided to him.
- Admin can allot room to students.
- Students can login using the credentials provided and can give feedback about staff and management.
- Admin can review the feedback provided by students.
- Students can provide mess feedback.
- Mess management can review the mess feedback.

→ Mess manager can update mess list.

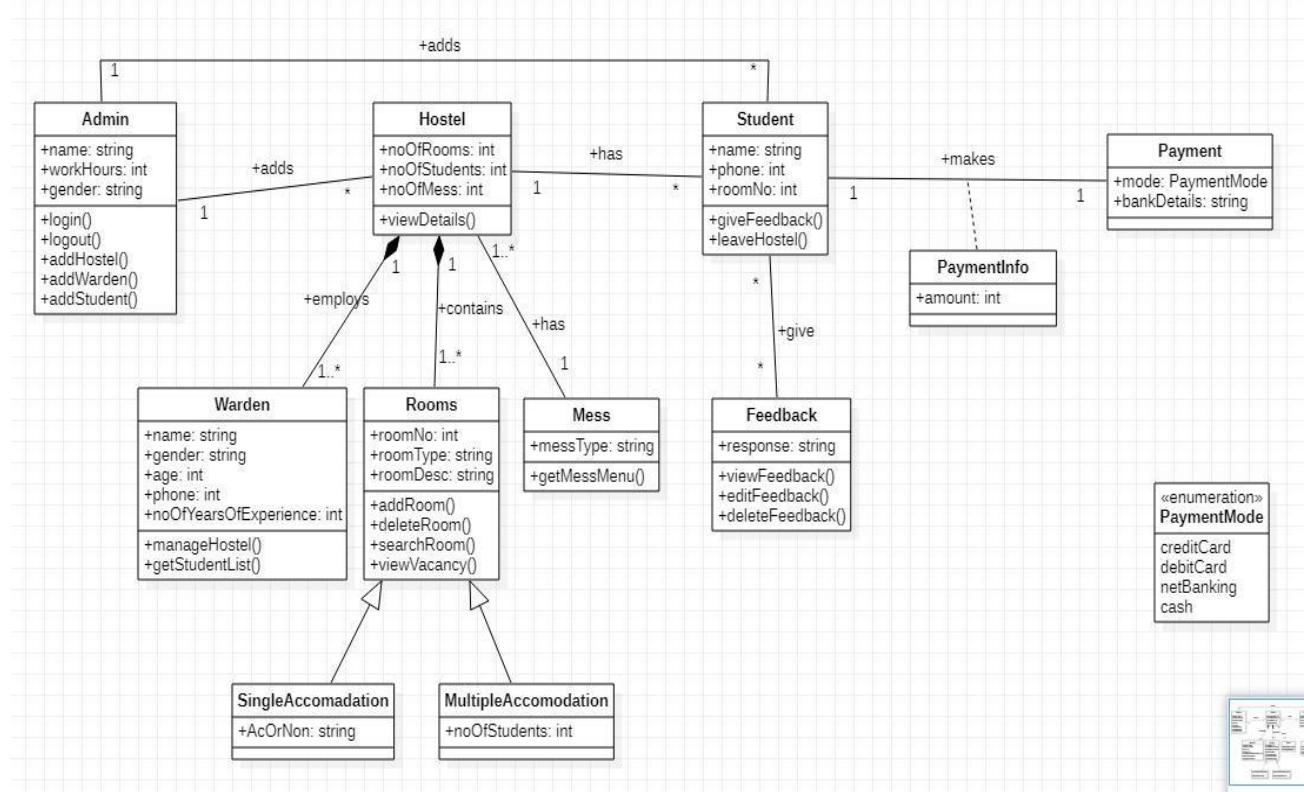
→ Admin can assign work to staff members.

→ The system should be easy to handle.

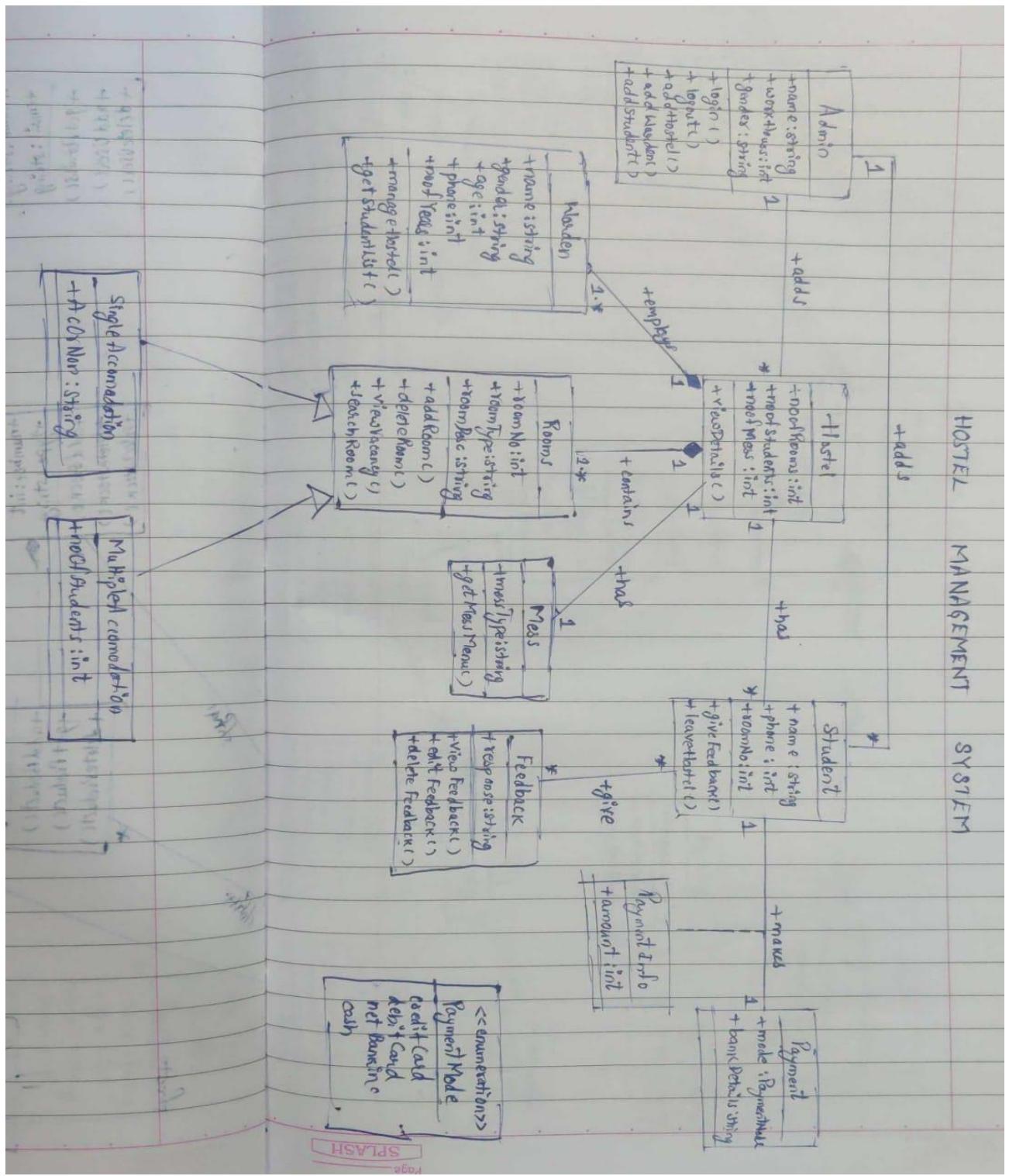
→ System should give expected performance results.

→ The response time should be small.

b) Advance Class Diagram:

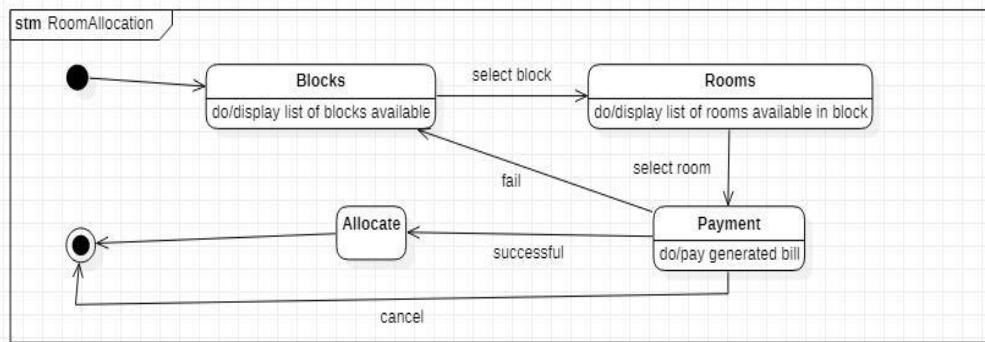
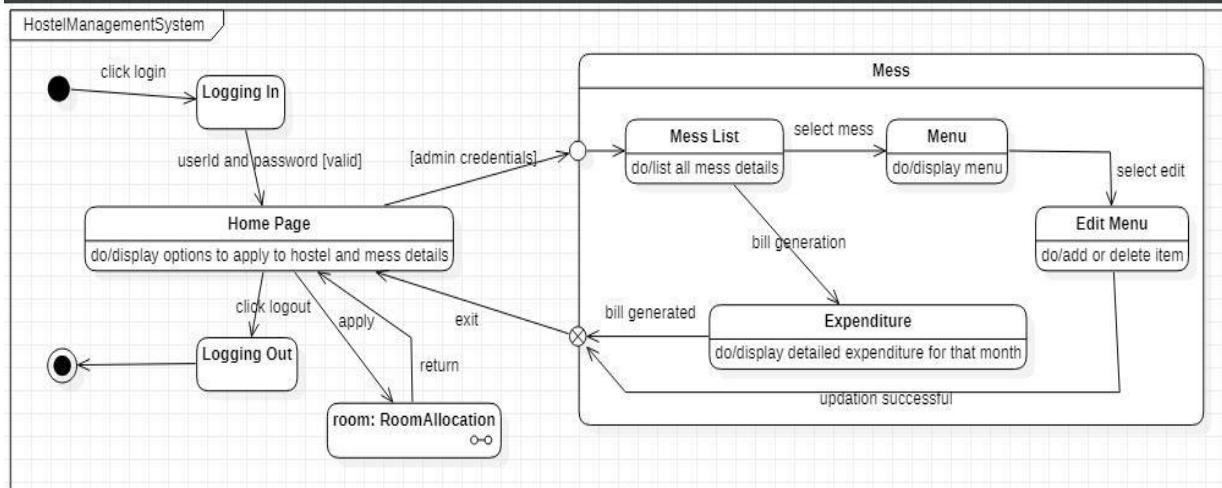


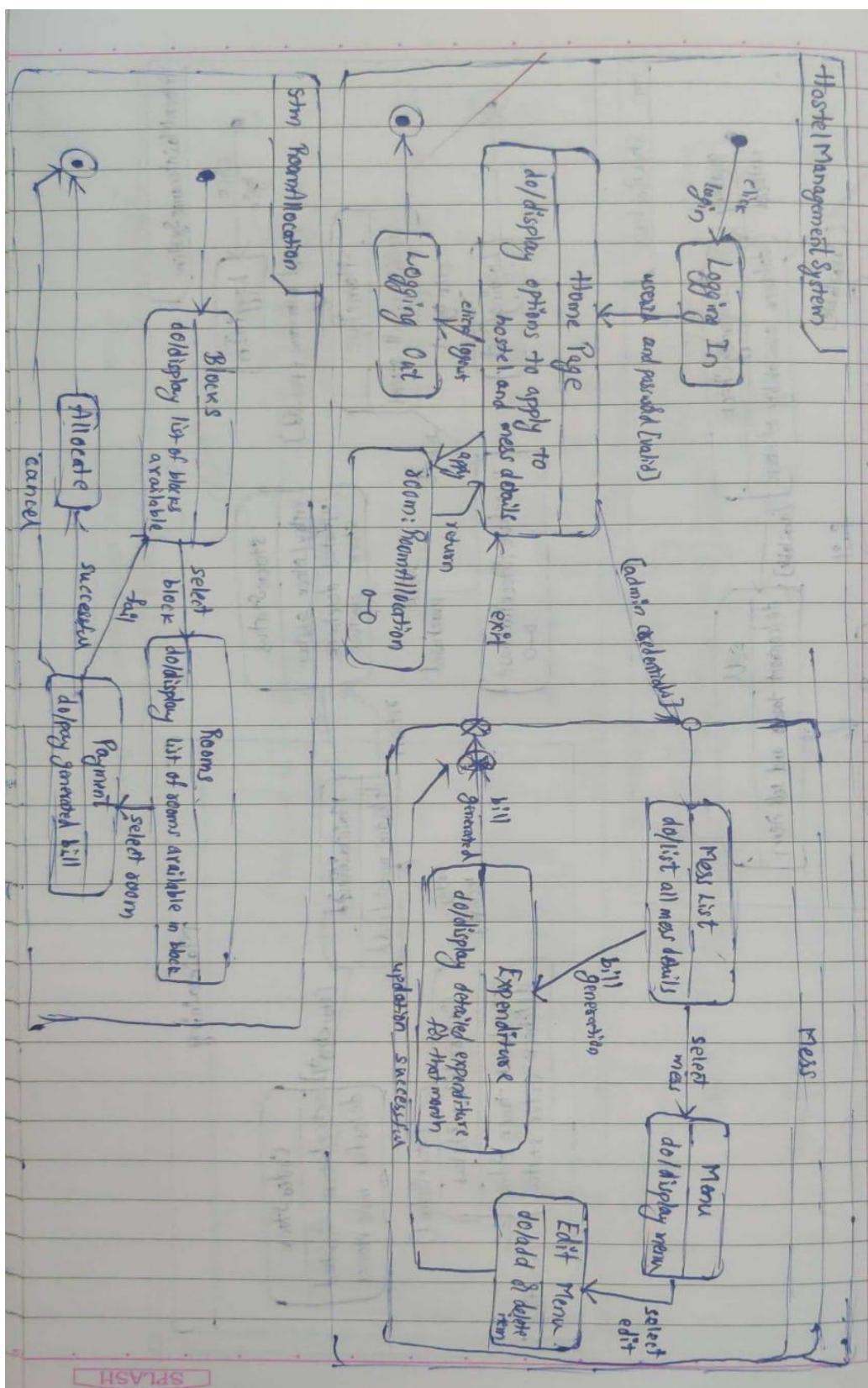
HOSTEL MANAGEMENT SYSTEM



Justification: Admin controls and allot the room, hence association, which can give feedback to the room, hence association. The students make payments through various payment methods, hence it is an enumeration. For every hostel block, a warden is assigned making it a composition.

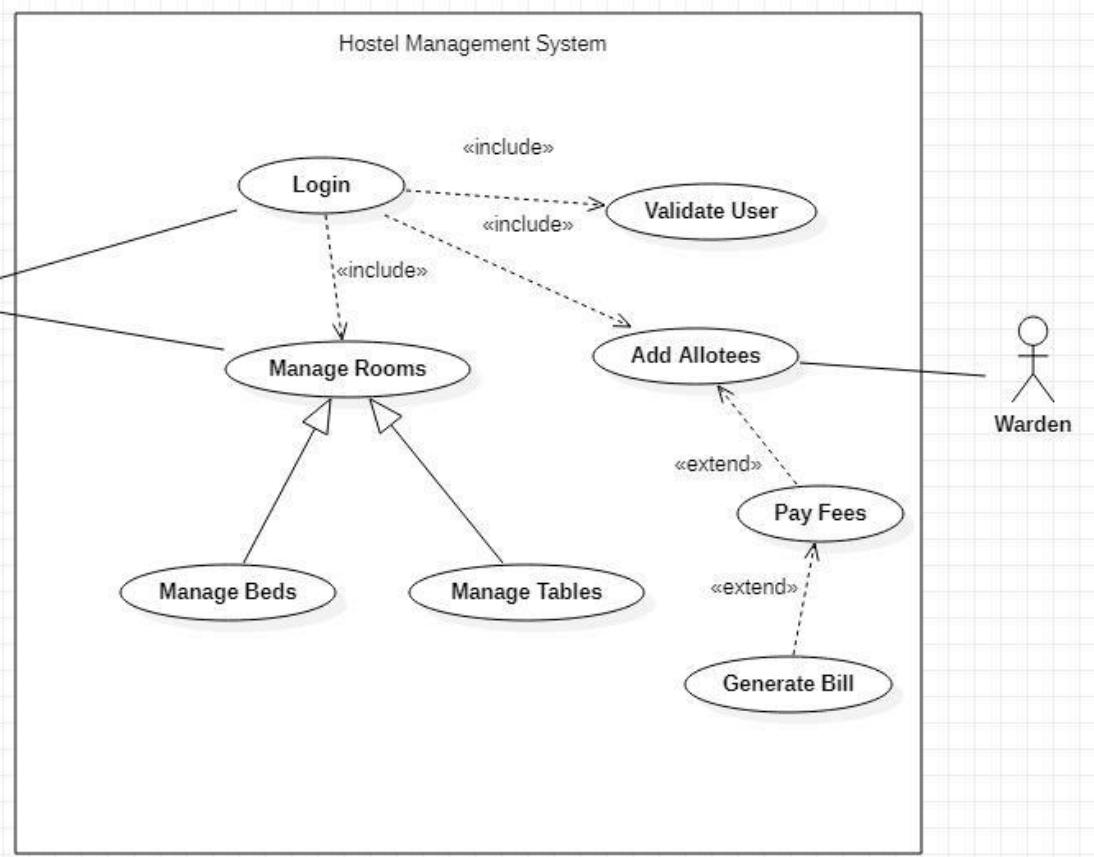
c) Advance State Diagram:

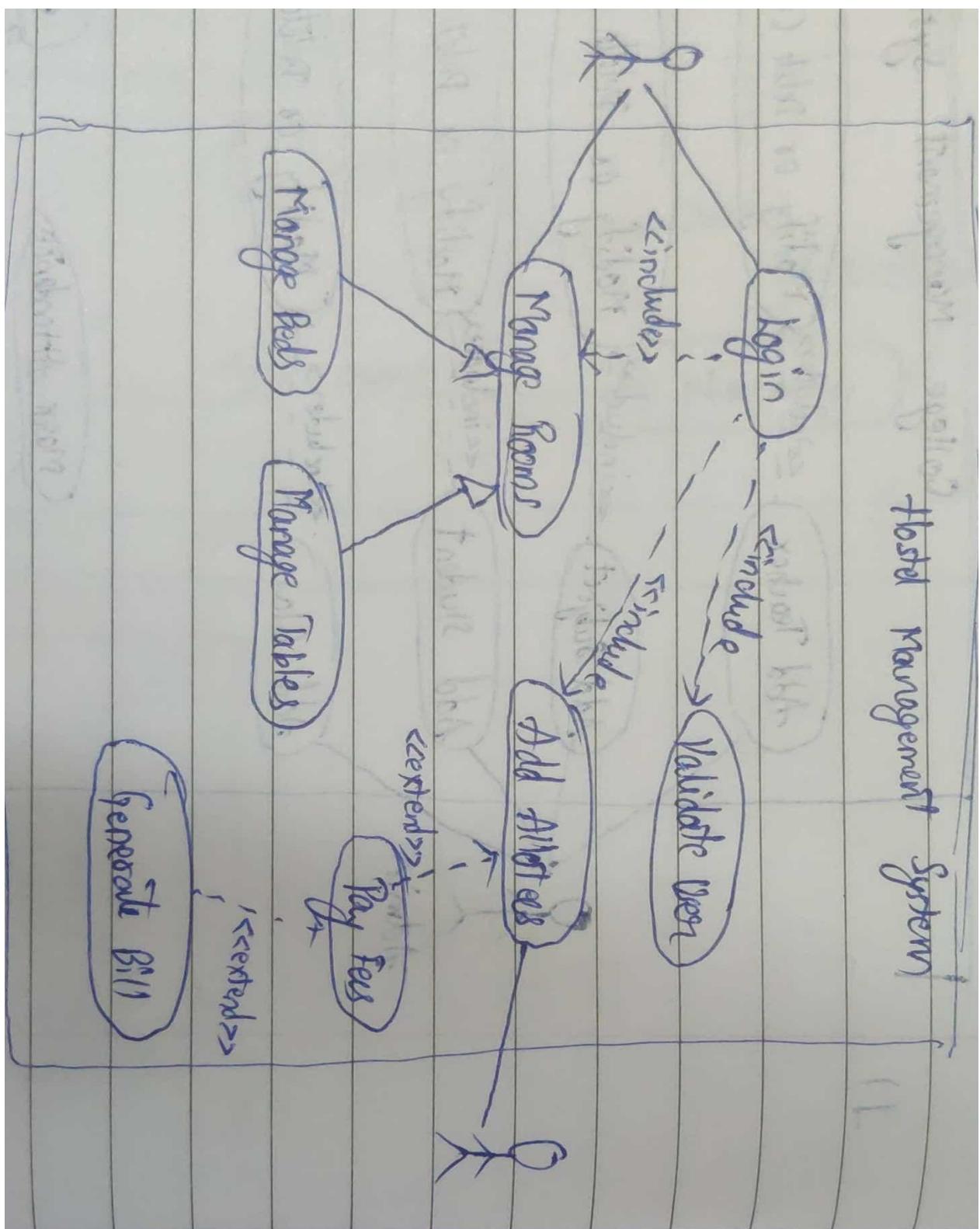




Justification: The given diagram gives a detailed description of the case with respect to a room allocation and mess menu details where it is explained with a sub machine in depth for room allocation. All the transitions and actions are mentioned.

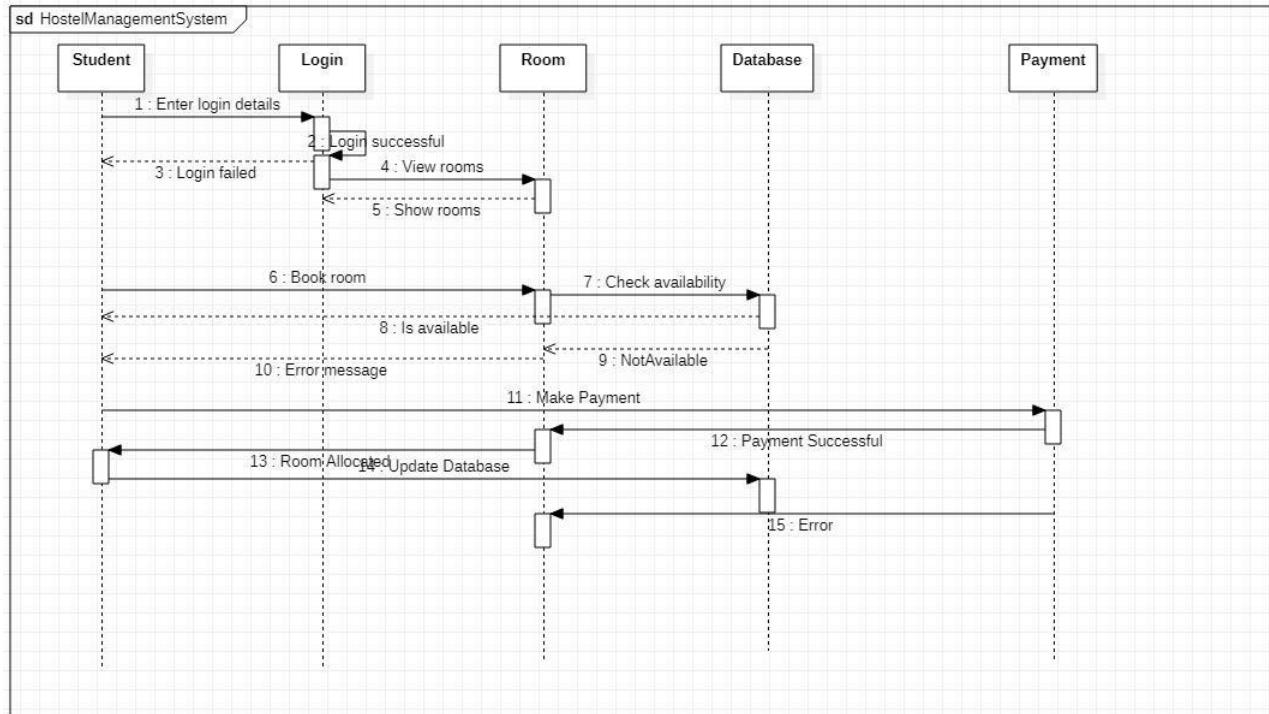
d) Advance Use Case Diagram:

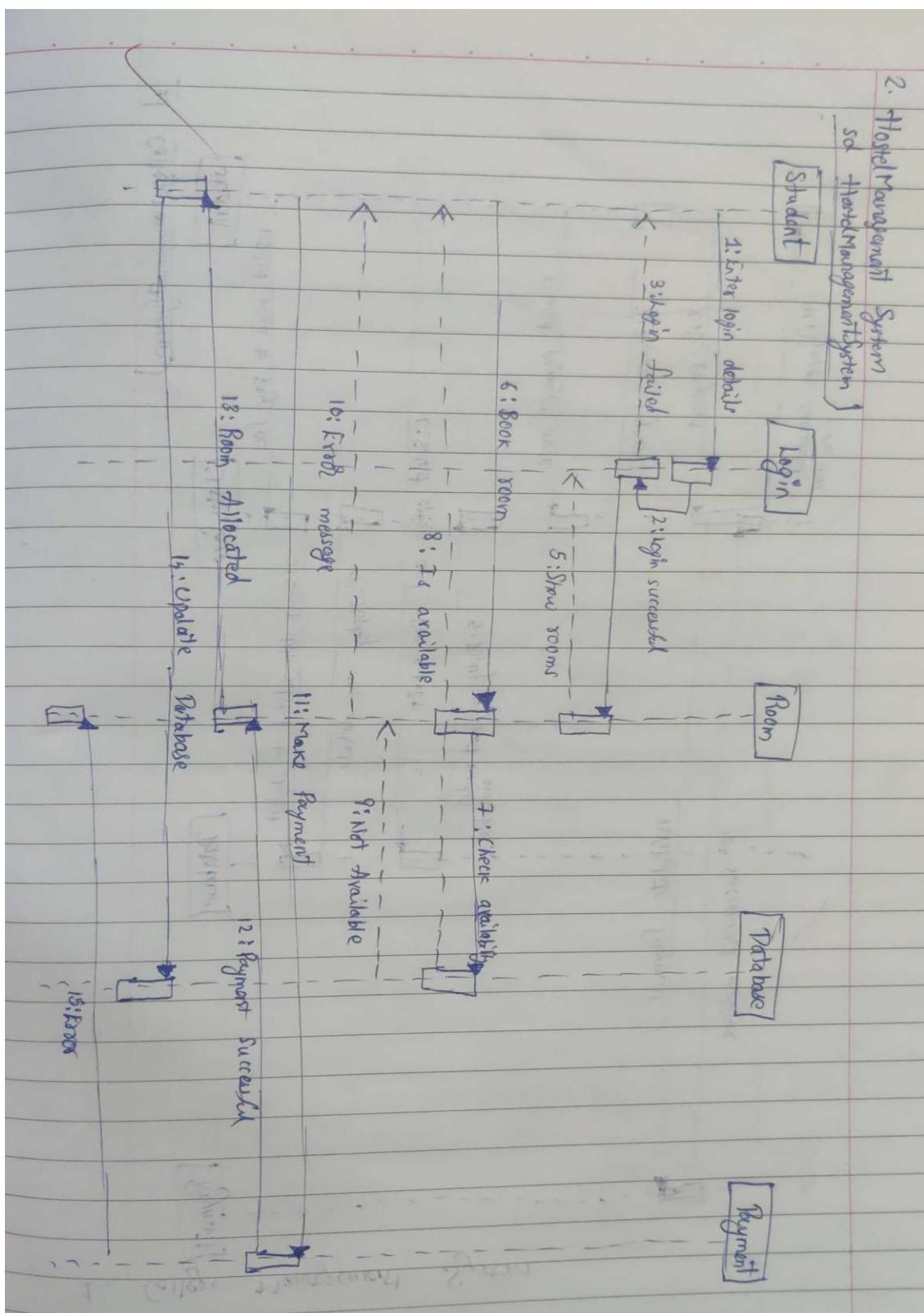




Justification: All the functionalities are mentioned in the given figure and all actors are involved in the system like student, faculty, admin, librarian and event manager. Their relations are clearly indicated in the given diagram.

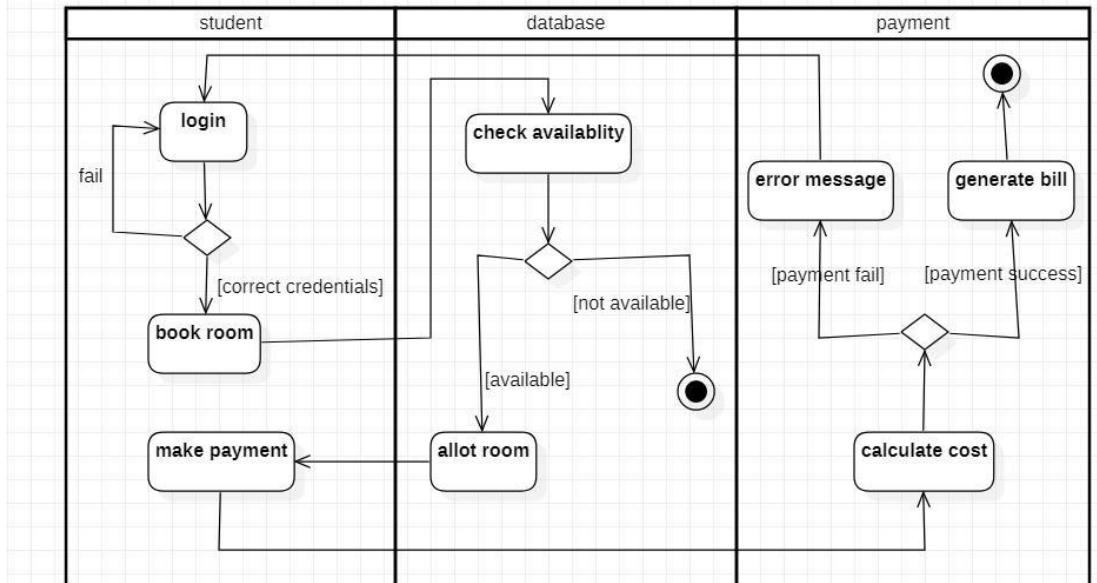
e) Sequence Diagram:



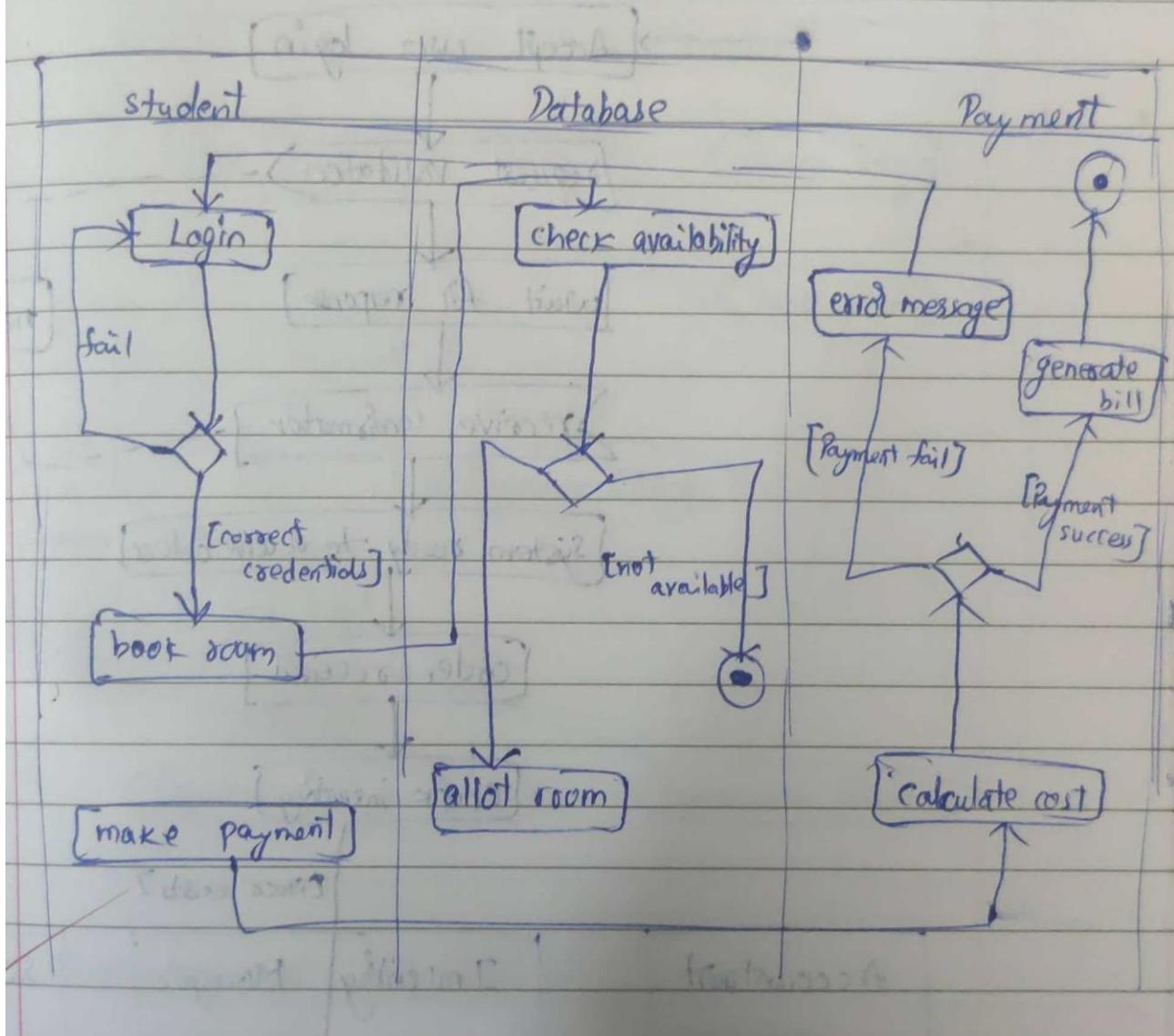


Justification: The given sequence diagram shows the complete order of all the interactions taking place between the user and user interface, database, payments and shows detailed information of payment, search and display in the system.

f) Activity Diagram:



Hostel Management system



Justification: The given diagram explains the complete working of the system from start, login to end of the session, and depicts various activities in the given application and shows the registration process of the system.

3. Stock Maintenance System

a) SRS:

STOCK MANAGEMENT SYSTEM

Problem statement :

The existing stock management system does not have more features. Stocks are not shown clearly and user interface is not good.

SRS:

The stock maintenance system will allow the employees to record information of items available in store. The new system will have a windows based desktop interface to allow users to enter information of sales, purchase orders, change employee preferences and create reports. The system retains information on all items in shop.

→ Owner has a manager which manages the inventory. The owner can order, sell stock. He can make payments, report quality issue, return stock and track order.

→ The manager maintains a ledger, do's quality check and reports to own.

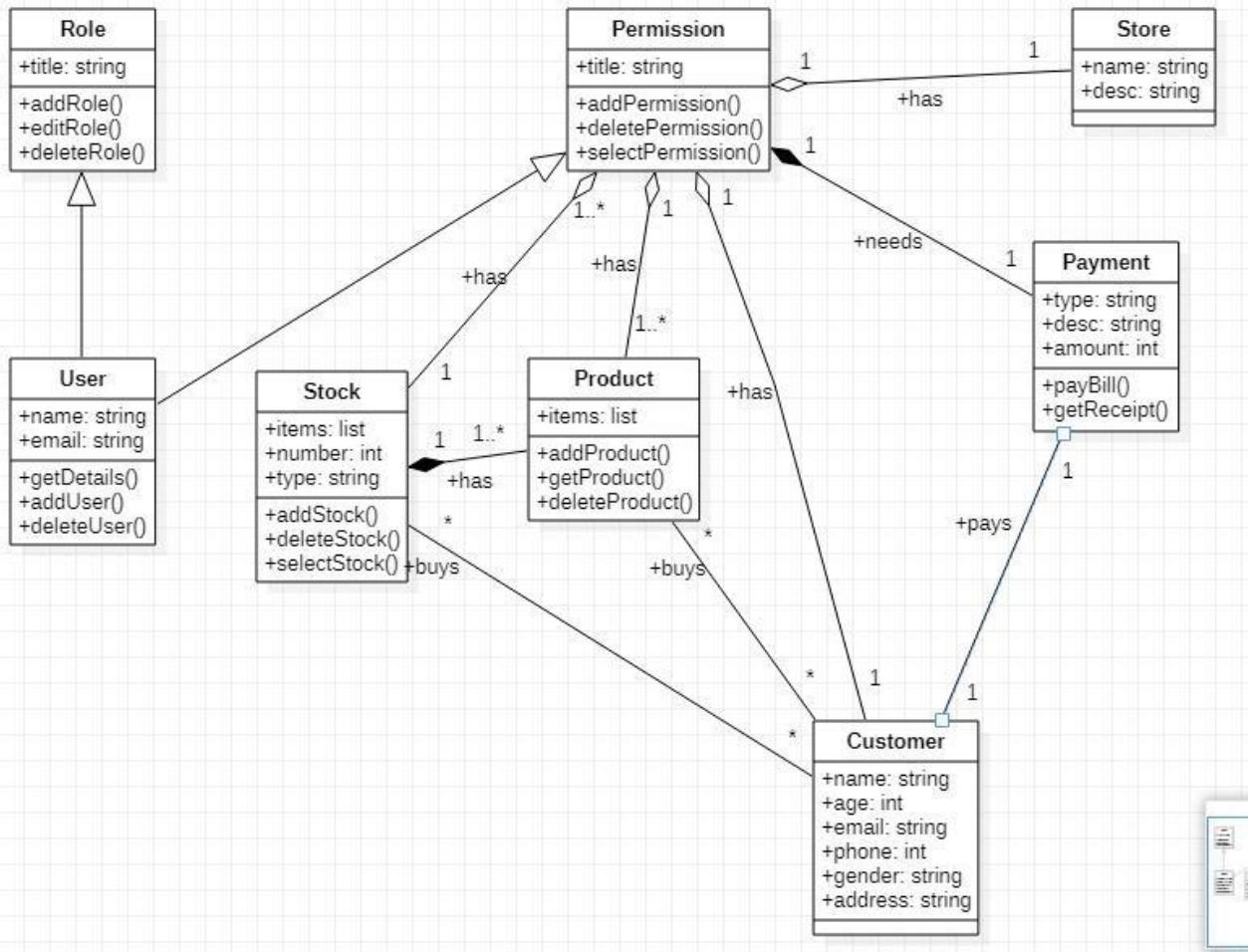
→ In inventory, we can add, remove edit and search the inventory. We can calculate the required stock.

→ The order details contain details of order.

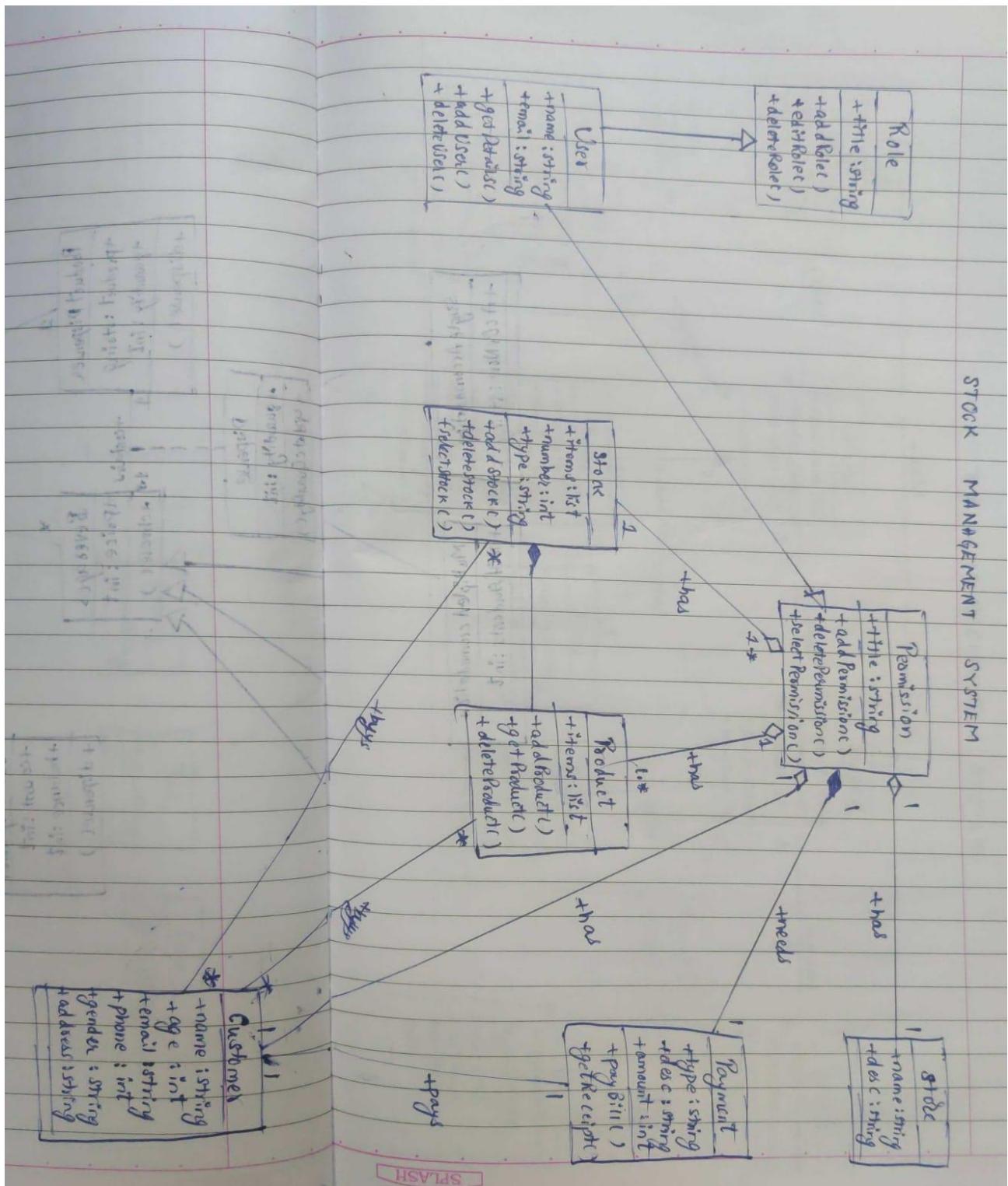
→ The stock can be viewed, edited, added and removed.

→ The supplier tracks order details and supplies the stock and receives payment.

b) Advance Class Diagram:

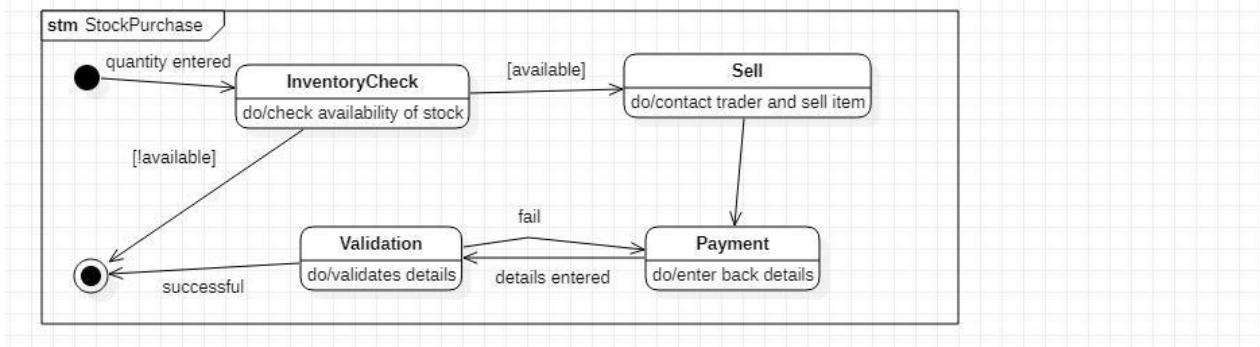
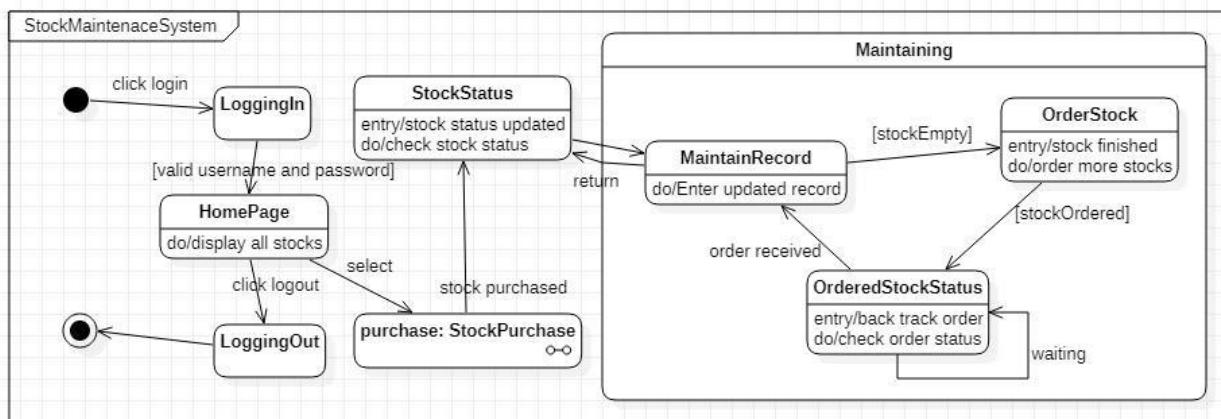


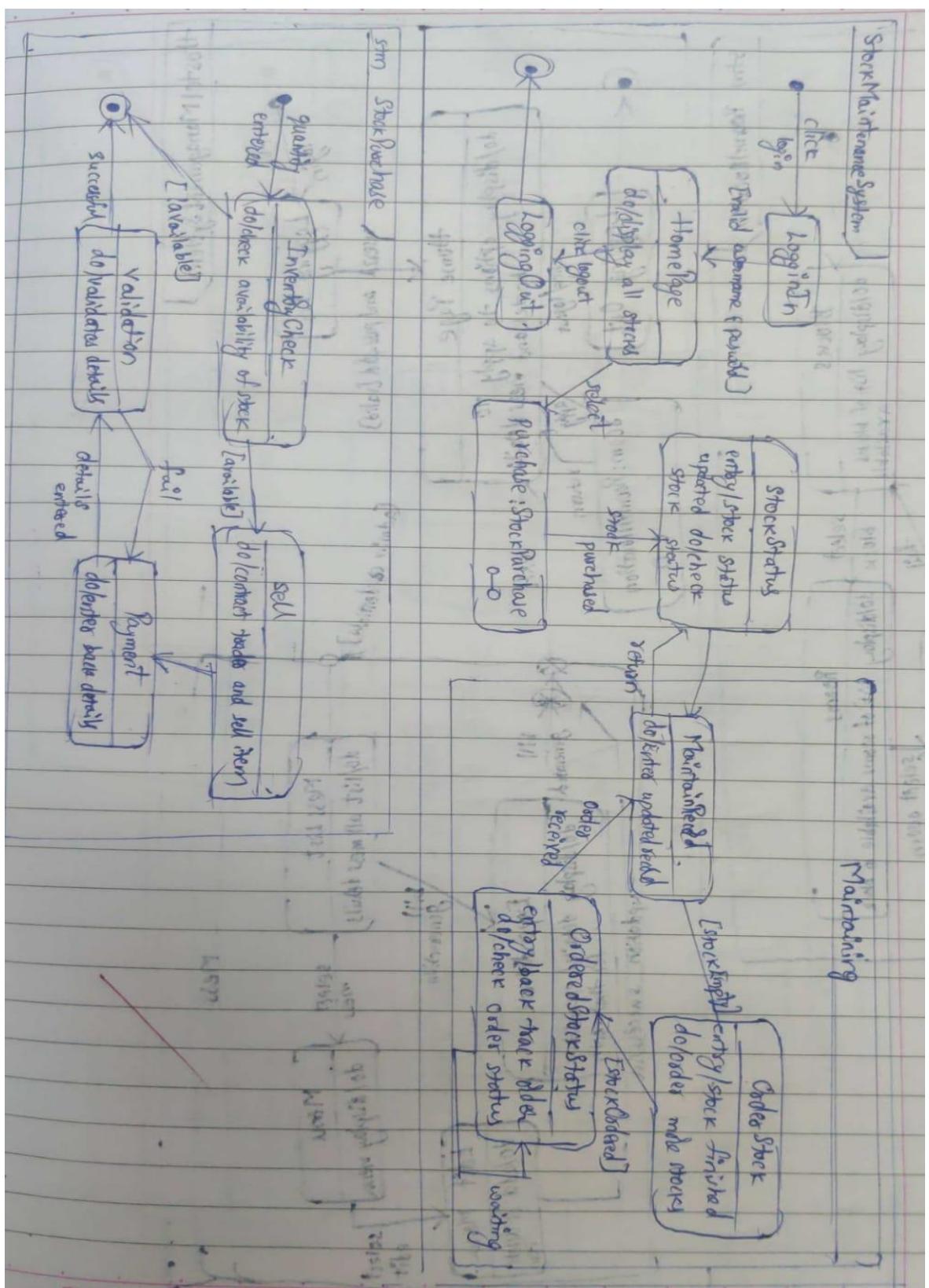
STOCK MANAGEMENT SYSTEM



Justification: A store has several substores generalized and composed of many products which are in turn associated with vendors. Every customer buys a product hence associated and pays the bill for stock purchased. All the stocks are aggregated to the product.

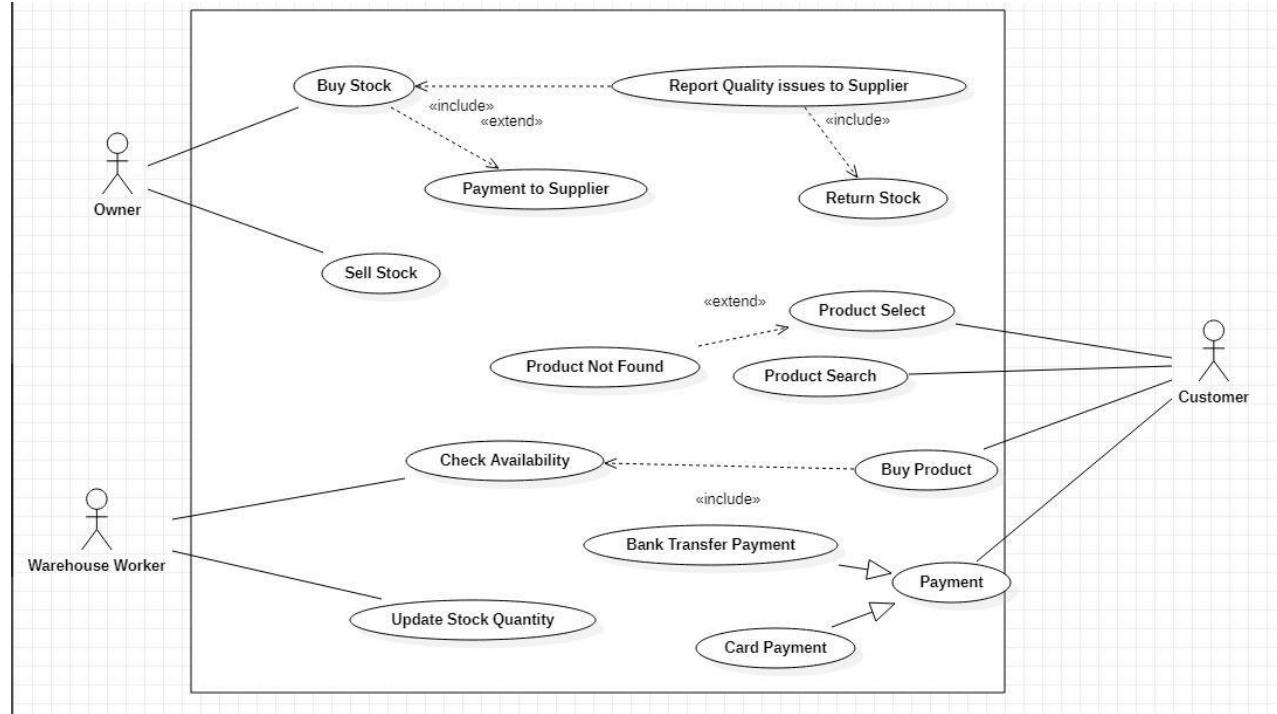
c) Advance State Diagram:

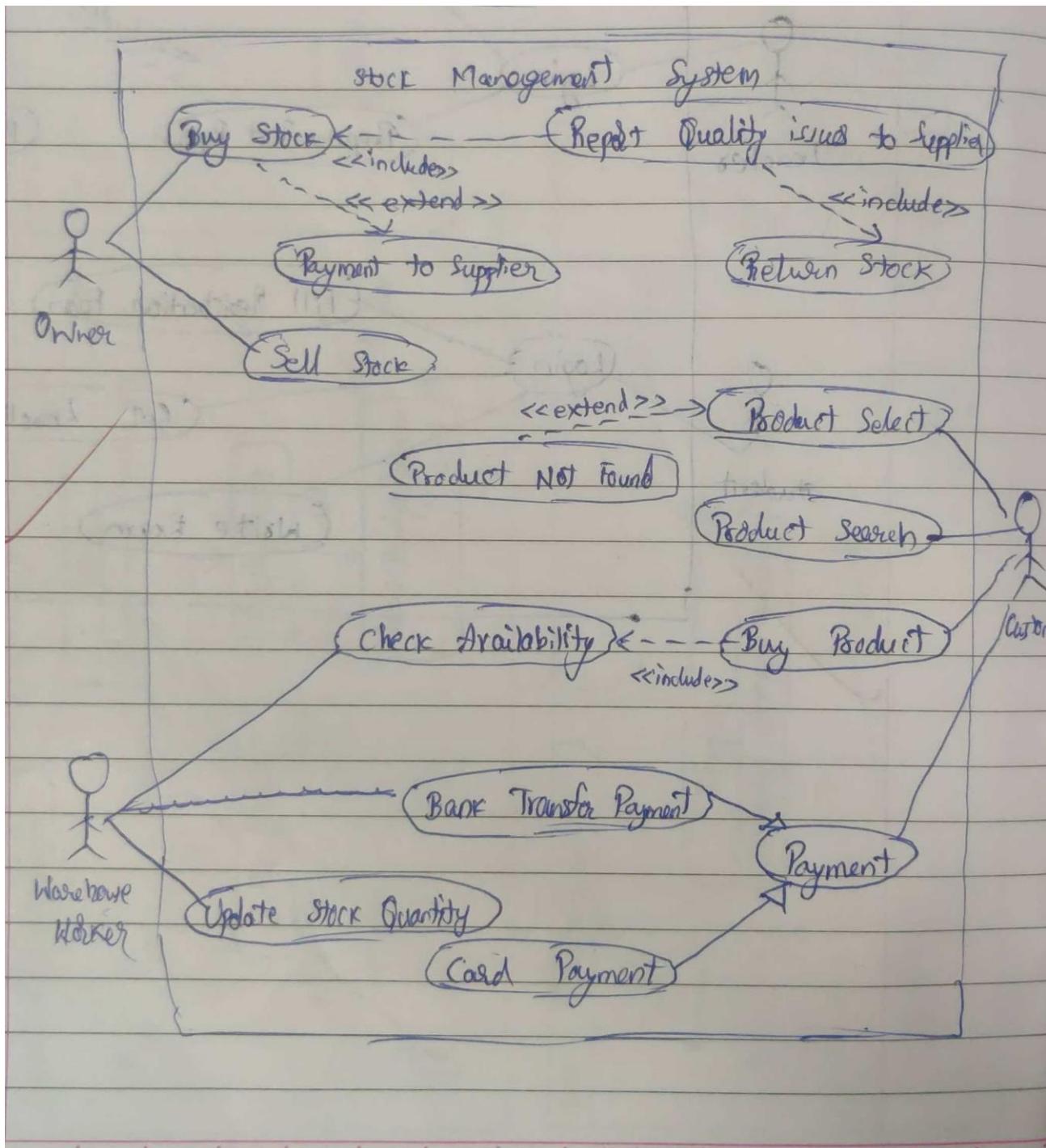




Justification: This machine explains a scenario of maintaining stocks and order of purchase. The details of the management are mentioned in the sub machine and all the respective transition and conditions are mentioned with all activities in detail.

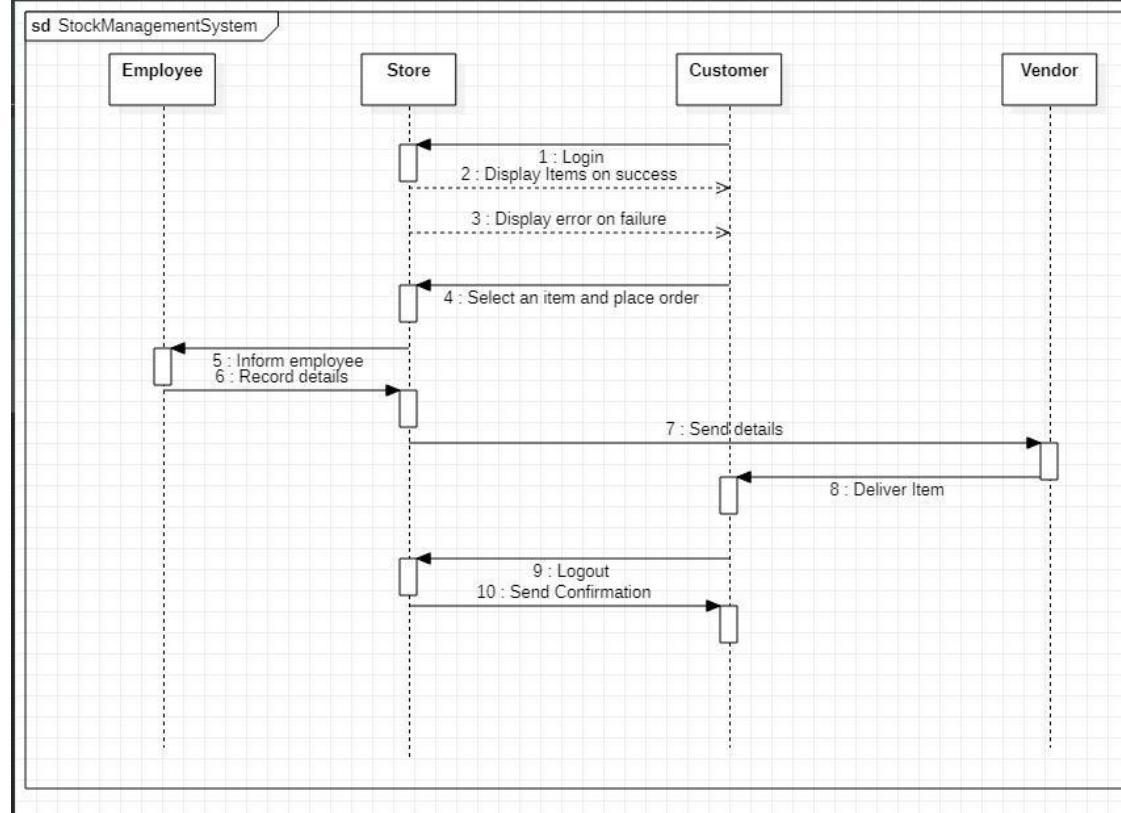
d) Advance Use Case Diagram:

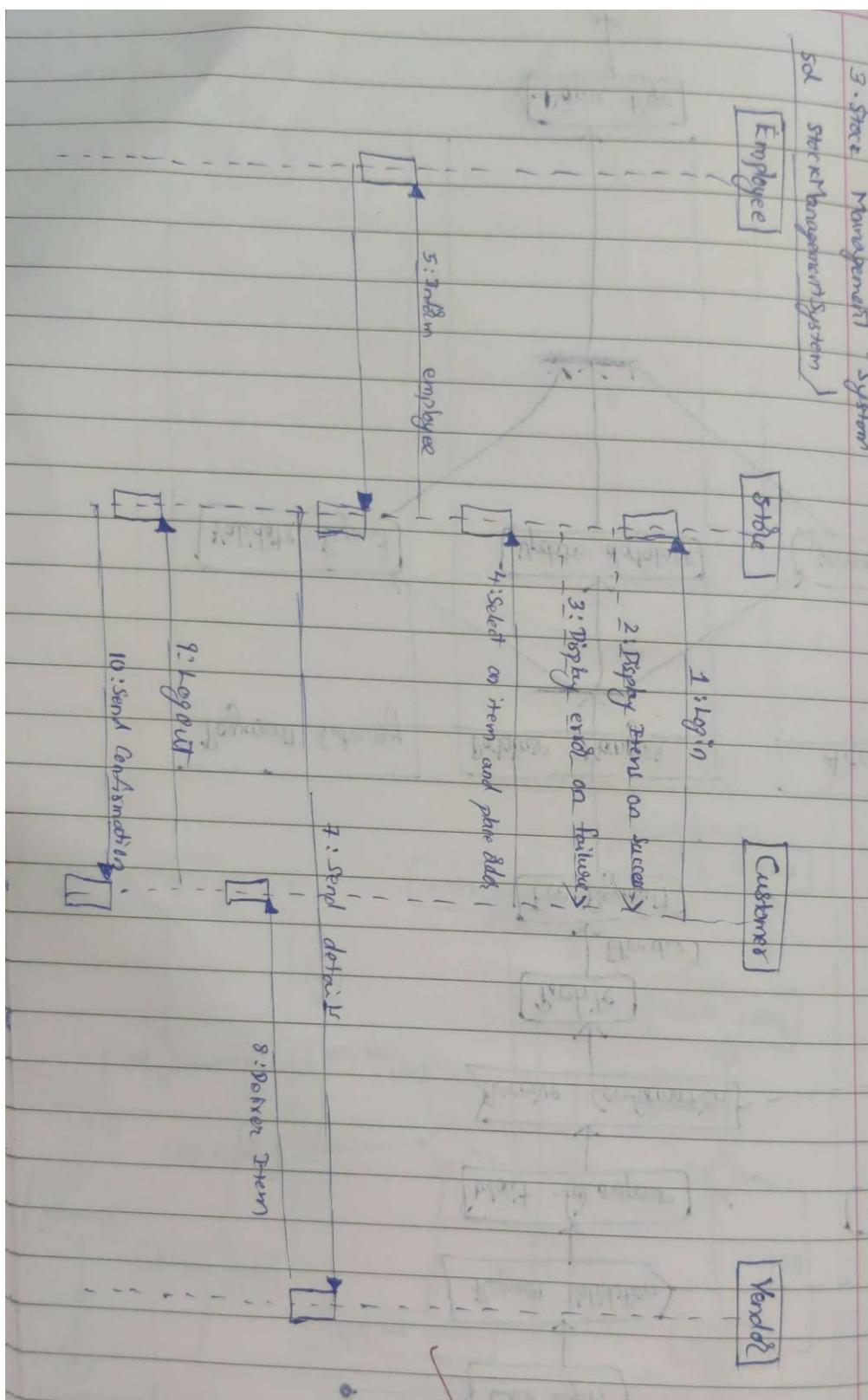




Justification: All functions for the given system are mentioned and actors such as customer, worker and owner are assigned appropriate roles and functionalities.

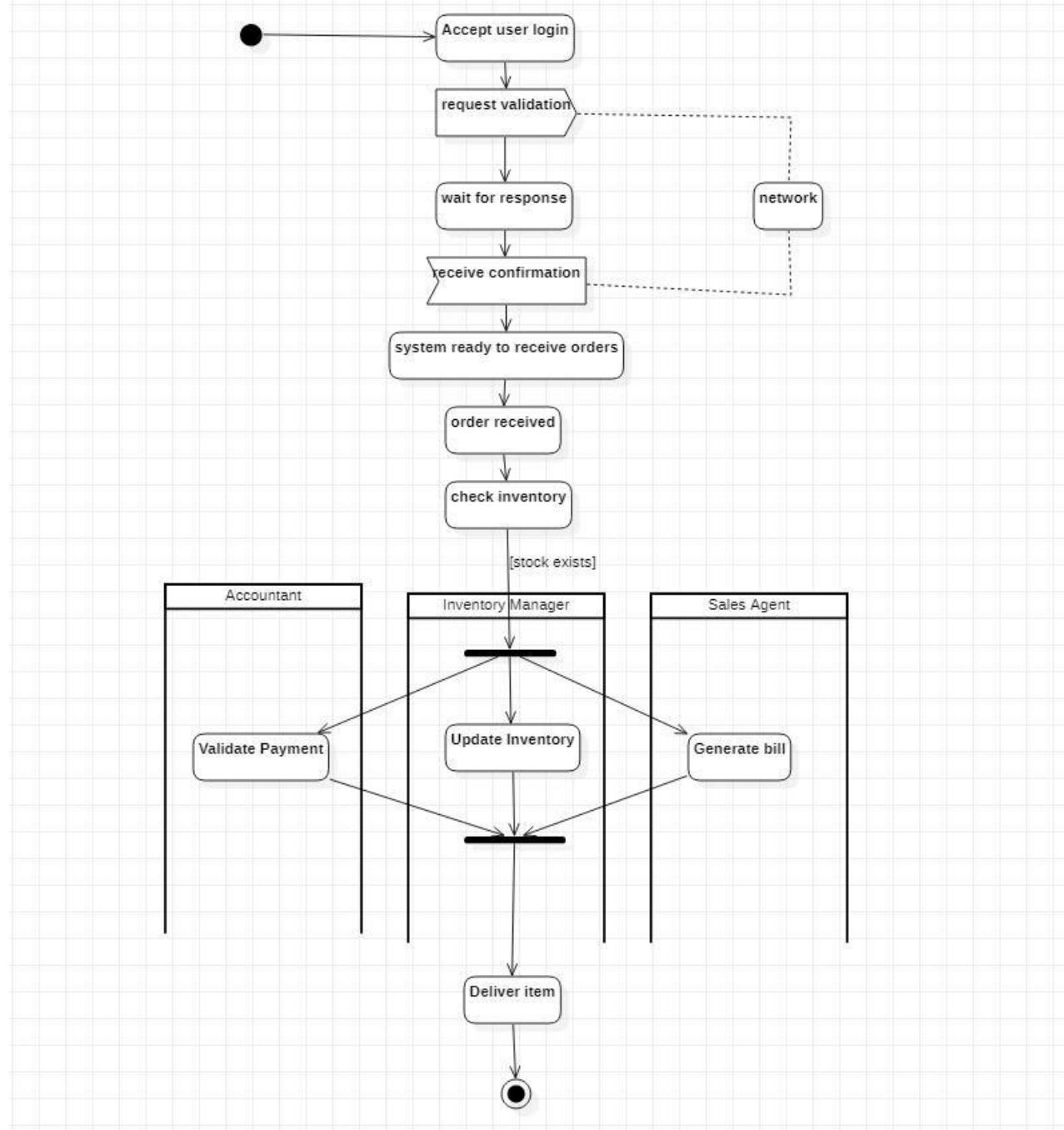
e) Sequence Diagram:

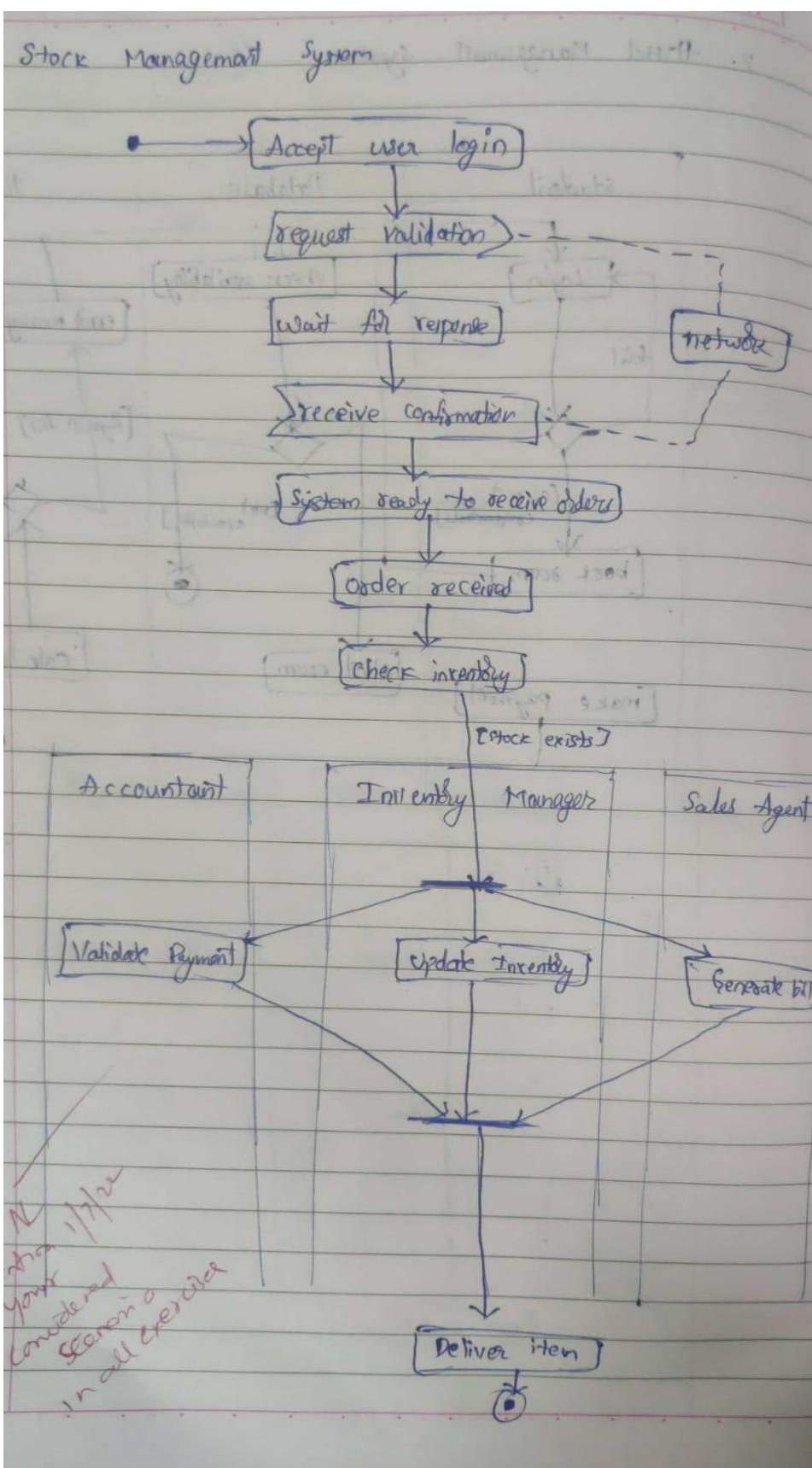




Justification: The given model shows the complete interactions of the customer with the vendor and all the steps in the process of login, search and selecting the stocks and purchasing them. All fields are updated accordingly

f) Activity Diagram:





Justification: The given activity diagram gives complete system interaction with user, explains from user's login, validation of credentials and management activities.

4. Coffee Vending Machine

a) SRS:

COFFEE VENDING MACHINE

Problem Statement :

The coffee used to get in hand by the third person. It is not good in these pandemic situation and it is lack of hygiene.

SRS :

Coffee vending machine is designed to dispense coffee in required quantity by collecting information such as type of coffee from customer and estimating price and quantity necessary for preparation of particular type of coffee.

→ Controller should dispense the correct product, check availability of product, update product quality of the each dispense.

→ The selection panel sends states of selected product.

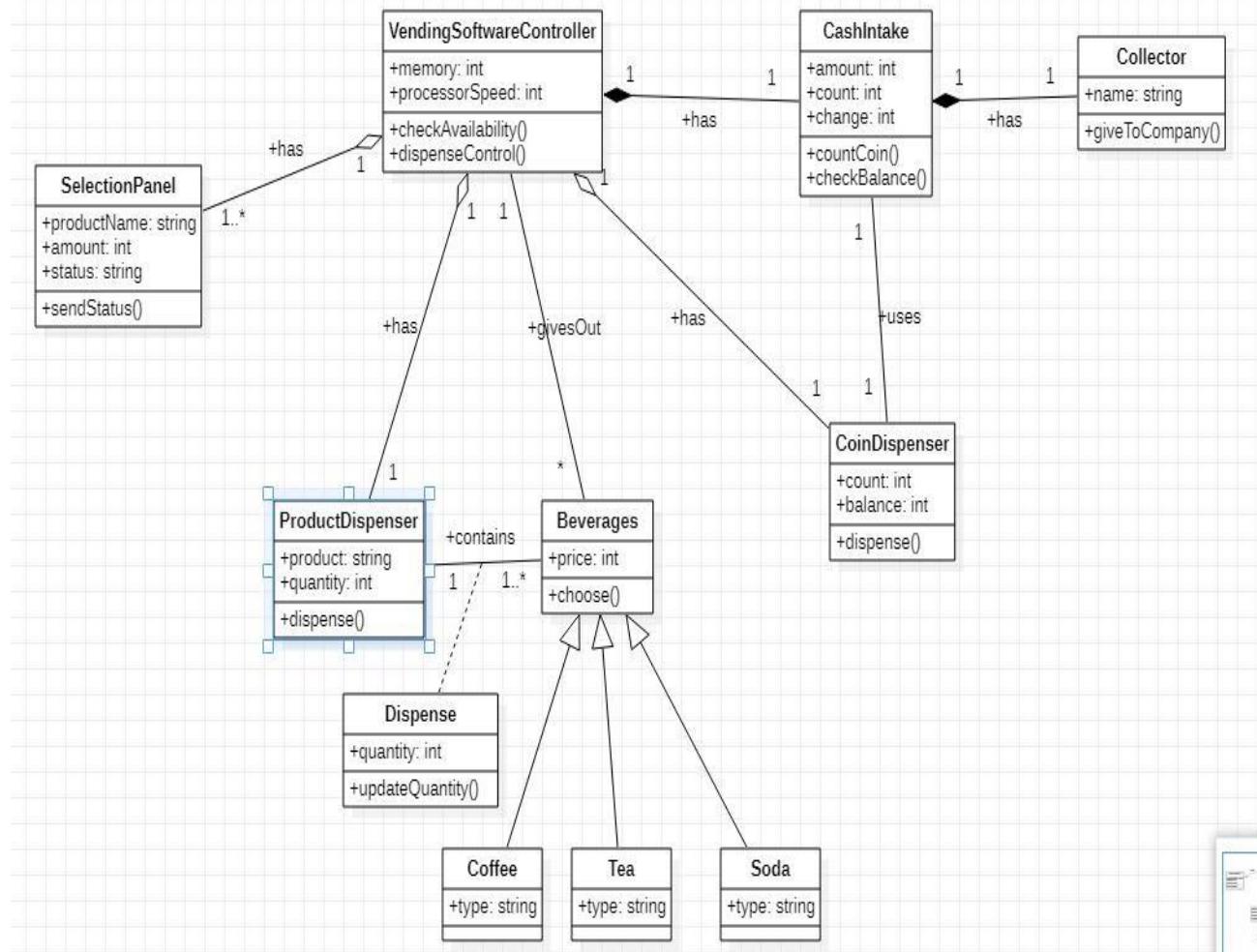
→ The can collector should count the coins given by customer and keep track of it.

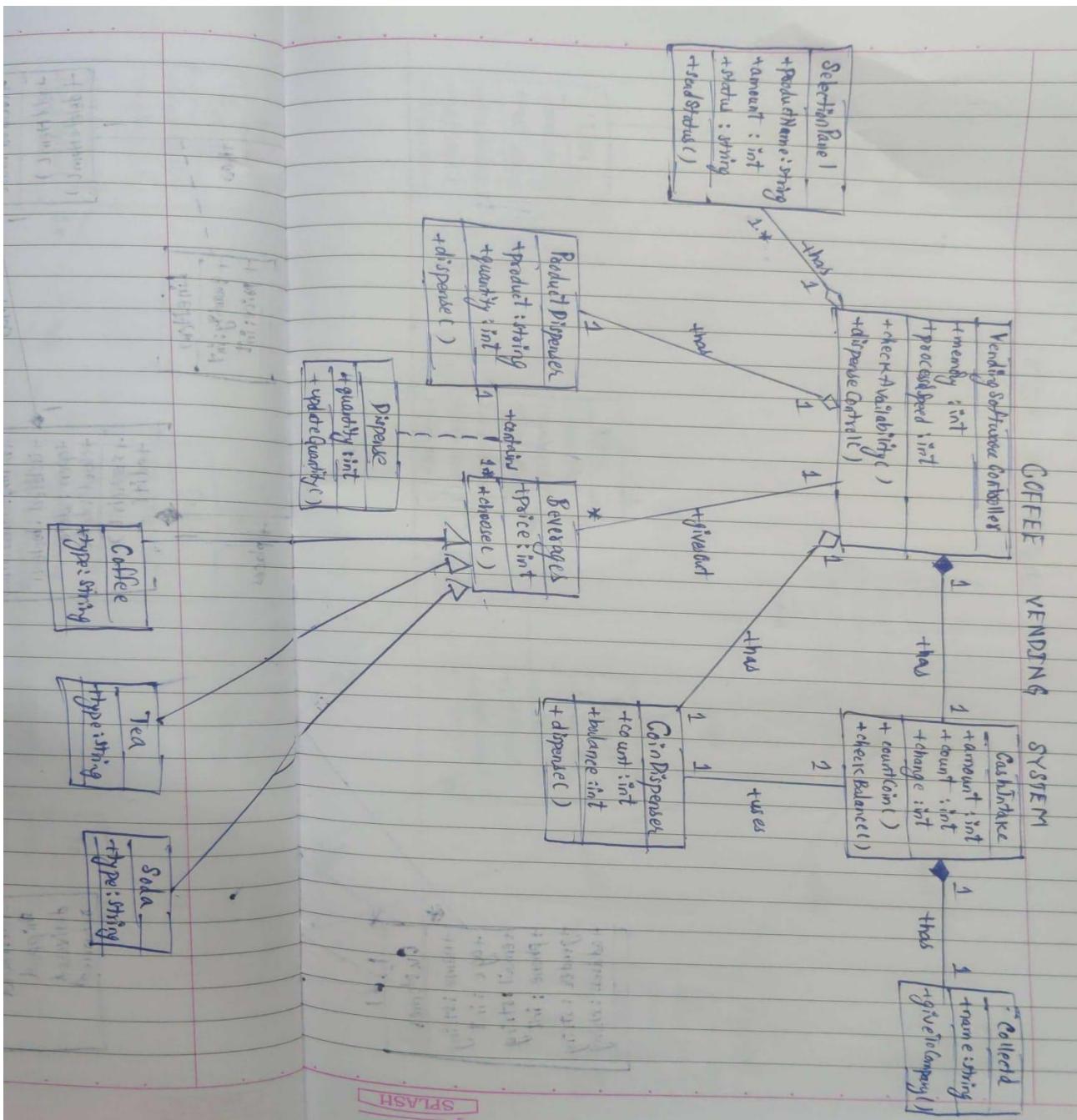
→ Product dispenser should dispense the selected product.

→ The price and quality of product should be maintained.

→ Coin dispenser should disperse remaining amount to the customer.

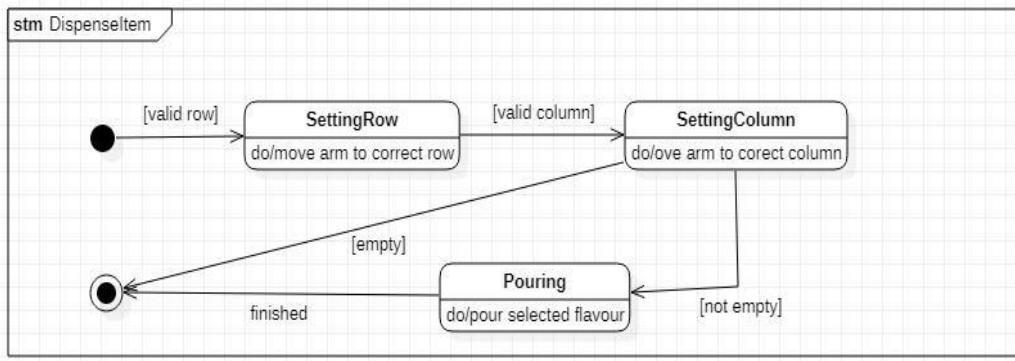
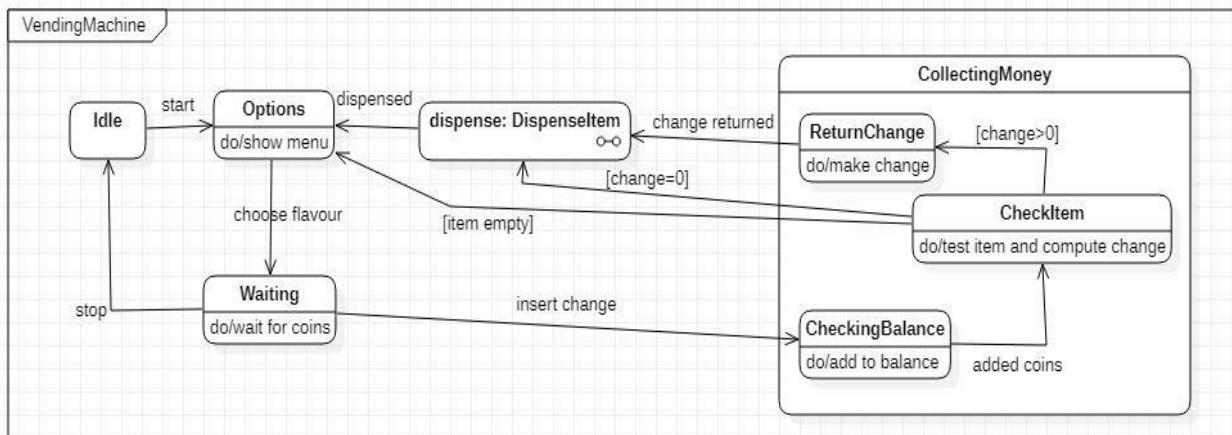
b) Advance Class Diagram:

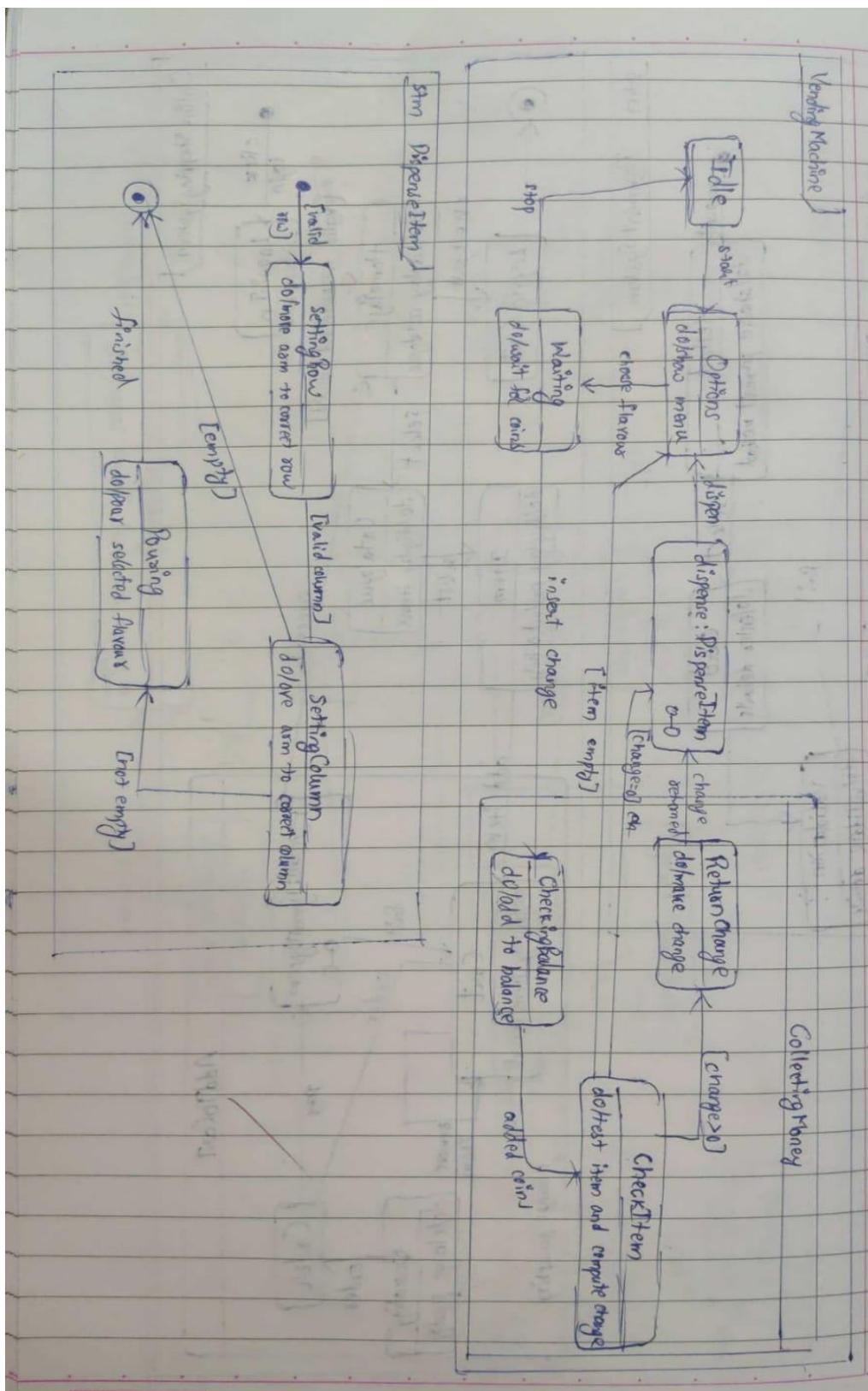




Justification: A coffee vending machine which has coin, product dispenser and coin collector as independent parts and hence they are aggregated, which is composed of product which is in turn composed of coffee, tea and milk. We use association with direction to link to them. Product dispenser is composed of products hence composition.

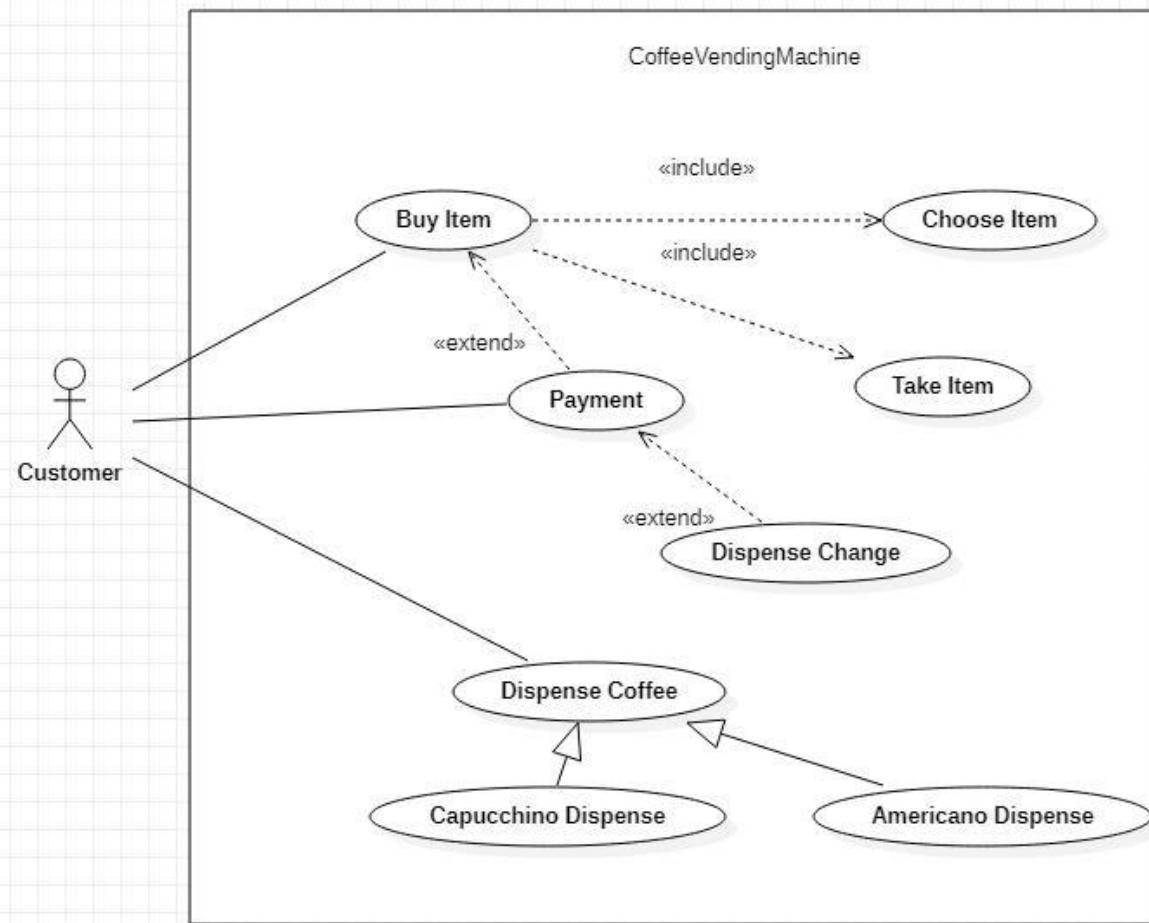
c) Advance State Diagram:

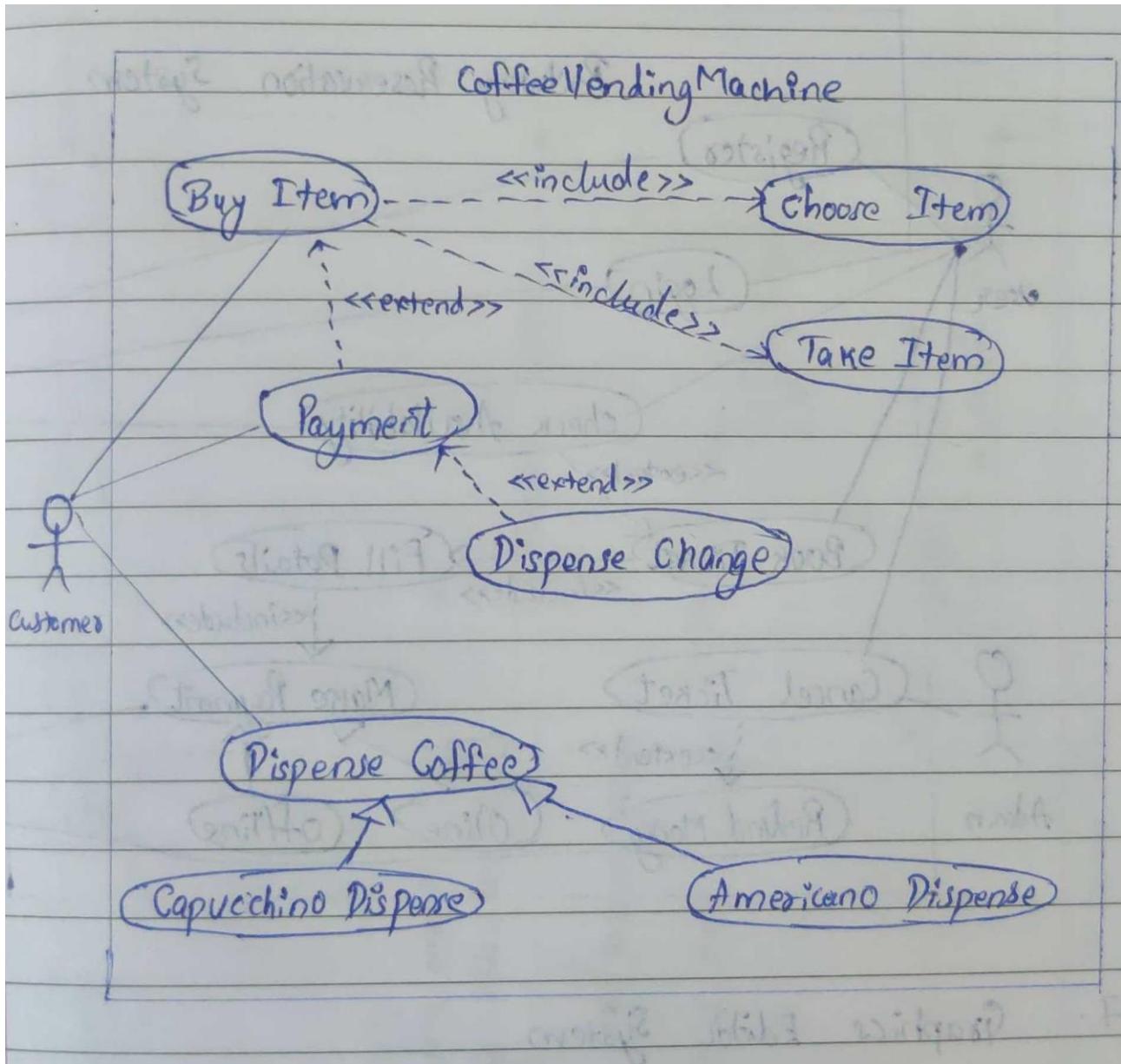




Justification: For the given application, all the respective functions of all the parts are mentioned with all involved actors customer, seller, system and operator.

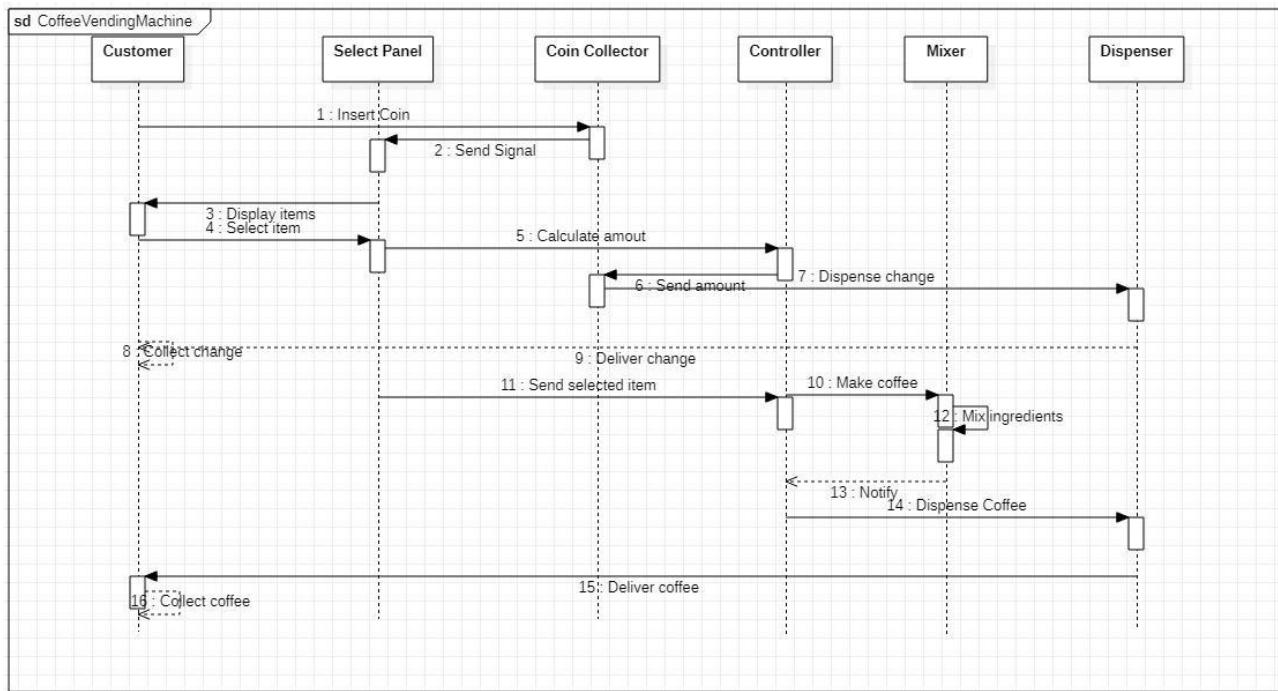
d) Advance Use Case Diagram:

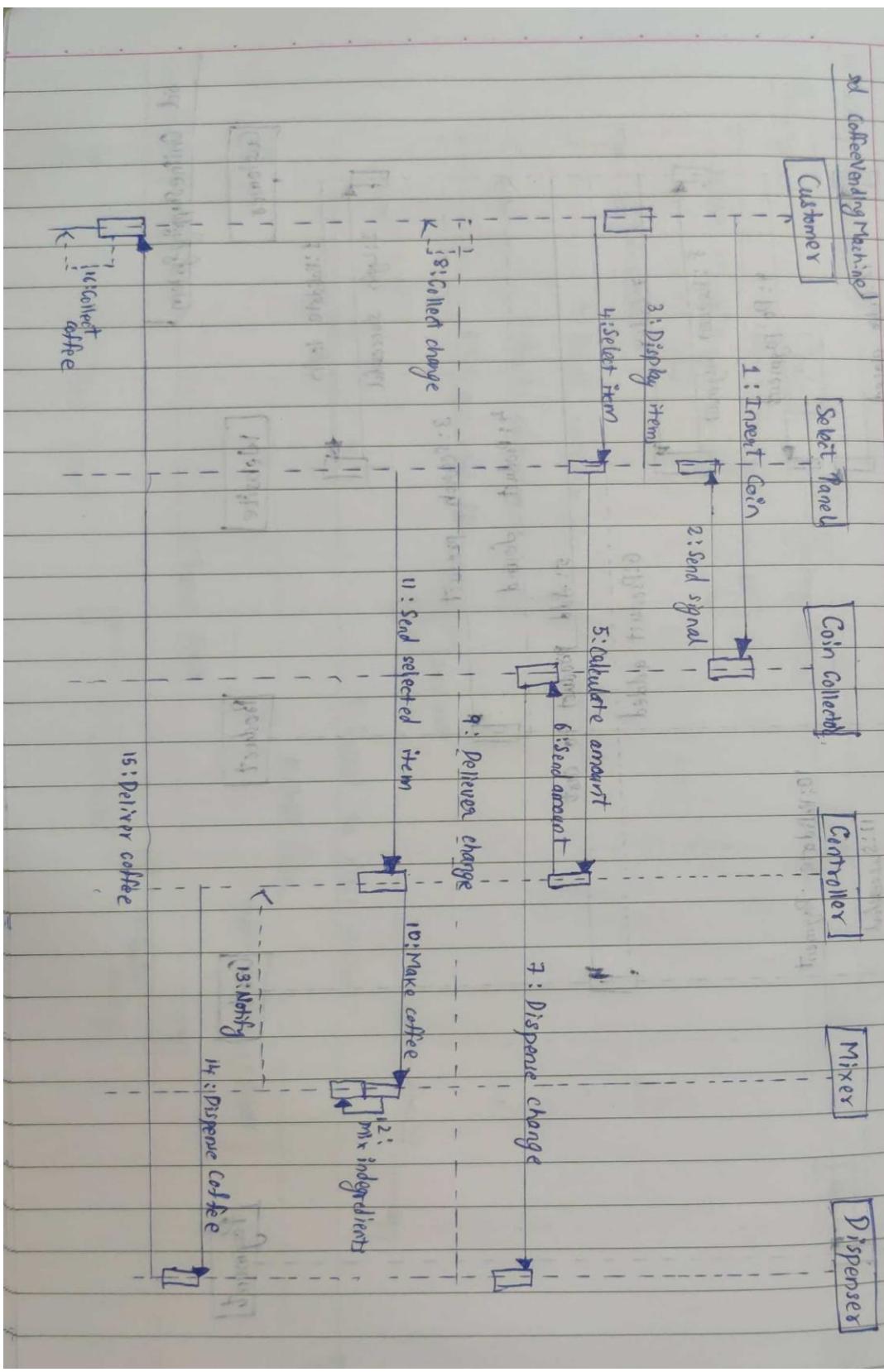




Justification: The given model shows all the interactions of the customer with the coffee vending machine with all respective parts and shows the complete process of how the coffee is dispensed by the system and delivers change.

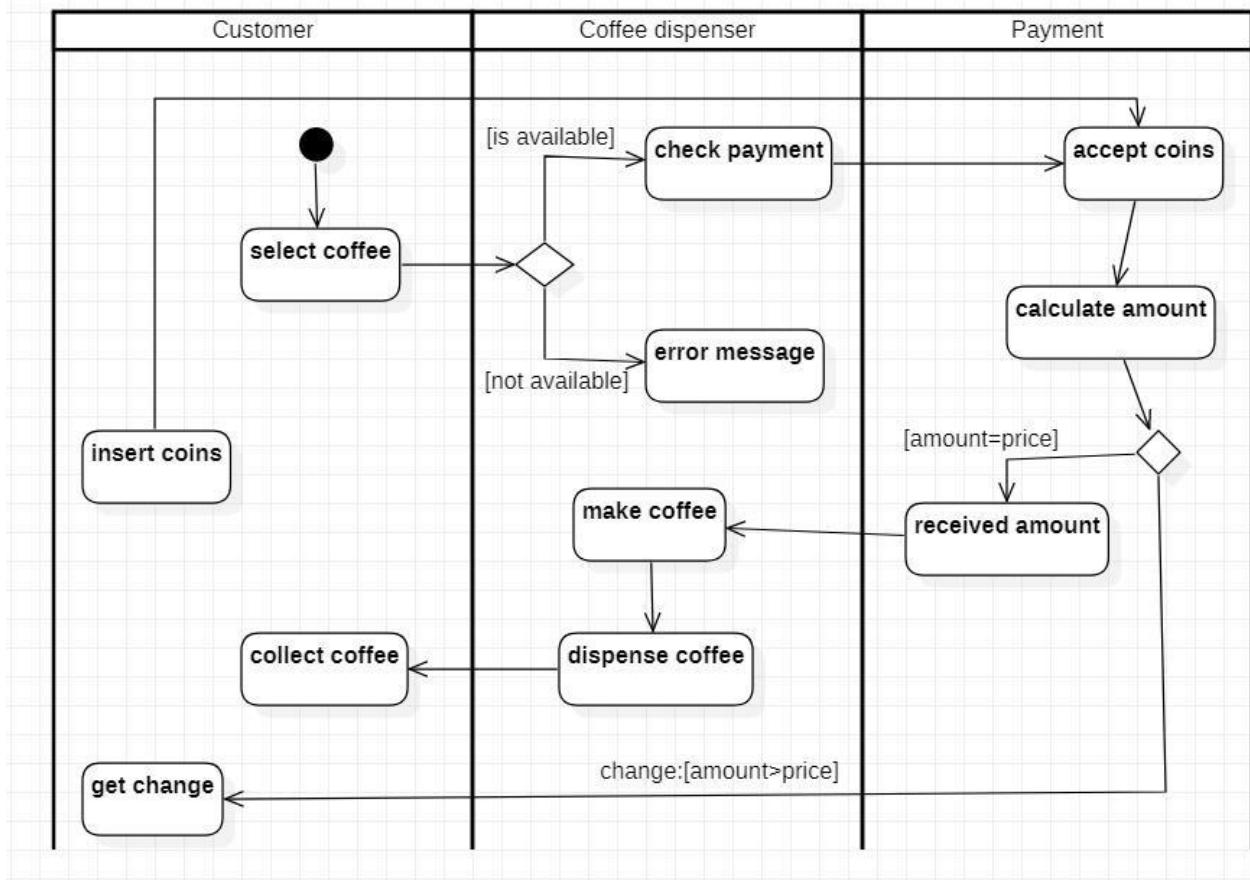
e) Sequence Diagram:

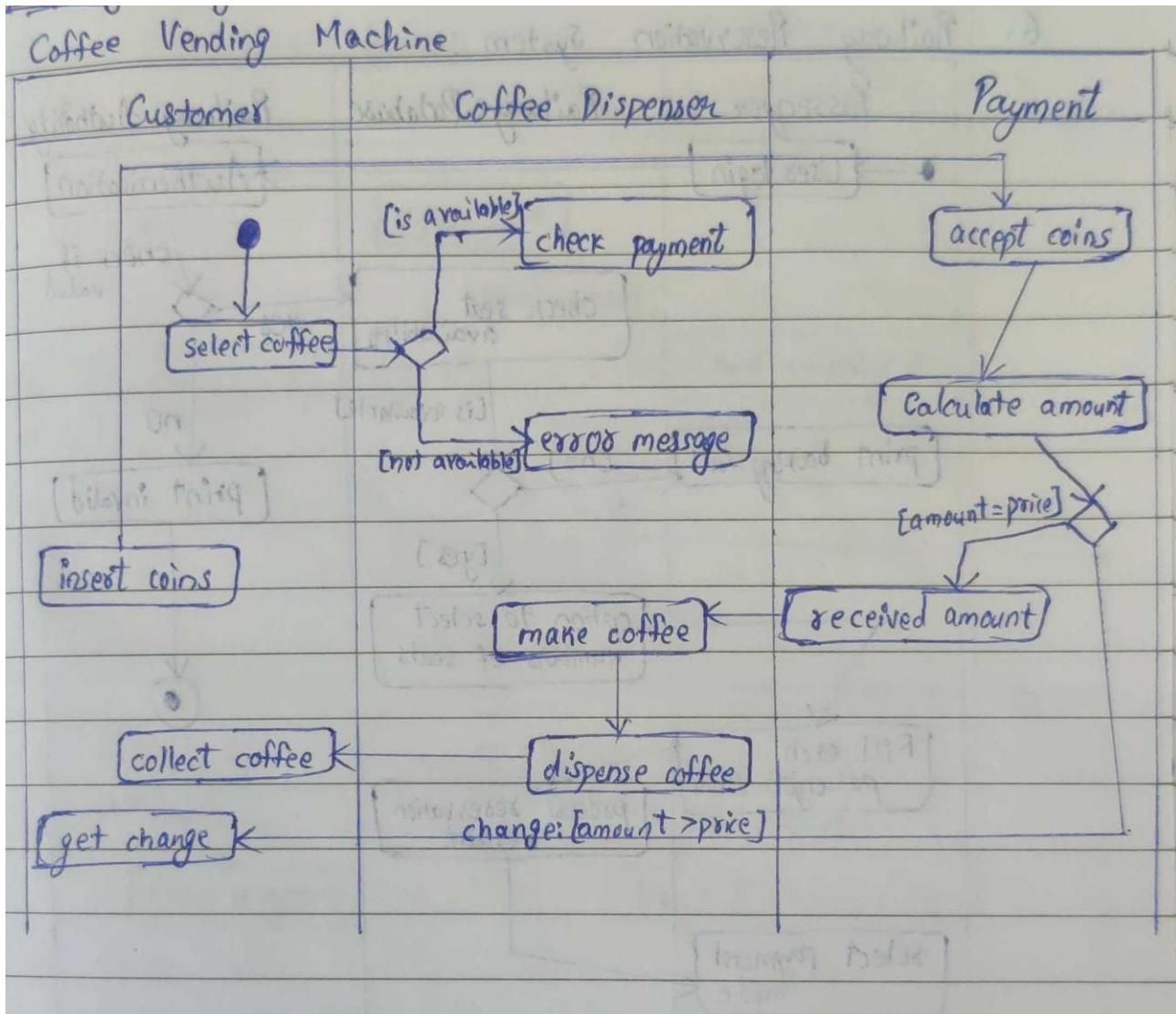




Justification: The given sequence diagram shows the appropriate sequence of processes with respect to the given system. It shows how user enters input and system responds appropriately.

f) Activity Diagram:





Justification: The given model explains the complete interaction between customer and the system from selecting the type of coffee, entering money into the machine and dispensation of the same.

5. Online Shopping System

a) SRS:

ONLINE SHOPPING SYSTEM

Problem statement:

The local shopping system does not have much collections. It also has the quality issue and price issue.

SRS:

The online shopping system allows the user and vendors to exchange products remotely and reduces the amount of cost and time substantially.

The software provides following facilities to customers:

- Facilities easy shopping online anywhere with free shipping.
- Provides information about products in category.
- Can avail the facility of purchasing second hand products.
- Customers are provided with upto date information on the products available.
- Provides email facility.
- Provides backup facility.
- Can add nearly ten products to their shopping cart at a time.

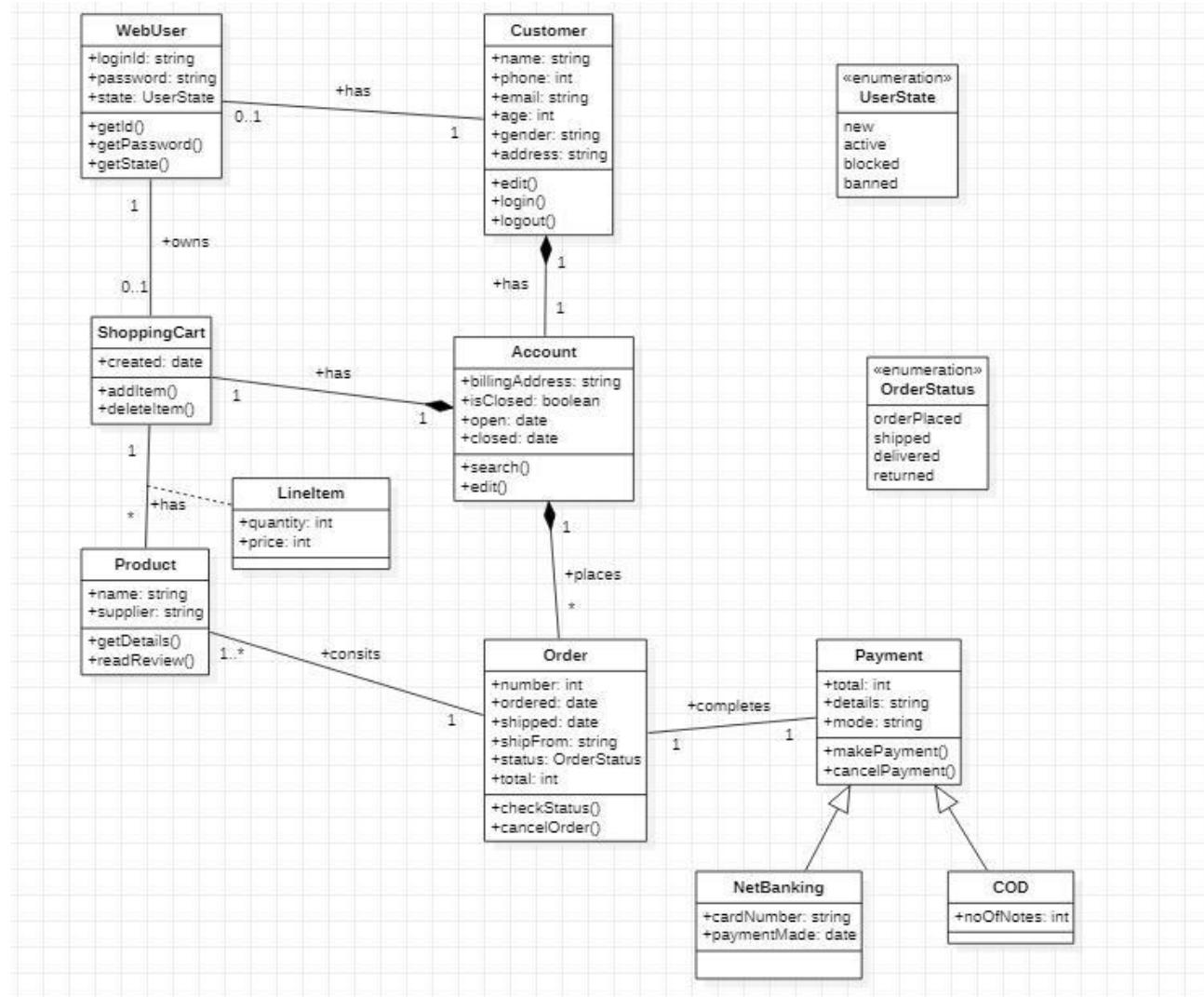
The software will not provide the following facilities to customers:

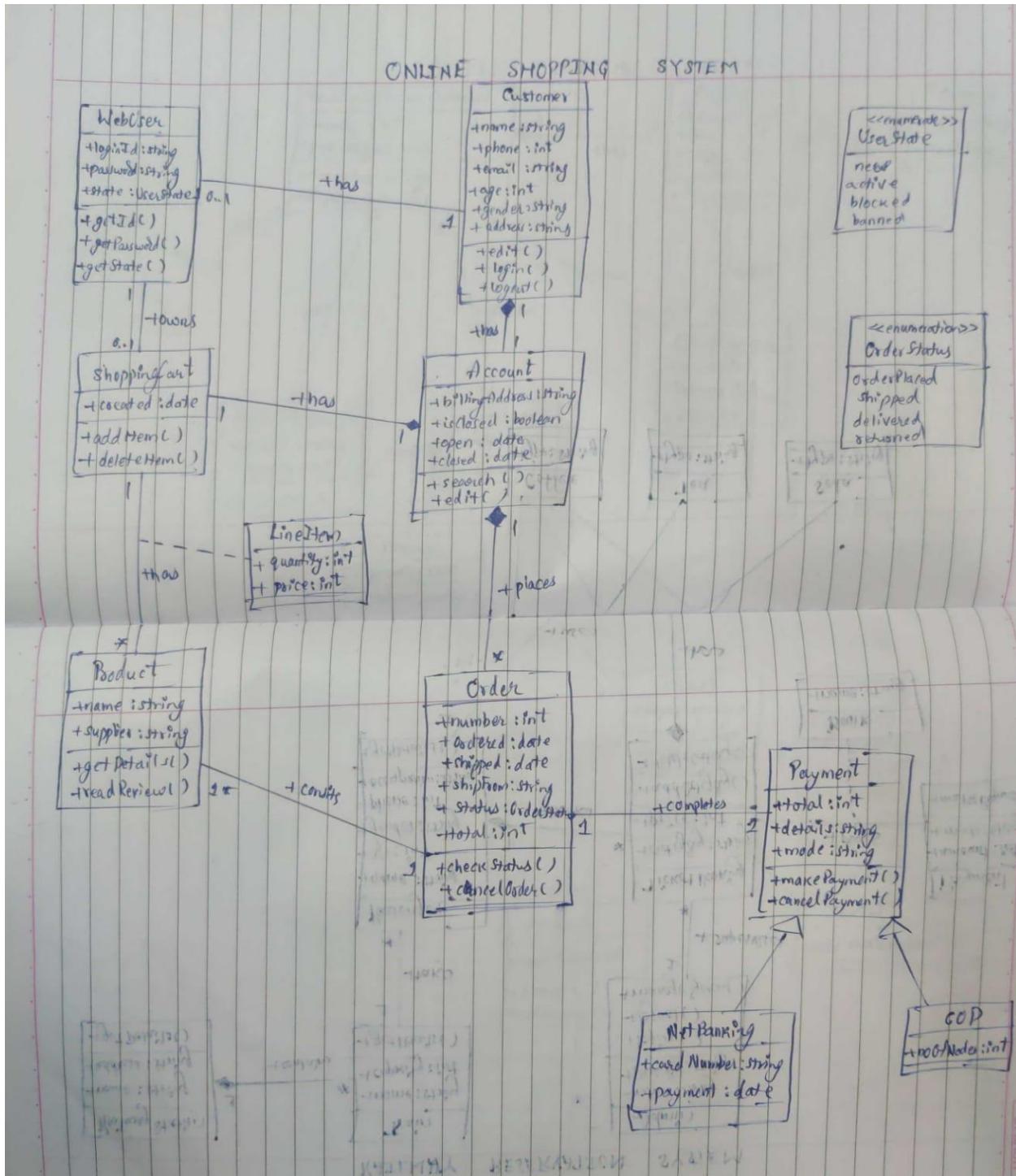
- Cannot reverse the products for more than two days.
- Cannot reverse more than two products.
- Responsibility of damages.

The software provides following facilities to merchants:

- Facilities easy bidding.
- Provide complete information about the customer.
- Provides complete information about the product.
- Can avoid the facility of email correspondence.
- can avail the brand catalog facility.

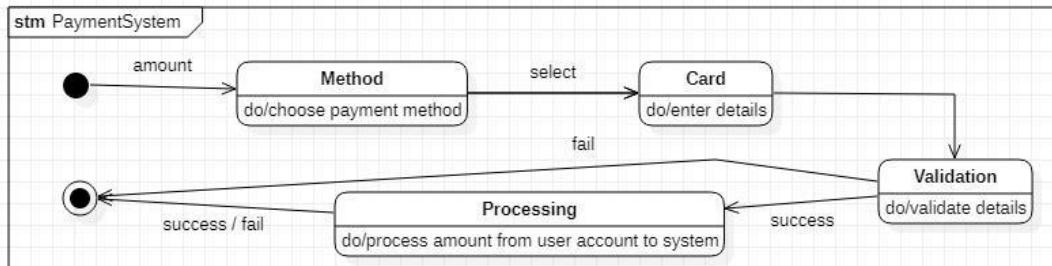
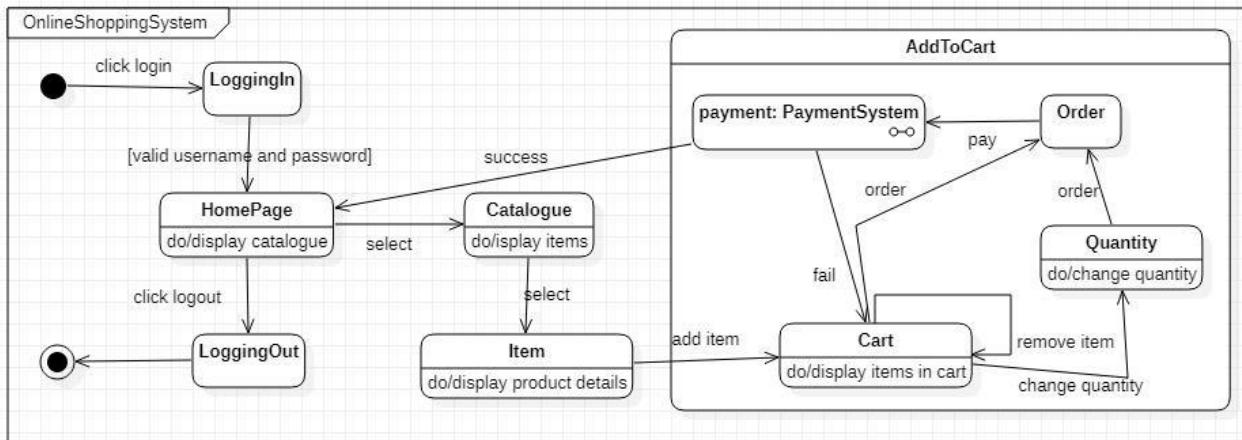
b) Advance Class Diagram:

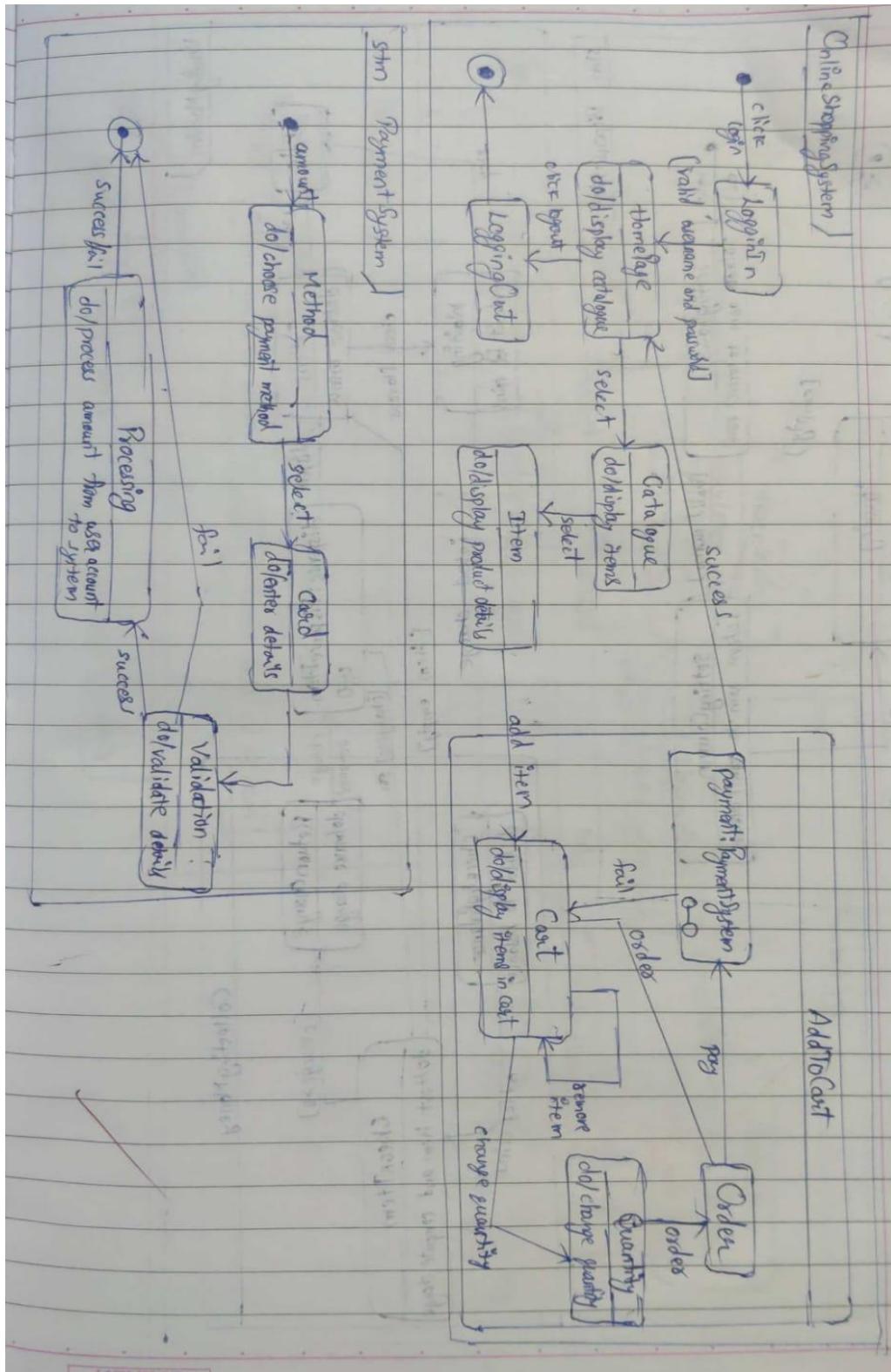




Justification: Every customer is linked with an account using id, where the account cannot exist without the customer, so it is composed. Every account has a shopping cart and order is associated with items which are placed in the shopping cart. Items are aggregated with products which are generalized into various classifications. The account, payment for the order to the bill is linked by association.

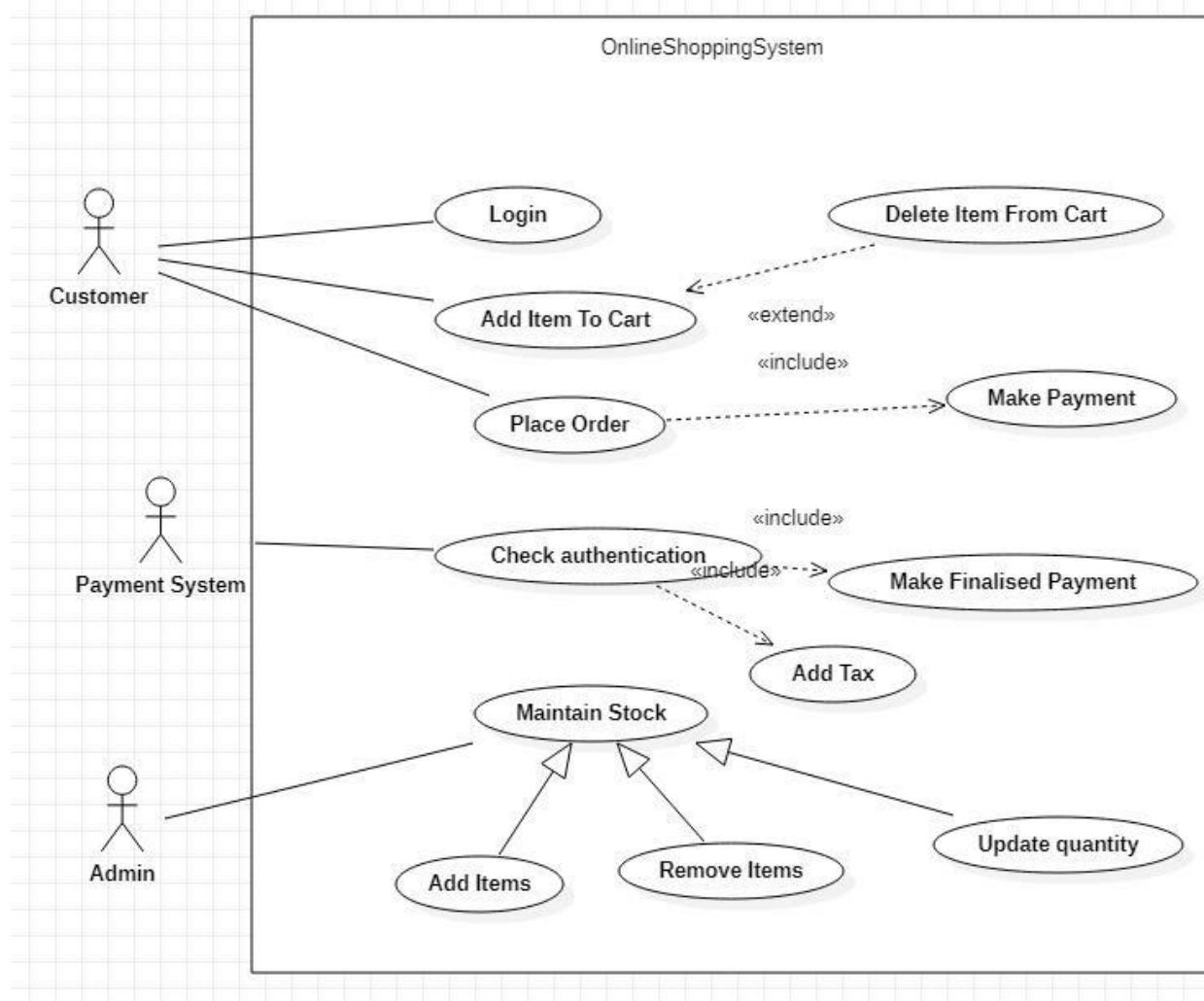
c) Advance State Diagram:



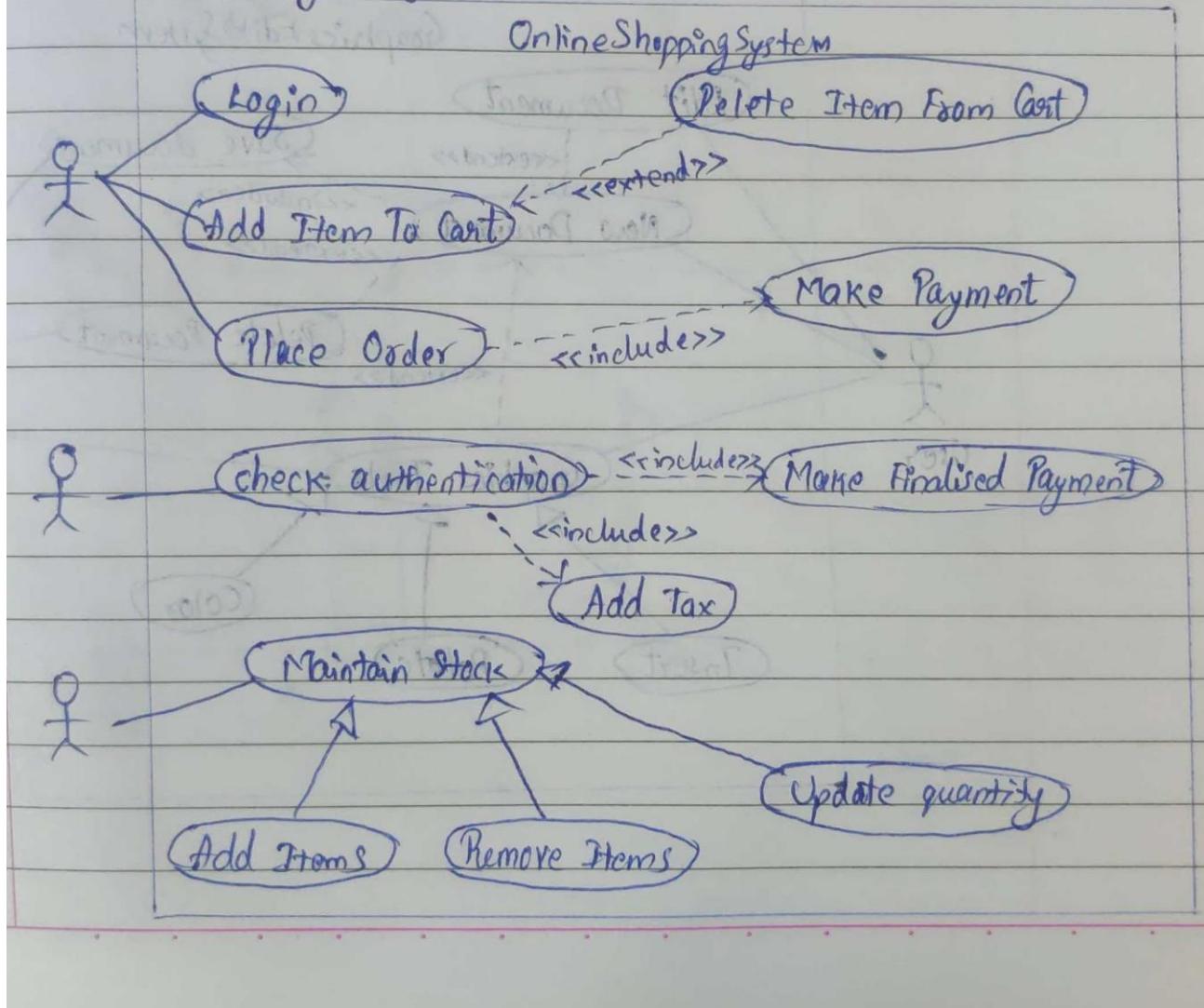


Justification: The given model explains with respect to an add to cart and payment system scenario with proper transactions and actions. The detailed composition and submachine model with the proper details.

d) Advance Use Case Diagram:

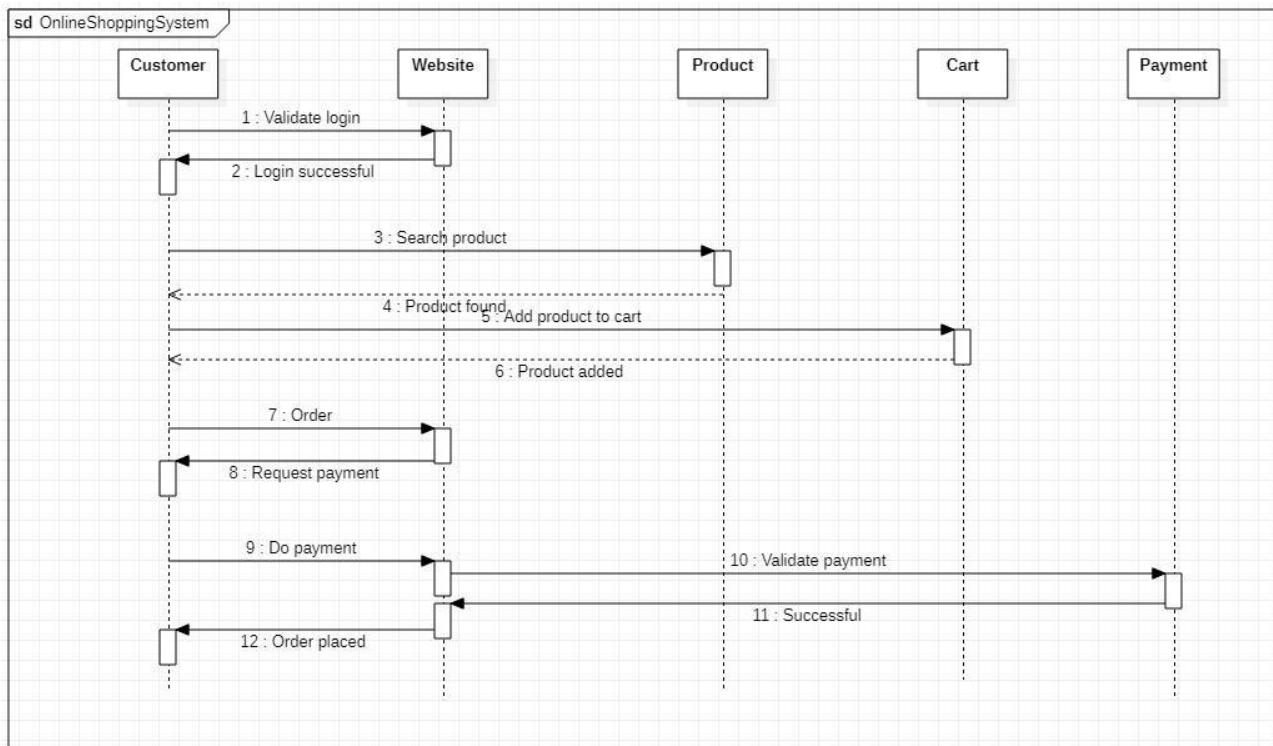


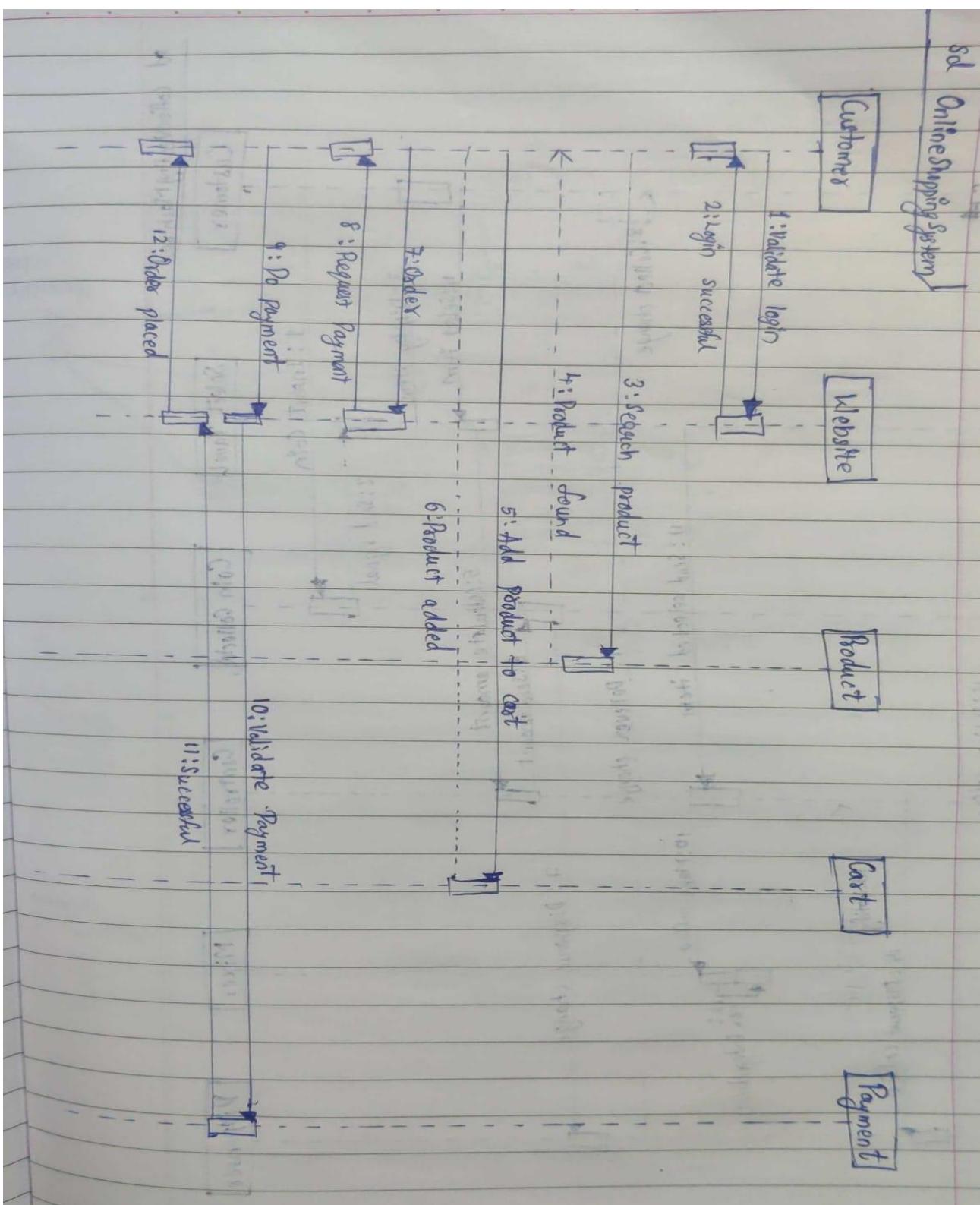
Online Shopping System



Justification: All the functions for the given system are given properly with all functions of the applications and all the actors are like customer, admin, payment system are given and all the relations for the given working is mentioned clearly.

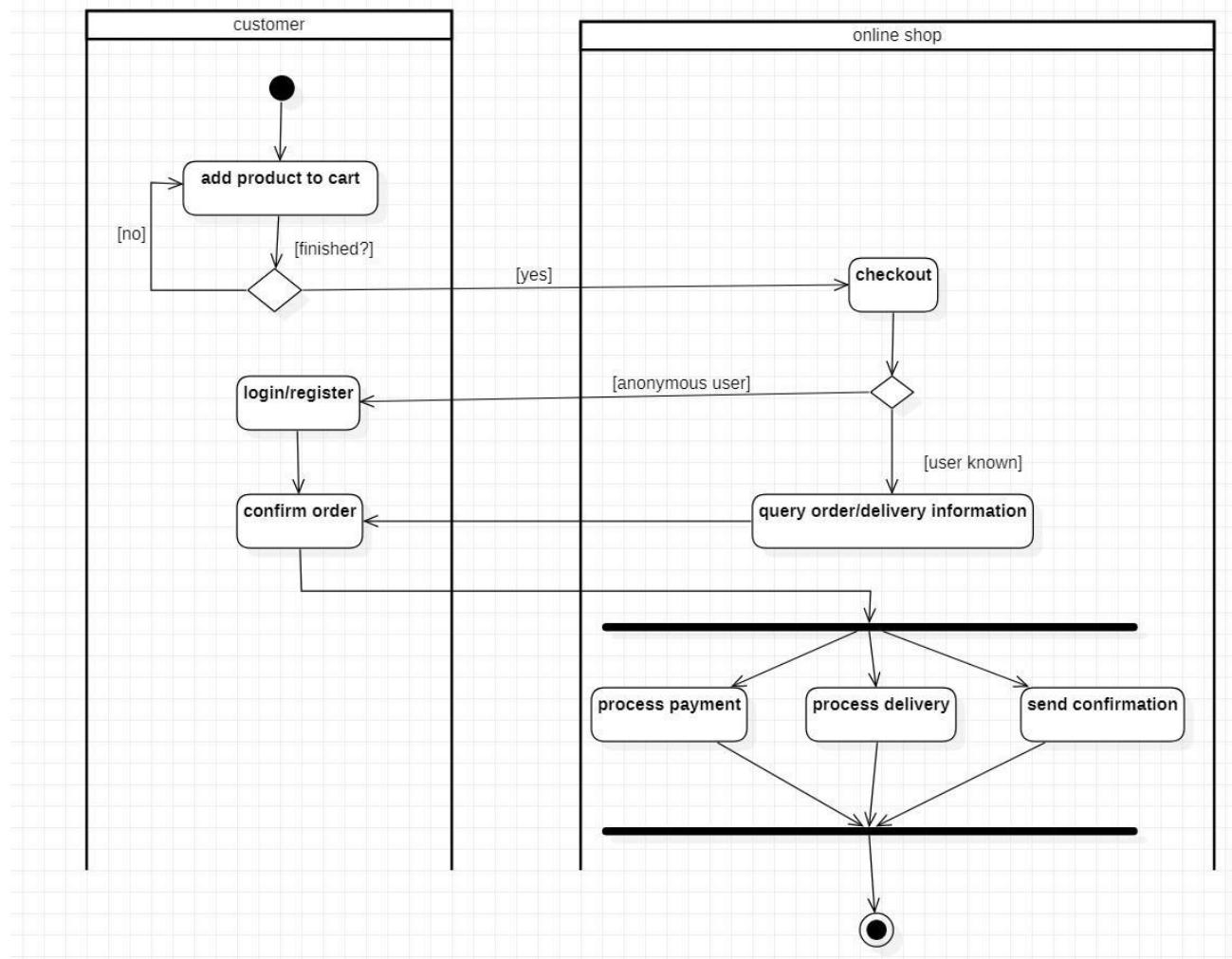
e) Sequence Diagram:

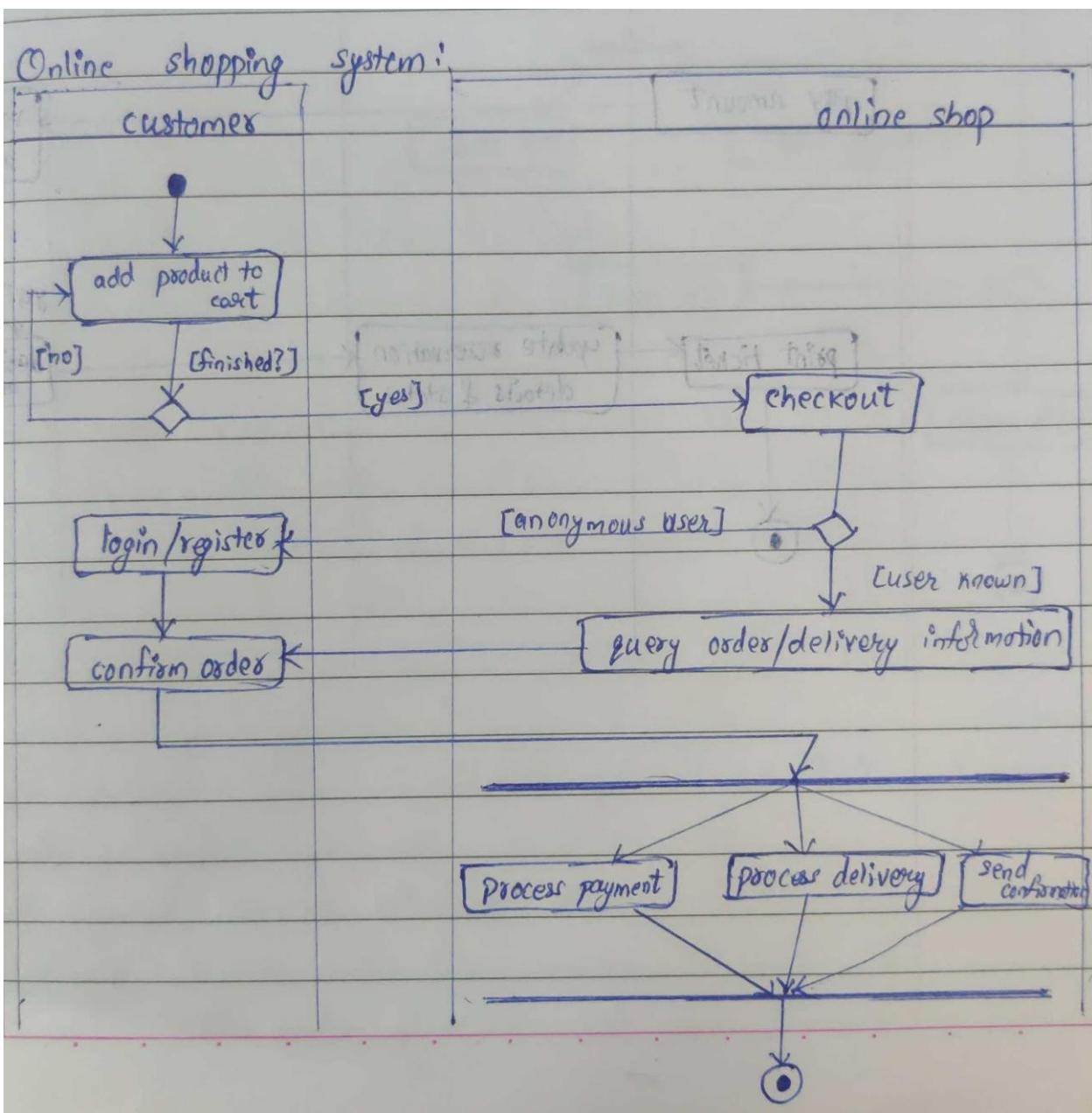




Justification: The given system shows the complete interaction between the customer in the process of purchasing the products from searching to booking to payment and delivery and all the respective activities are mentioned.

f) Activity Diagram:





Justification: The given activity model explains the various interactions between taking place during the given customer login and shops from add to cart checkout and payment to process delivery all the given respective interactions are mentioned.

6.Railway reservation system

a) SRS:

RAILWAY RESERVATION SYSTEM

Problem Statement:

The ticket booking in station is a lengthy process and takes time. It is a waste of time.

SRS:

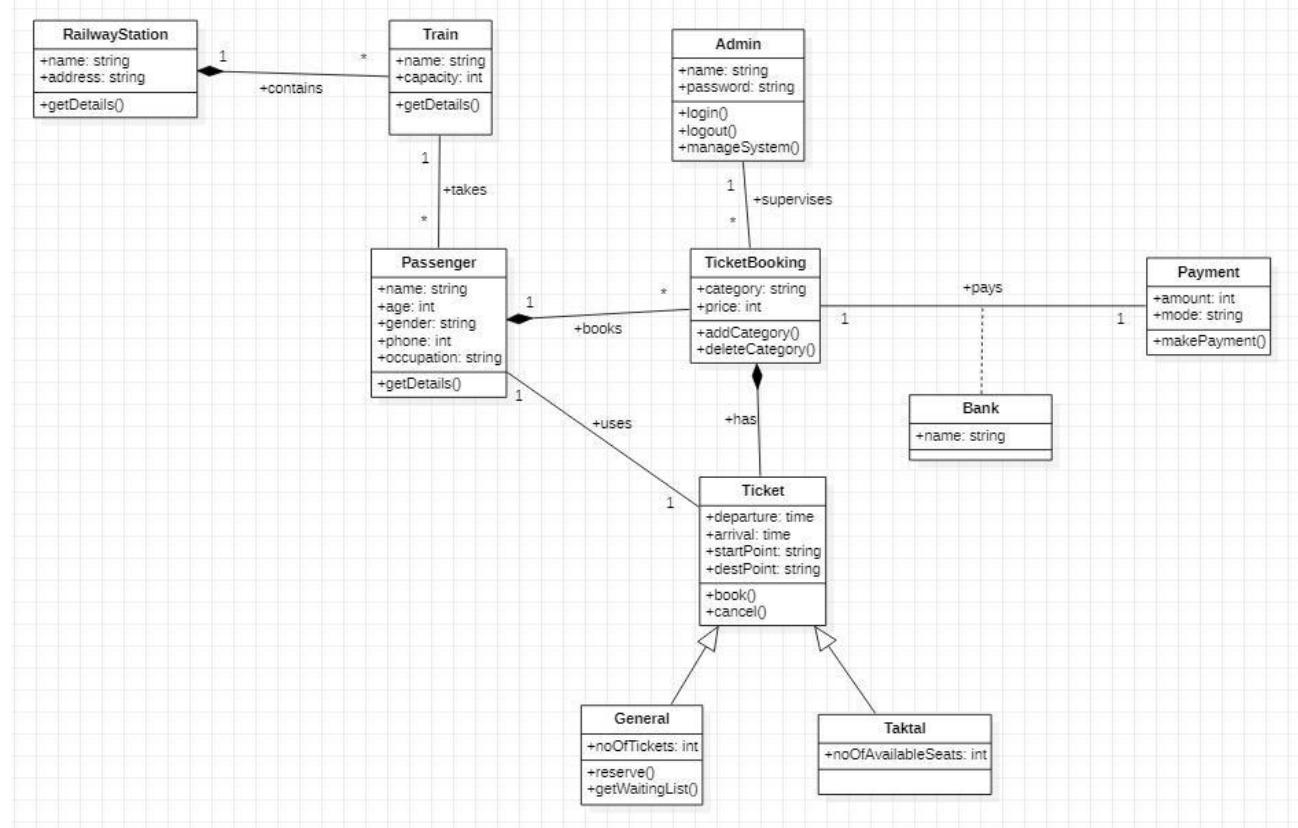
To develop a user friendly railway reservation system to enable passengers to book ticket online and make payment online as well.

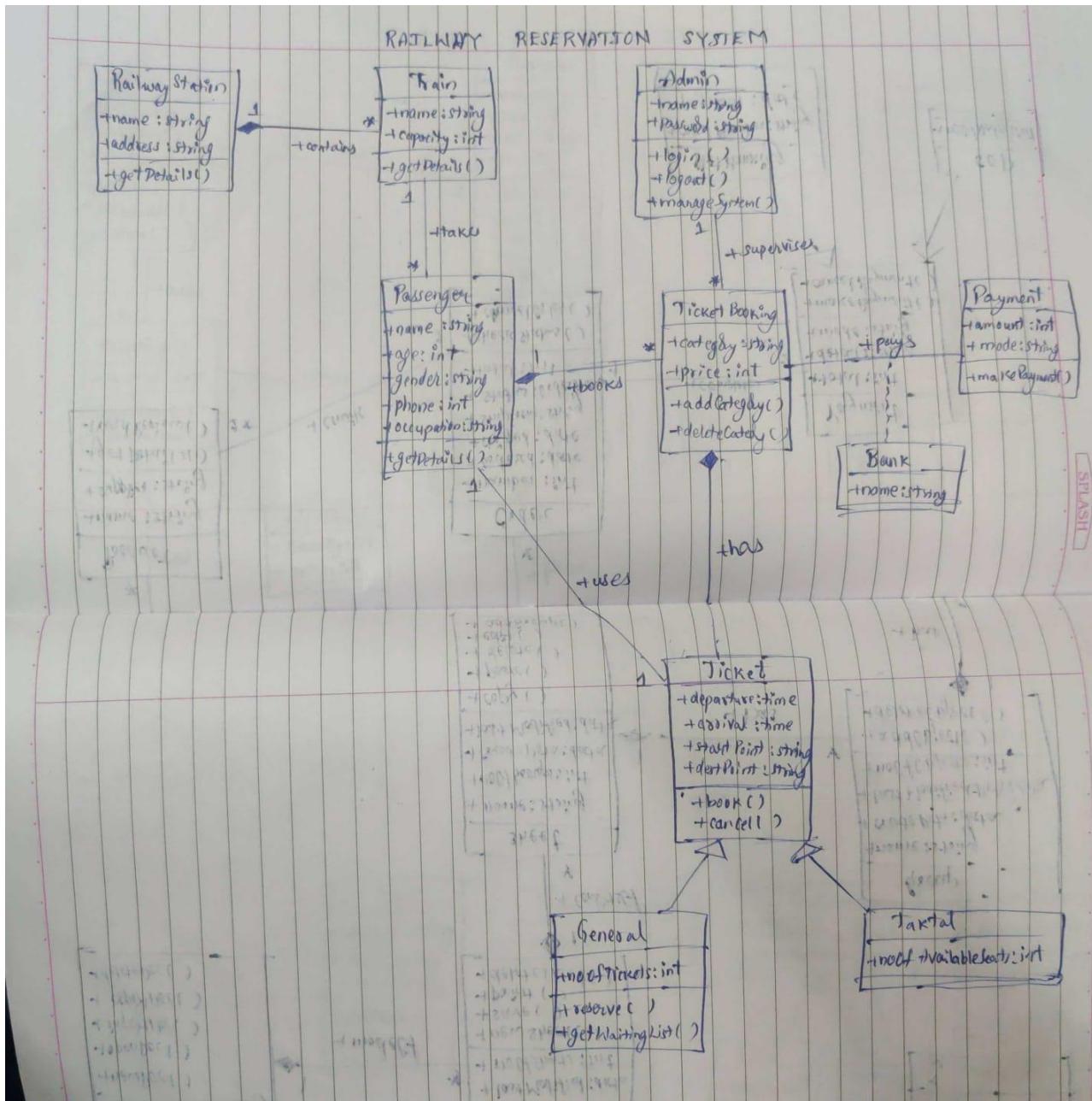
Railway reservation system which provides the train timing details, reservation, billing and cancellation on various type of reservations namely.

- Confirm reservation for seat.
 - Reservation against cancellation.
 - Waiting list reservation.
 - Online reservation
 - Total reservation.
-
- Admin can add new train and supervise the ticket booking.
 - Train has name and number of passenger it can carry is specified.

- Railway station has name and details of train pass through it.
- Passenger can login/signup and can book ticket in particular train.
- Ticket has departure time, arrival time, start point and destination point on it.
- Ticket can be booked in general or travel quotes.
- Passenger can pay the ticket price online.

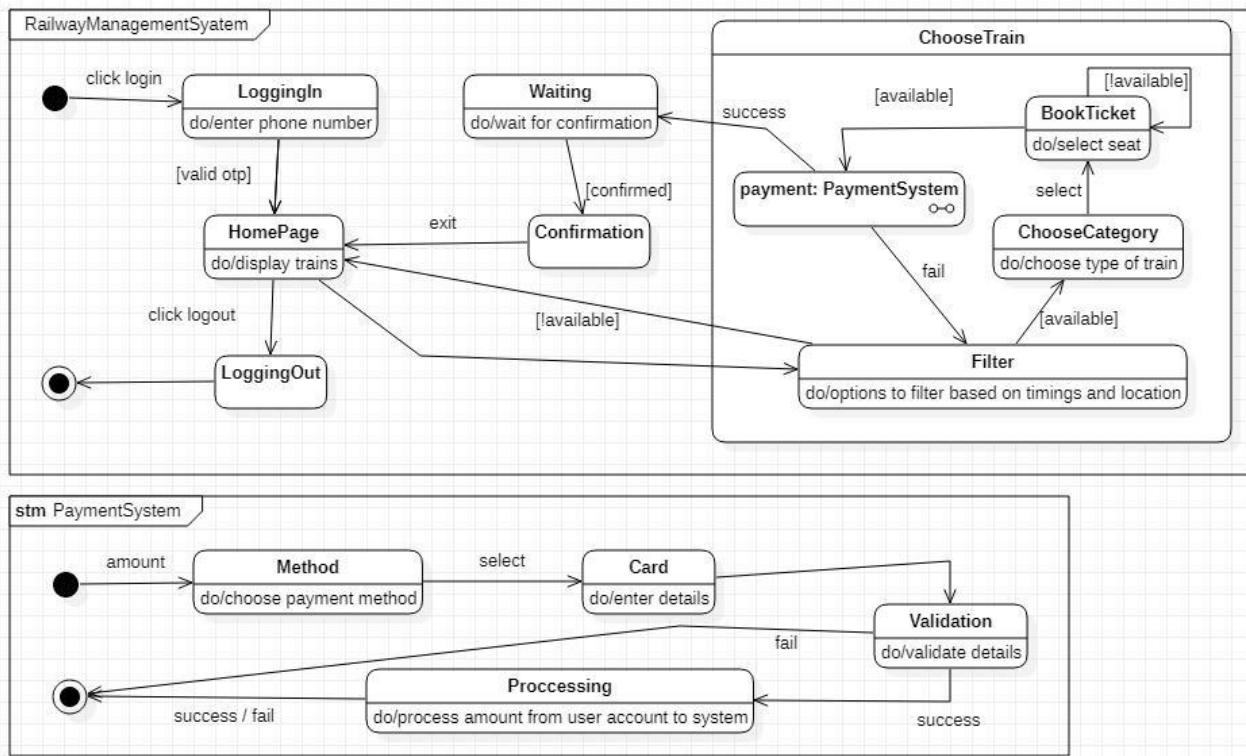
b) Advance Class Diagram:

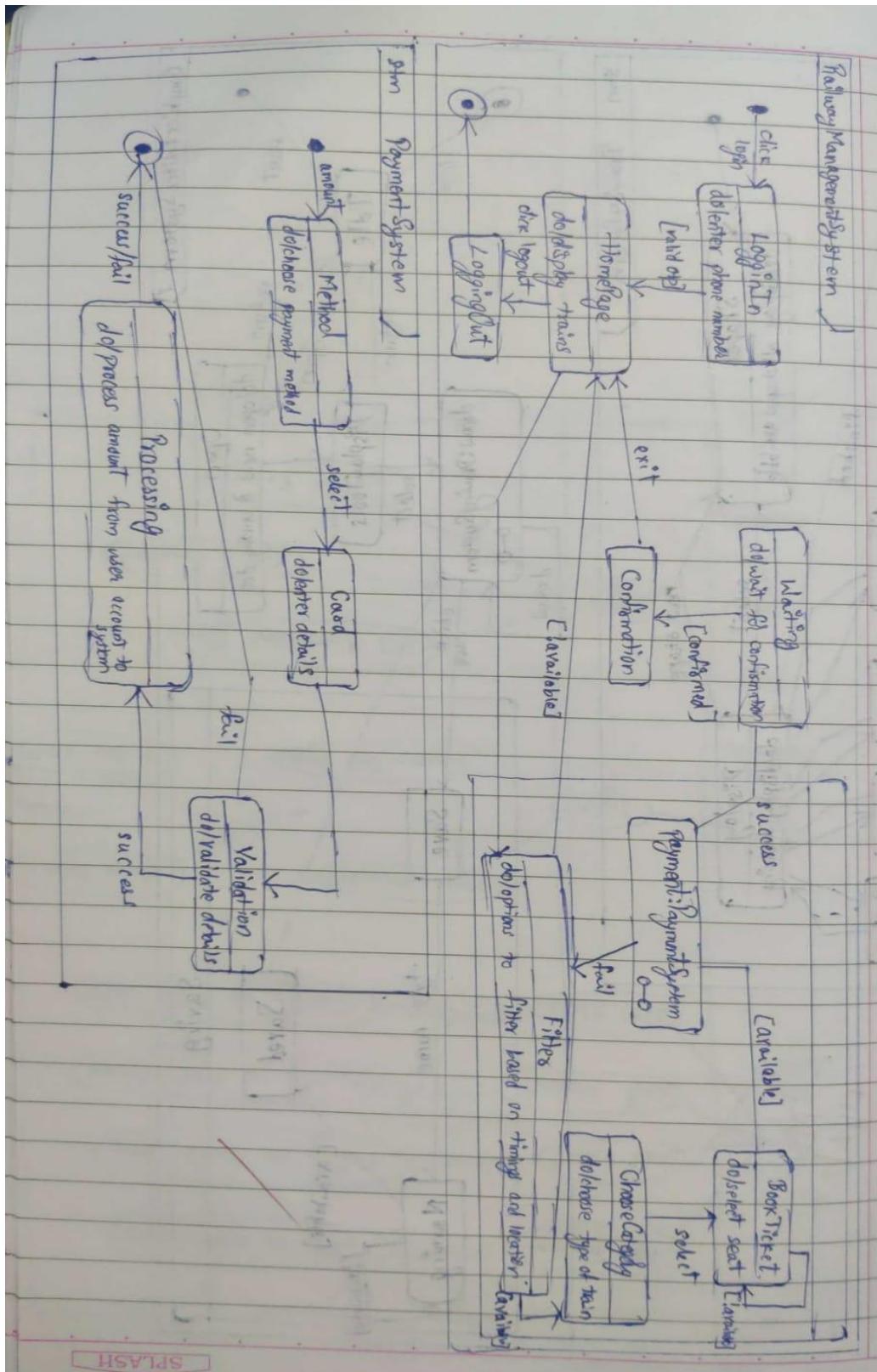




Justification: The reservation system is linked by association and coach and engine are a part of the train but can exist without it as well as it is an aggregation. Administrator is linked to every train by train no. Reservation is generalized into waiting to RAC, Confirmed, Waiting list. Passengers make reservation and book the ticket and after the payment e-ticket is obtained hence composition.

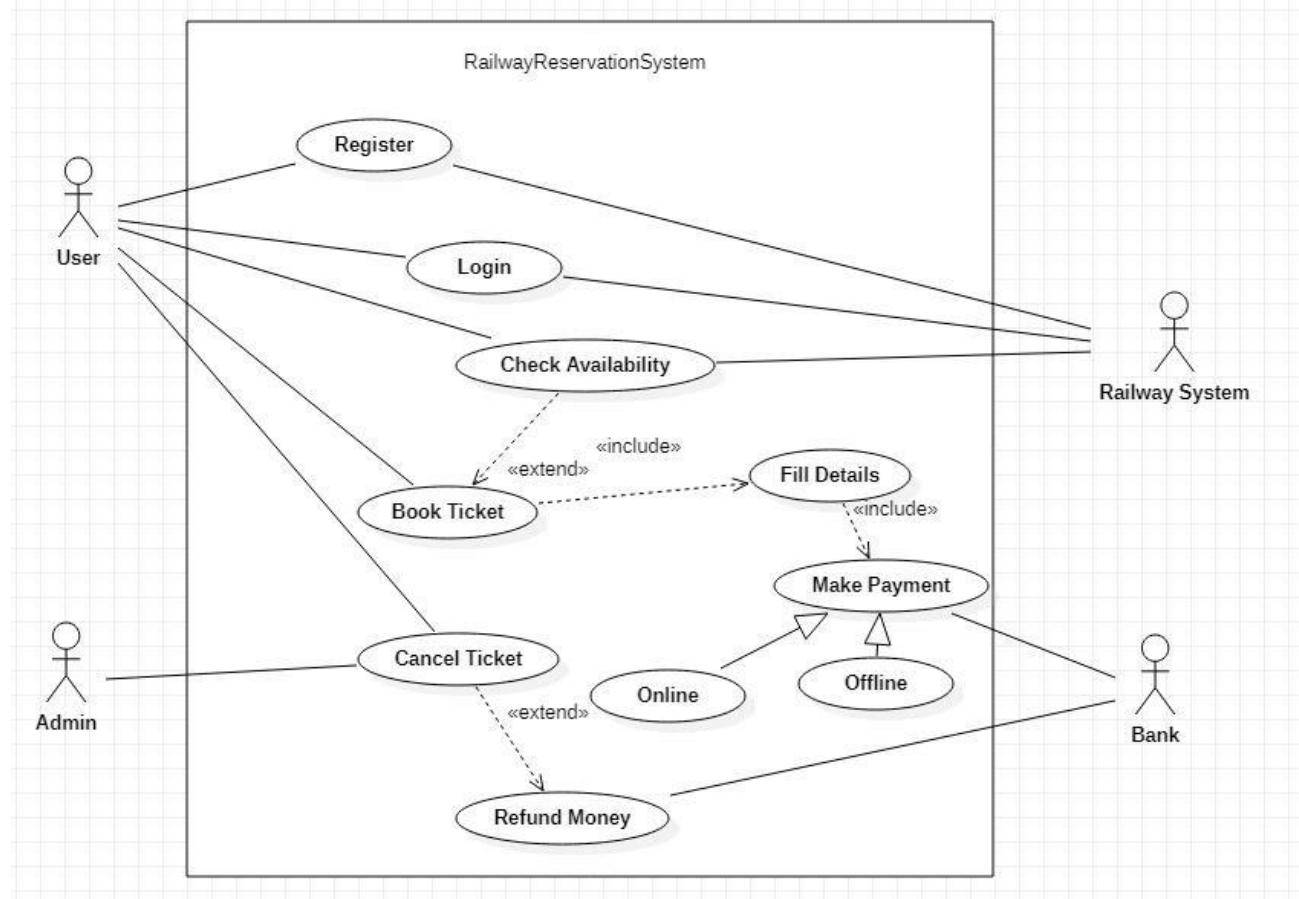
c) Advance State Diagram:

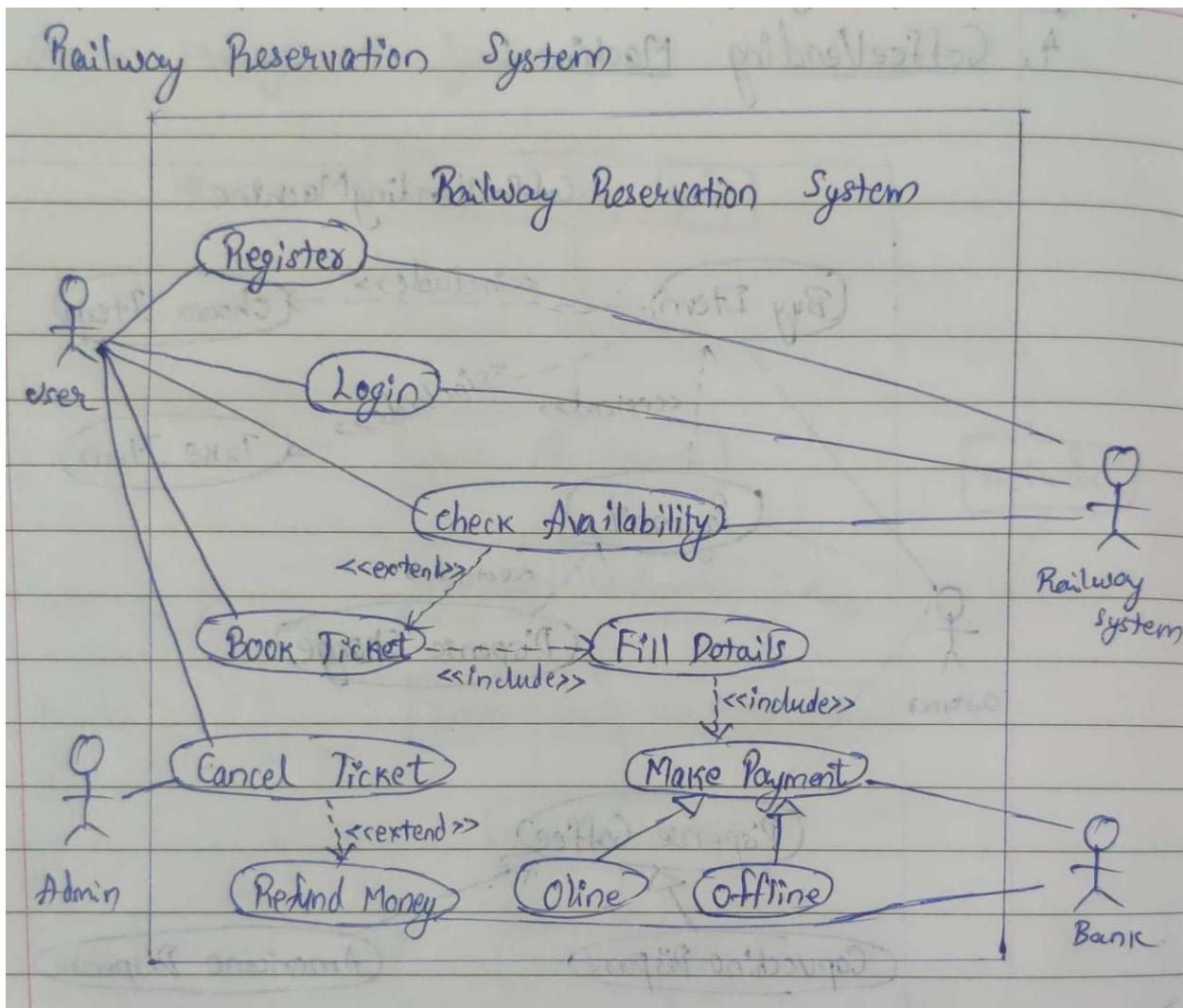




Justification: For the given case selecting train and payment for reservation is the scenario selected for the expansion of the state machine with all advance features and proper transitions mentioned for the detailed design.

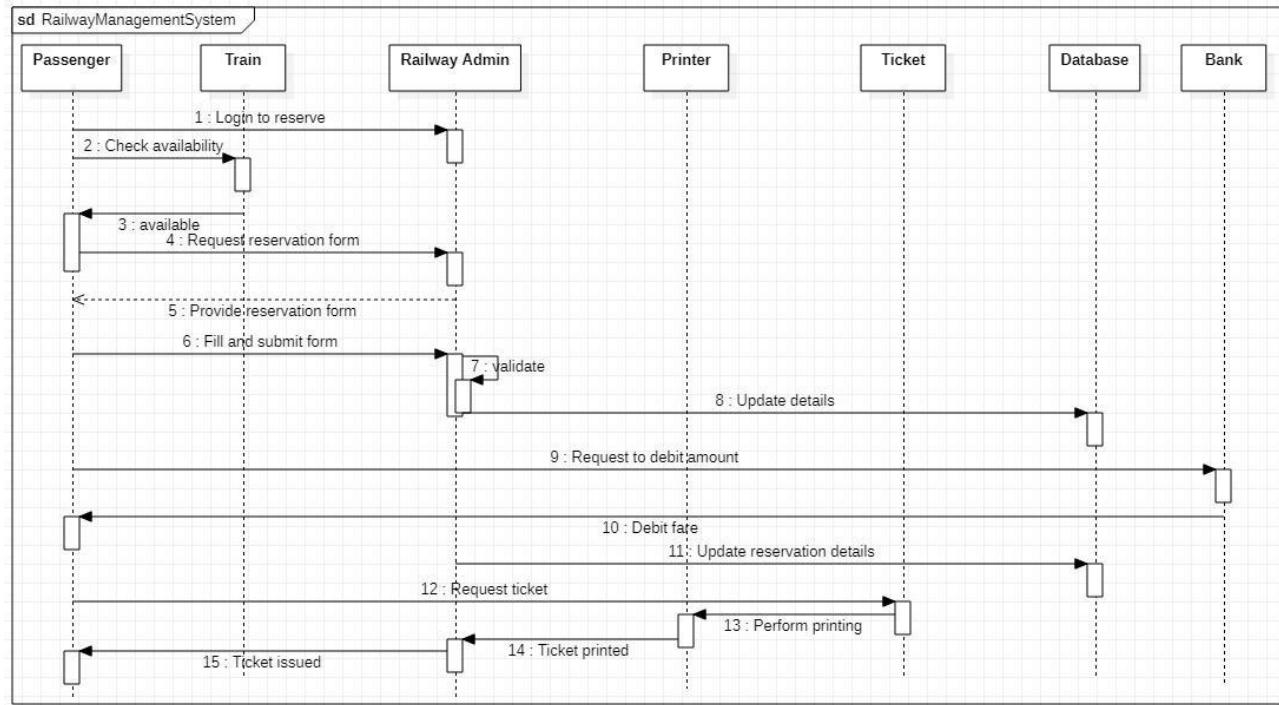
d) Advance Use Case Diagram:

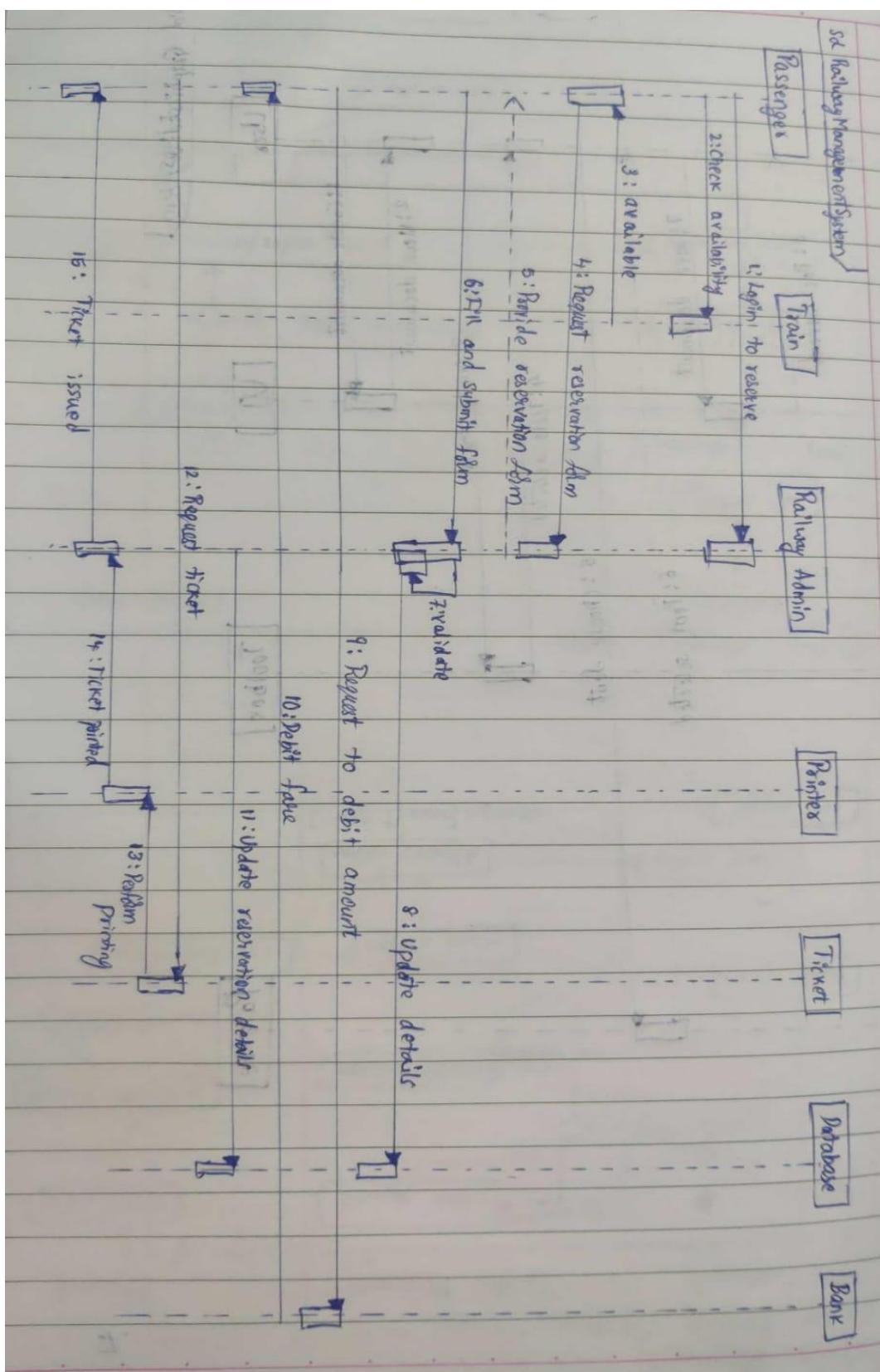




Justification: The given application all the respective functions involved for the given system are mentioned in detail and all the relation between the functions are also mentioned and also actors like user, admin, involving system and bank are mentioned and their relation is mentioned.

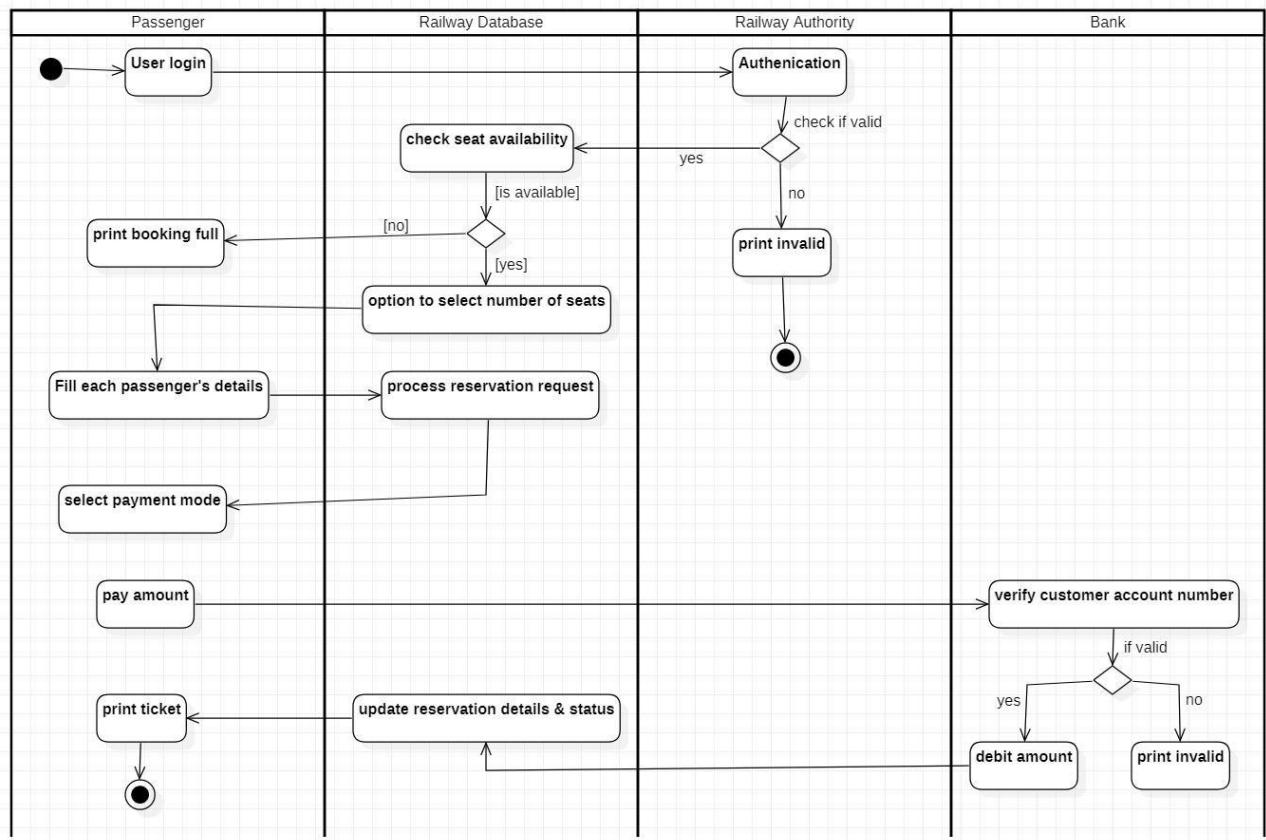
e) Sequence Diagram:

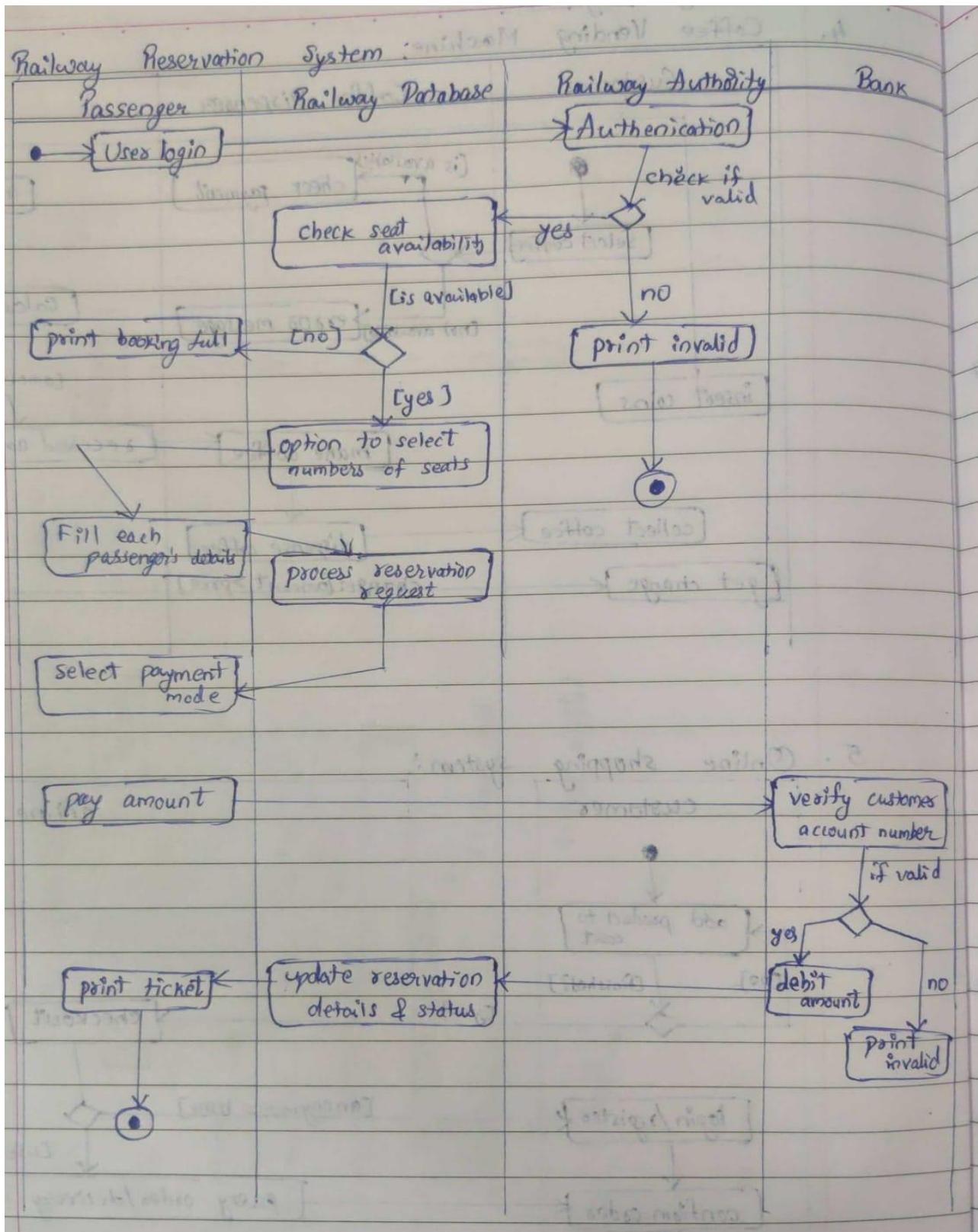




Justification: The given model represents the complete interactions and steps of various procedures taking place for the reservation system, from login to selecting to update details to payment and issue the ticket for the passenger.

f) Activity Diagram:





Justification: The interaction of the passengers with the system is shown in detail with respect to the railway database, authority, payment with all conditions mentioned.

7.Graphics Editor

a) SRS:

GRAPHICS EDITOR SYSTEM

Problem statement :

The existing graphics system has some loose polls. The API is not good and does not contain new methods.

S.R.S :

The graphics editor provides an application programmer's interface that enables a programmer to develop their own graphical model editor for a specific type of model. This API in turn, relies on extending the eclipse graphical editing framework to provide an environment in which editor functions

→ It contains the tool box which contains tools like line, circle, rectangle, arc etc.

→ color bar or palette.

→ standard toolbox with options for new, open, save toolbox and text toolbox.

→ One integrated view to users the toolbox, colorbox and graphic screen.

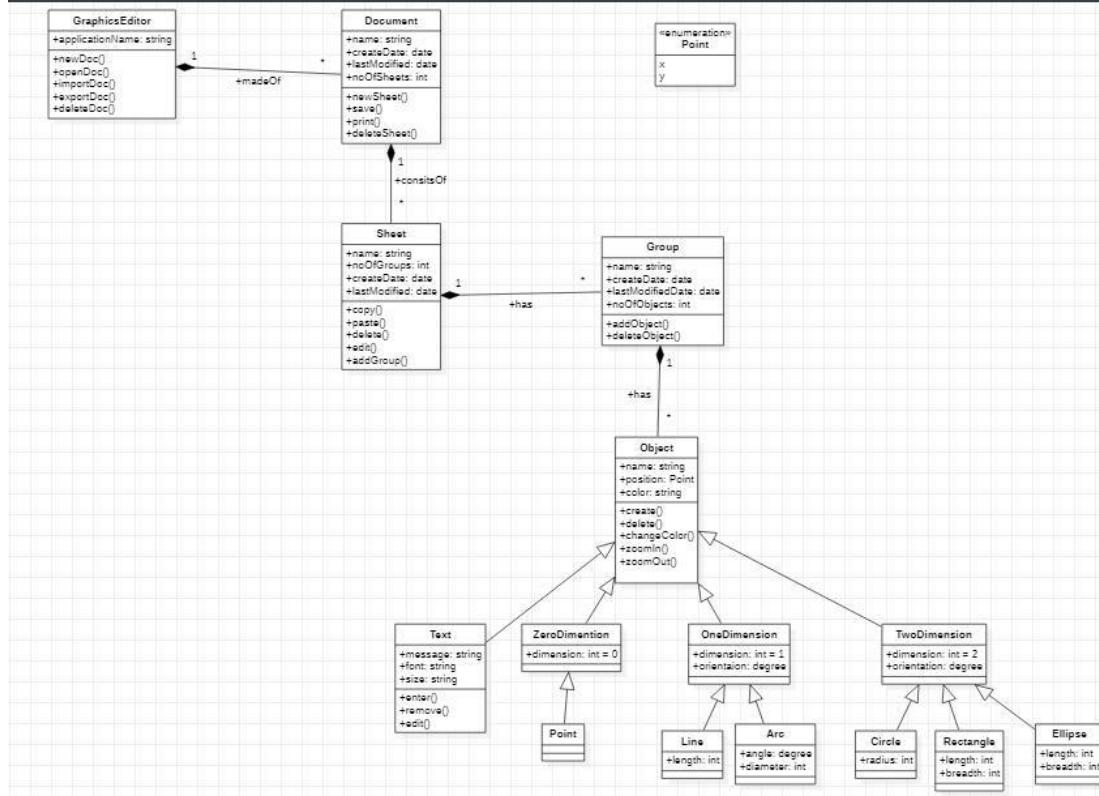
→ Easy handling of tools for users.

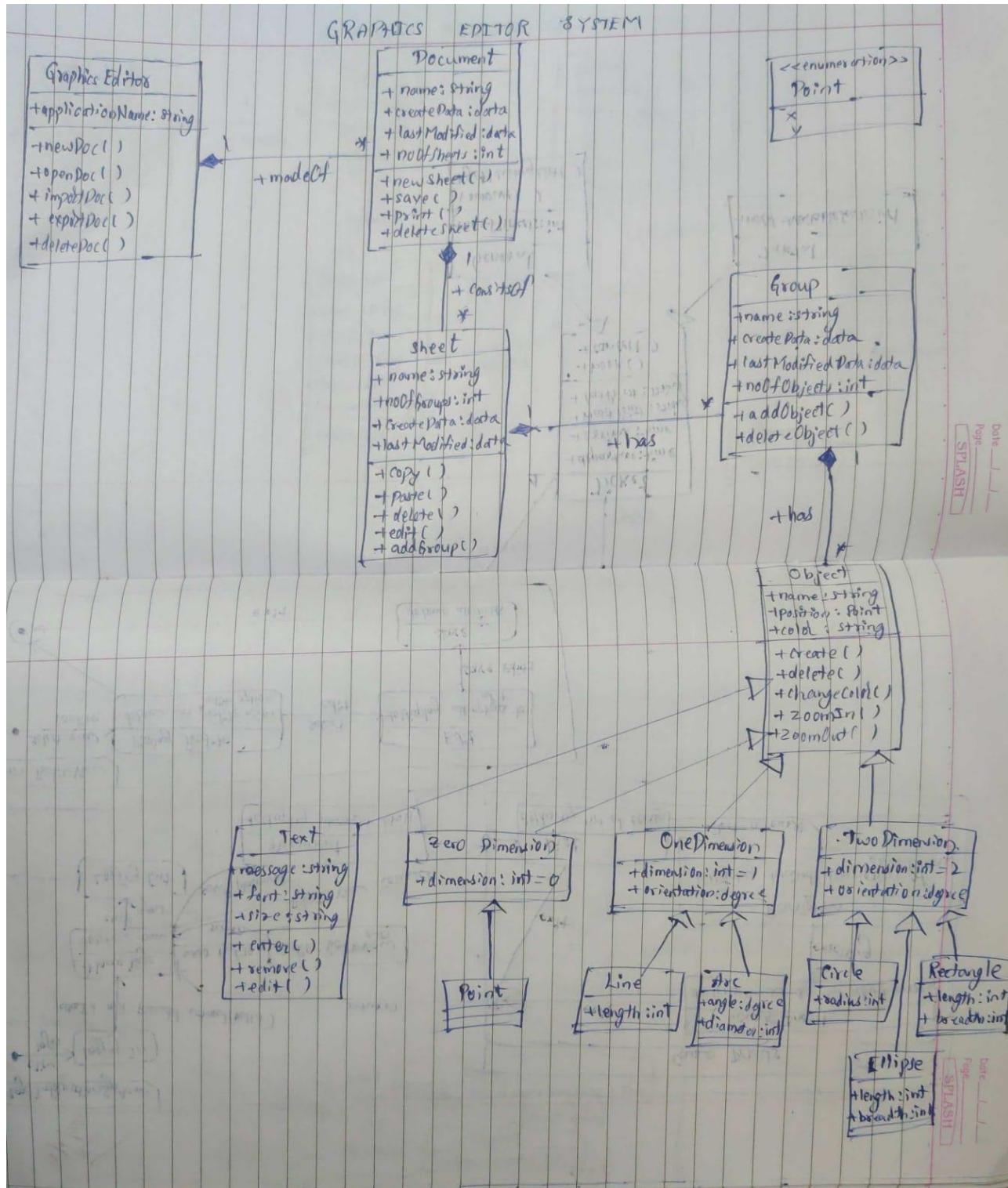
→ Ability to group several drawings into one i.e. complex drawing.

→ Provision of zoom in and zoom out.

→ Different shadings of line tool are provided.

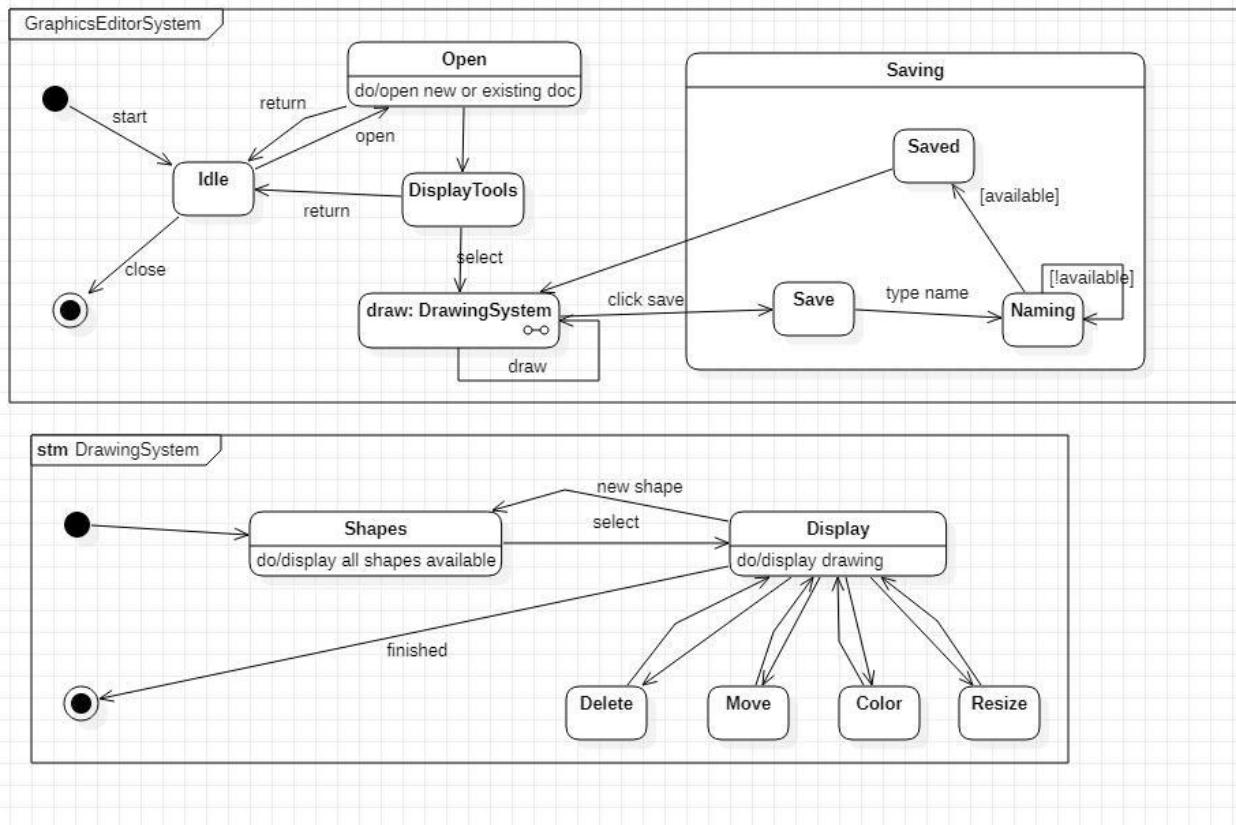
b) Advance Class Diagram:

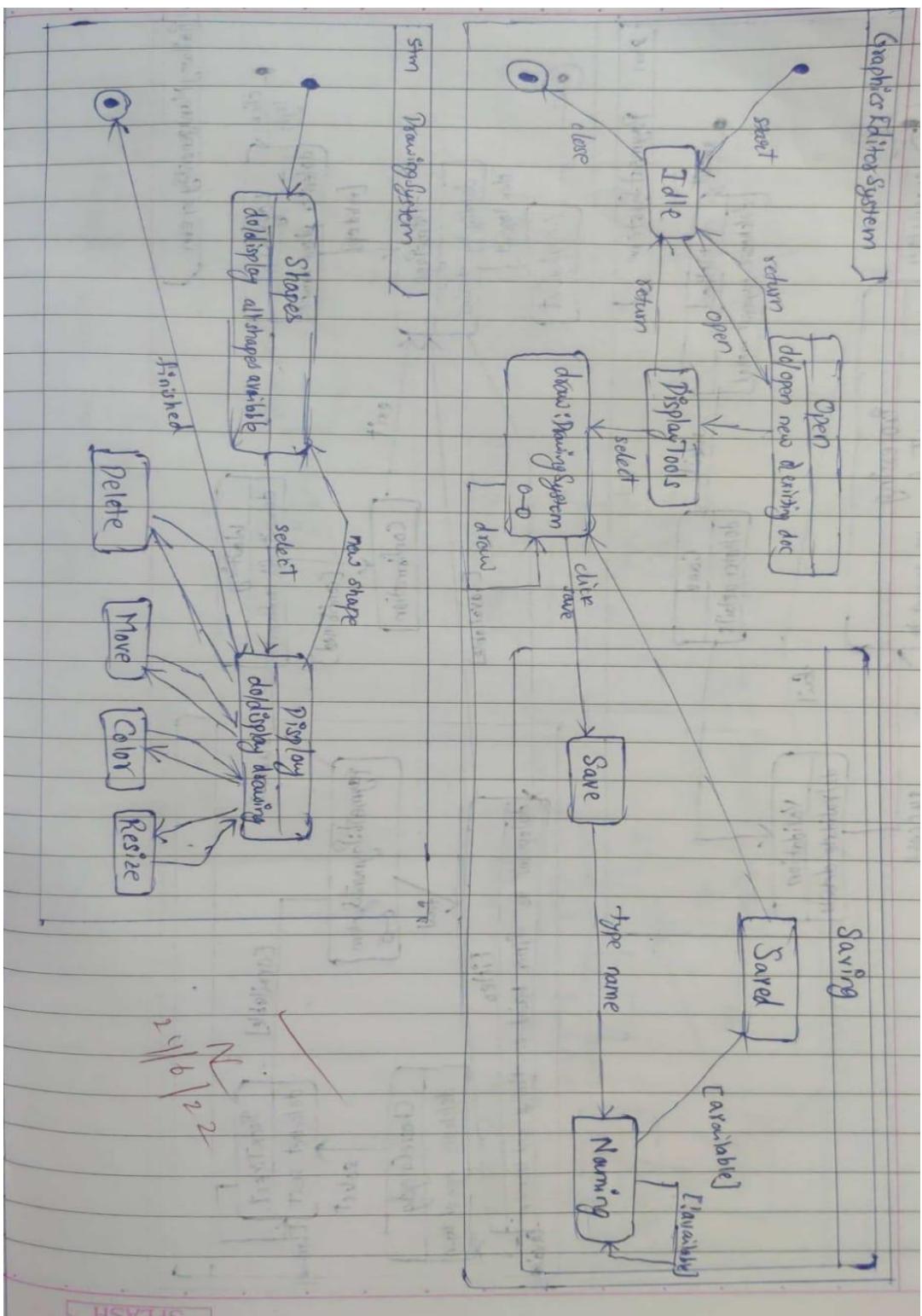




Justification: Every graphic editor has a document with which doc id for association. Document is composed of sheets which are composed of drawing objects. Which has text, geometrical objects which is generalized into several categories , groups which are linked by aggregation.

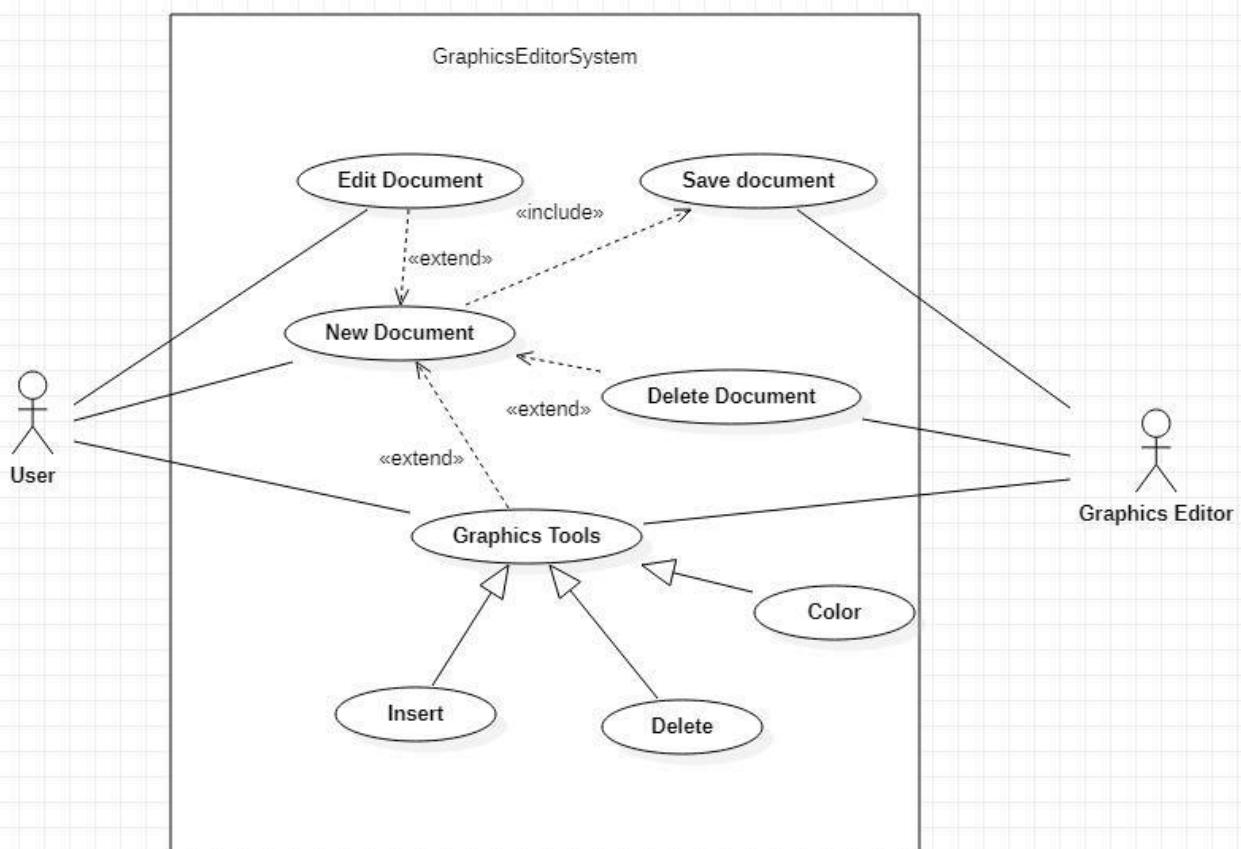
c) Advance State Diagram:

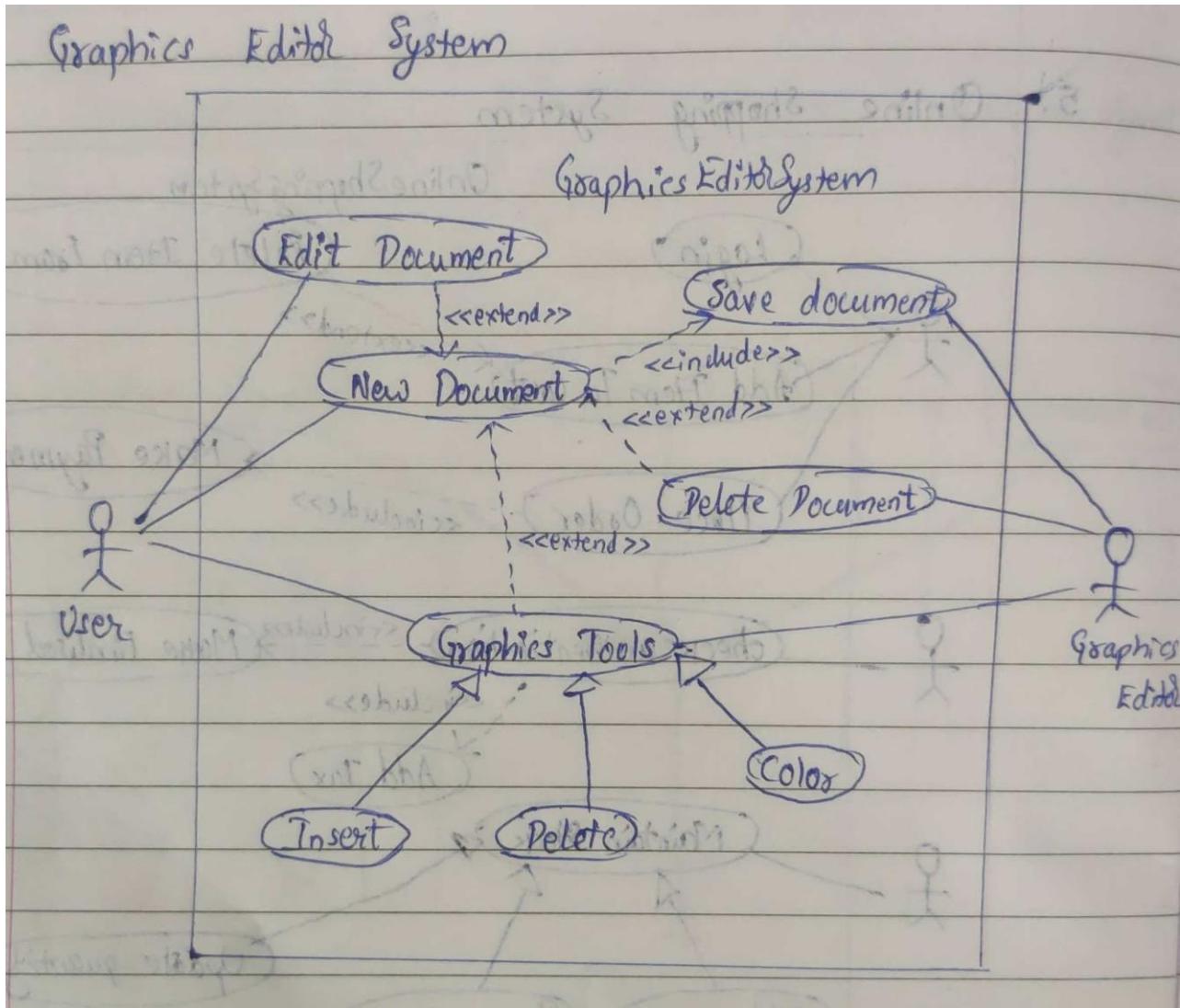




Justification: For the given case, the state machine is drawn with saving a file and drawing system as the scenario with detailed description with advance features included, for proper understanding of system with appropriate transitions and conditions.

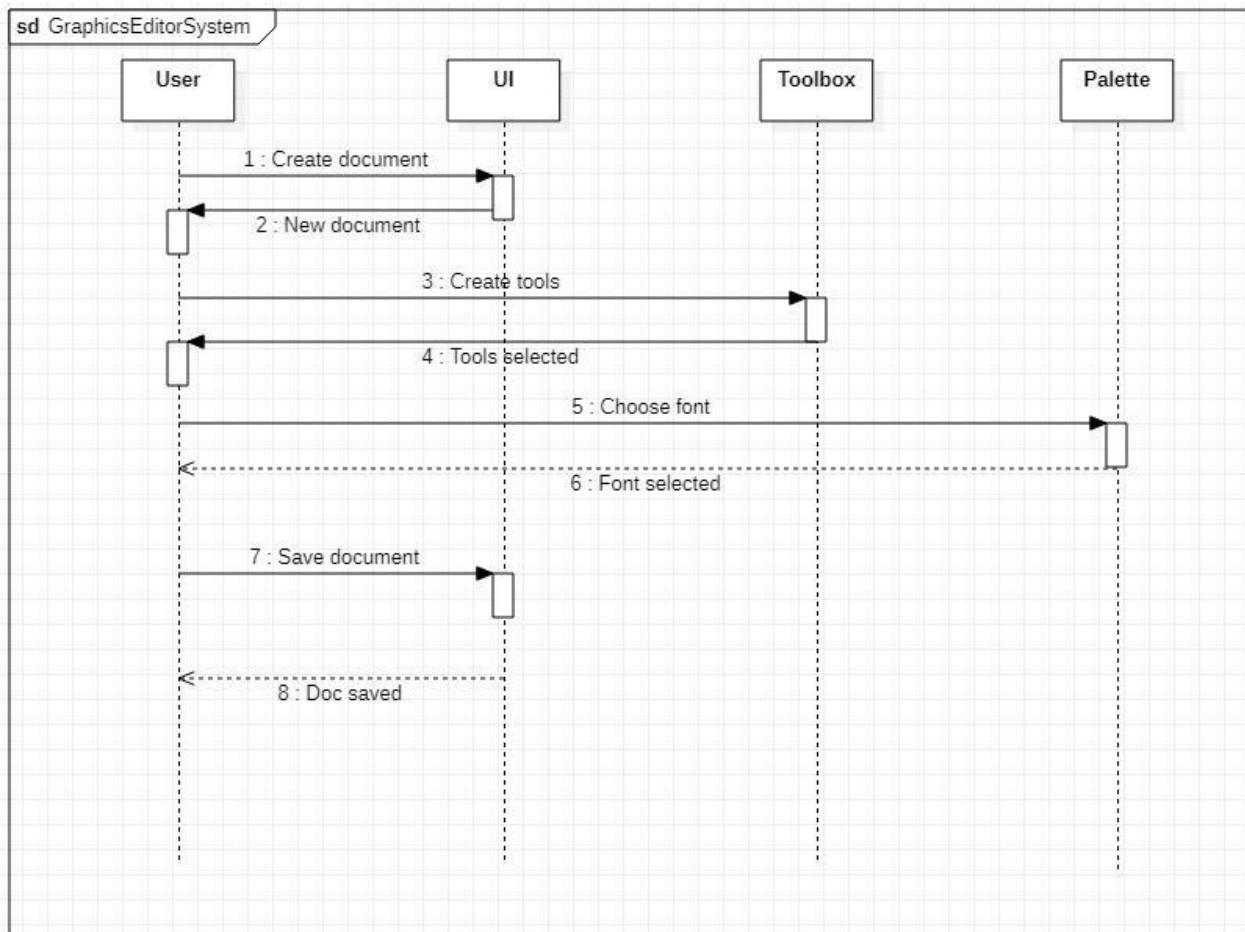
f) Advance Use Case Diagram:

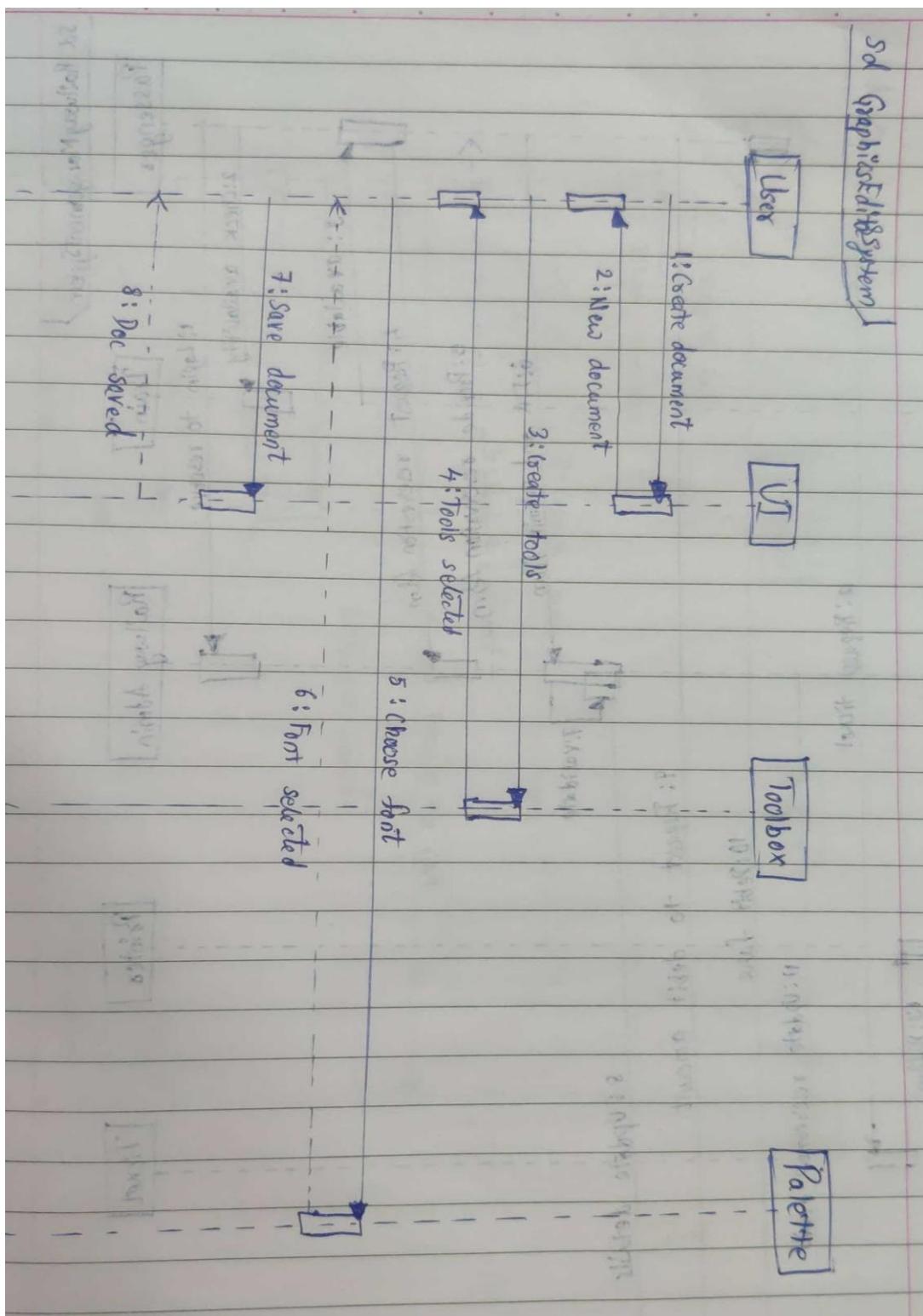




Justification: All the functions for the given application are mentioned and all the relations with the functions are given with all the respective actors like user, graphics system. They are given with appropriate functionalities.

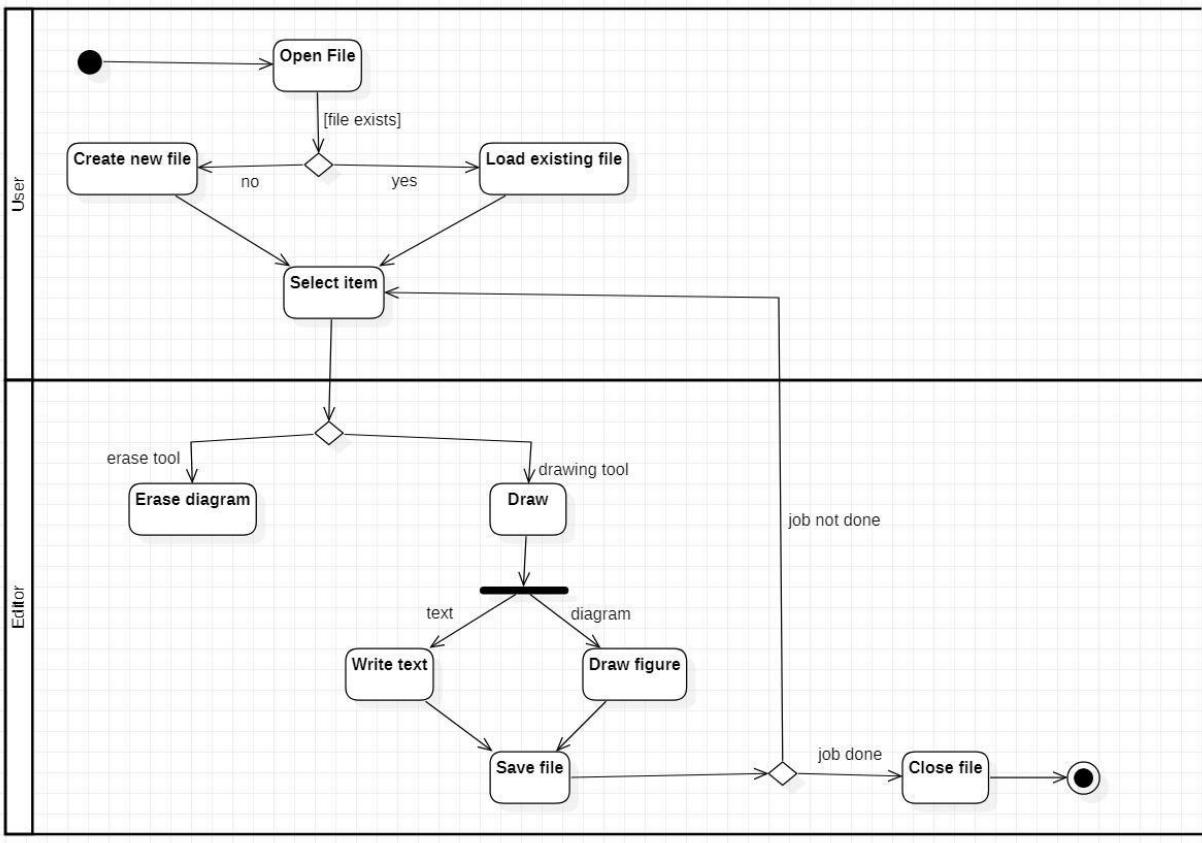
g) Sequence Diagram:

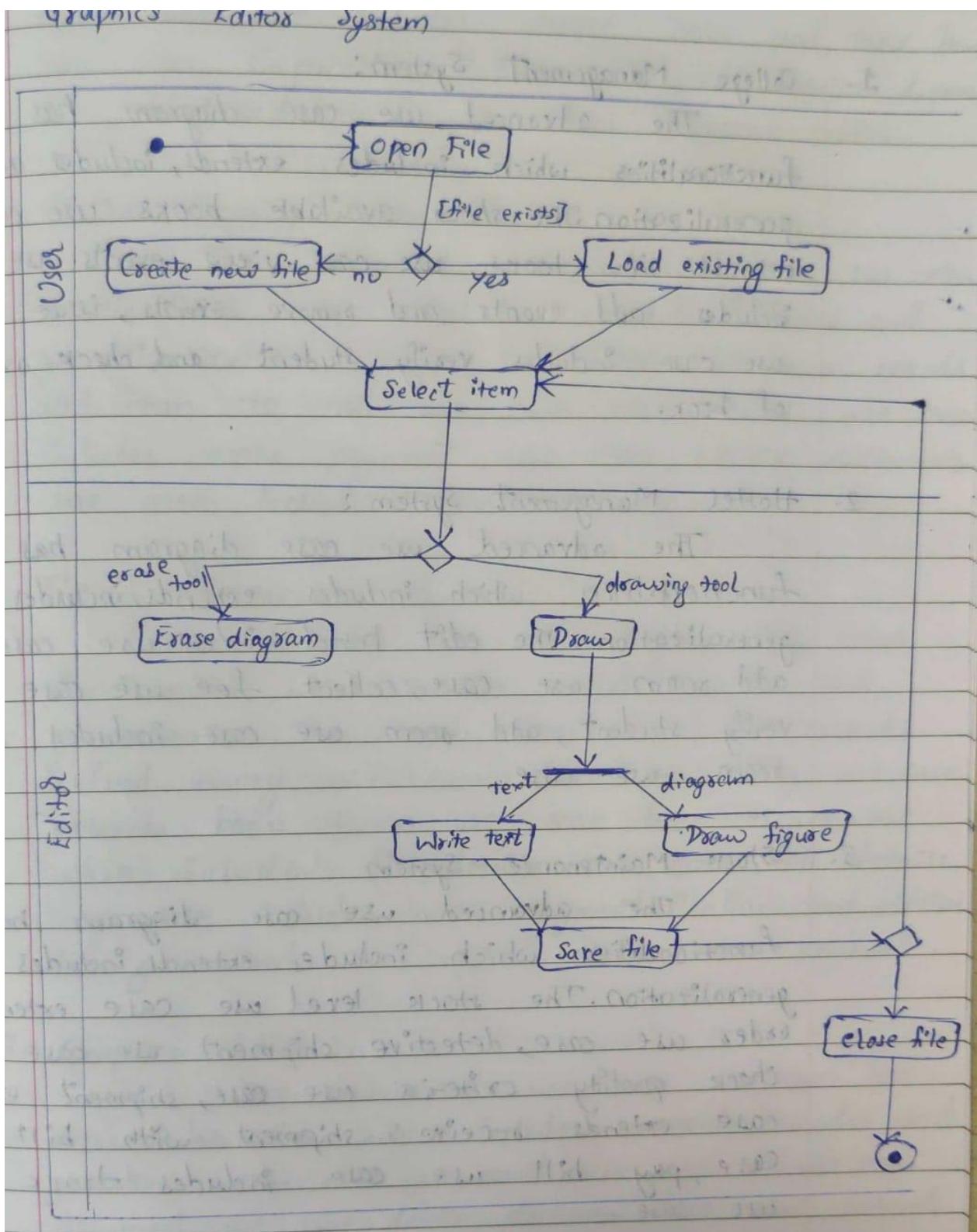




Justification: The given system gives the computer interactions of the system between users and the editor, it gives a detailed step by step procedure from creating the document to saving the document, including typing of text and addition of geometrical objects.

h) Activity Diagram:





Justification: The given activity model explains the complete interaction between the user and the editor and how the various functions are performed, from the diagrams to saving the file.