

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

“JnanaSangama”, Belgaum -590014, Karnataka.



LAB REPORT

on

COURSE TITLE

Submitted by

MOHD IRFAN (1BM20CS409)

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 MODELLING AND DESIGN**" carried out by MOHD IRFAN (**1BM20CS409**), 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 MODELLING AND DESIGN** work prescribed for the said degree.

Dr Shyamala G

Department of CSE
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Index Sheet

Course Outcome

CO4	Ability to conduct practical experiment to solve a given problem using Unified Modeling language.
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Exercise 1:

1. Write SRS

1. College Information System:

Software Requirement Specifications

1. Purpose: The purpose of this document is to give a detailed description of the requirements of the college information system. It explains the constraints & interfaces of the system.

2. Scope: It will be a web-based application which will help the college in managing the activities of the students, teachers and the catalogue of books in the library. The assignments which are assigned to the students, their attendance, results etc.

3. Requirements:

a. Functional Requirements:

i. Adding a student to a department.

ii. Entry of a faculty to a department.

iii. Assigning of Assignments to the Students with the Due date by a faculty.

iv. Declaring of Student Results.

v. Students Borrowing books from the library.

vi. Updating of the profile details of students, faculties & so on.

b. Non-Functional Requirements:

i. The Response time of the system must be very low.

ii. The college information which is being stored in a database must be secure.

iii. Mobile Friendliness.

iv. The system must be developed within the allocated time and budget.

2.Hostel Management System:

Software Requirement Specification :

1. Purpose: The Purpose of this document is to describe the detailed description of the Hostel management system software its constraints & interfaces.

2. Scope: This System will be a web-based system that will helps the college to maintain the details of the hostels.

3. Requirements:

a. Functional Requirements:

i. Administrator can allot the students to the different block of the hostel.

ii. Control the status of the fee payment.

iii. Administrator can edit the details of the students.

iv. Vacate the students for the hostels.

b. Non-Functional requirements:

i. Performance Requirement.

ii. Security Requirements.

iii. Safety Requirements.

iv. The database must be able to accommodate the hundreds of records.

v. System should have Good Response Time.

3.Stock maintenance system:

Software Requirement Specification :

1. Purpose: The purpose of this document is to give a detailed description of the requirements for building an online stock management system also the constraints & the interaction of the system.

2. Scope: The System aims at providing an efficient interface to the stock persons where they get to know the real time updates regarding the stock market in a very efficient manner.

3. Requirements:

a. Functional Requirements:

- i. Able to track the products.
- ii. The system must be easy to use by both the stock managers as well as the stock holders.
- iii. The stocks should get update automatically.
- iv. Should be able to generate the stock reports

b. Non-Functional Requirements:

- i. The System must give accurate information.
- ii. The system must not lag due to the increased number of users.
- iii. The system must be designed in such a way that It should work fine on a system with low configuration.
- iv. All the functions of the system must be available to all the categories of users all the time.

4.Coffee vending machine:

the scope and the overview of the coffee vending machine and its requirements are shown below:

- 1.customer can deposit money to the machine**
- 2.Excess money can be refunded**
- 3.the customer can choose the type of coffee he wants**
- 4.Customer can choose the quantity**
- 5.Once all certain is done,the customer is charged an appropriate amount**

Non functional requirements:

- 1. The system must be secure**
- 2.The system must be developed within the time and budget**

5.The Online Shopping System:

Software Requirements Specifications Purpose:

The Online Shopping System is a web Application which is Intended to provide complete solutions for vendors as well as customers through a single gateway using the internet. It will enable vendors to setup online shops, customers to browse through the shop and purchase them online without having to visit the shop physically.

Scope: E-commerce is a term for any type of business, or commercial transaction that involves the transfer of information across the internet.

Functional Requirements:

- Minimum steps to make a purchase
- Mobile-friendliness
- Unique, recognizable design
- Relevant, useful content
- Shipping & payment systems integration
- Live chat

Non-functional Requirements:

- ◆ Provide better performance than usual as the website is run from a server and takes an initial load of internet to fetch.
 - ◆ Provide secure data transfer between server and customer system.
- Online Shopping System**
- ◆ The server should provide sufficient data storage for customer data.
 - ◆ The system should make the whole process reliable. ◆ Providing safety from errors, damages, accidents considerable or non-considerable.
 - ◆ The database should be properly maintained

User Requirements:

- ❖ Login/sign up page. Homepage containing productions according to user interest
- .❖ Screen displaying information about products and user searches.
- ❖ On selecting a product, the new tab is opened. d. A user copy of the invoice generated.

6.Railway reservation system:

Software Requirement Specifications :

- 1. Purpose:** The purpose of this document is to give a detailed description about the various requirements & constraints for developing a railway reservation system.
- 2. Scope:** The scope of this system in creating Reservation is that, from any Railway Station we can Create Reservation, which is updated automatically in all the stations. Hence, there is no confusion to the Reservation Clerk in all the stations to create the Reservation. This can be possible by maintaining Global Database.
- 3. Requirements:**

a. Functional Requirements:

- i. The system is designed in such a way that it should meet the user expectations.
- ii. The system should safeguard itself against undesired events without human intervention
- iii. The software should not be architecture specific and should be transferable to other platforms if needed b.

Non-Functional Requirements:

- i. As the database is continuously updated and the changes are getting reflected, it should be well maintained.
- ii. Should have good response time.

7. Graphics editor system:

Software Requirement Specification :

- 1. Purpose:** The Graphic editor is an interactive application that allows the user to create, edit, layout, save and print arbitrary graphs.

2. Scope: Graphic editors create visual concepts, using computer software or by hand, to communicate ideas that inspire, inform, and captivate consumers. They develop the overall layout and production design for various applications such as advertisements, brochures, magazines, and corporate reports.

3. Requirements:

a. Functional Requirements:

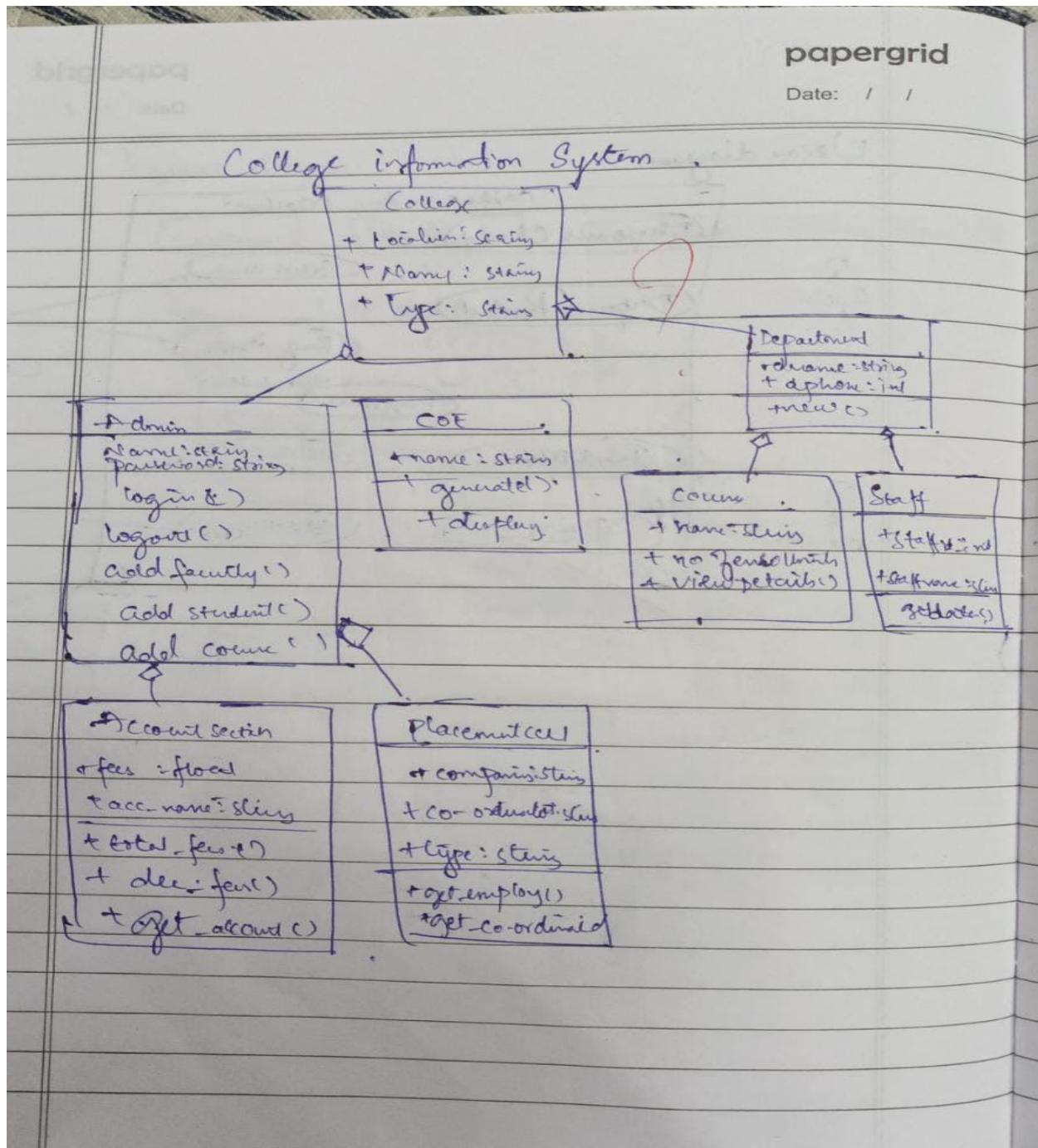
- i. The entry of an editor.
- ii. Software to edit.

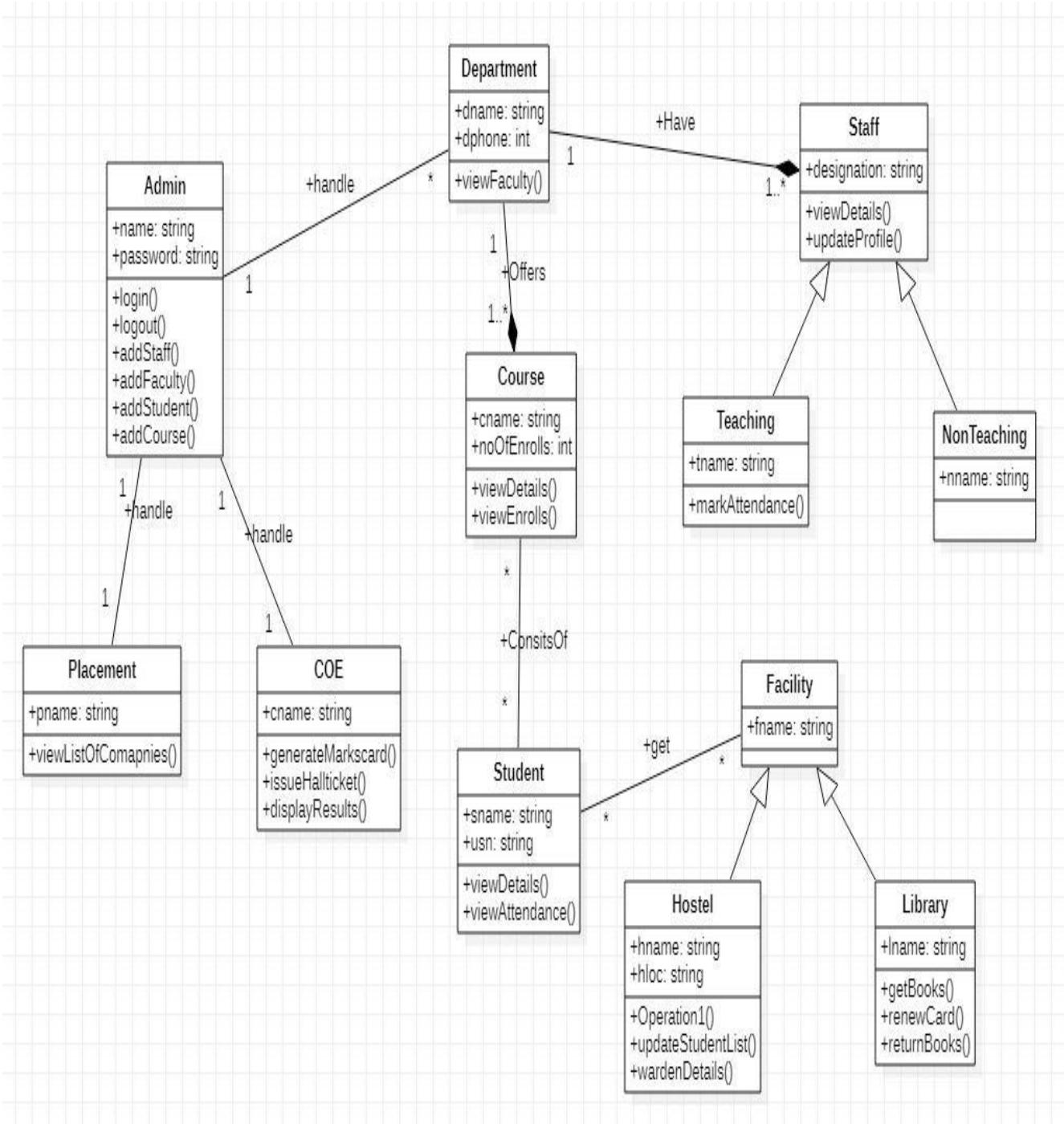
b. Non-Functional requirements:

- i. The database storing the details must be secured.
- ii. The response time should be very small.
- iii. The system should be developed within the specified time & allotted budget.
- iv. The system should be easy to work with.

2. Draw the advanced class diagram

1. College information system:





Admin can view and modify the student's records, teachers and department details. 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. Here user will first login and by entering valid user id and password it enters transit to homepage now

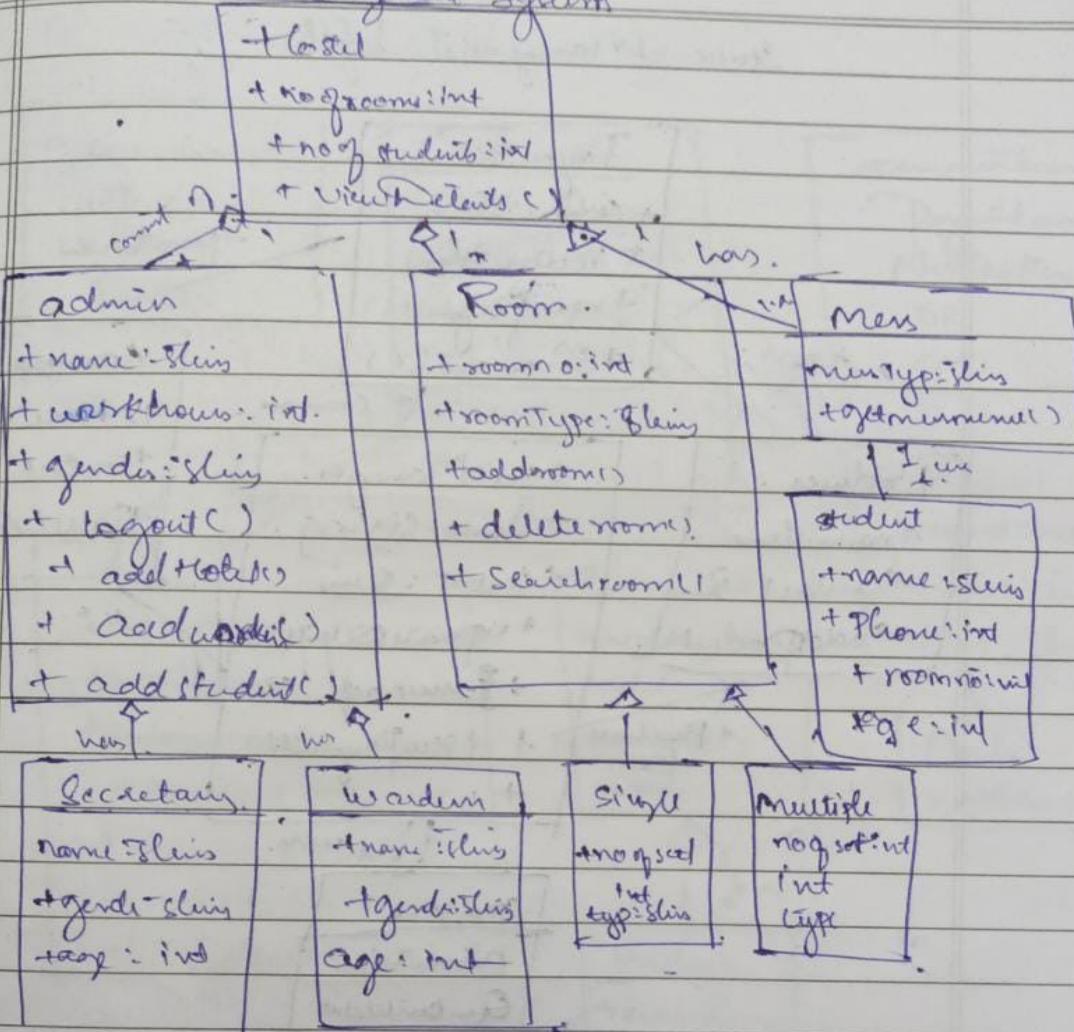
to view by clicking an event it transit to sub machine state called profile view there to → display profile

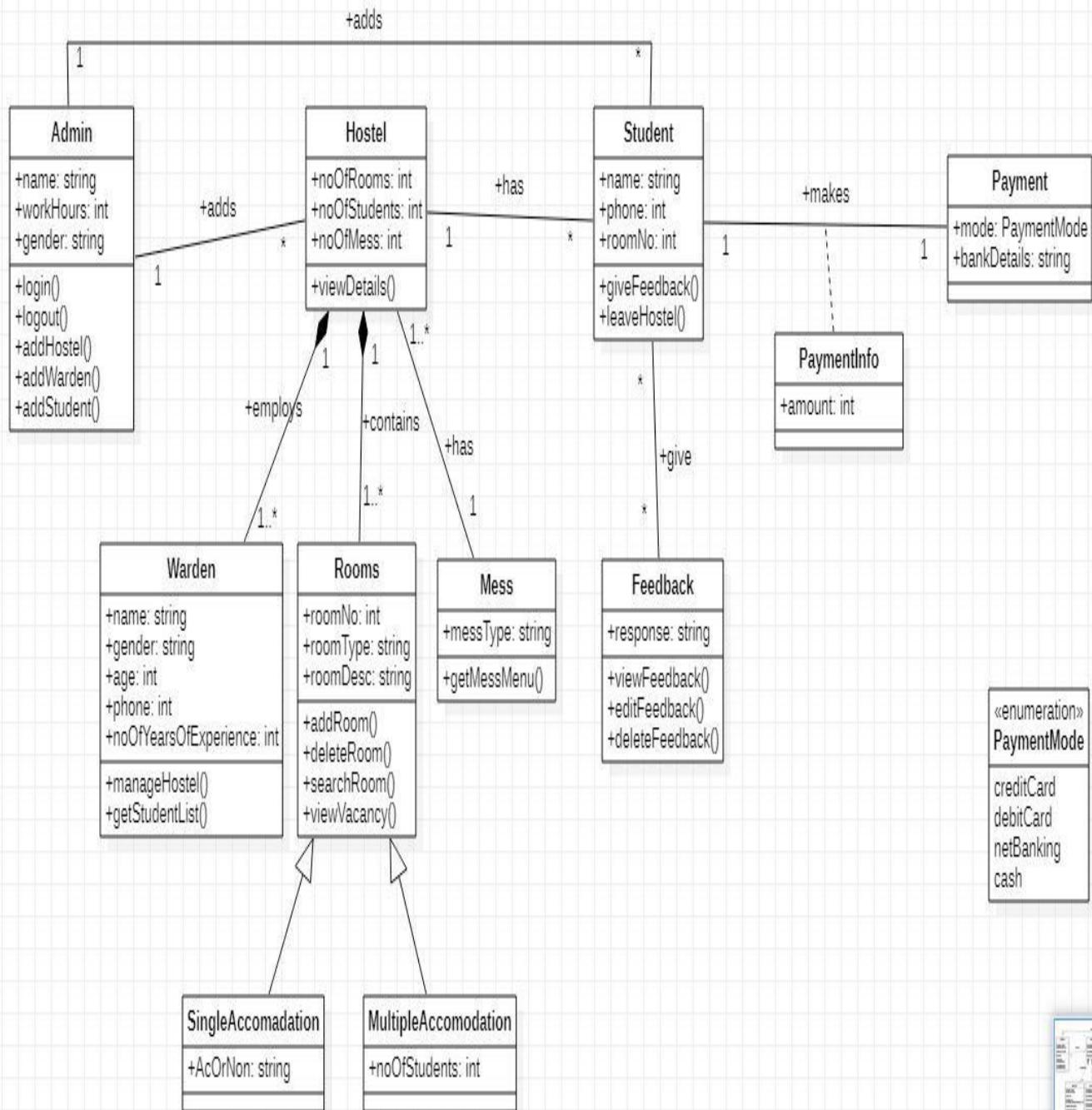
and editing option and save and exit. or from home page to course details get list and check description

and can decide to enroll and return to home page and can logout

2.Hostel management System:

Hostel Management System

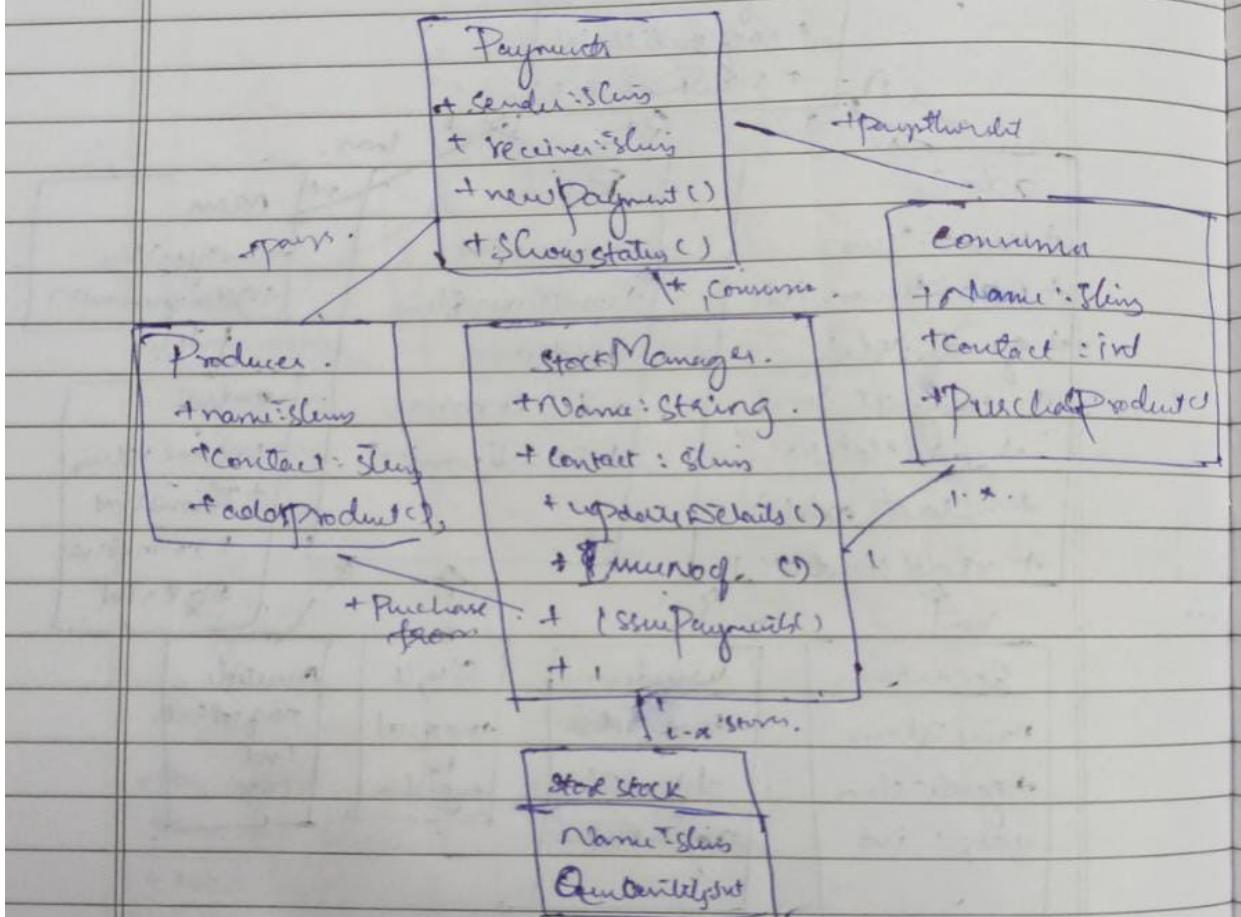


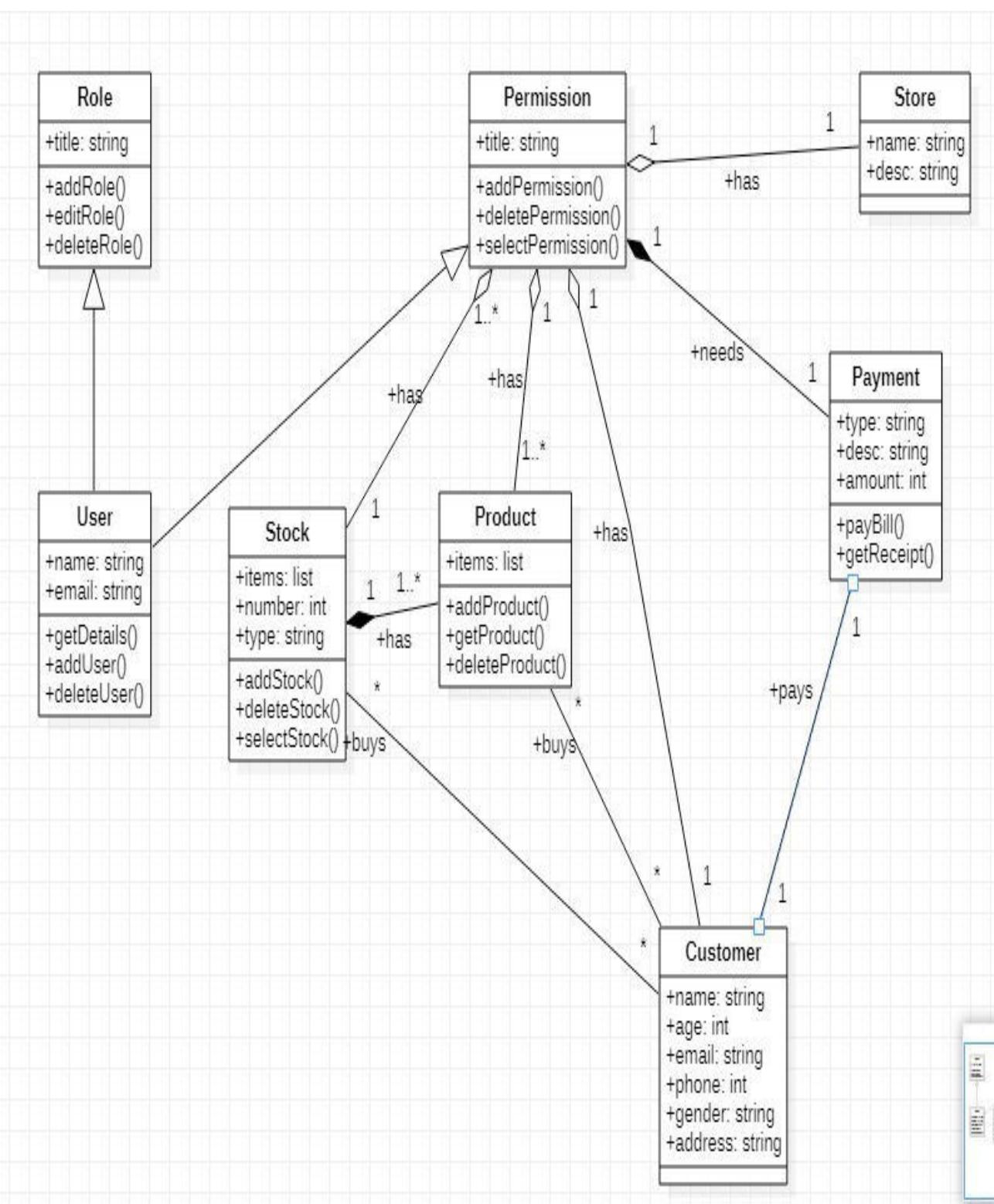


Hostel management system has admin who manages the hostel,allot-es and payment methods.The allot-es makes payment according to the bill generated which have the attributesbill number,type and date.The hostel is categorized into two types I.e boys and girls hostel.Ahostel is made up of mess and rooms.A mess account will also generate. This account havingthemess status of the whole month.

3.Stock management system:

Stock Management System

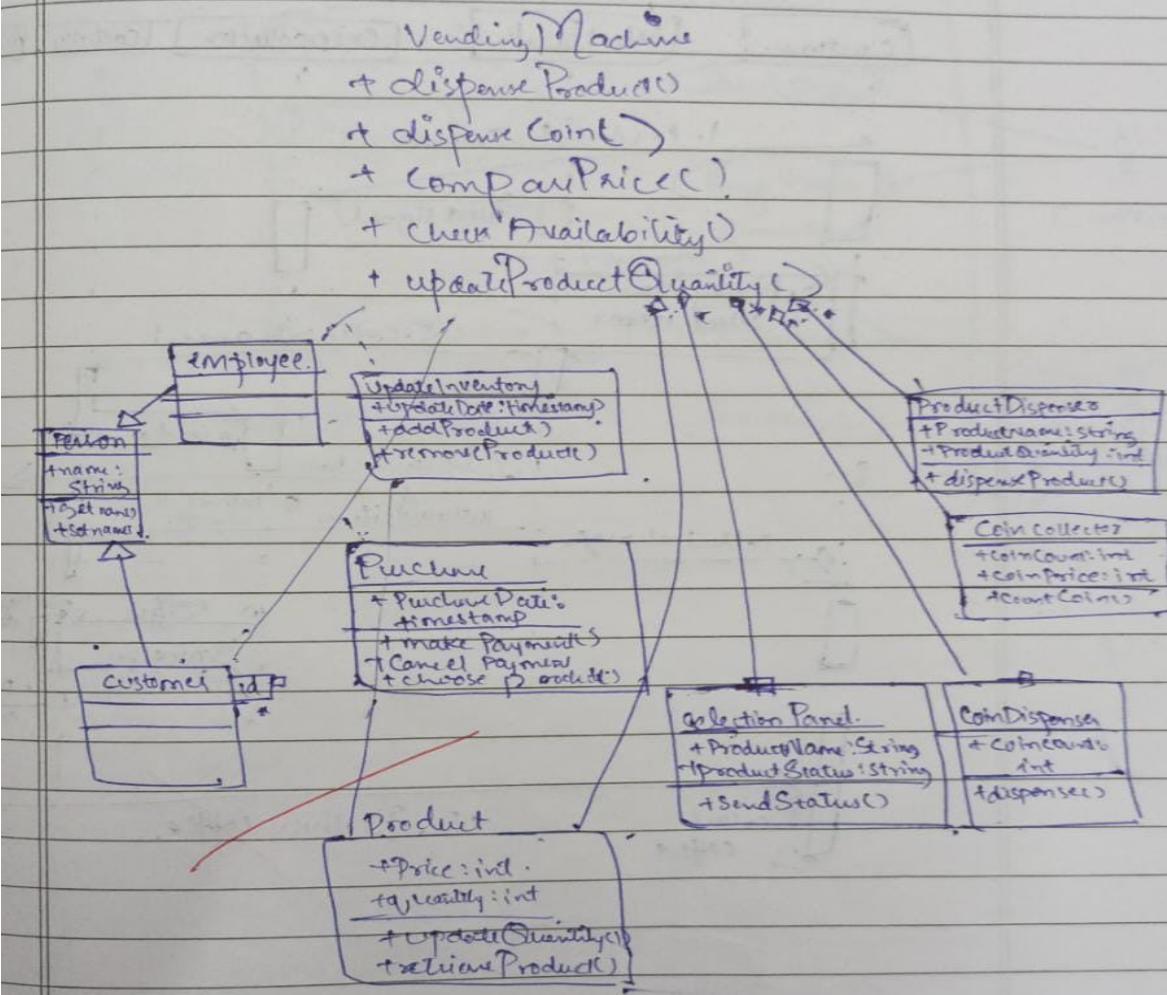


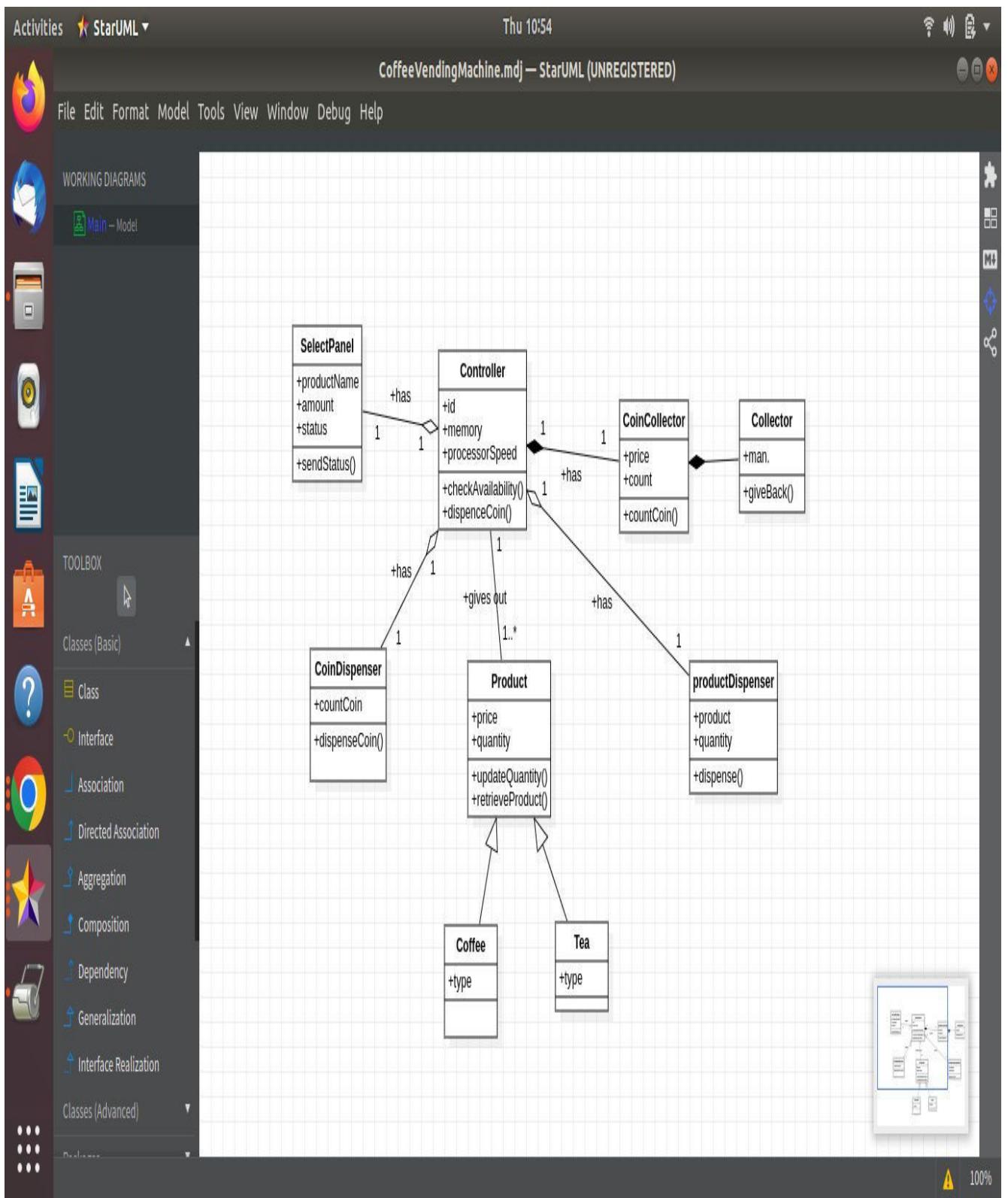


Hostel management system has admin who manages the hostel,allotees and payment methods.The allotees makes payment according to the bill generated which have the attributesbill number,type and date.The hostel is categorized into two types I.e boys and girls hostel.Ahostel is made up of mess and rooms.A mess account will also generate. This account havingthemess status of the whole month.

4.Coffee vending machine:

Coffee Vending Machine :

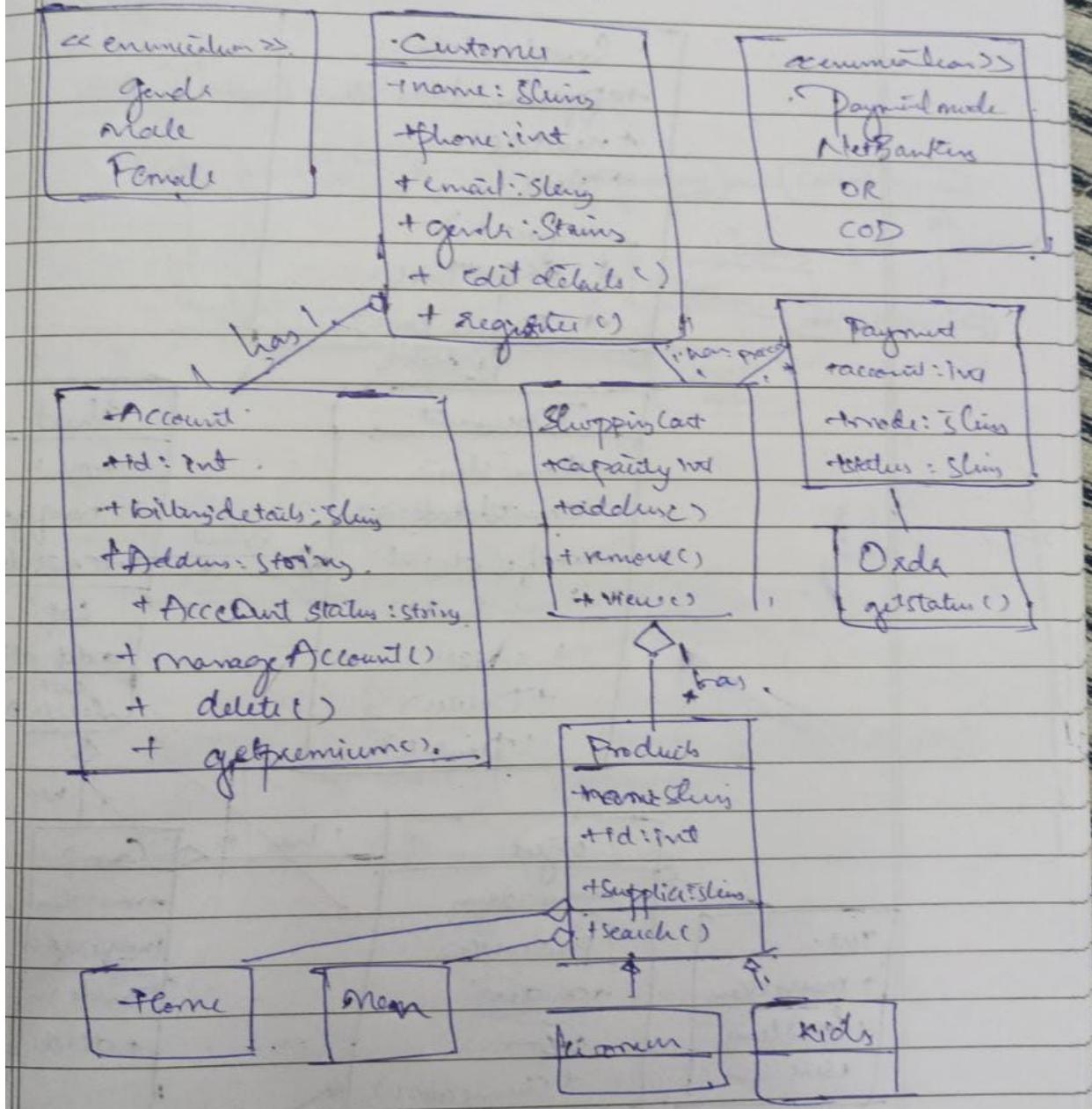


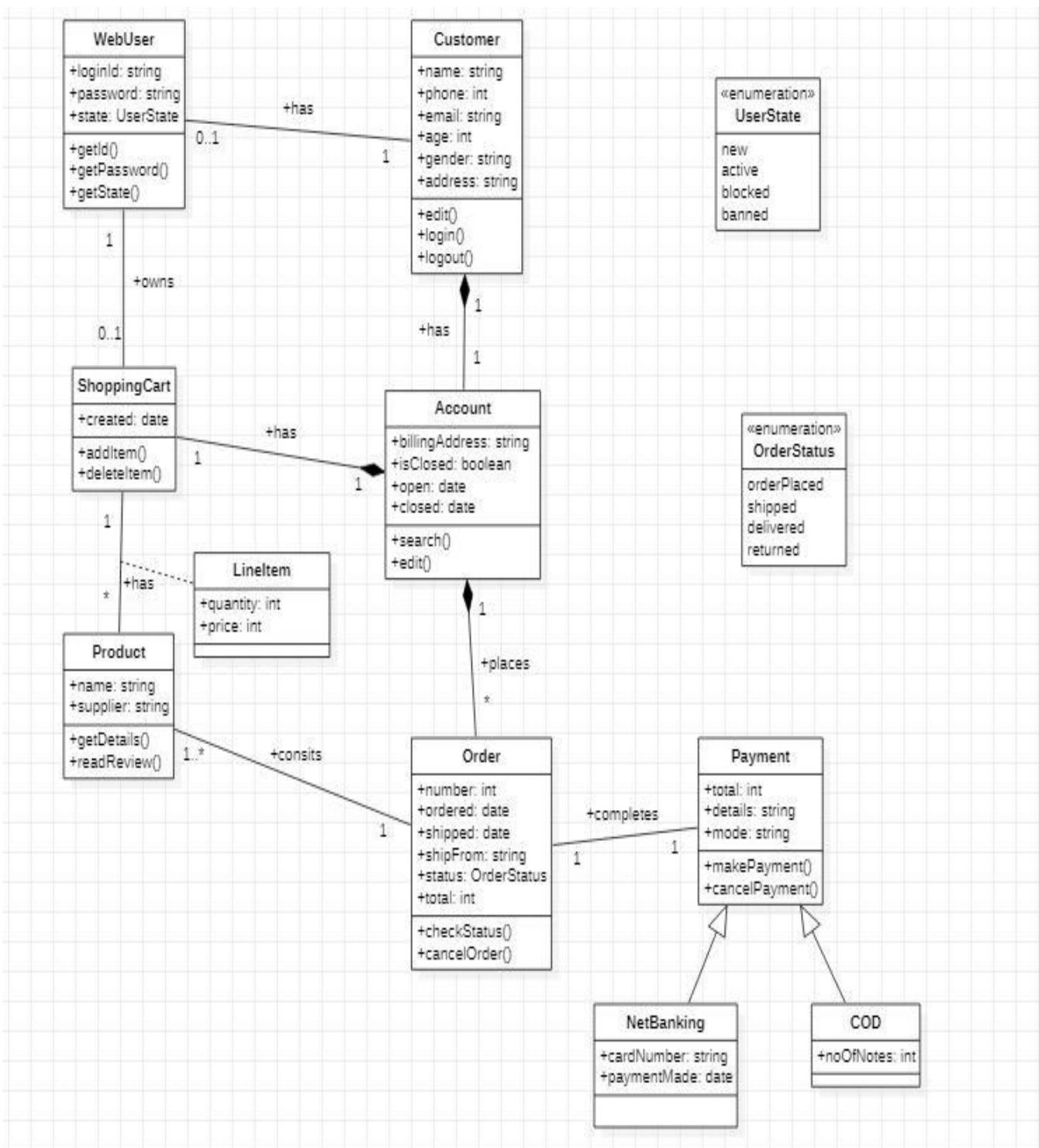


The vending machine must have money box, coin slot, display screen and products i.e coffee for the machine to be used. The user on selecting a coffee ,the coffee machine must be able to dispense the selected coffee to the user. The user shall get empty cup placed right below the filter. The user shall be able to choose his preferred beverage from the list of options. There are different types of coffee such as cappuccino, black coffee, cold coffee and latte. Each type of coffee has a price and a name. A customer can buy their choice of coffee by selecting the button of their coffee and paying for the same through the coin box

Online shopping system:

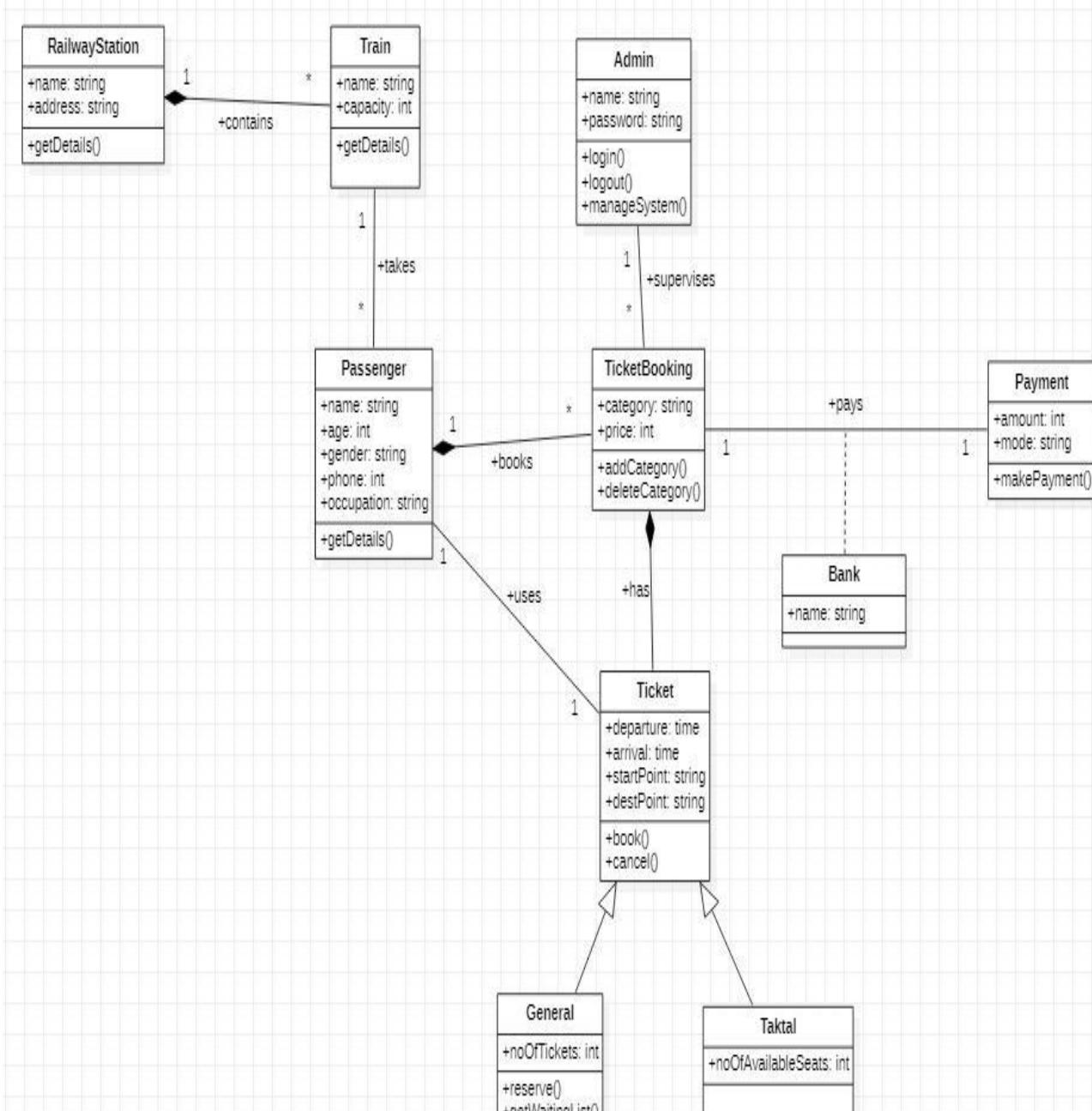
Online Shopping System





The online shopping system has customers who must have an account in the online website wherehe/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 systemby enteringvaliduser id and password for the shopping.The products sold for customers are sold for variouscategories like men,women,kids and home products.After the payment or surf the product thecustomer will logged out

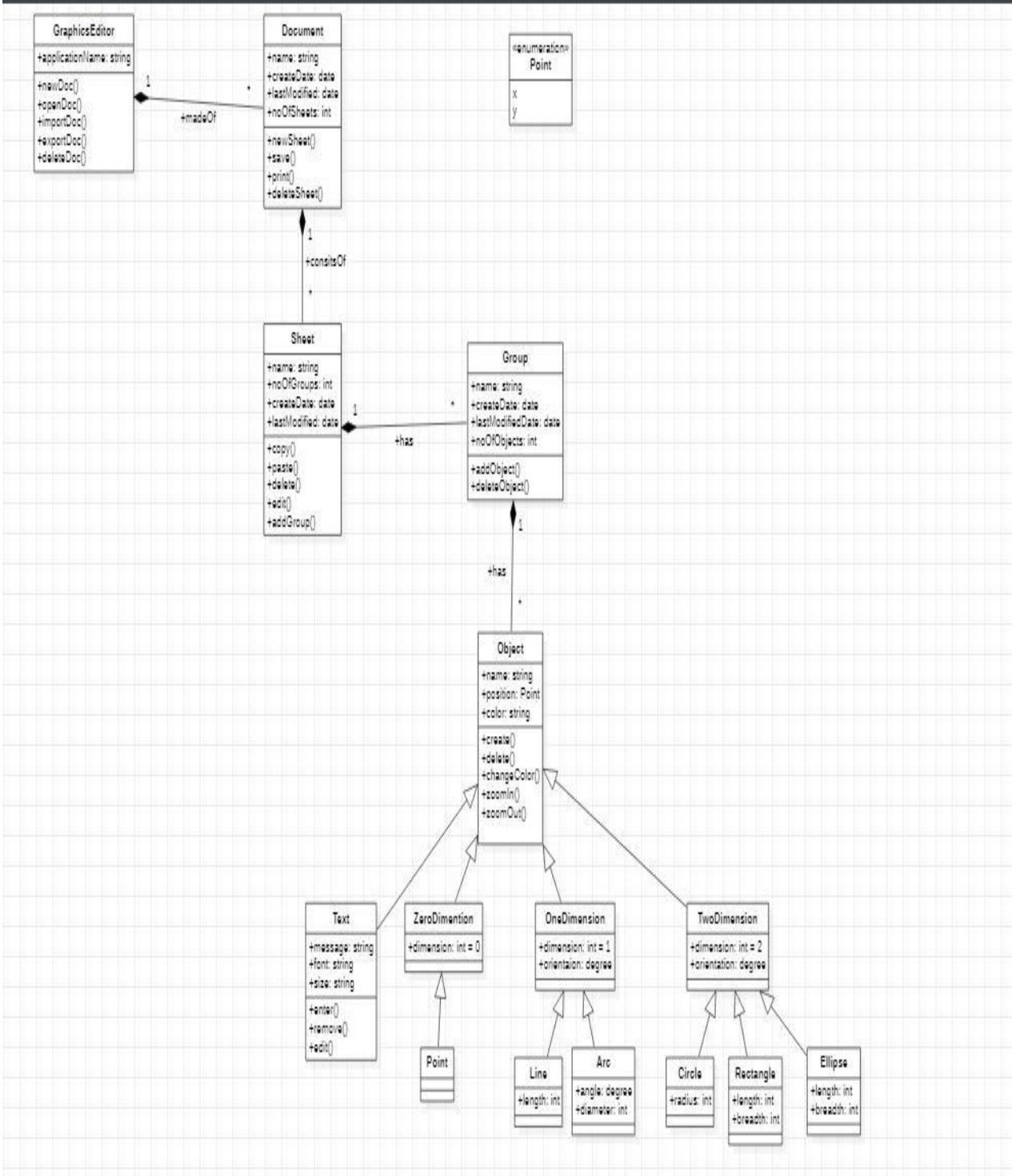
5.Railway reservation system:



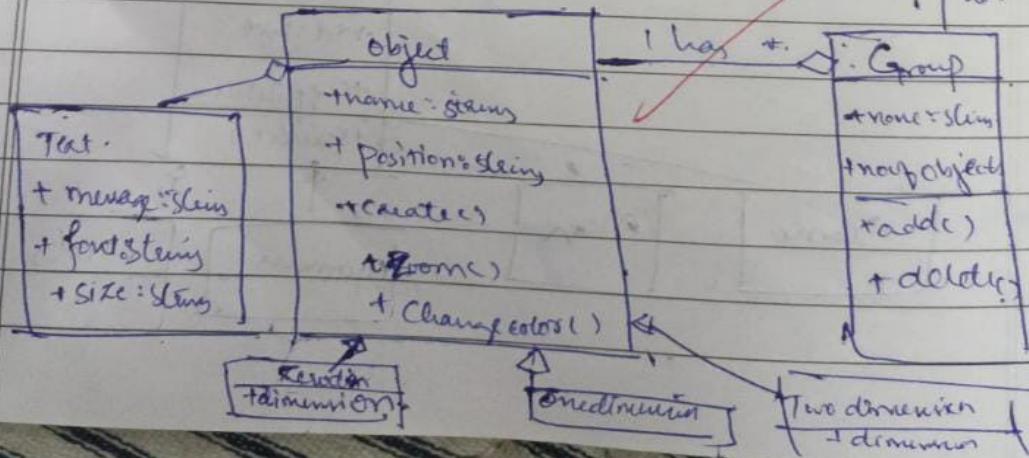
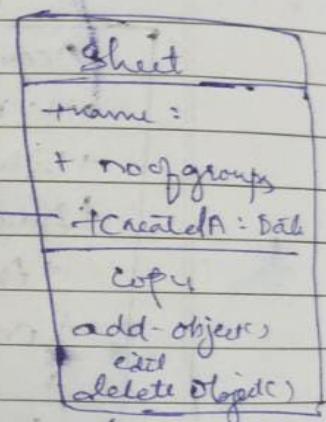
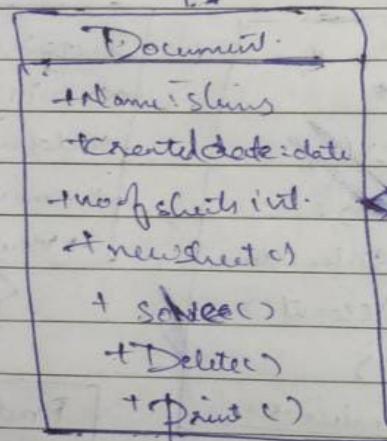
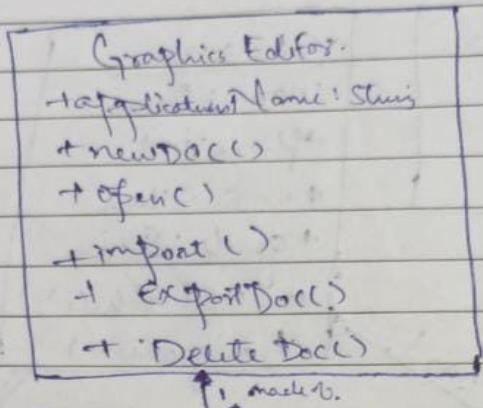
The admin manages the trains and reservation related to railway reservation system. There are three types of reservation, I.e RAC,waiting and confirmed.The passengers with a reservation goes

to one or the other reservation. A train consists of coaches and engine.A passenger pays for the ticket booked .Tickets can be booked in two ways by i-ticket or by e-ticket booking

6.Graphics editor system:



Graphics Editor

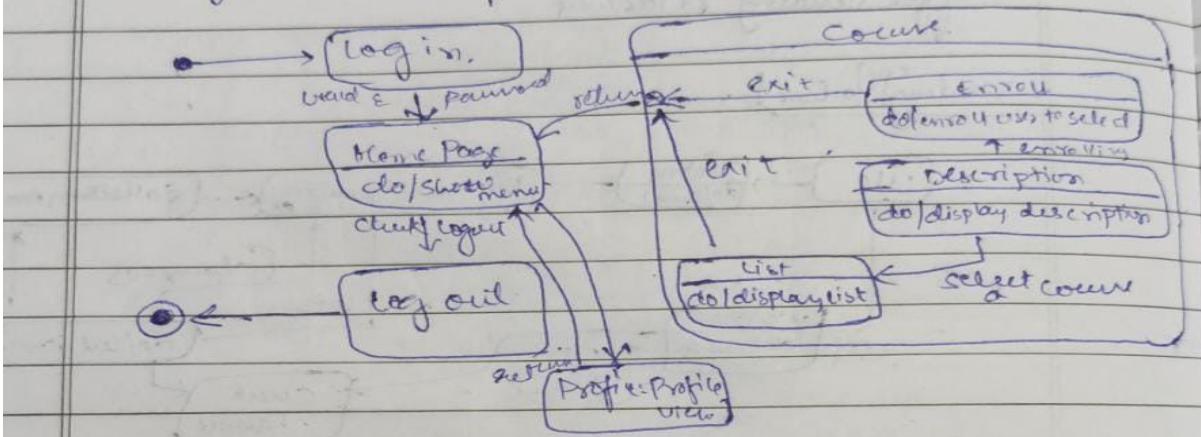


The graphical editor has documents consisting of several sheets. Each sheet contains drawingobjects, including text, geometrical objects and groups. A group is simply a set of drawingobjects. A geometrical object includes circle, ellipse, rectangles, lines and squares

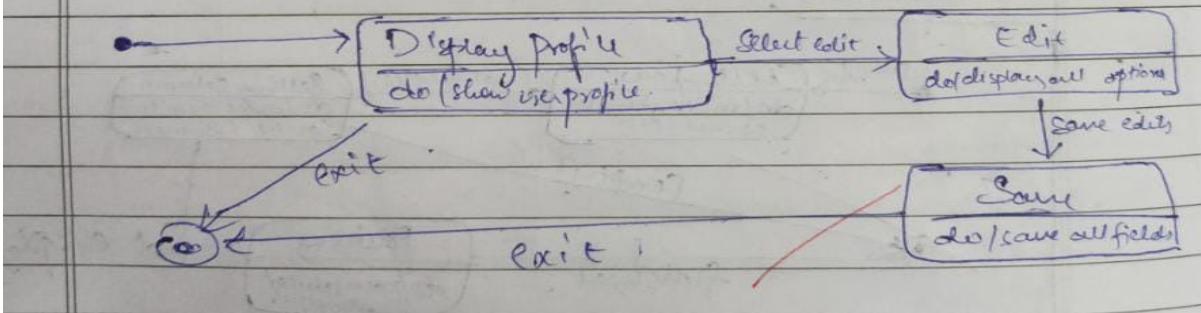
- 3. Draw the advanced state diagram**
 - a. Give a description of the scenario considered for developing the model**

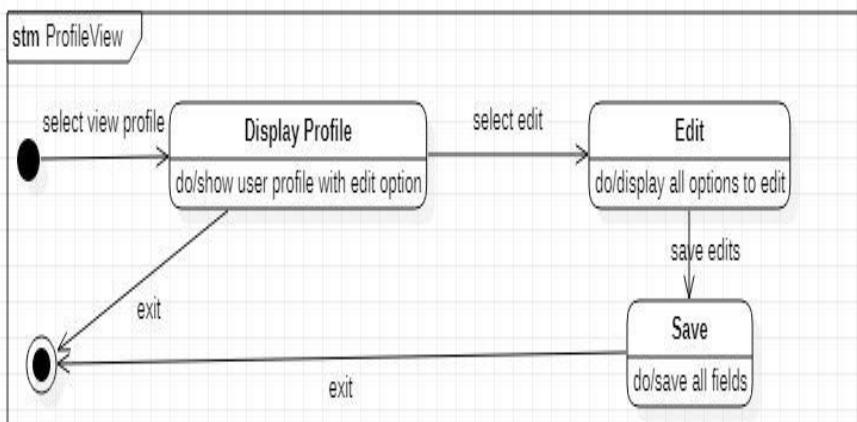
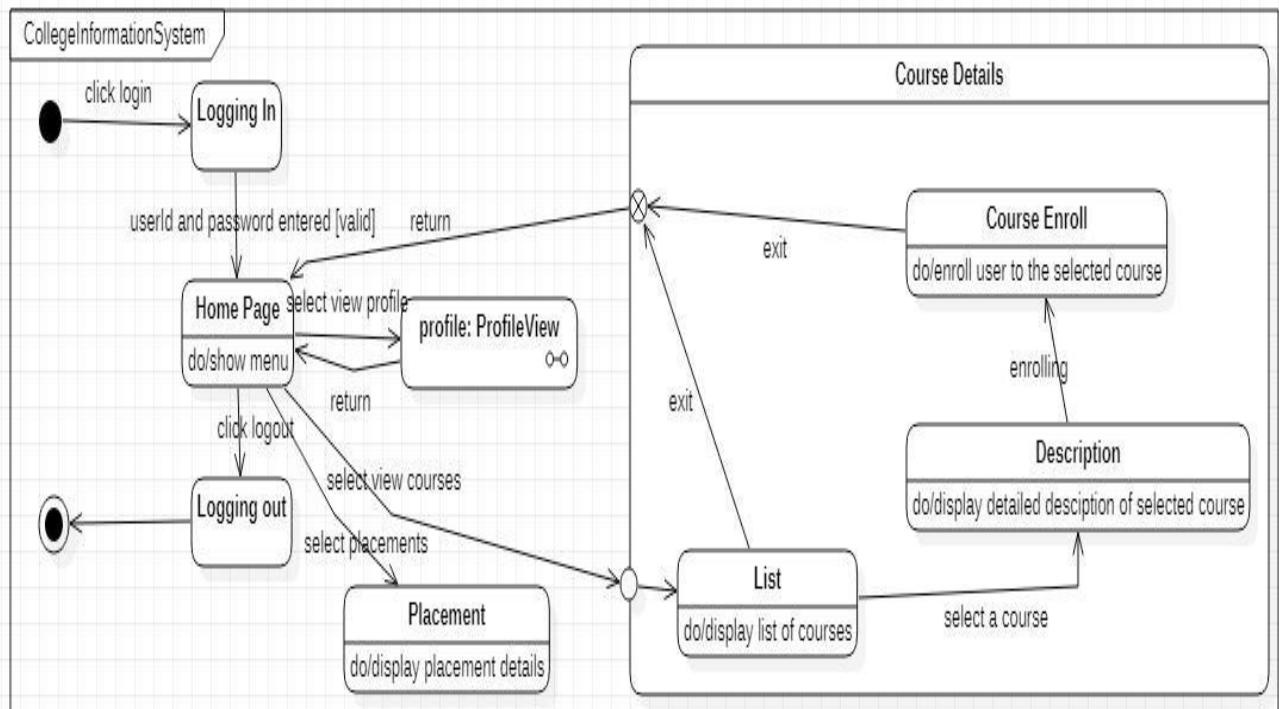
College information system:

College Information System:



Sem Profile View.

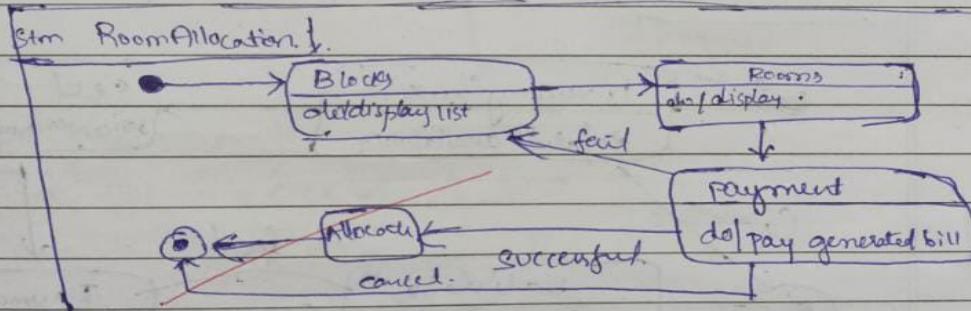
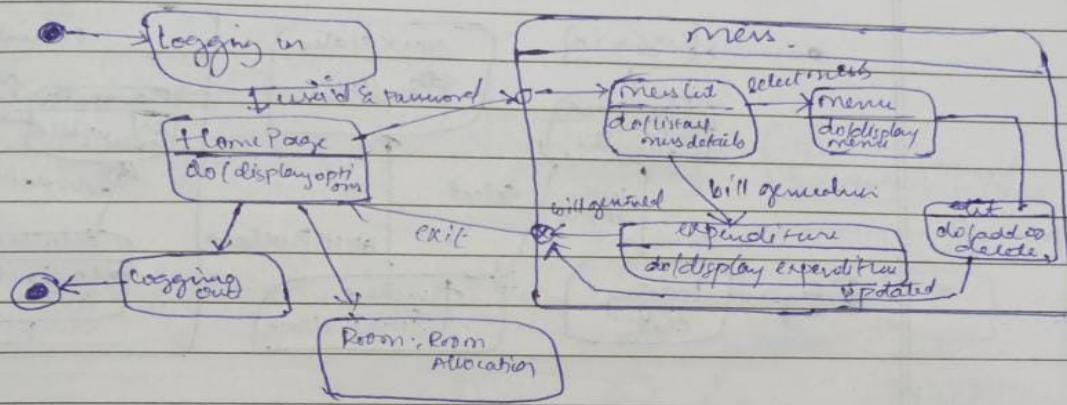


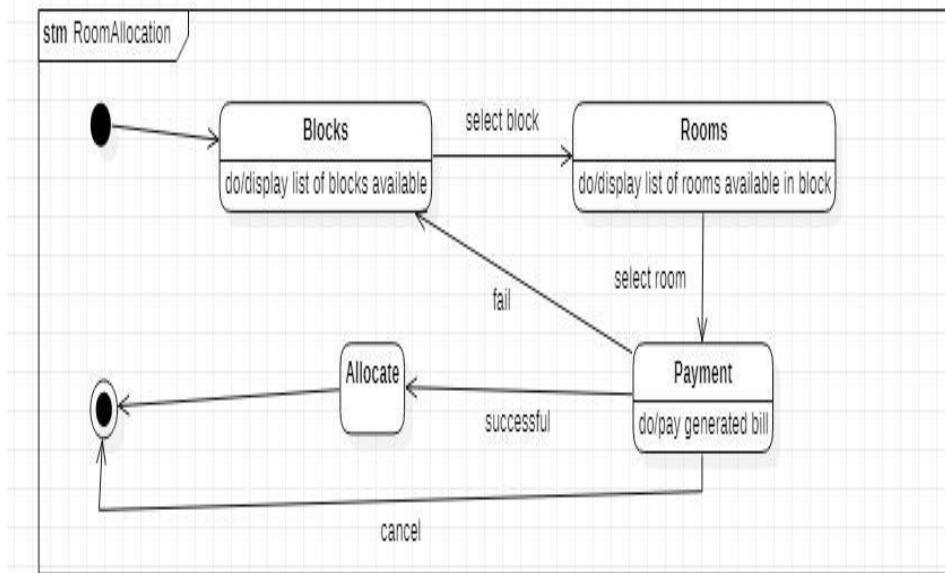
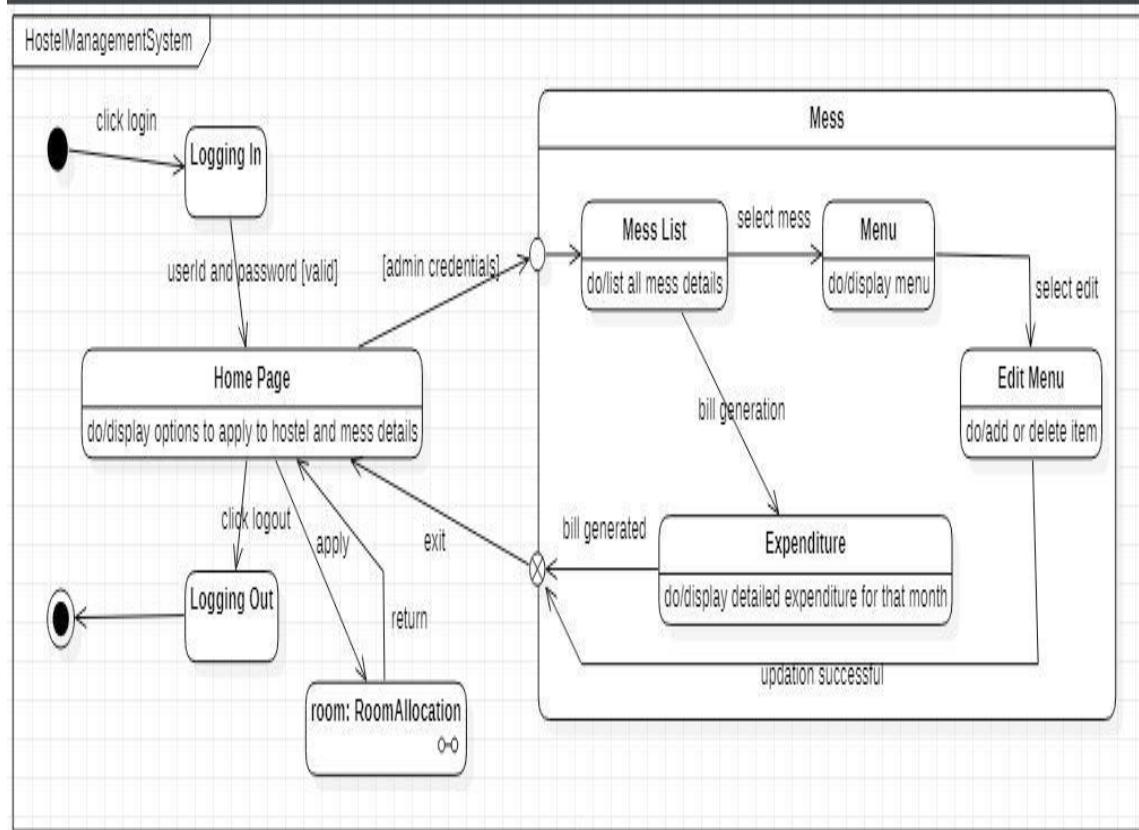


The above state diagram describes the states the admin goes through in uploading information of student, staff and department. The admin first needs to login which then leads to the validatestate, where the login id and password are validated. If invalid it then goes back to the loginstate or goes to the get information state. Upon receiving the correct information it goes to the uploadstate 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 manage information related to the student, teacher, or department. After necessary changes the admin can update the information and logout from the system

Hostel management system:

Hotel Management System

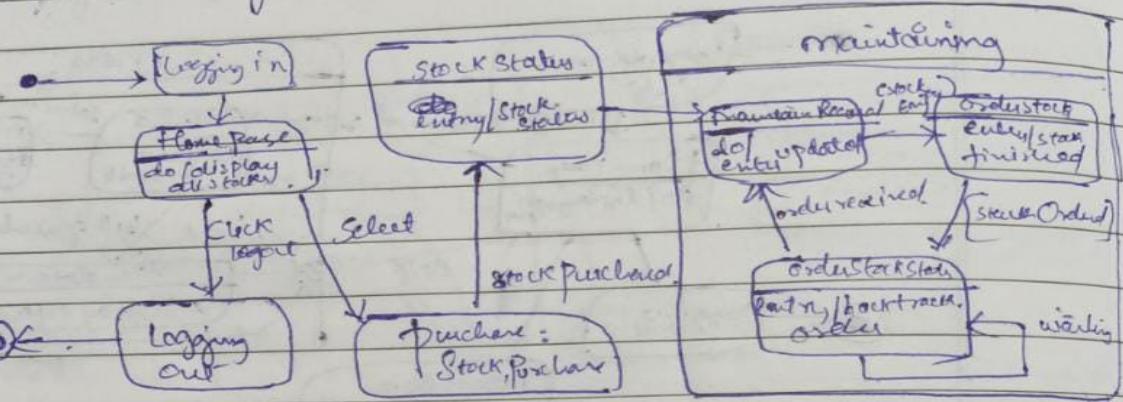




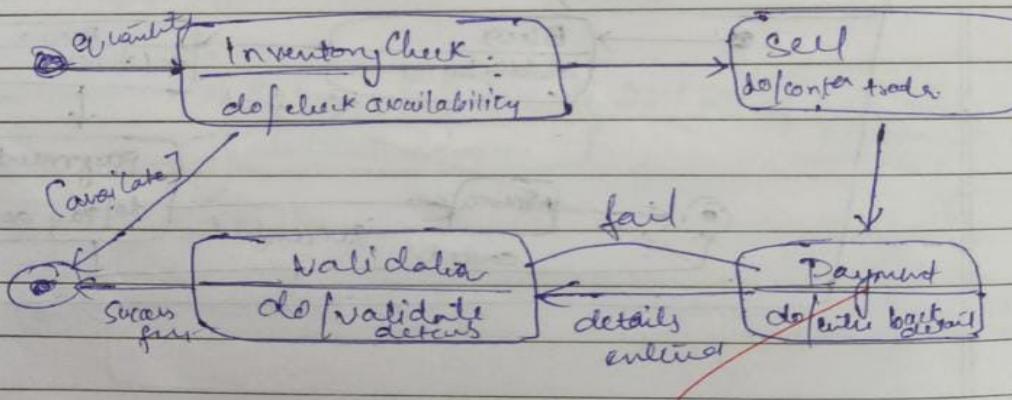
The above state diagram gives the movement of states in allotting a room to a student. The admin allots rooms for students. The admin first logs in to the database, which displays a set of options. The admin then chooses to allot rooms and finds the availability for rooms. If rooms are available then the admin allots room to the student and when successful the student makes the payment. If no rooms are available, a message is displayed and control goes back to the display state.

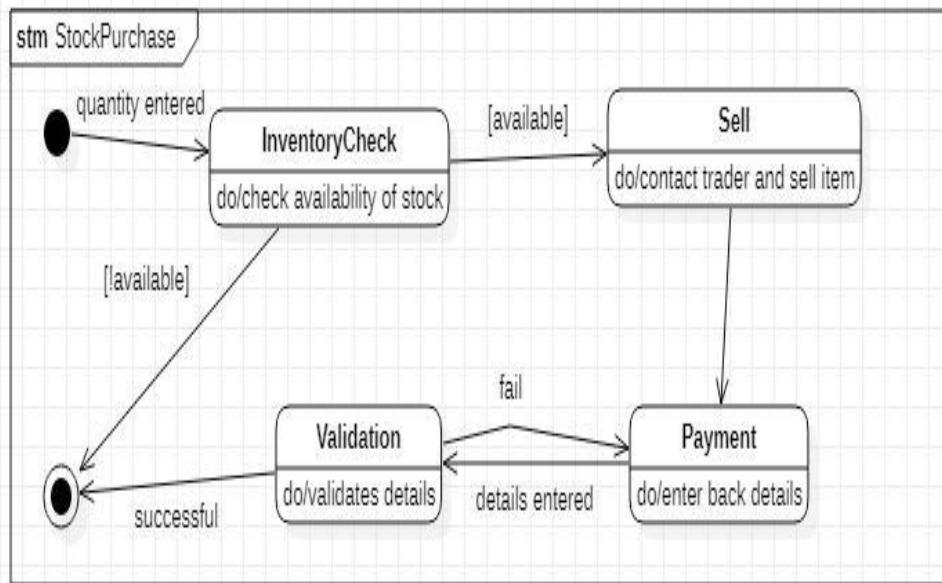
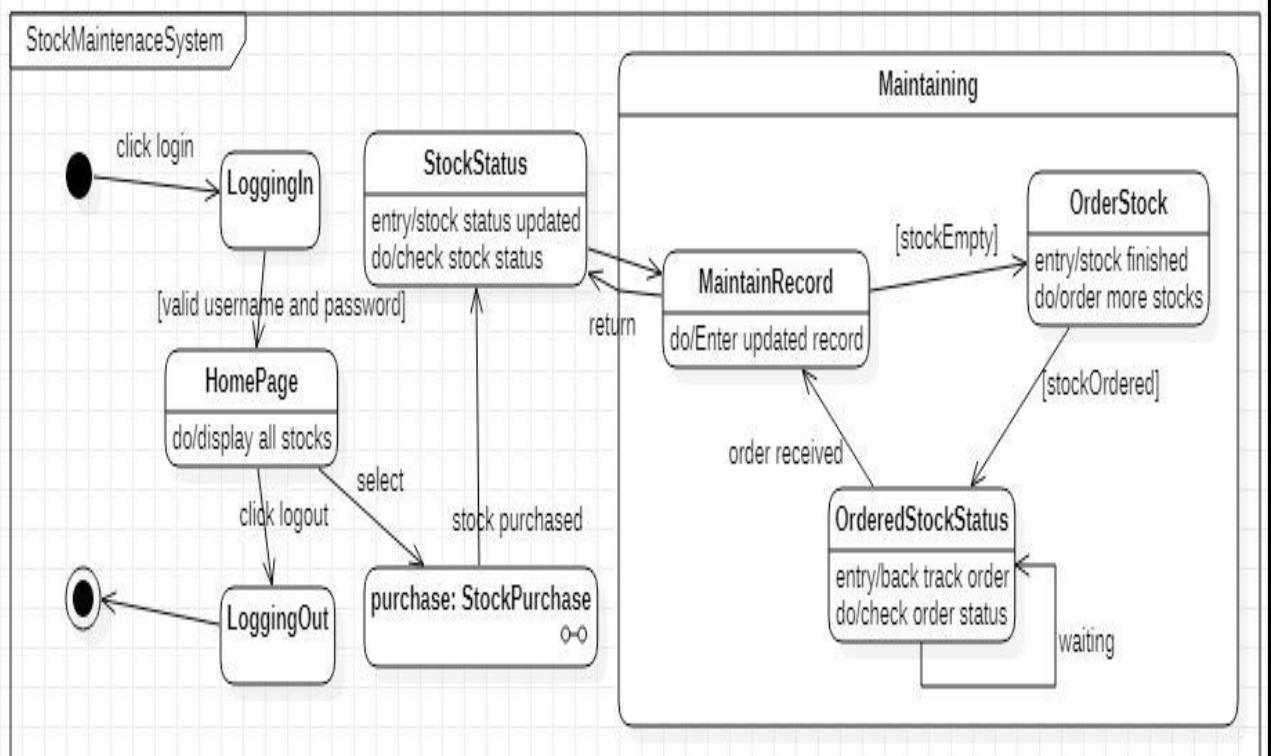
Stock management System:

Stock Maintenance System

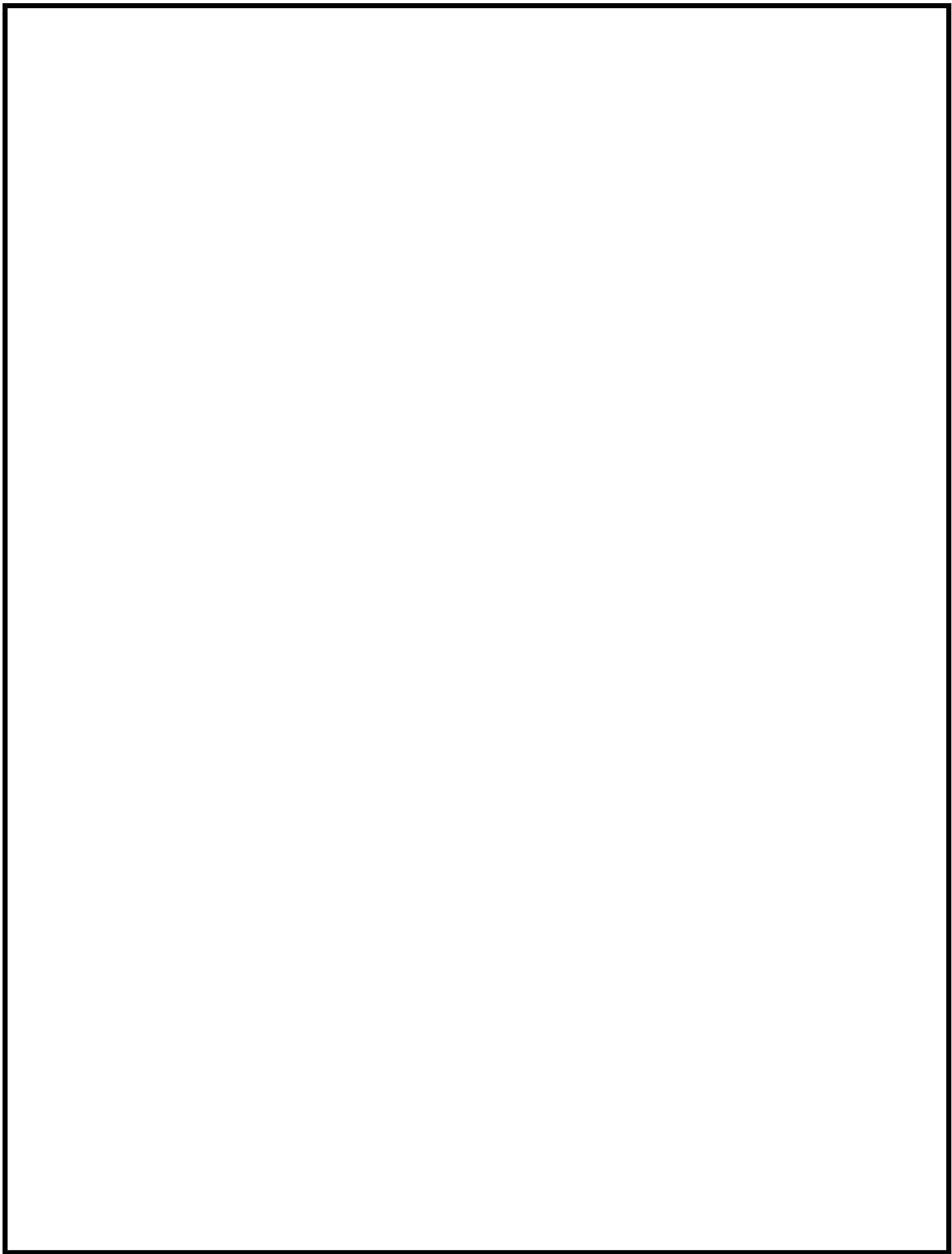


sem: StockPurchase





The state diagram above gives us the states involved in purchasing an product and placingtheorder for the same. There is first an inventory check ,where is stock of products is notedandifthe stock is less than minimum an order is placed by first searching for suitable trader . if asuitable 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.

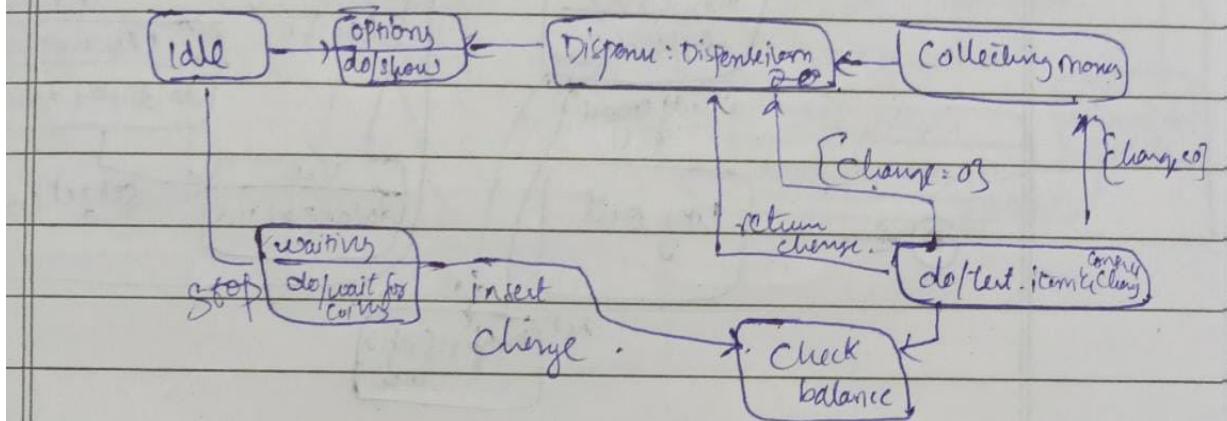


Coffee vending machine:

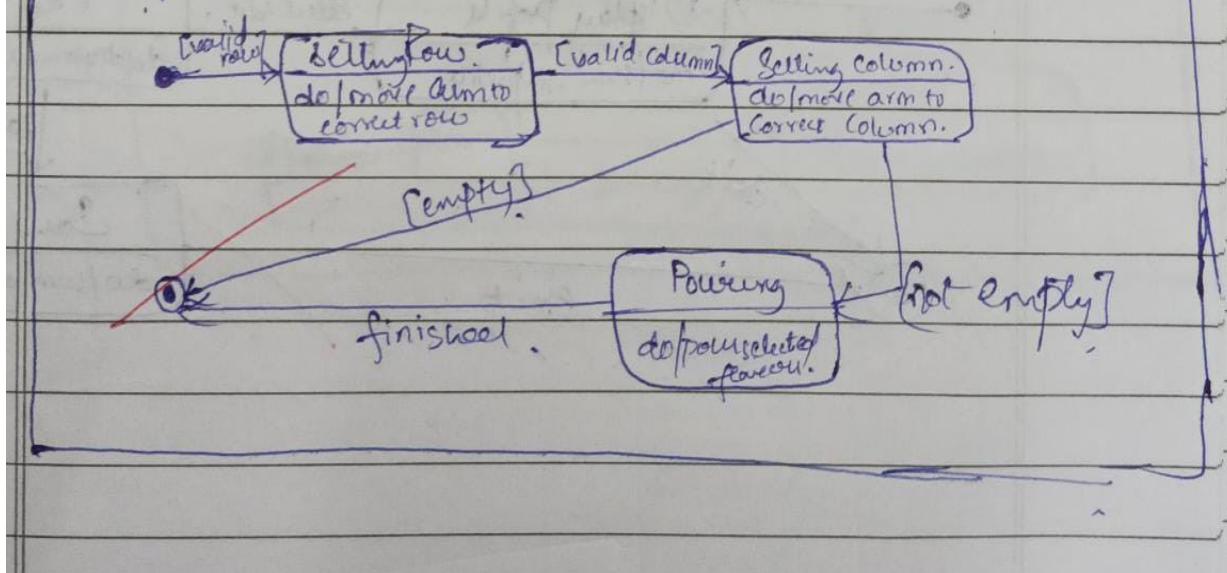
State Diagrams:

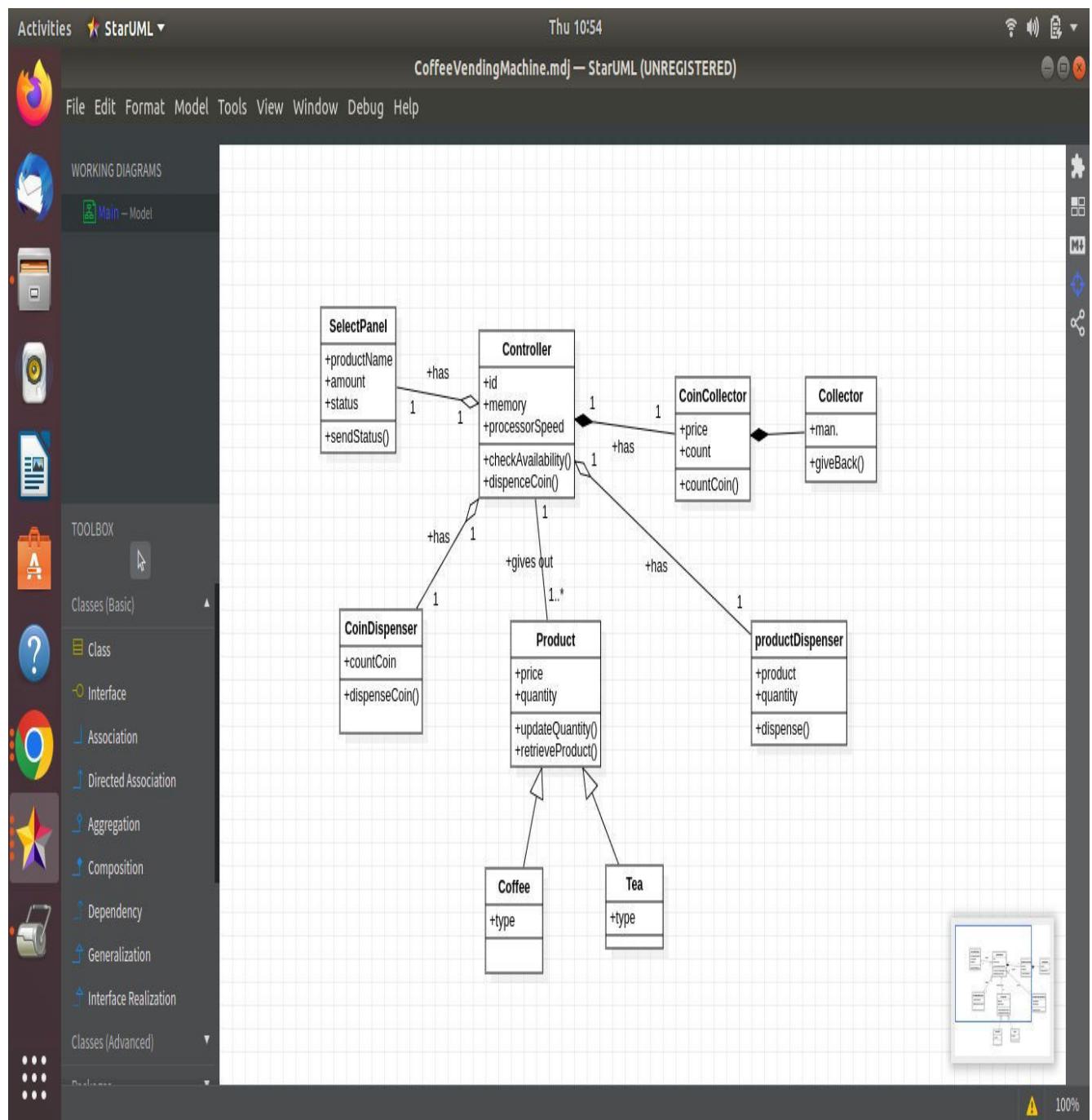
Coffee Vending Machine

Vending Machine



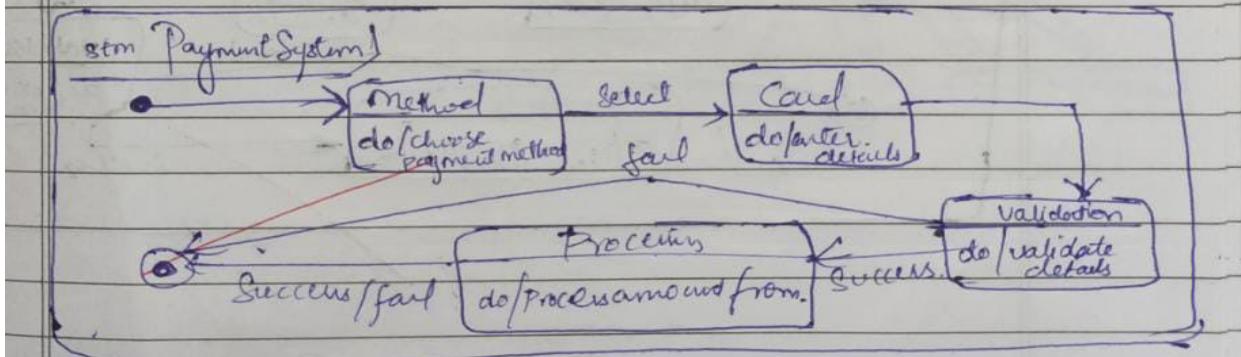
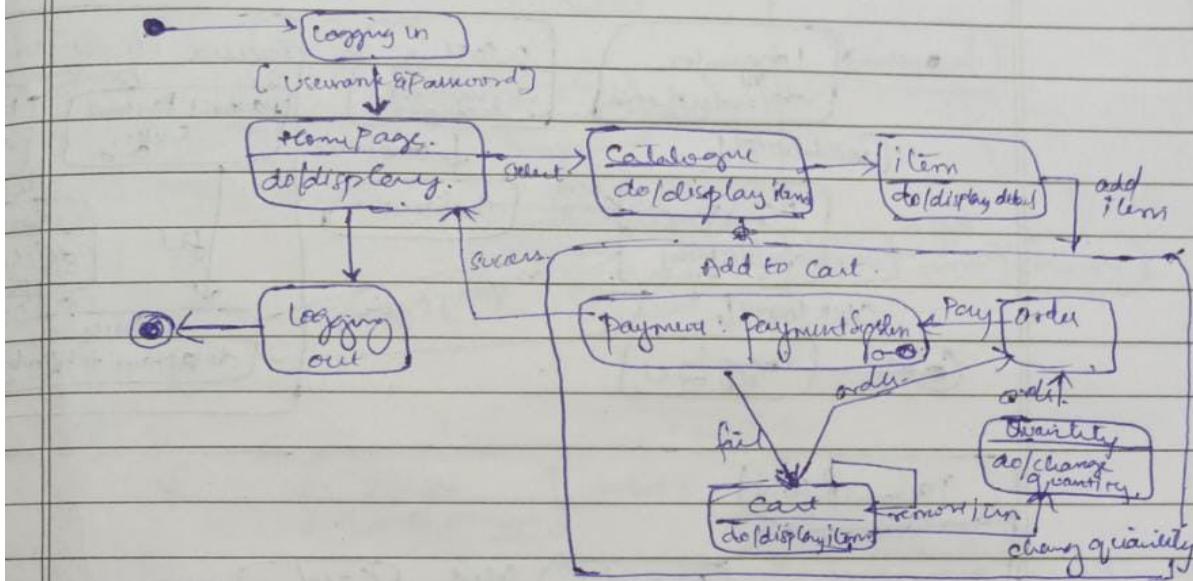
DispenseItem

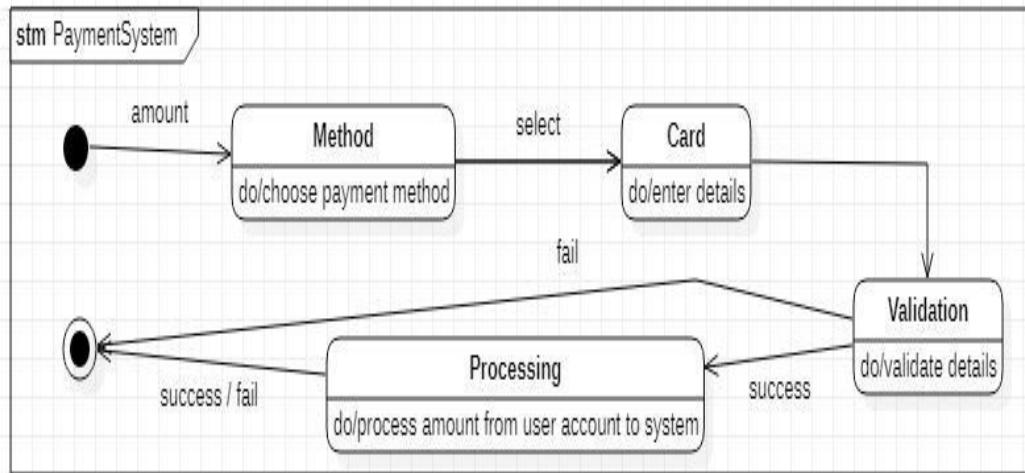
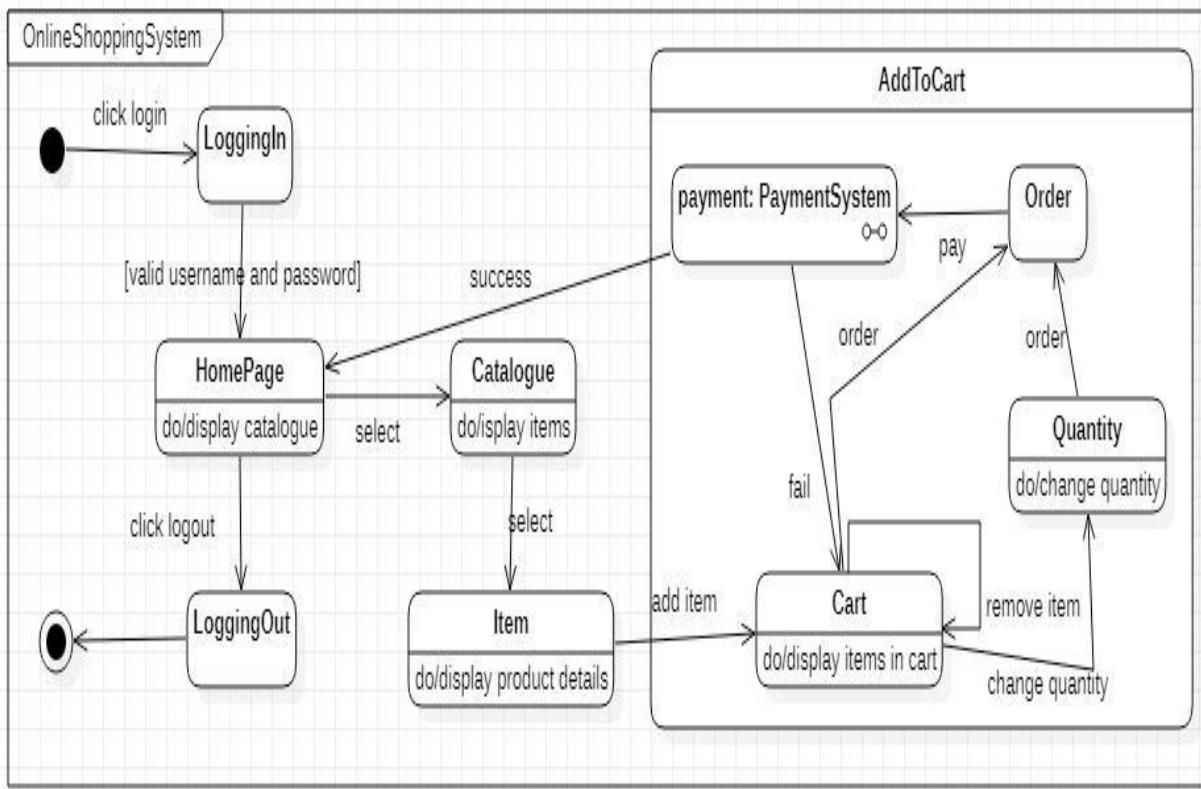




Initially the vending machine is in the waiting state. The machine displays the selected item selected by the user. When the person inserts a coin the machine adds the amount to the cumulative balance. After adding some coins, a person can select any item. If item is empty or balance is insufficient, the machine waits for another selection. Otherwise the machine dispenses the item and returns the appropriate change. The state diagram for coffee vending machine has a submachine called dispense Item, which has the states for dispensing an item from the vending machine. The arm of the machine first moves to an appropriate row, when ready, moves to an appropriate column and when the arm is ready it finally dispenses the item from the machine.

Online shopping system:

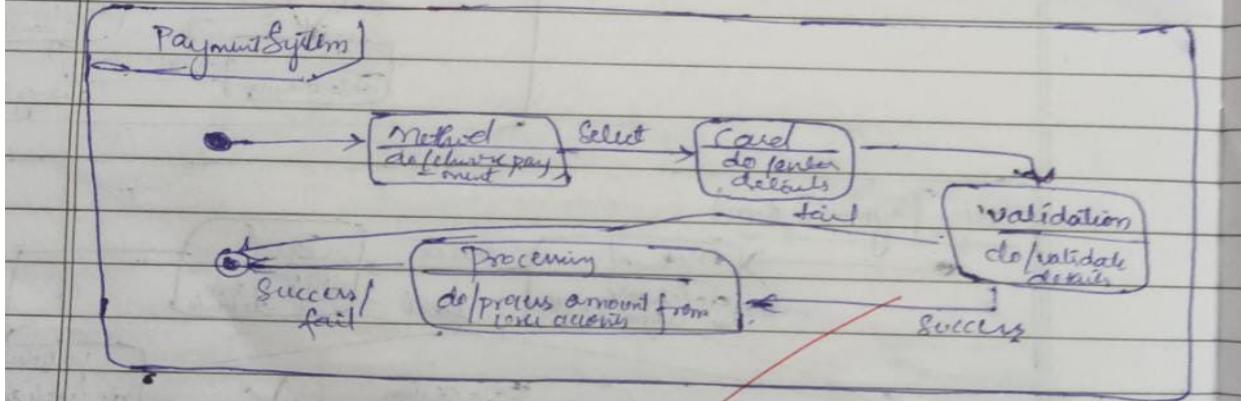
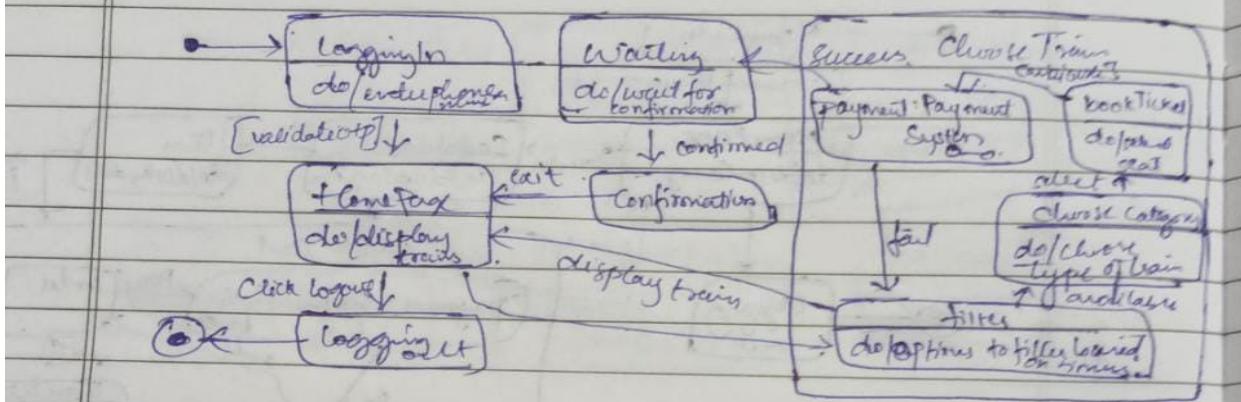
Online Shopping System

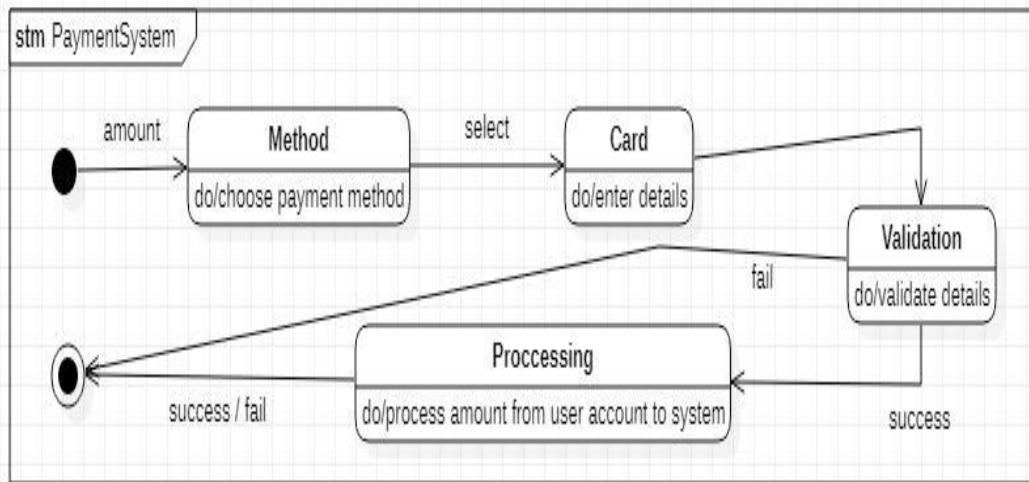
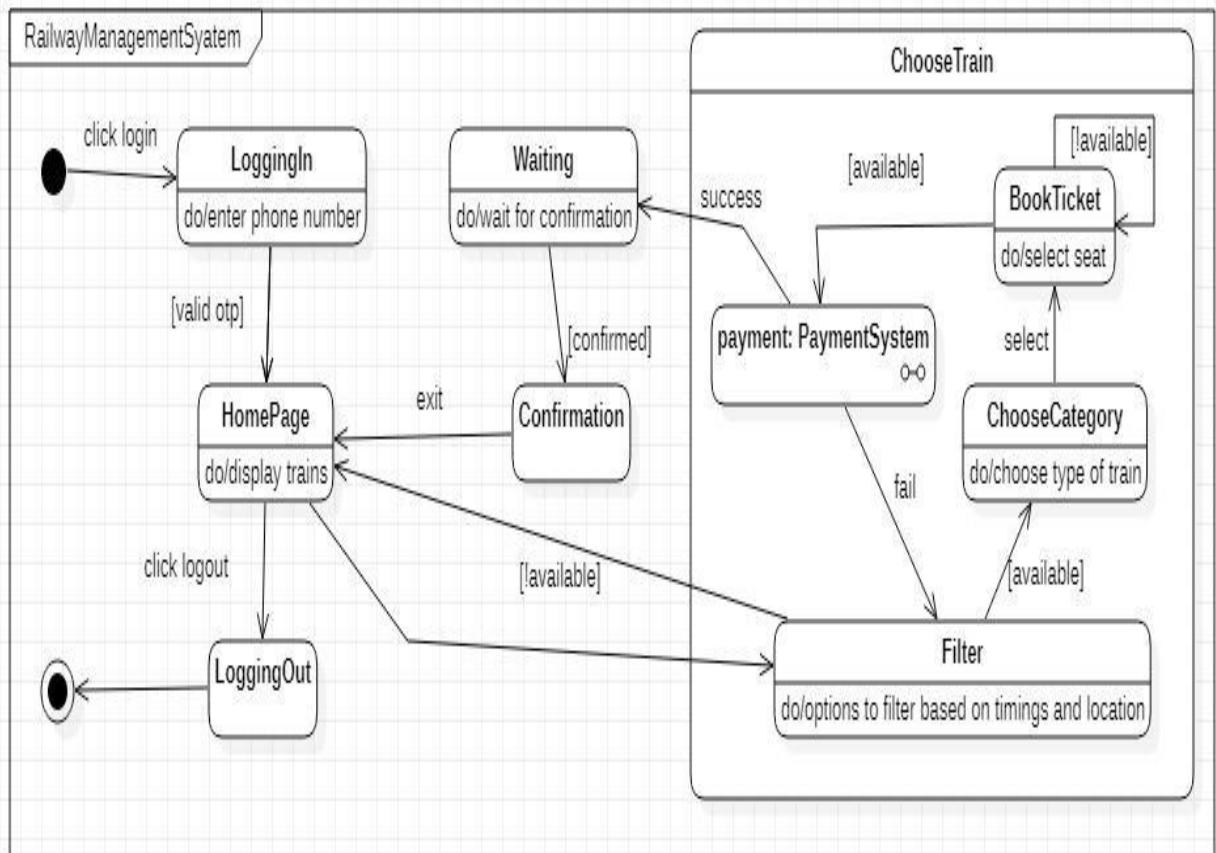


The advanced state chart diagram has states explaining the product purchase and payment. It has two sub machines i.e product selection and checkout product. Product selection allows user to select products and add them to cart. Checkout product has states explaining the payment methods and validating the methods.

Railway reservation system:

Railway Management System

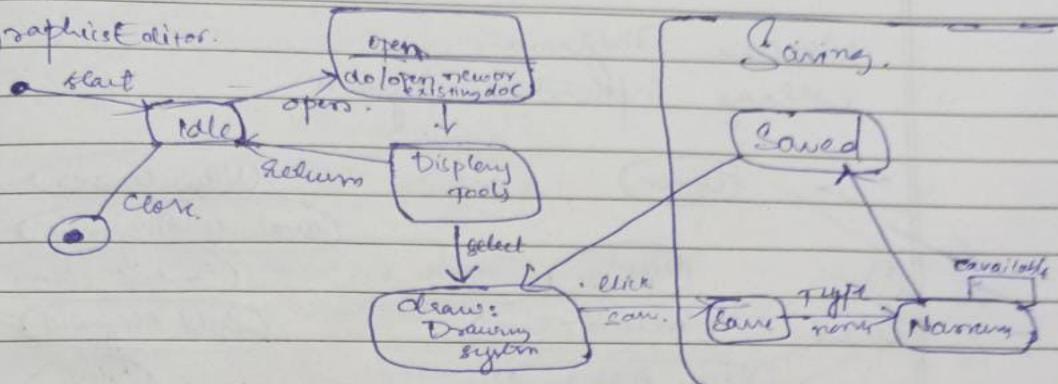




The user can see the train details and book a train for a particular source and destination. on timeout an error message is displayed and redirected to the main page. The user can then select a train and make payment for it. The advanced state diagram has states for paying the ticket. From the ready state the user goes to payment initiation after which the card details are accepted and an OTP is sent to the registered mobile number. On verification the money is deducted and ticket is sent to the customer

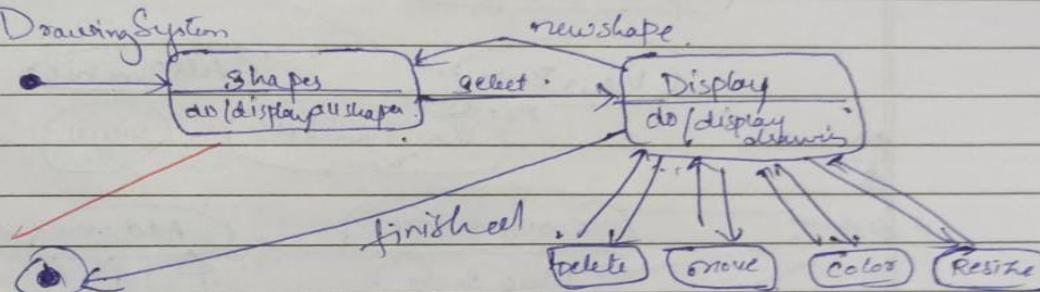
Graphics editor system:

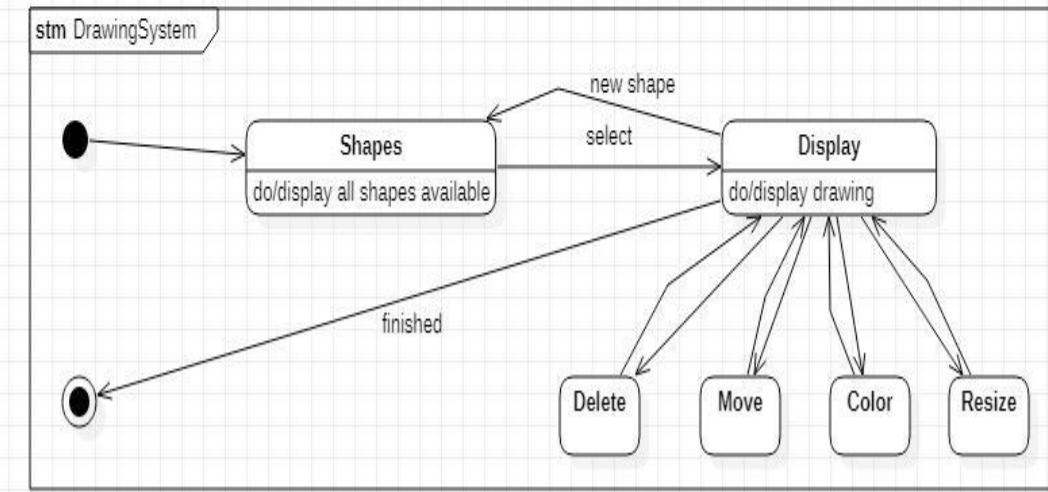
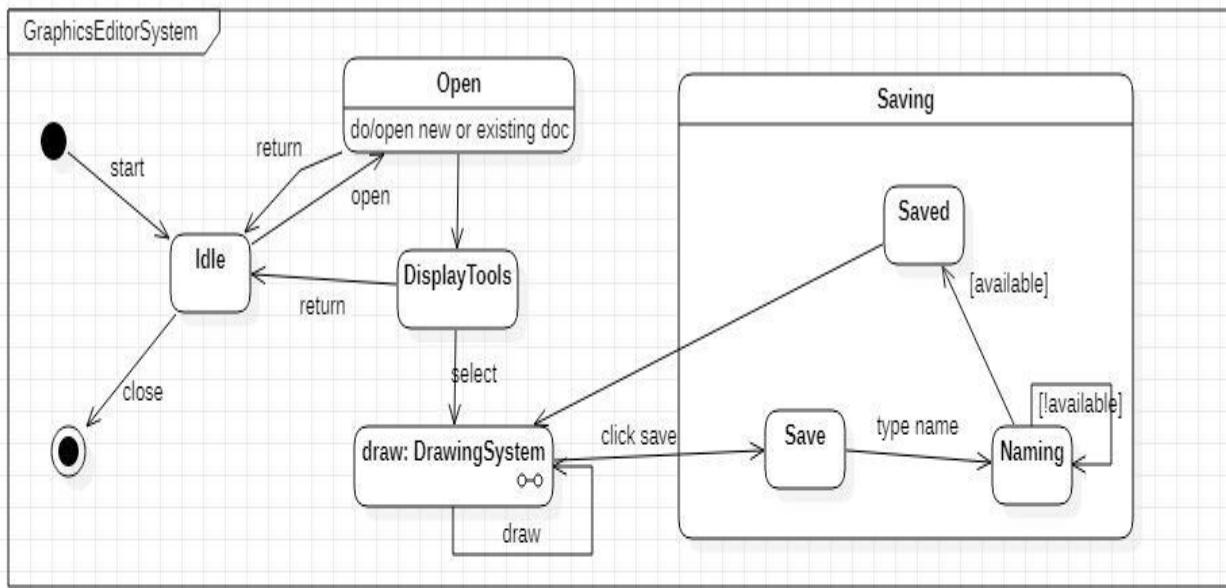
Graphic editor.



Saving.

sem Drawing System

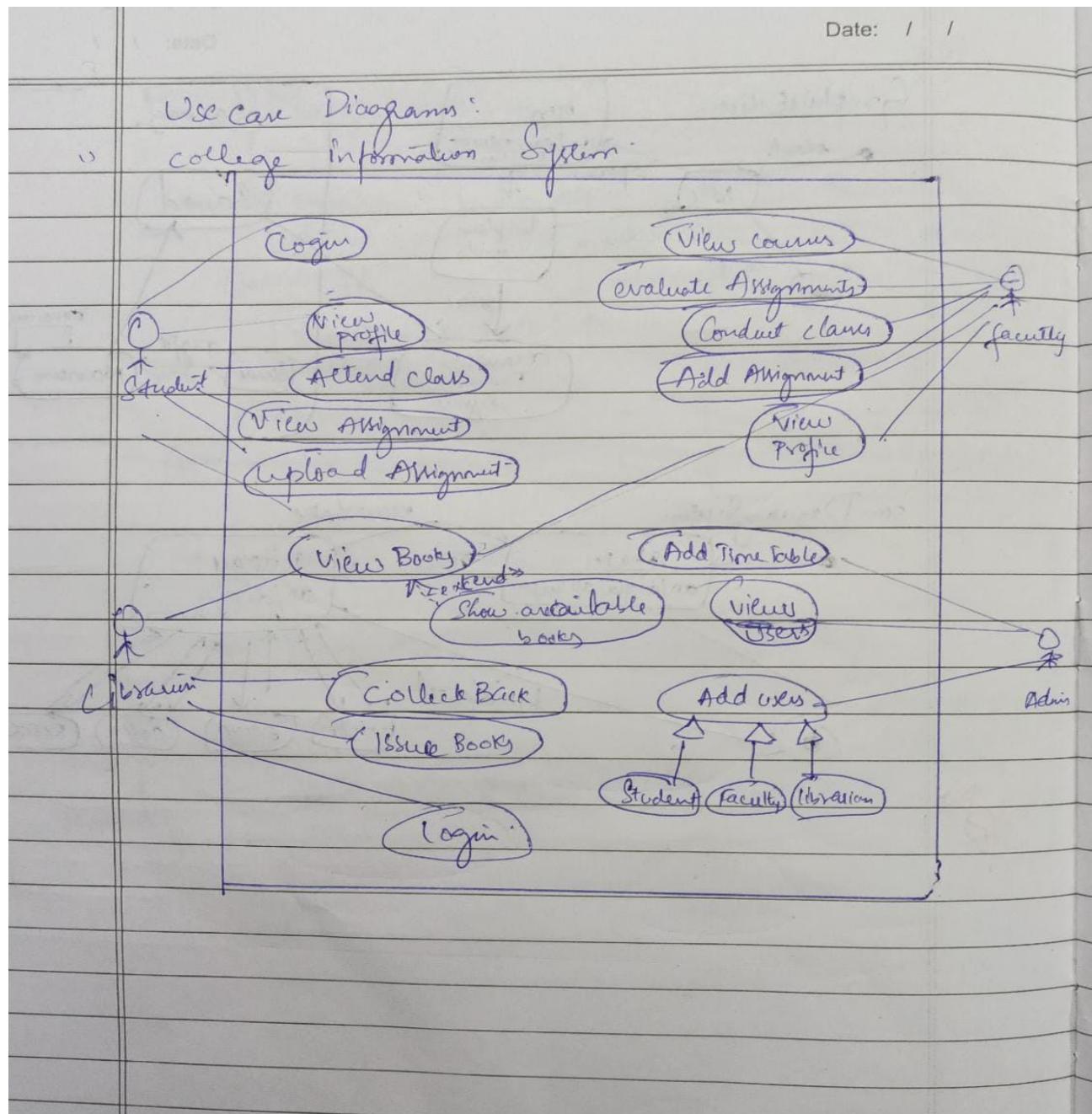


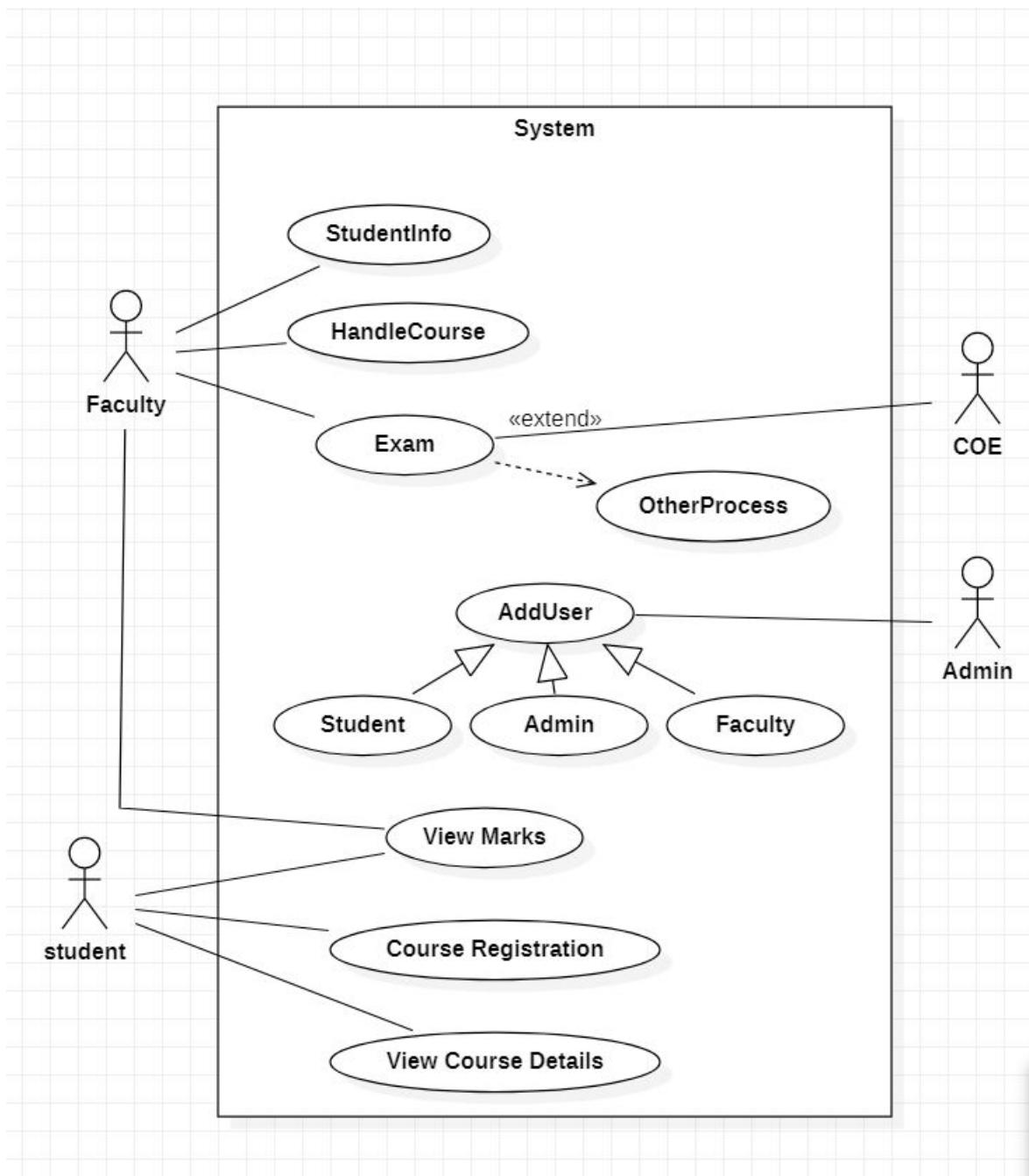


advanced state diagram gives the states involved in making and saving a graphic file. first the user selects a new document and draws graphics. If there is a mistake he can erase and select a color from the color palette. He can then save the file created. The advanced state diagram had a composite state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

- 4. Draw the advanced use case diagram**
 - a. Give a description of the scenario considered for developing the model**

1. College information system:

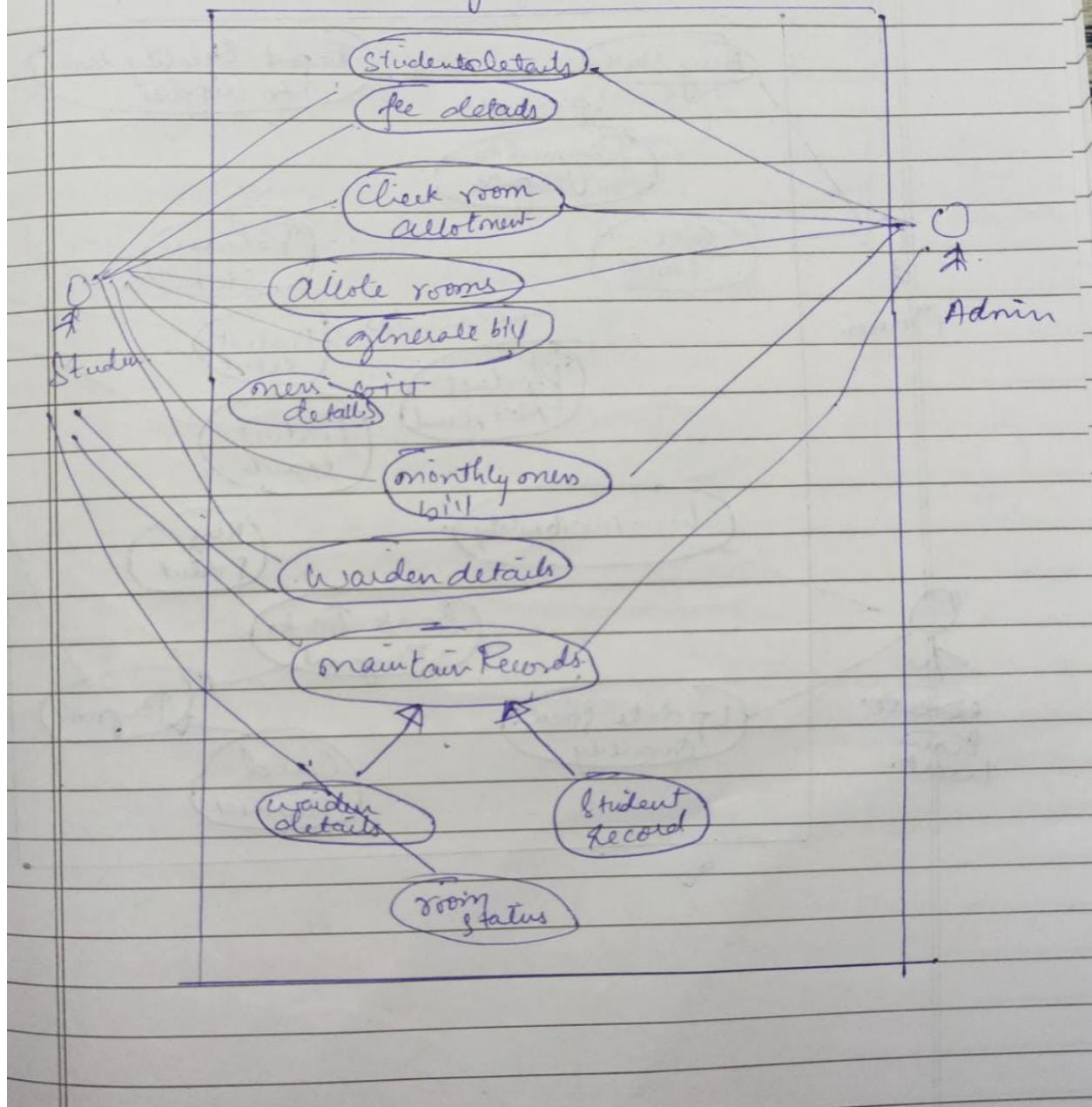


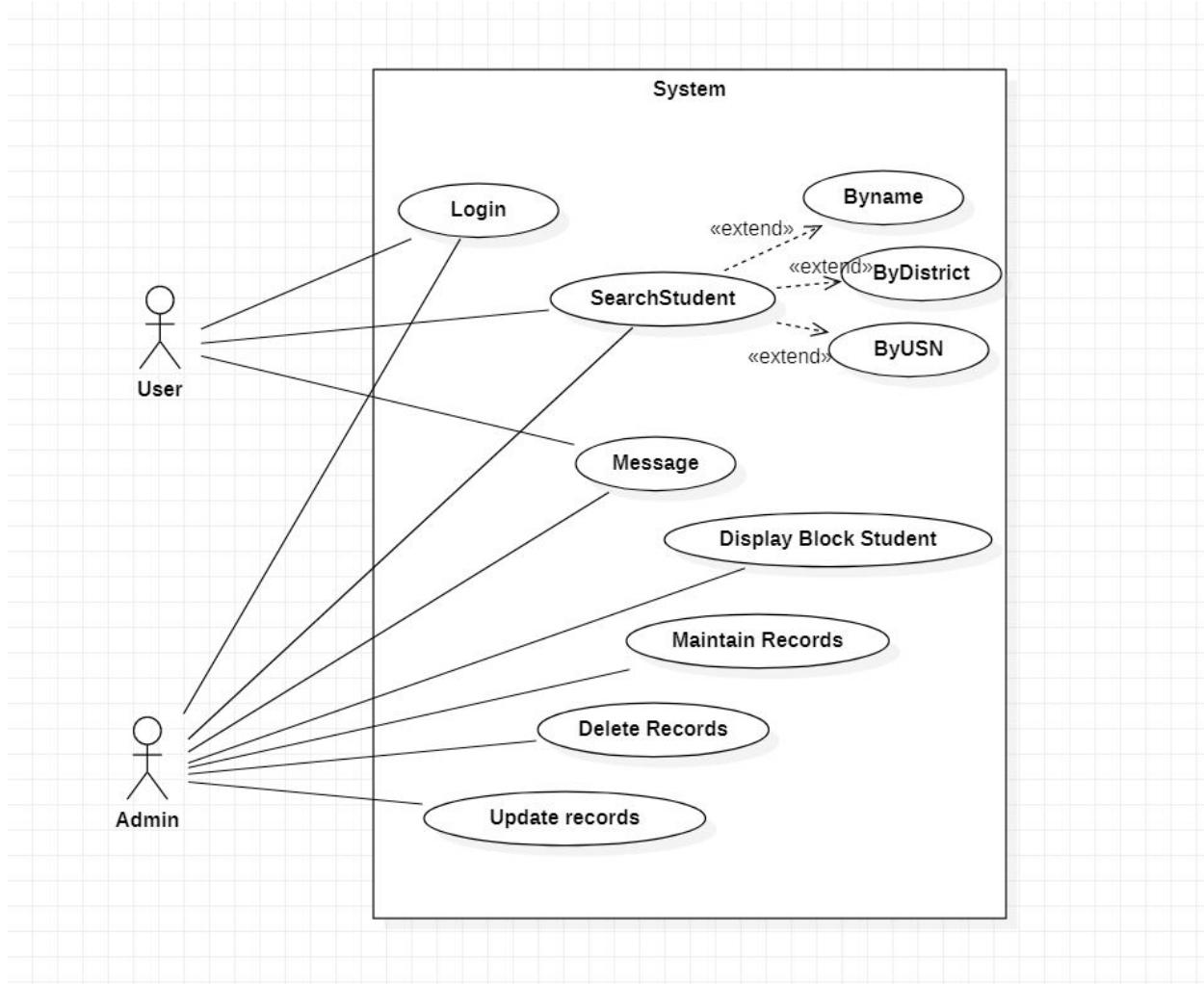


Actors: Admin:the person who manages everything Student: A person who uses the system COE: A person who is responsible for examinations Staff: A person who works in the college Use Cases:
Manage details: the admin can update,insert or delete the data.
View results: displays the result of students. **Subject details:**various details related to subject is displayed. **View student details:** the details of student is displayed **Declare results:** the results of exams written by student is displayed.

2.Hostel management system:

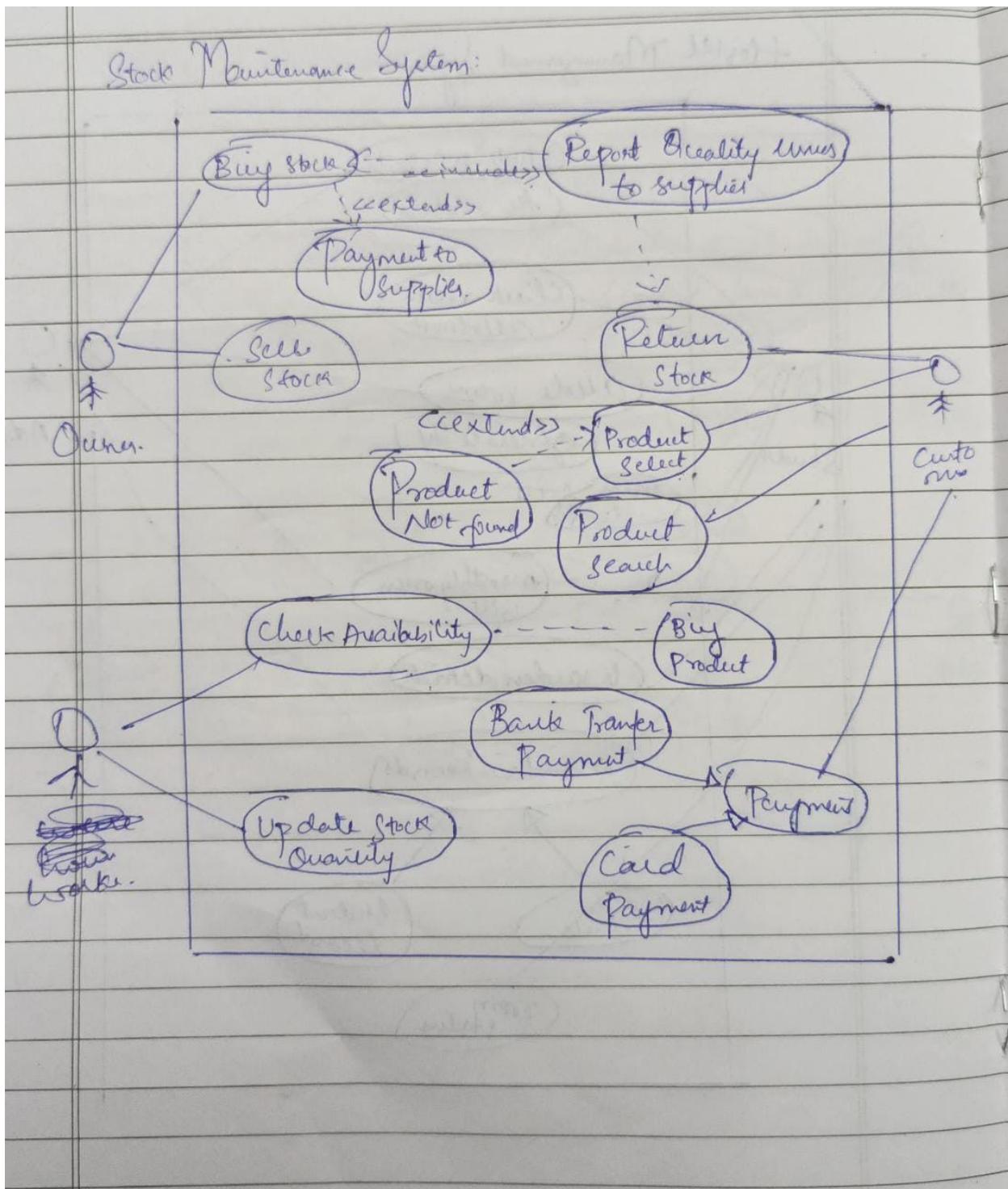
Hostel Management System

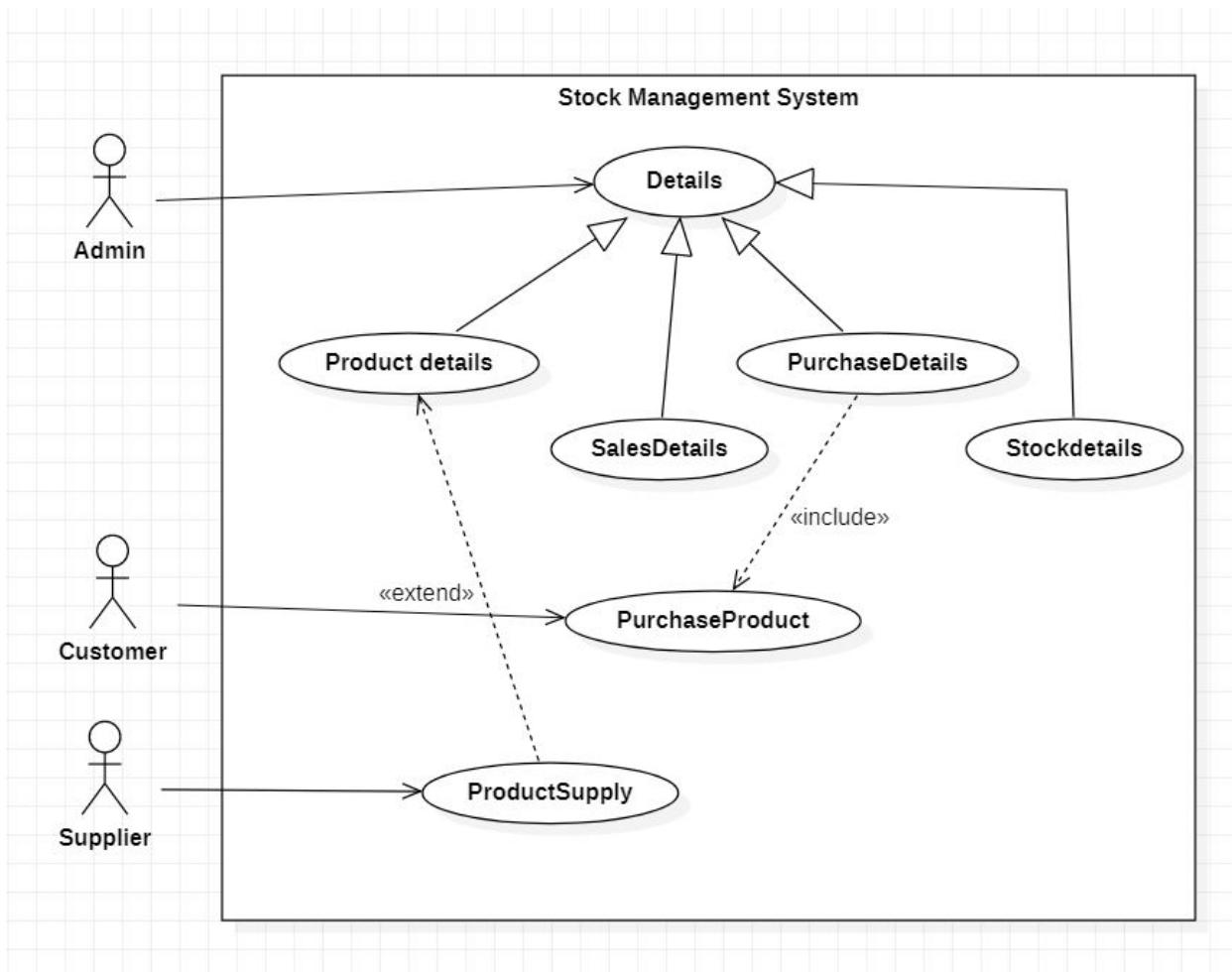




Actors: Admin: the person who manages the whole system
Warden : the person who manages the allottees **Student :** the person who uses the hostel system **Use Cases:** Manage hostel : allows actor to update delete or add information **Login :** allows actors to login into the system. Add allottee: the students are allotted hostel rooms **Book hostel:** the student can select the hostel they wish to stay in. **Pay fees:** the fees payment is done by this use case.

3. Stock maintenance system:





Actors: Customer: a person who purchases the products Retailer: a person who sells the products Stock

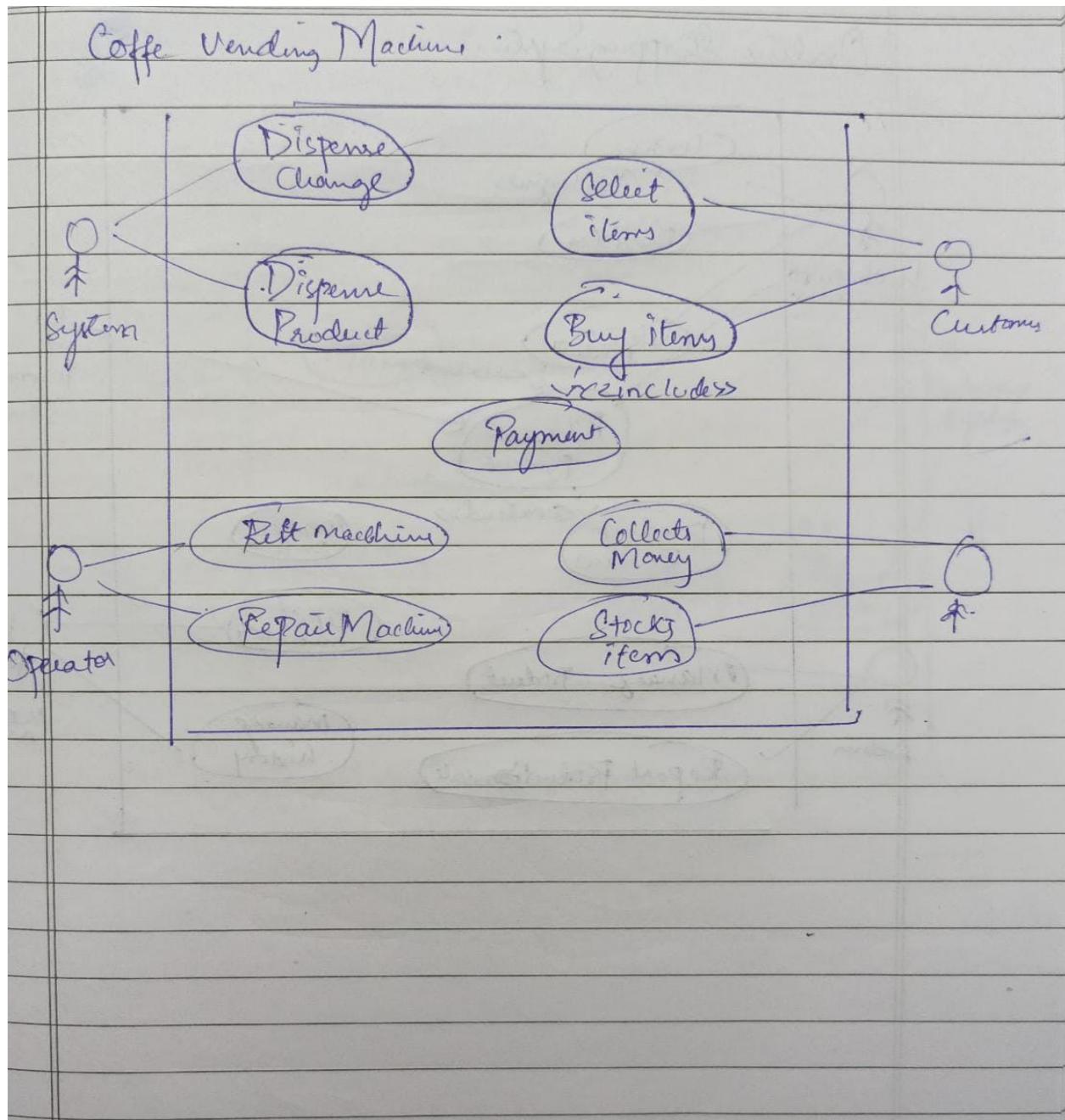
person : a person who keeps check of the stock Supplier: a person who supplies the products

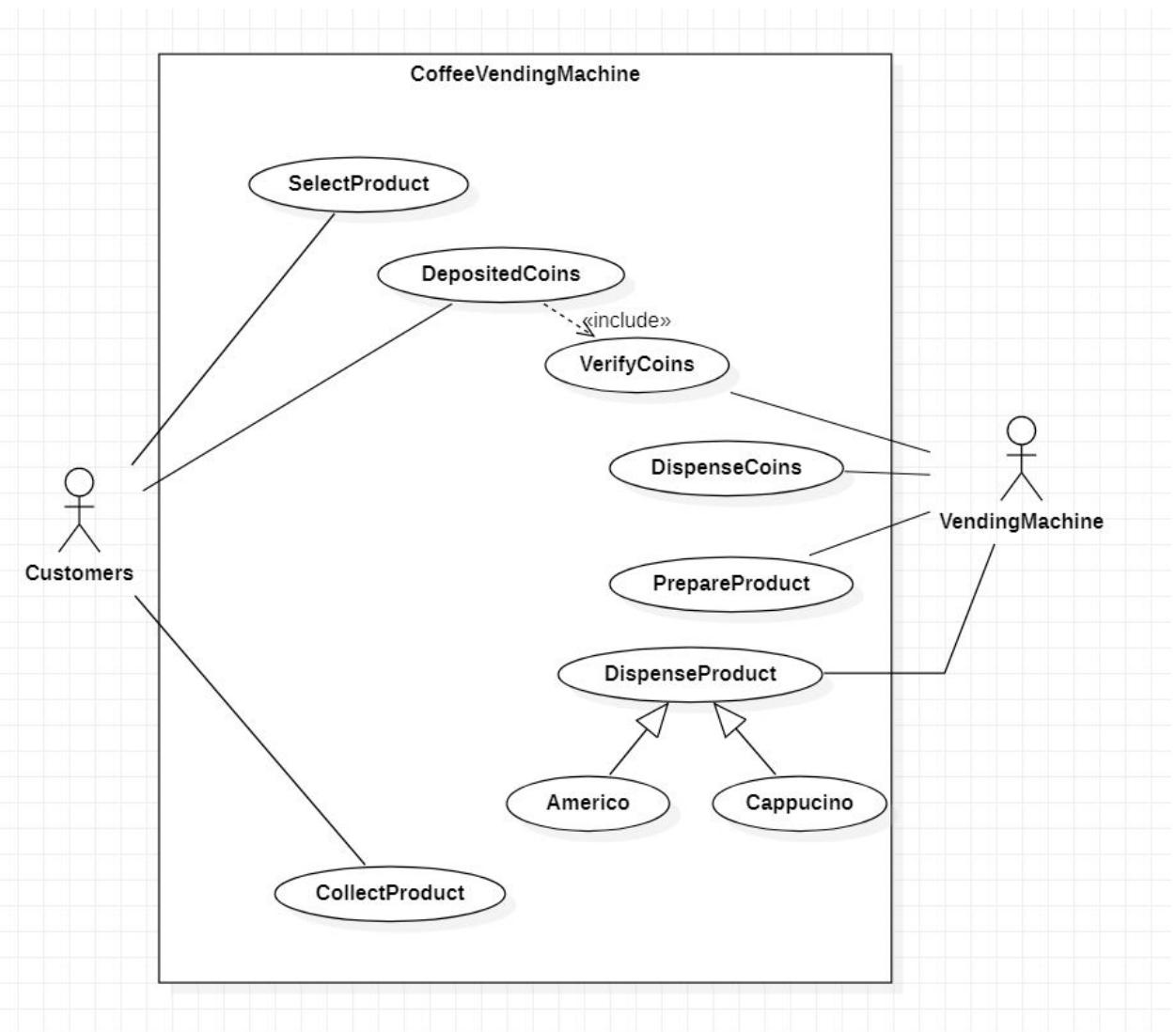
Use Cases: Purchase item: allows a user to purchase any product
Make payment: accepts the payment Supply stock: keeps track of the stock supplied

Find traders: provides a list of traders Update 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

4.Coffee vending machine:

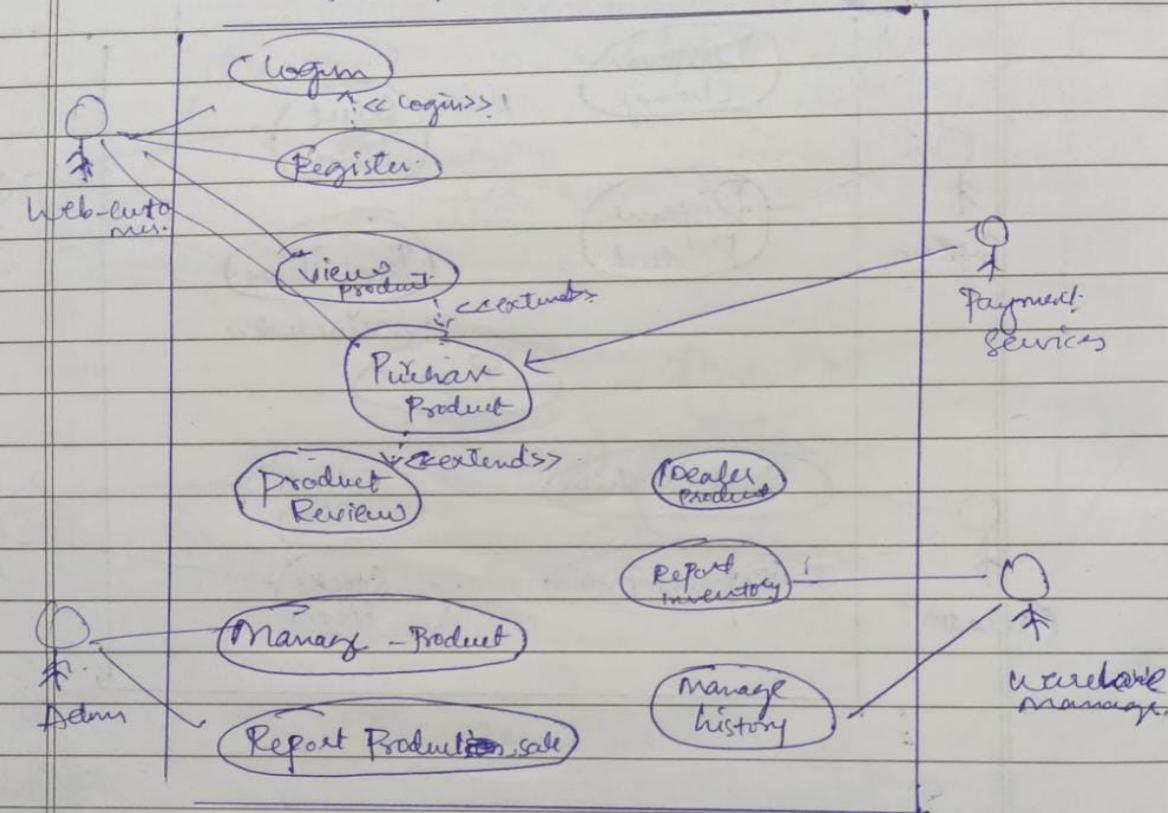


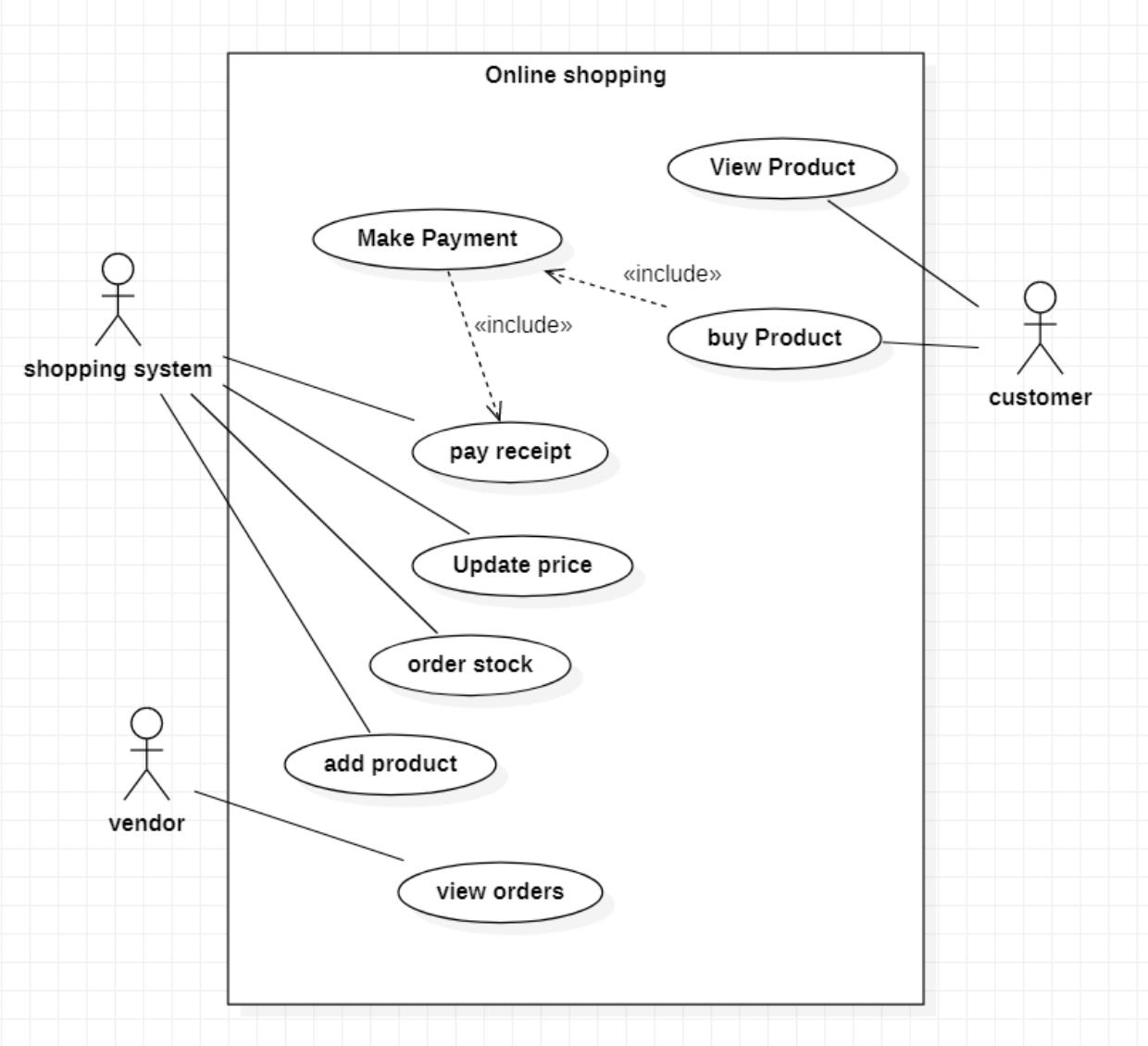


Actors: Customer :a person who uses the coffee vending machine Stock clerk : a person who maintains the stock Coffee vending : a person who maintains the machine **Use Case:** Display payment details : displays the payment details Request coffee : allows user to order their coffee Make payment : accepts money for the coffee Load ingredients : is the use case where the operator fills the machine with ingredients Dispense coffee : the coffee ordered is prepared and given

Online shopping system:

Online Shopping System

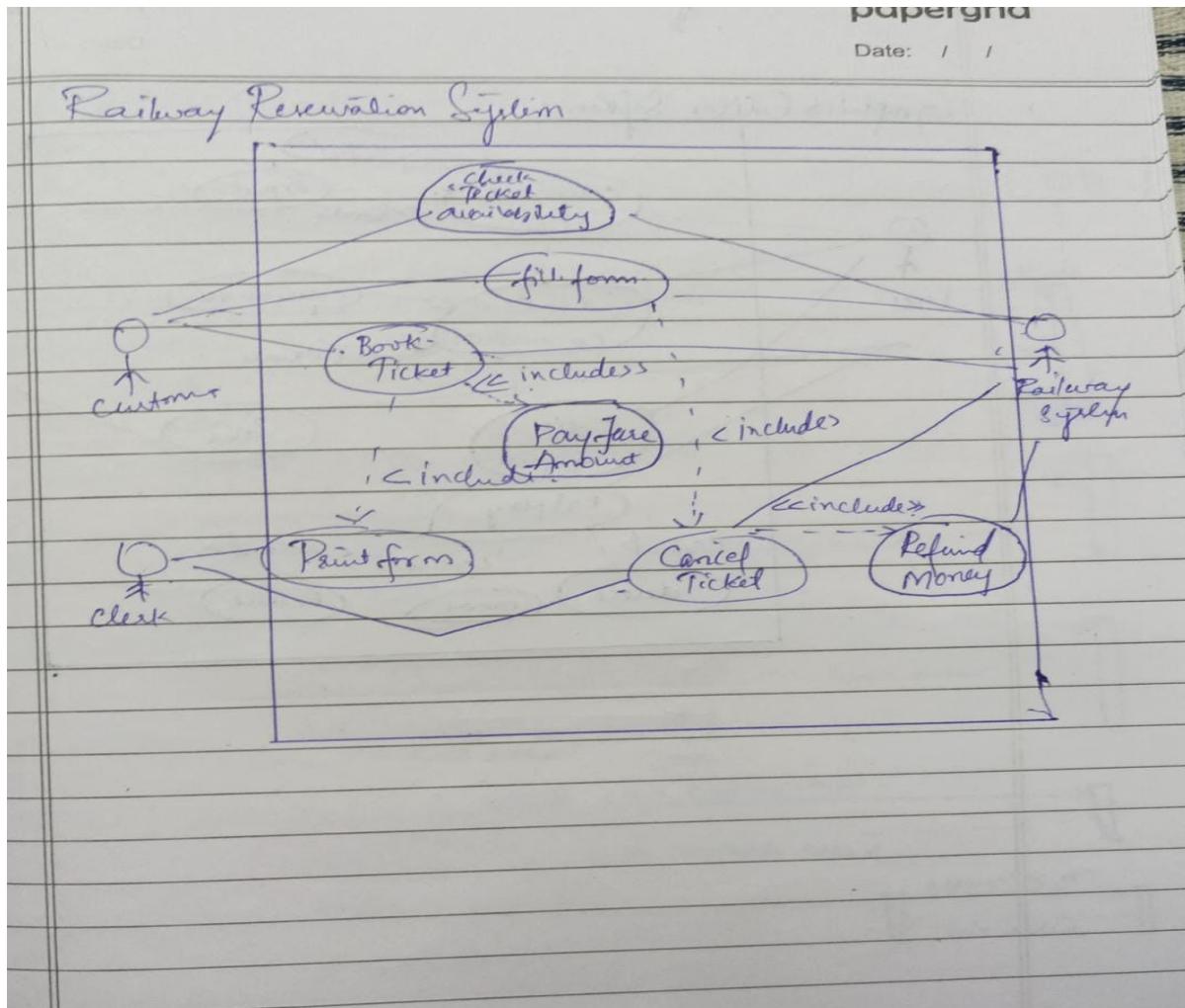


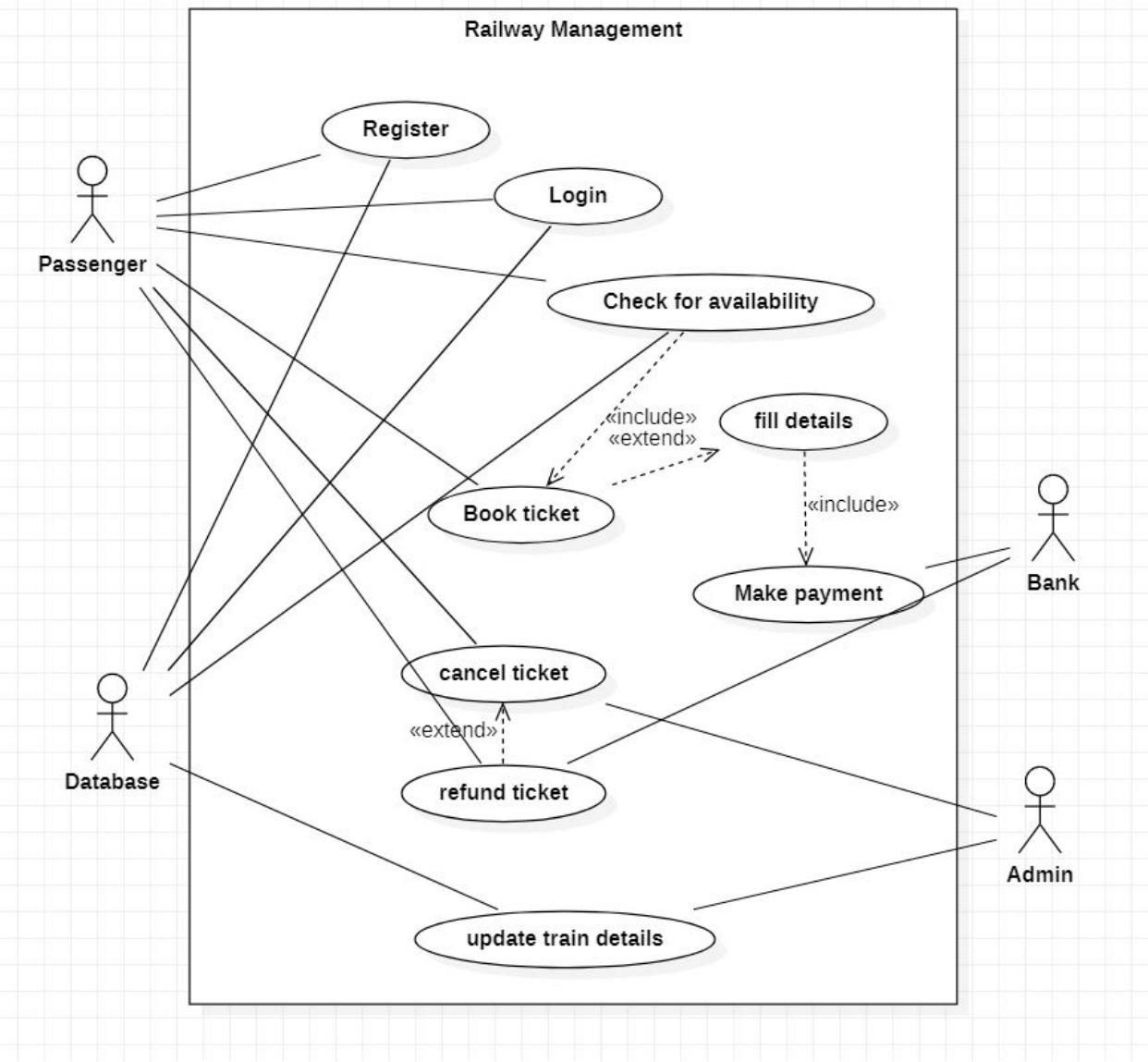


Actors: Customer: a person who uses the online shopping system
Supplier : person who supplies products Payment System: person who handles the payment Delivery executive : a person who manages the delivery

Use Case: view product details : displays all product details Place order : order the items present in the cart Make payment : accepts payment for the products purchased Deliver product : delivery of the product is handled Supply Product : product supply is maintained Maintain Stock : stock availability is checked

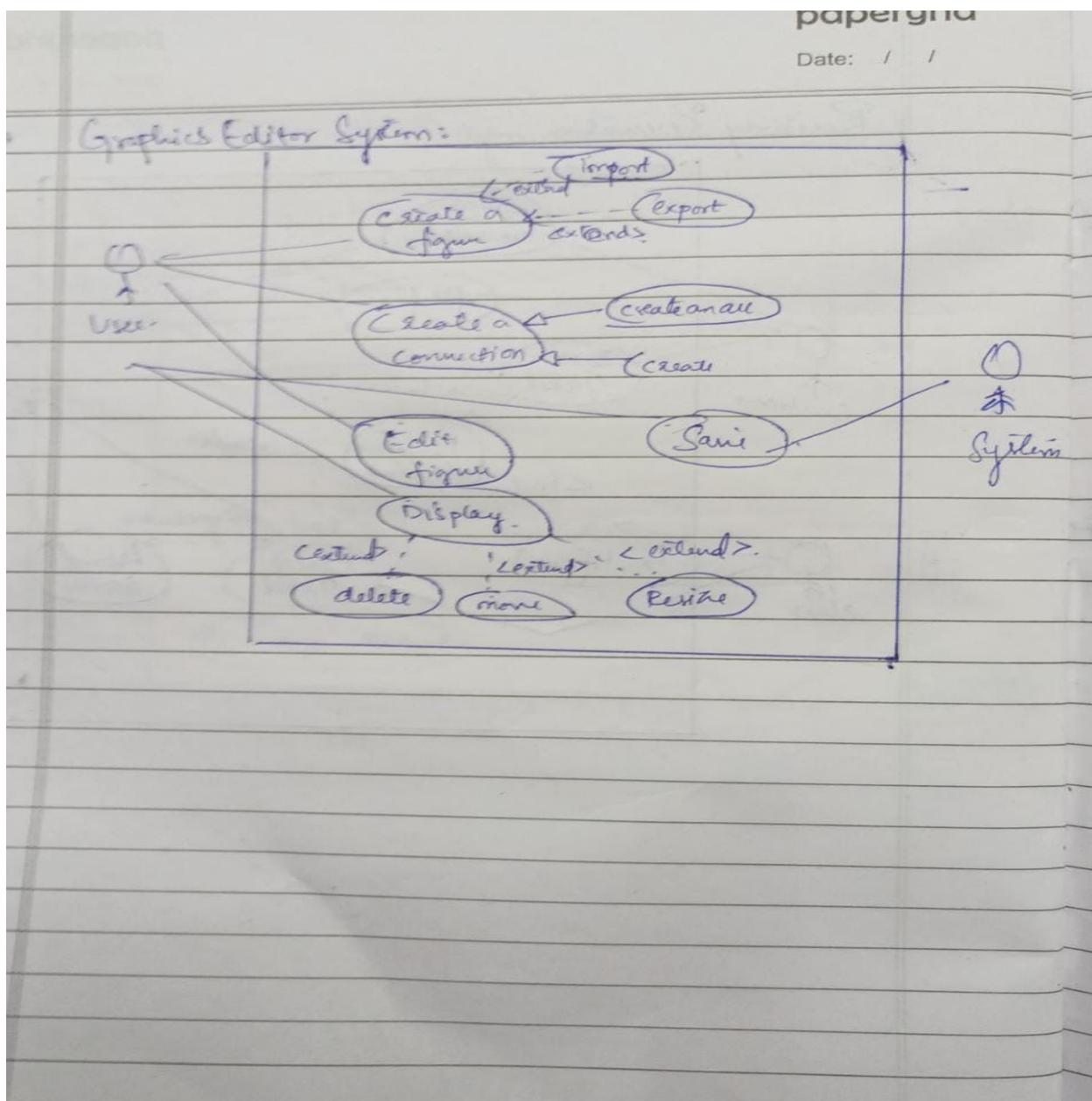
Railway reservation system:

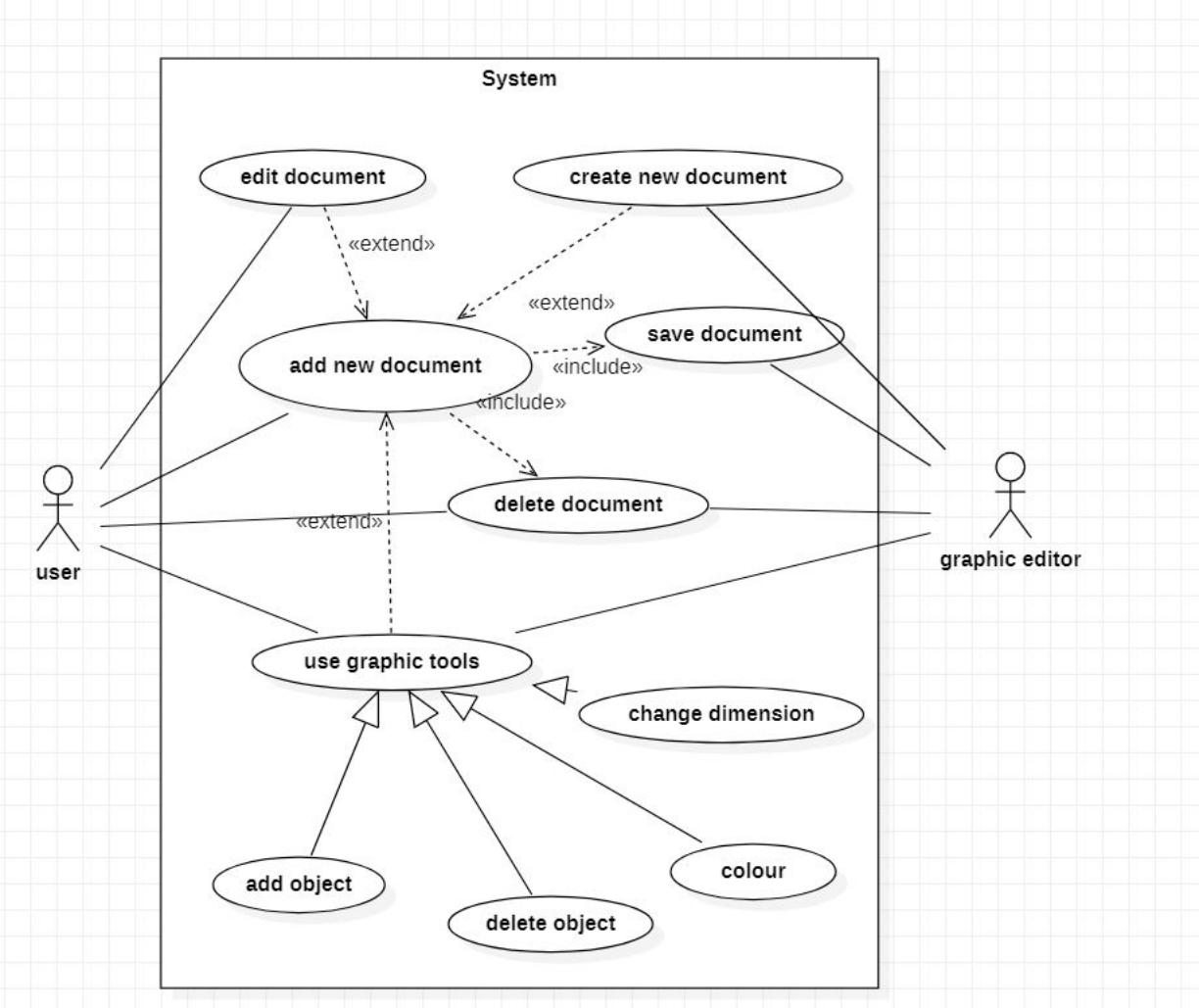




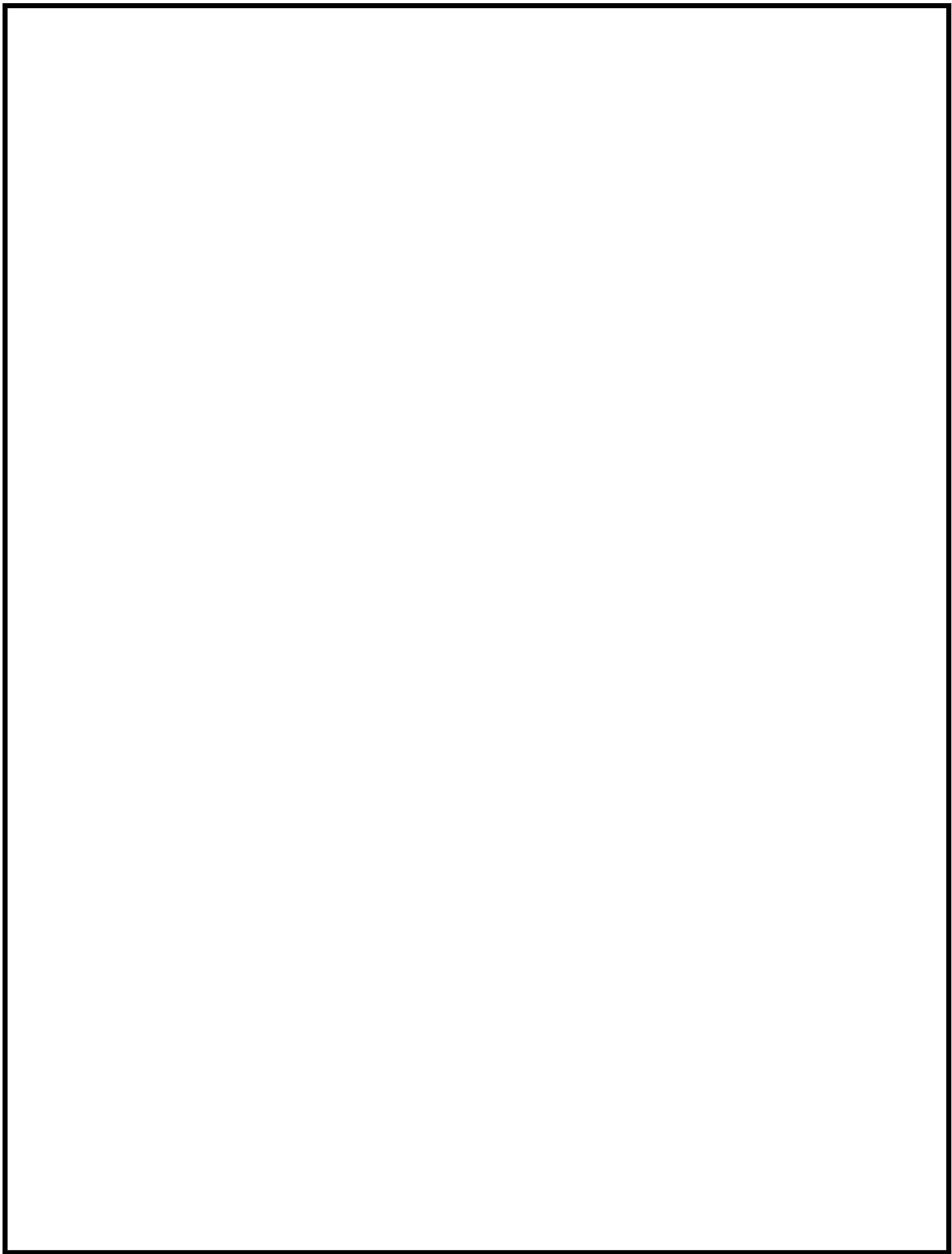
Actors: User: uses the railway reservation system. Admin: manages all information **Railway System:** System that is used for train ticket reservation. **Use Case:** Register: The first time user has to create an account in railway system. Book Ticket: User can select the type of coach and no of seats and book the ticket. Make payment: System displays the payment details. User can make his payment

Graphics editor system:



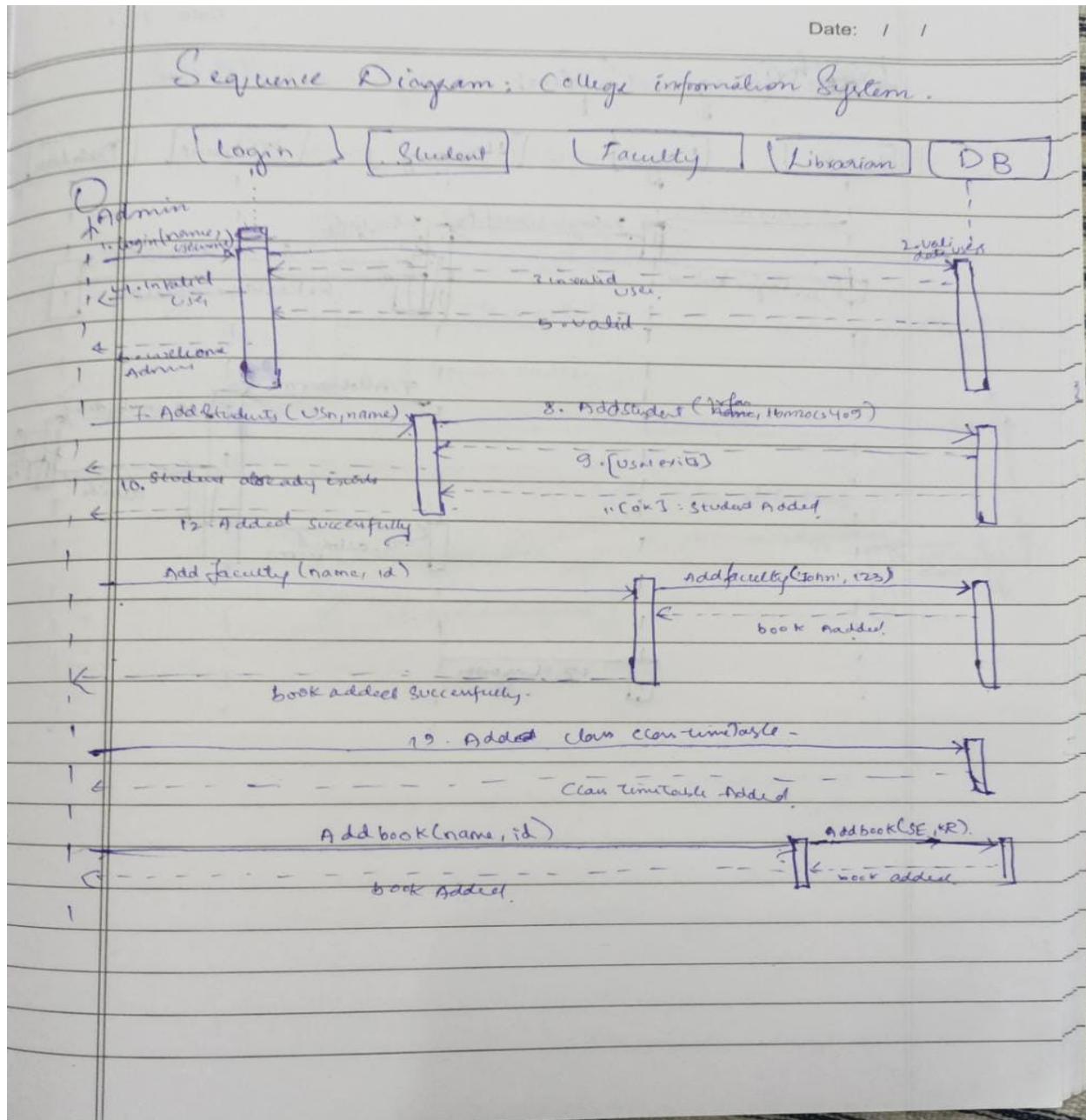


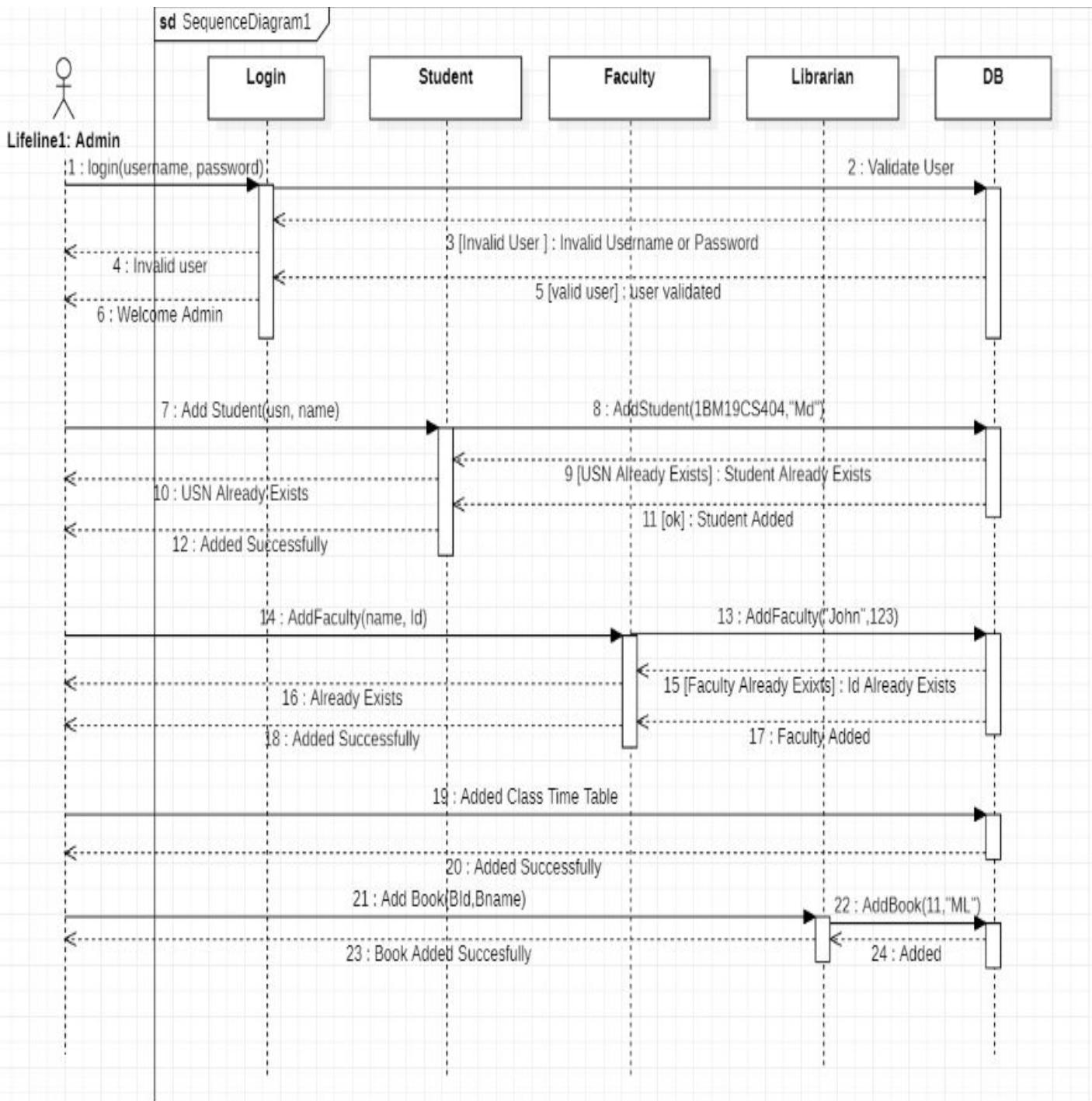
Actors : User: the person who uses the graphic system
Graphics system: manages the system
Use case: Create document : performs creation of new document
Edit document: performs editing of document
Display toolbox: displays the available tools
Add graphic object : insert a new graphic object
Choose tools from toolbox: allows user to choose tools
Delete document : Permanently deletes the document



- 5. Draw the advanced sequence diagram**
 - a. Give a description of the scenario considered for developing the model**

Date: / /

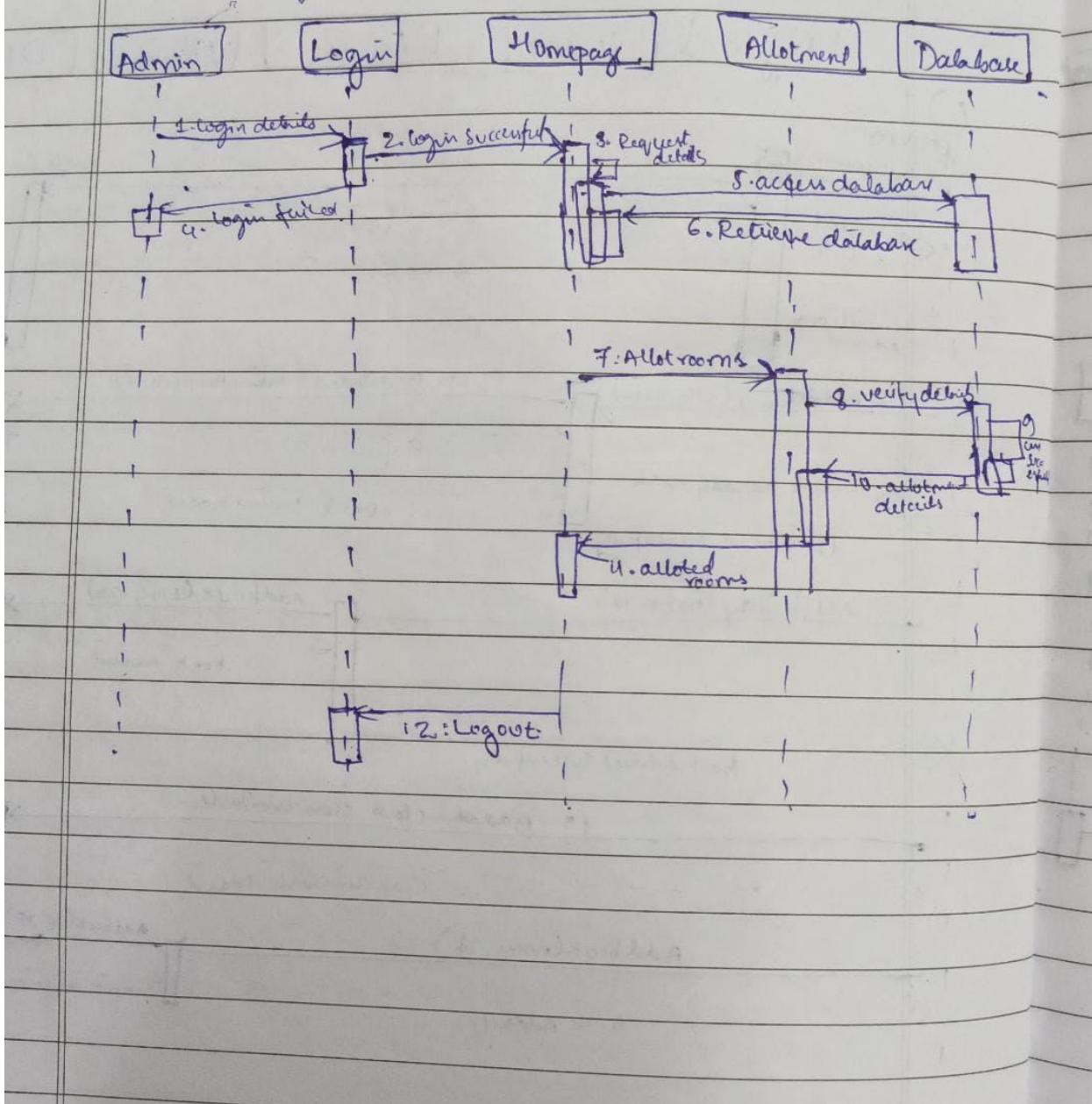


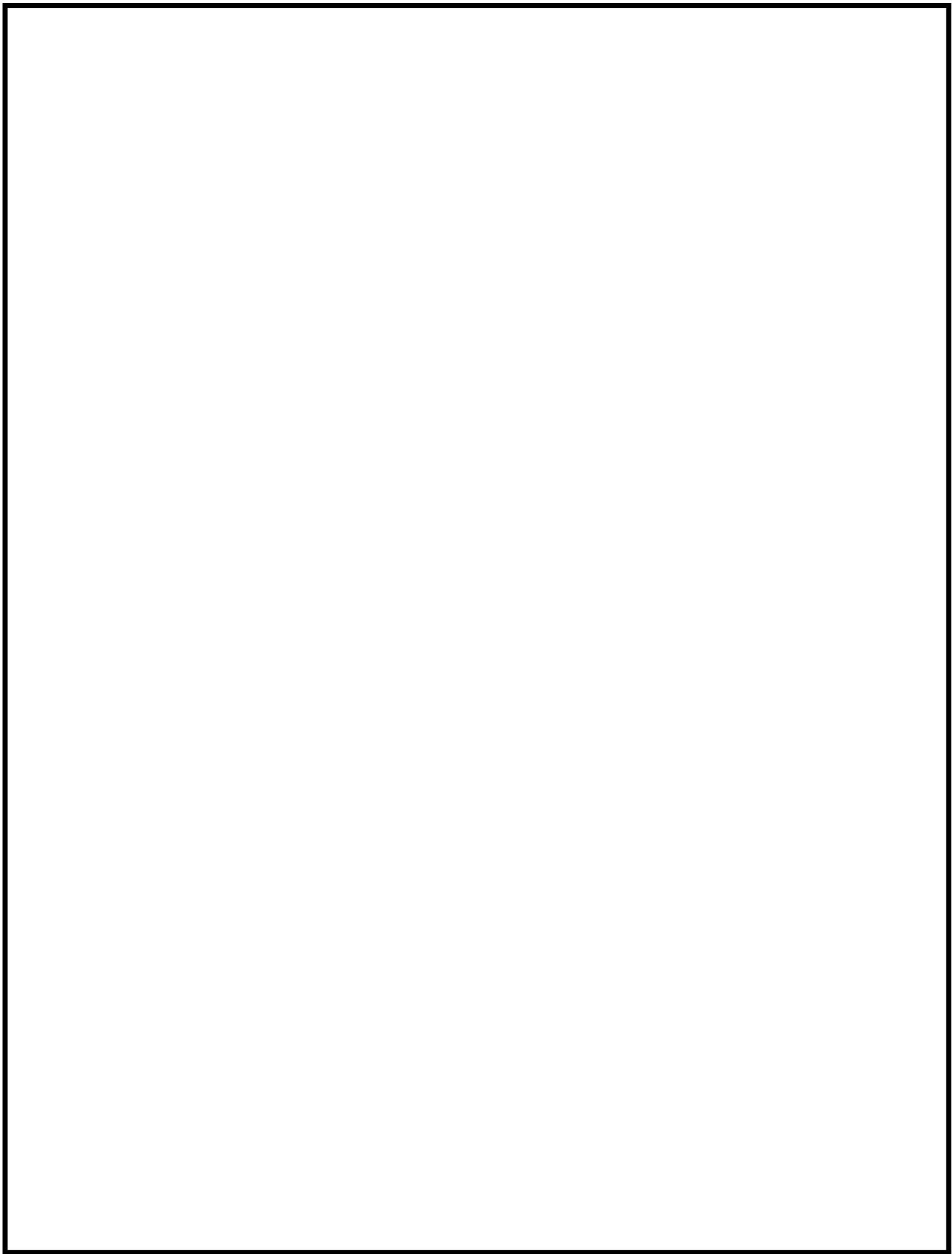


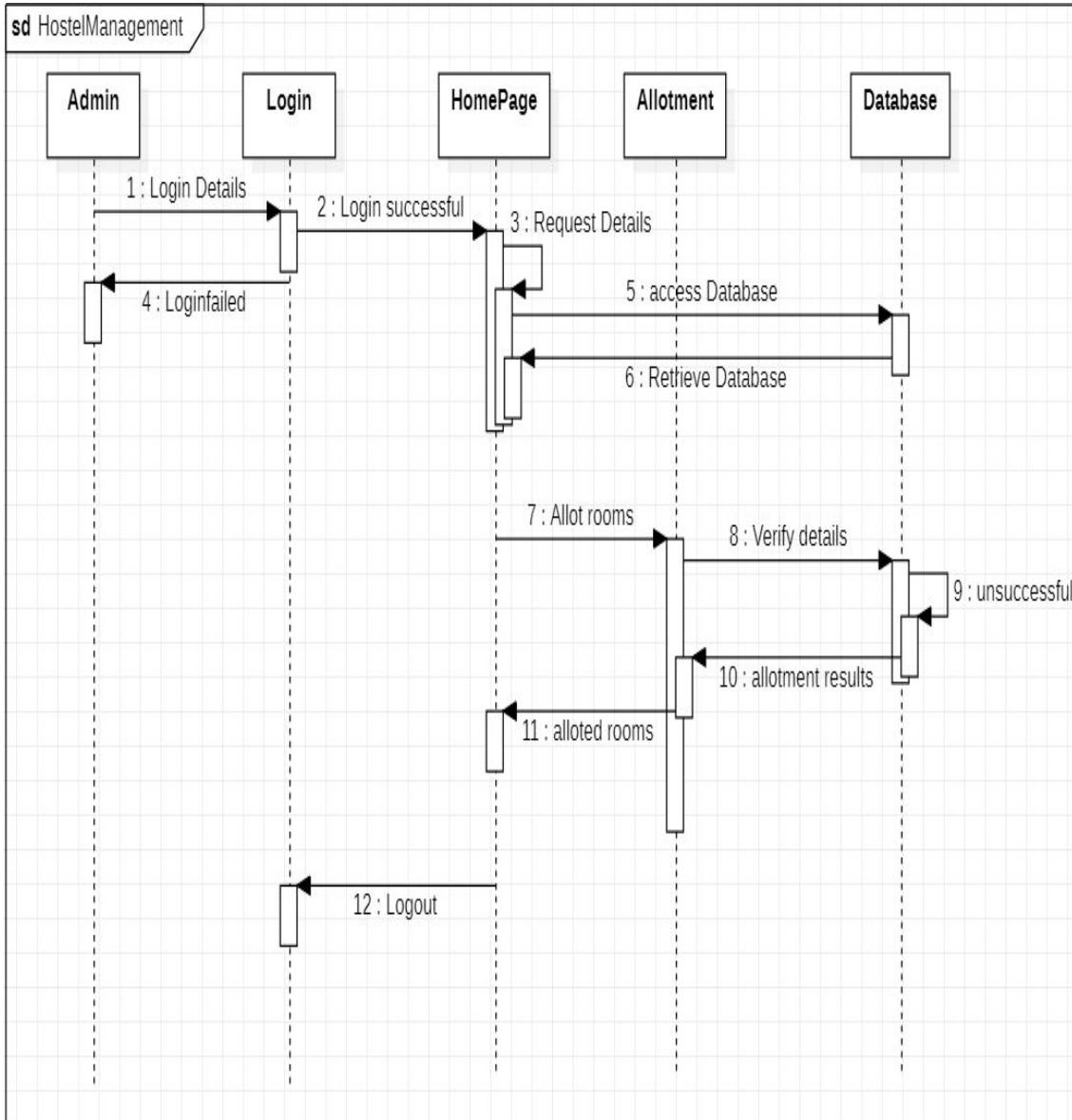
The above sequence diagram gives the interaction between objects while a user is logging into a system. The user enters login information in the website which sends to the server, where the information is validated and the appropriate reply message is displayed to the user

The above sequence diagram gives us the steps in accessing the marks and attendance of the student from the database if the login was successful

Hostel management system

~~Hostel~~ Management System:

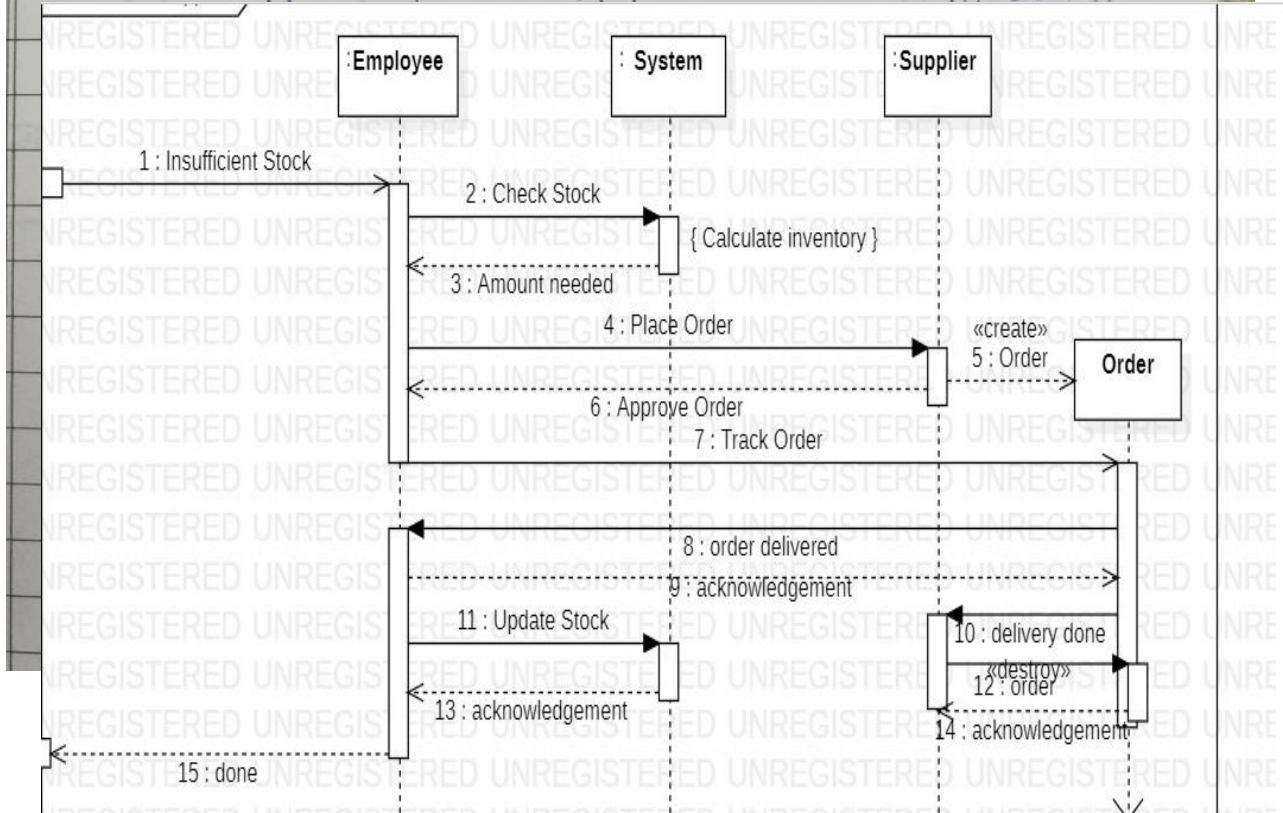
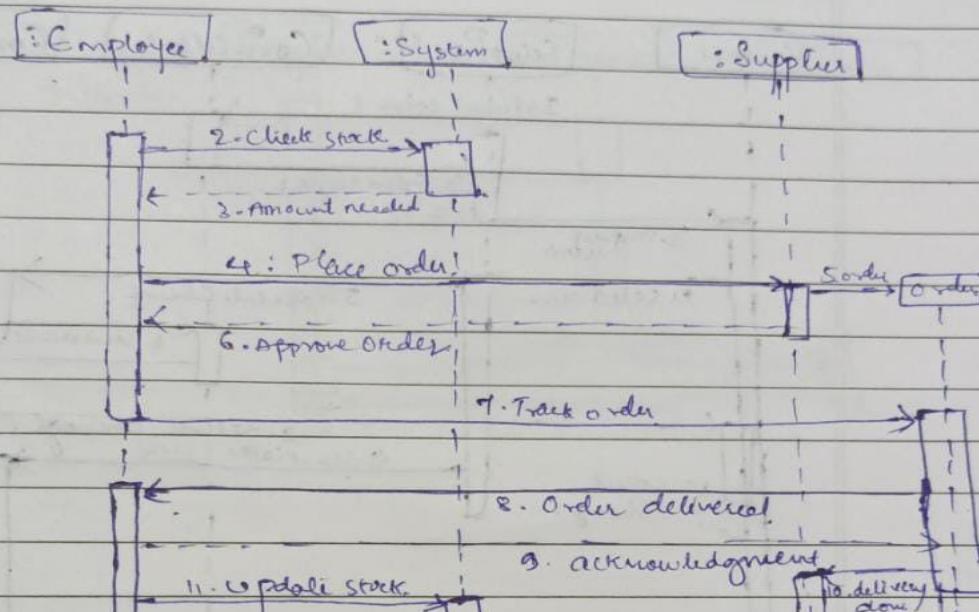




The above sequence diagram give the steps involved in a student logging in, booking a room, which is verified in the database and the payment for the same is made by the student.

Stock management system:

Stock Maintenance System:

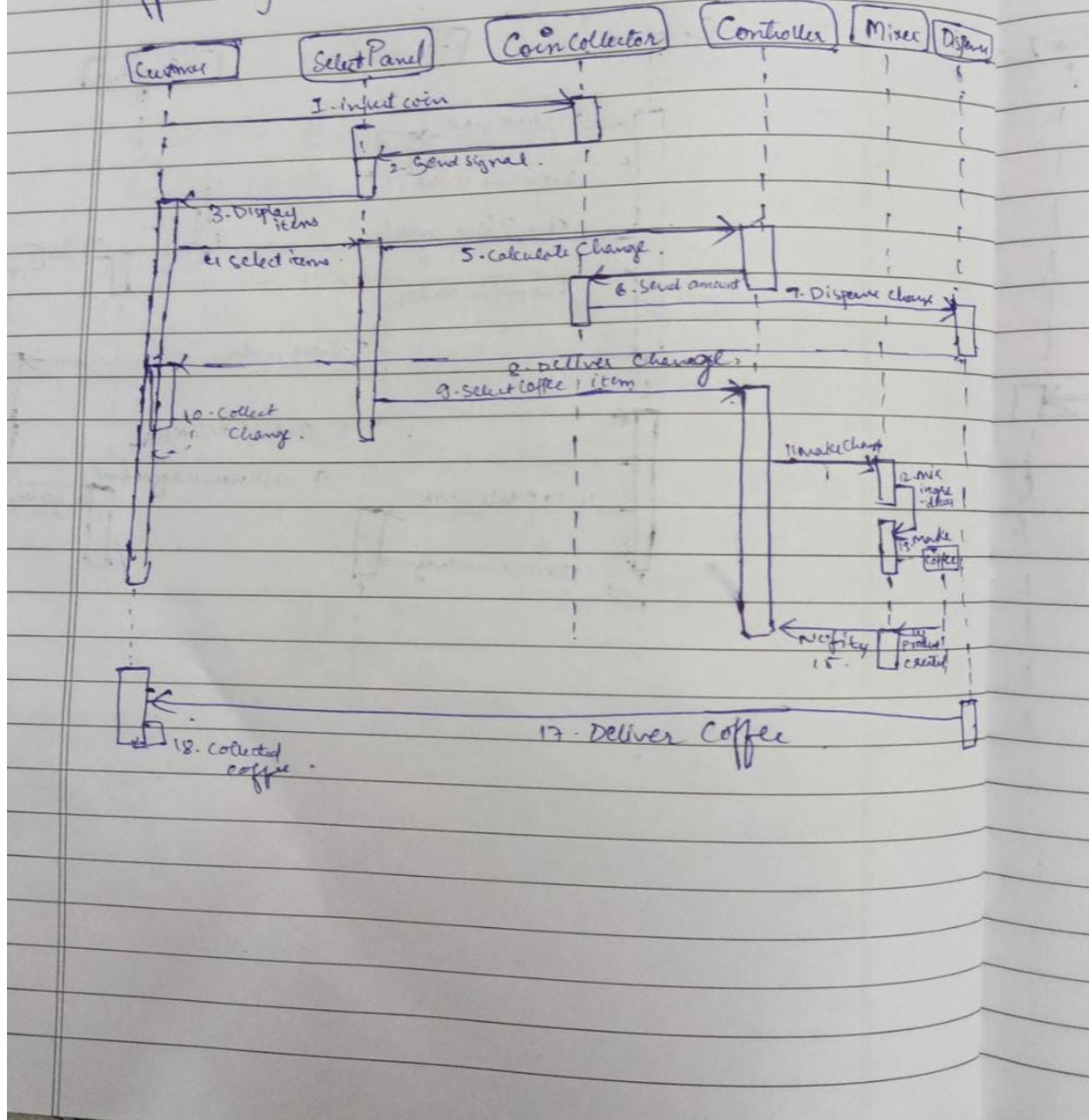


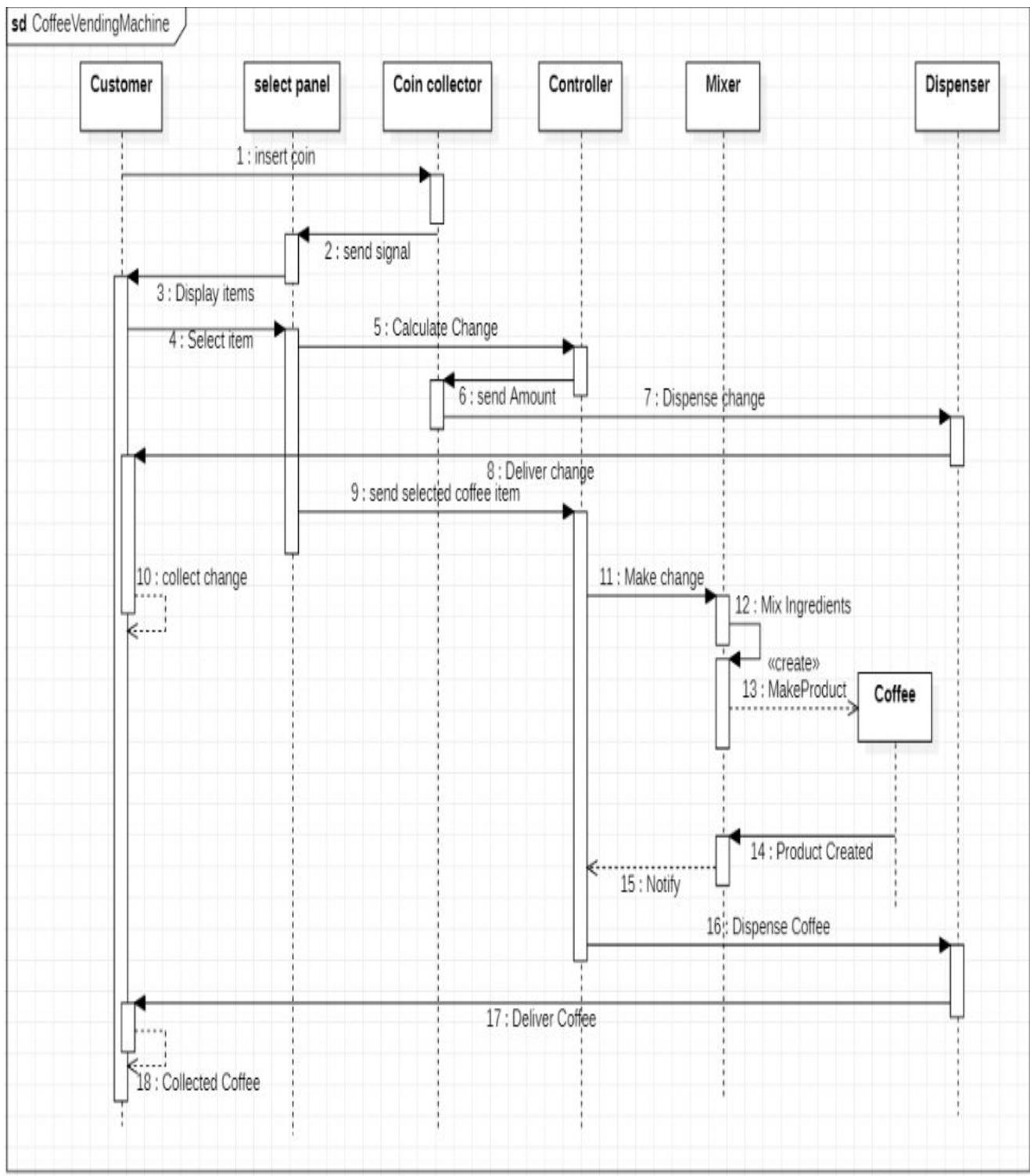
Place request for purchase/sale of stock **Contact seller for purchase/sale** **Seller confirms purchase/sale** **Confirmed purchase/sale order** **Check available balance in case of purchase order** **Purchase/sale order possible** **Purchase/sale order approved** **Purchase/sale of stock confirmed and approved.**

Coffee vending machine:

Date: / /

Coffee Vending Machine:



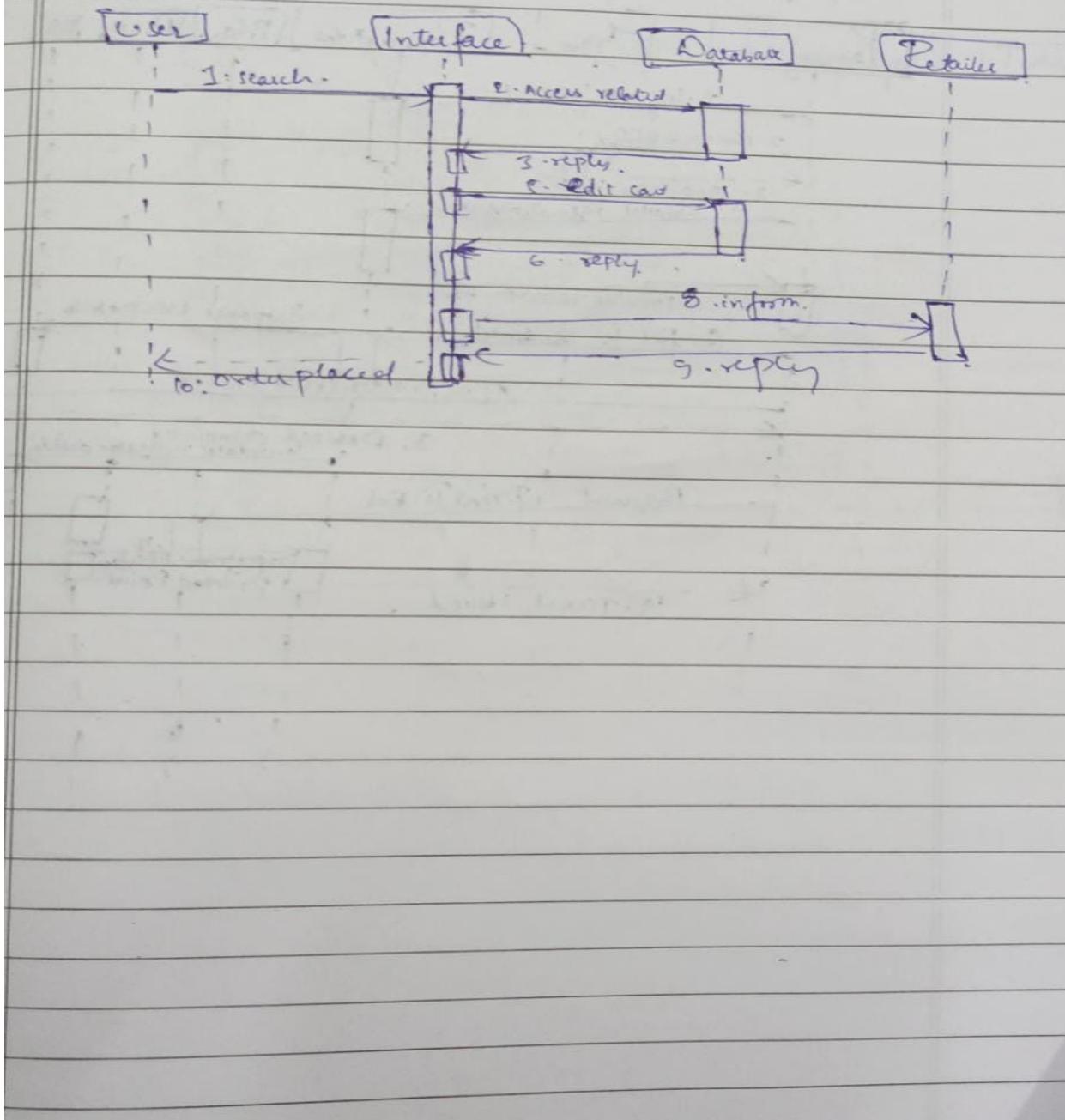


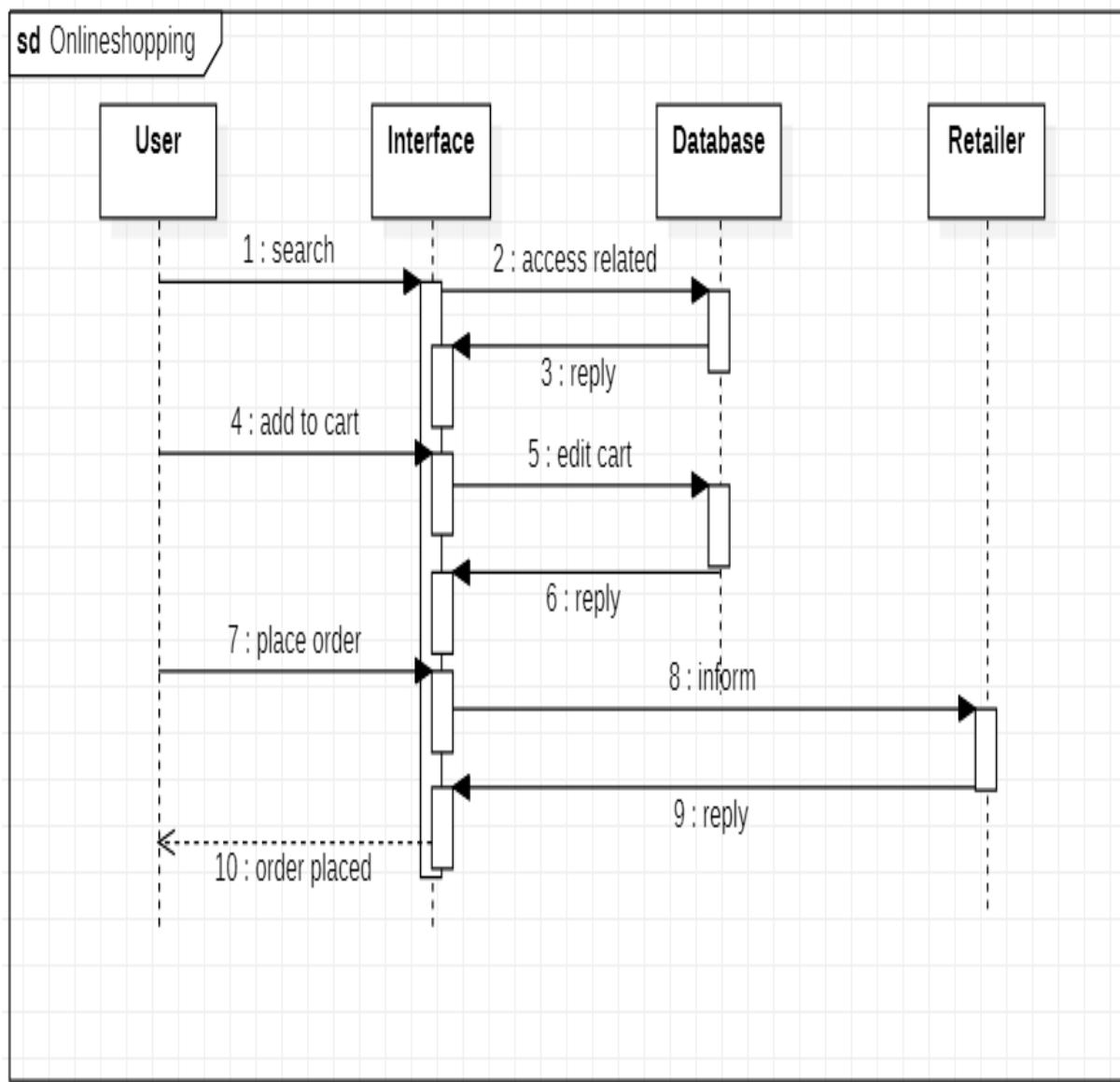
The above sequence diagram gives us the steps involved in dispensing a product from the coffee machine. First an enquiry for the product is made and if available the coins are inserted and calculated ,if correct the product is dispensed .

Online shopping system:

Date: / /

Online Shopping System:



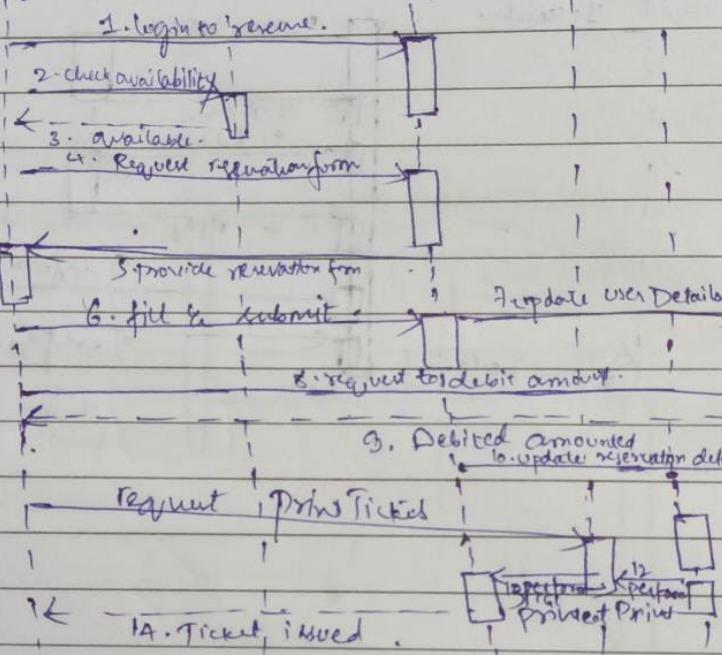


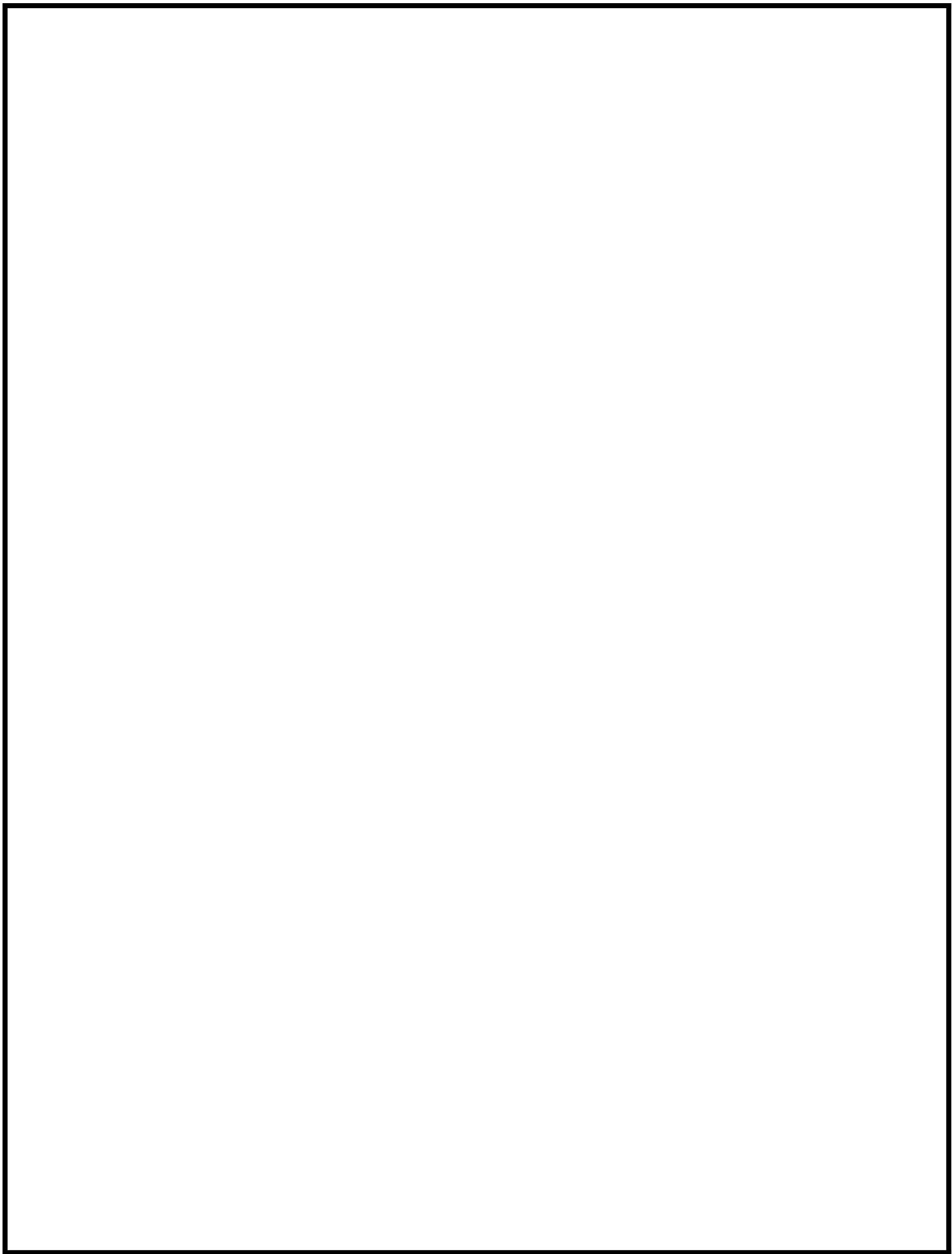
the customer logs into the online interface The items are displayed The customer adds items into cart and reply from interface is sent The customer places the order The online interface requests for payment The customer provides details and confirmation is sent The customer logs out The logout confirmation is sent to the customer

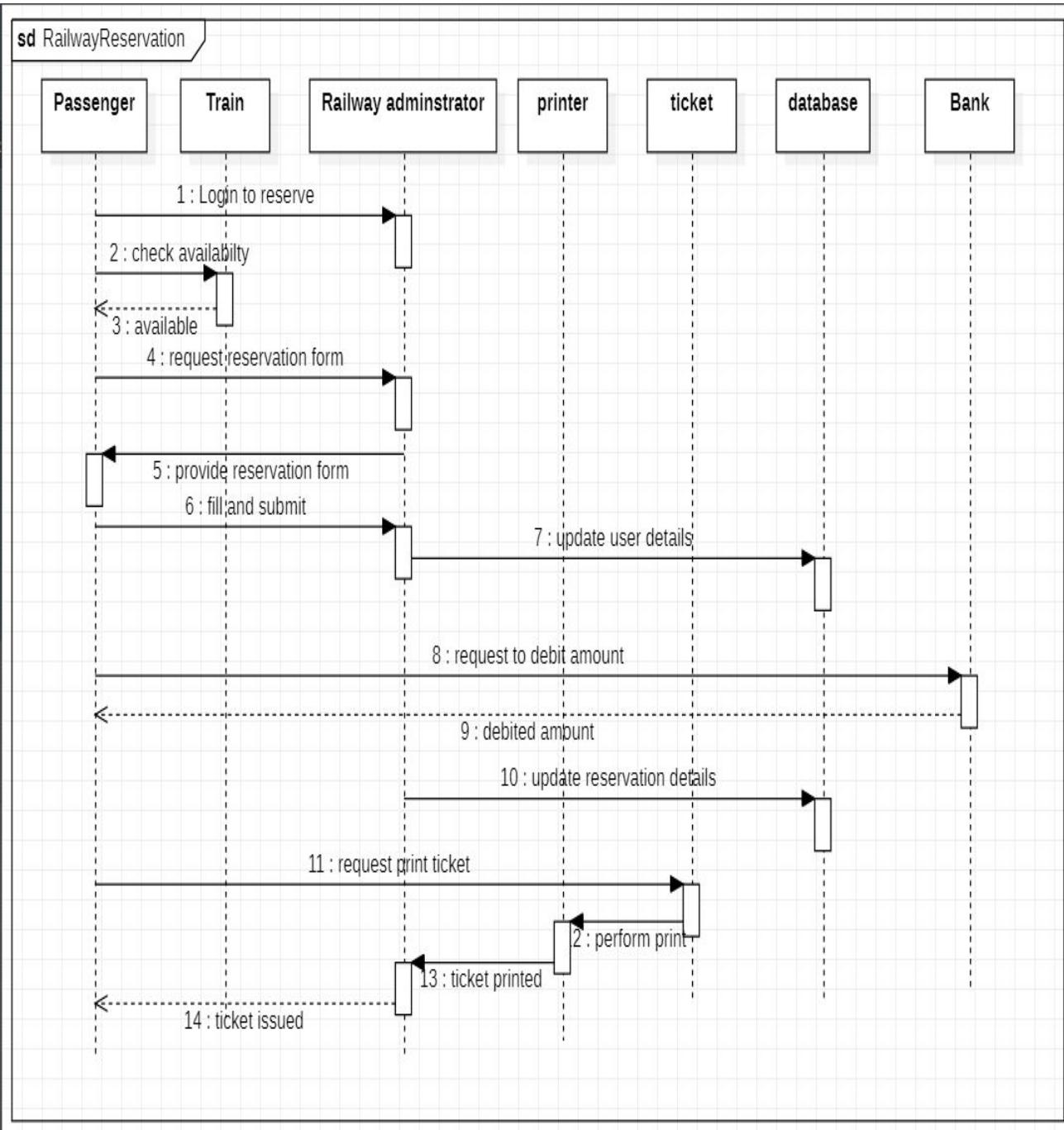
Railway reservation system:

Railway Reservation

Passenger [] Train [] Railway Admin [] Points [] Tickets [] DB [] Bank []





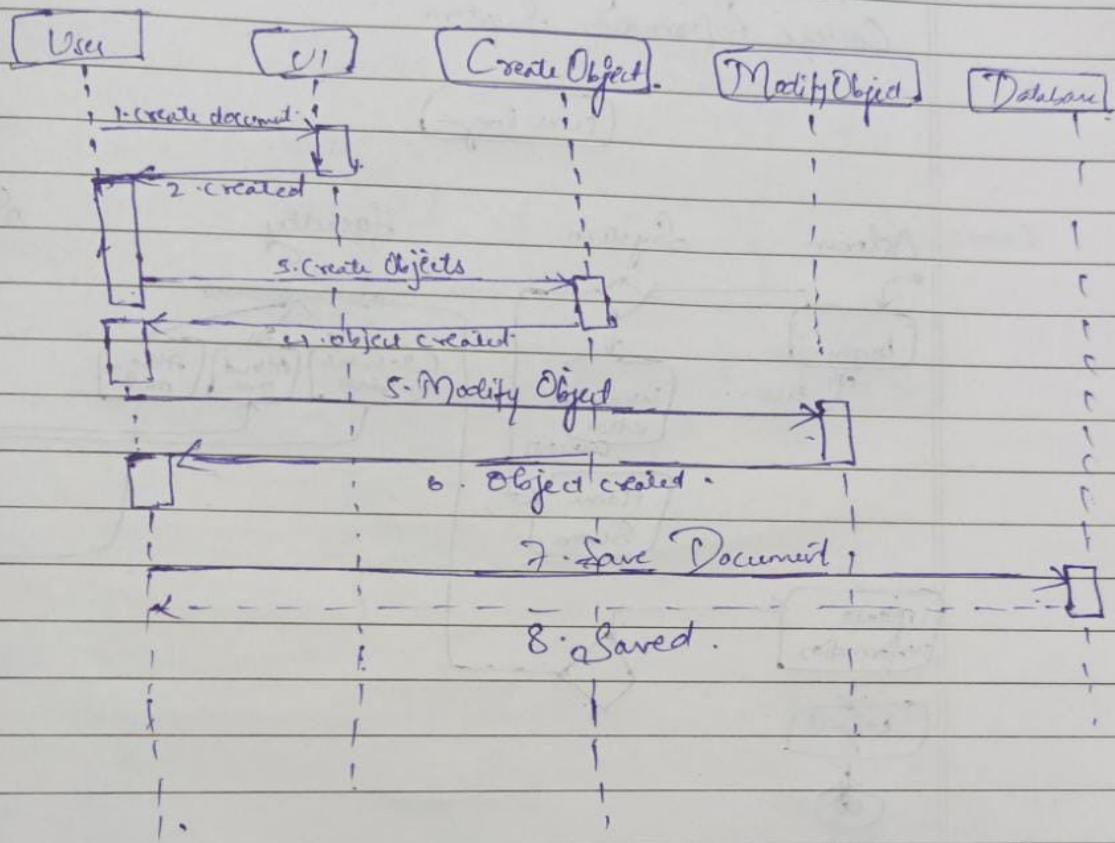


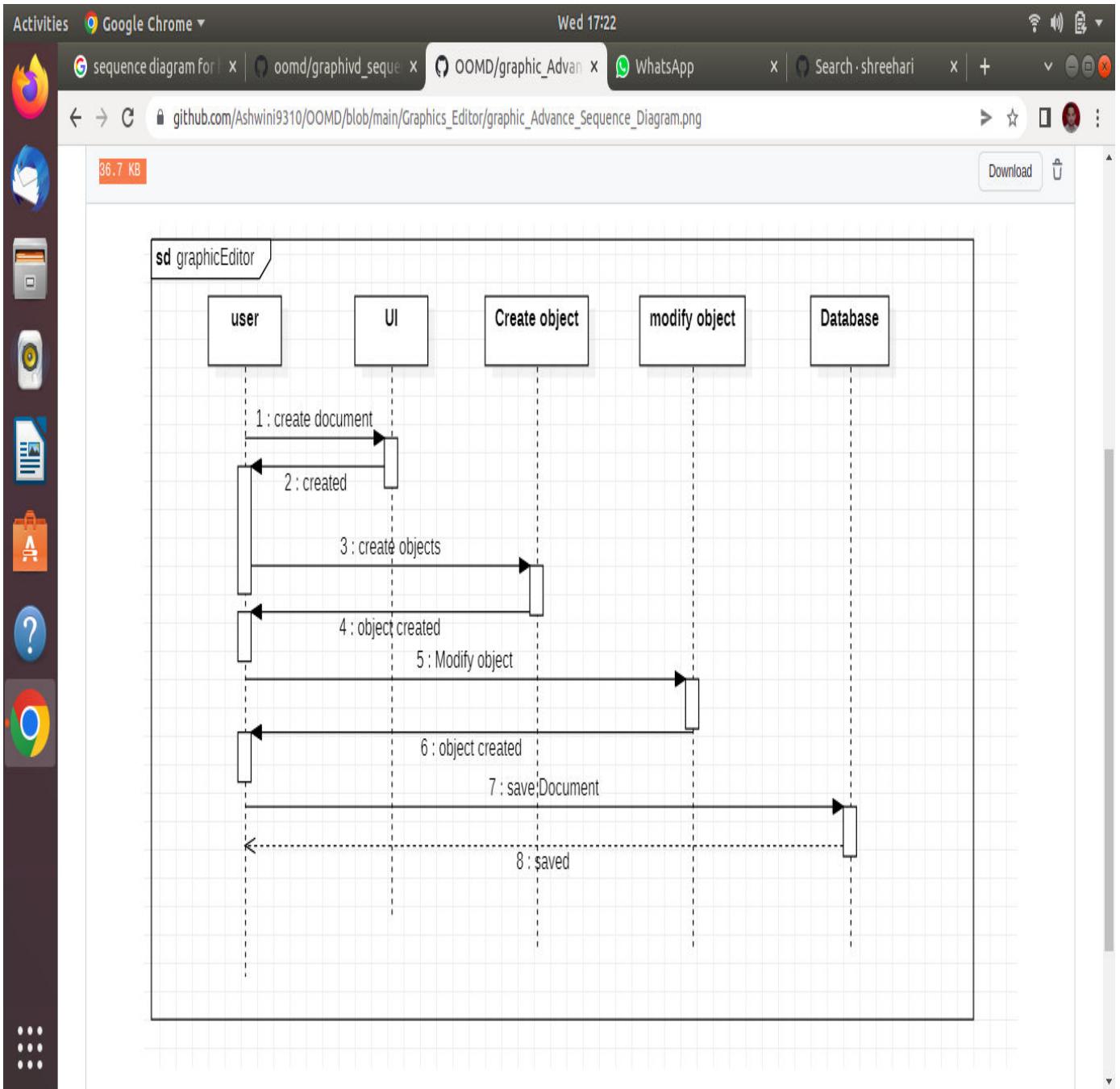
User logs into the railwayreservation system. Admin verifies the login details. System establishes securecommunication. User checks for availabilityoftrains . Admin updates the train details. System displays the train details. User books tickets. System displays payment details. User makes the payment. System issues the e-ticket. User logs out .

Graphics editor system:

Date: / /

Graphics Editor





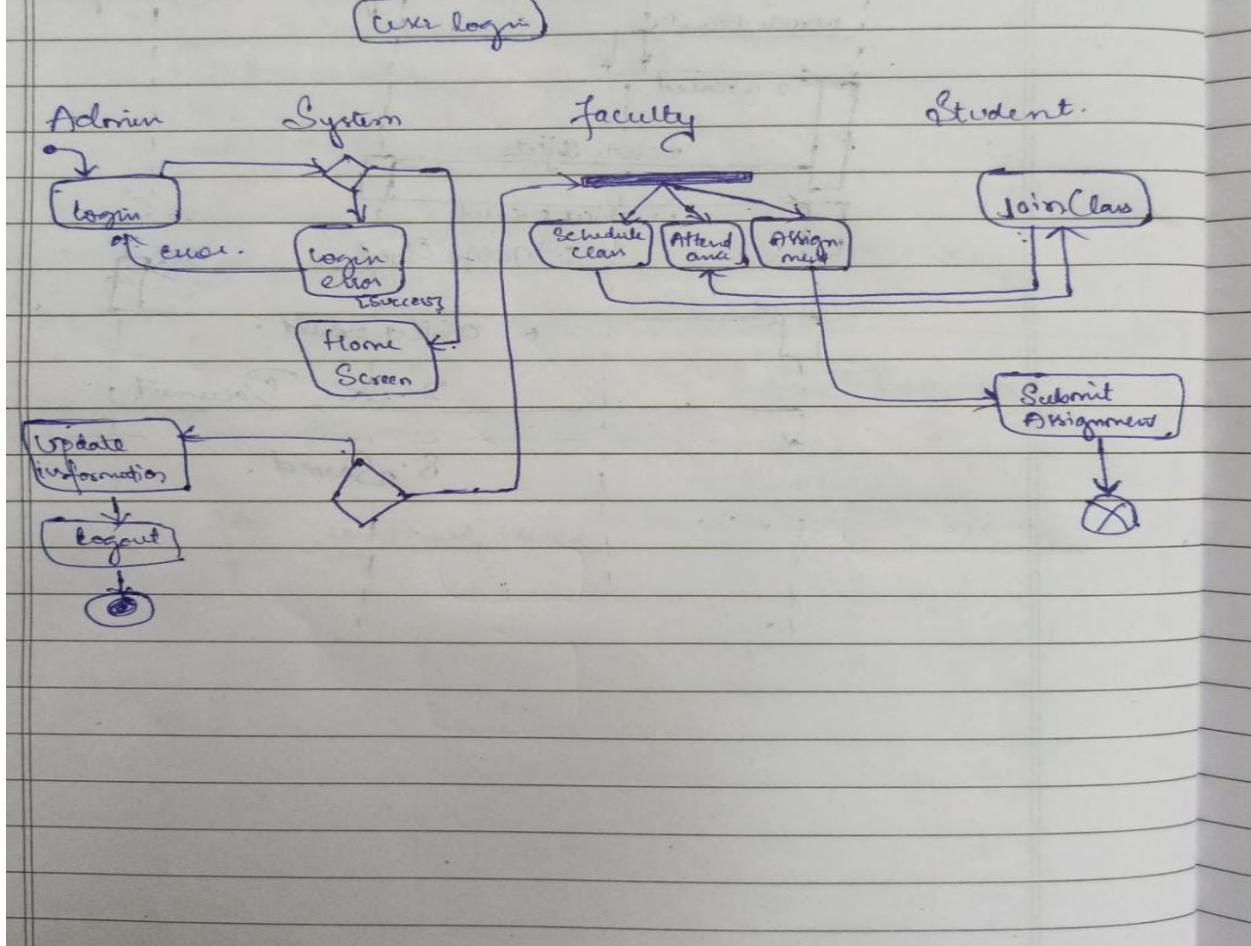
The graphics editor displays options to user The user selects an option **The graphics editor displays shapes** The user selects a shape **Parameters are asked by the editor** User enters all the required parameter **The graphics editor displays the diagram**

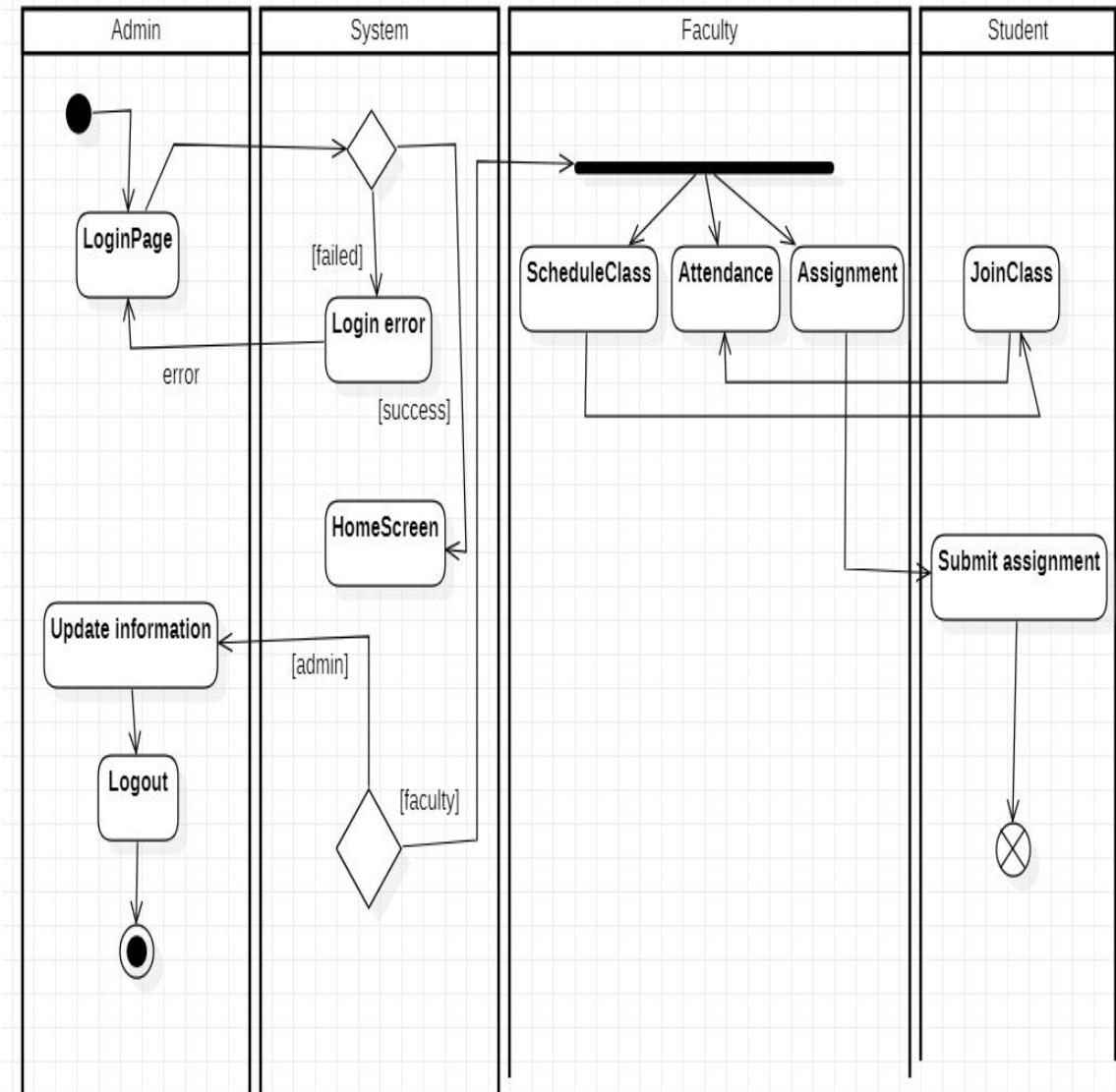
6. Draw the advanced activity diagram

- a. Give a description of the scenario considered for developing the model**

College information system:

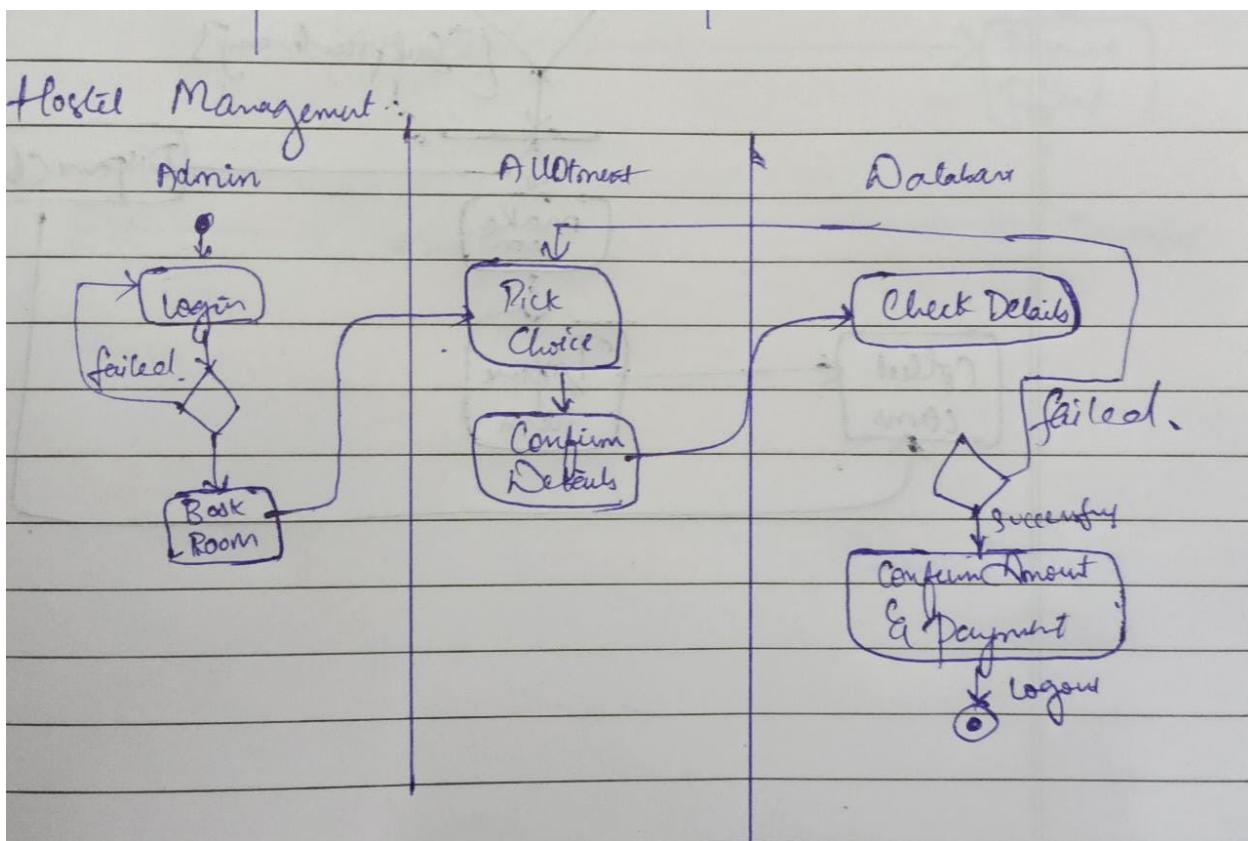
Activity Diagrams:
College information System.

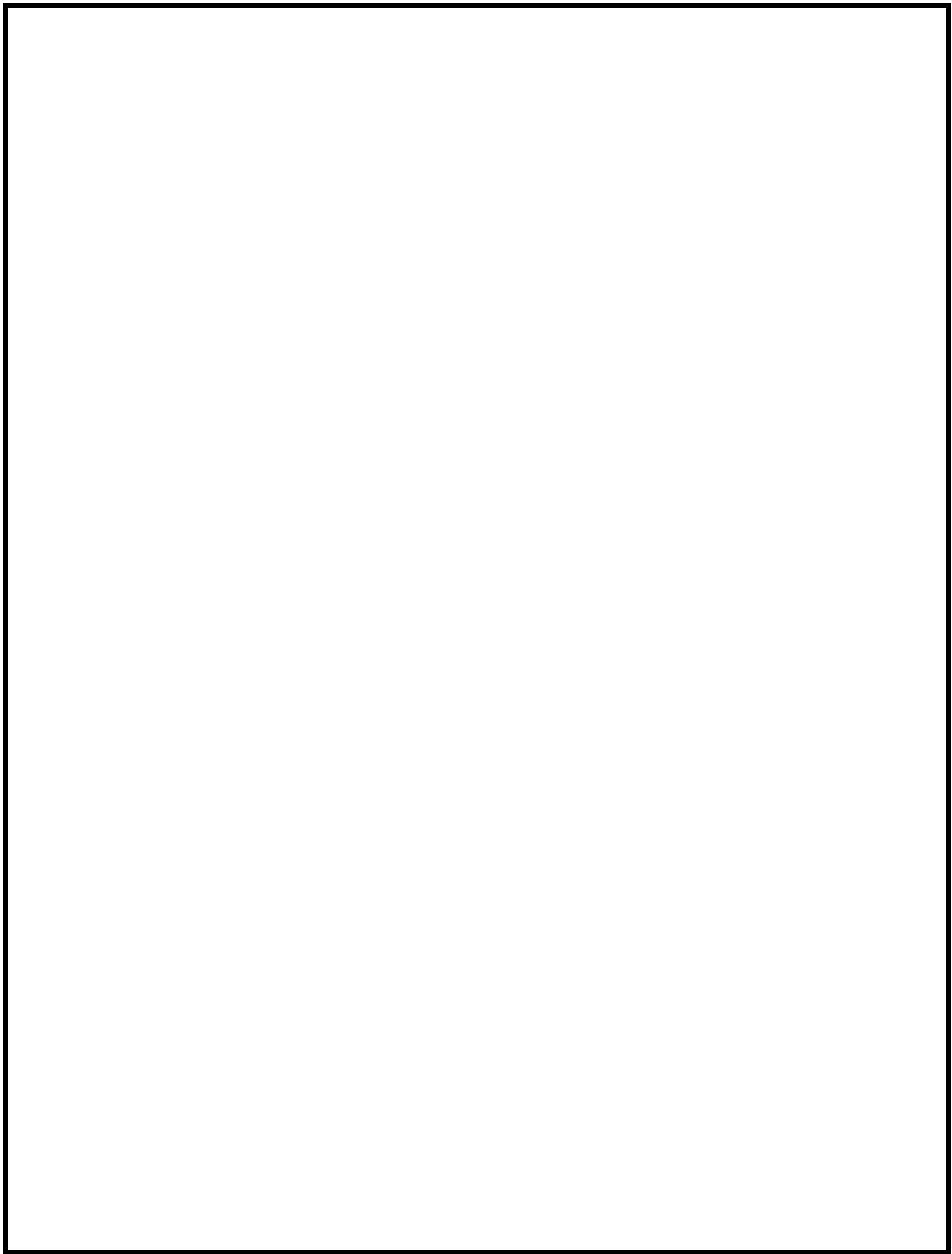


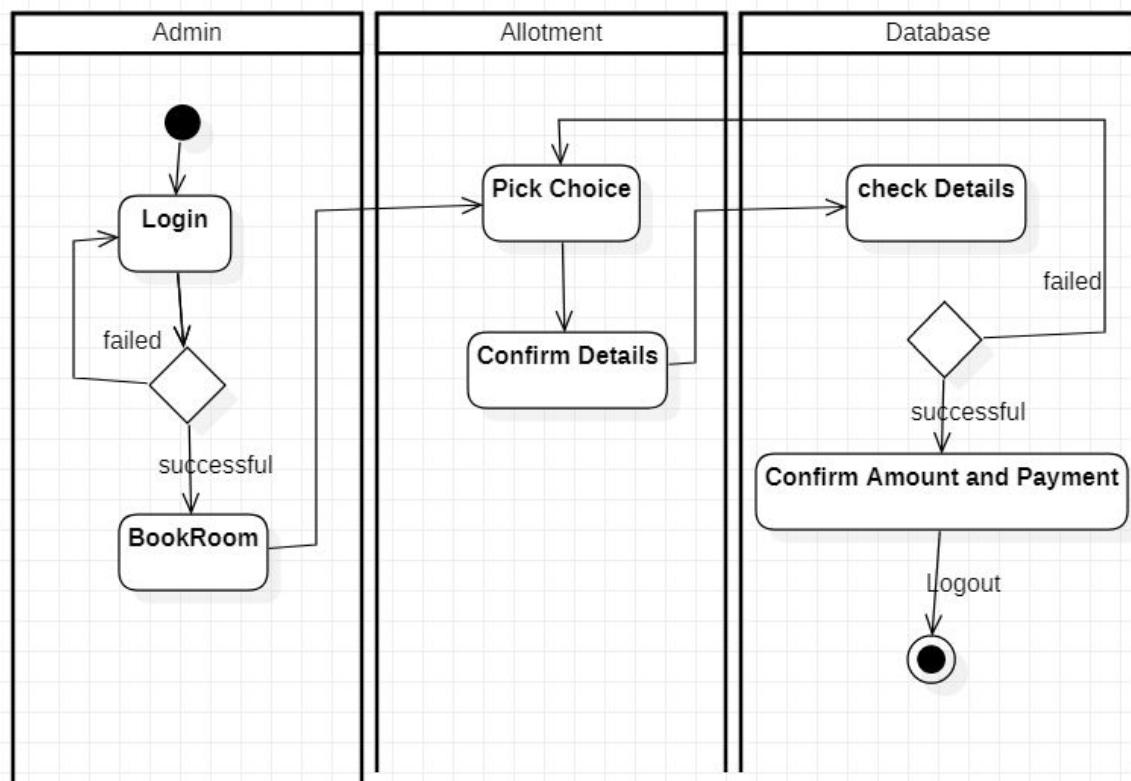


The above activity diagram has three swimlanes mainly admin, database and teacher. The admin can login and manage information. The database verifies the login information and on success has two options. He teacher can view attendance, view course details, and view student list.

Hostel management system:







The activity diagram tells about the activities involved in payment of fees. The above activitydiagram give the steps involved in a student logging in, booking a room, which is verifiedinthedatabase and the payment for the same is made by the student.

Stock management ssystem:

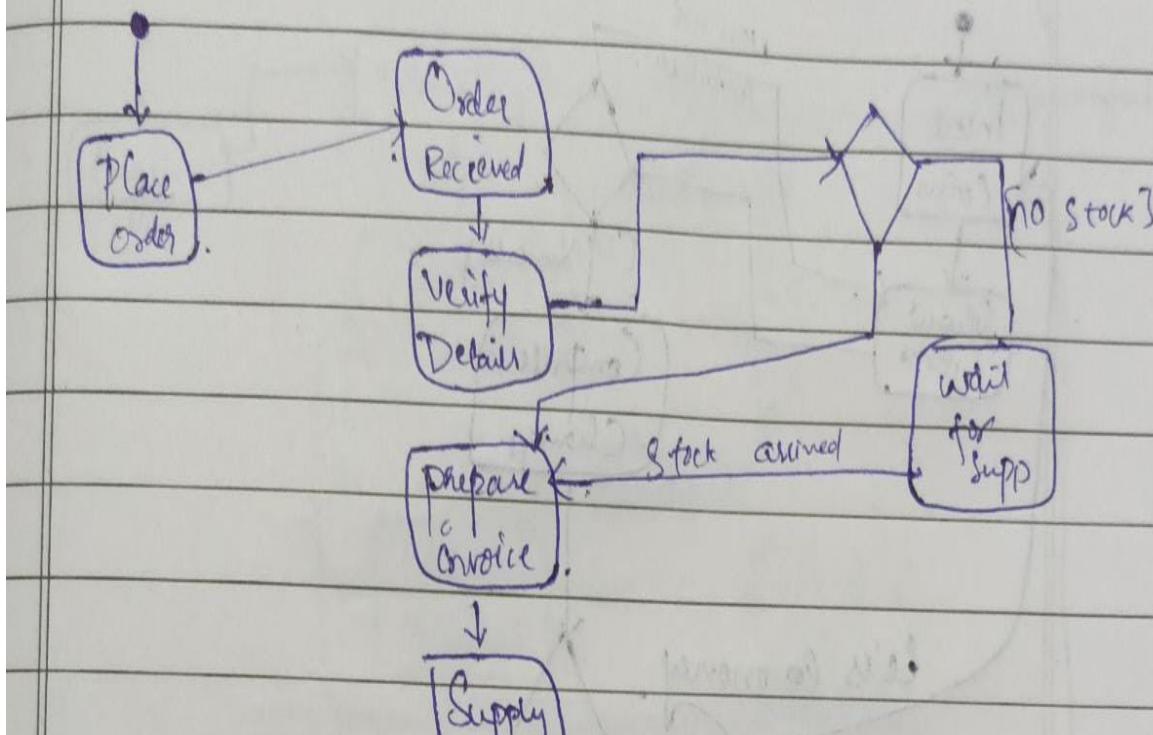
Date: / /

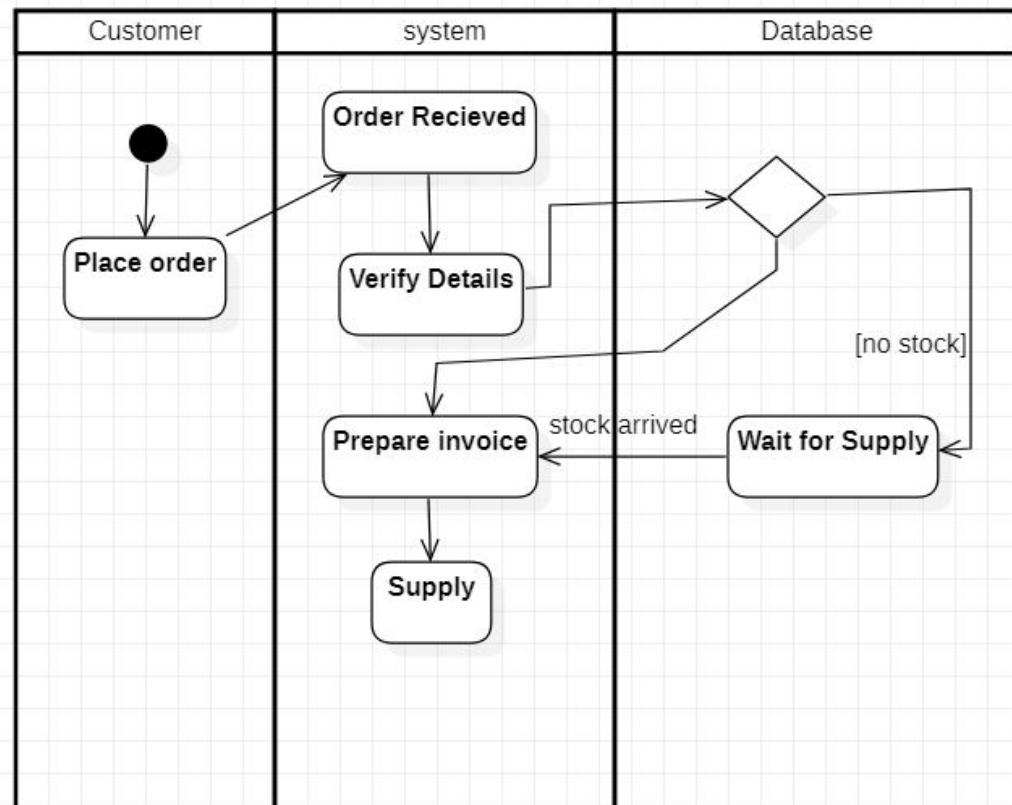
Stock maintenance System.

Customer

System

Database

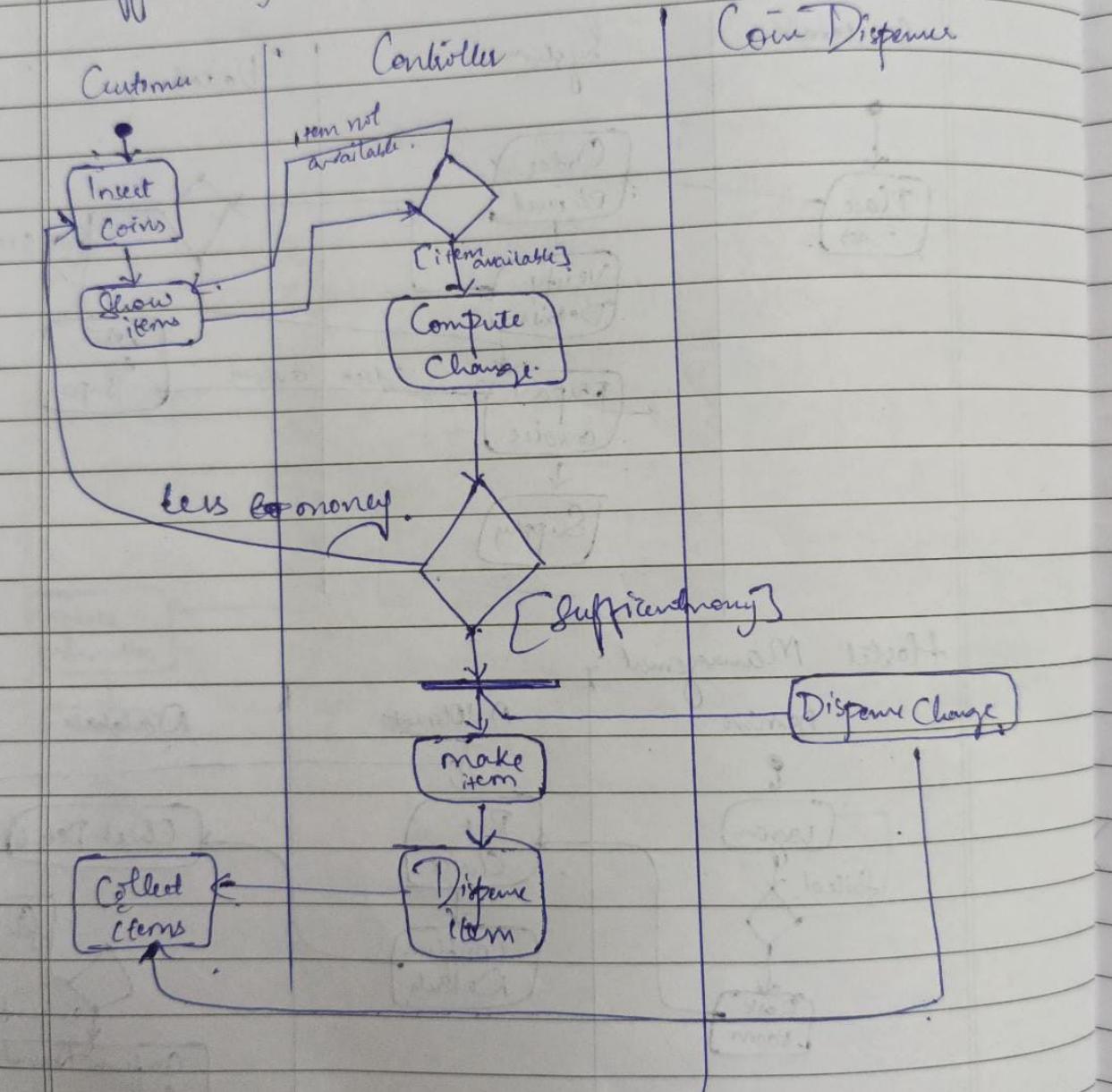


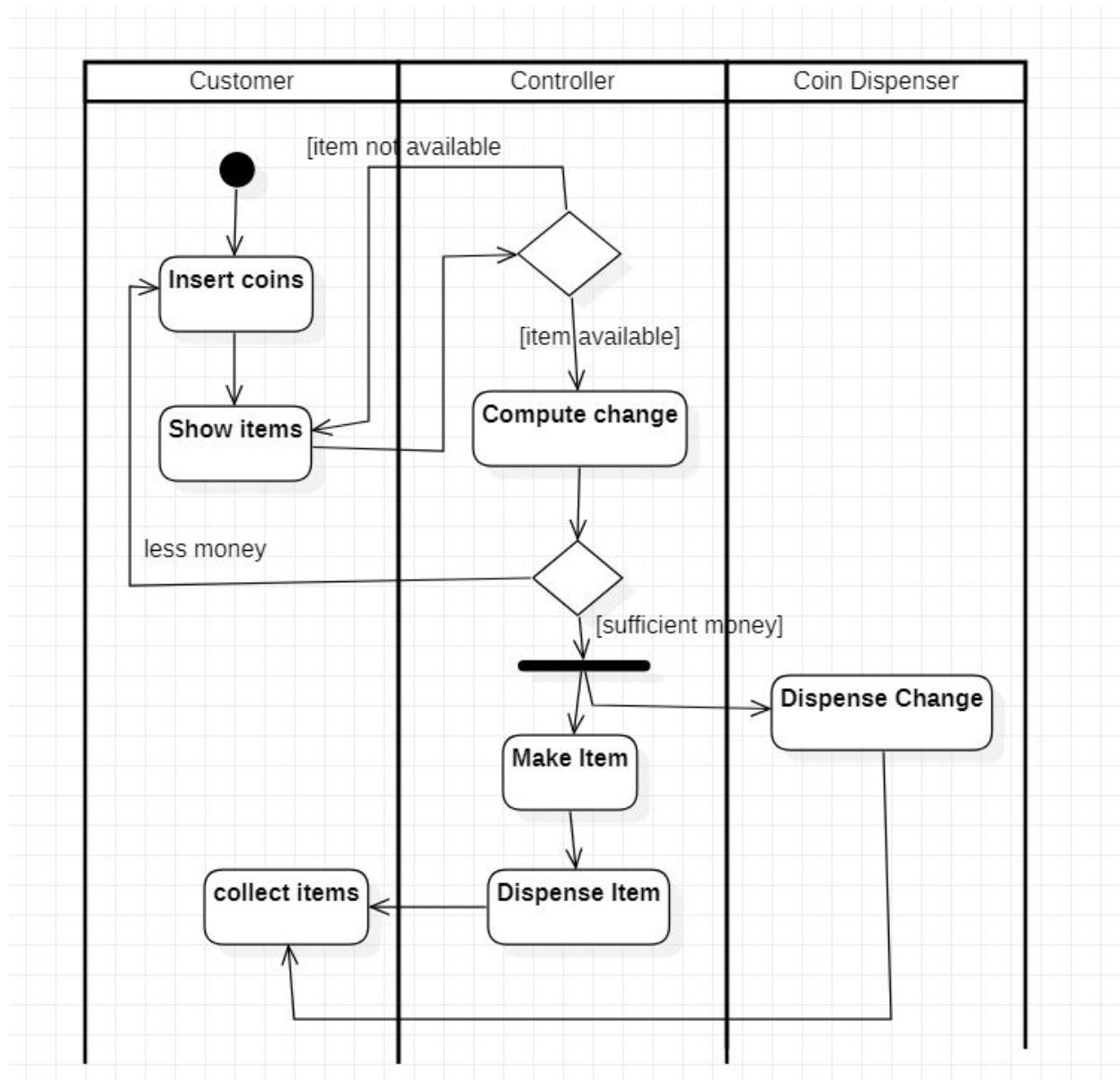


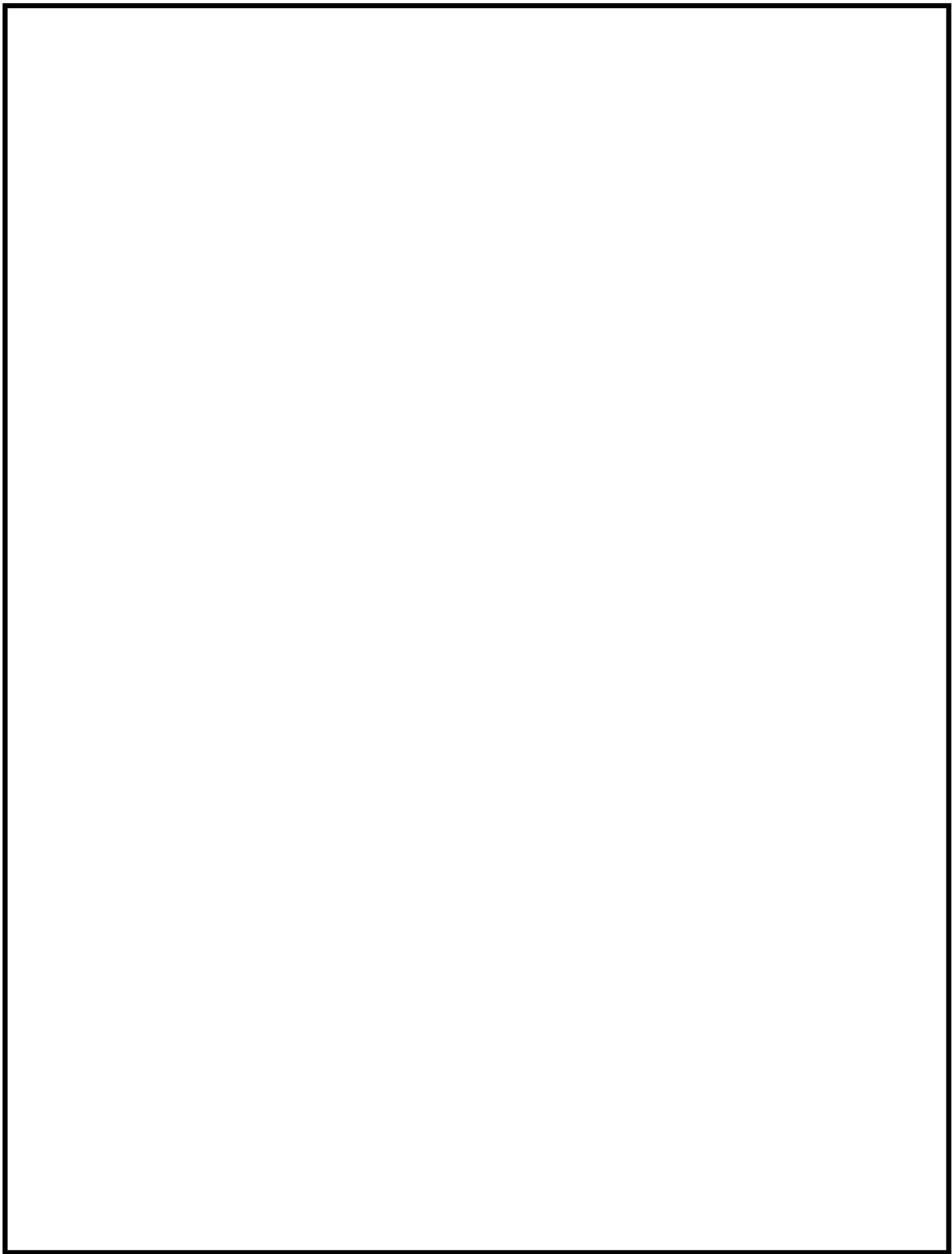
The above advanced activity diagram gives us the activities involved with each swimlane. There are three swim lanes I.e supplier, order process and inventory system which have the activities of placing order, receive order and check for stock, and ship the item respectively.

Coffee vending machine:

Coffee Vending Machine:

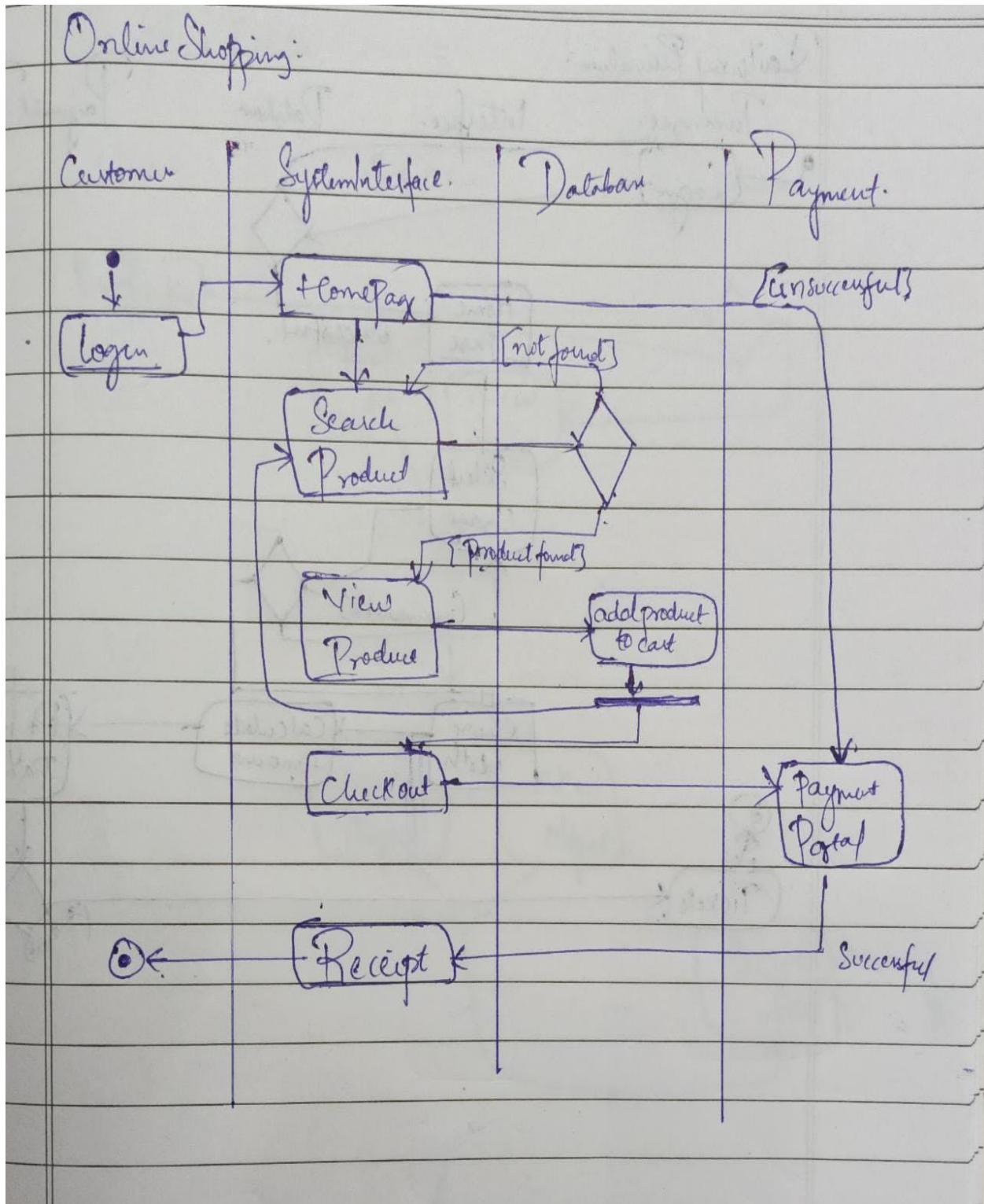


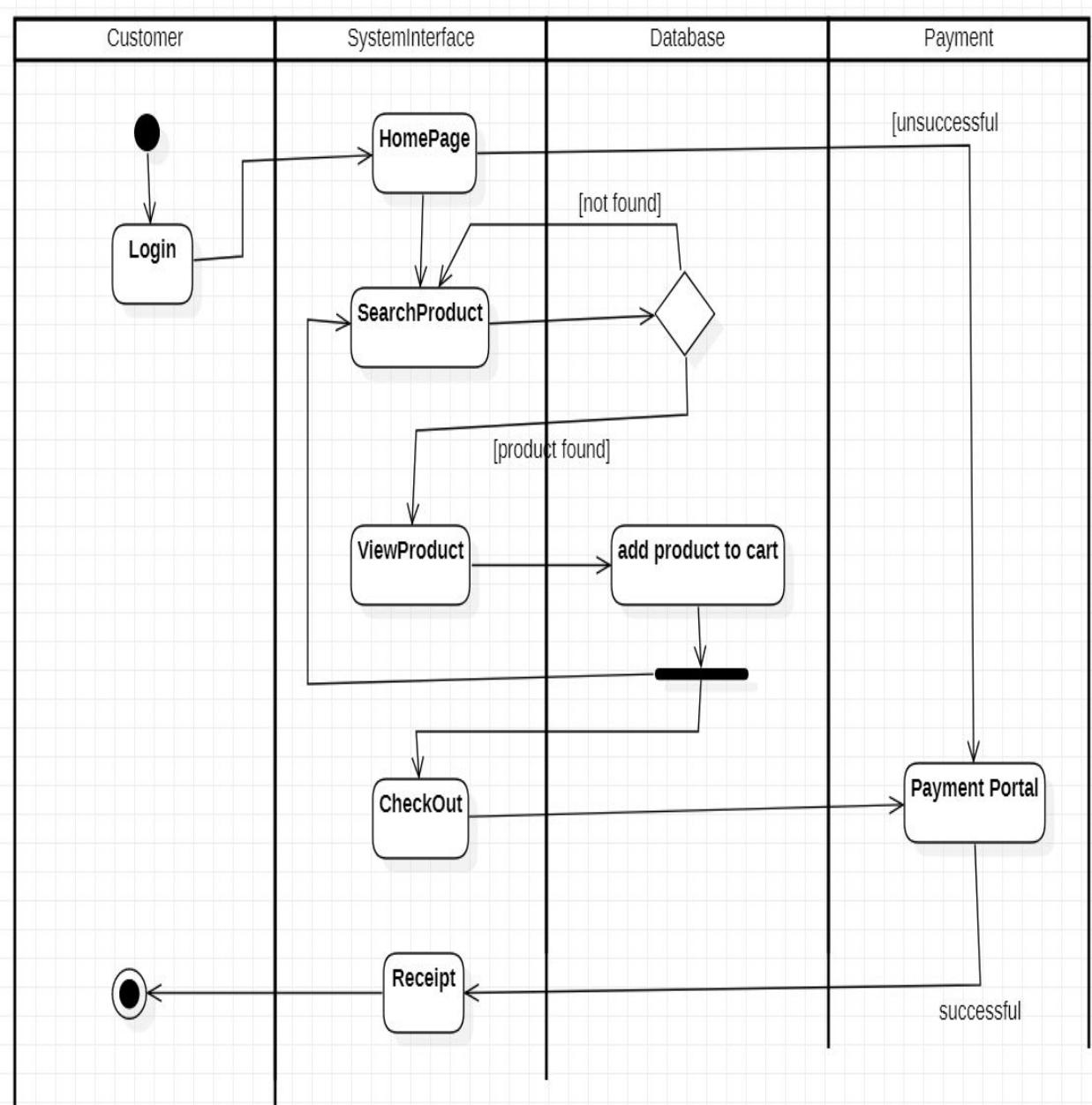




The advanced activity diagram has three swim lanes i.e customer,coffee dispenser and payment. The customer can select coffee ,insert coins,get change and collect coffee. The coffee dispenserchecks for payment and makes ,dispenses the coffee. The payment lane accepts coins, calculatesamount and gives back the change

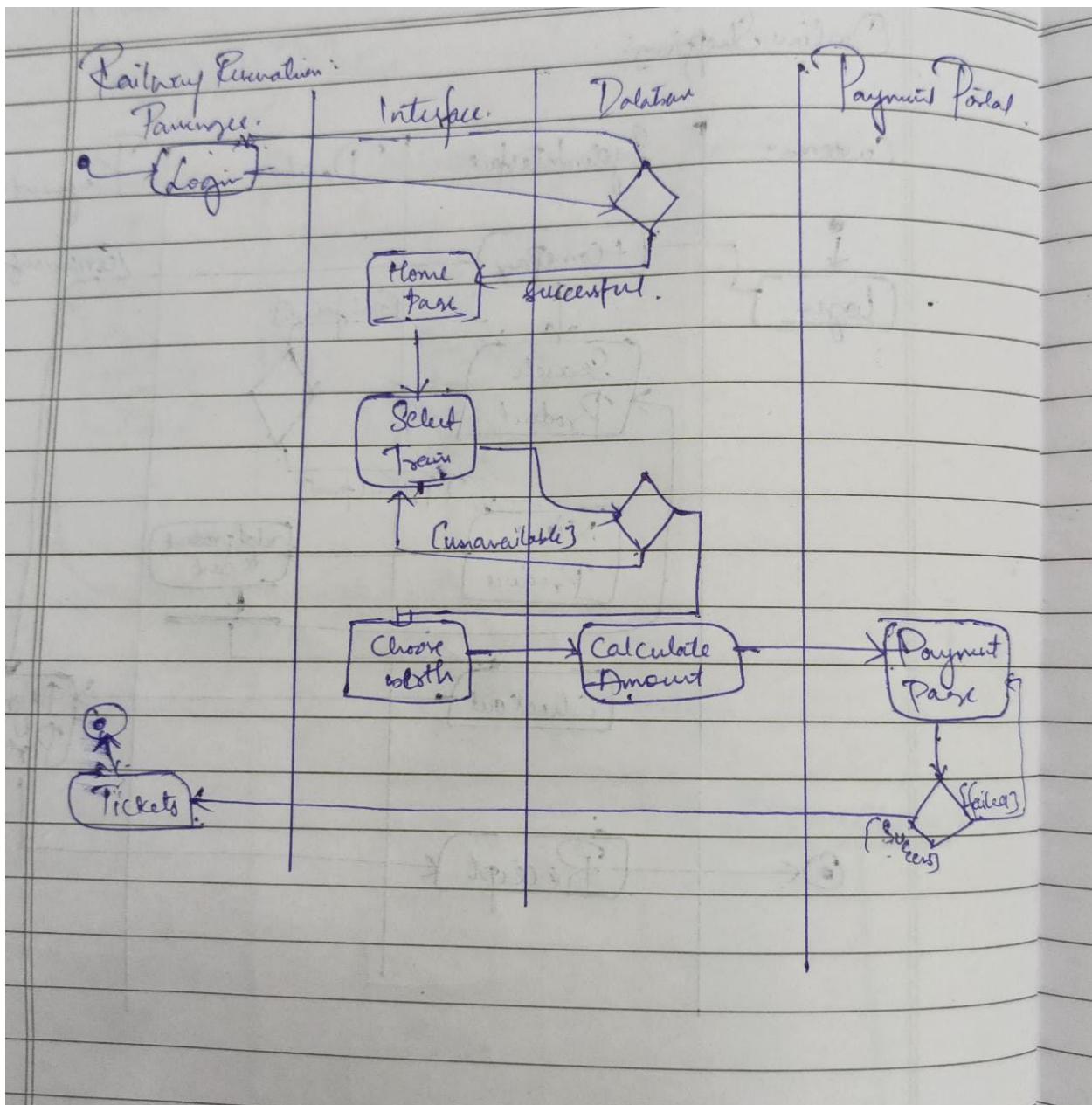
Online shopping system:

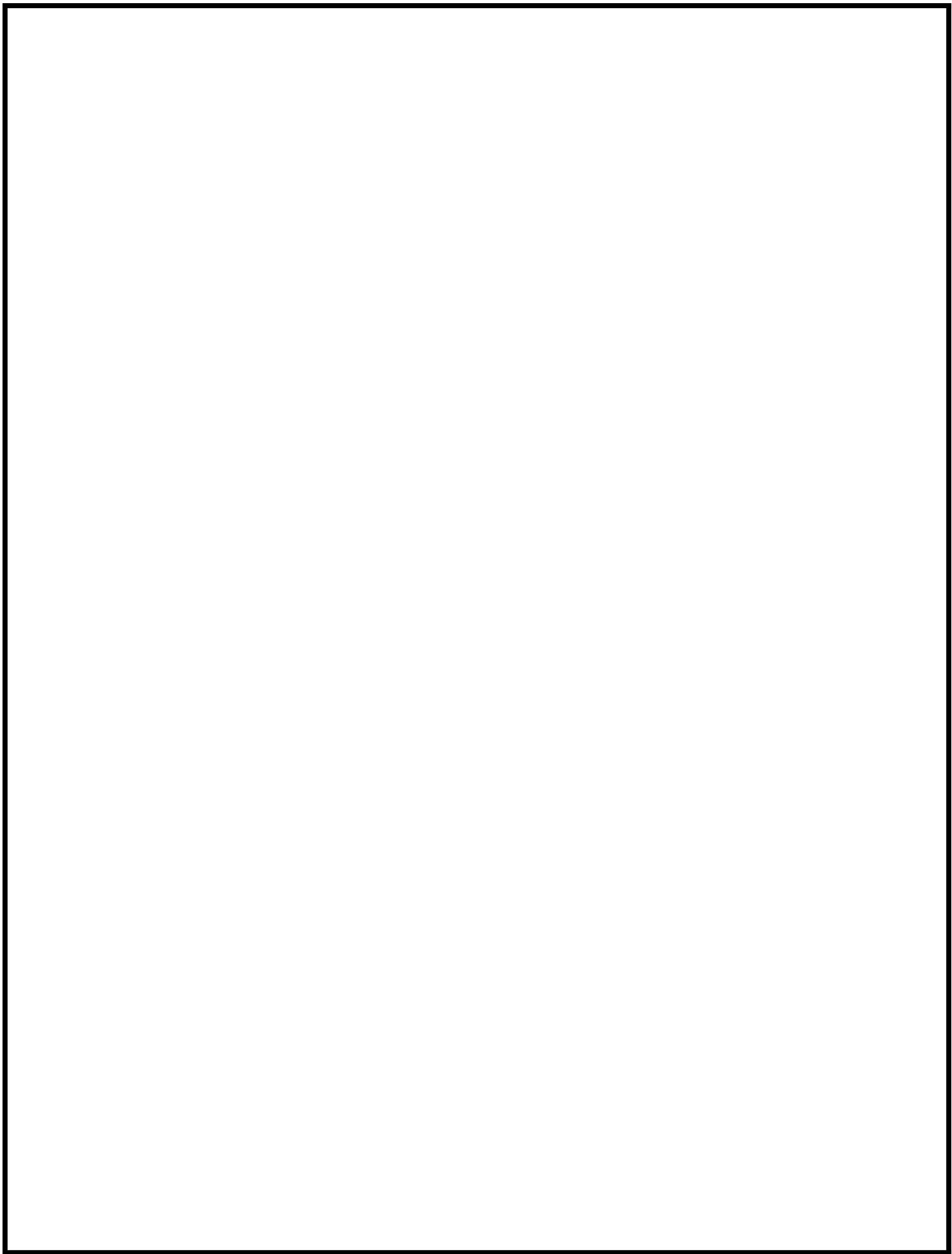


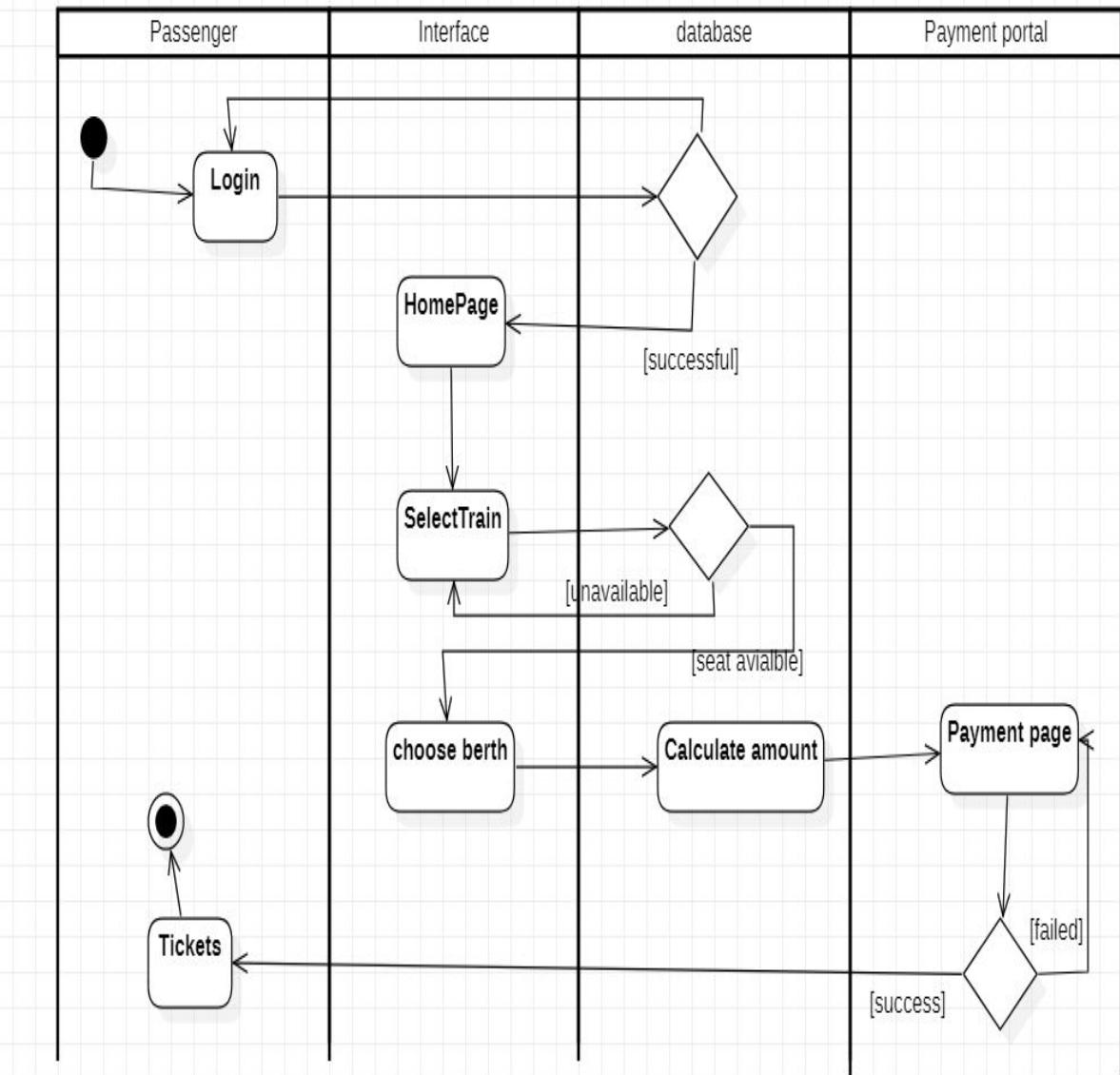


the advanced activity diagram has two swim lanes i.e customer and online shop. The customer can add product to basket and login/register and confirm order. The online shop can checkout the products, deliver, process payment and send confirmation to customer.

RAILWAY RESERVATION SYSTEM:

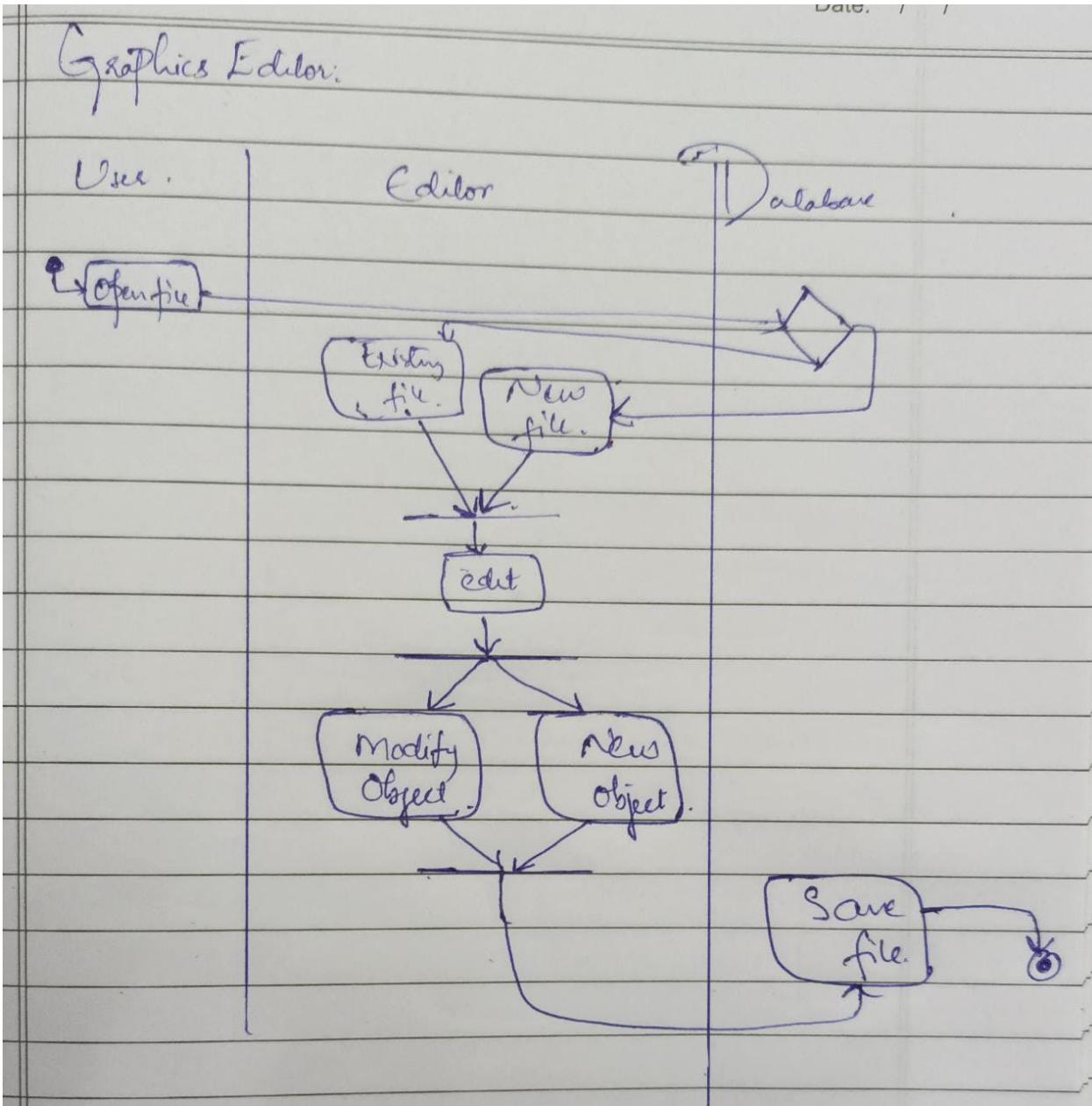


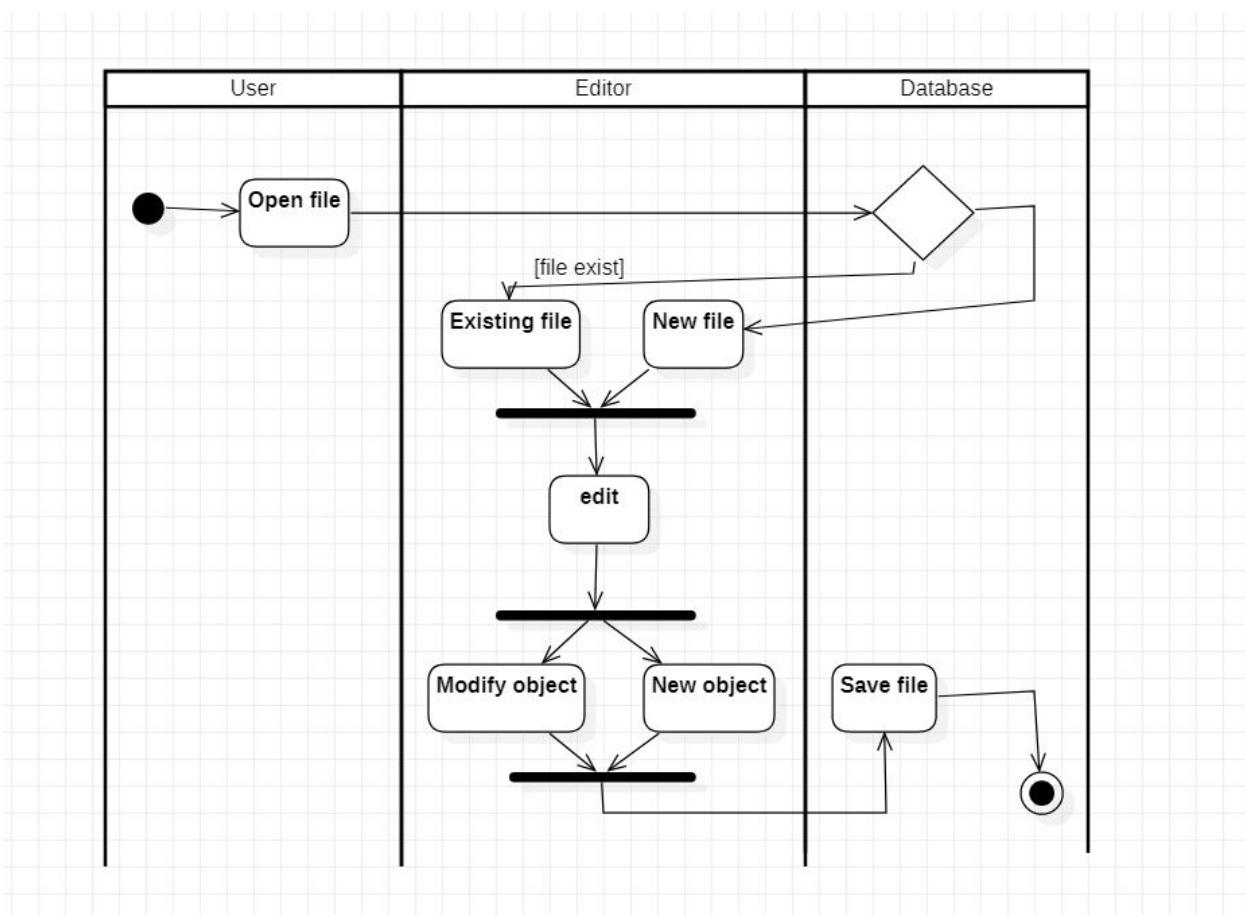




The activity diagram tells about the steps happening while canceling a ticket which is booked.the user first need to login and select his ticket,confirm cancellation, request refund and print the canceled ticket and logout

Graphics editor system:





Note: For each of the diagrams mentioned above, upload hand-drawn diagram you're your observation as well the starUML snapshot.

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.

THE SAME STEPS ARE TO BE FOLLOWED FOR ALL EXERCISES.