

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

“JnanaSangama”, Belgaum -590014, Karnataka.



LAB REPORT on

Object Oriented Analysis and Design

Submitted by

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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)
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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 **Kusum M R (1BM19CS077)**, 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 an **Object Oriented Analysis and Design - (20CS6PCOMD)** work prescribed for the said degree.

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Index Sheet

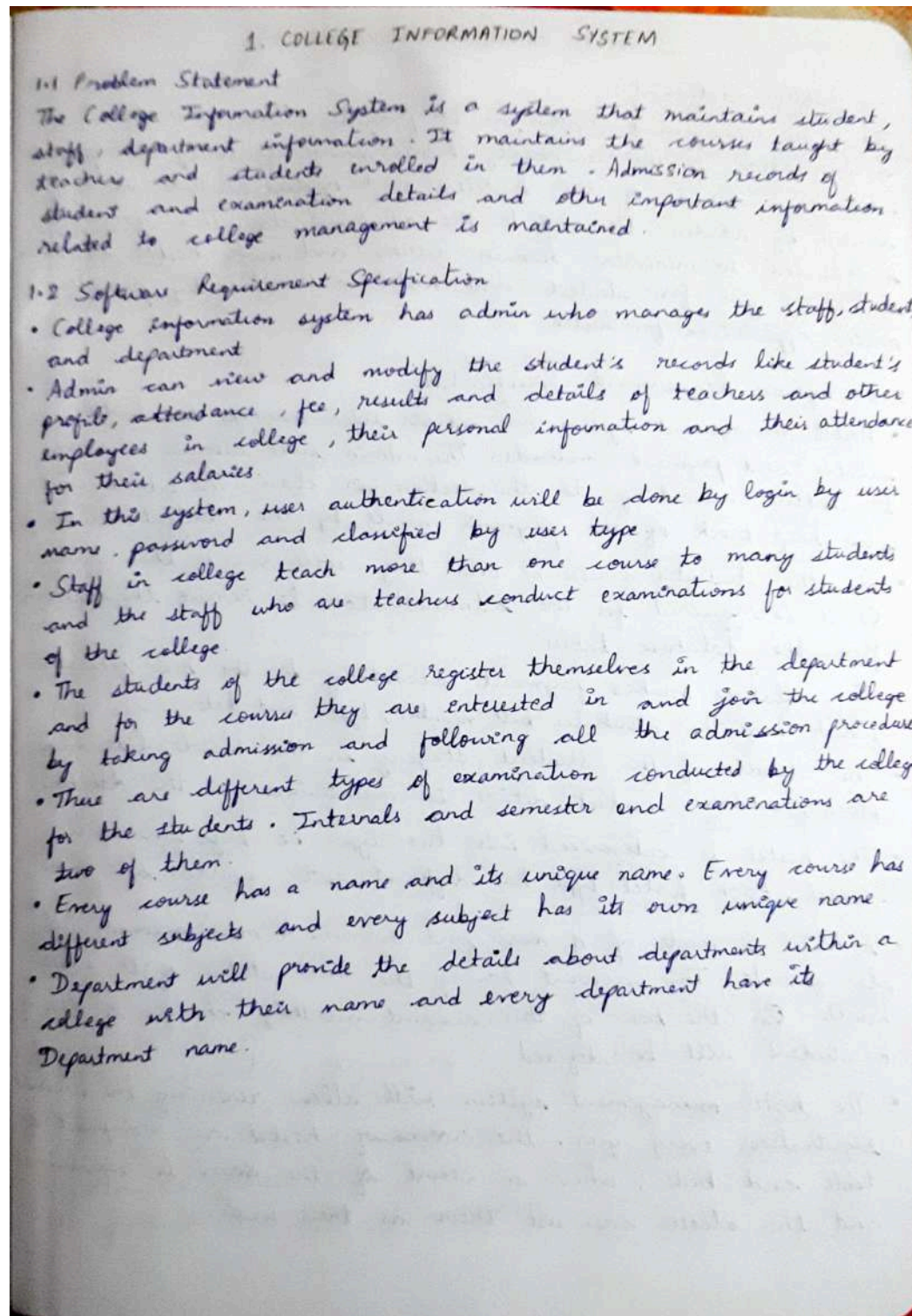
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Course Outcome

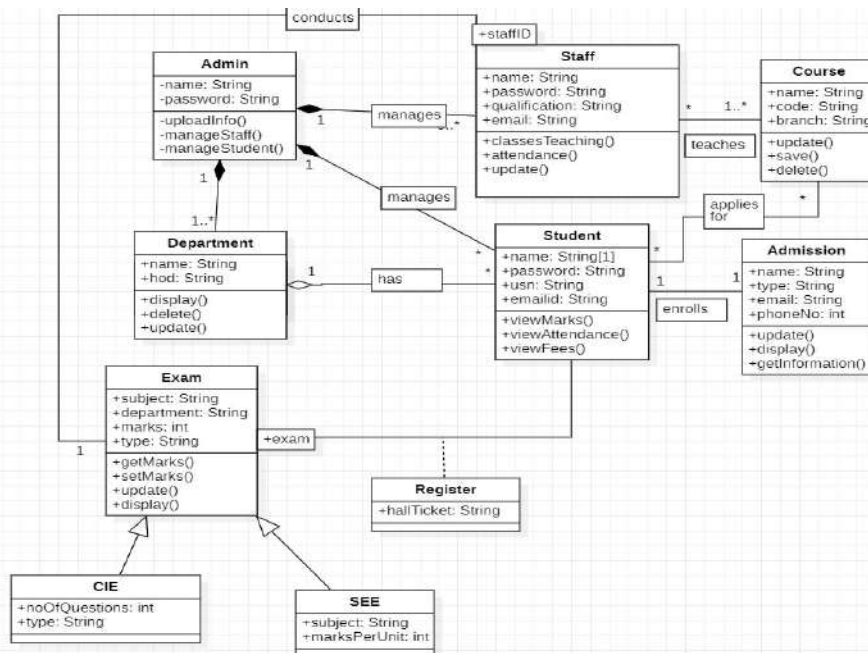
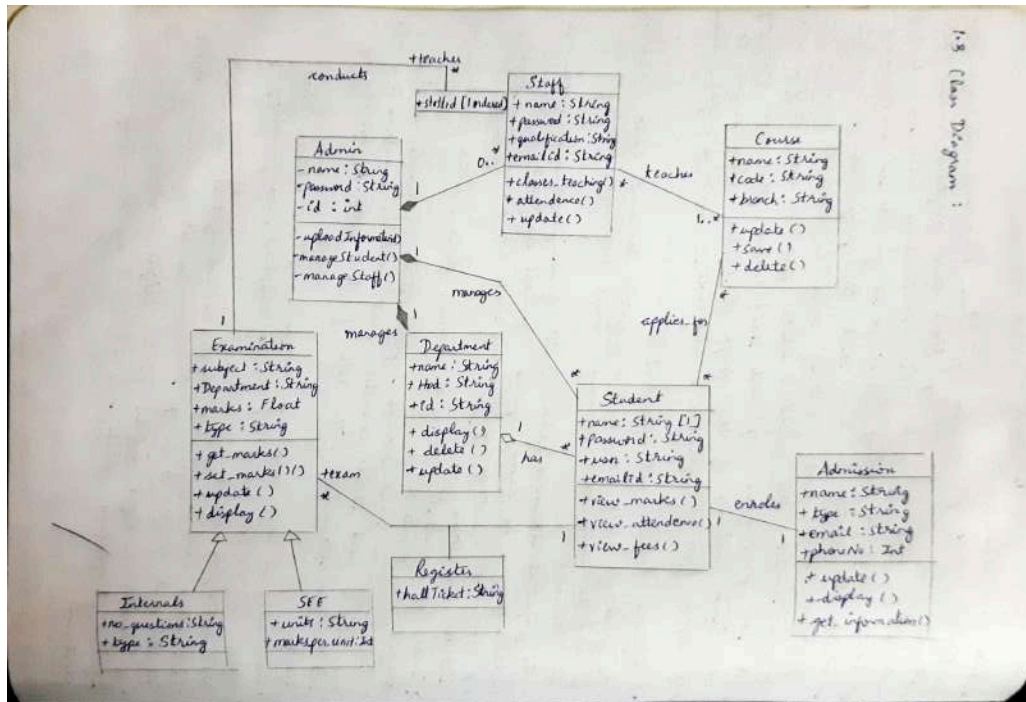
CO4	Ability to conduct practical experiment to solve a given problem using Unified Modeling language.
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1. College Information System -

a) SRS:

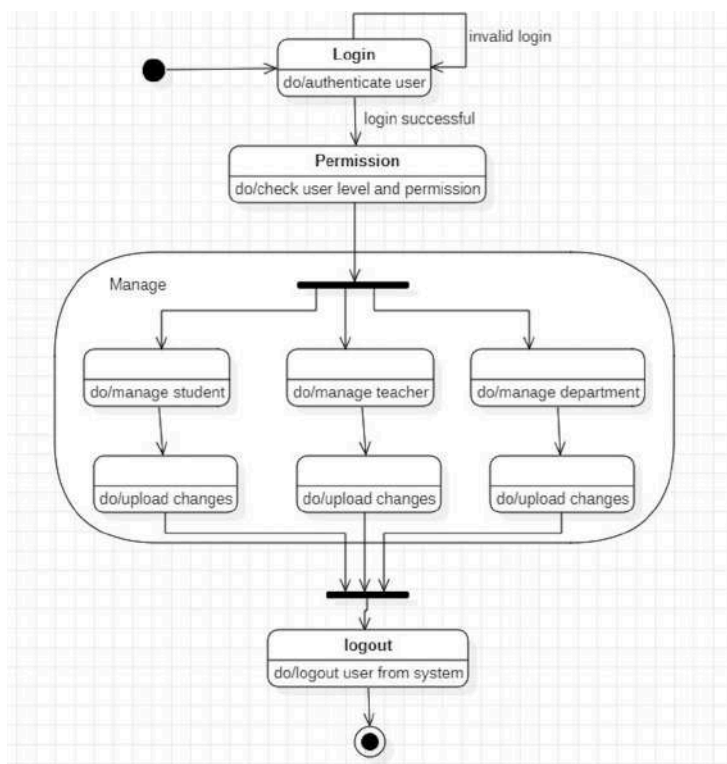
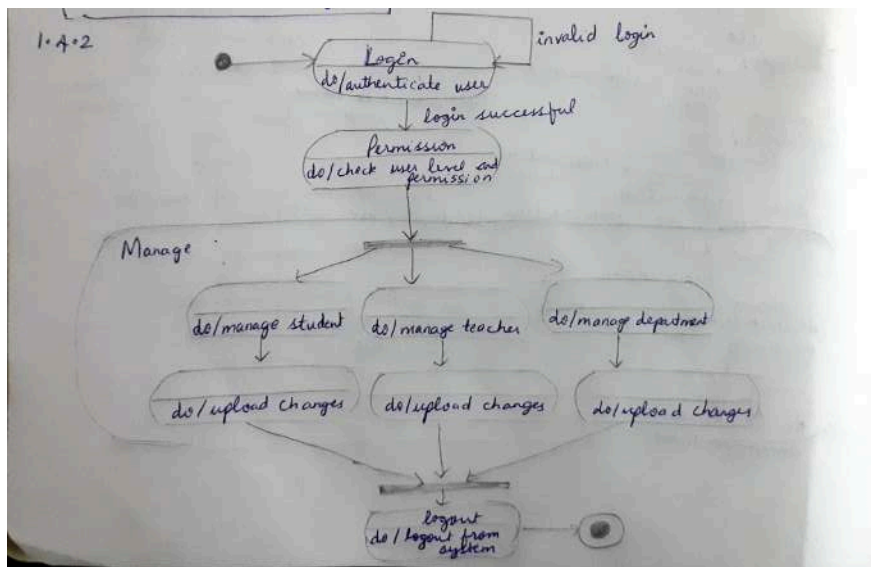


b) Advance Class Diagram:



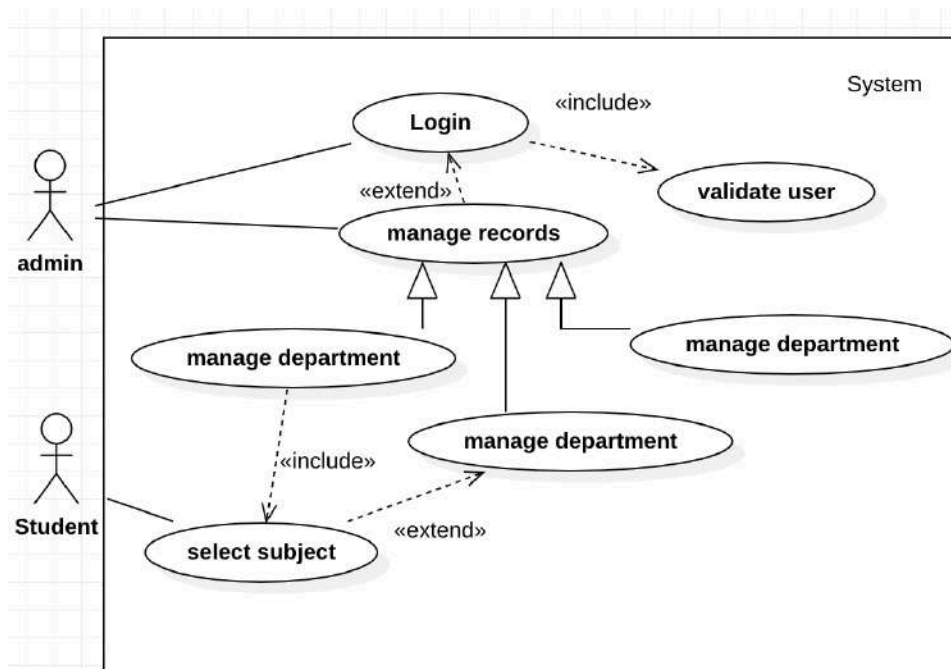
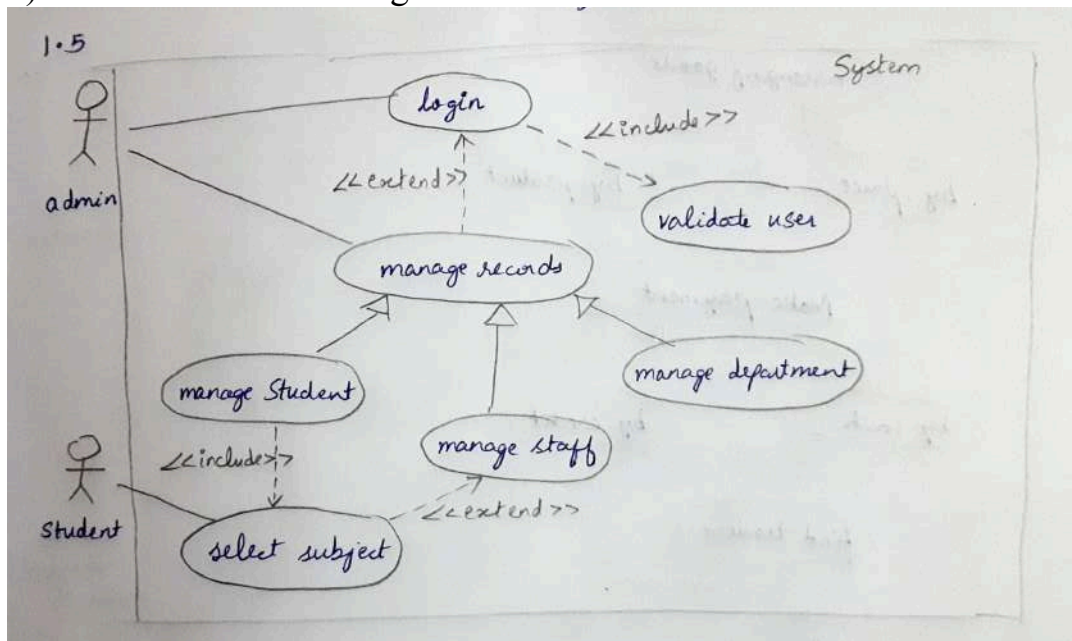
Admin can view and modify the student's records, teachers and department details. The students of the college register themselves in the department and examination and for the courses they are interested in and join the college by taking admission and following all the admission procedures. College conducts Internals and semester end examination for student

c) Advance State Diagram:



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 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 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 manage information related to the student, teacher, or department. After necessary changes the admin can update the information and logout from the system.

d) Advance Use Case Diagram:



Actors:

Admin: the person who manages everything

Student: A person who uses the system

Use Cases:

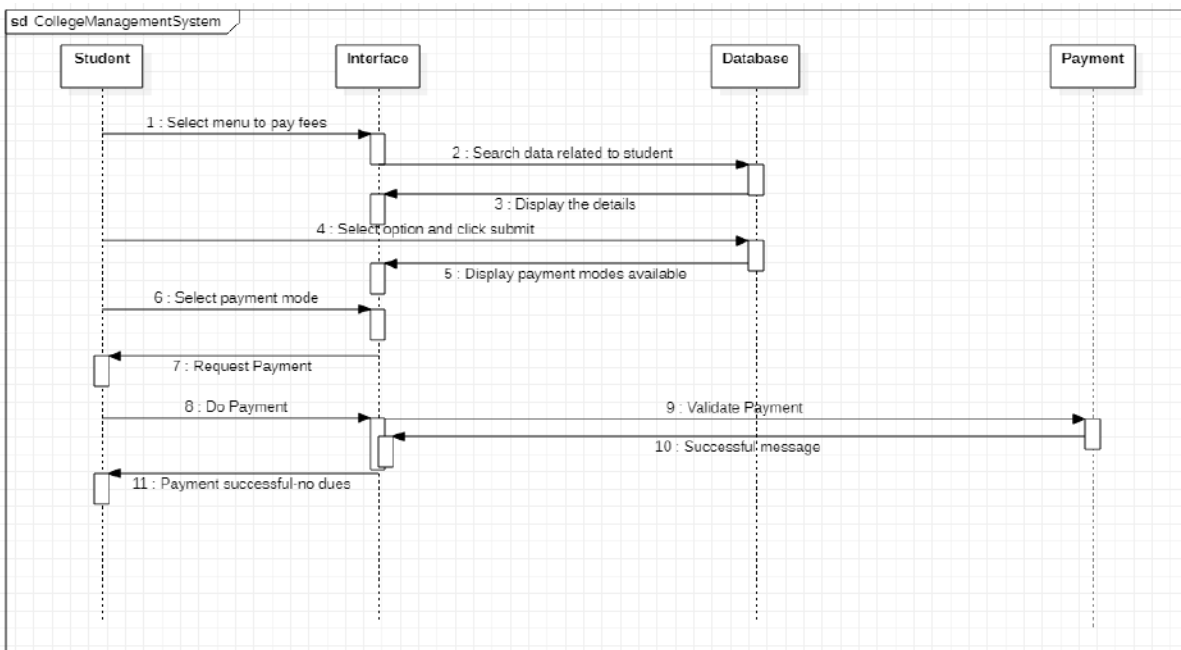
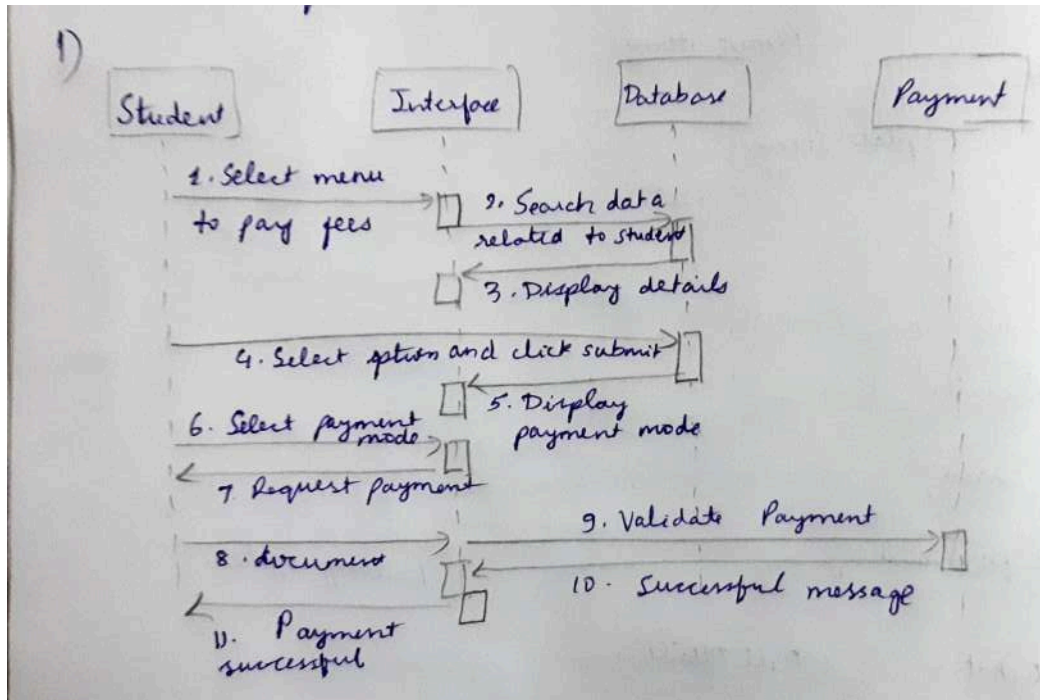
Manage details: the admin can update, insert or delete the data.

View results: displays the result of students.

Subject details: various details related to subject is displayed.

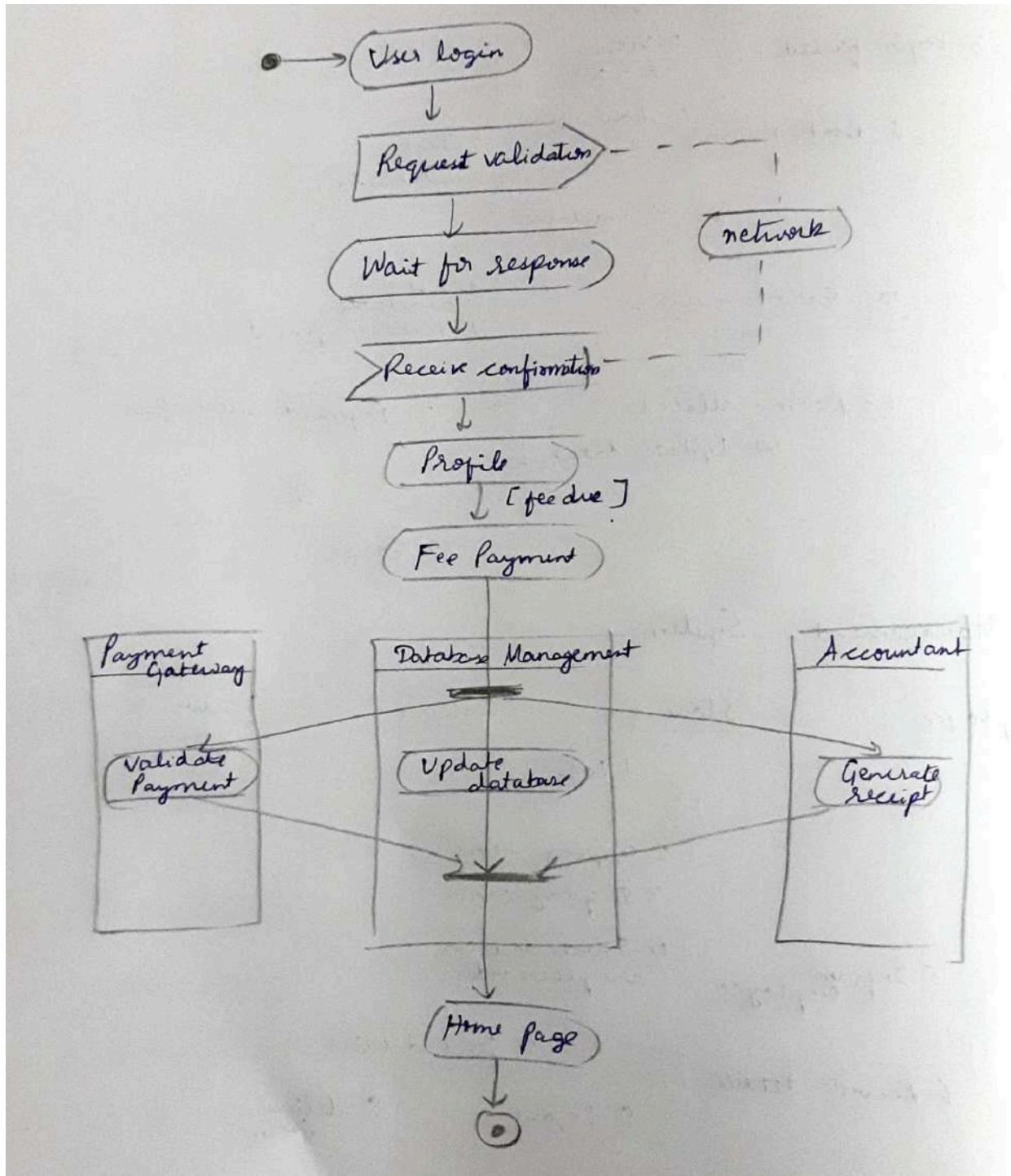
View student details: the details of student is displayed

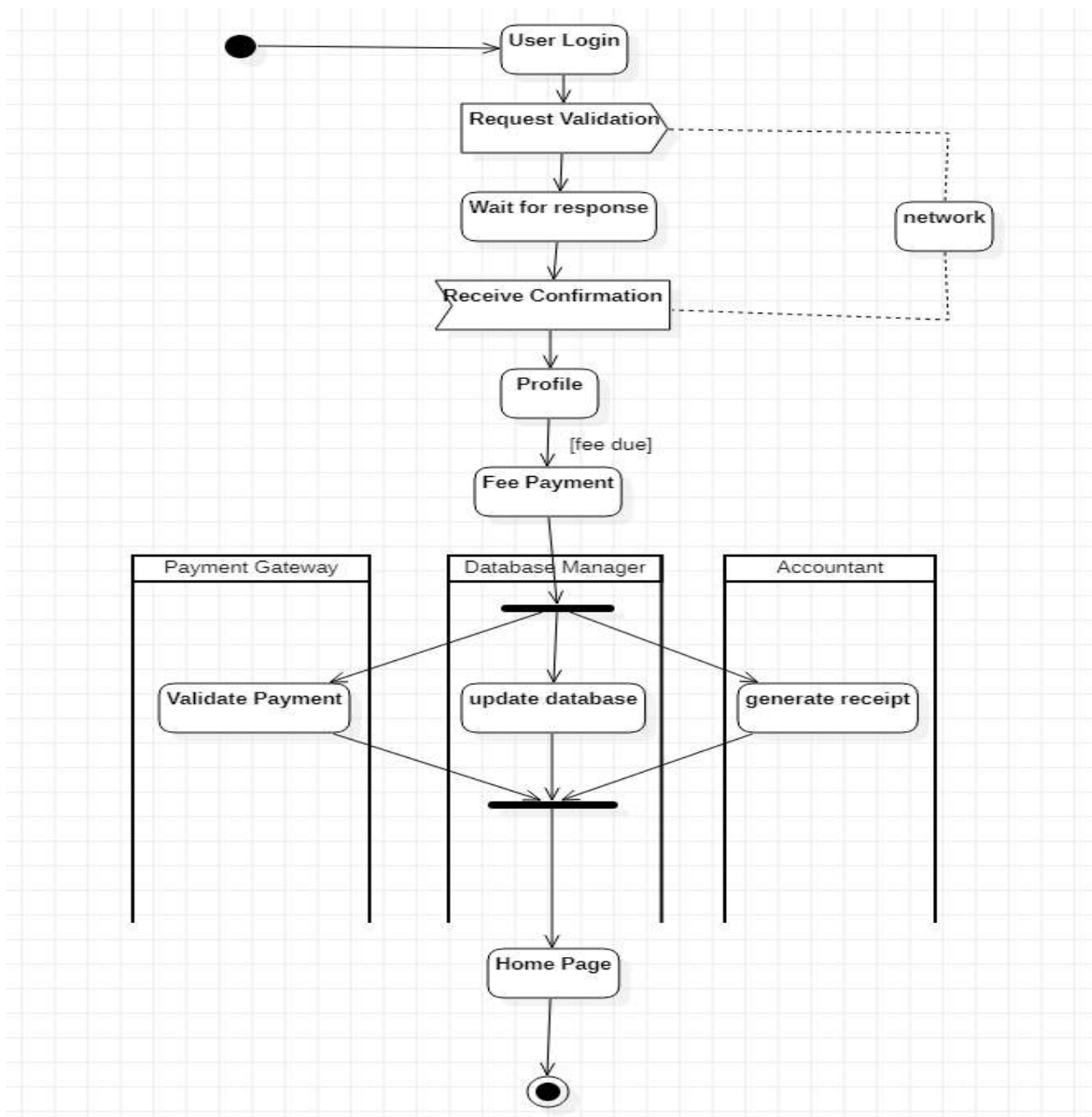
e) Sequence Diagram:



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.

f) Activity Diagram:

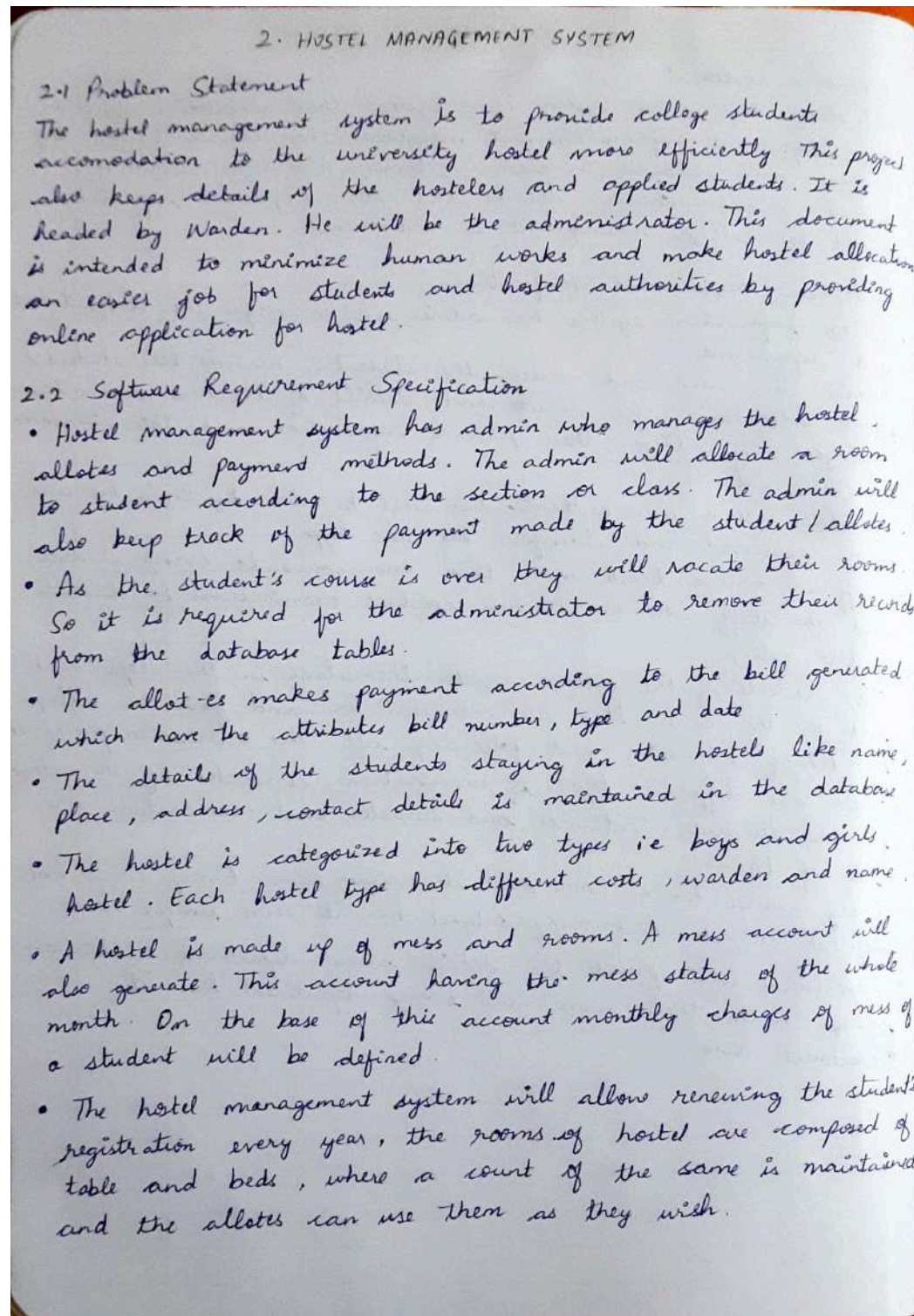




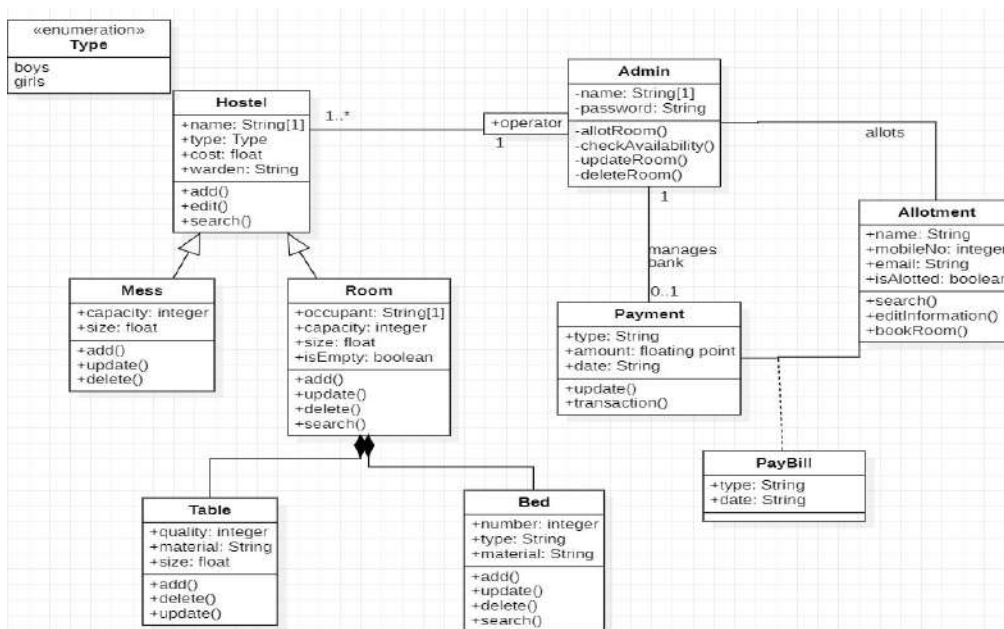
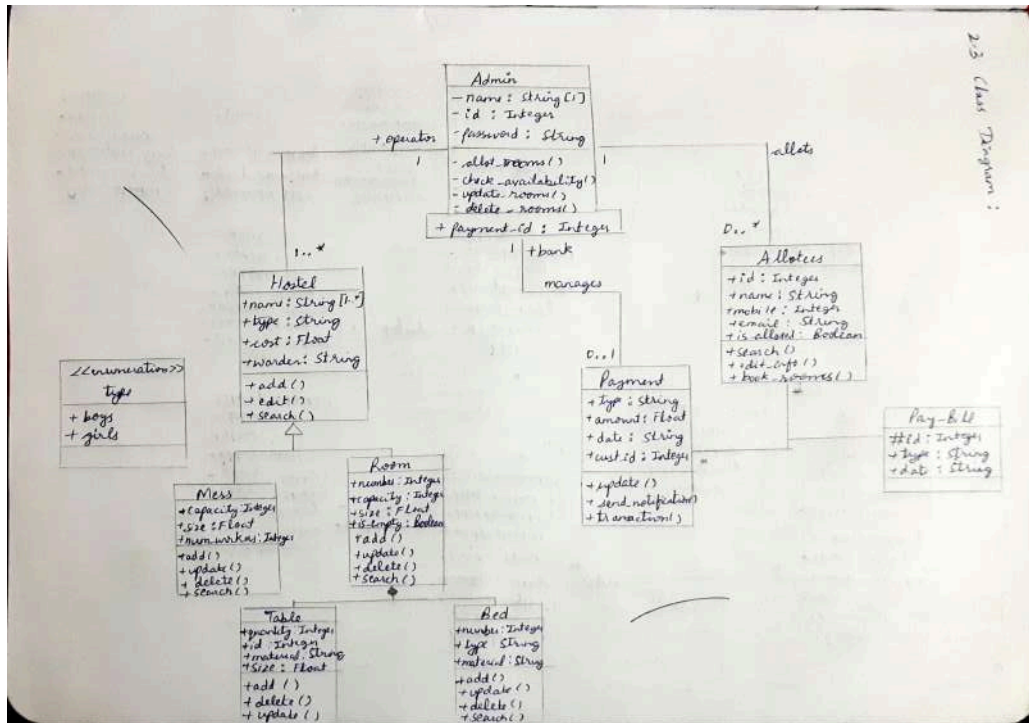
The above activity diagram has three swimlanes mainly admin, database and teacher. The admin can login and manage information. The database verifies the login information and on success has two options. He teacher can view attendance, view course details, and view student list.

2. Hostel Management System-

a) SRS:

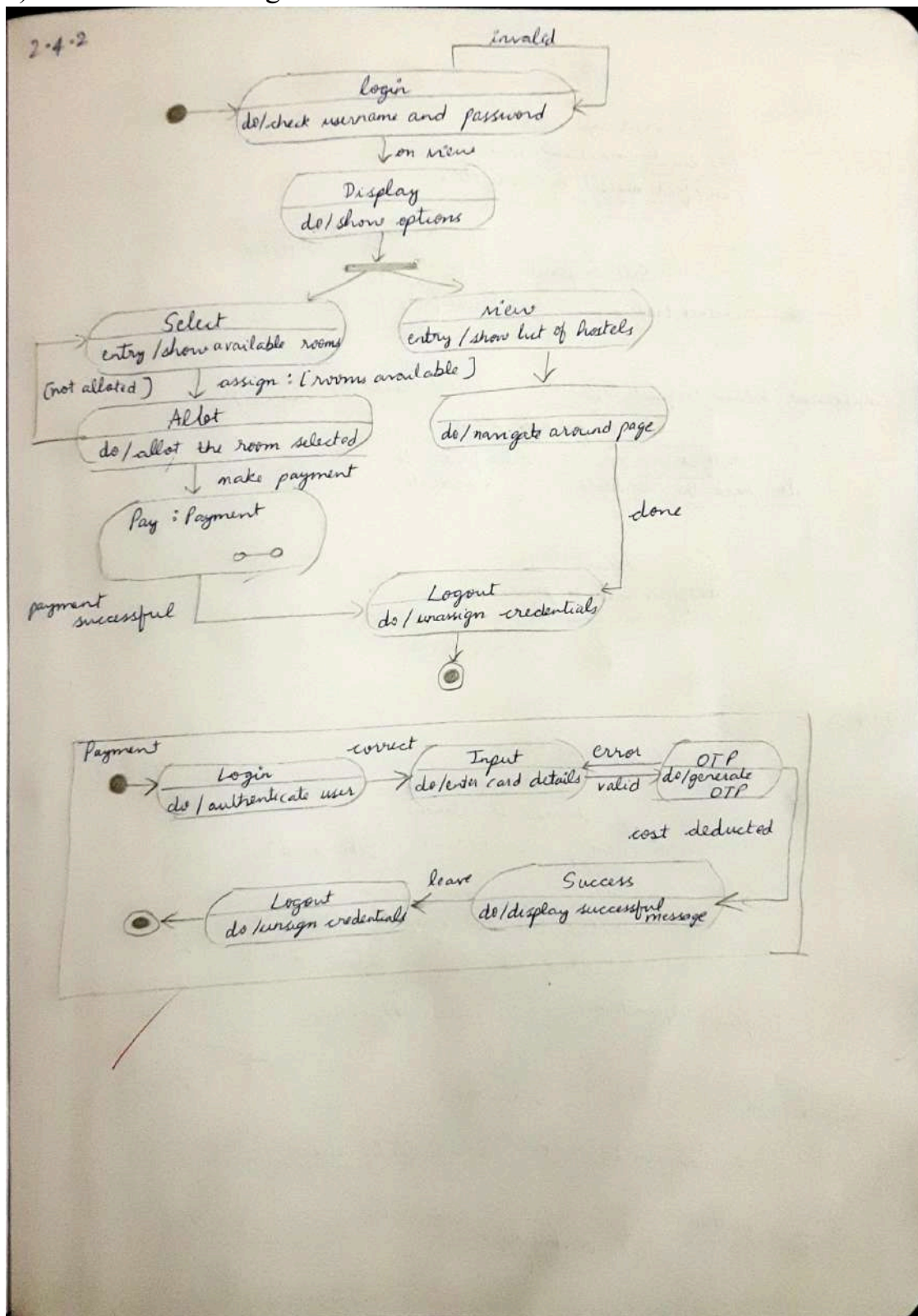


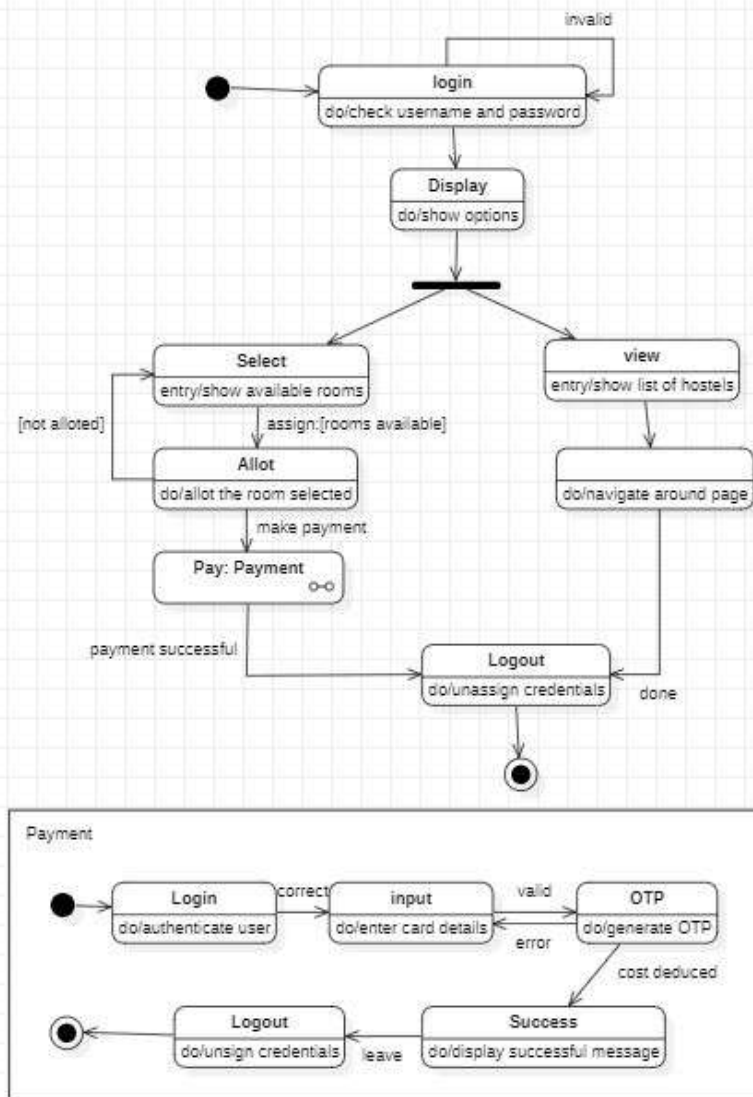
b) Advance Class Diagram:



Hostel management system has admin who manages the hostel, allot-ees and payment methods. The allot-ees makes payment according to the bill generated which have the attributes bill number, type and date. The hostel is categorized into two types I.e boys and girls hostel. 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.

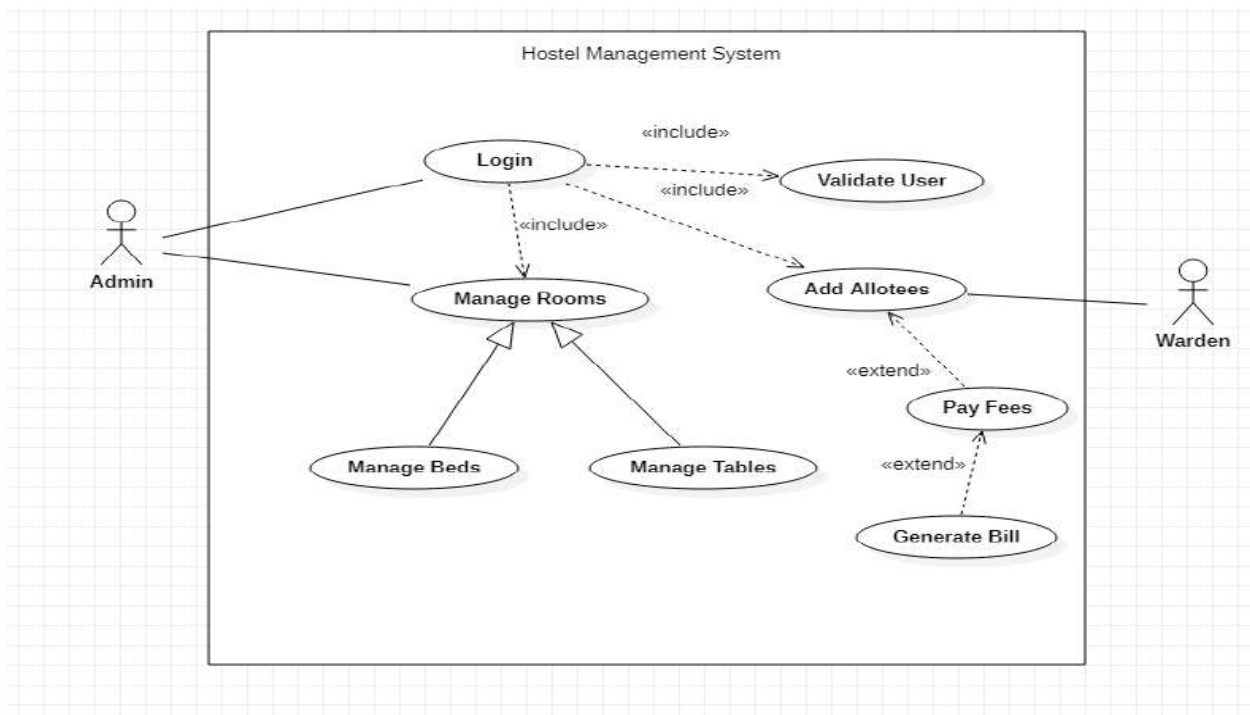
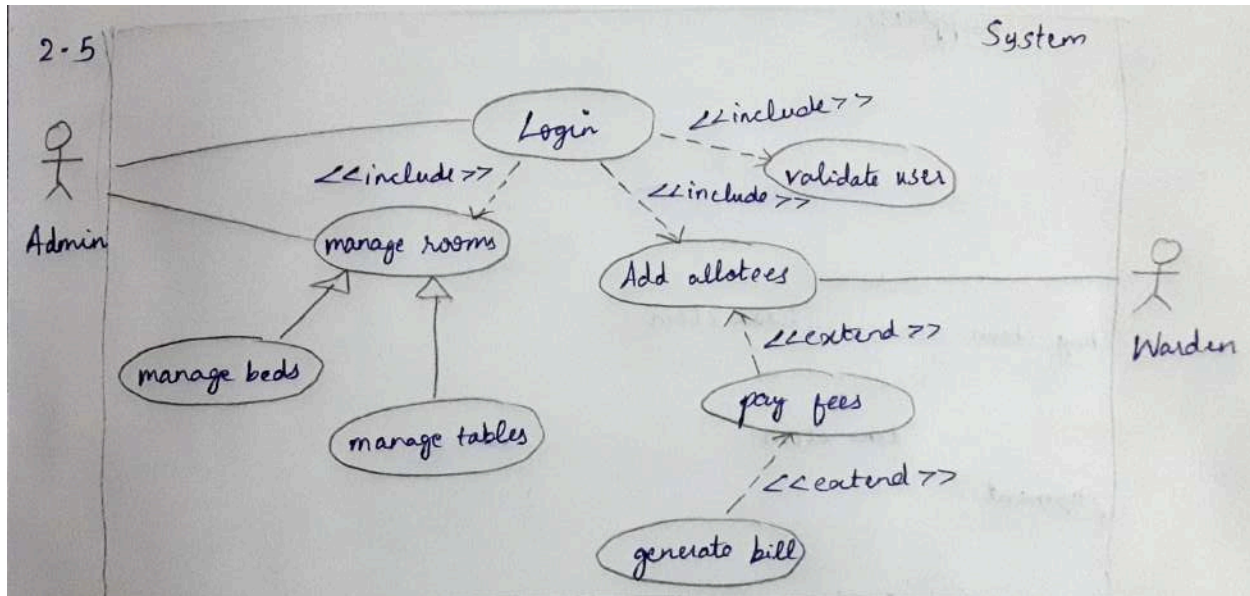
c) Advance State Diagram:





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 login s 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.

d) Advance Use Case Diagram:



Actors:

Admin: the person who manages the whole system

Warden : the person who manages the allottees

Use Cases:

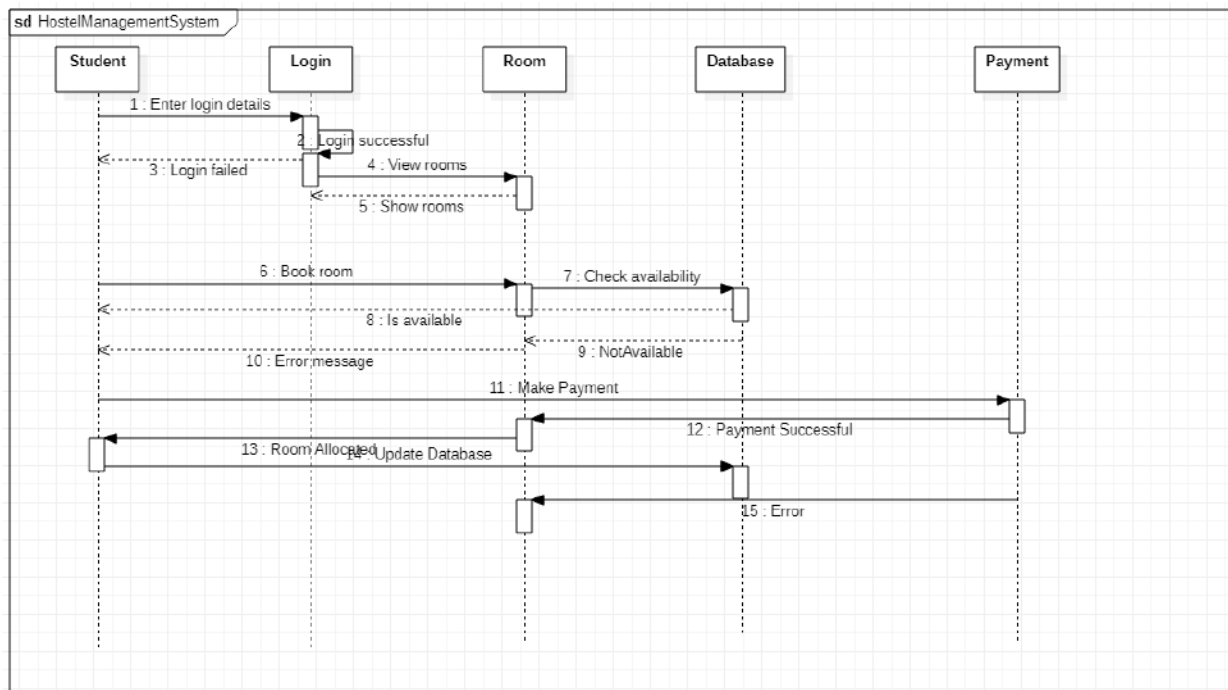
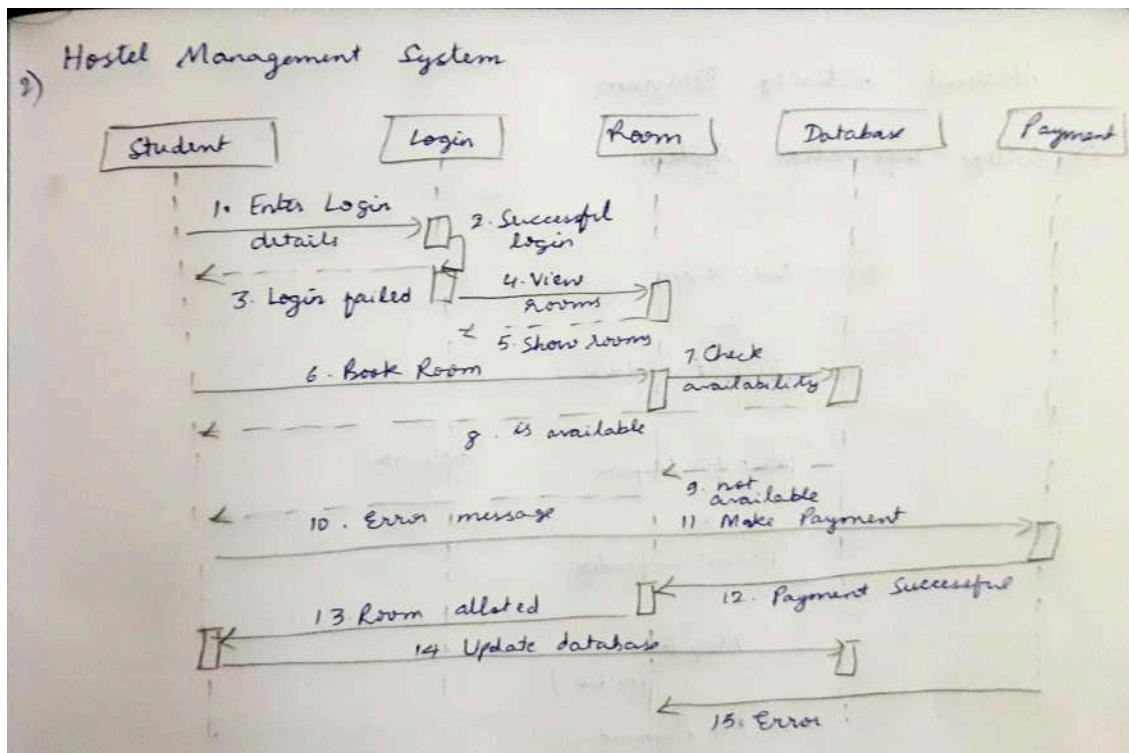
Manage hostel : allows actor to update delete or add information

Login : allows actors to login into the system.

Add allottee: the students are allotted hostel rooms

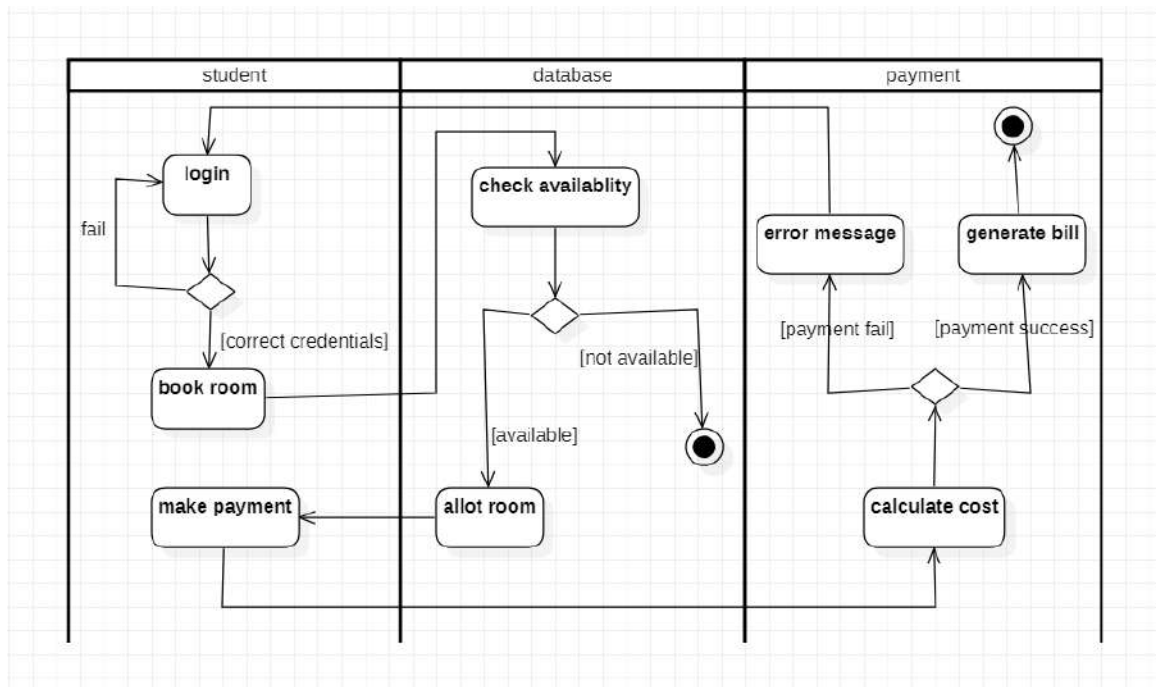
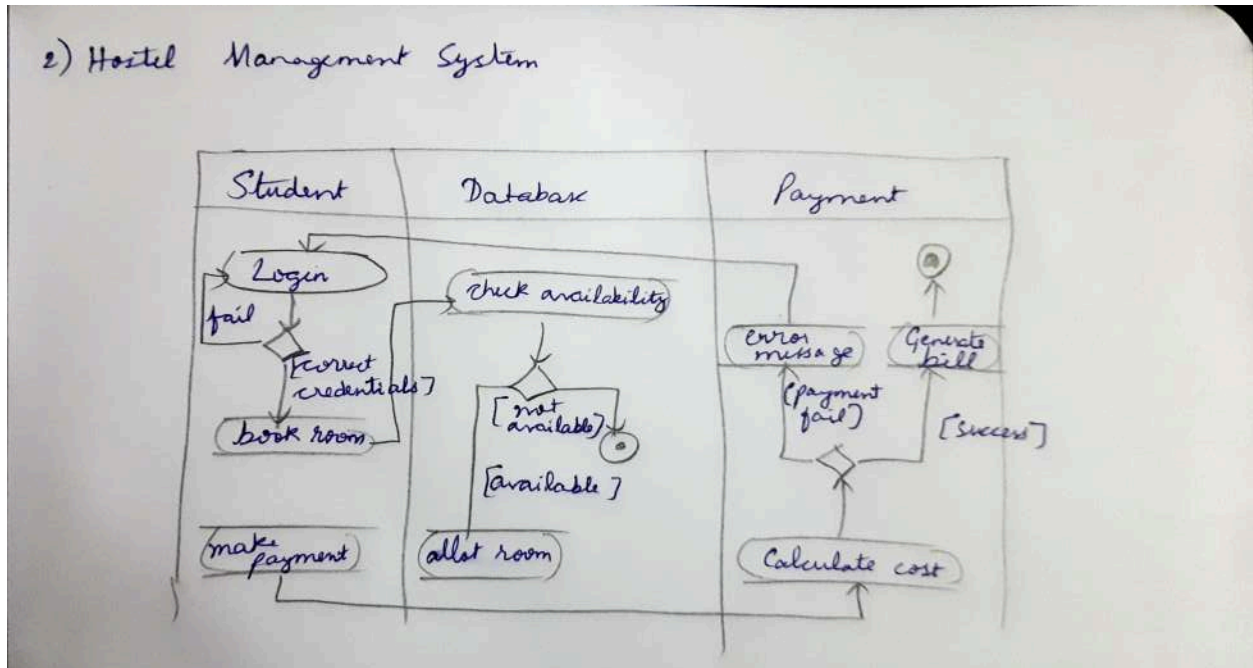
Book hostel: the student can select the hostel they wish to stay in.

e) 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.

f) Activity Diagram:



The above activity 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.

3. Stock Maintenance System-

a) SRS:

3- STOCK MAINTAINANCE SYSTEM

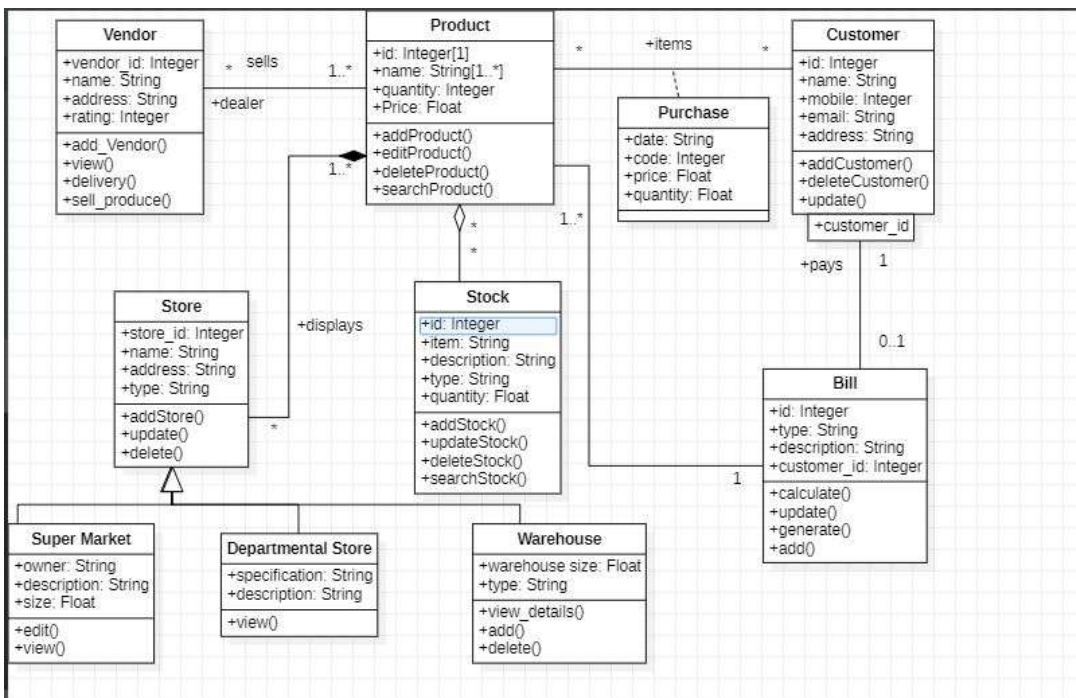
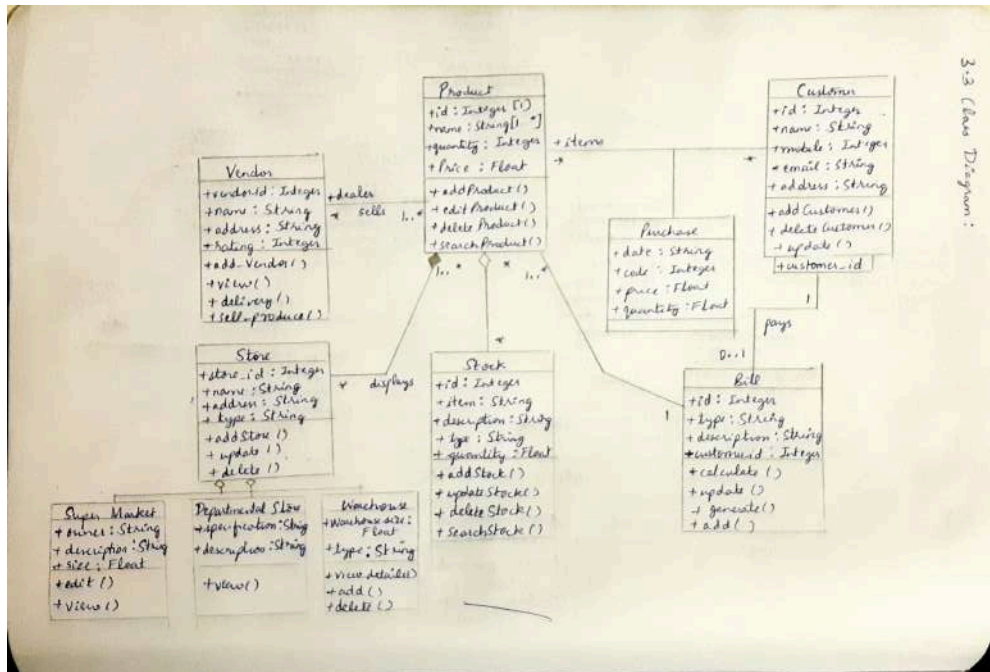
3.1 Problem Statement

The stock maintenance system is basically for the customers who access the information about the stock and retrieve the information. The stock maintenance system is to replace the existing maintenance system which is inefficient. The new stock maintenance system will allow the employee to record information of the products available in the store. The vendor deals with the information of the products available in the store. The vendor deals with the information.

3.2 Software Requirement Specification

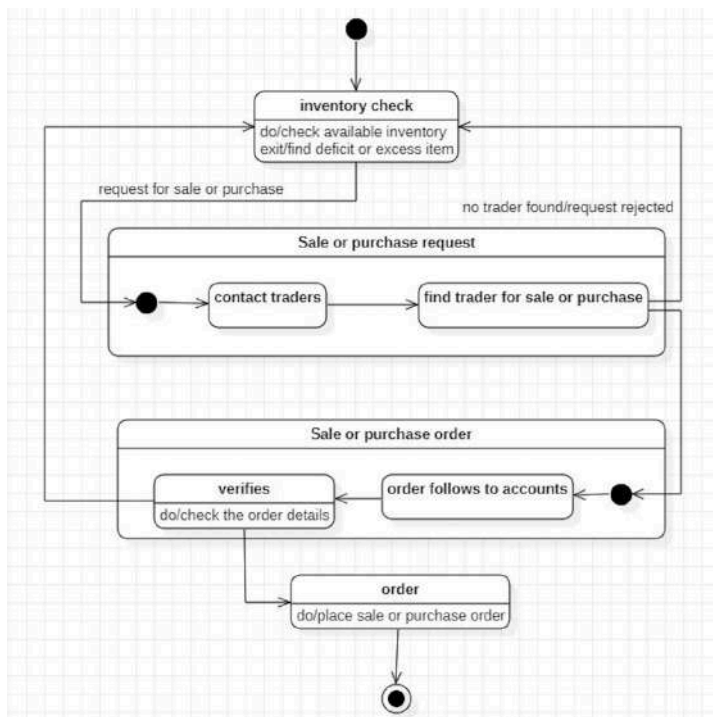
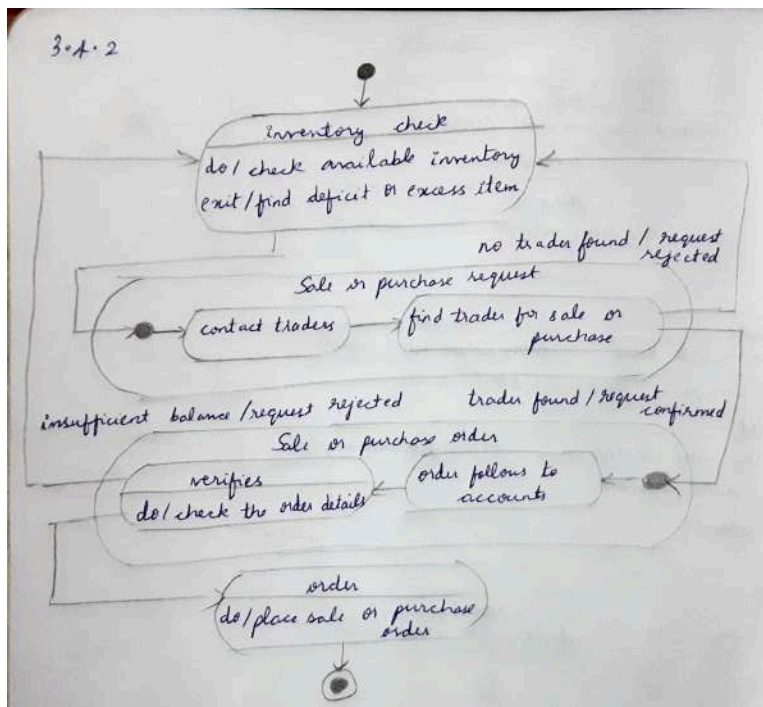
- The customer can purchase one or more products on any day, which will have a code, price and quantity.
- The customer will need to pay the bill for the products he or she has purchased, the bill number, type, description and customer who is paying the bill is maintained.
- The stock of the products is maintained separately, the stock deals with information about the details of the product that the concern handling.
- Stock consists 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 consists 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 warehouse where the products are kept for display.

b) Advance Class Diagram:



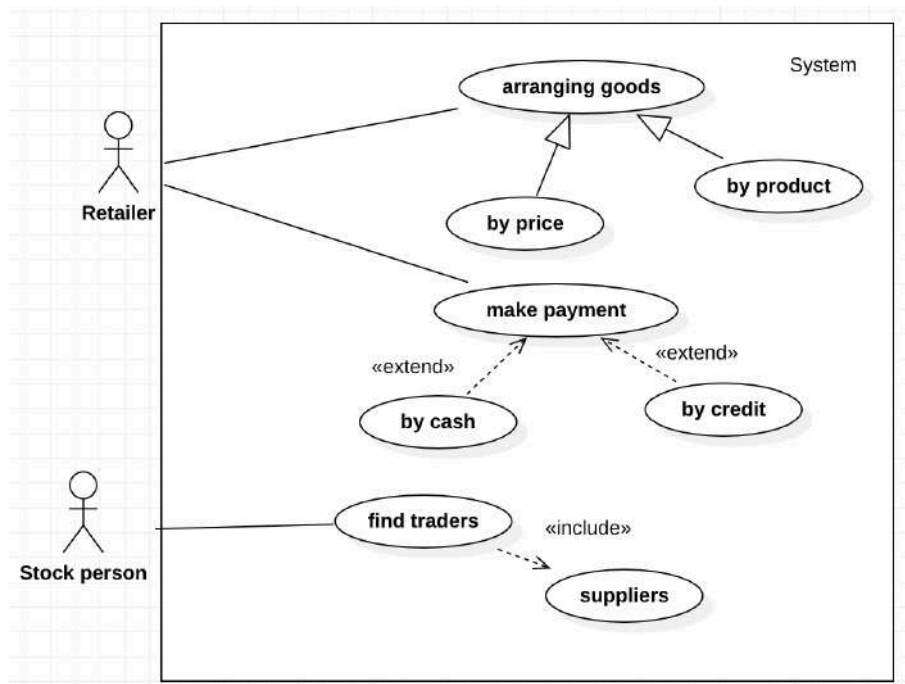
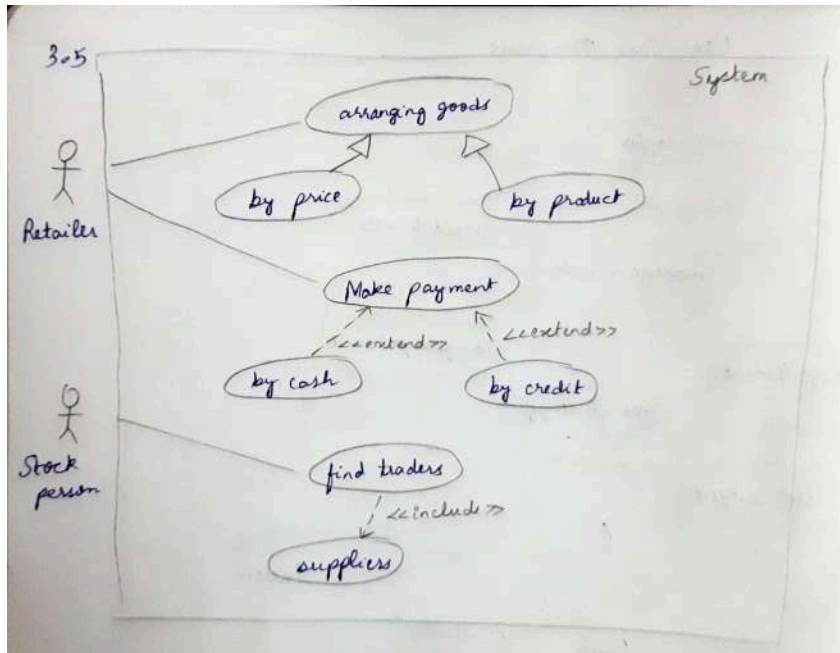
The products are displayed in stores across the city or world. All the information regarding the store are used to locate any product. The stores can be of many types. Some of them are departmental stores, super markets and warehouses where the products are kept for display. The vendor deals with the 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.

c) 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 the stock of products is noted and if the stock is less than minimum, an order is placed by first searching for a 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.

d) Advance Use Case Diagram:



Actors:

Retailer: a person who sells the products

Stock person : a person who keeps check of the stock

Use Cases:

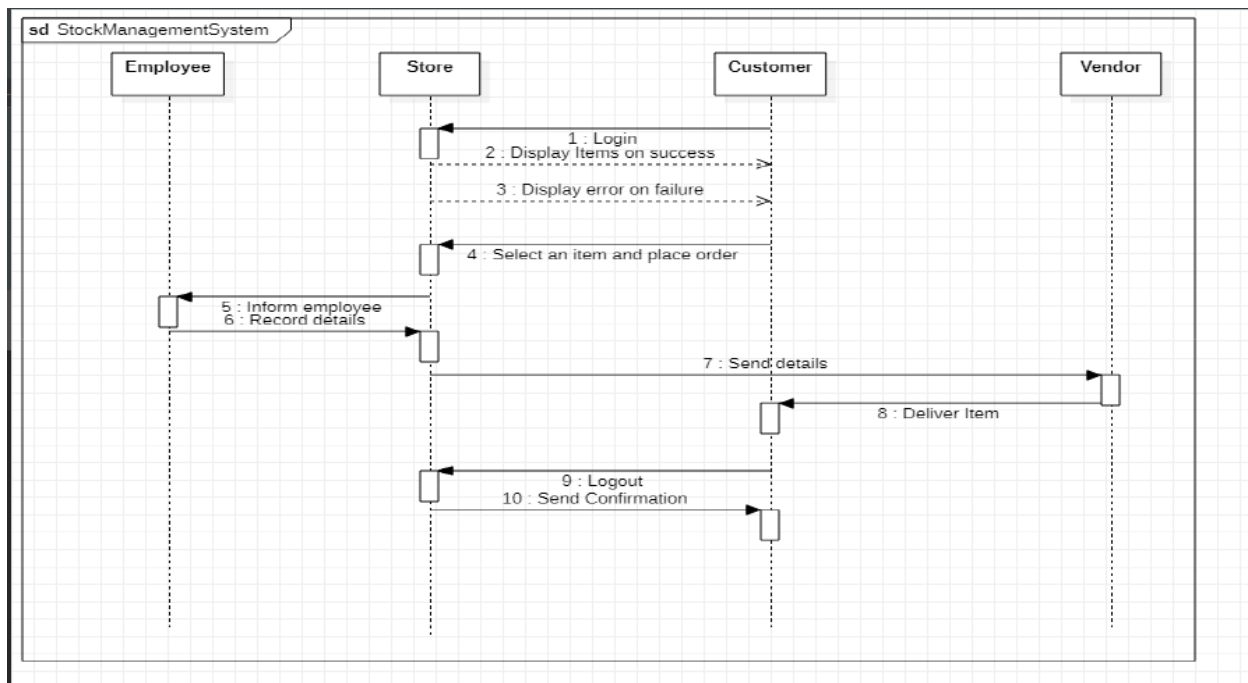
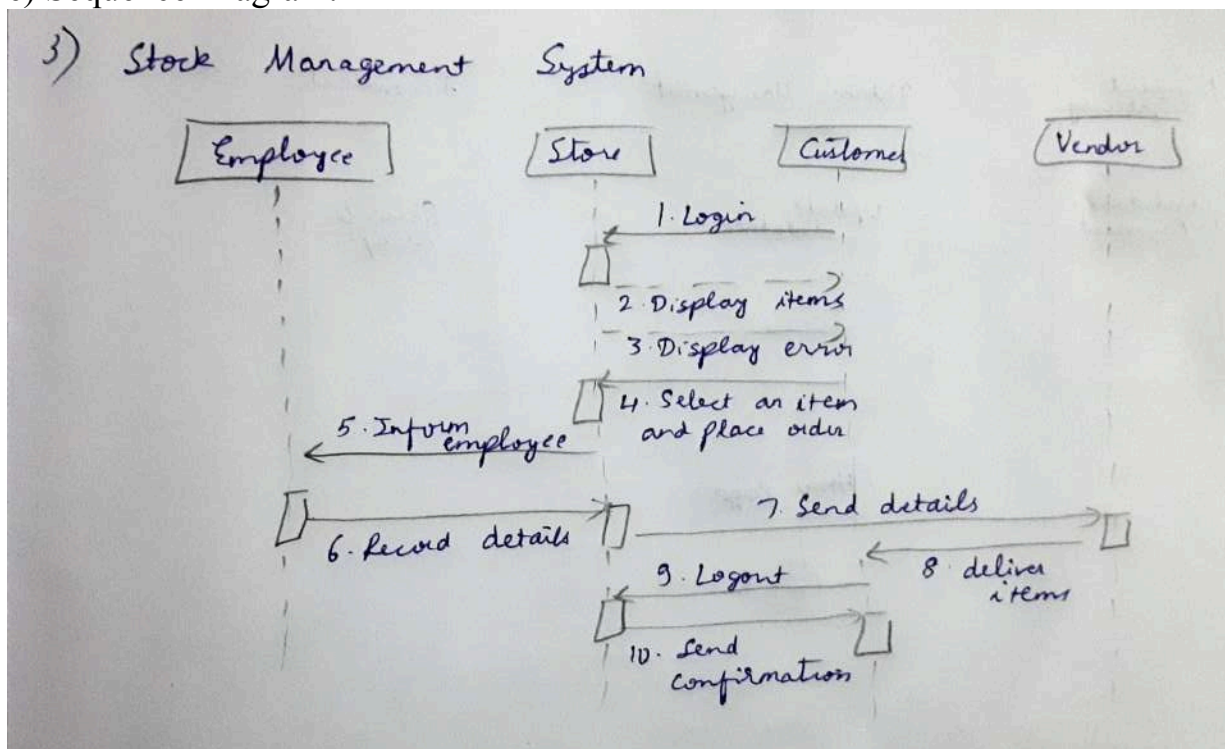
Purchase item: allows a user to purchase any product

Make payment: accepts the payment

Supply stock: keeps track of the stock supplied

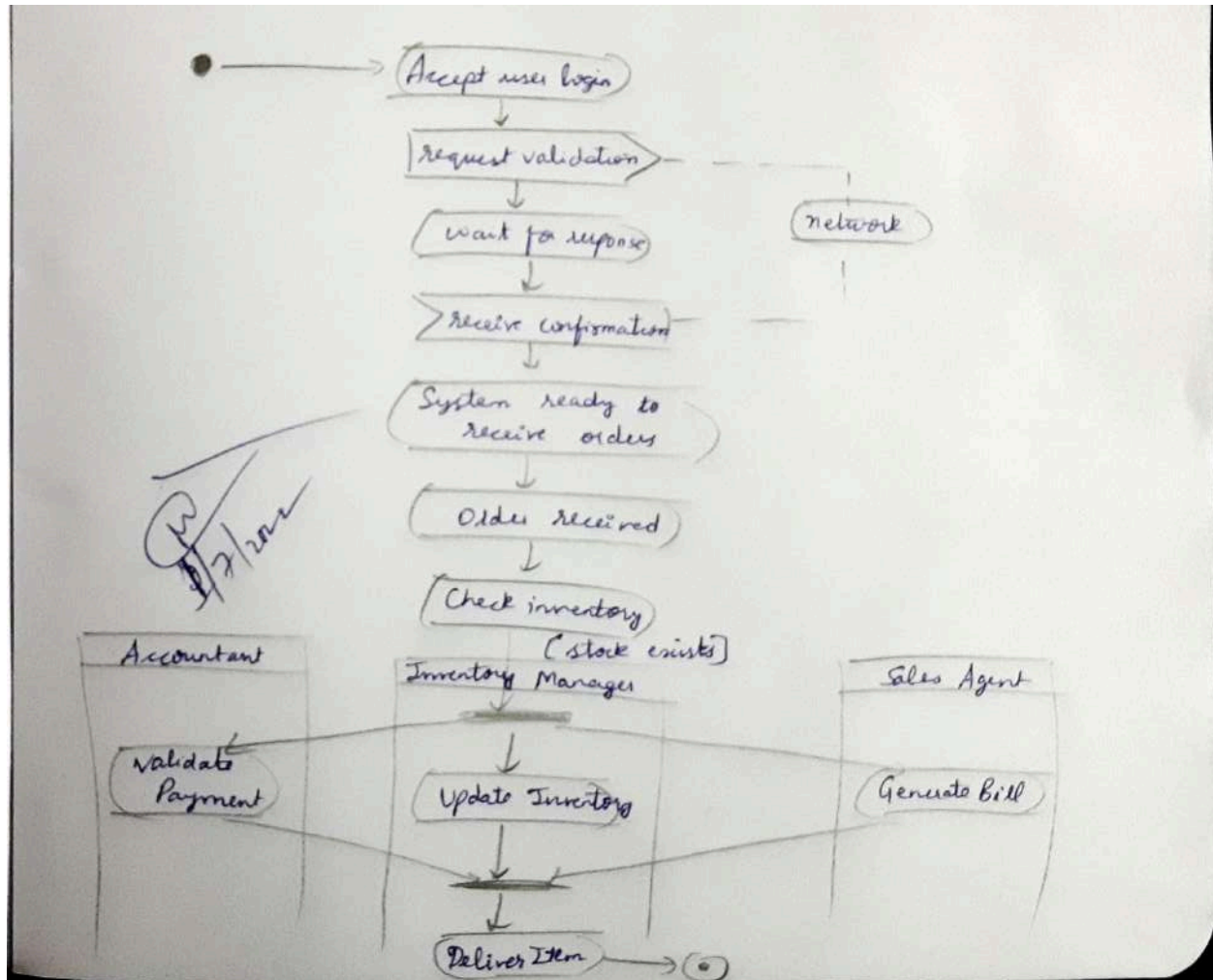
Find traders: provides a list of traders

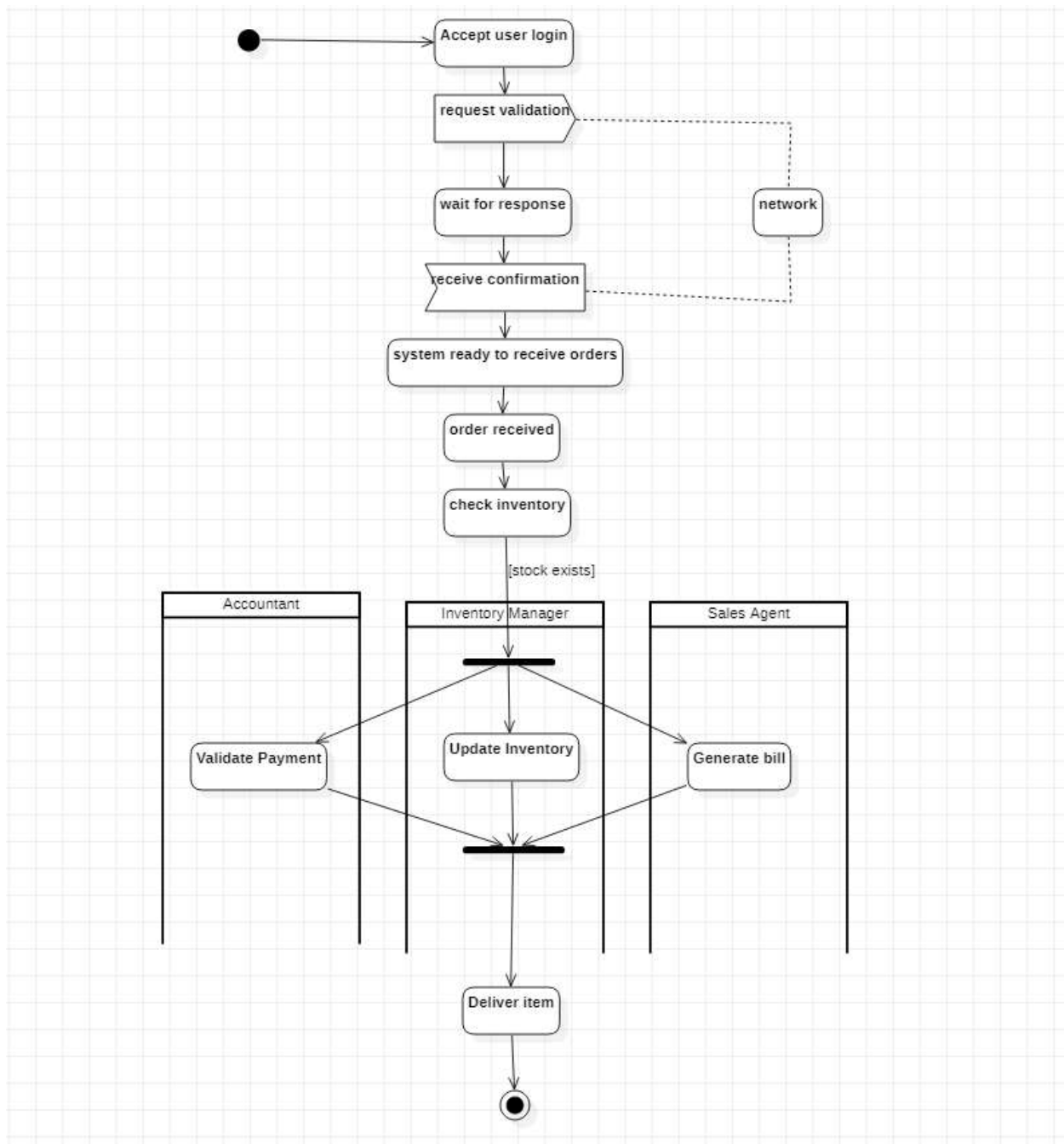
e) Sequence Diagram:



The above sequence diagram give the steps involved in placing 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.

f) Activity Diagram:

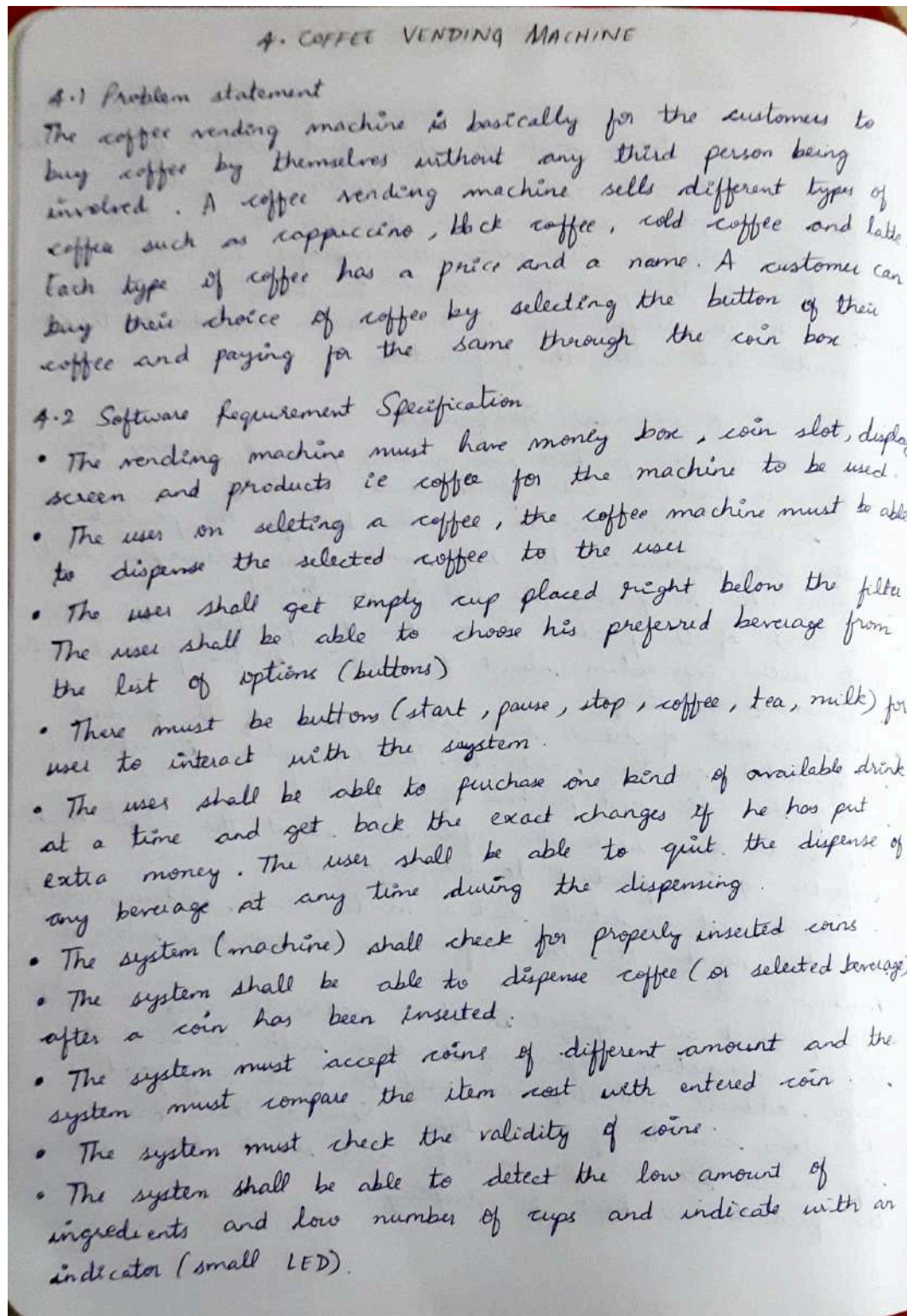




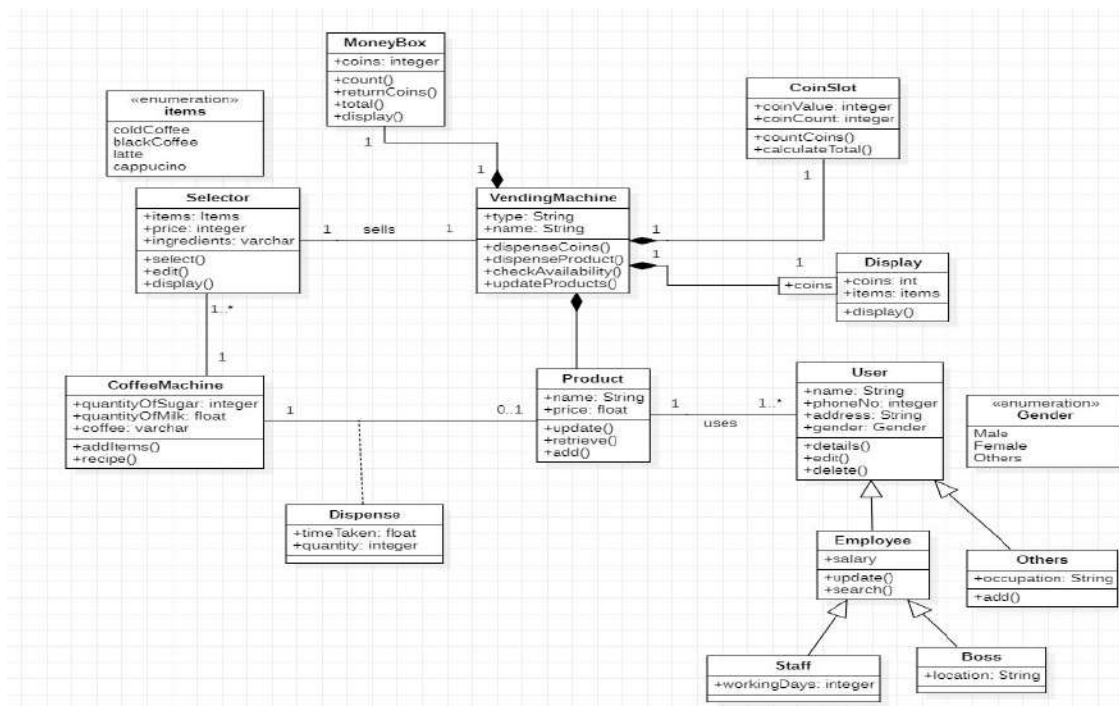
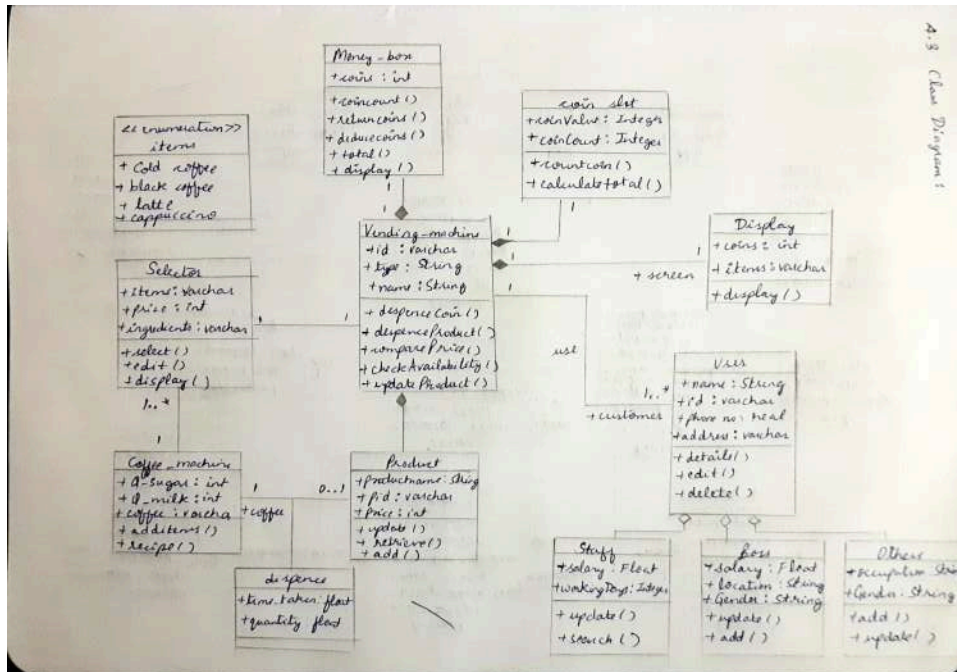
The state diagram above gives us the states involved in purchasing a product and placing the order for the same. There is first an inventory check ,where is stock of products is noted and if the stock is less than minimum an order is placed by first searching for suitable trader .

4. Coffee Vending Machine-

a) SRS:

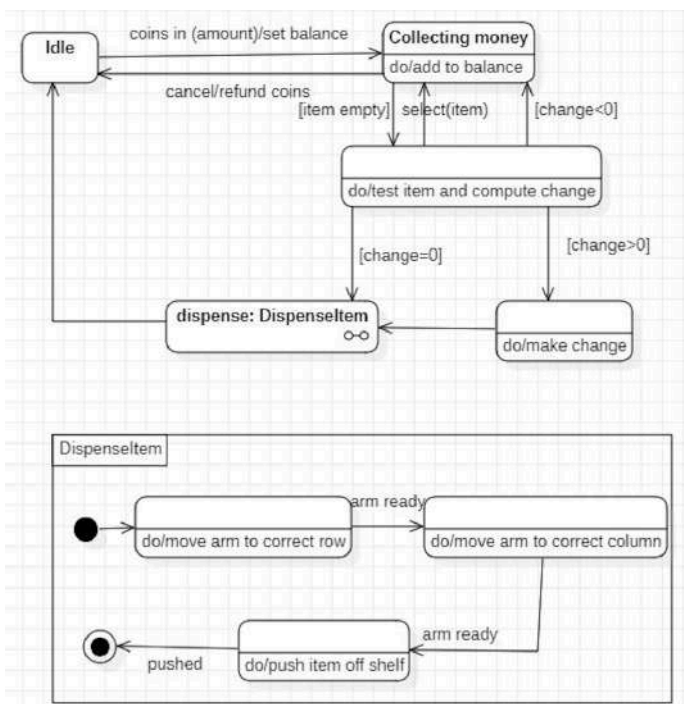
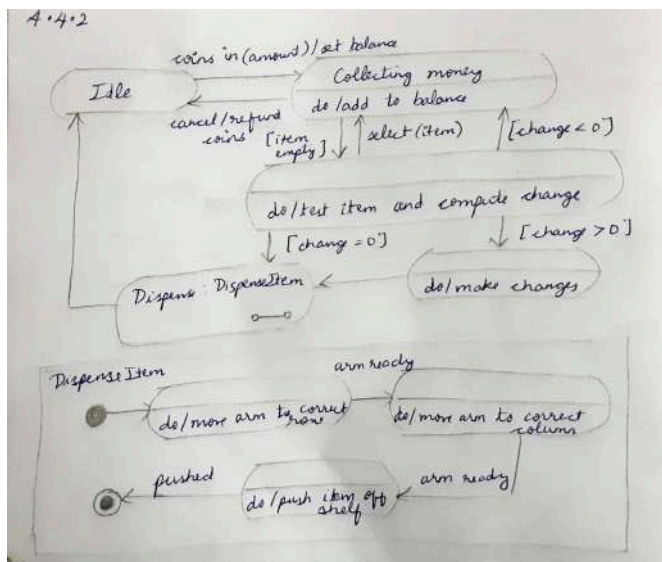


b) Advance Class Diagram:



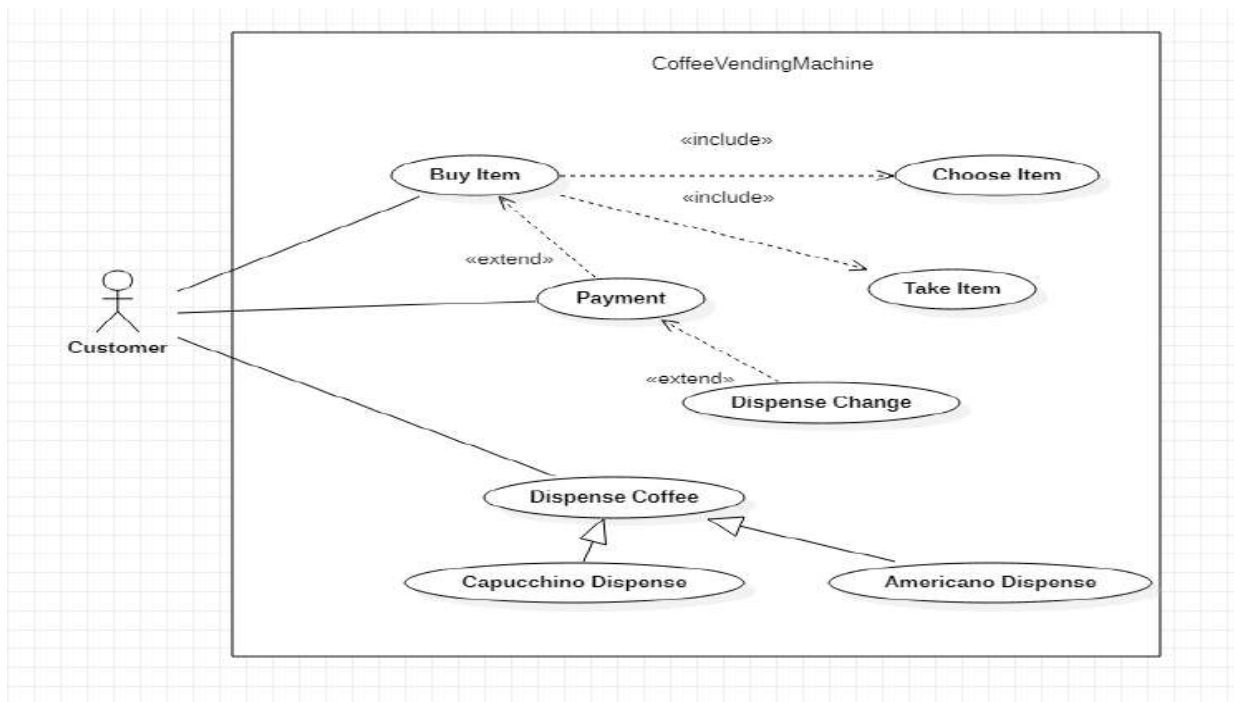
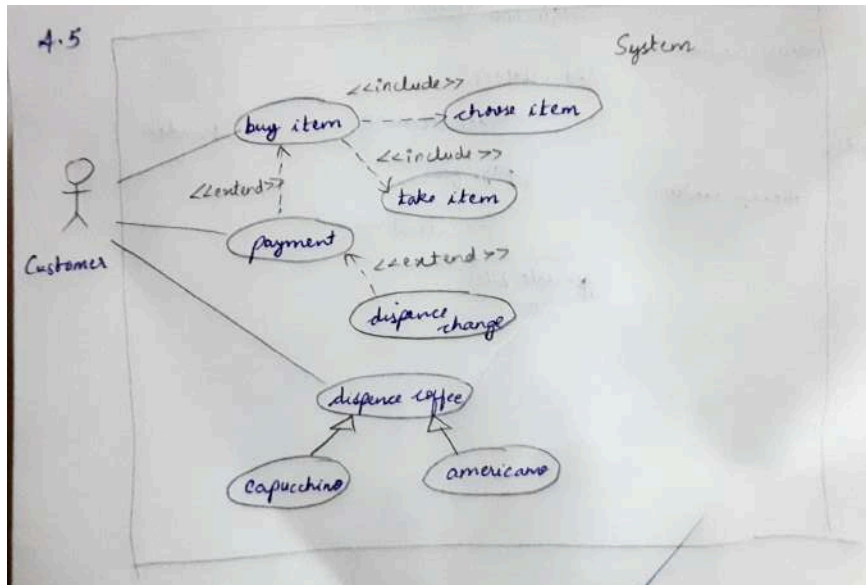
The vending machine must have money box, coin slot, display screen and products i.e coffee for the machine to be used. The user on selecting a coffee, the coffee machine must be able to dispense the selected coffee to the user. The user shall get empty cup placed right below the filter. The user shall 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.

c) 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 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.

d) Advance Use Case Diagram:



Actors:

Customer : a person who uses the coffee vending machine

Use Case:

Display payment details : displays the payment details

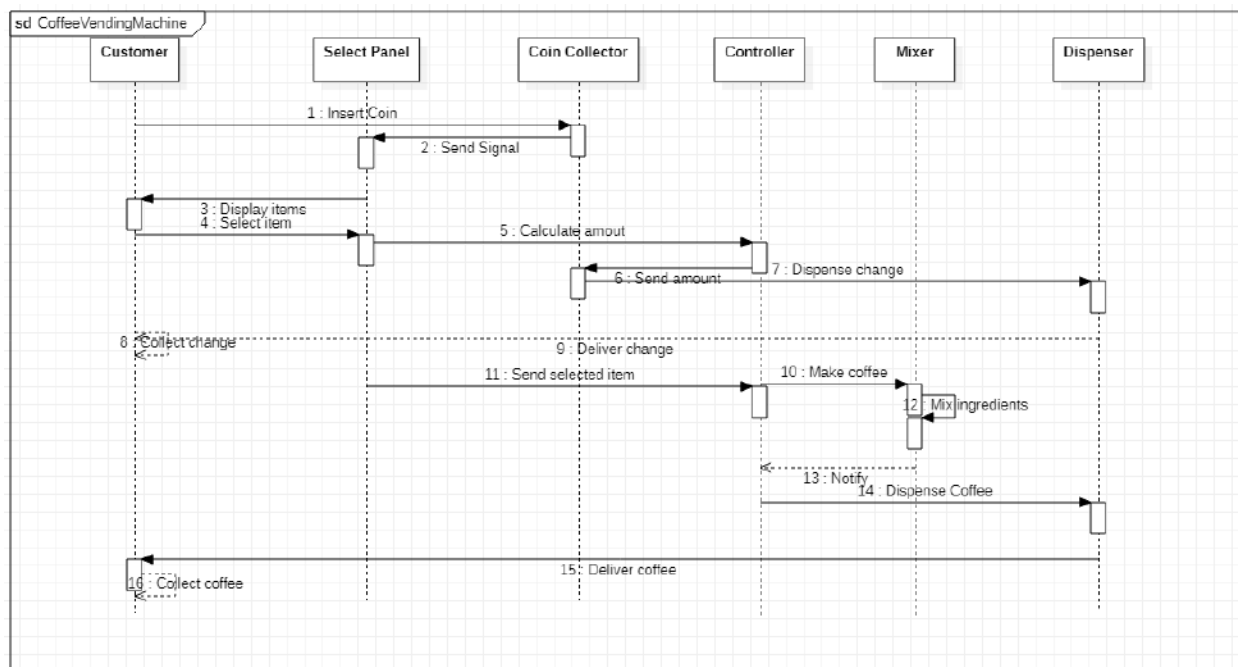
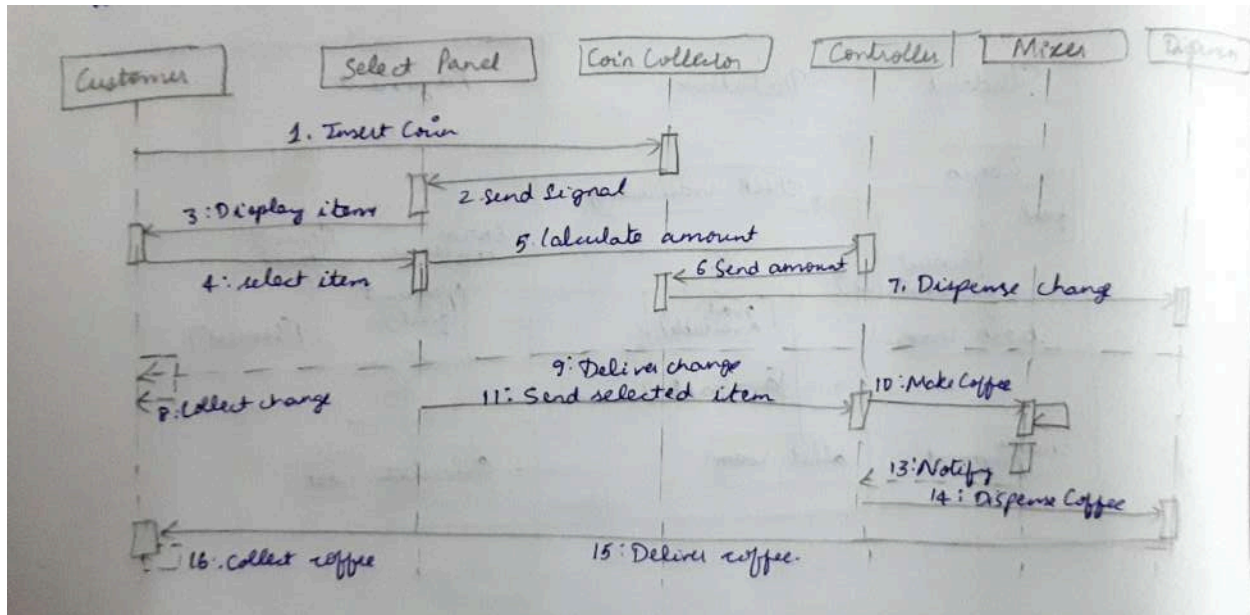
Request coffee : allows user to order their coffee

Make payment : accepts money for the coffee

Load ingredients : is the use case where the operator fills the machine with ingredients

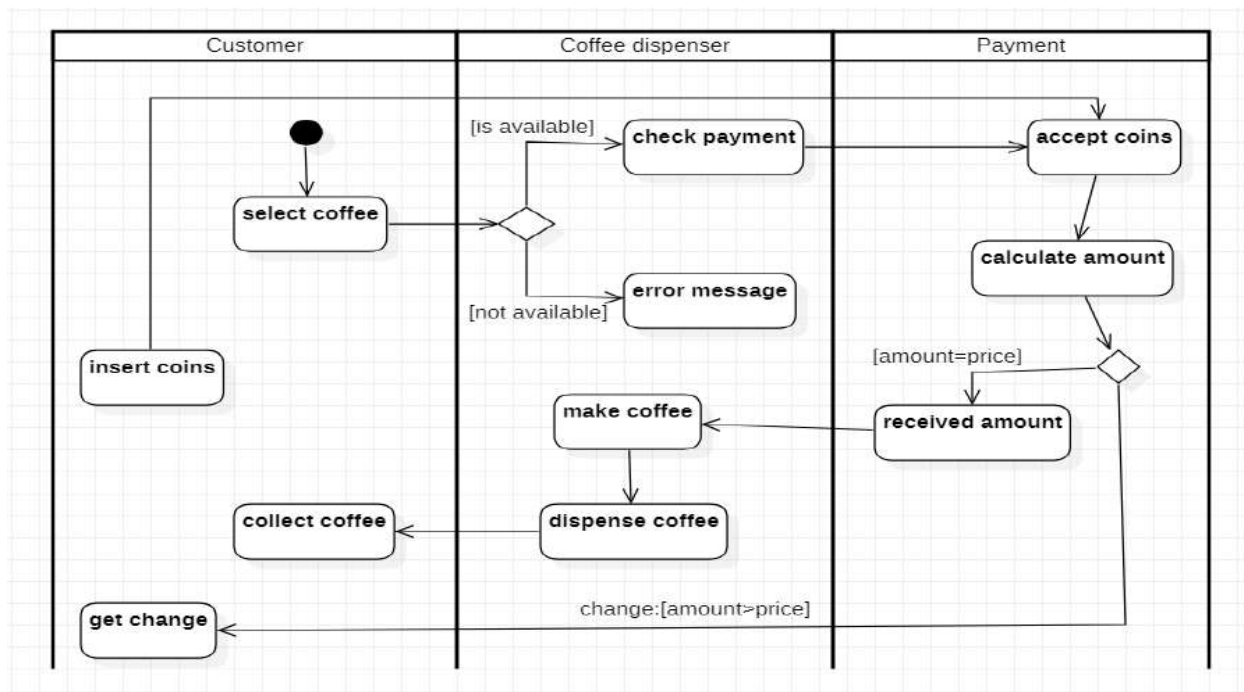
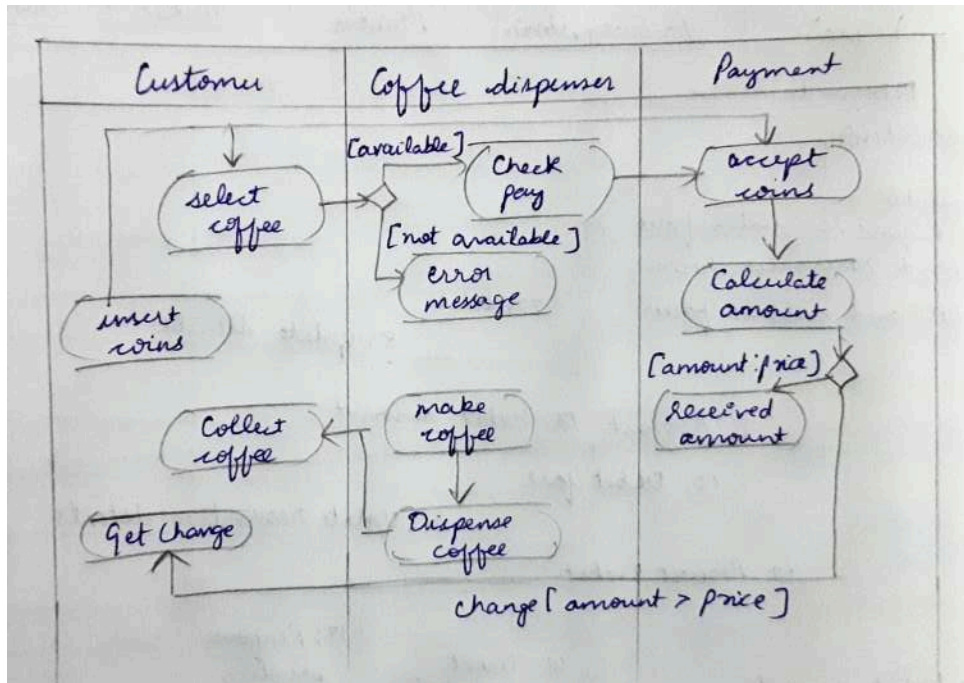
Dispense coffee : the coffee ordered is prepared and give

e) 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 the product is dispensed .

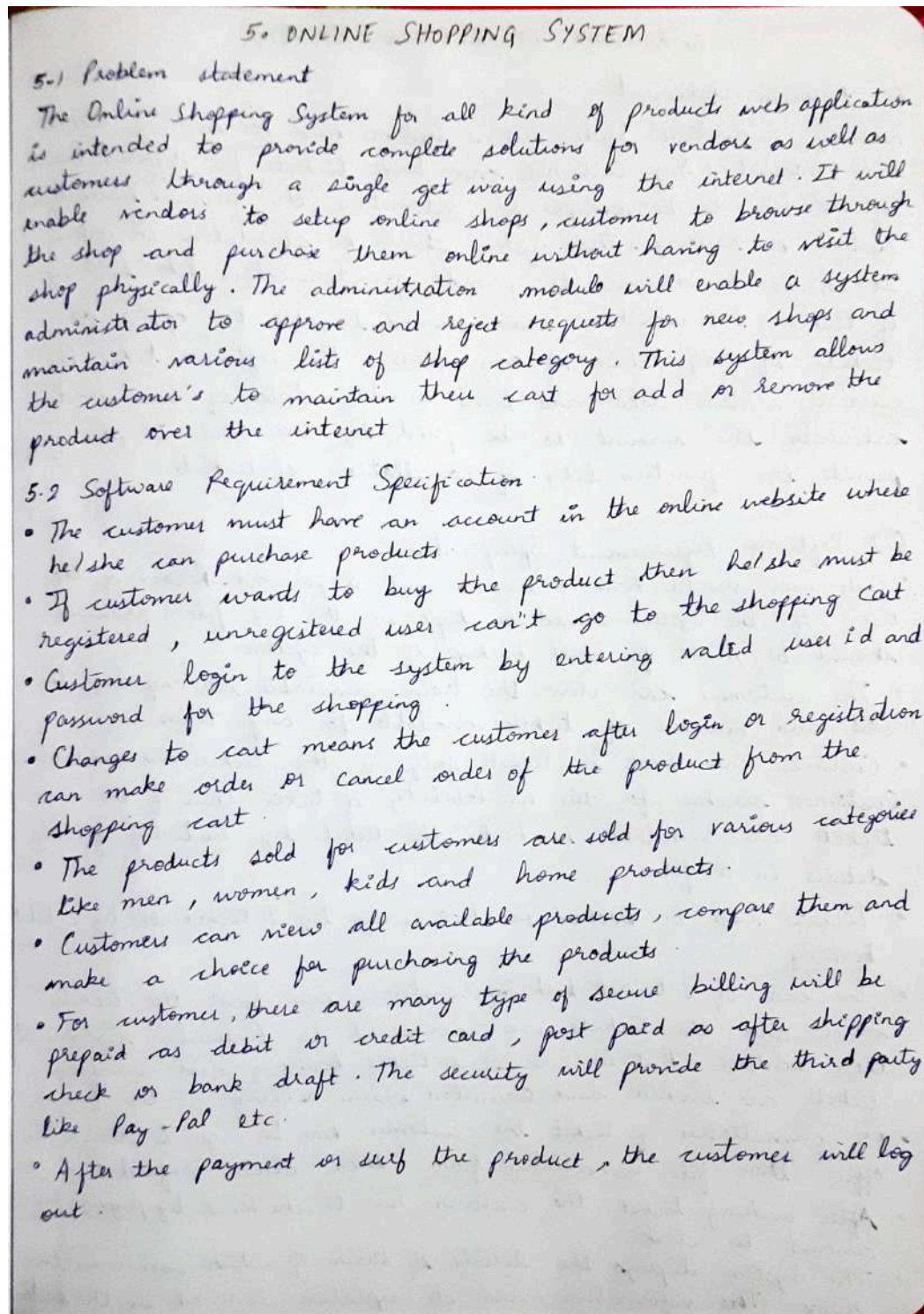
f) Activity Diagram:



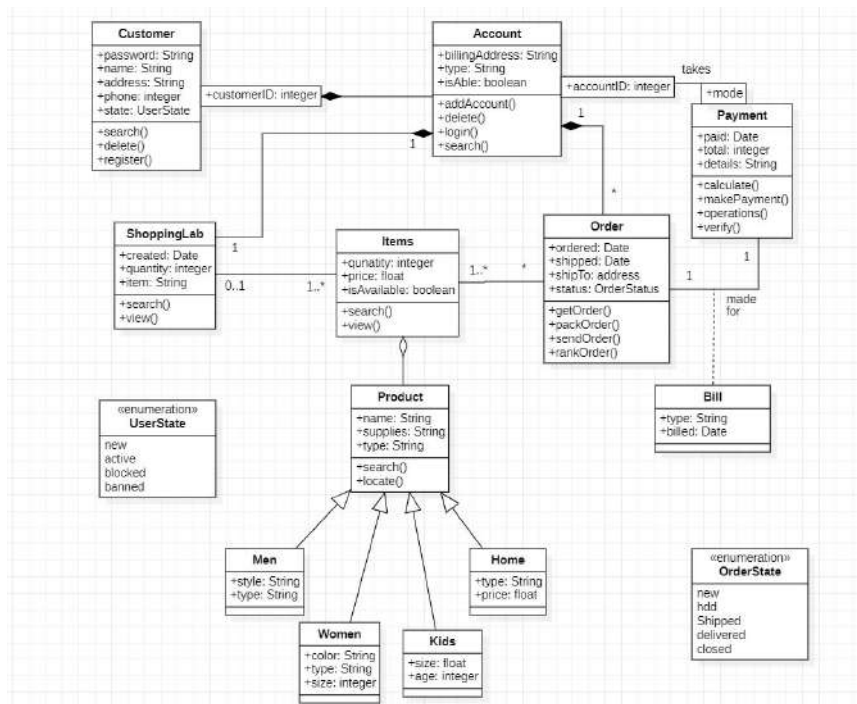
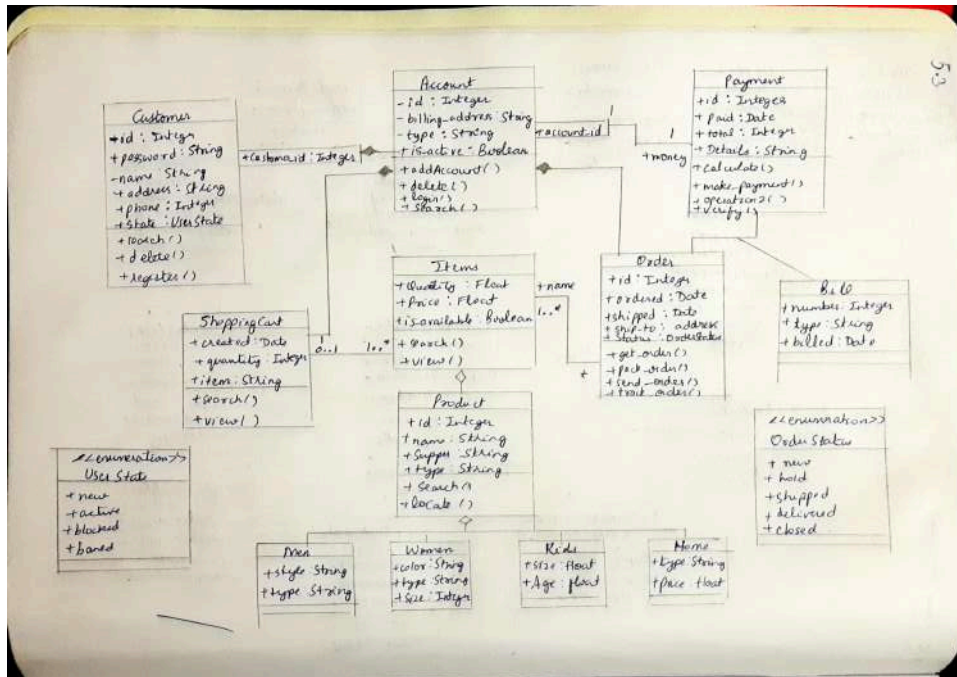
The advanced activity diagram has three swim lanes i.e customer, coffee dispenser and payment. The customer can select coffee ,insert coins, get change and collect coffee. The coffee dispenser checks for payment and makes ,dispenses the coffee. The payment lane accepts coins, calculates amount and gives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

5. Online Shopping System-

a) SRS:

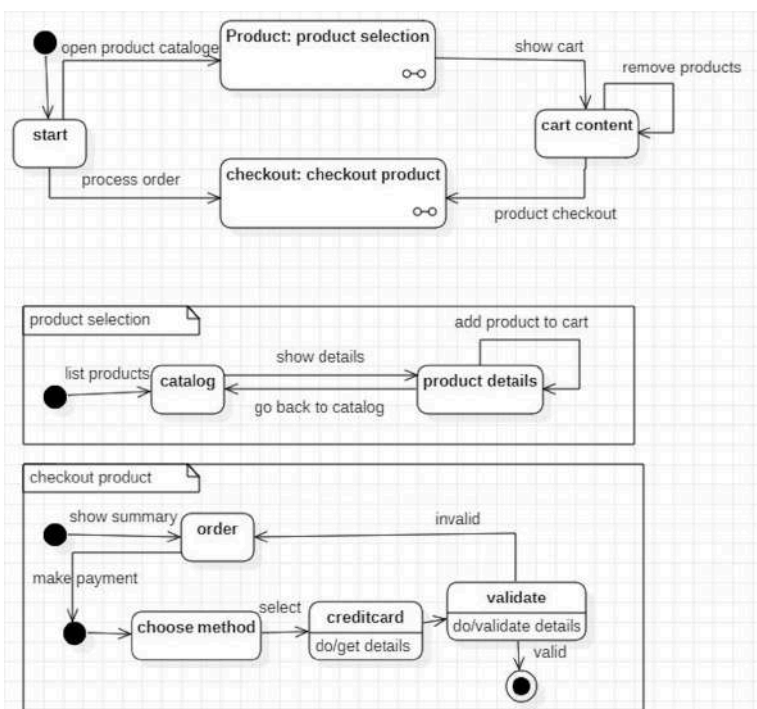
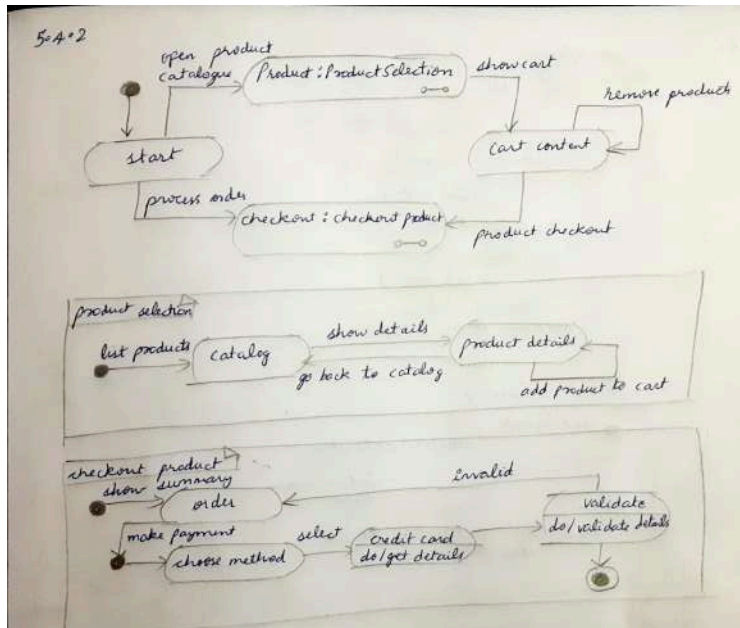


b) Advance Class Diagram:



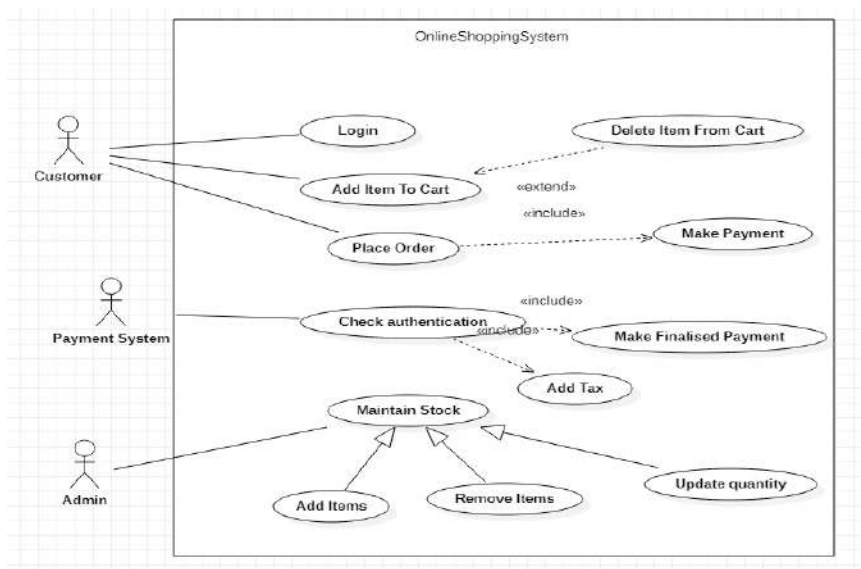
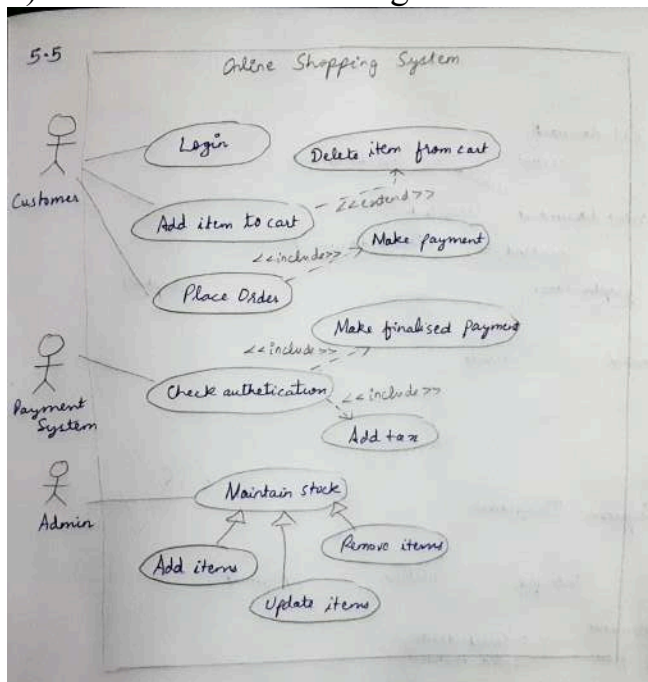
The online shopping system has customers who must have an account in the online website where he/she can purchase products. If customer wants to buy the product then he/she must be registered, unregistered user can't go to the shopping cart. Customer login to the system by entering valid user id and 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.

c) Advance State Diagram:



The simple state chart diagram gives us states in purchasing a order and paying for the order. The customer is first mad to register and then login into their account. Then the items are displayed, where they can select their choice and add them to cart or reserve or order them. The transaction details are displayed. 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 us to select products and add them to cart. Checkout product has states explaining the payment methods and validating the methods.

d) Advance Use Case Diagram:



Actors:

Customer: a person who uses the online shopping system

Payment System: person who handles the payment

Admin : a person who manages the delivery

Use Case:

view product details : displays all product details

Place order : order the items present in the cart

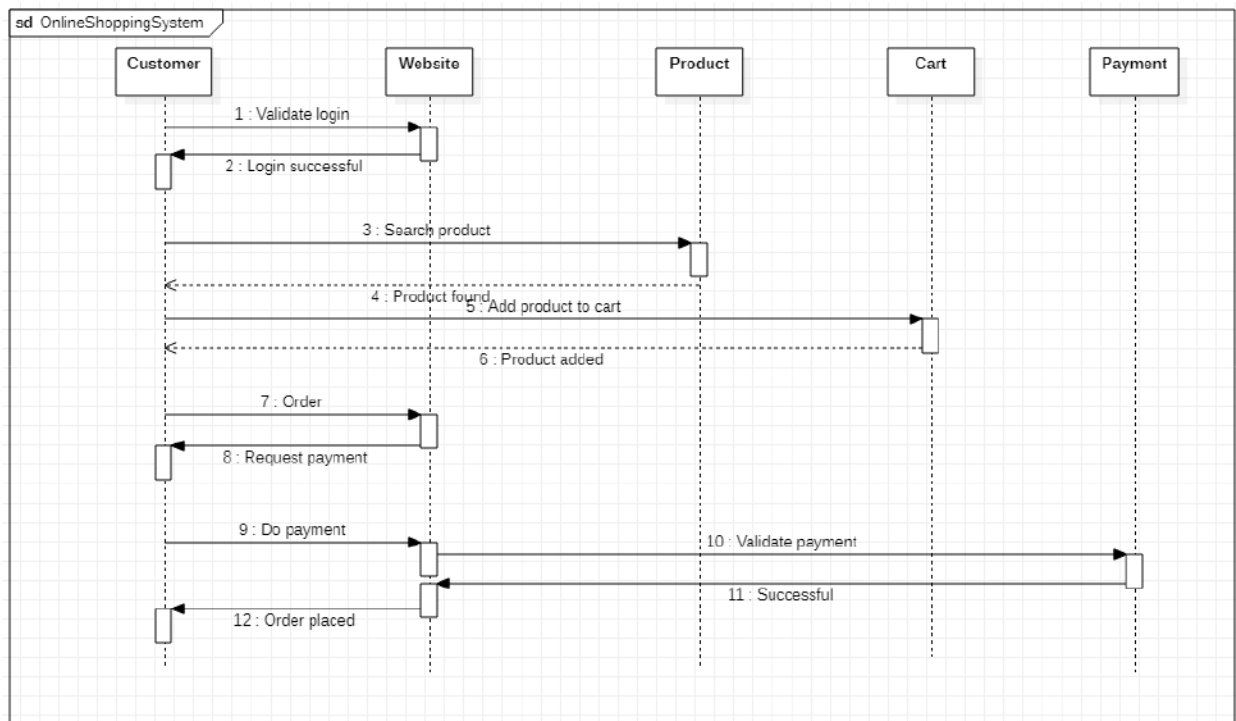
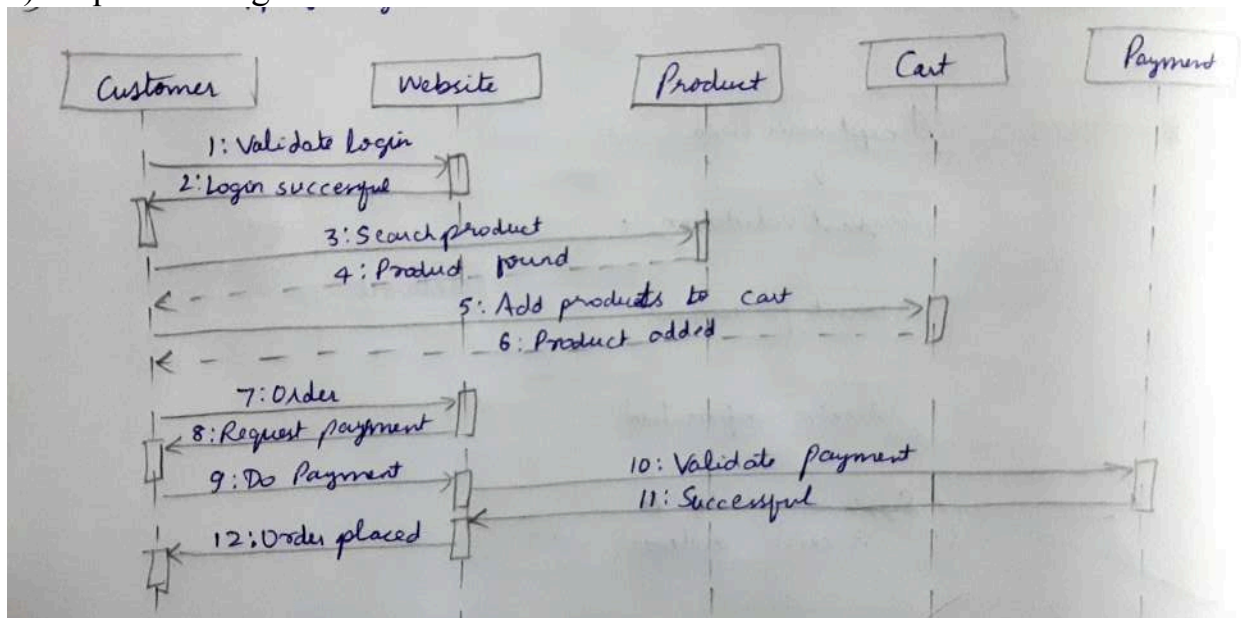
Make payment : accepts payment for the products purchased

Deliver product : delivery of the product is handled

Supply Product : product supply is maintained

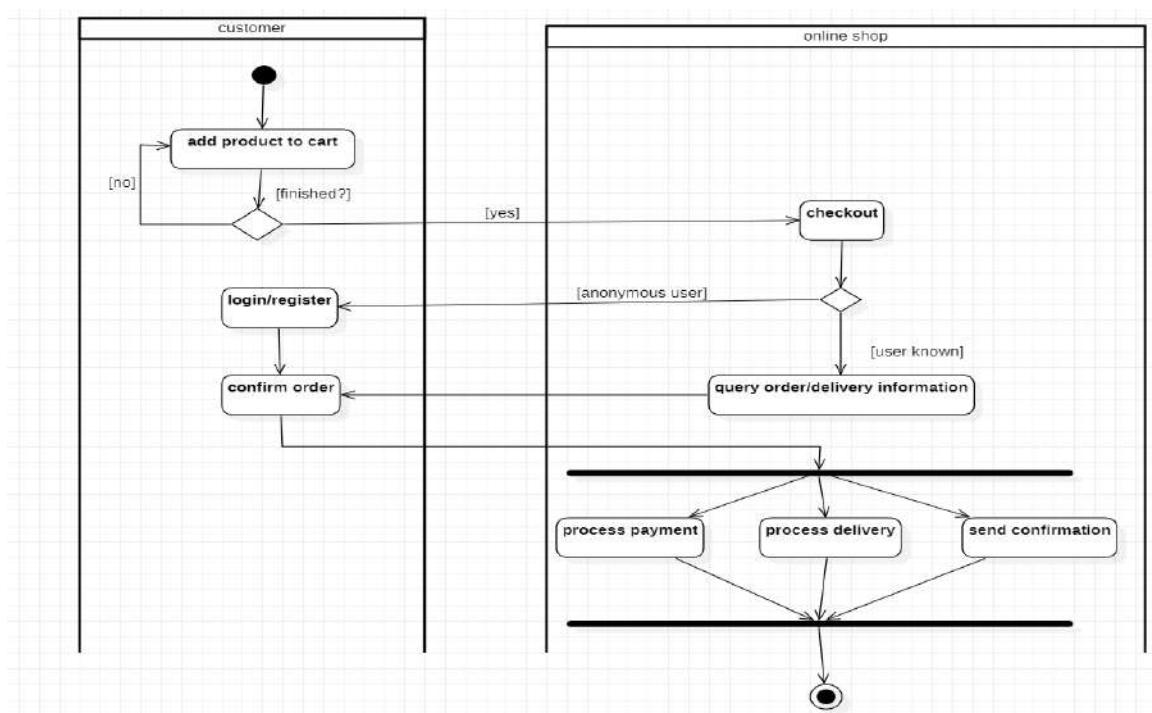
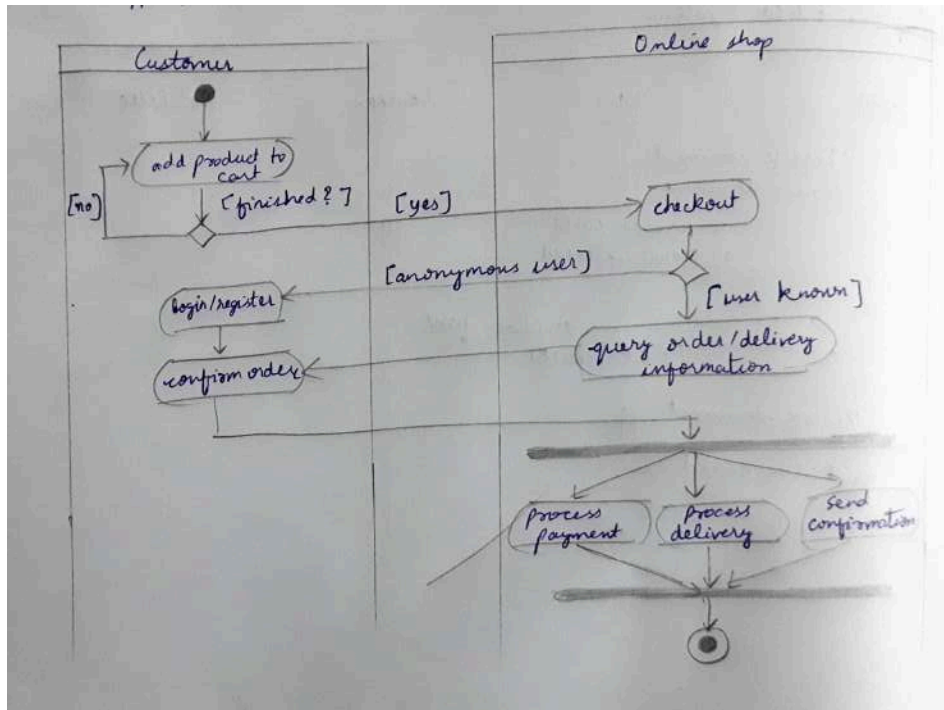
Maintain Stock : stock availability is checked

e) Sequence Diagram:



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

f) Activity Diagram:



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.

6. Railway reservation system-

a) SRS:

6. RAILWAY RESERVATION SYSTEM

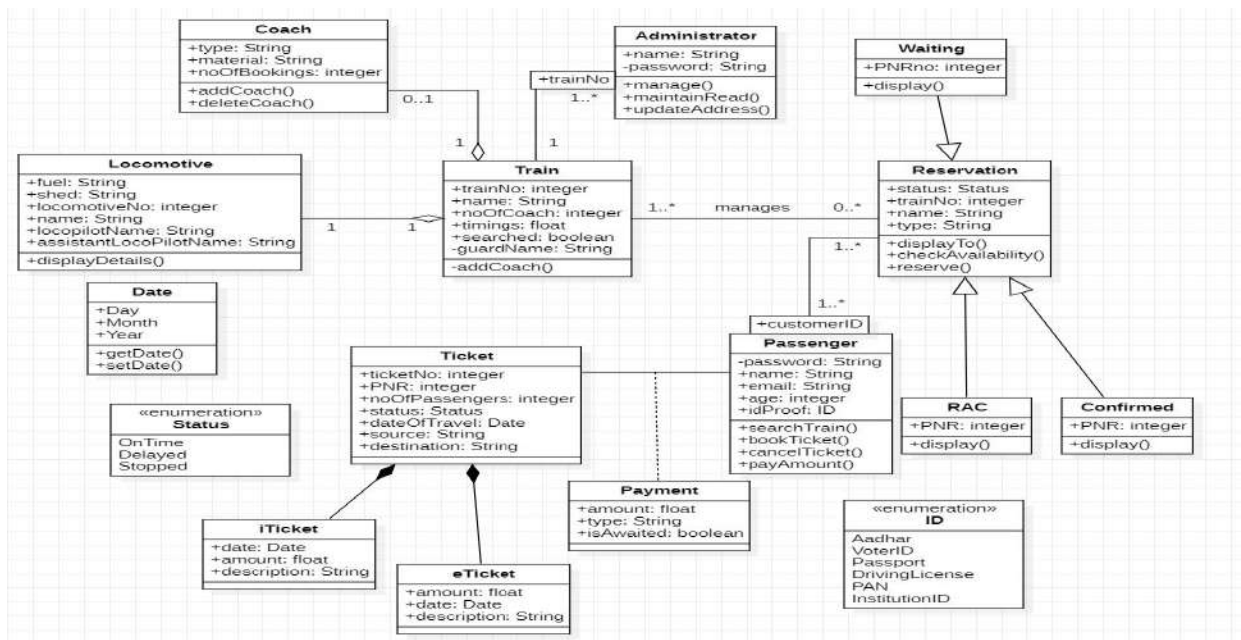
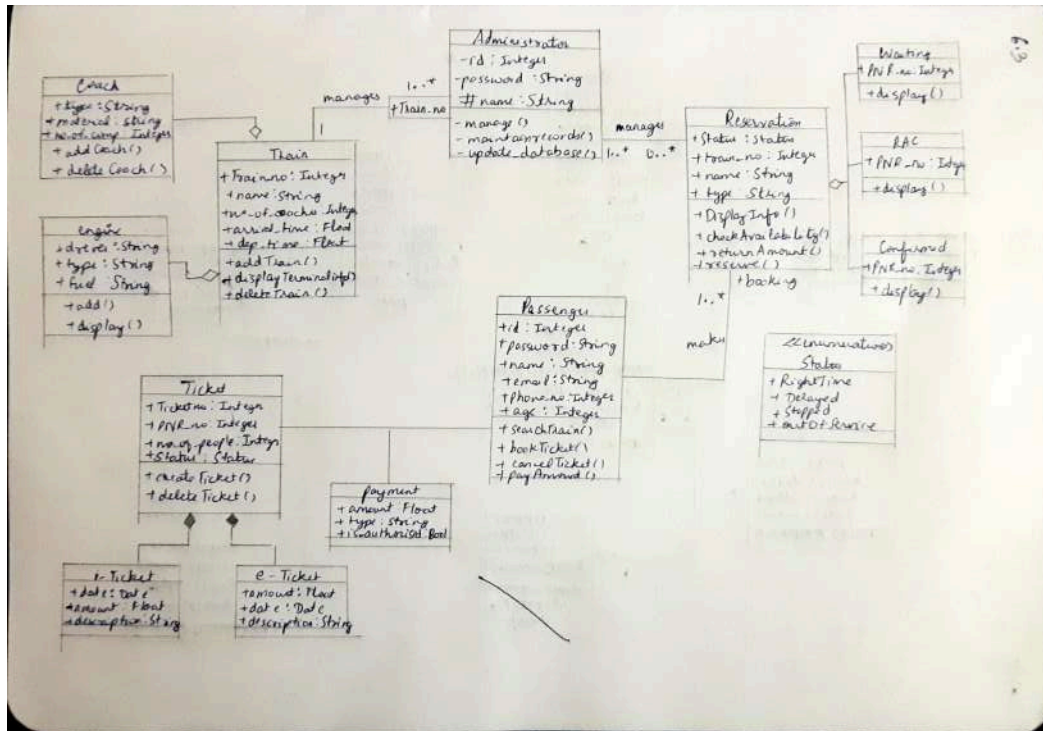
6.1 Problem Statement

Railway Reservation System is a system used for booking tickets over internet. Any Customer can book tickets for different trains. Software has to be developed for automating the manual reservation system of railway. The system should be standalone in nature. It should be designed to provide functionalities like booking of tickets in which a user should be able to apply for tickets of any train of any class. The software takes the current system data and time as the date of issue and calculates the amount to be paid by the user. It also provide the functionality of cancellation of tickets.

6.2 Software Requirement Specification

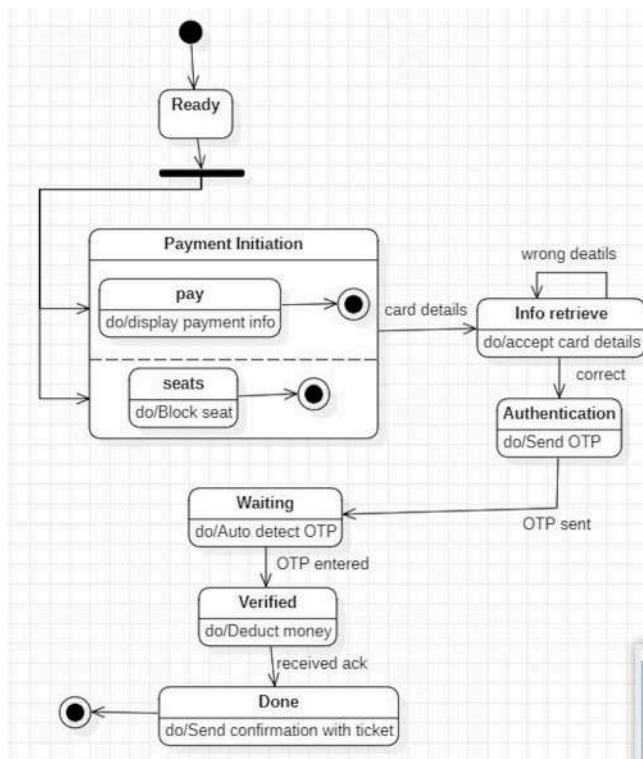
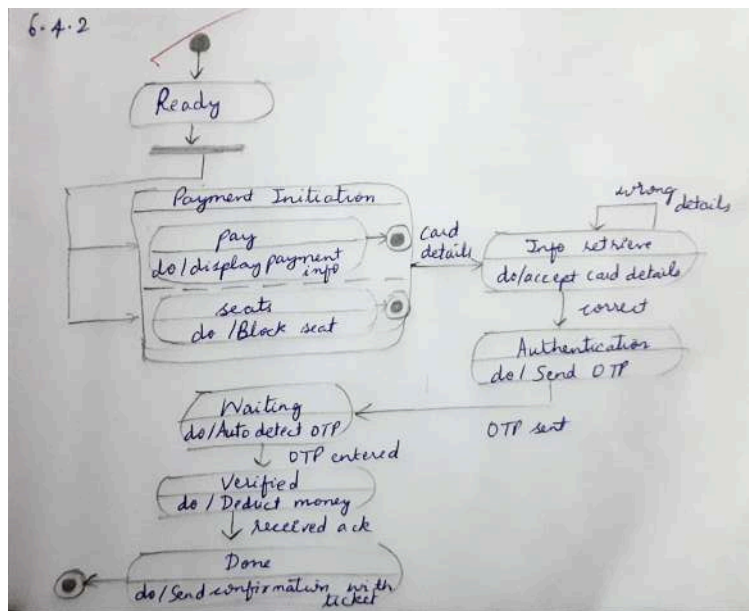
- Each user should have a user id and a password. Record of the users of the system should be kept in the log file. Provision should be made for full backup of the system.
- The customers can view the trains available at any day, the cost and number of tickets available for any train.
- Customer can 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 cancelled online sitting at the home.
- For cancellation of ticket the customer has to go to reservation office then fill cancellation form then claim refund.
- After booking ticket the customer has to checkout by paying for amount to clerk.
- The system displays the details of train of which user enter the name. The information and its updation is saved in the database.

b) Advance Class Diagram:



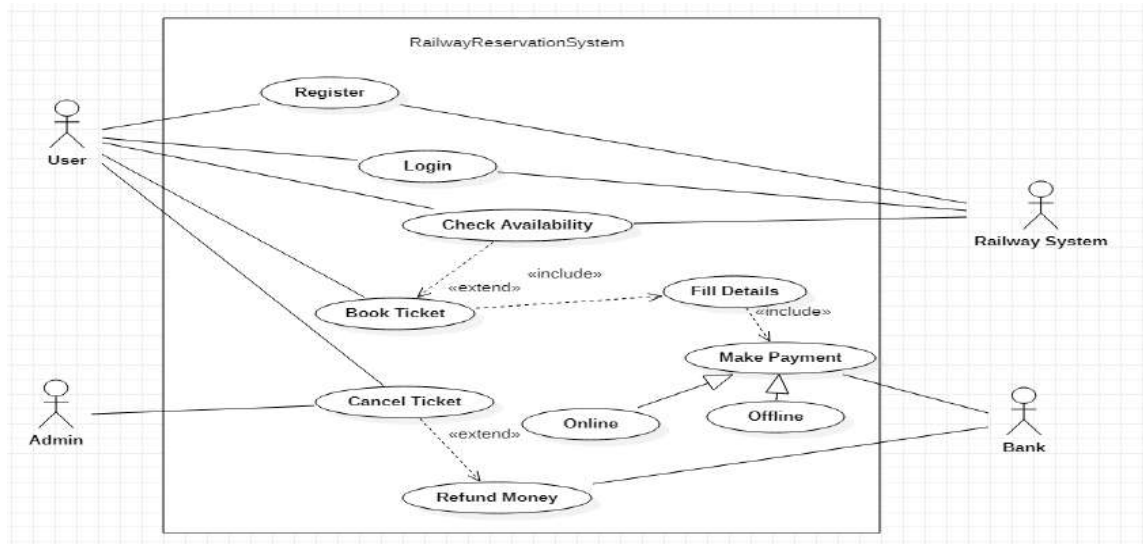
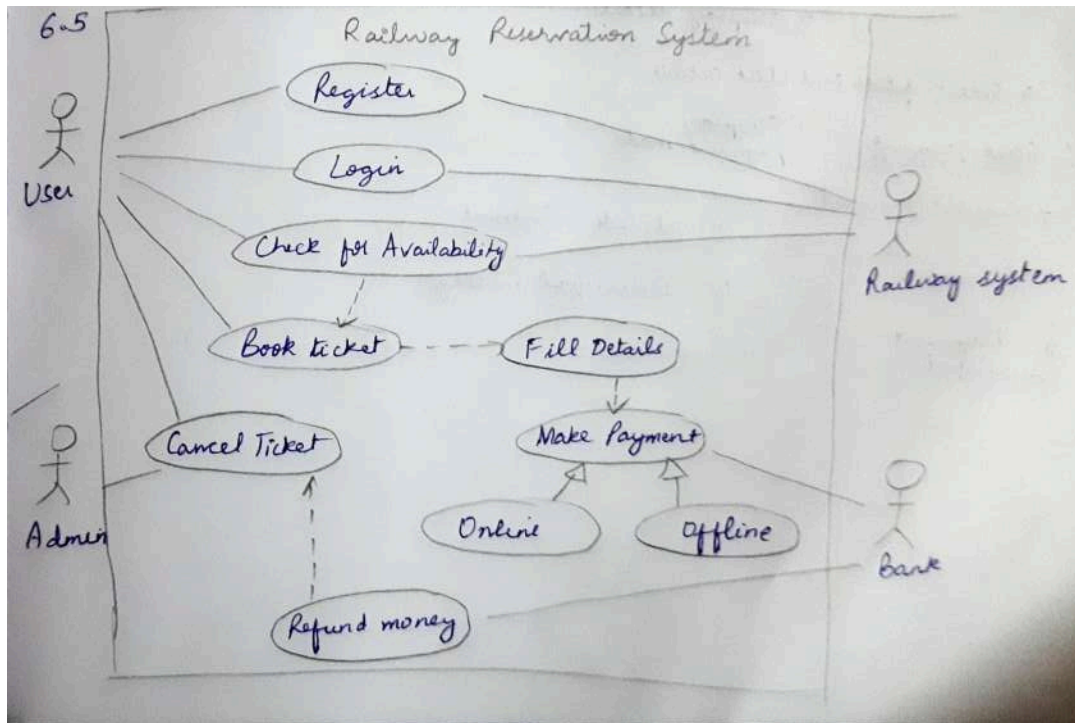
The admin manages the trains and reservation related to railway reservation system. There are three types of reservation, i.e. RAC, waiting and confirmed. The passengers with a reservation go to one or the other reservation. A train consists of coaches and engine. A passenger pays for the ticket booked. Tickets can be booked in two ways by i-ticket or by e-ticket booking.

c) Advance State Diagram:



The simple state diagram gives the states involved in booking a train ticket and paying for the same. 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.

d) Advance Use Case Diagram:



Actors:

User: uses the railway reservation system.

Admin: manages all information

Railway System: System that is used for train ticket reservation.

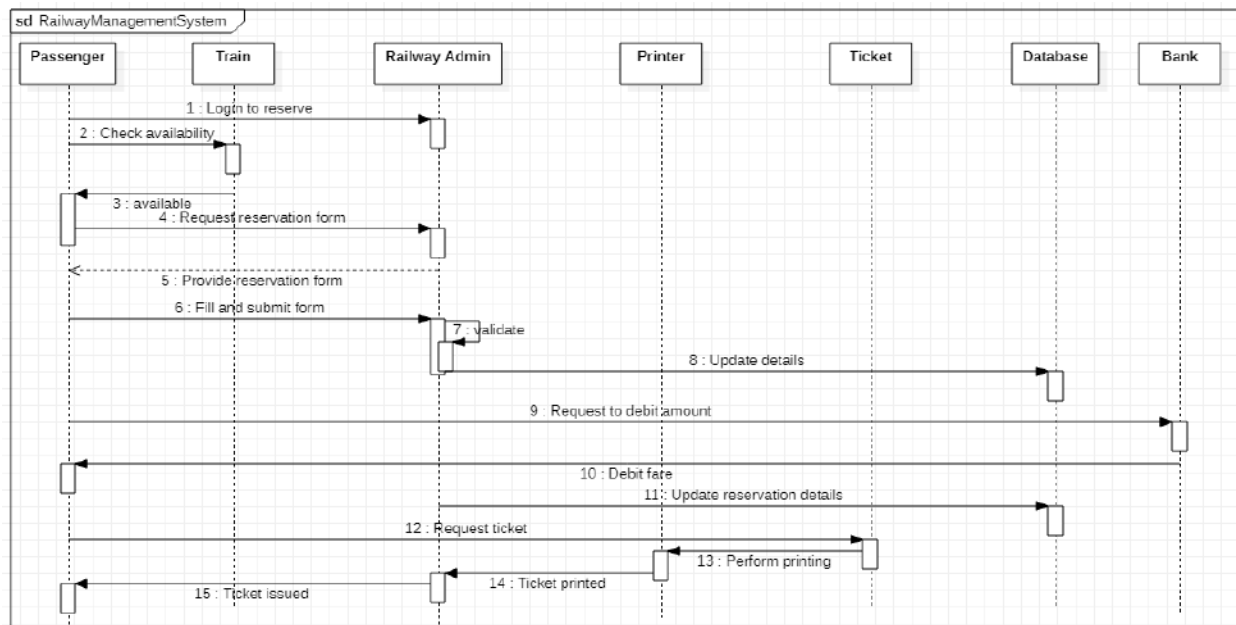
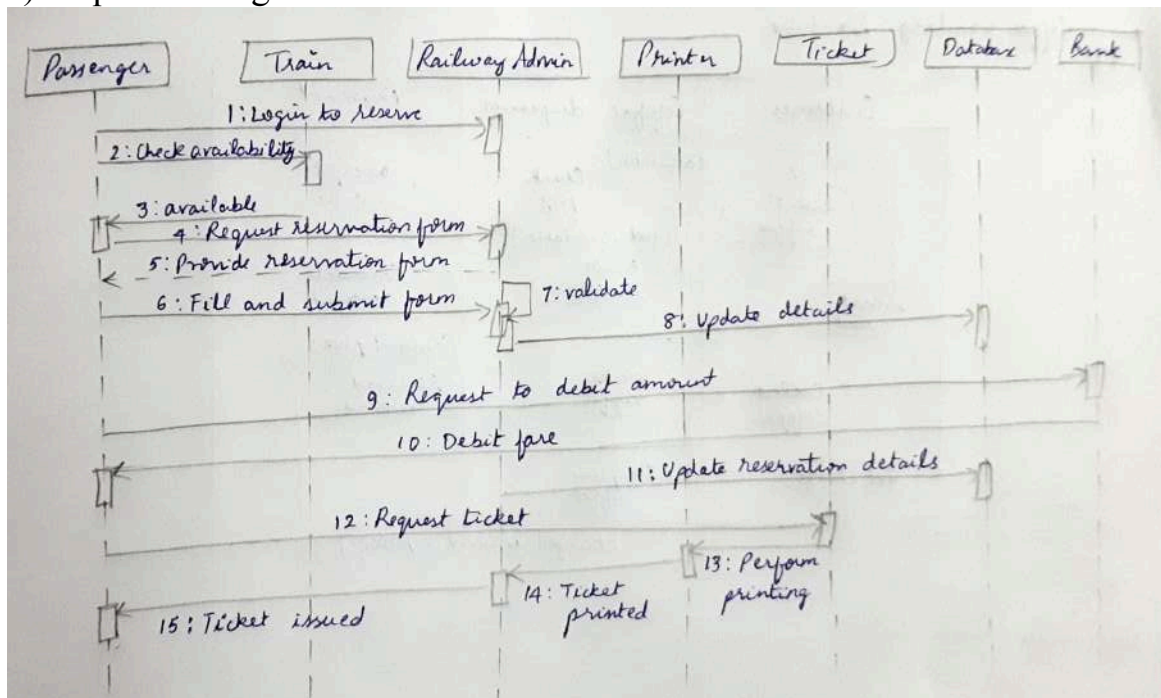
Use Case:

Register: The first time user has to create a account in railway system.

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

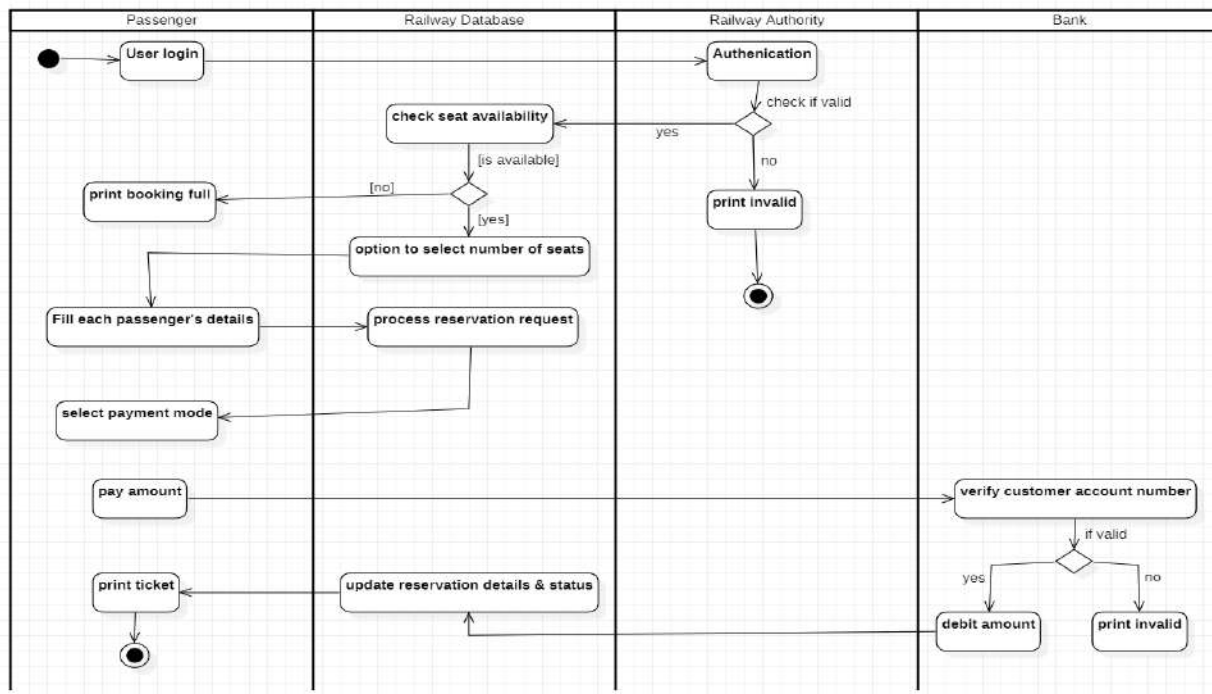
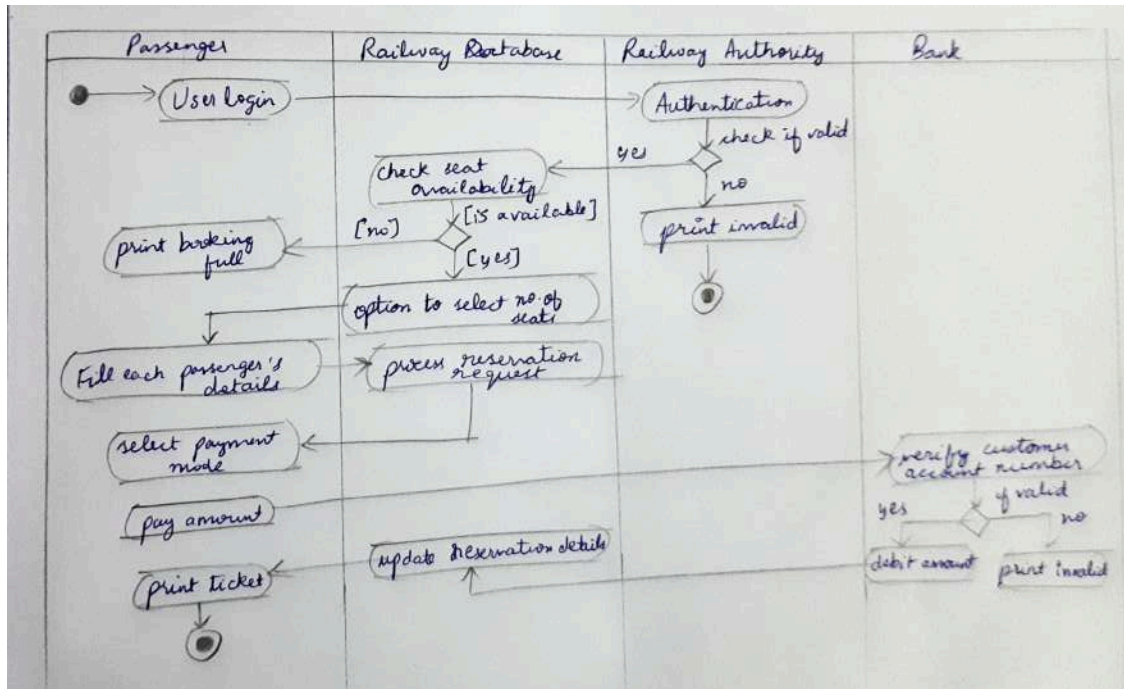
Make payment: System displays the payment details. User can make his payment.

e) Sequence Diagram:



User logs into the railway reservation system. Admin verifies the login details. System establishes secure communication. User checks for availability of trains. 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.

f) Activity Diagram:



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

7. Graphics Editor-

a) SRS:

7. GRAPHICS EDITOR

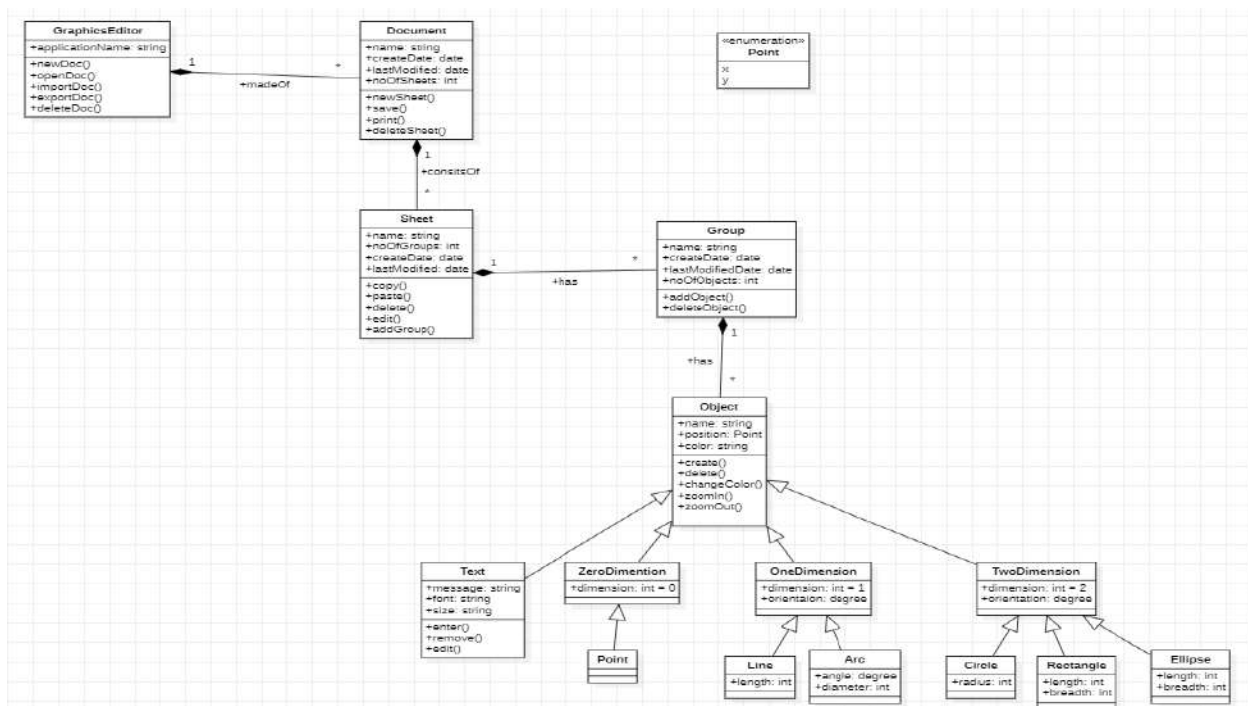
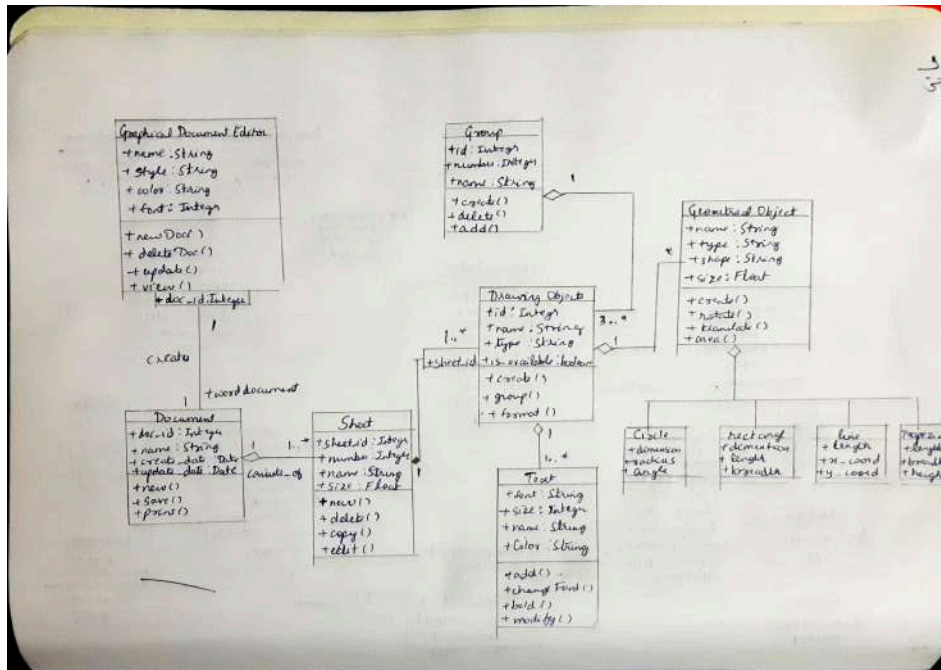
7.1 Problem Statement

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 the editor functions and the programmer can create a graphical editor and palette of shapes in order to modify an underlying model, the graphical editor provides an interface with which the programmer implements said editor for a given underlying model. Such instance of the graphical editor allows a user to drag objects from a specified model into a working graphical diagram.

7.2 Software Requirement Specification

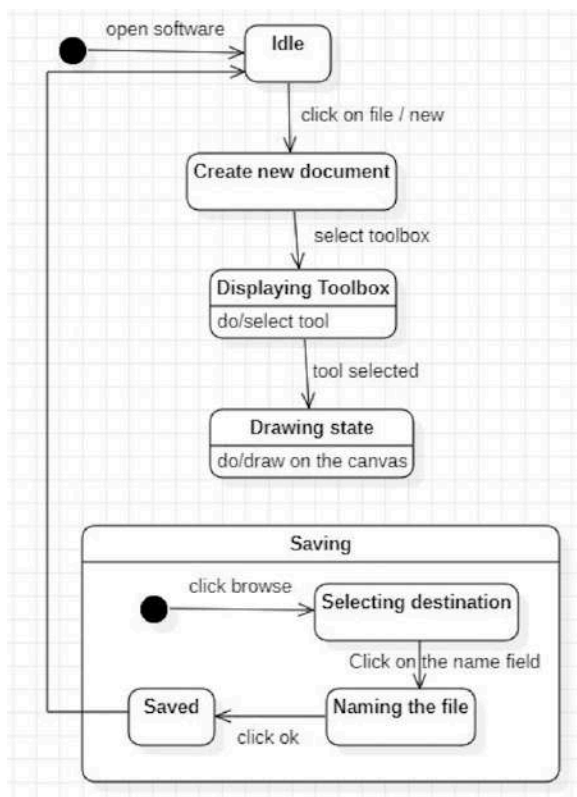
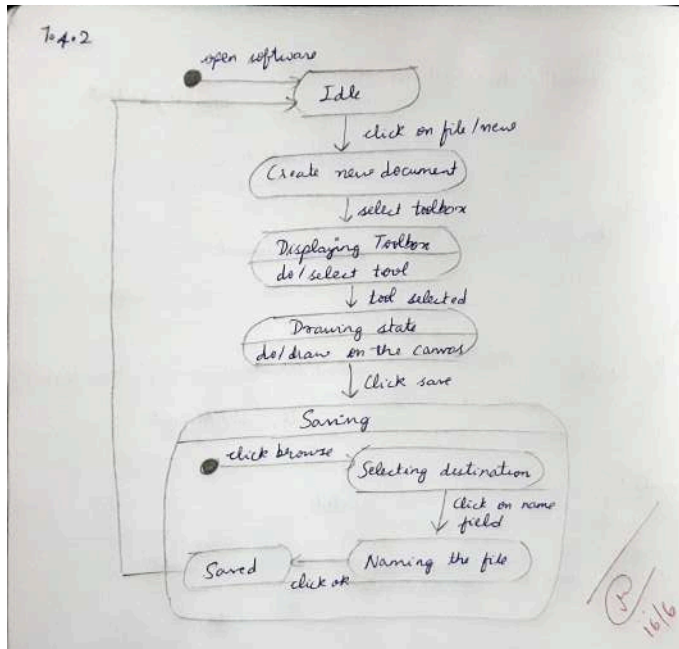
- The graphical editor consists of a graphical document editor which can be used to create new document, delete document, update or view the document.
- The graphical document editor consists of many documents, where each document can be saved, opened, printed or create a new one.
- A document is made 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.
- 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 circles, ellipse, rectangles, lines and squares, trapeziums which are identified by their respective constraints.

b) Advance Class Diagram:



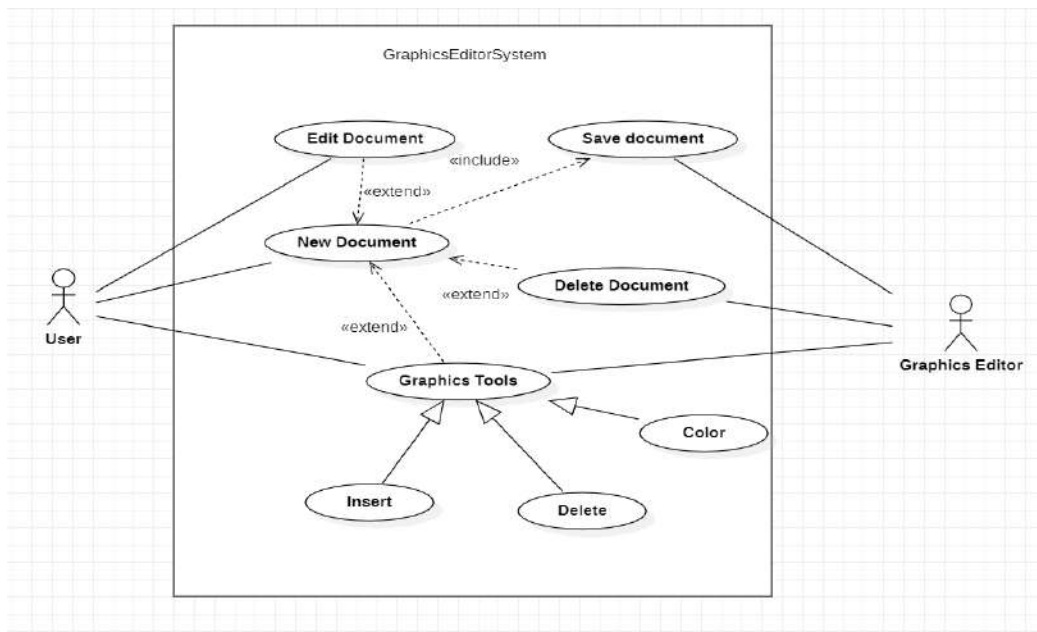
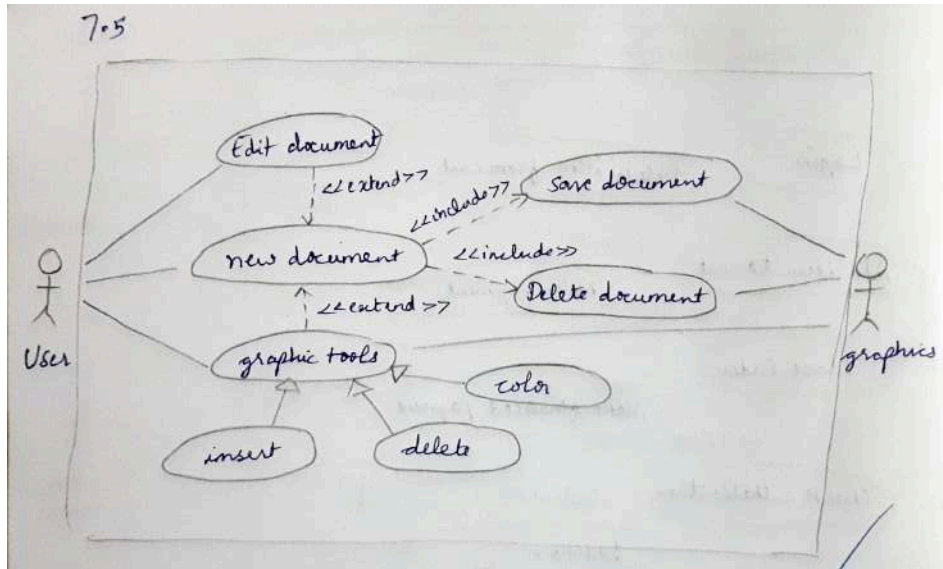
The graphical editor has documents consisting of several sheets. Each sheet contains drawing objects, including text, geometrical objects and groups. A group is simply a set of drawing objects. A geometrical object includes circle, ellipse, rectangles, lines and squares.

c) Advance State Diagram:



The simple state diagram and 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.

d) 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

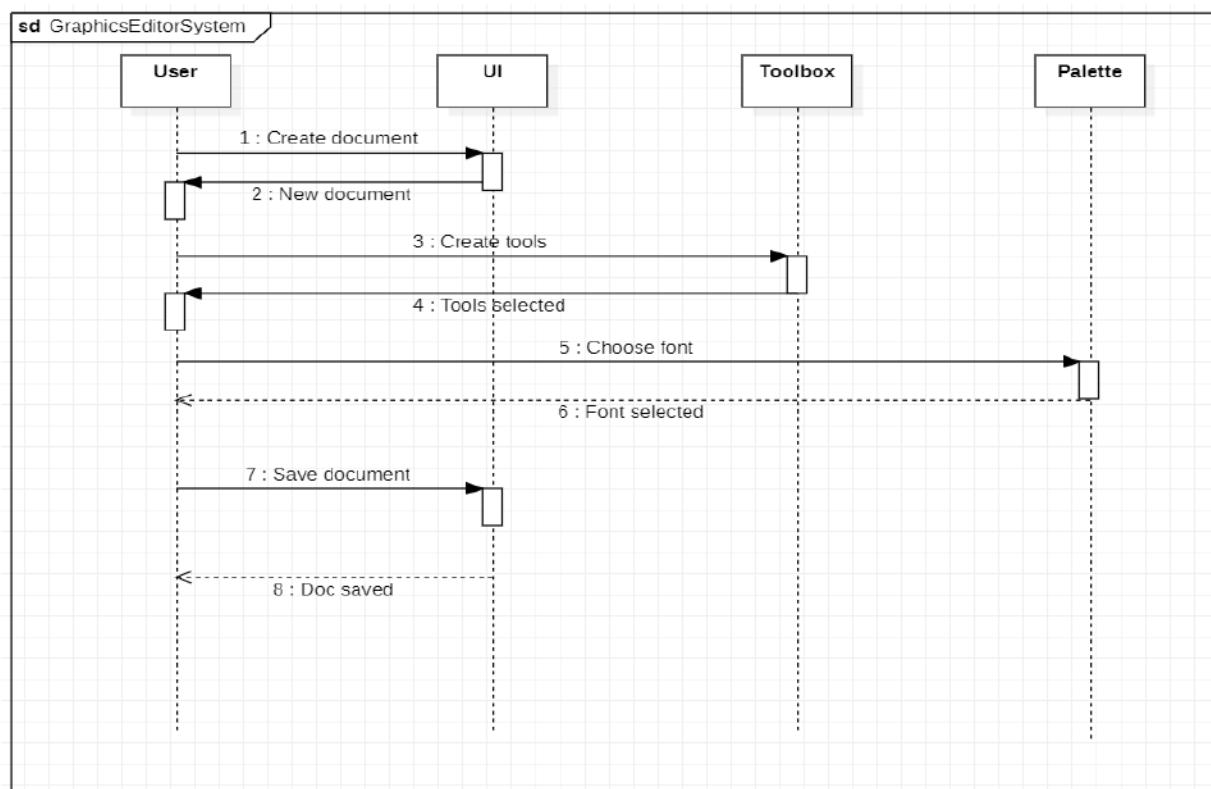
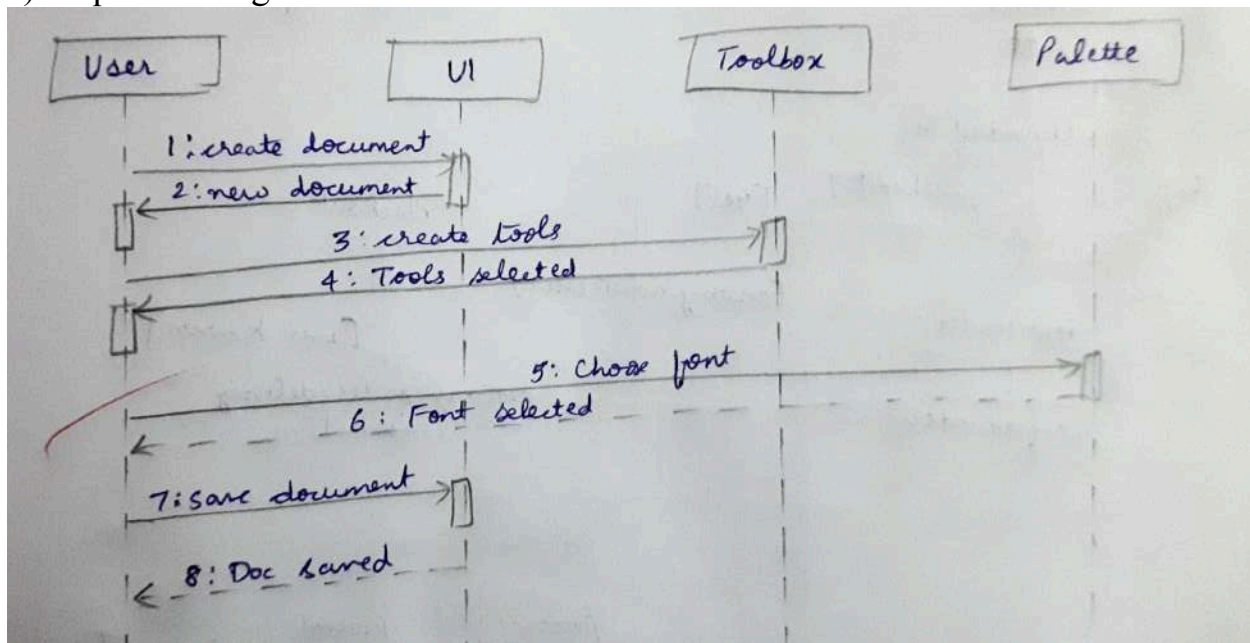
Display toolbox: displays the available tools

Add graphic object : insert a new graphic object

Choose tools from toolbox : allows user to choose tools

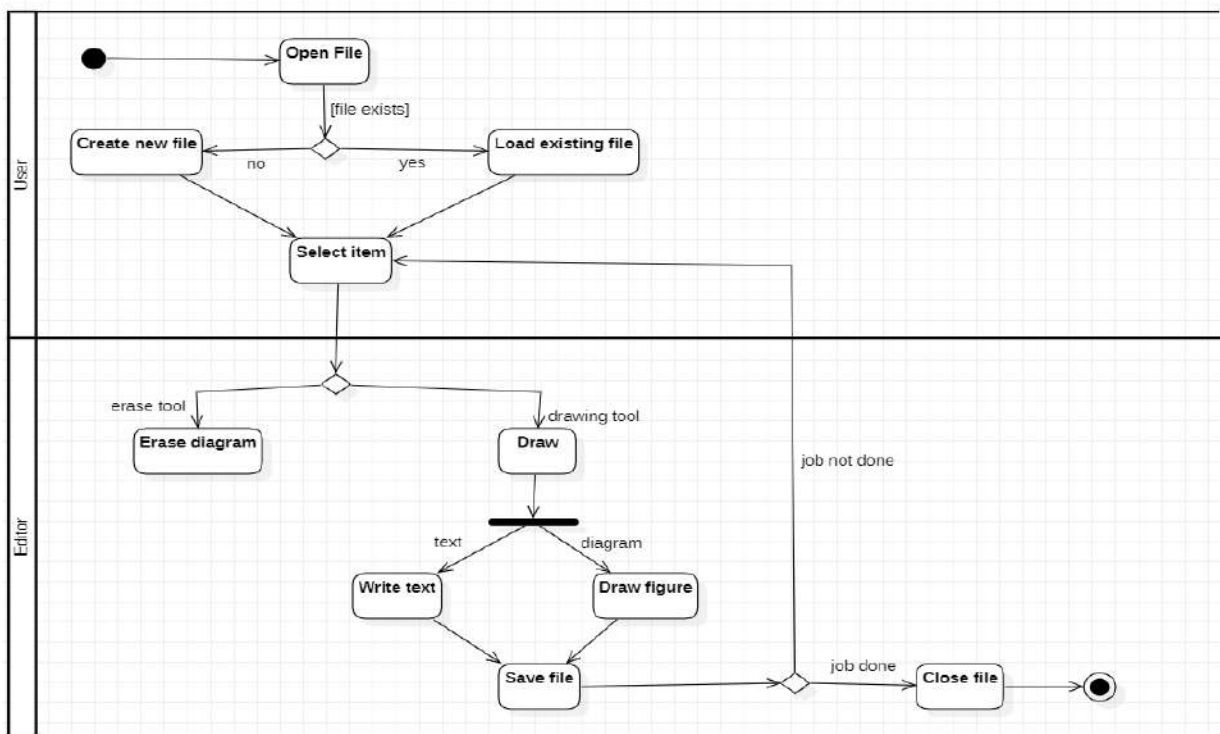
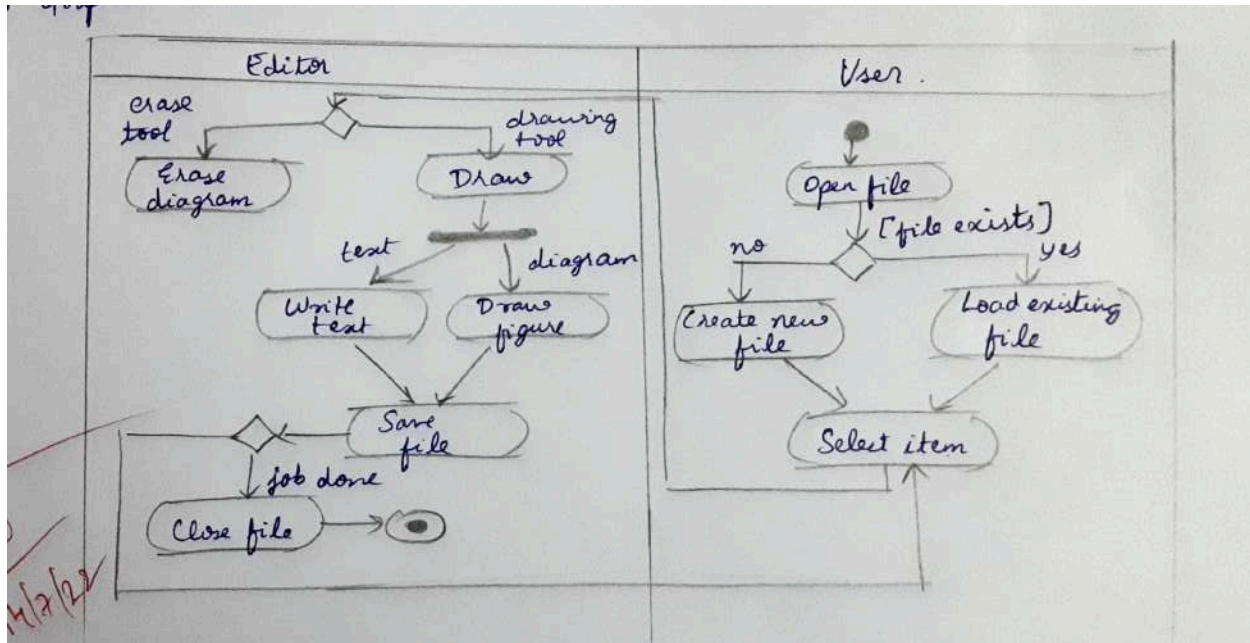
Delete document : Permanently deletes the document

e) Sequence Diagram:



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

f) 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.

