VISVESVARAYA TECHNOLOGICAL UNIVERSITY

"JnanaSangama", Belgaum -590014, Karnataka.

LAB REPORT
on

Object Oriented Modelling And Design

Submitted by

Pankaj Gupta (1BM19CS110)

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

B.M.S. COLLEGE OF ENGINEERING
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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 "LAB COURSE **Object Oriented Modelling and Design**" carried out by **Pankaj Gupta(1BM19CS110),** 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 (Course code)** work prescribed for the said degree.

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BMSCE, Bengaluru

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Index Sheet

Course Outcome

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

LAB 1:

College Management System

SRS:

A centralized approach and system for managing, storing, accessing and updating all the information and details present in relevance to students, and teaching and non-teaching faculty, increasing efficiency and convenience of information management in educational institutions.

● Educational institutions should be able to add, edit and view student personal details, like name, age, gender, email, phone number, address and so on.

● Educational institutions should be able to add, edit and view student academic details, like USN, department, semester and registered courses.

● 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.

● The COE office should be able to view all student details, and view and edit internal and examination marks, and publish results.

● Placement section should be able to view all student details, and add companies coming to the campus for placements.

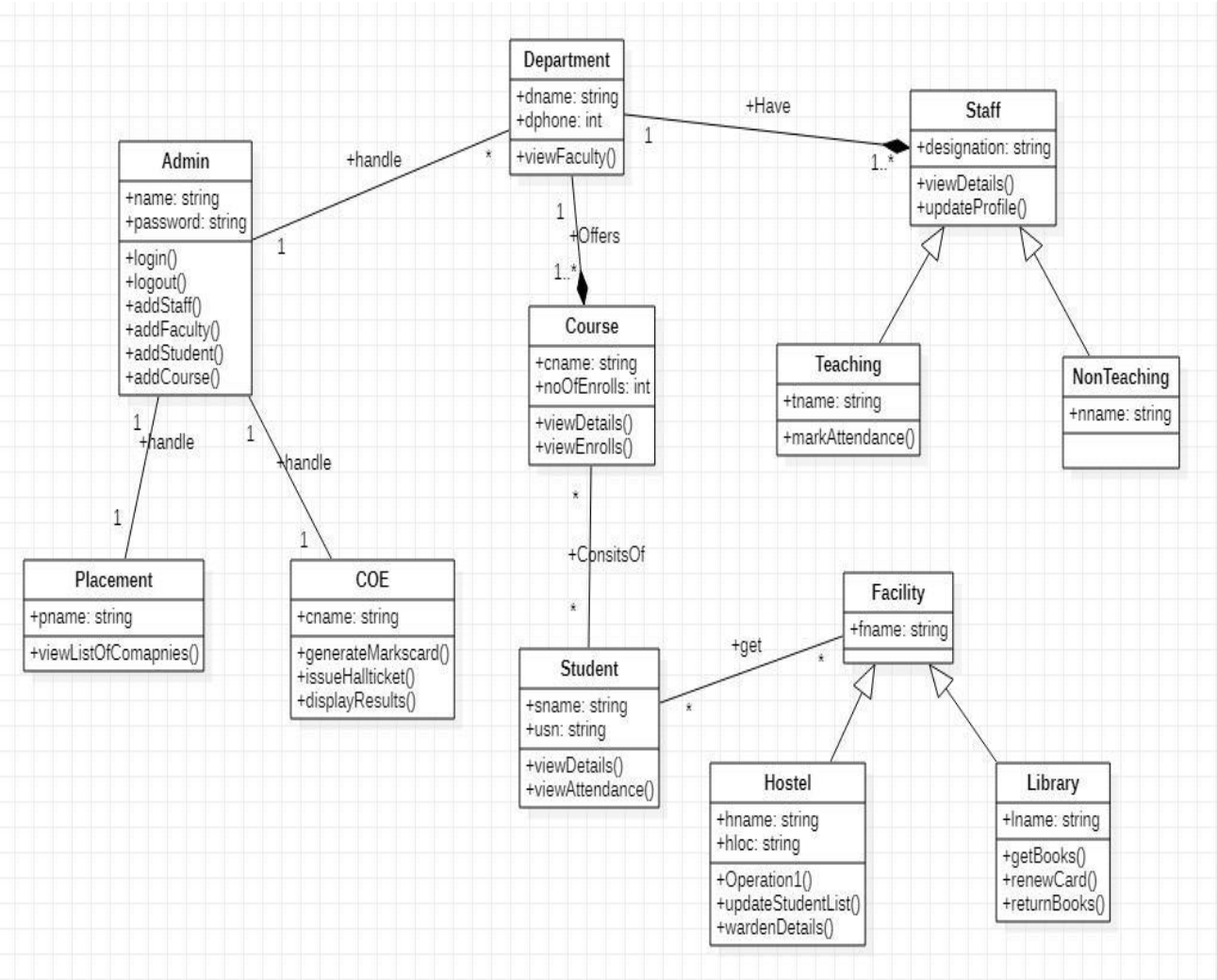
● Management section should be able to view, add and edit teaching and non-teaching staff details.

● Students should not be allowed to edit their personal or academic details.

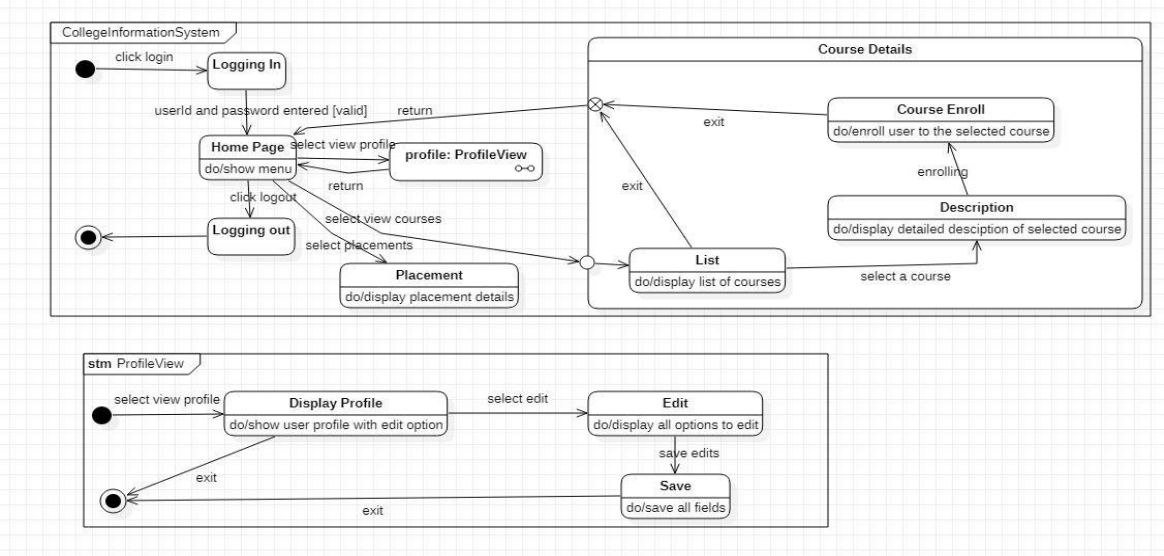
● The system should be convenient and easy to use by students, management and faculty.

● The system should be a reliable source of information viewing (most importantly, academic grades) for students, COE and faculty

Class Diagram:

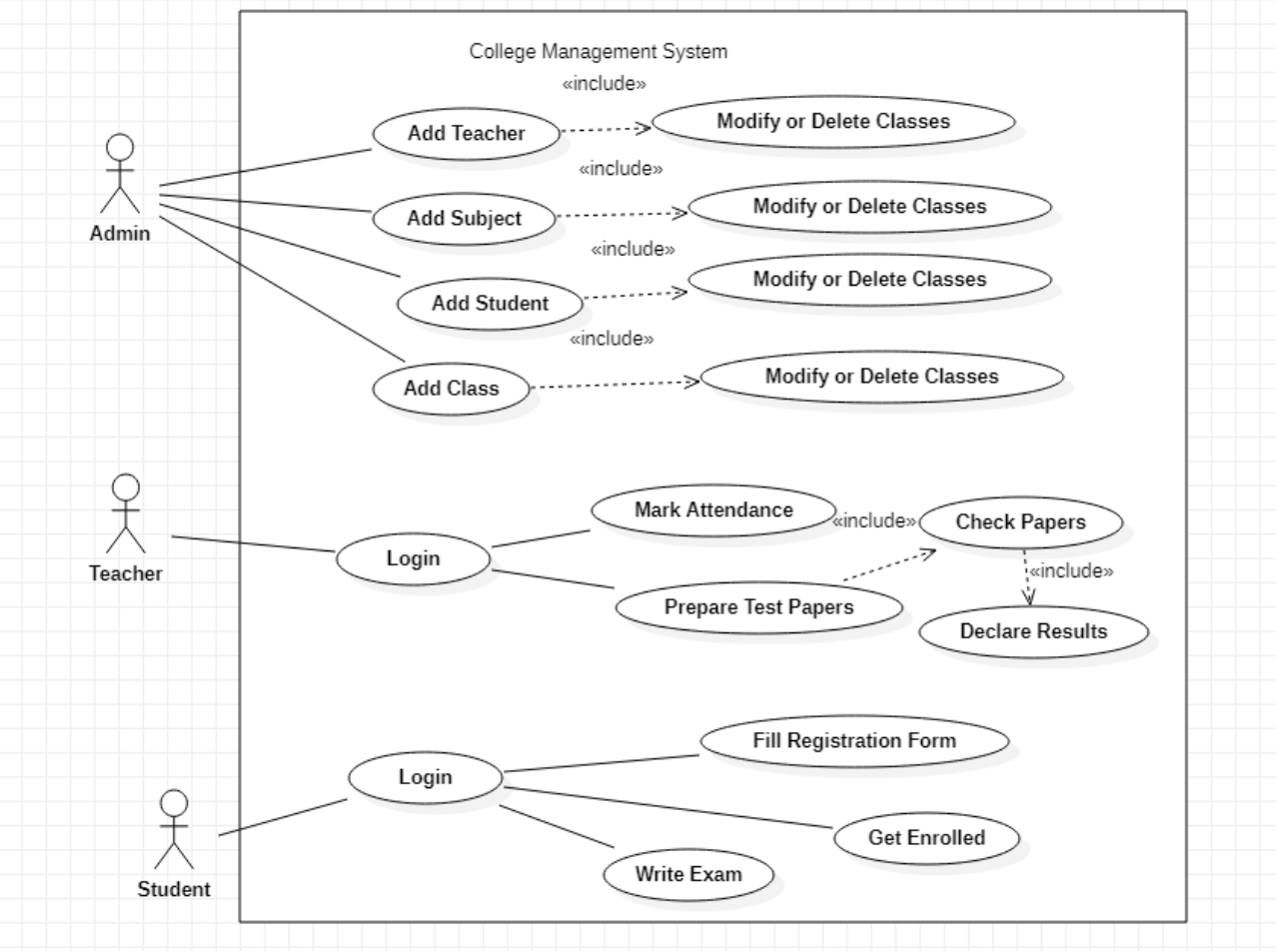


State Diagram:



The above state diagram describes the states the admin goes though 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.

Use Case Diagram:



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.

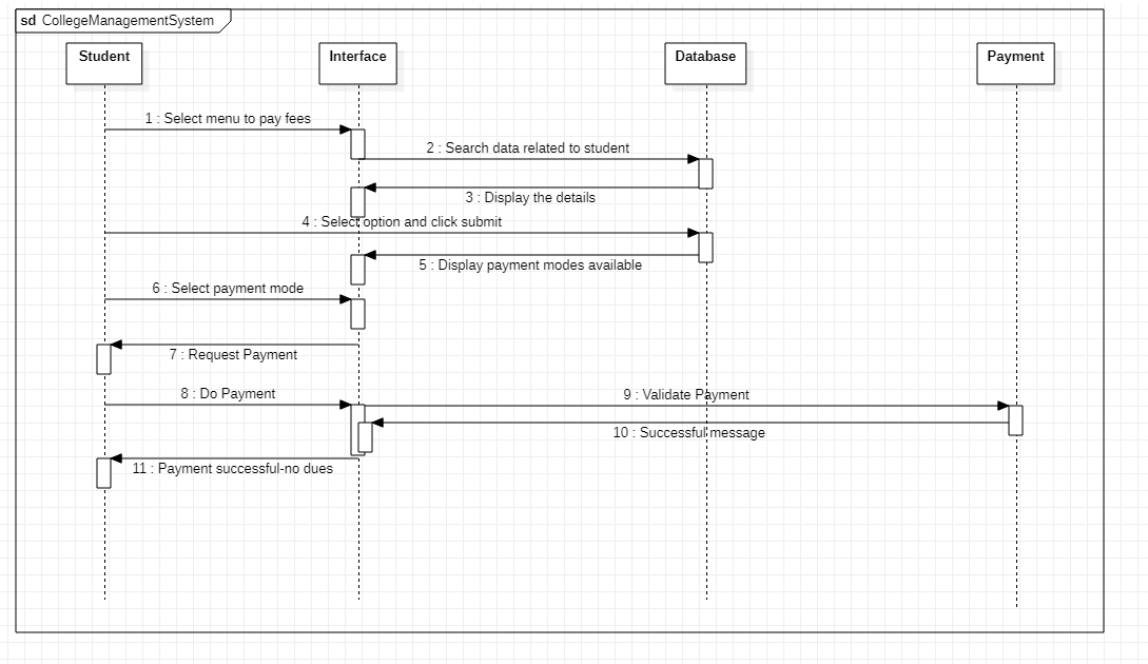
Subject details:various details related to subject is displayed.

View student details: the details of student is displayed

Declare results: the results of exams written by student is displayed

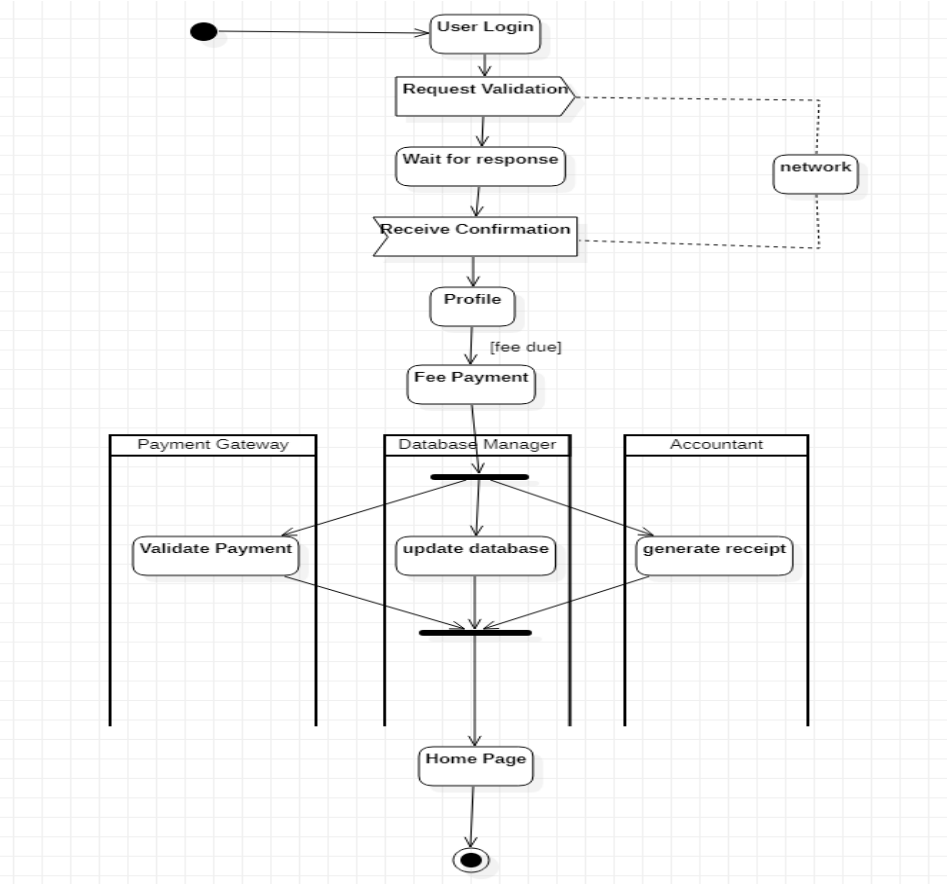
.

Sequence Diagram:



The above sequence diagram gives the interaction between objects while a user is logging into 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.

Activity Diagram:



The above activity diagram has three swimlanes mainly payment gateway,database and Accountant. The accountant generates reciepts. The database verifies the login information and on success has two options. The payment gateway validates payment.

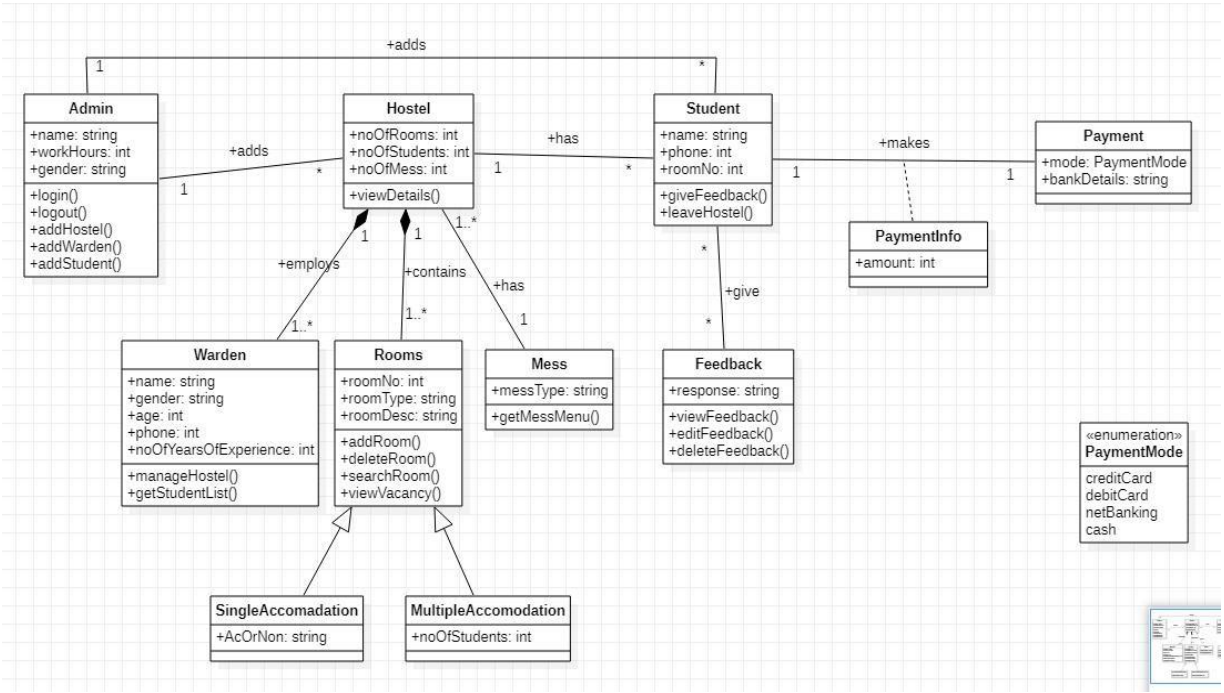
LAB 2:

Hostel Management System

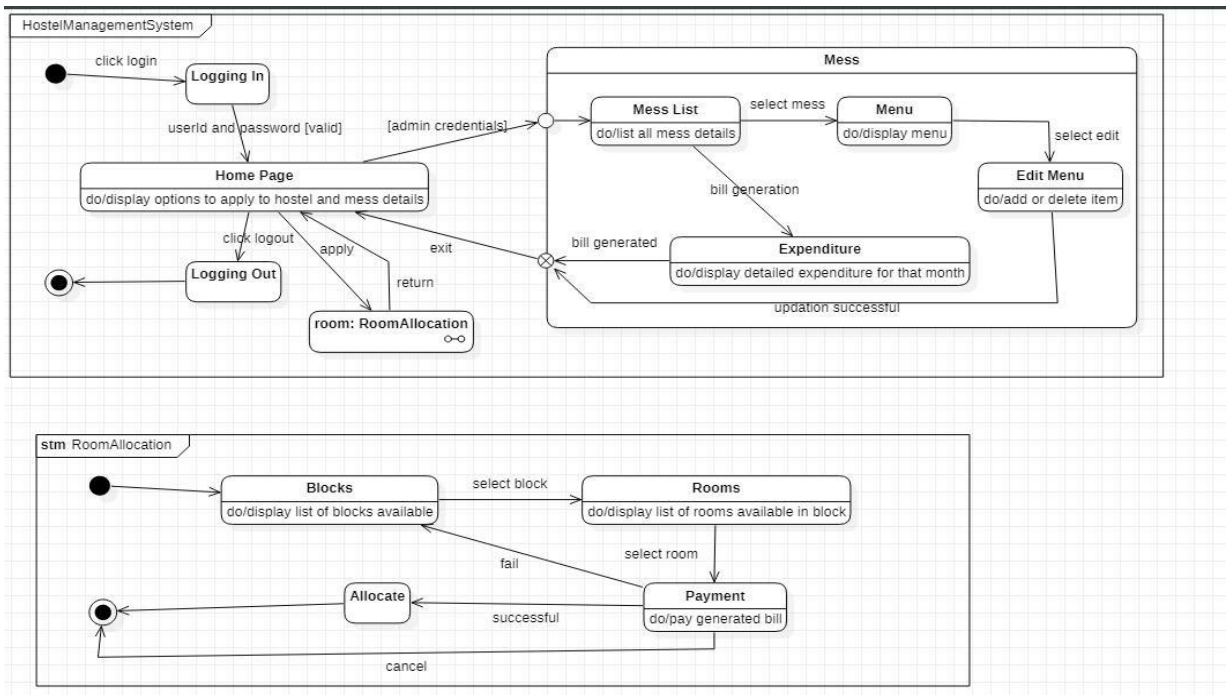
SRS:

- Admin can login using credentials provided to him.
- Admin can allot room to students.
- Students can login using the credential provided and can give feedback about staff.
- Admin can review the feedback provided by students.
- Admin can appoint staff.
- Students can provide mess feedback.
- Mess managers can review the mess feedback.
- Mess manager can update the menu 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.

Class Diagram:



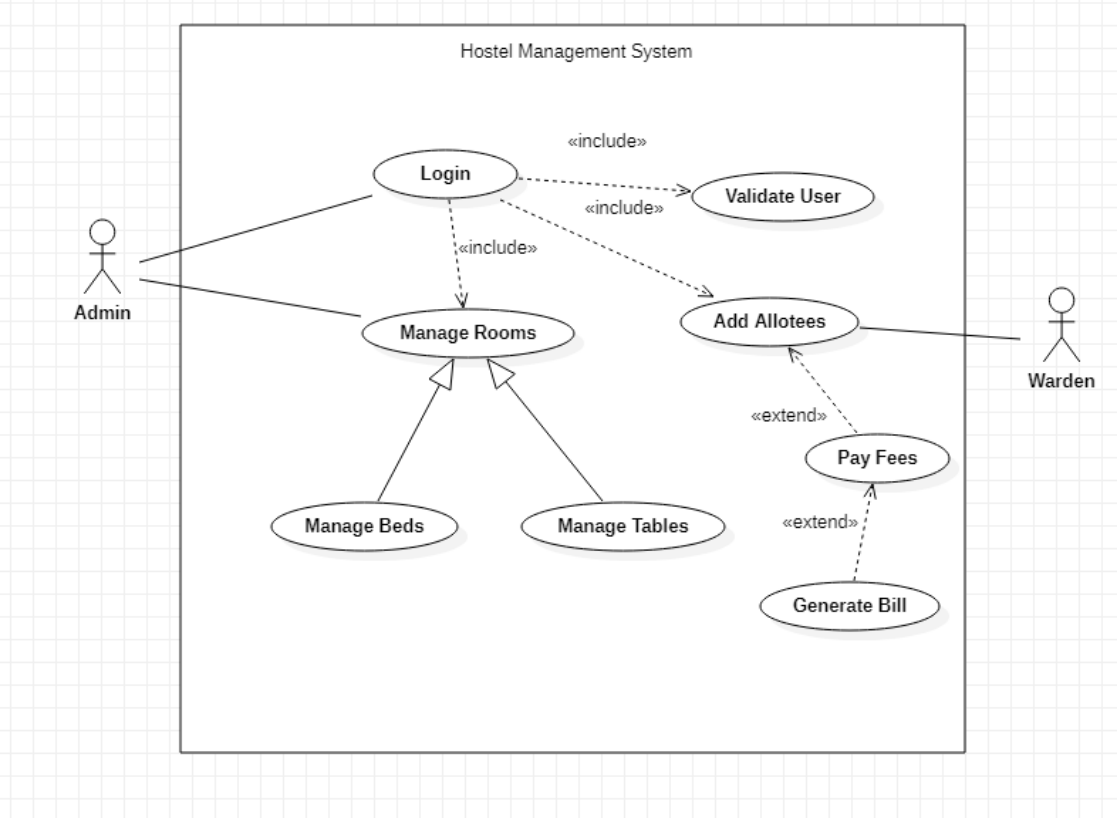
State Diagram:



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.

Use Case Diagram:



Actors:

Warden : the person who manages the allotees

Student : the person who uses the hostel system

Use Cases:

Manage hostel : allows actor to update delete or add information

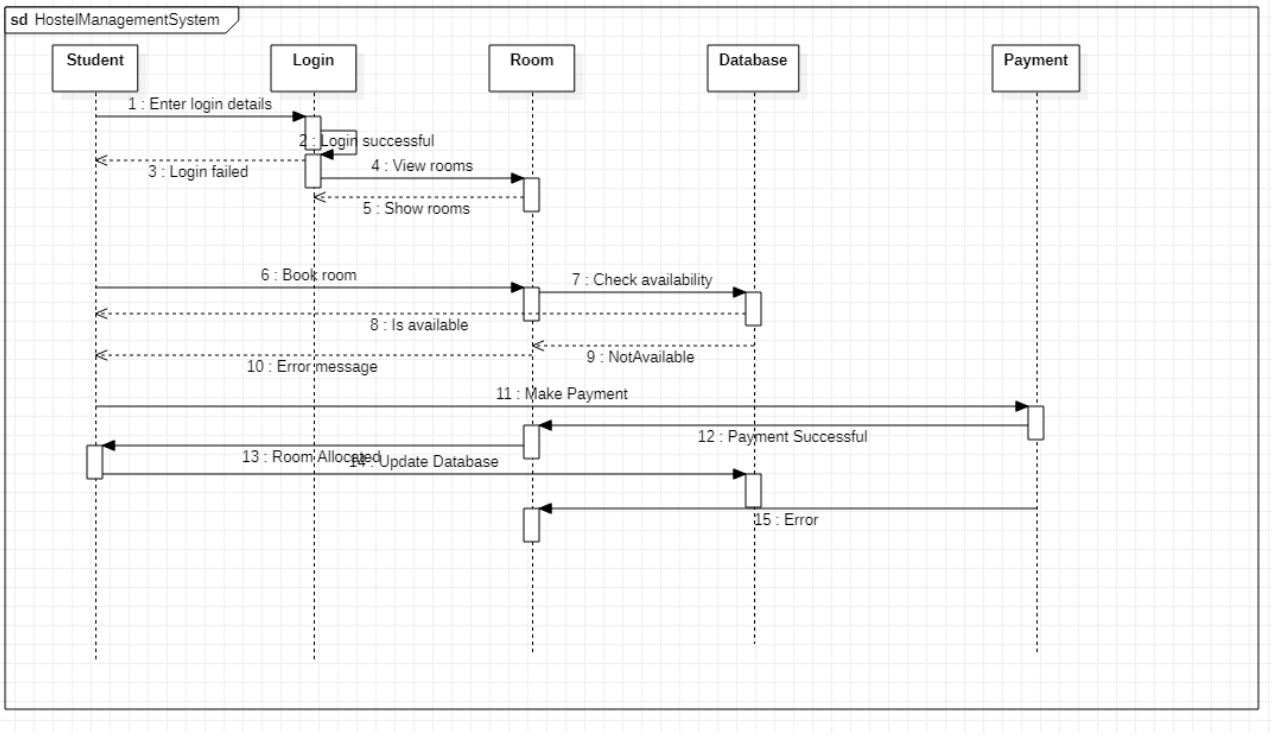
Login : allows actors to login into the system.

Add allotee: the students are allotted hostel rooms

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

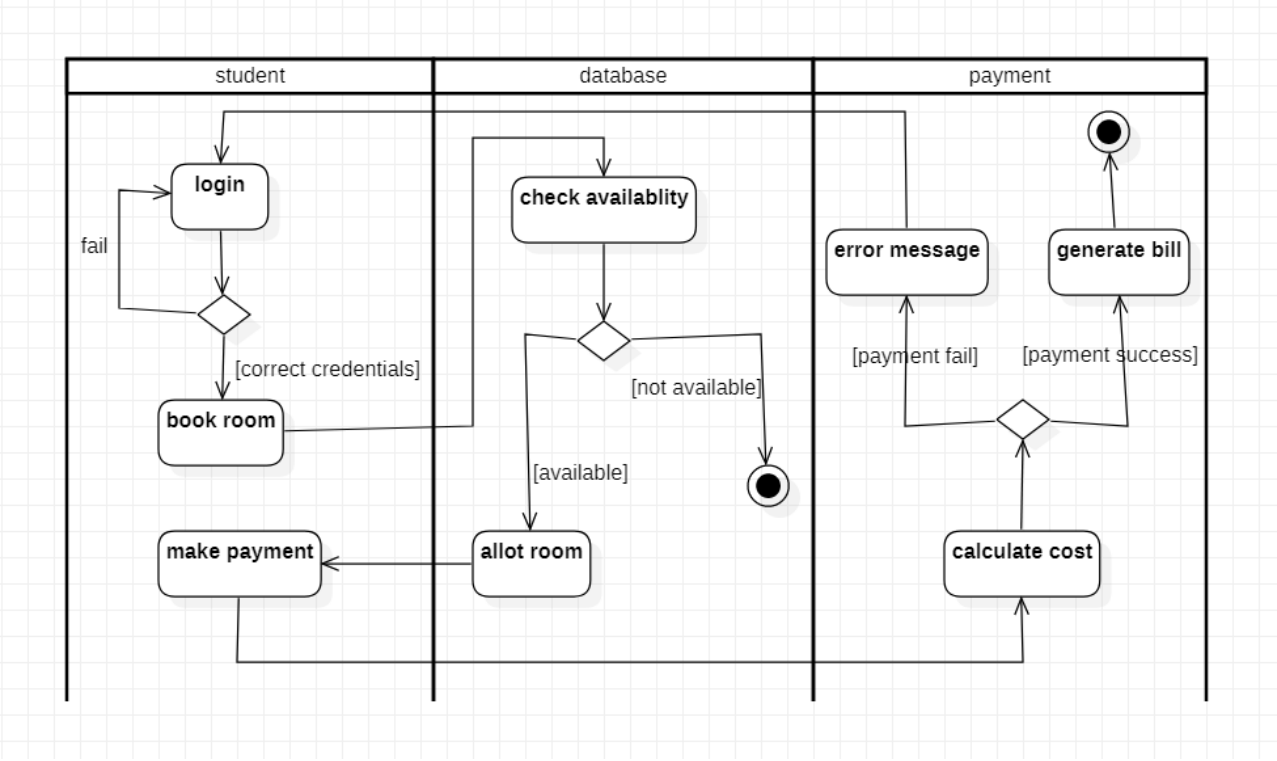
Pay fees: the fees payment is done

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.

Activity Diagram:



The activity diagram tells about the activities involved in payment of fees. 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.

LAB 3:

Stock Management System

SRS:

The stock maintenance system will allow the employees to record information of

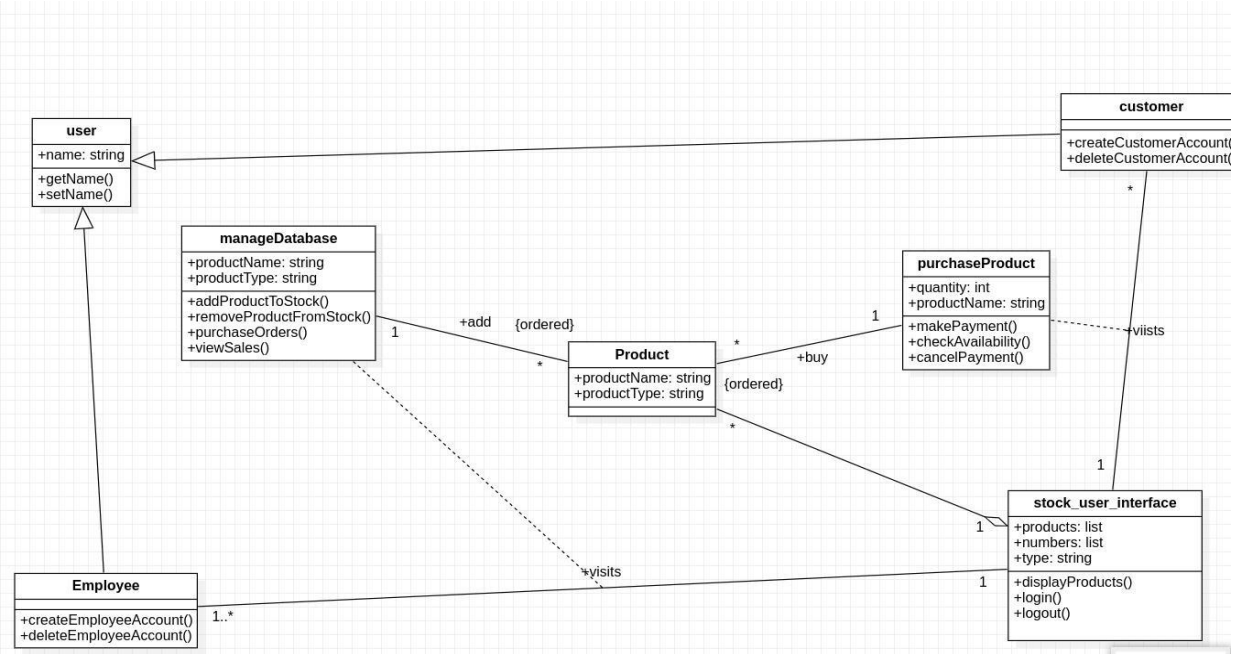
the items available in the store and generate reports based on the total amount of sales. The new system will have a windows-based desktop interface to allow employees to enter the information of sales, purchase orders, change employee preferences and create reports. The system retains information on all the items in

the shop. The system retains the records of the cost, expiry date, vendor details, Discount, quantity. The employee maintains the information of the sale of the item. He can add the items at the right time and update the database. The customer can view the availability of the required items and the price of the items. The customer can just view them but cannot make any changes

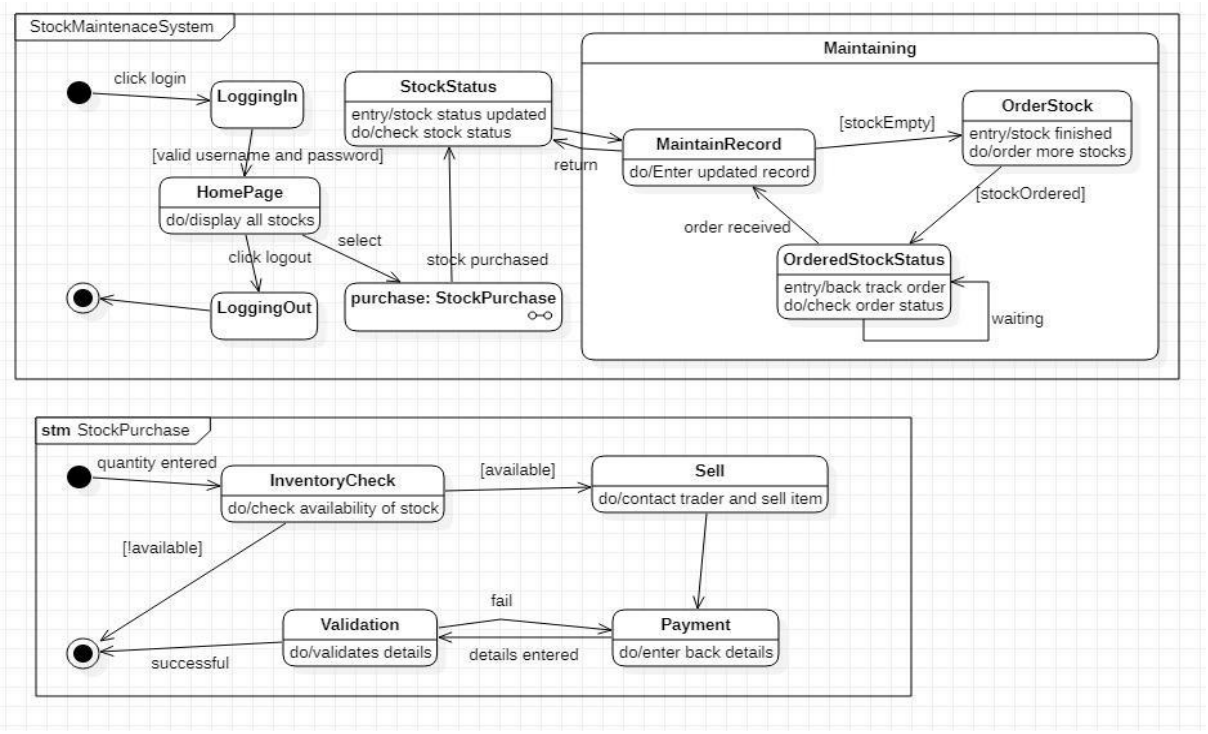
The process of stock maintenance system is that the customer logs in to the particular site to place the order for the customer product. The stock maintenance system is described sequentially through steps

- The customer logs in to the particular site.
- They fill the customer details.
- They place the orders for their product.
- The vendor logs in and views the customer details and orders

Class Diagram:

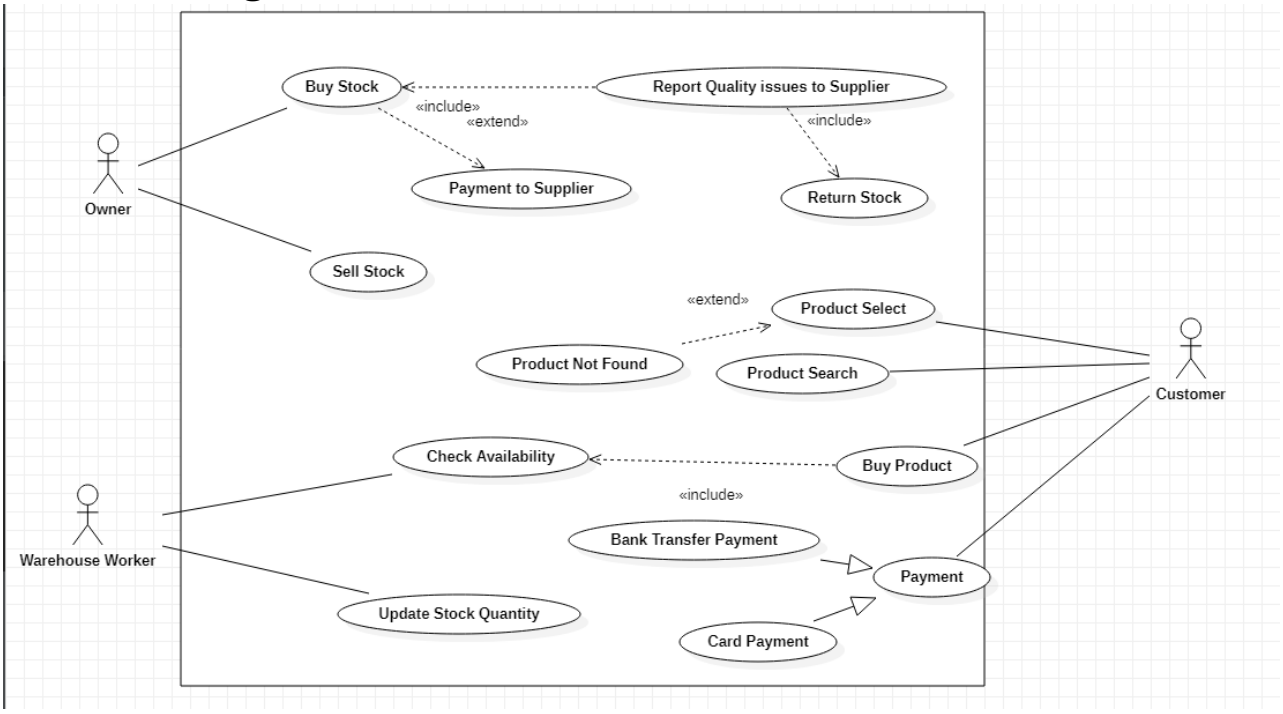


State Diagram:



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

Use Case Diagram:



Actors:

Customer: a person who purchases the products

Retailer: a person who sells the products

Warehouse Worker : 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

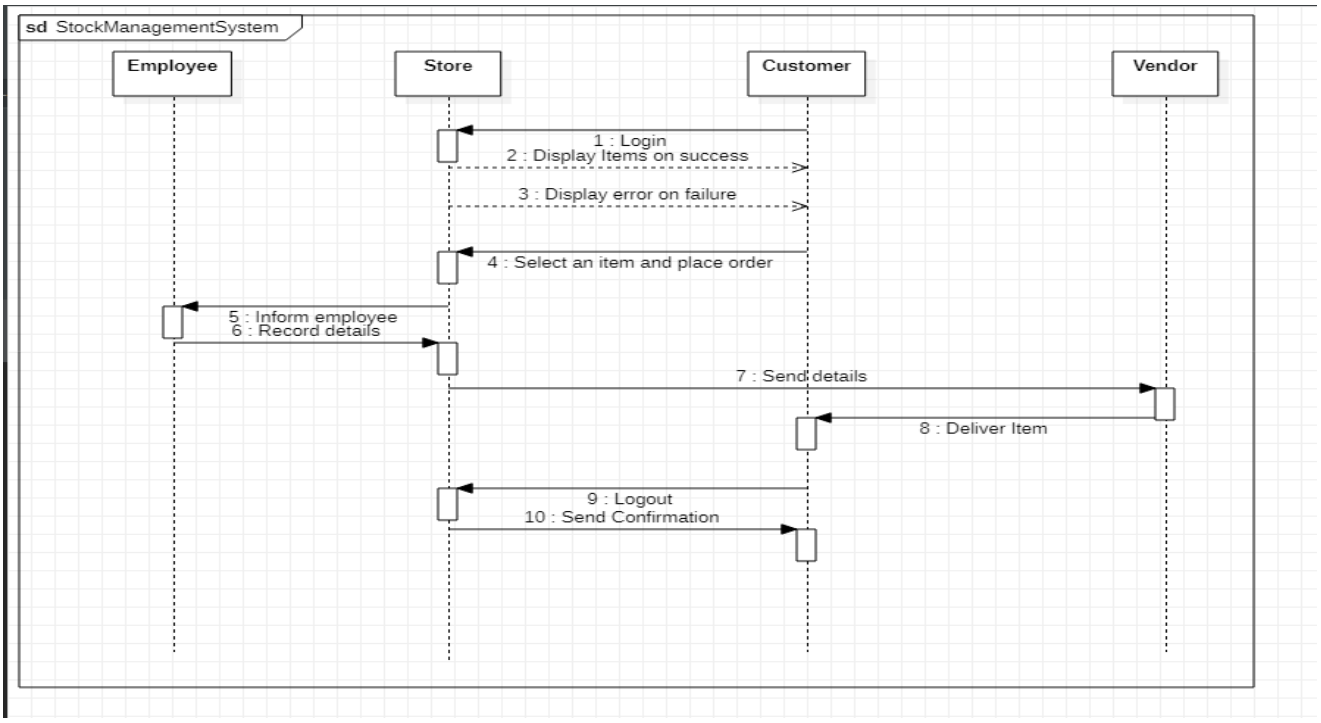
Find traders: provides a list of traders

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

Sequence Diagram:



Place request for purchase/sale of stock

Contact seller for purchase/sale

Seller confirms purchase/sale

Confirmed purchase/sale order

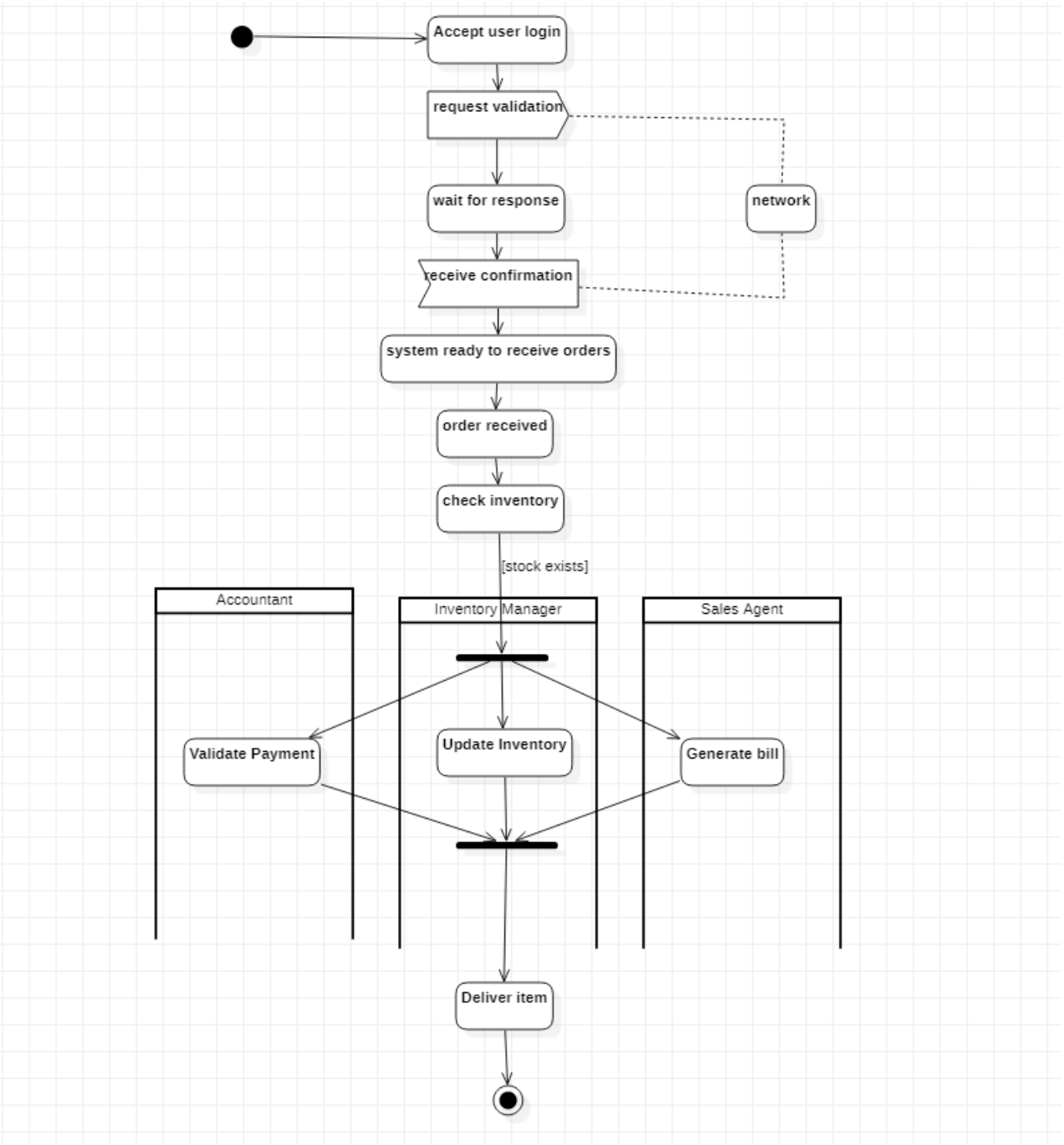
Check available balance in case of purchase order

Purchase/sale order possible

Purchase/sale order approved

Purchase/sale of stock confirmed and approved.

Activity Diagram:



The above advanced activity diagram gives us the activities involved with each swim lane. 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

LAB 4:

Coffee Vending Machine

SRS:

The Objective of the system is to prepare a coffee vending machine for commercial purpose. The system will be able to prepare coffee by processing all its required ingredients. Users will be provided with sophisticated and easy to use user interfaces.

There are many different types of coffee makers using a number of different brewing principles, in the most common devices, coffee grounds are placed in a paper or metal filter inside a funnel, which is set over a glass or ceramic coffee pot, a cooking pot in the kettle family. Cold water is poured into a separate chamber, which is then heated up to the boiling point, and directed into the funnel.

• Cash Box:Knows amount of money put in; Give change; Knows price of coffee; Turns front panel on and off.

• Front panel:Captures selection; Knows what to mix in each; Instructs mixer when to mix.

• Mixer:Knows how to talk to the dispensers.

• Dispenser [cup-, coffee powder-, sugar-, creamer-, water-]:Knows how to dispense a fixed amount, knows when it is empty.

Features :

• Small carbon footprint

• Energy saving advanced power management system

• Comprehensive drink range

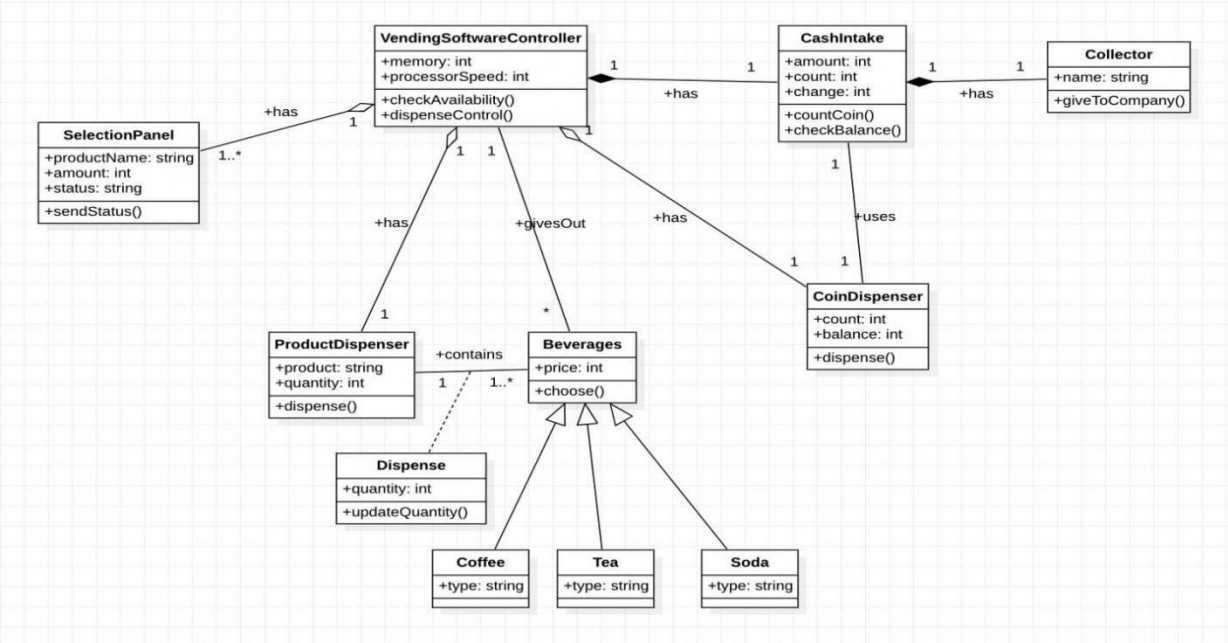
• Simple user interface

• One touch servicing

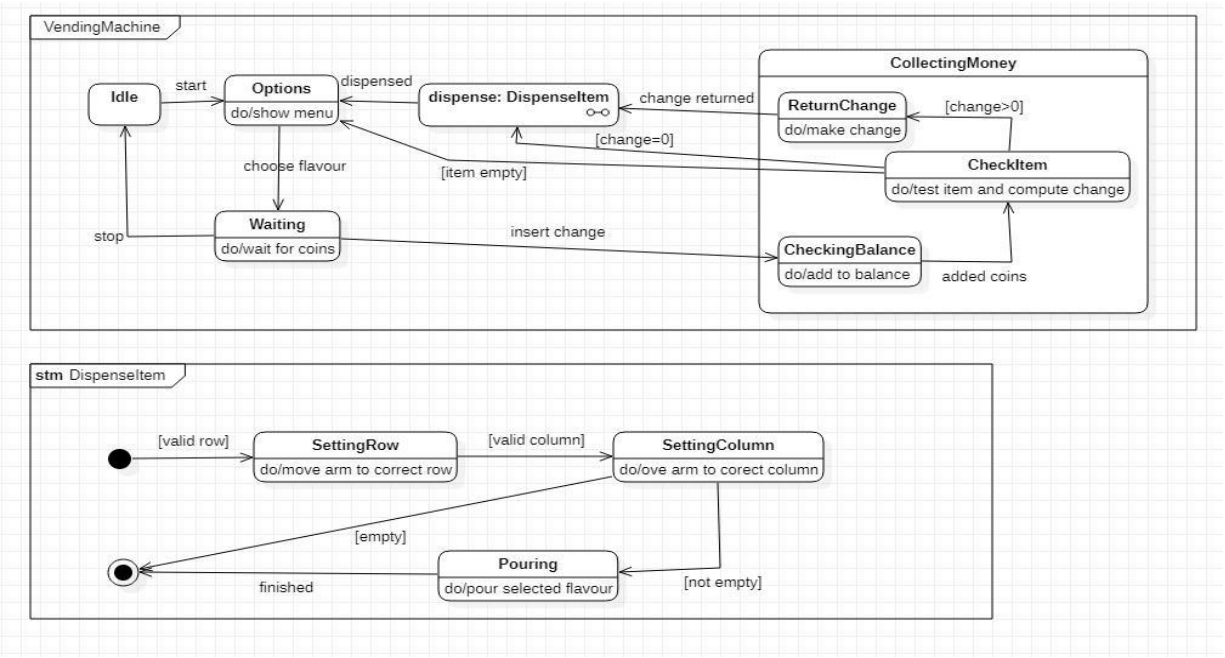
Working : Coffee vending machines are quite simple and basic. The way they work is not too different to how a tabletop coffee machine or even a drip coffee

machine operates. If you think about it, making coffee is simply adding together coffee beans or grounds to hot water and mixing with milk and sugar, that's exactly what a hot drink vending machine does.

Class Diagram:



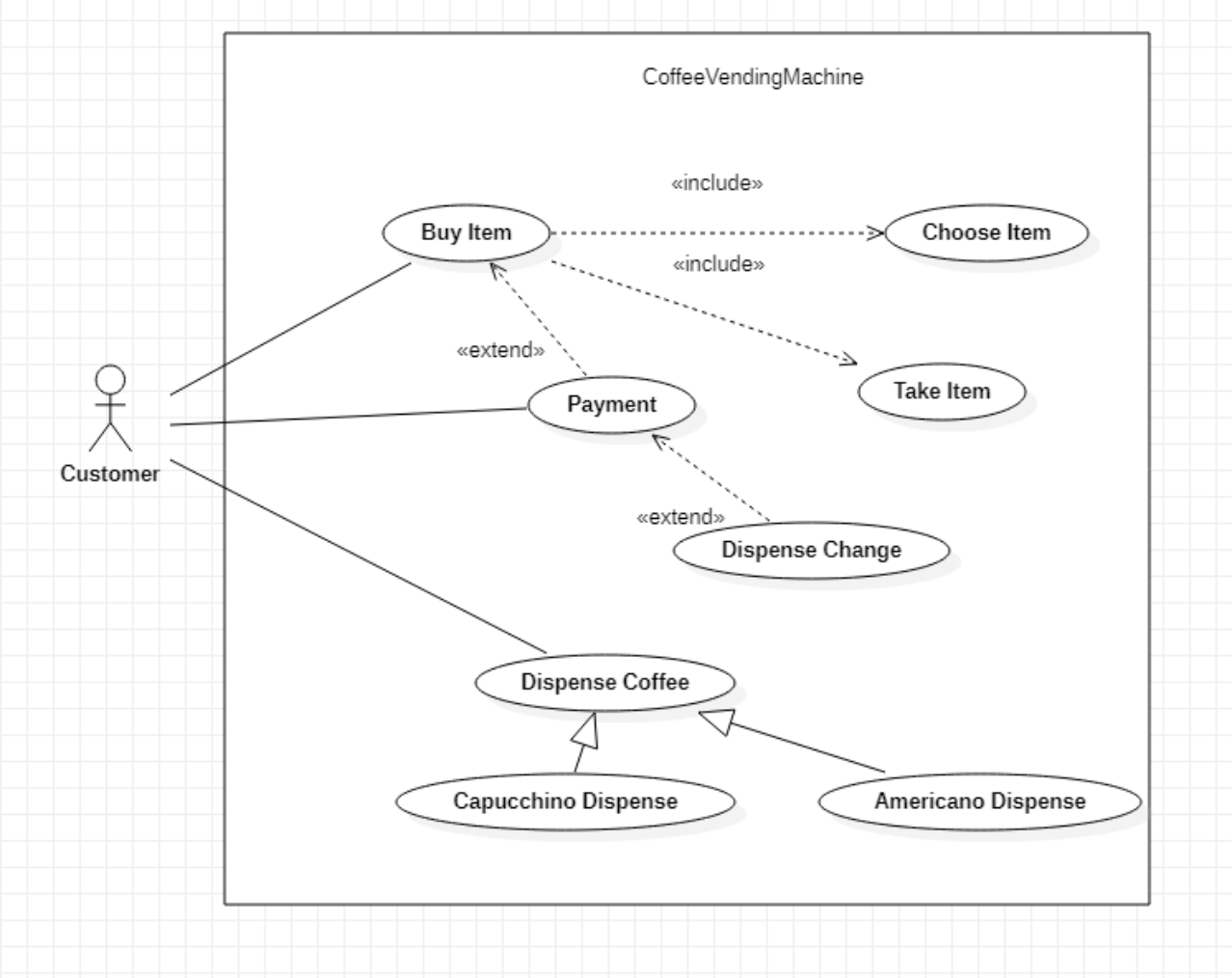
State Diagram:



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

dispences the item from the machine.

Use Case Diagram:



Actors:

Customer :a person who uses the coffee vending machine

Use Case:

Display payment details : displays the payment details

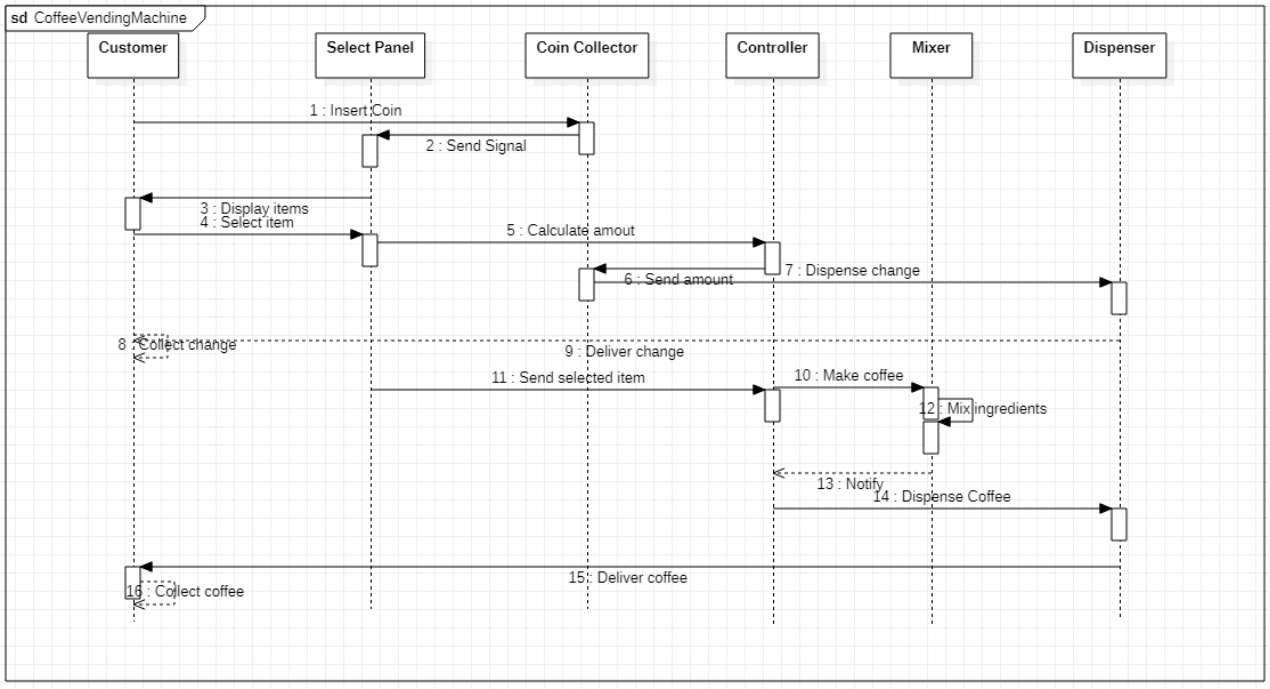
Request coffee : allows user to order their coffee

Make payment : accepts money for the coffee

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

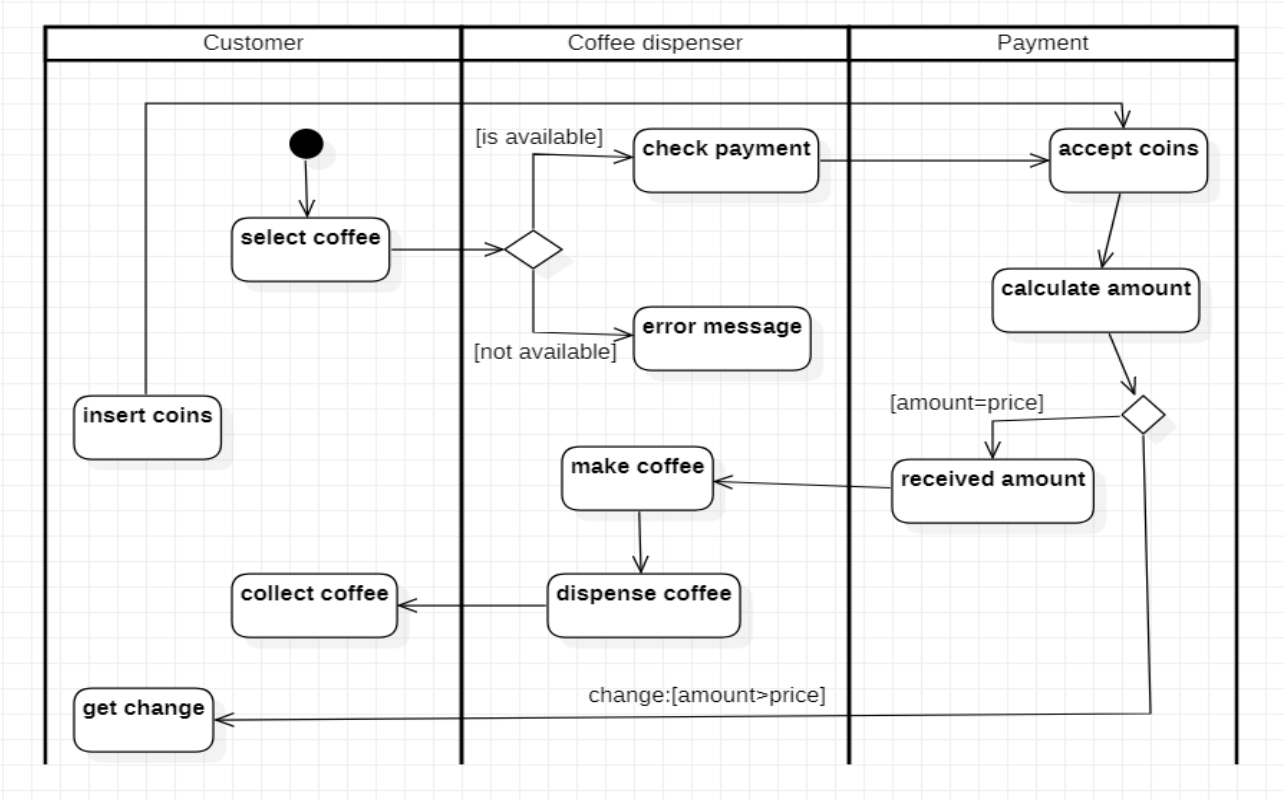
Dispense coffee : the coffee ordered is prepared and given

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 .

Activity 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 .

LAB 5:

Online Shopping System

SRS:

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

The software provides the following facilities to the customers:

• Facilitates easy shopping online anywhere with free shipping (conditions apply).

• Provides information about the products in categories

• Can avail the facility of purchasing second hand products

• Can reserve if the particular product is not available

• Customers are provided with up to date information on the products available

• Provides email facility for future correspondence

• Provides backup facility

• Can add nearly ten products to their shopping cart at a time

The software will not provide the following facilities to the customers:

• Cannot reserve the product for more than two days.

• Cannot reserve more than two products

• Responsibility of damages

• The product cannot be changeable once confirmed

The software provides the following facilities to the merchants:

• Facilitates easy bidding facility

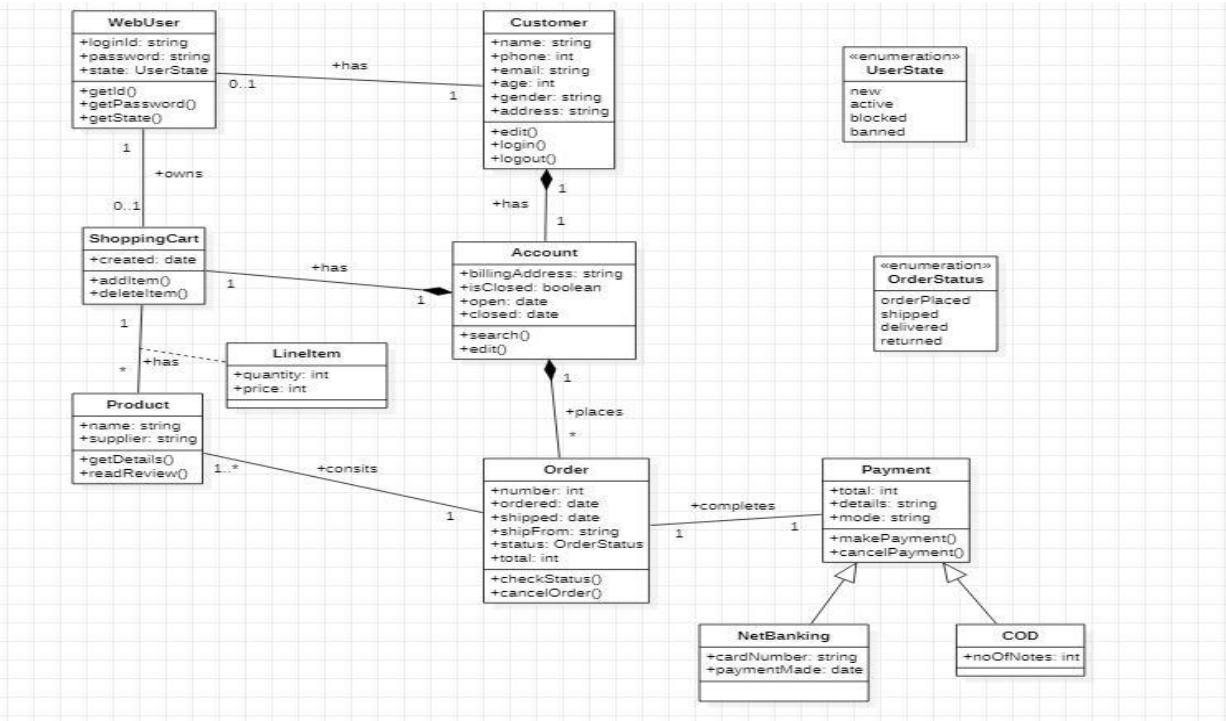
• Provides complete information about the customers

• Provides complete information about their products

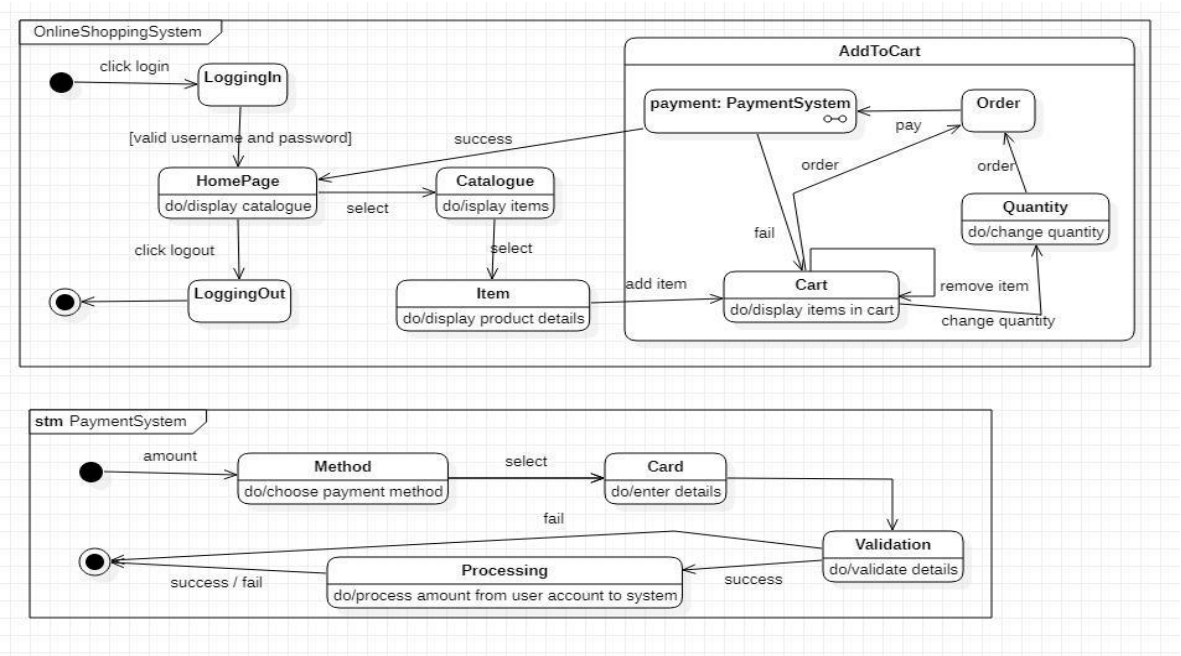
• Can avail the facility of email correspondence

• Can avail the brand catalog facility

Class Diagram:

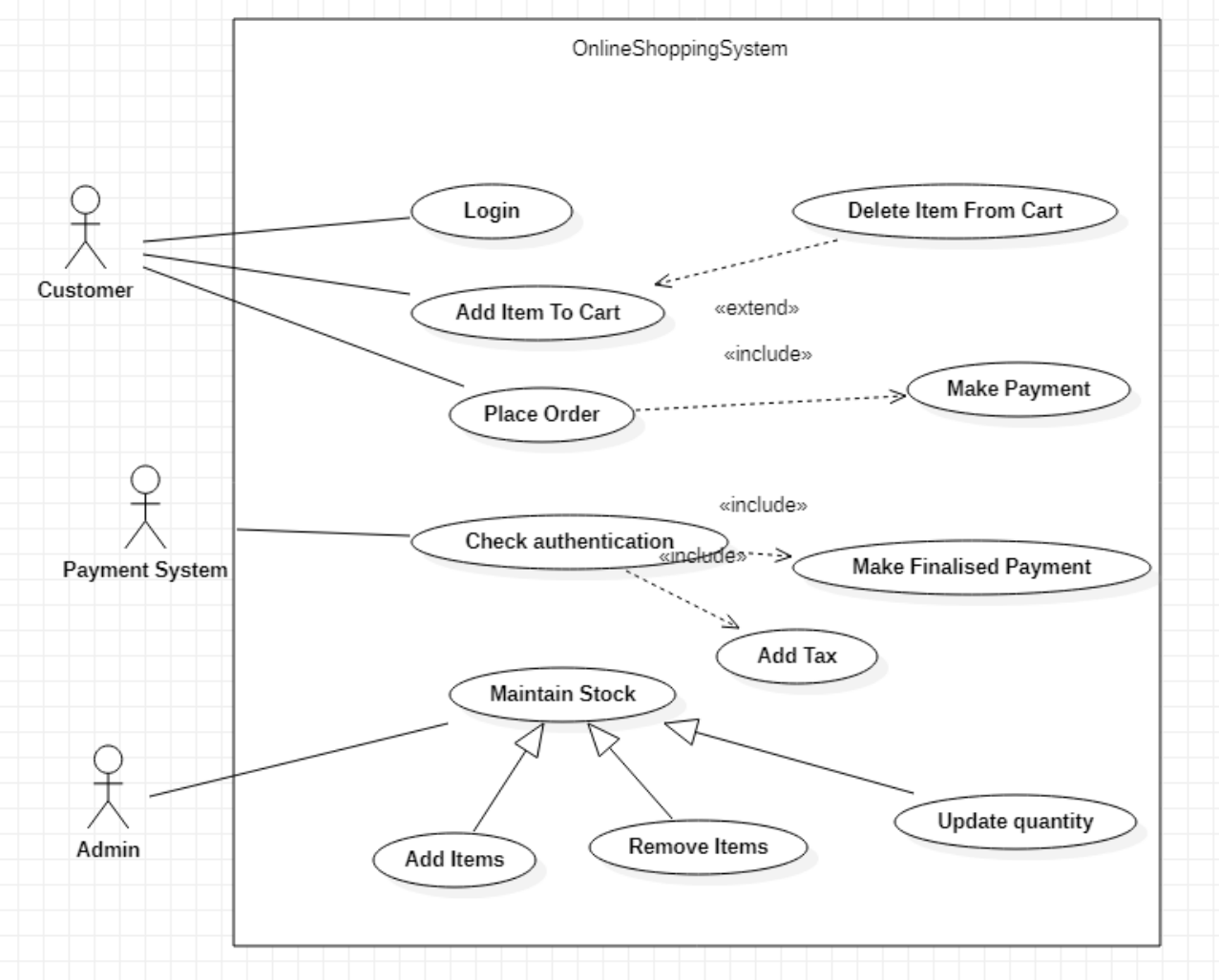


State Diagram:



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.

Use Case Diagram:



Actors:

Customer: a person who uses the online shopping system

Admin : person who maintains stock

Payment System: person who handles the payment

Use Case:

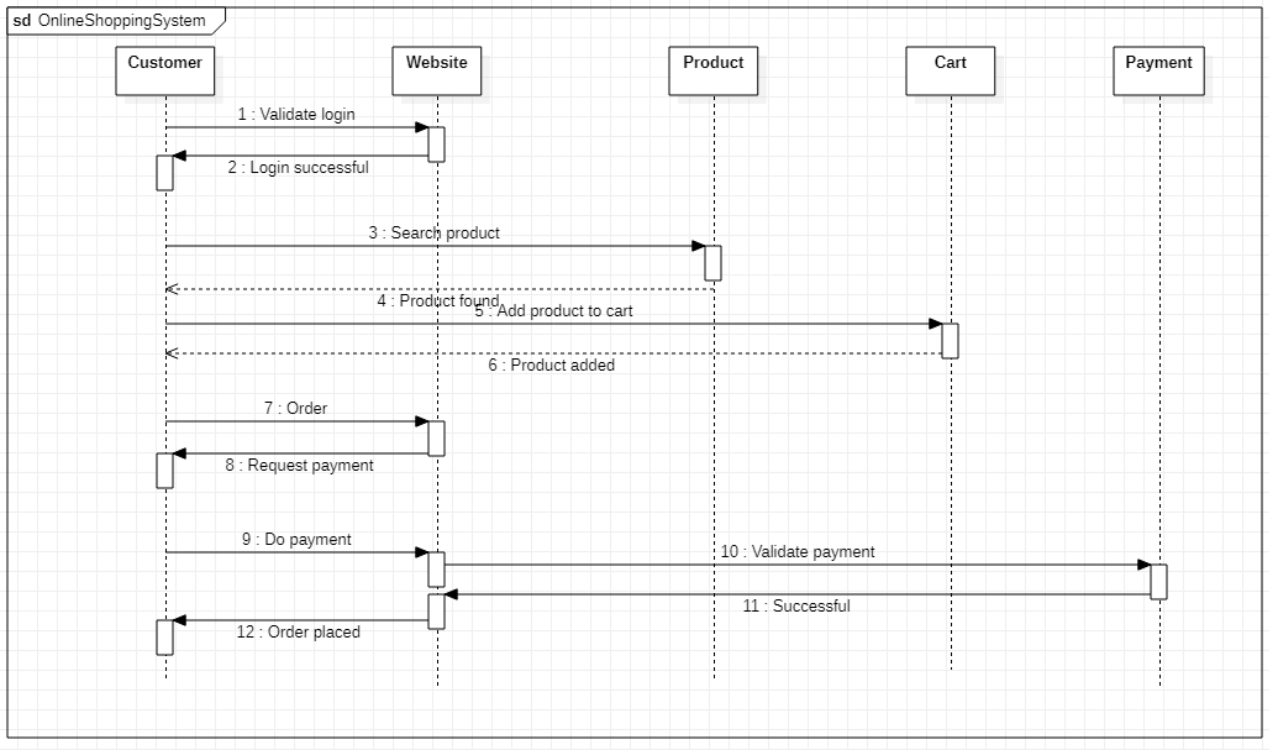
view product details : displays all product details

Place order : order the items present in the cart

Make payment : accepts payment for the products purchased

Maintain Stock : stock availability is checked

Sequence Diagram:



the customer logins 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

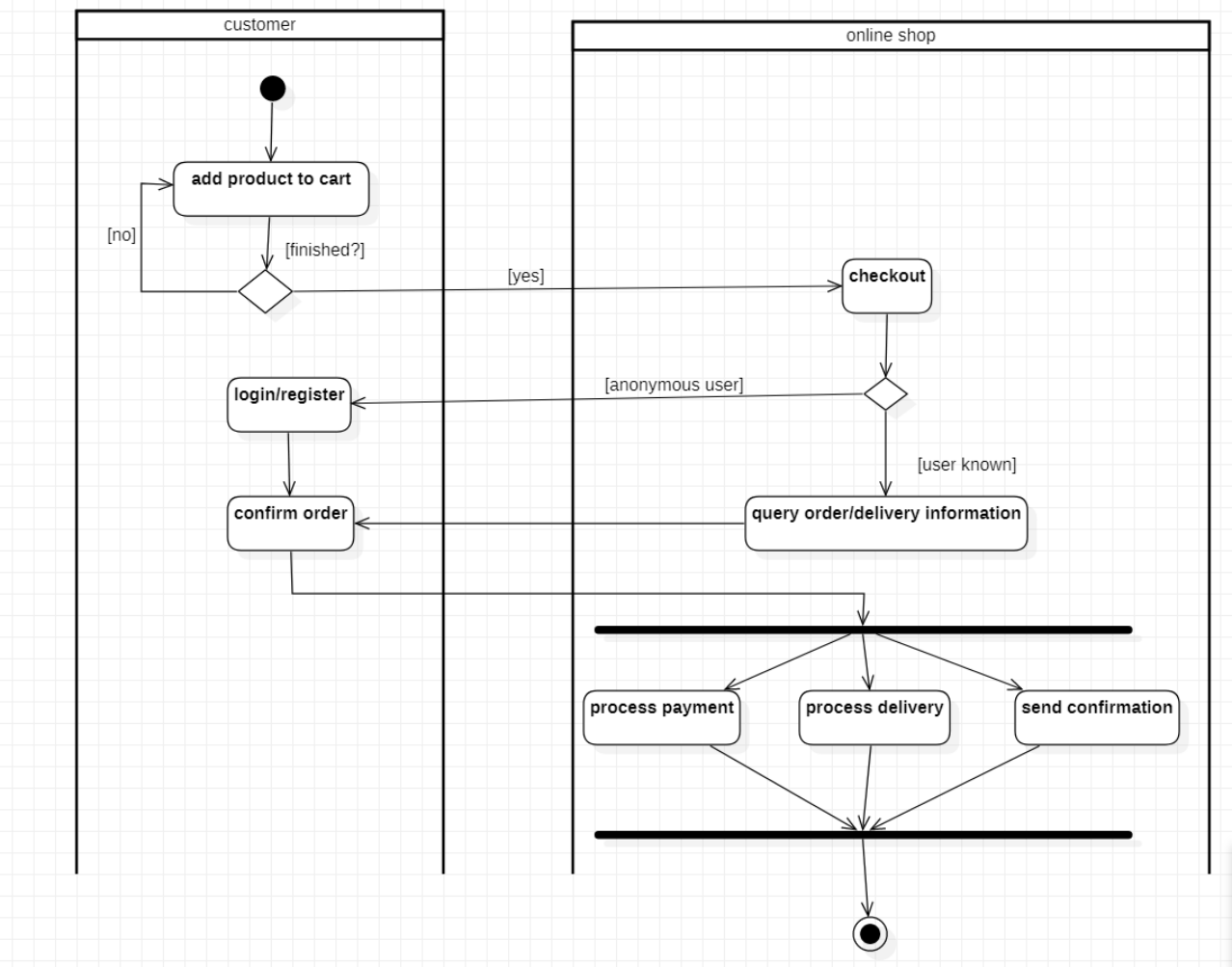
The online interface requests for payment

The customer provides details and confirmation is sent

The customer logs out

The logout confirmation

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.

LAB 6:

Railway Reservation System

SRS:

To develop a user-friendly Railway Reservation System to enable passengers to

book tickets online and make payment online as well.

Railway reservation system project which provides the train timing details,

reservation, billing and cancellation on various types of reservation namely,

• Confirm Reservation for Seat.

• Reservation against Cancellation.

• Waiting list Reservation.

• Online Reservation.

• Tatkal Reservation

This system enables the Advance booking in any class, against general and

ladies quota, on payment of fare in full for adults and children, a maximum of six

berths/seats at a time, for journey between any two stations served by a train.

It also provides details about

1. Timetable

2. Train Fares

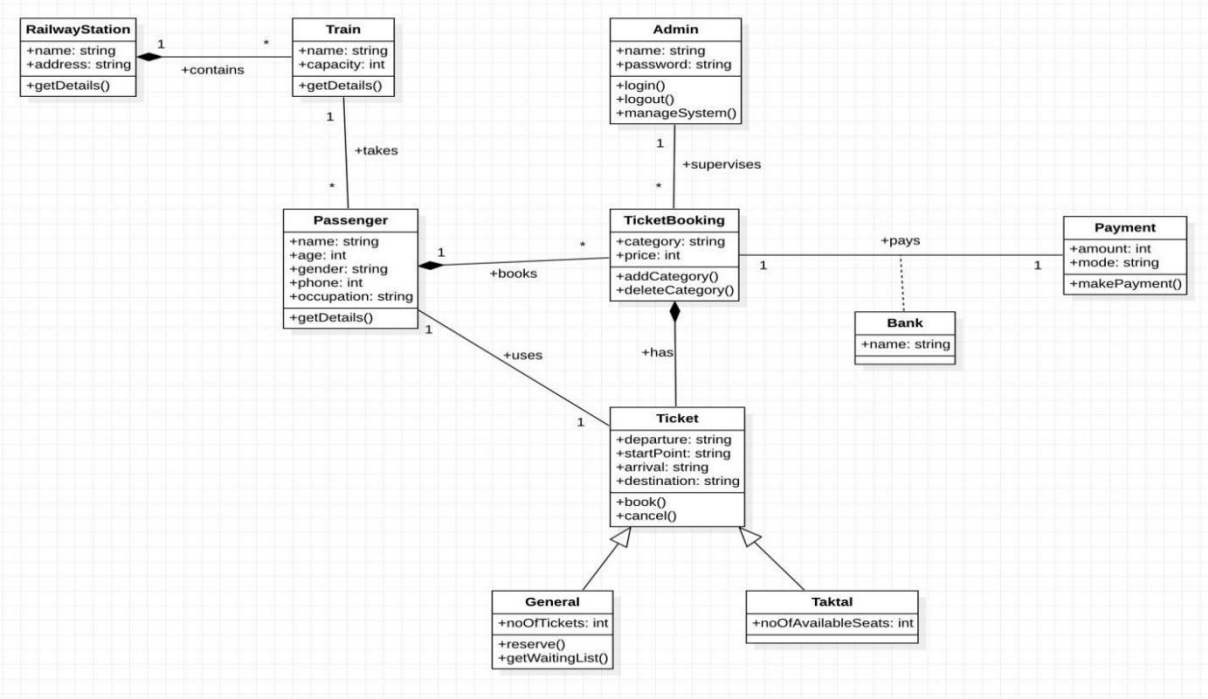
3. Current status of reservation position

4. Train available between a pair of stations

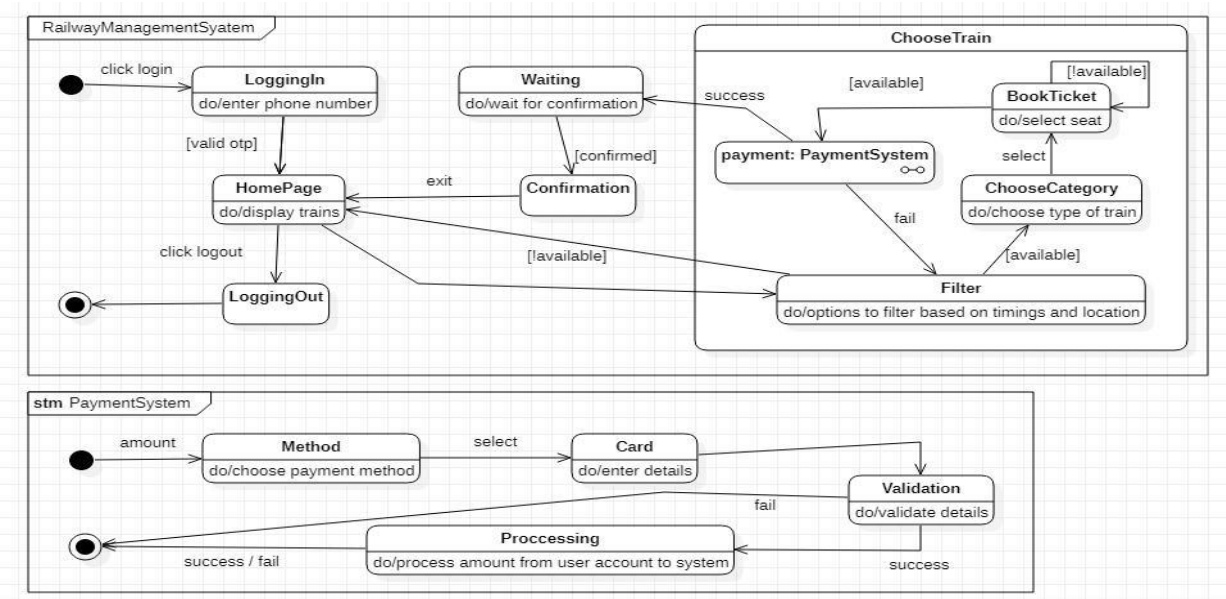
5. Accommodation available for a train/date combination Types of tickets:

General and Tatkaal

Class Diagram:

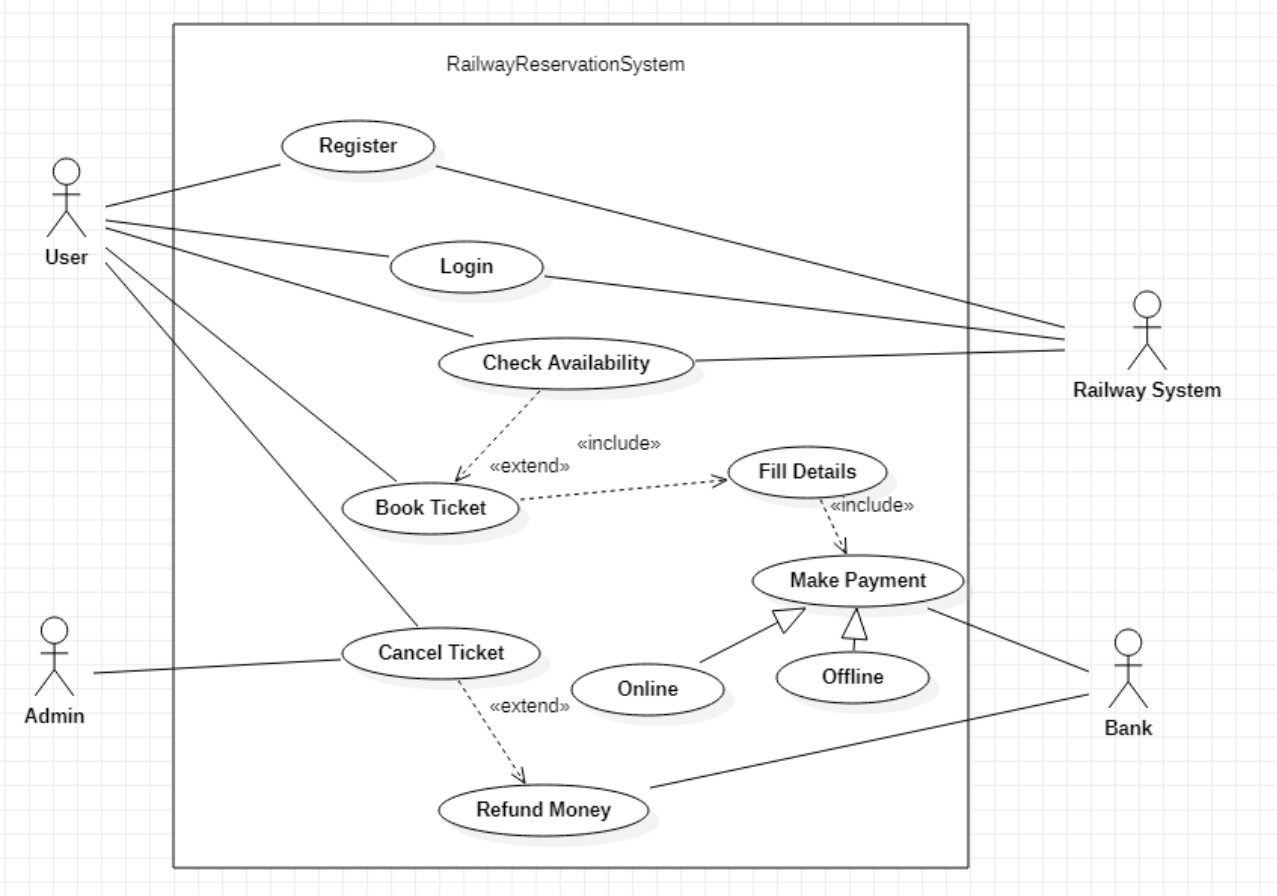


State Diagram:



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.

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.

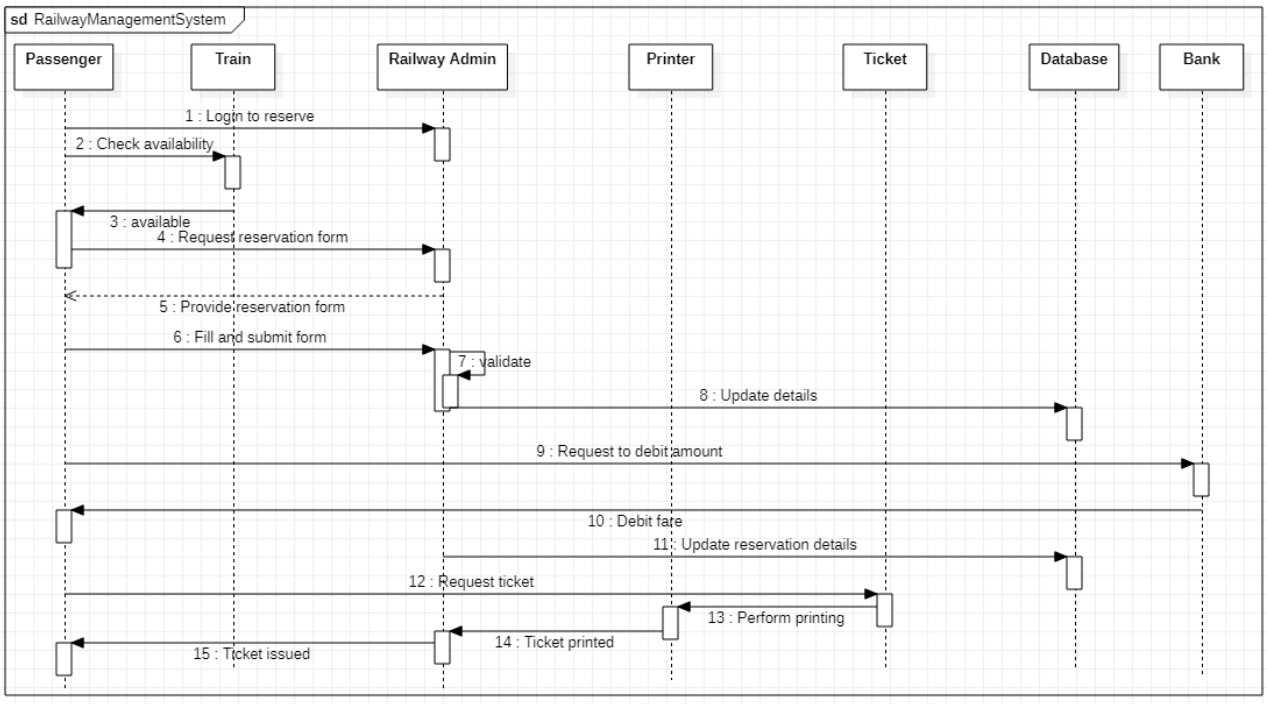
Book Ticket: User can select the type of coach and no of seats and book the ticket.

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

Cancel Ticket: User can cancel the ticket . The amount will be refunded.

Verify login credentials: The admin verifies the user details, if it matches with the details in database then he allows access to the system.

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.

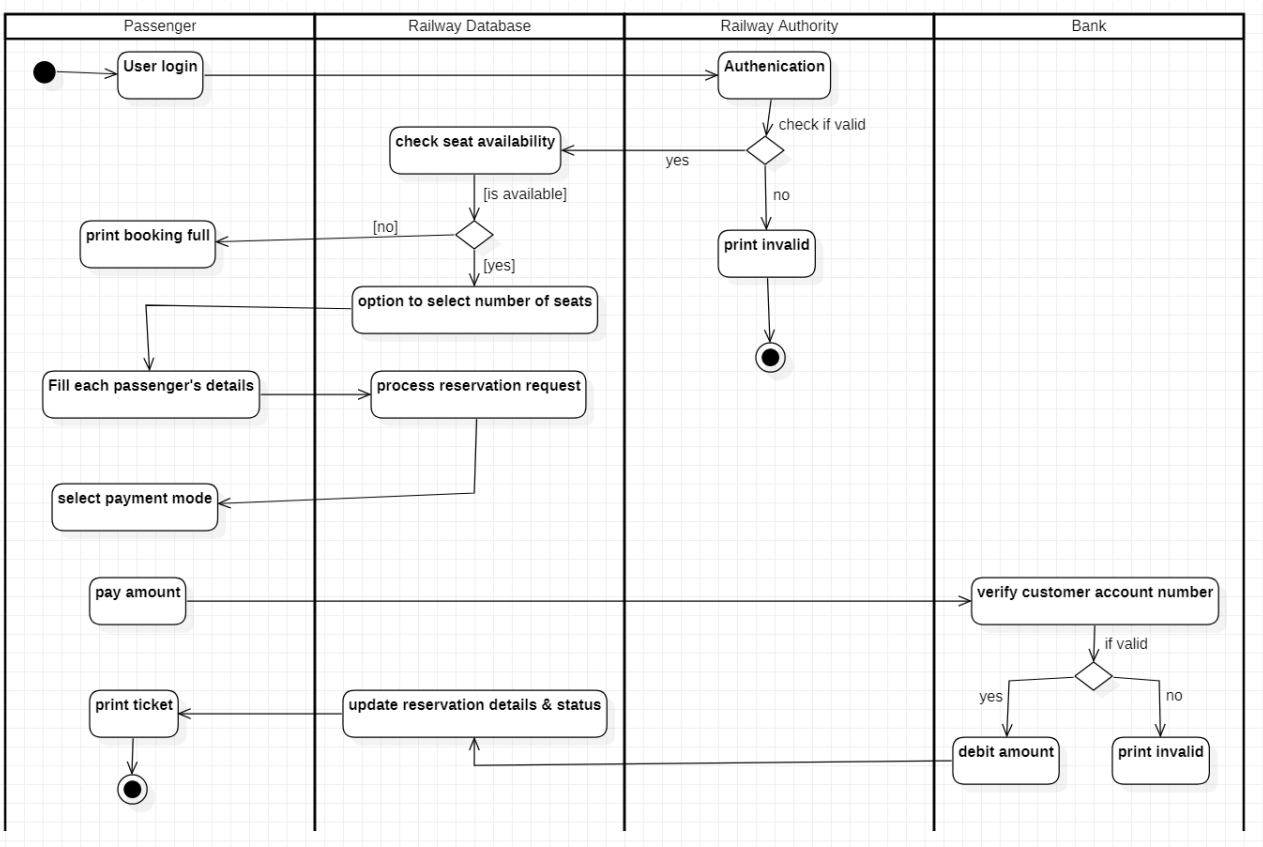
System displays payment details.

User makes the payment.

System issues the e-ticket.

User logs out .

Activity Diagram:



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

LAB 7:

Graphics Editor System

SRS:

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 an instance of the graphical editor allows a user to drag objects from a specified model into a working graphical diagram.

It should support following functionalities:

• It contains the toolbox which contains tools like: Line, Circle, Rectangle,

Arc,Text, Draw, Eraser

• Color box or palette

• Standard toolbar with options for New, Open, Save, toolbox and Text Toolbox.

• One integrated view to users for toolbar, color box, menu, and graphic screen.

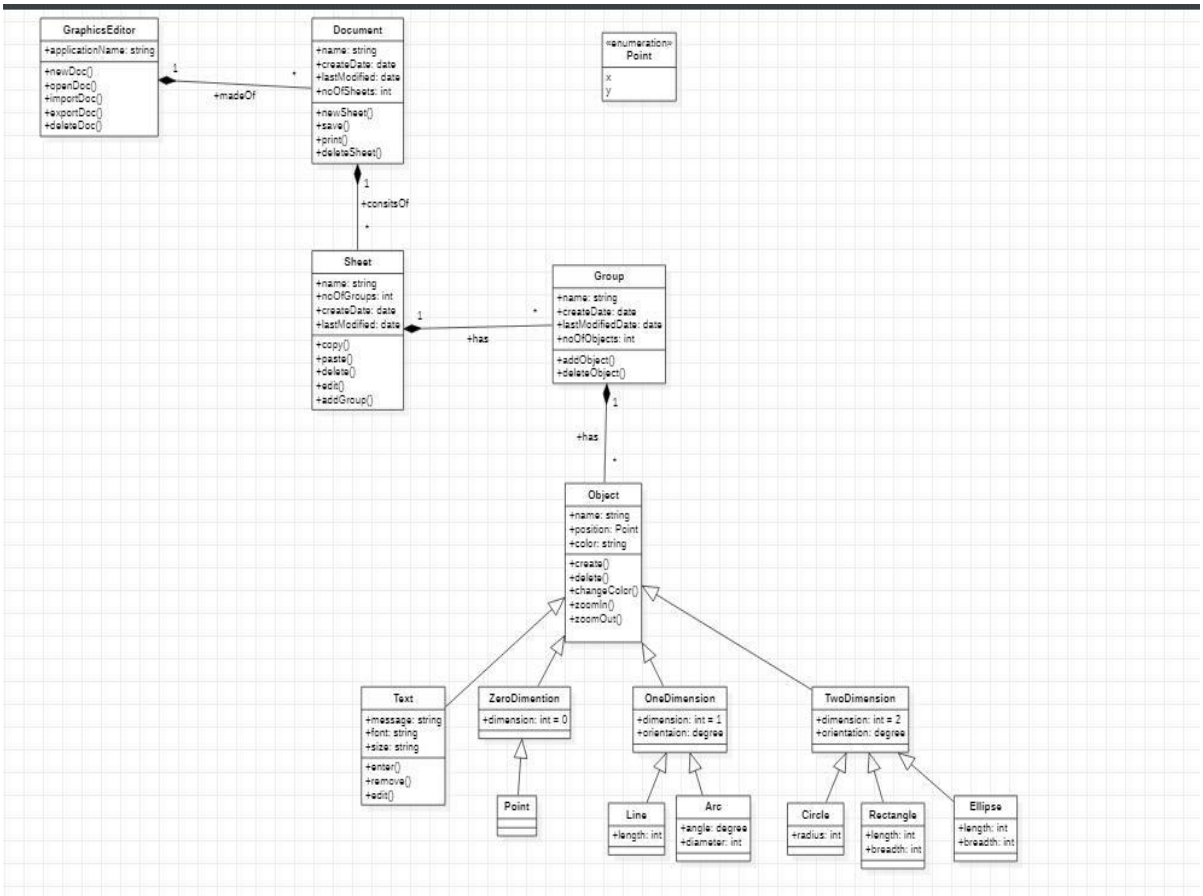
• Easy handling of tools for users.

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

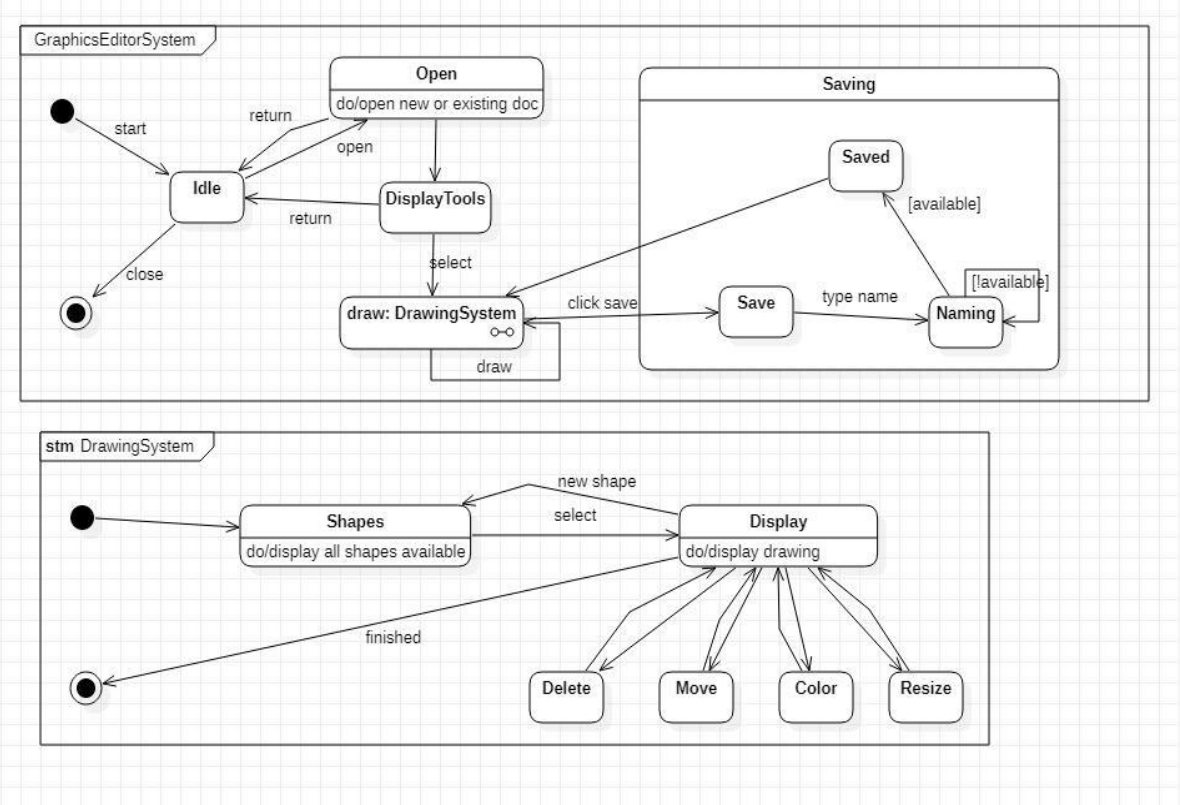
• Provision of zoom in and zoom out.

• Different shadings of line tool are provided

Class Diagram:



State Diagram:

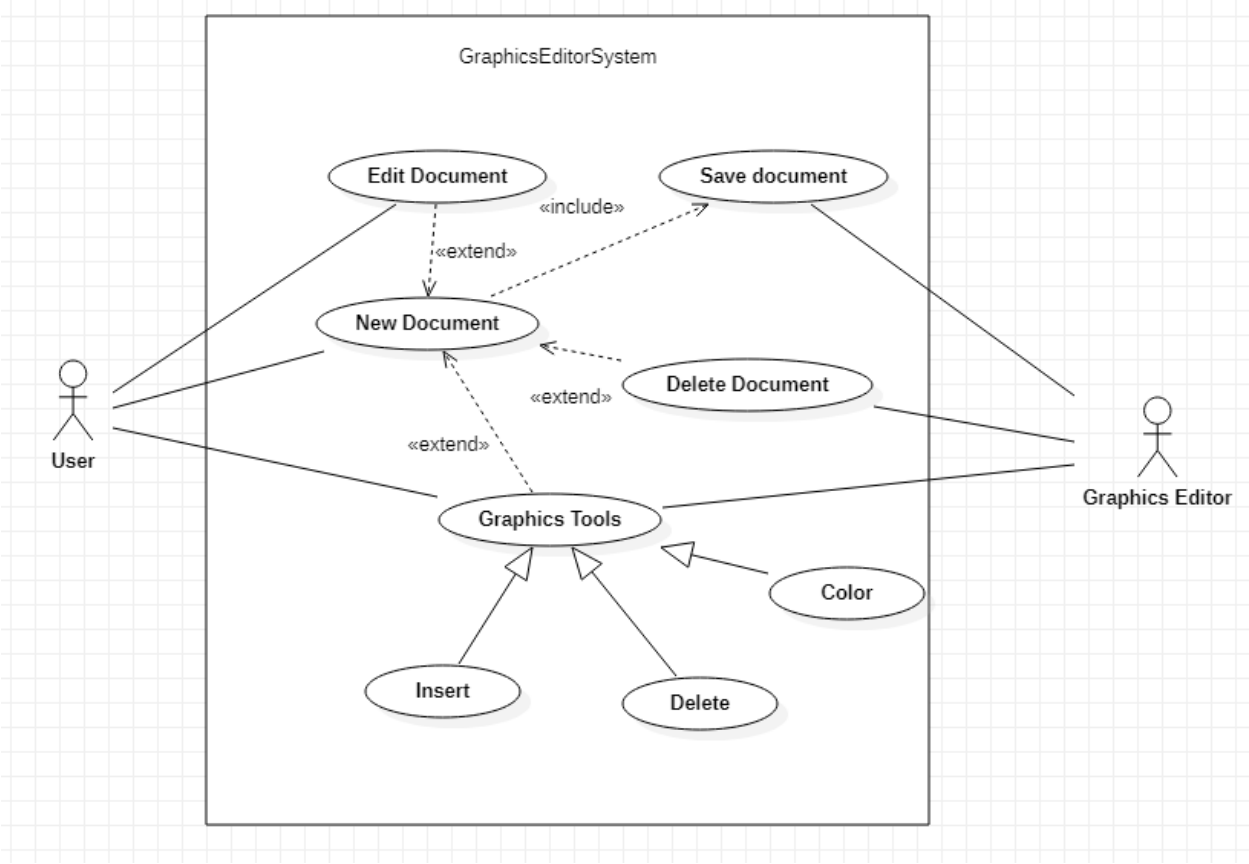


The advanced state diagram gives the states involved in making and

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

in their desired location.

Use Case Diagram:



Actors :

User: the person who uses the graphic system

Graphics Editor: manages the system

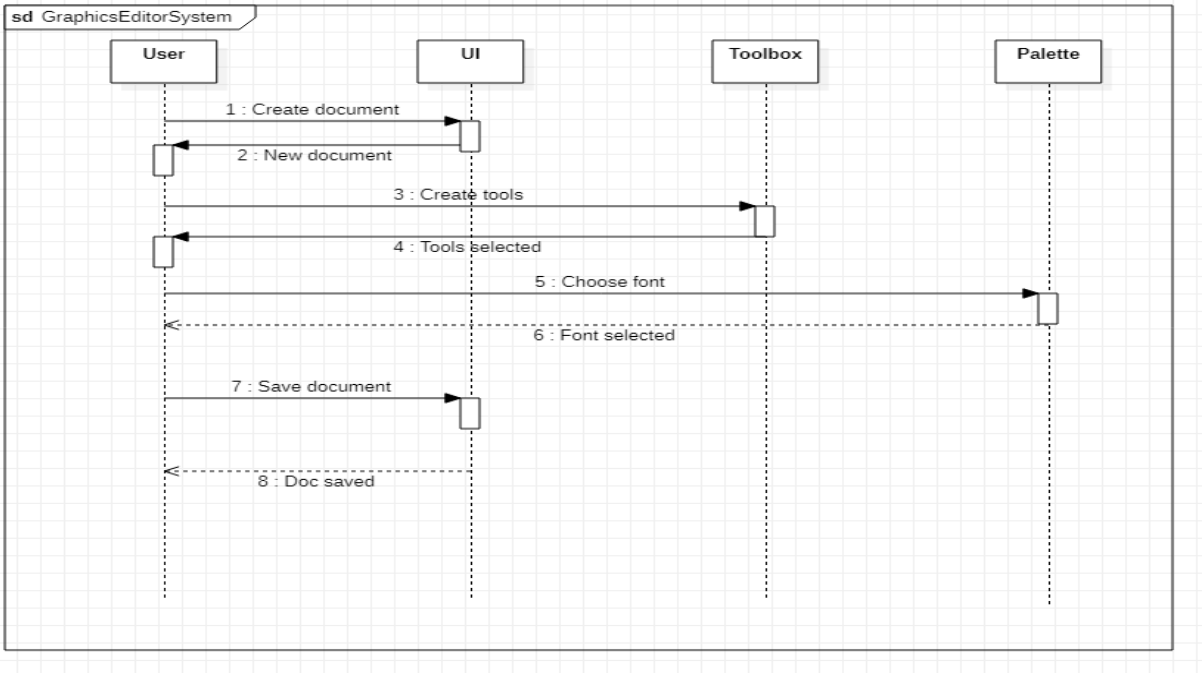
Use case:

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

Sequence Diagram:



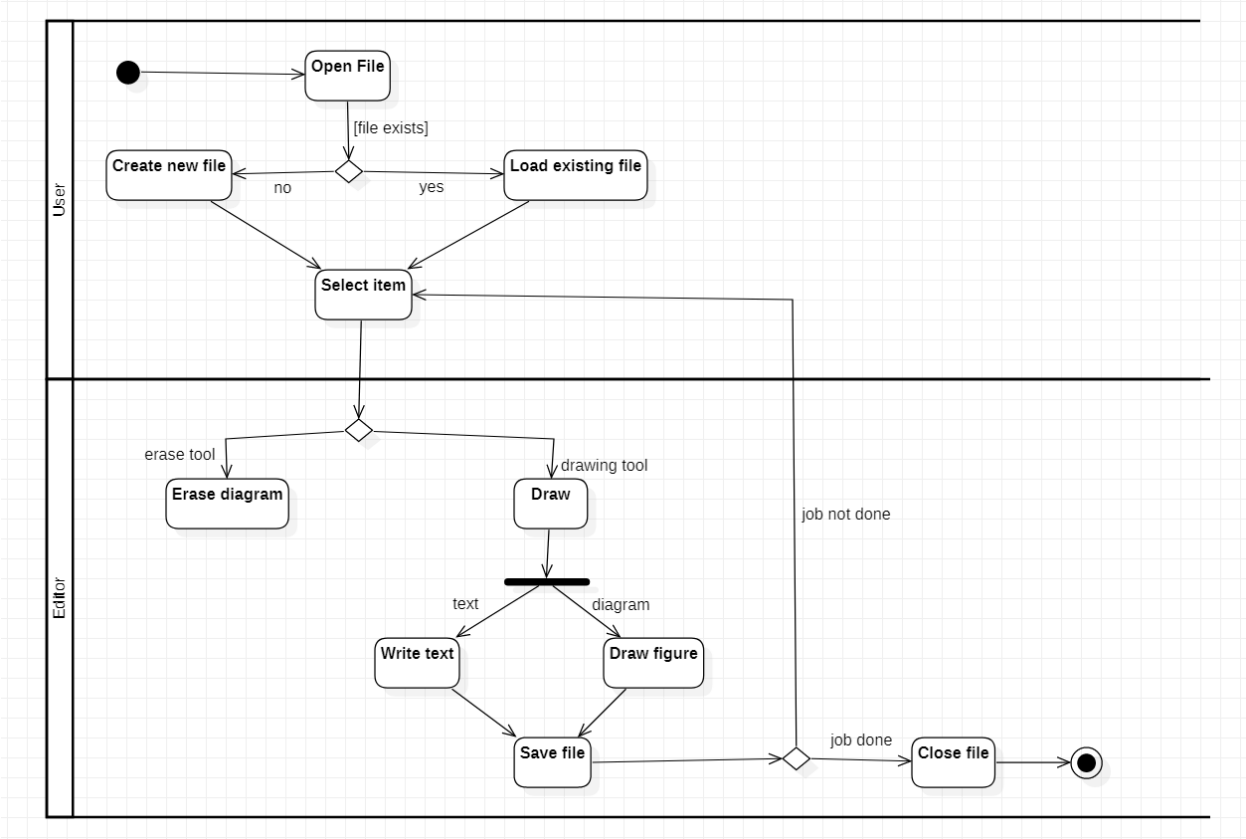
the graphics editor displays options to user
The user selects an option
The graphics editor displays shapes
The user selects a shape

Parameters are asked by the editor

User enters all the required parameter

The graphics editor displays the diagram

Activity Diagram:



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