System Requirement Specification (SRS)
Farm Management System

Group 05

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1. <u>Introduction</u>

1.1 **Purpose** :

This document is meant to delineate the features of FMS , so as to serve as a guide to the developers on one hand and a system validation document for the prospective client on the other. It will illustrate the purpose and complete declaration for the development of system. It will also explain system constraints, interface and interactions with other external applications along with all required diagrams. This document aims to provide concise description of system requirements, system feasibility and architecture of the proposed system.

1.2 **Acronyms and Abbreviations**

FMS   - Farm Management System.
SRS   - Software requirement specification.
SMS   - Short message service.
DBMS   - Database Management system.
POS   - Point of Sale.
CURD   - Create Update Retrieve Delete

1.3 **Domain Description**

Labuduwa farm is the one of government farm which is conducted by ministry of Agriculture. Many Kind of Vegetables and fruits are cultivated in this farm. So animal products and plant products are produced by farm. So anyone can buy these items through the farm shop. Registered farmers can auction their productions for farm shop. So Registered shop owner may order the farm productions. There is a Agriculture school that conducted by labuduwa farm . any farmer who interested to study about correct farming methods can enroll for those courses. After successfully completing the courses they may register under the farm as registered farmer. A few Green houses are maintained by Labuduwa farm to cultivate vegetables of up country.

1.4 **Limitations of current systems**

No proper
- Connection among shops, transportation methods, registered farmers and stores.
- Method of informing about course and registration.
- Method to create reports and analyze farm details**.**
- Method to ensure the safety and quality of food.
- Method to ensure whether goods are delivered on time to economy centers.
- Method to detect Temperature and Humidity of greenhouses.

No computerized method to create invoices**.**

1.5   Objectives & Goals

❖ To continue a better connection among Farm, shops, vehicles, stocks and ensure the safety and quality of food.

❖ Standardize and increase efficiency of **farm management process**

   Creating Report

   Detecting temperature and humidity of cultivations

   Deliver on time

Selling, storing, Loading and purchasing

1.6 Scope:

Scope of FMS can be divided into few sub scopes

- *Farm Manage(Admin) point of view-:*
  Admin should have an ability to add details about a new farm product and update existing details such as item code, price, and discount details. So there should be a proper method for accepting productions of registered farmers and also loading those things and farm productions in to farm store and farm shop. So admin should have ability to registration tasks of farmers and shops .then admin should have dashboard to join with the registered farmer's auctions and to verify registered shops owner's orders. Adding new course details and viewing registration's details of student should be done by system admin. Finally System should have a good ability to analysis farm business process and generate reports and detect Temperature and humidity of Green house of labuduwa farm.

- *Farm shop point of view-:*
  Point Of Sale system (POS) should have for cashier of farm shop to create invoices.

- *Registered Farmer point of view-:*
  A platform should be developed for registered farmers for auction their production for labuduwa farm and interface should have to view previous business details of them with labuduwa farm.

- *Registered shop point of view-:*
  The system should supply a interface for registered shop owners to order /perchance farm production online.(a mobile app)

In Scope:

- FMS for admin to manage whole process and generate reports.
- point of sale(POS) for Shop.

- Mobile app for online purchase/order.
- Course Registration.
- Temperature detecting of greenhouses.
- GPS Tracking of vehicles.

Out of Scope:
- Fuel detecting of transport vehicles.
- what are the payment methods of system.
- what are the special things to do.
- Emergency issue of transport.

Assumptions

- Users may enter valid details for fields where proper validation is not feasible such as signing up in the system and creating their profiles.
- Users will use either desktop computers and / or Smartphones with an internet connection with a sufficient bandwidth.
- The system is implemented on a dedicated server.
- Users will have enough knowledge to interact with the system

2. Feasibility Study

2.1 Technical Feasibility
- Internet bandwidth required.
- The Web Application can run on any web browser which supports HTML5.
- Database development will be based on MySql.
- Mobile Application will be developed using Android for any smartphone,minimum mobile OS version needed.
- IoT System will be developed using Arduino, Arduino board and sensors are required.

2.2 Operational Feasibility
- Web application provide the ability for farm manager to Create Report, Manage courses and registered farmers, detect temperature & humidity of green houses, ensure that vegetables are delivered on time and issue items for farm shop.
- Web application provide the ability for Registered farmers to auction their products to farm shop.
- Point Of Sale system provide the ability to create bills & invoices.
- Mobile application provide the ability for registered shops to order or purchase vegetables online.

2.3 Resource Feasibility

Computers, Smart phones and other resources are required to develop web application and mobile application. Half Size Breadboard, ESP12E (Node MCU) Development Board , Micro USB Cable, 10k Resistor, DHT11 Temperature and Humidity Sensor are required to read temperature of Greenhouse.

2.4 Economic Feasibility

- There are no any significant cost in developing the System along with the Mobile Application
- For iot based temperature detecting system -:
  - ESP12E (Node MCU) Development Board - 1,323.32LKR
  - DHT11 Temperature and Humidity Sensor - 752.350LKR
  - Micro USB Cable - 547.514LKR
  - Half Size Breadboard - 542.794LKR

2.5 Legal/Ethical Feasibility

- We will ensure that the project undertaken will meet all legal and ethical requirements.
- Sensitive information will not be published to the outside world by the system.
- Correct Standards and Procedures will be followed in developing the System.

2.6 Risks

- Nothing is safe on the internet. Therefore there is a risk of data leaks.
- After few years the databases might grow big and affect the overall performance of the system

2.6 Schedule Feasibility
Development Methodology

| Product Backlog | Sprint Backlog | Sprint | Working increment of the software |

Project Plan

Task	Timeline (Month – Week)
Project Identification	March – Weeks 2–3
Client Meeting	March – Week 4
Project Proposal	April – Weeks 1–3
Feasibility Studies	April – Weeks 2–4
Client Meeting	April – Week 4
Use Case Modeling	May – Weeks 1–2
SRS Completion	May – Week 3
System Design Architecture	June – Weeks 1–2
Class Diagrams	June – Week 2
System Design Specification	June – Week 3
Client Meeting	June – Week 4
UI Design	May Week 4 / June Week 1; July – Weeks 1–2
UI Implementation	June – Weeks 2–3; July – Weeks 1–2
Database Design	June – Weeks 2–3; July – Weeks 1–2
Client Meeting	
Temperature and humidity detecting system development	August – Weeks 2–3
Web app development	June – Weeks 3–4
Mobile app development	August – Weeks 1–3
Testing	September – Weeks 1–3; October – Weeks 1–3
Feedback	May – Weeks 1–2; July – Weeks 1–3; September–October

3.0 Deliverables

- Web Application
- Mobile Application
- User Manuals

4.0 Requirement

4.1 Functional Requirement

Web Application

- Add and Update details of Productions.
- Load Items to the Shop and Vehicles (economy centers).
- Store Farm products and registered farmers' products.
- Farmers' registration.
- Shops registration.
- View bill details, shop details and stores details.
- Add and view courses.
- Register courses.
- Send massages for farmers who registered courses.
- POS(Billing) system for shop.
- Generate Report.
- Filter analysis data.
- Hand over goods which were purchased online for registered shop.
- Make and Cancel Orders online.
- View the temperature, humidity of Greenhouses.

Mobile Application

- Purchase the vegetables online by registered shops
- View the location of the transport vehicles.
- View order details, store details and stocks details
- Make and Cancel Orders

4.2 Non-Functional Requirements

- Availability:
  - ✓ The system should be available for service when requested by end users.

- Maintainability:
  - ✓ The system must be allowed the changes to functionalities.

- Security:
  - ✓ Unauthorized persons can't access the system. ☐ System will use secured database.

- Usability:
  - ✓ System should be user friendly.

- Performance:
  - ✓ The performance of the system should be fast and accurate.
  - ✓ Increase the number of operations performed per second.
  - ✓ The system should be able to handle large amount of data.

- Reliability:
  - ✓ The system will be able to process all work correctly and completely without being aborted.
  - ✓ System should be able to handle errors and prevent loss in data.

- Safety:
  - ✓ The system should have ability to restore functions and data in the event of a failure.
  - ✓ The details need to be maintained properly.

4.3 Stakeholders

Admin -
  Registered farmers- Farmers who have completed courses successfully. They may auction their product for farm.
Registered Shop - Shops which have registered to order/ purchase items online
Student(other users) - to view shop and register courses of farm school.

5.0 Proposed System's Architecture

High-level Architecture
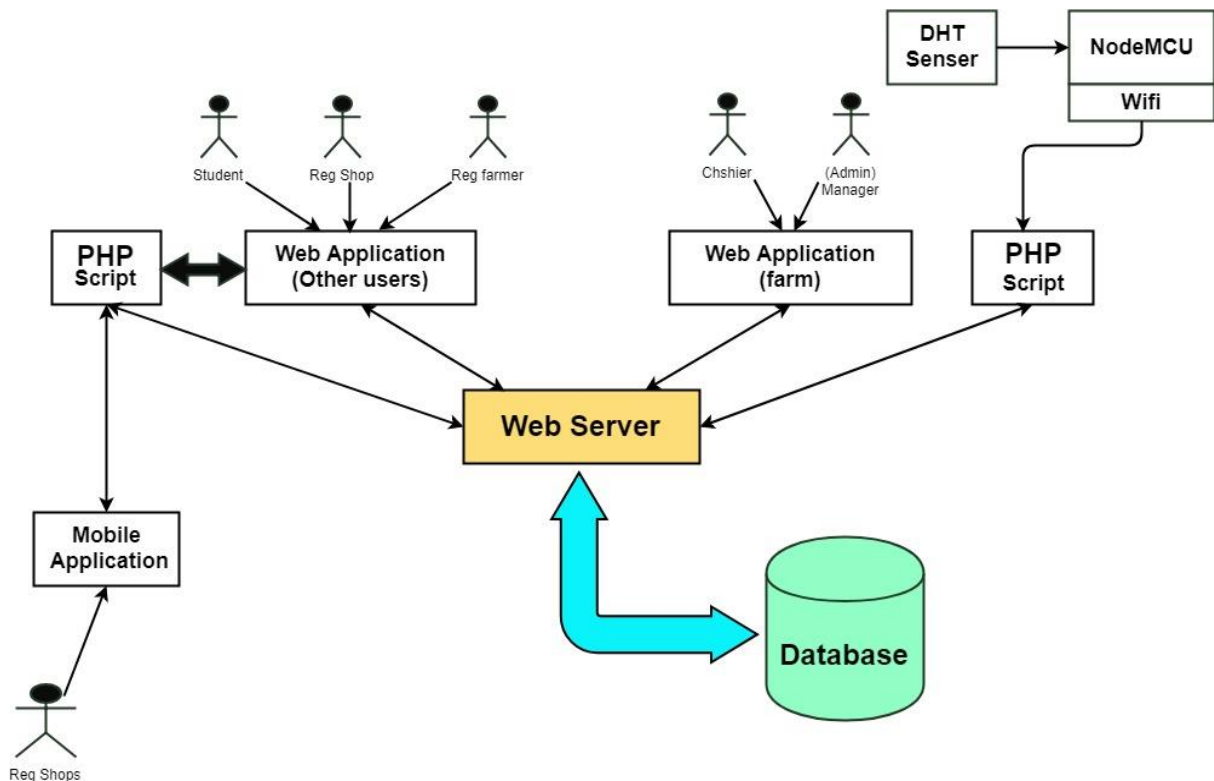
Both the Web application and Mobile application will follow MVC architecture.

Web application
> The web application would be built using free and open source software such as:
> PHP, HTML, CSS, Bootstrap ,Angular js, and MySql.

IOT System
> Arduino(using C programing)

Mobile Application
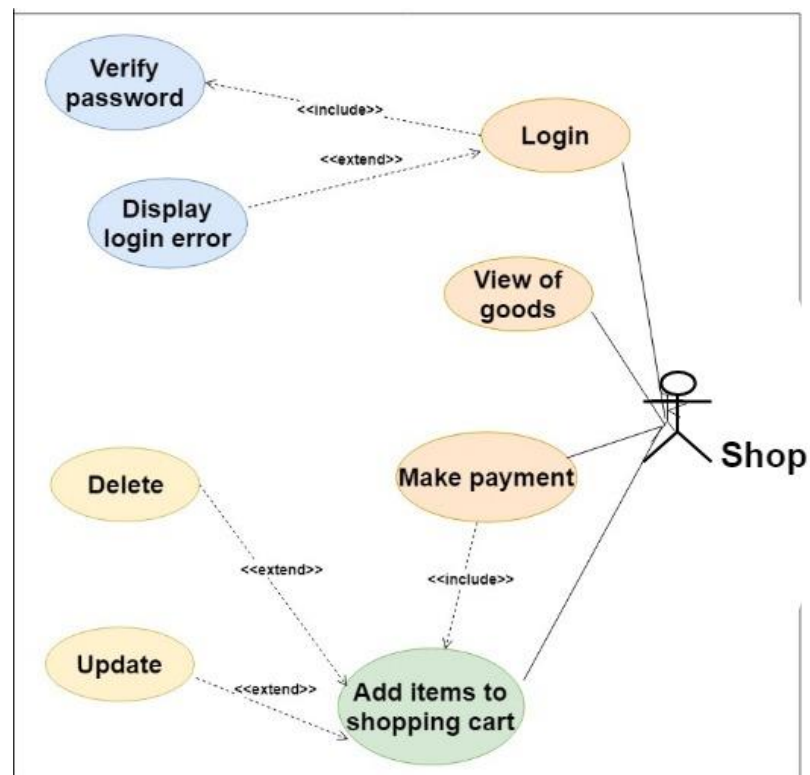> The mobile application would be developed using android studio and Java

Database Design
> We would be using MySQL to build and serve our database, because it is free, and it
> has a relatively better performance when performing CURD operations.

6.0 System Design

Admin use case

Farm Shop

Registered shop
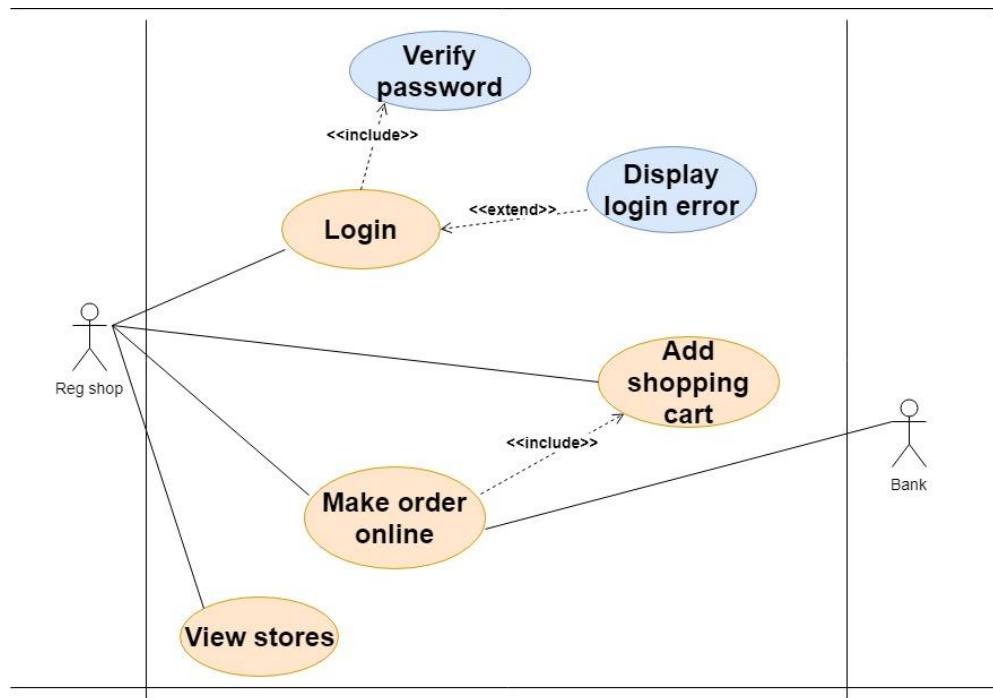
Registered Farmers and other Users
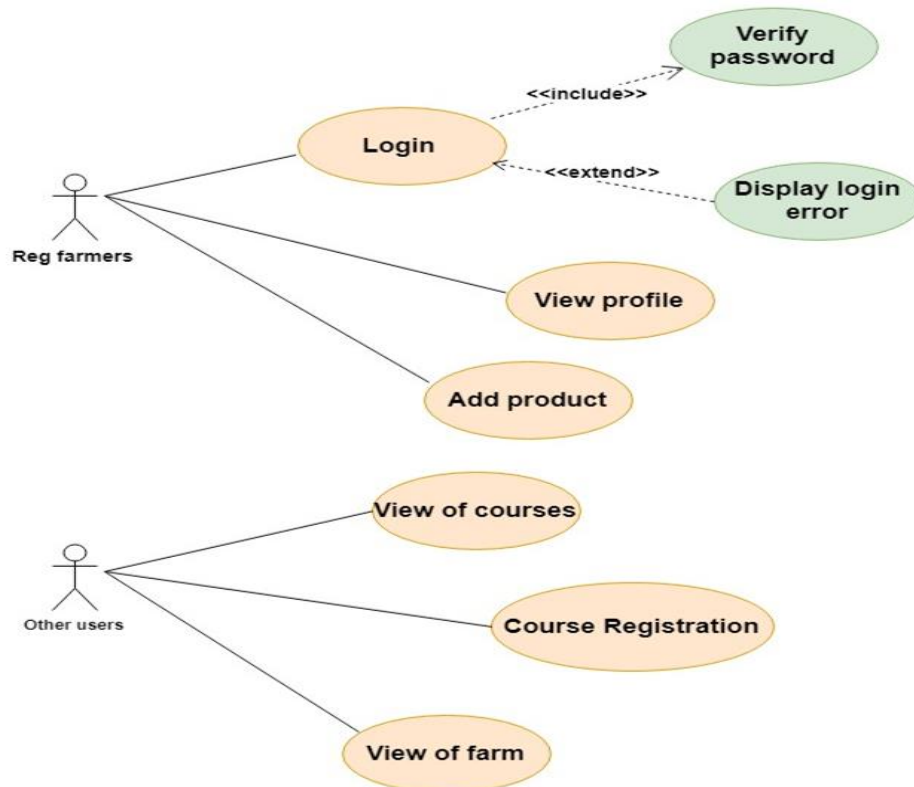
Final use case diagram
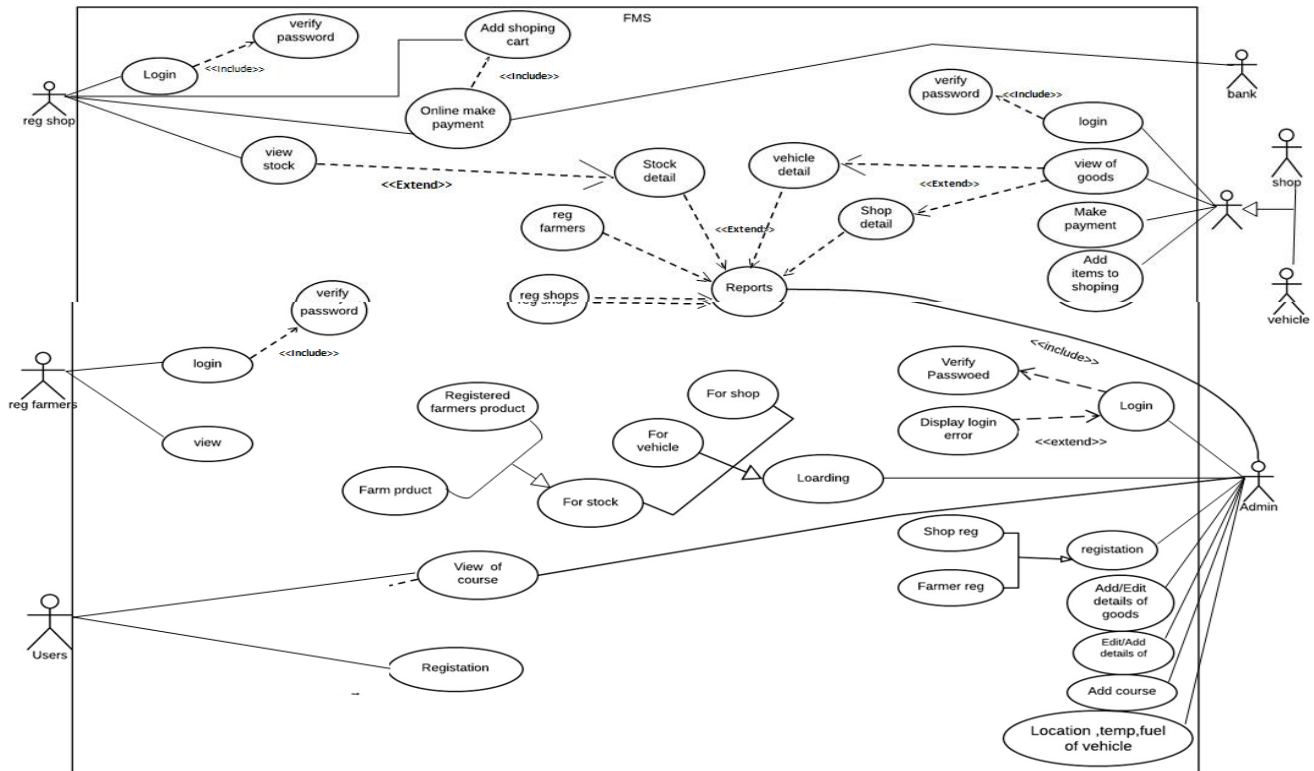
Use case narrative

Use Case Name	Login(Admin)
Use case ID	0001
Brief description	Admin can login system by giving correct username and password
Primary Actors	Admin
Other participating Actors	None
Other interested Stakeholders	None
Pre-Conditions	Admin should have correct username and password
Post-conditions	Dashboard is opened for system tasks

Use Case Name	Add and Edit details of shop
Use case ID	0002
Brief description	1. Add details of new farm productions (price,code,Name,Discounts) 2. Update/Remove current existing details.
Primary Actors	Admin
Other participating Actors	None
Other interested Stakeholders	Customer, cashier of farm shop
Pre-Conditions	Admin should have login to the system
Post-conditions	Cashier of farm shop , customer of farm shop ,online buyer can view these details.

Use Case Name	Farmers Registration
Use case ID	0003
Brief description	Farmers who have completed essential condition then they can register under the farm.
Primary Actors	Admin
Other participating Actors	Farmer
Other interested Stakeholders	None
Pre-Conditions	None
Post-conditions	Farmers can auction their production for form shop through the webApp.

Use Case Name	Shop Registration
Use case ID	0004
Brief description	Admin or shop can register shop under the farm then shop owner can order or perchance farm production online.

Primary Actors	Admin , shop owner
Other participating Actors	None
Other interested Stakeholders	None
Pre-Conditions	None
Post-conditions	Reg shop can order or perchance items online.

Use Case Name	Loading for shop
Use case ID	0005
Brief description	Farm production can be load from store to farm shop
Primary Actors	Admin
Other participating Actors	None
Other interested Stakeholders	Cashier of farm shop
Pre-Conditions	None
Post-conditions	Farm shop database will be updated from new items which were issued by farm store.

Use Case Name	Loading for store
Use case ID	0006
Brief description	Farm productions and registered farmers productions can be added in to farm store.
Primary Actors	Admin
Other participating Actors	Registered farmers
Other interested Stakeholders	None

Pre-Conditions	None
Post-conditions	Items can be issued for farm shop or registered shop owner's orders.

Use Case Name	View courses
Use case ID	0007
Brief description	1. A registration form is supplied for anyone who wants to register for courses which are conducted by farm. 2. Registration details of students can be gotten for admin
Primary Actors	1. Anyone who want to register 2. Admin
Other participating Actors	None
Other interested Stakeholders	None
Pre-Conditions	Student should login to the system.
Post-conditions	Verification email will be sent.

Use Case Name	Add Course
Use case ID	0008
Brief description	Admin can add course details to the site.
Primary Actors	Admin
Other participating Actors	None
Other interested Stakeholders	Student(Anyone who wants to enroll courses)
Pre-Conditions	None
Post-conditions	None

Use Case Name	Temperature and humidity detecting system
Use case ID	0009
Brief description	Admin can detect humidity and temperature of each Green houses.
Primary Actors	Admin
Other participating Actors	None
Other interested Stakeholders	None
Pre-Conditions	WiFi connection should be available for Node MCU
Post-conditions	None

Use Case Name	Reports
Use case ID	0010
Brief description	Financial Reports are generated by system from analyzing business details.
Primary Actors	Admin
Other participating Actors	None
Other interested Stakeholders	None
Pre-Conditions	None
Post-conditions	None

Use Case Name	Make Order online
Use case ID	0011
Brief description	Reg shop owners can make order of farm productions online. Registration and verification may be done by admin.
Primary Actors	Reg farmer

Other participating Actors	Admin
Other interested Stakeholders	None
Pre-Conditions	Reg shop owners should login to the system.
Post-conditions	None

Class diagrams
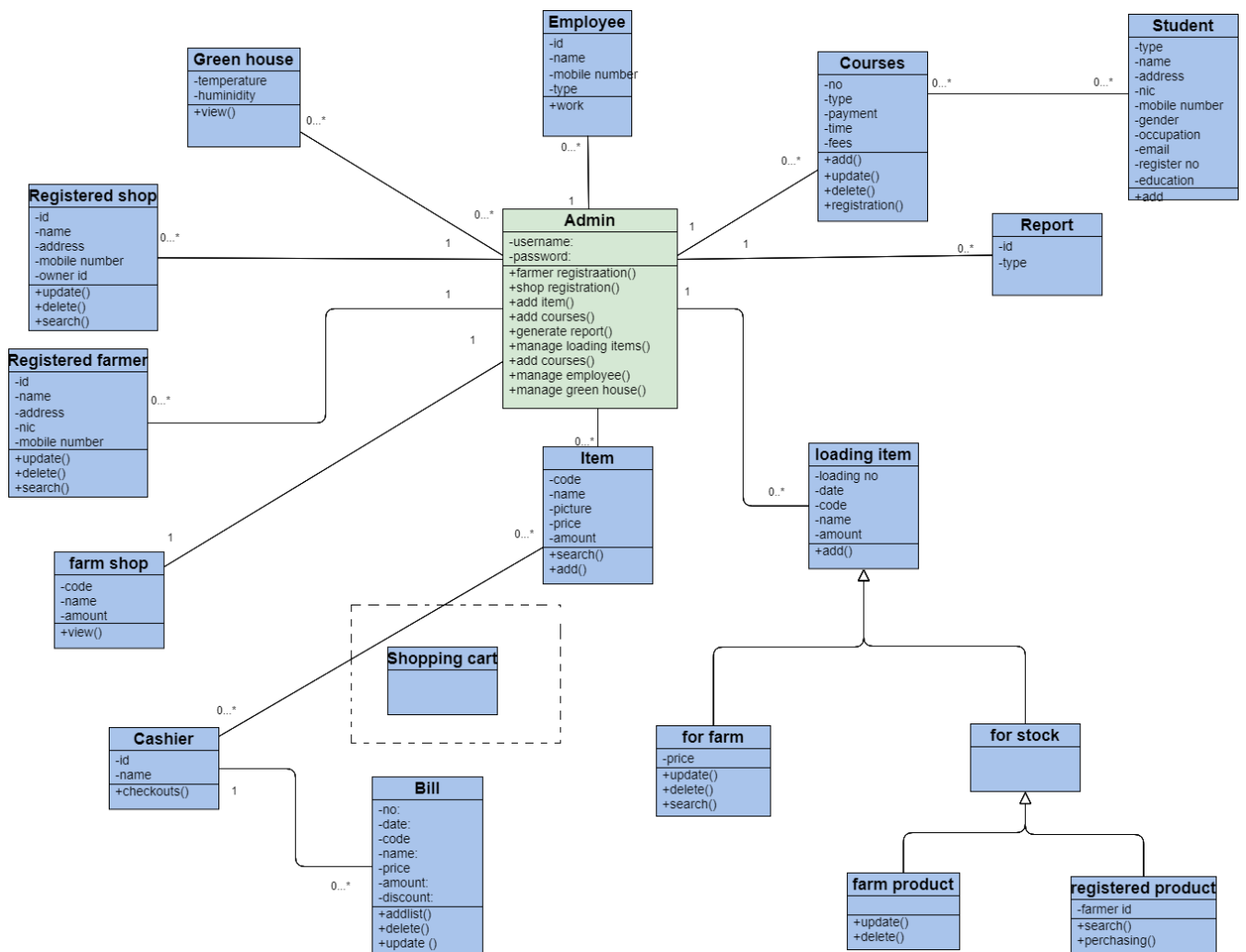
Components and their responsibilities

Point of sales system	To create Bill for form shop. To give Invoices for registered farmers when accepting their productions.
Online ordering system	to order farm production for registered shops
Online purchasing system	To purchasing farm production for registered shops.
Course registration system	Used to register for courses which are conducted by farm.
Report generating system.	Used to generate reports monthly, annually.
Registration system (farmer,shop)	1) Register farmers as a supplier of farm shop. 2) Register shops as buyer of farm product.
Temperature detecting system.	to detect the temperature inside Green houses
Humidity detecting system	To detect the humidity inside Green houses.
Product auction system.	For registered farmer to sell their production for farm.

Component Interactions
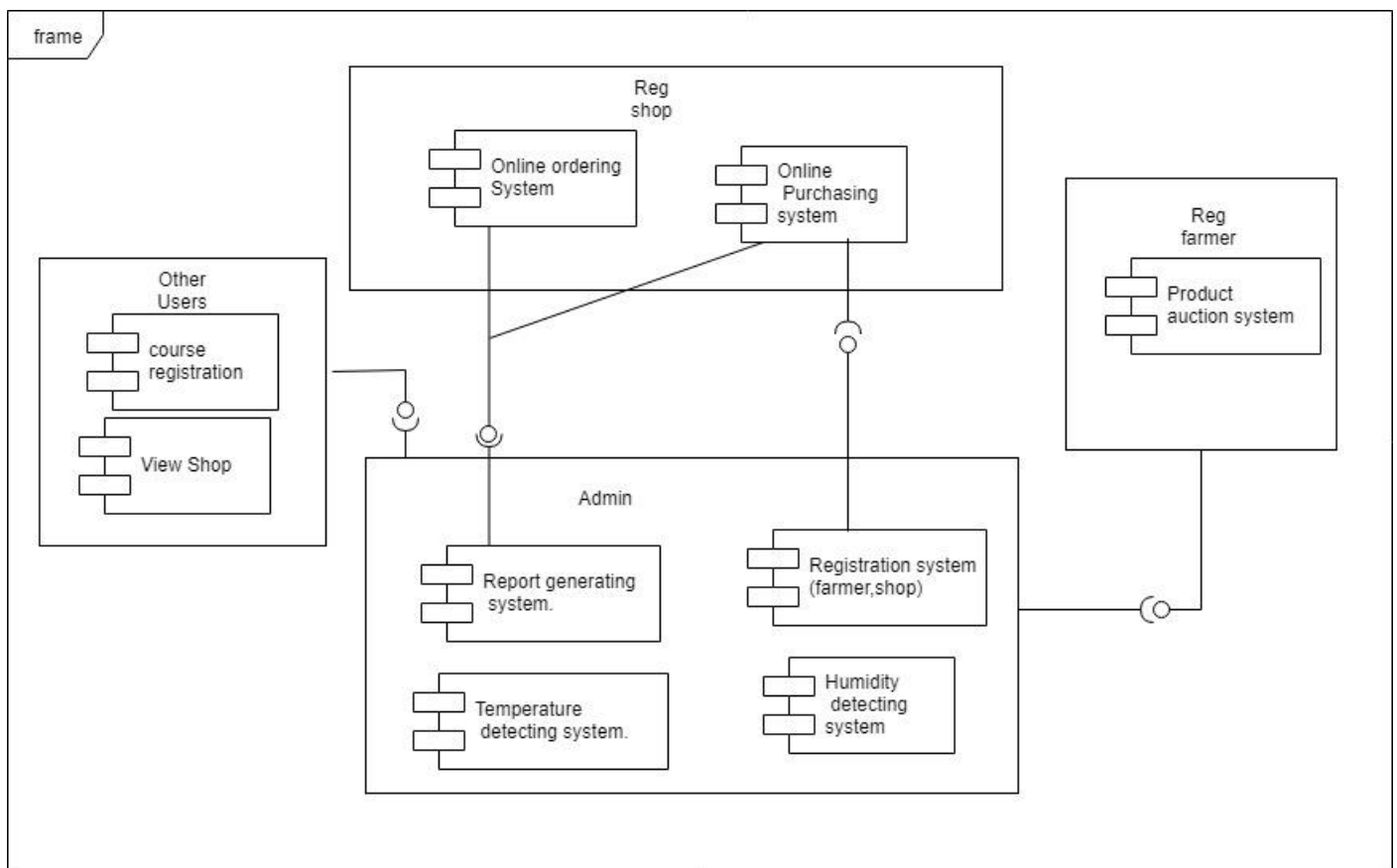
1. System's Design

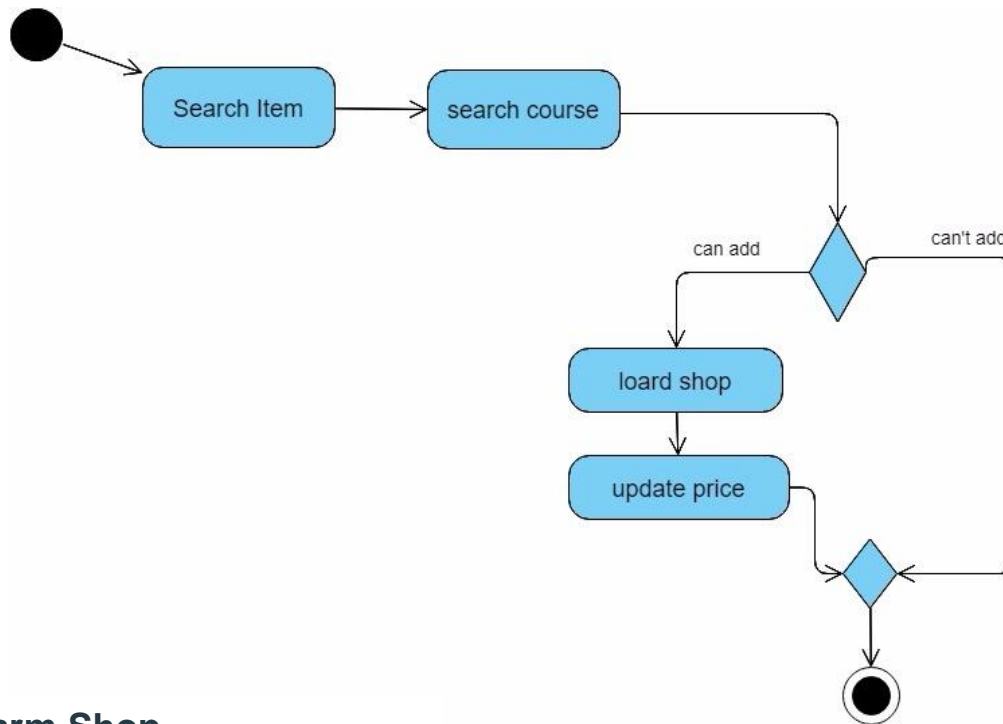## Sequence diagrams
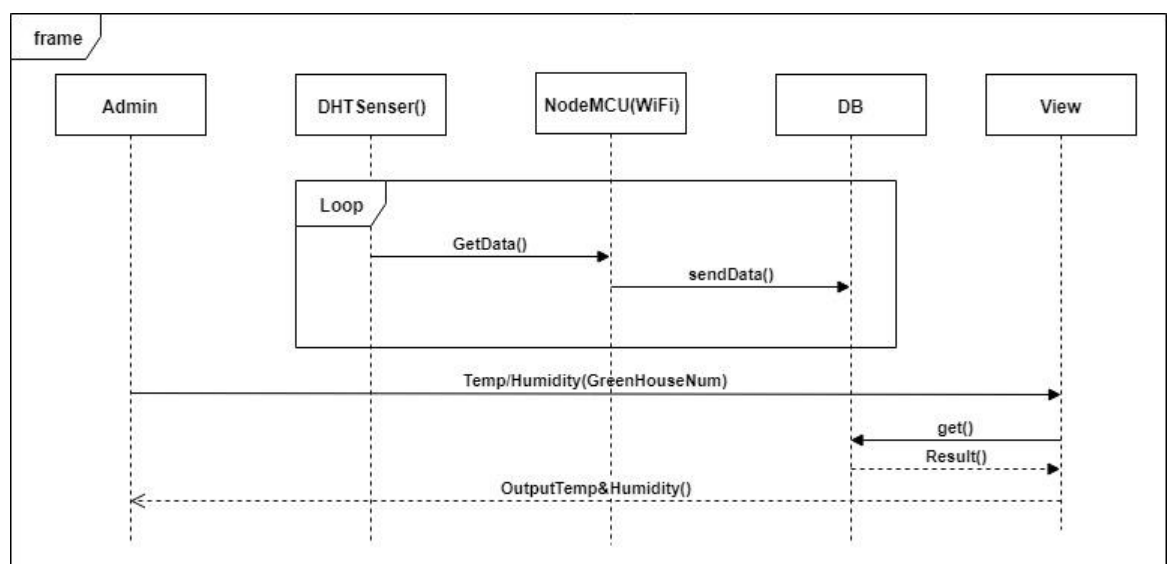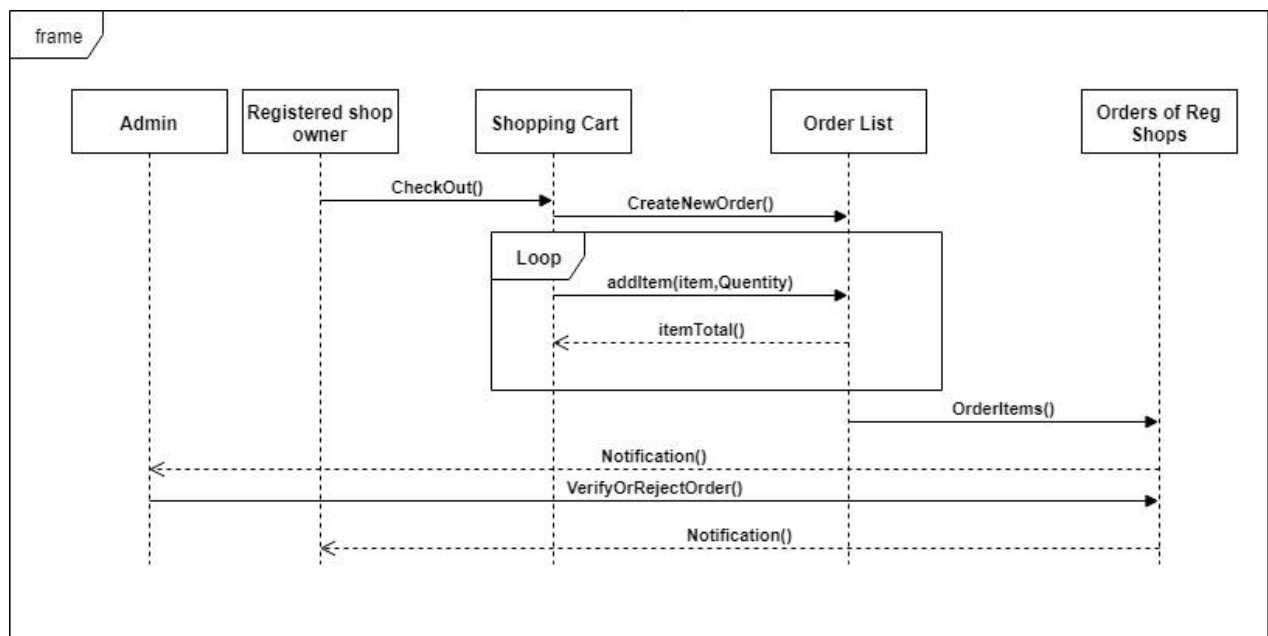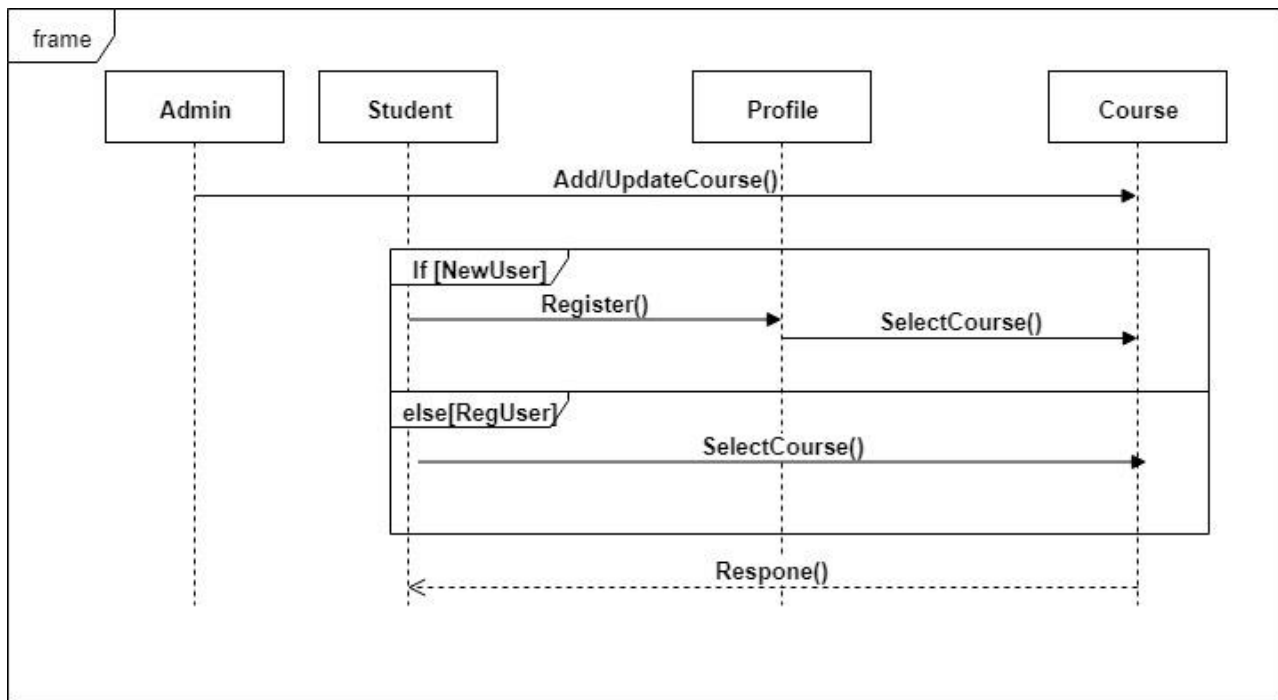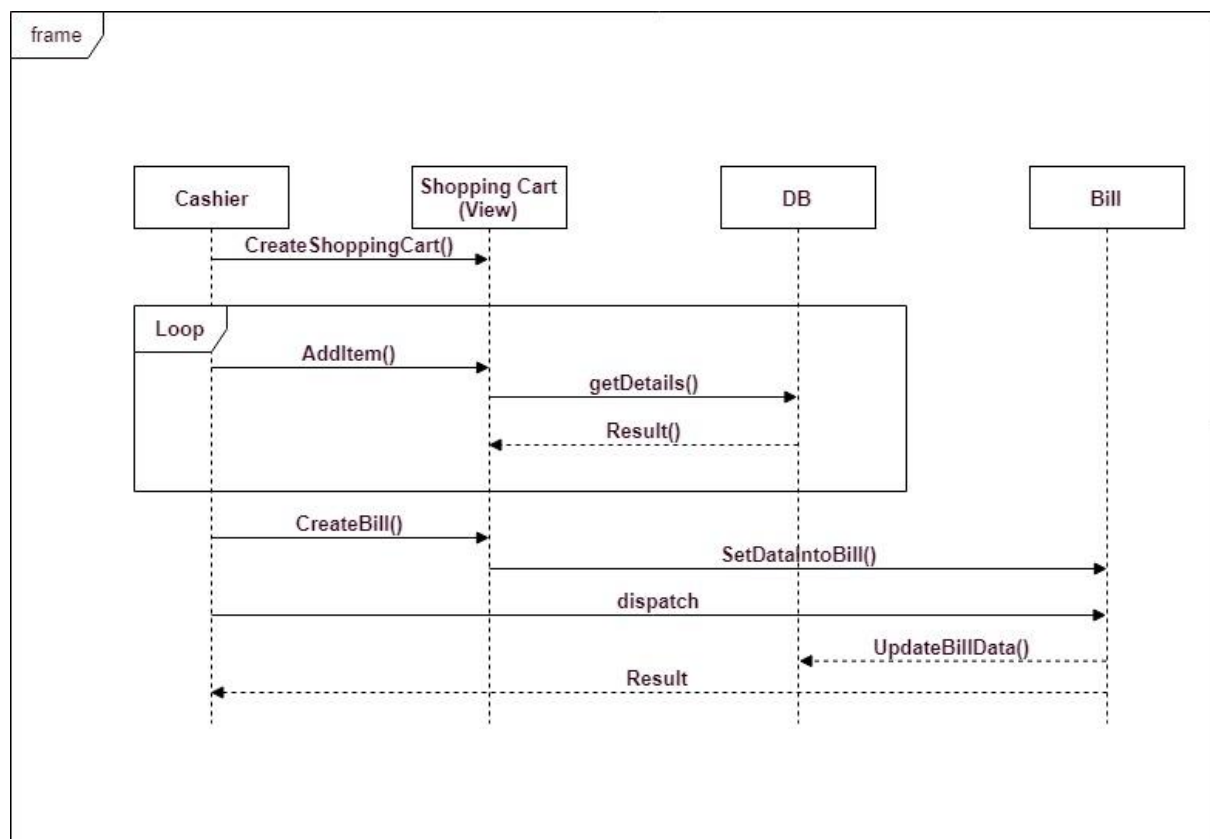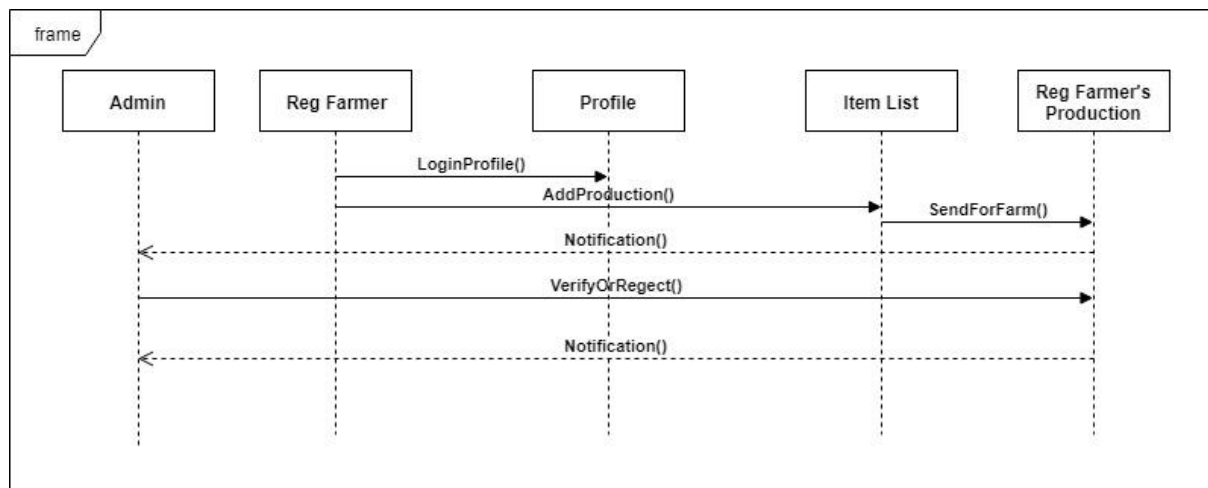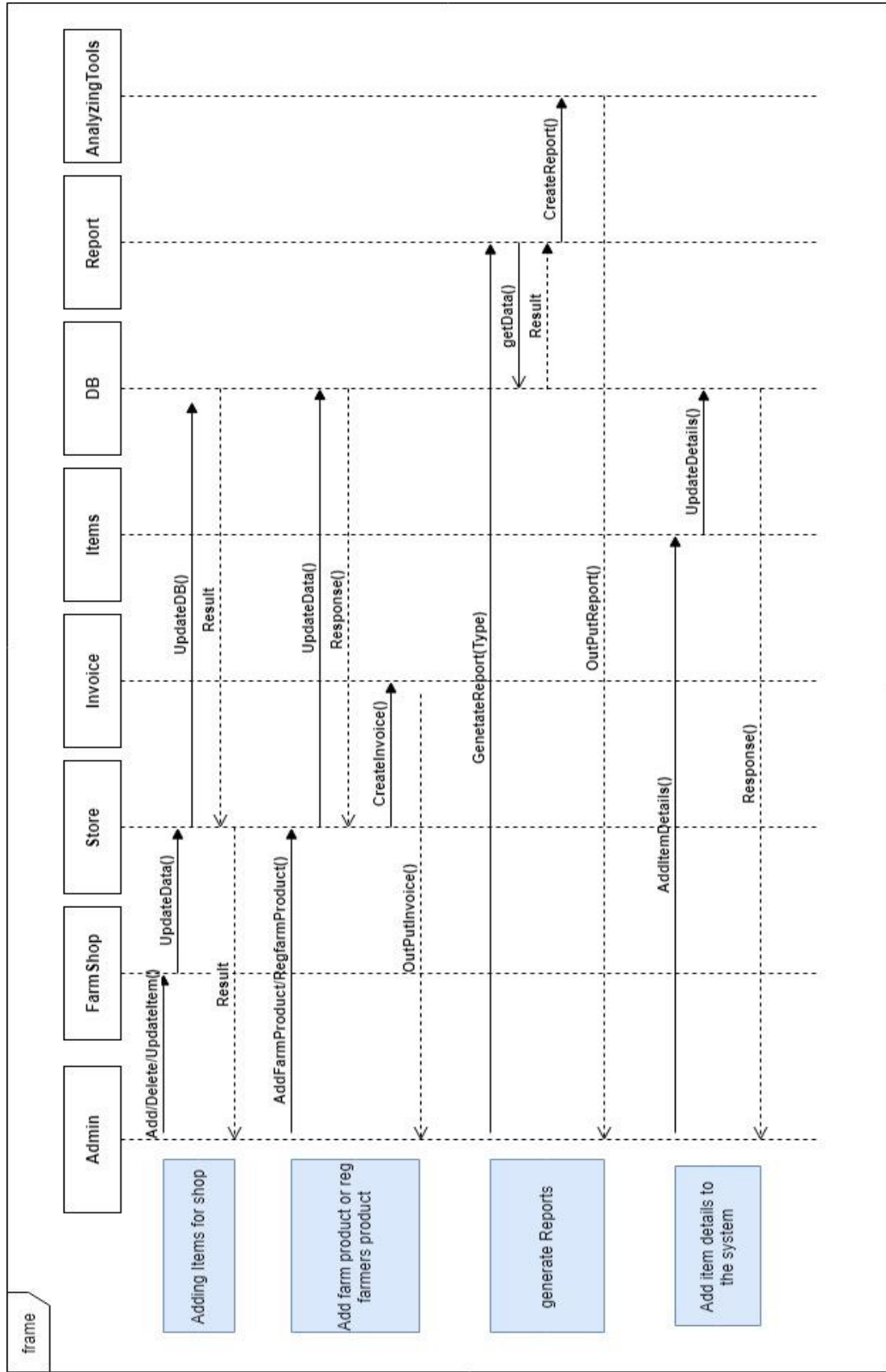
Activity diagram
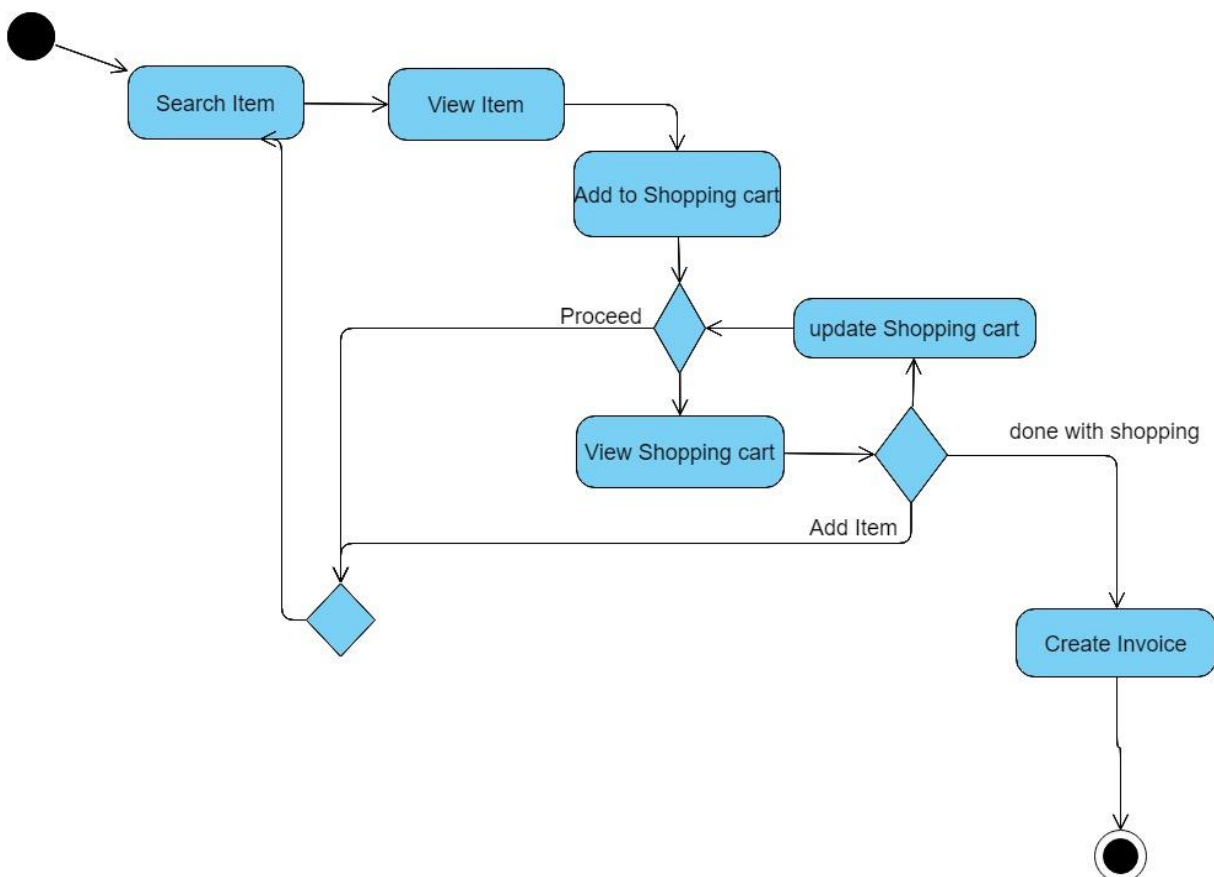
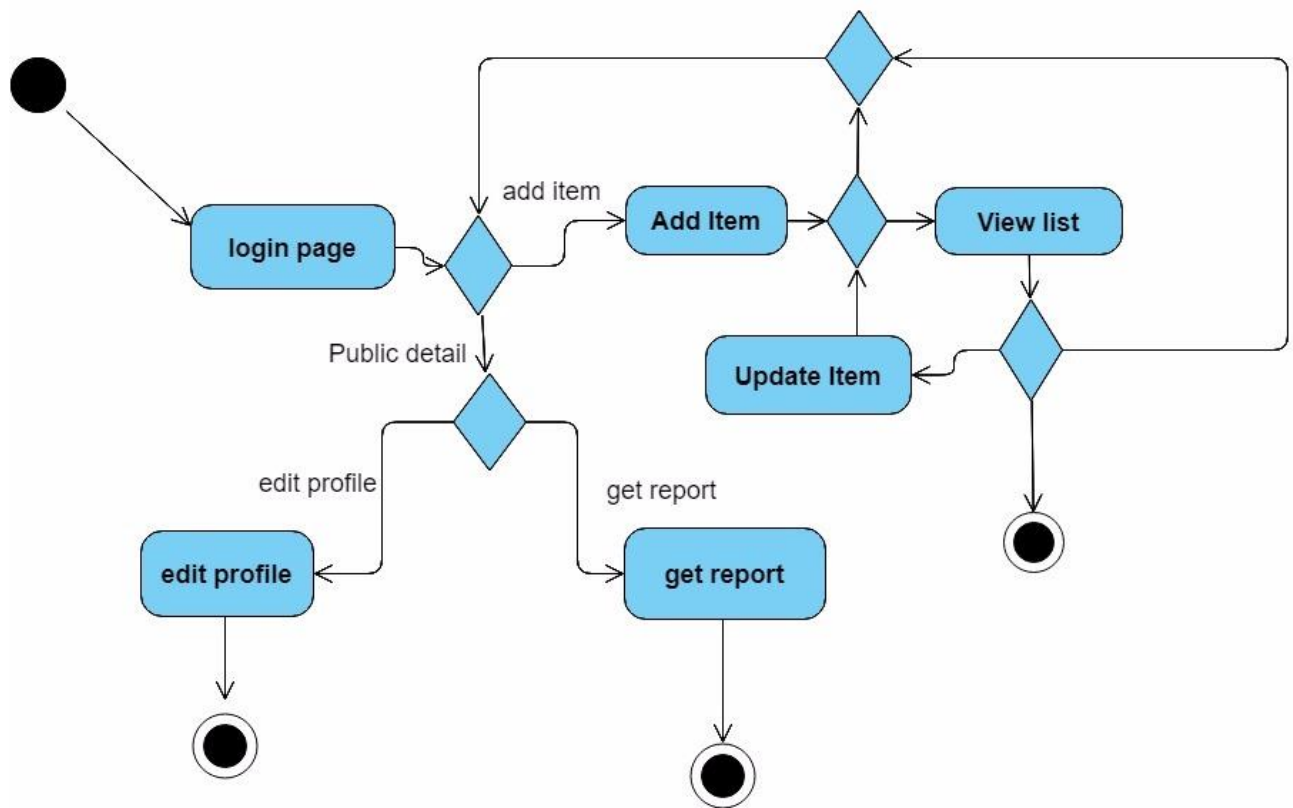### Online Ordering – Registered shop
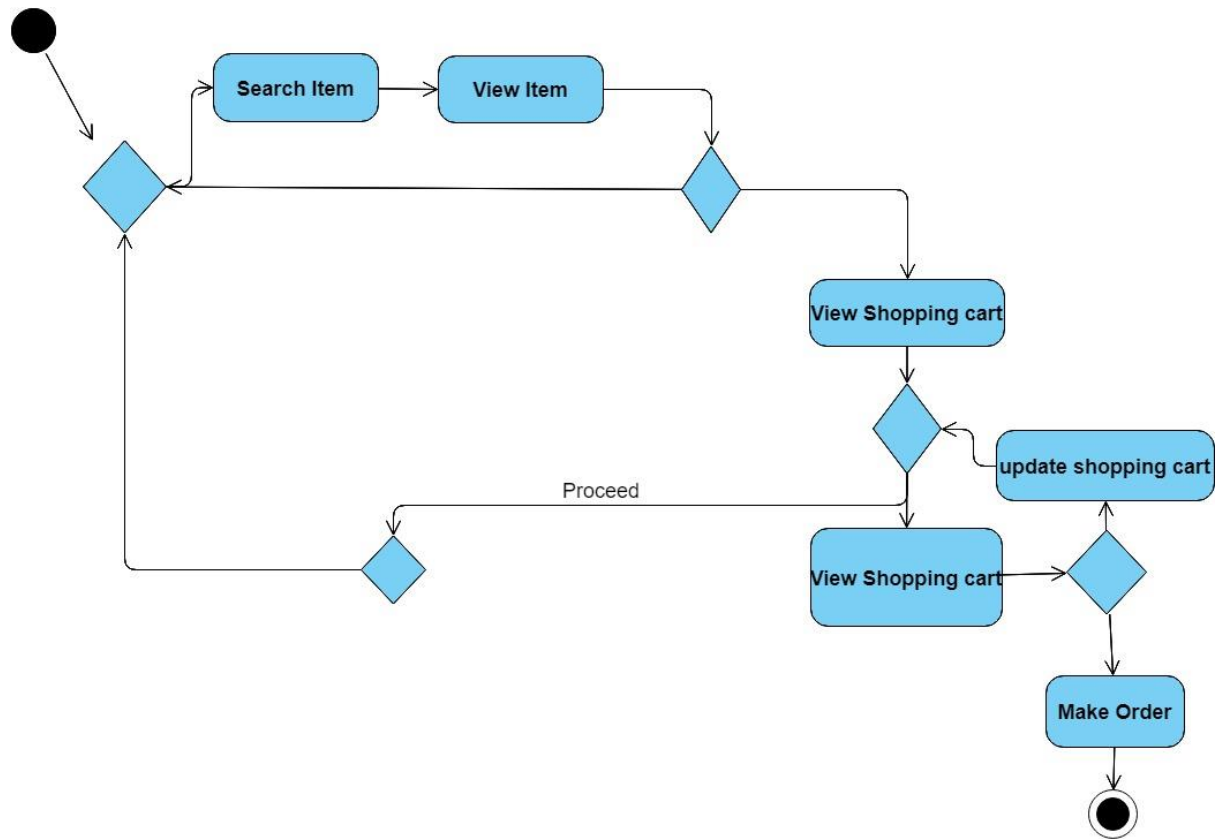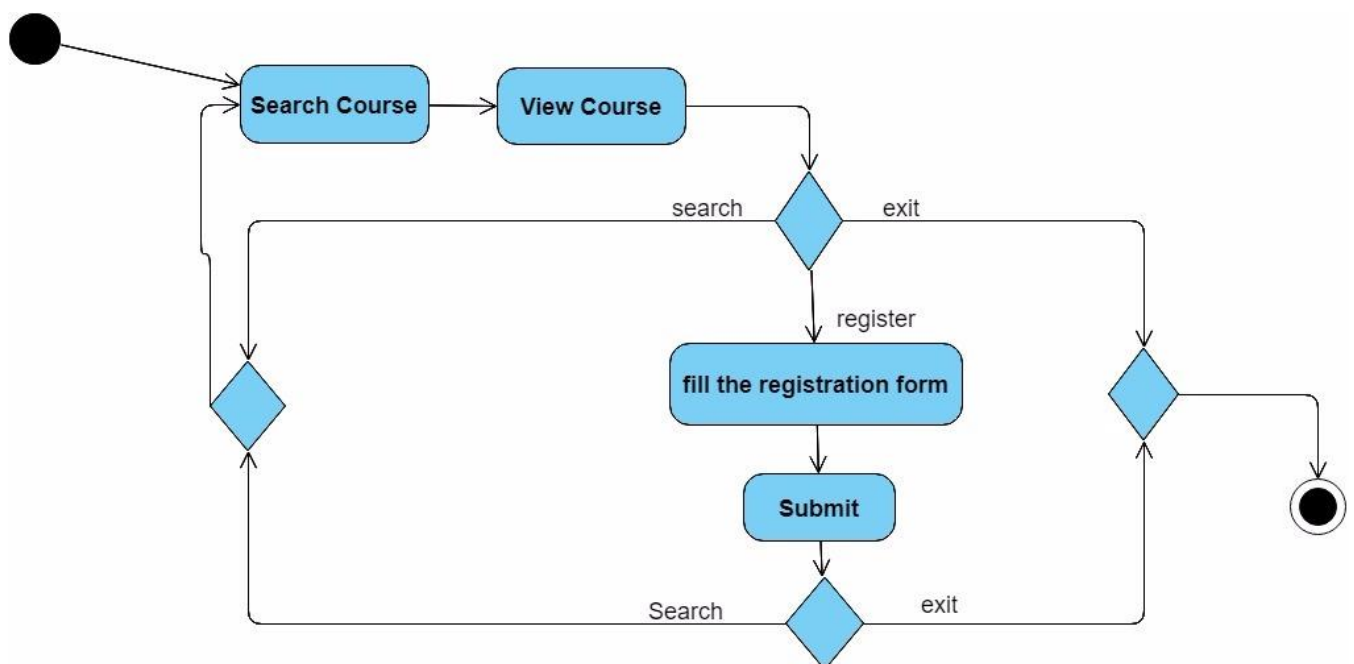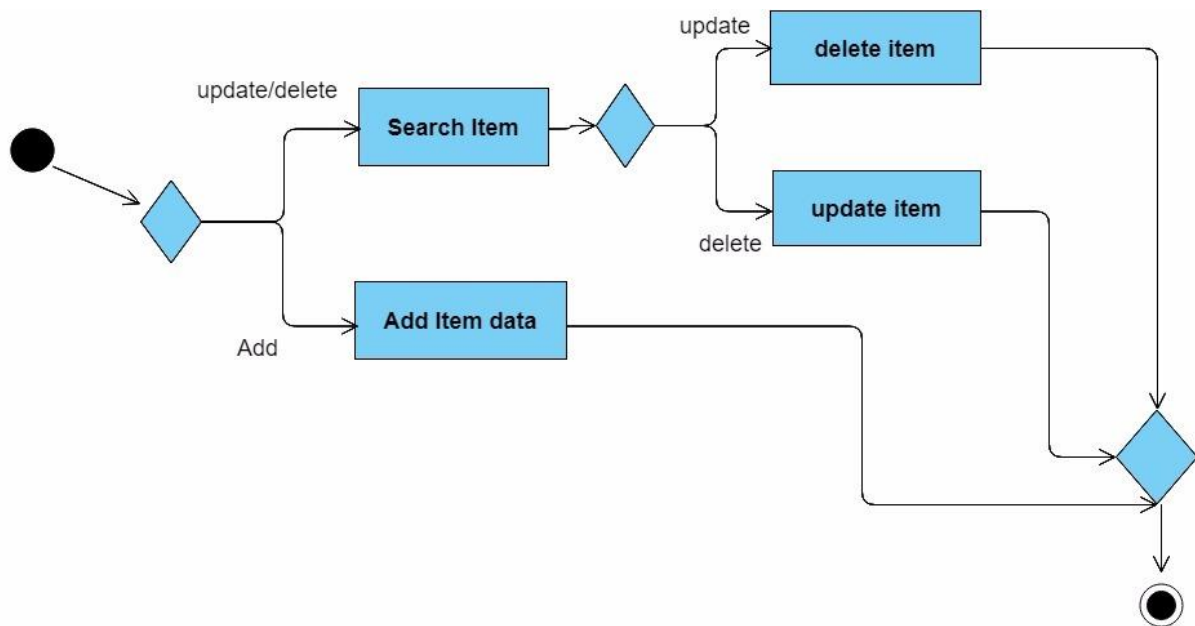

Temperature & humidity
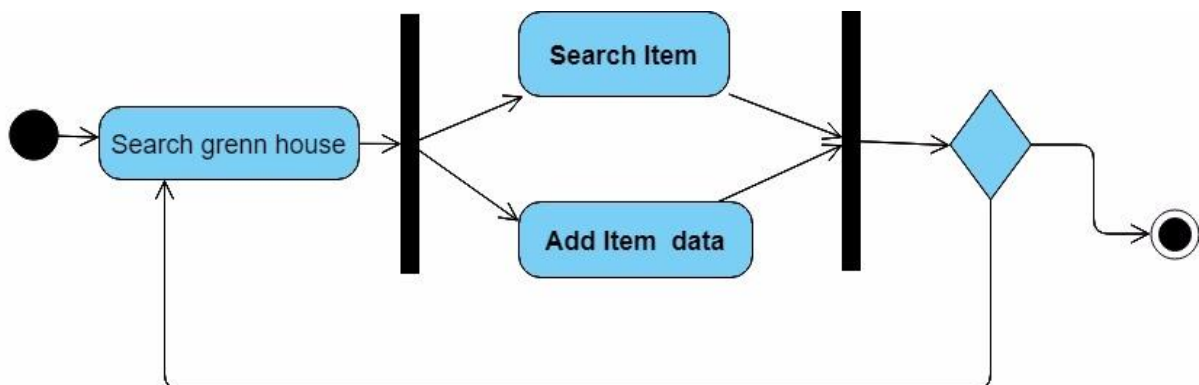
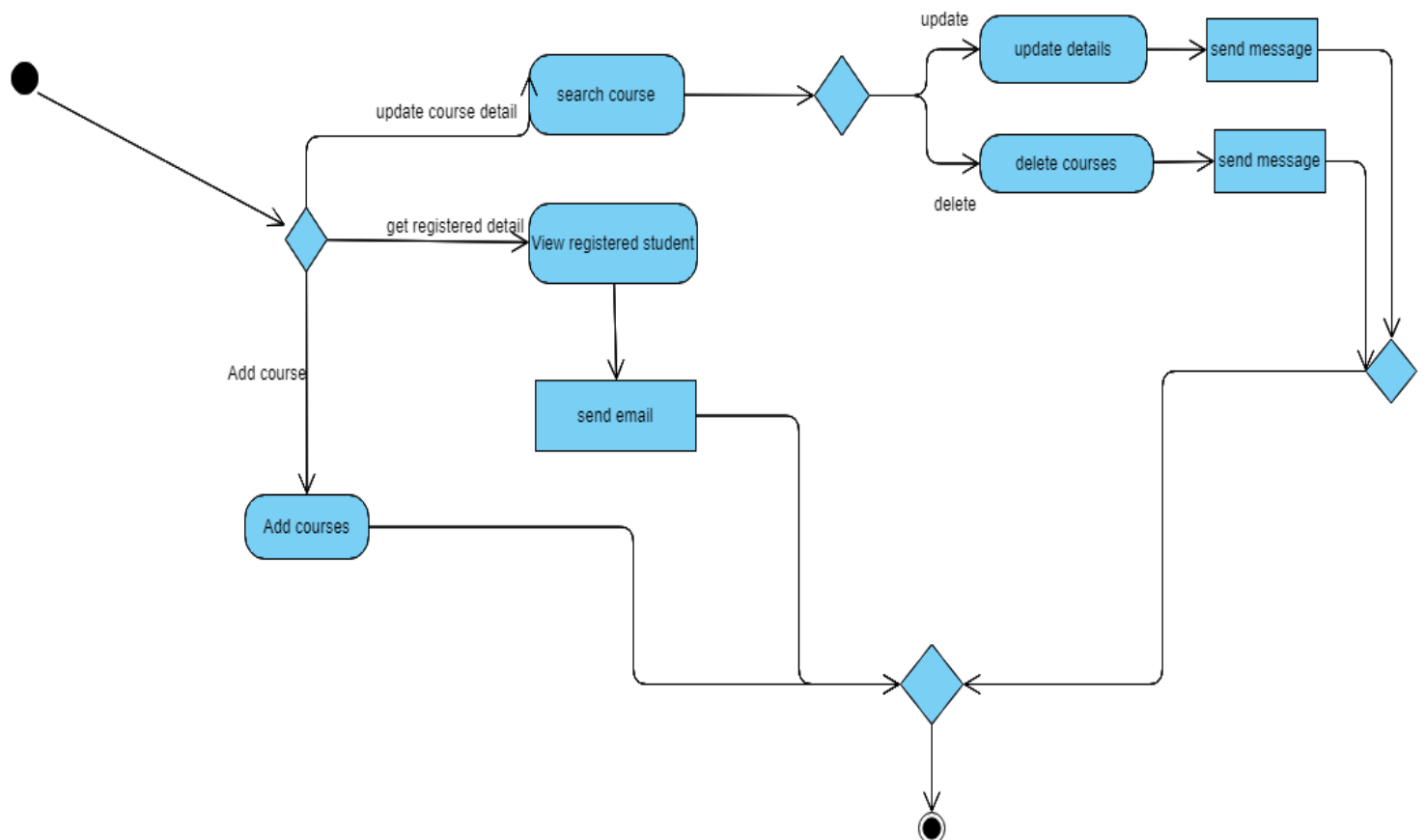## Add item to the shop

Farm Shop
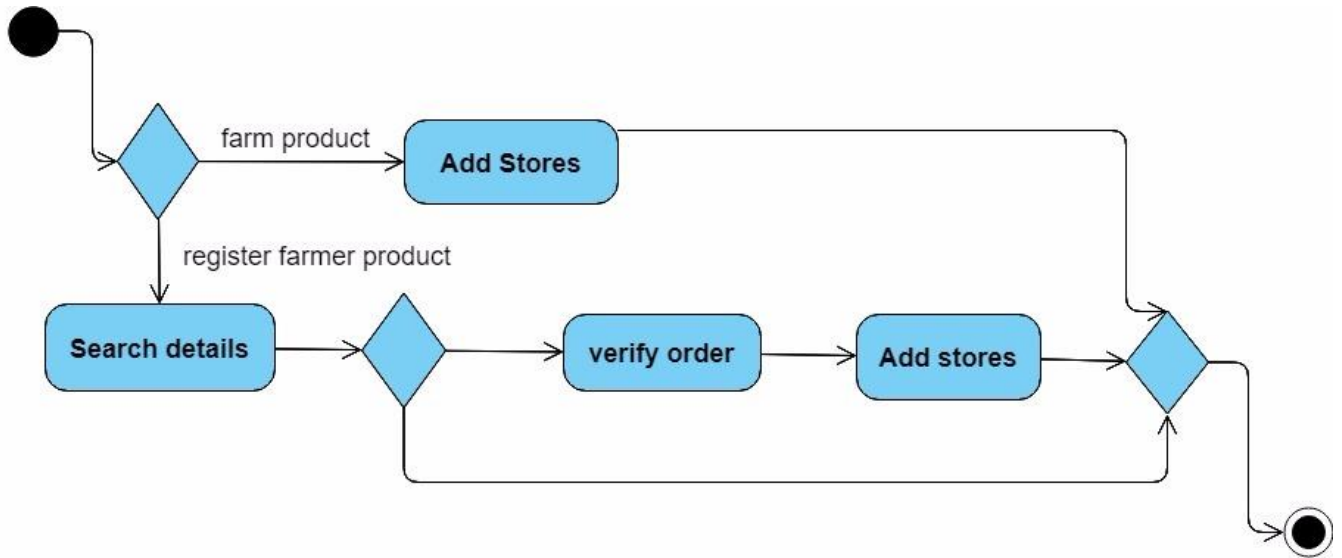
Registered Farmer

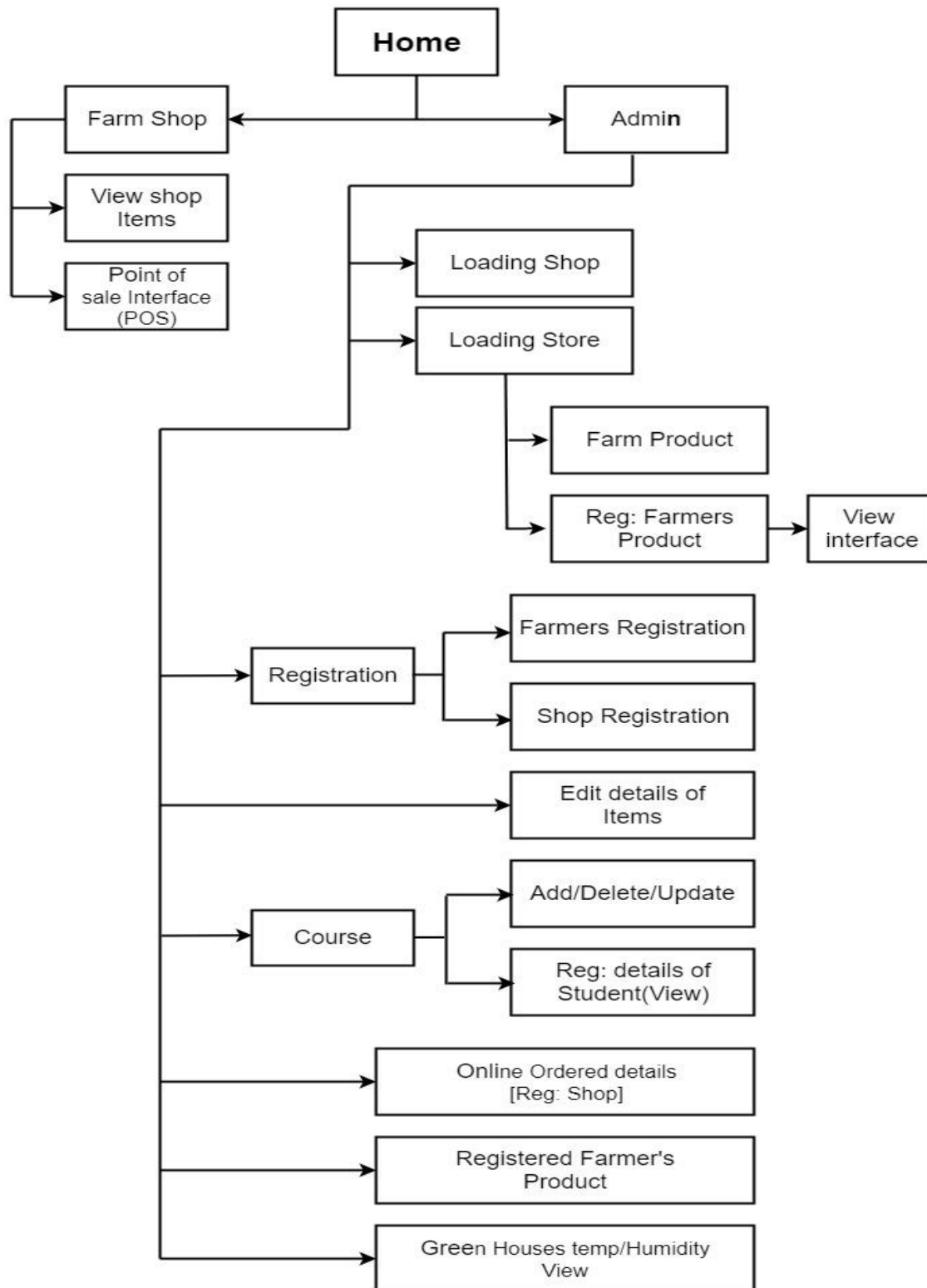## Course Registration

Add / Update Items data

Add Courses
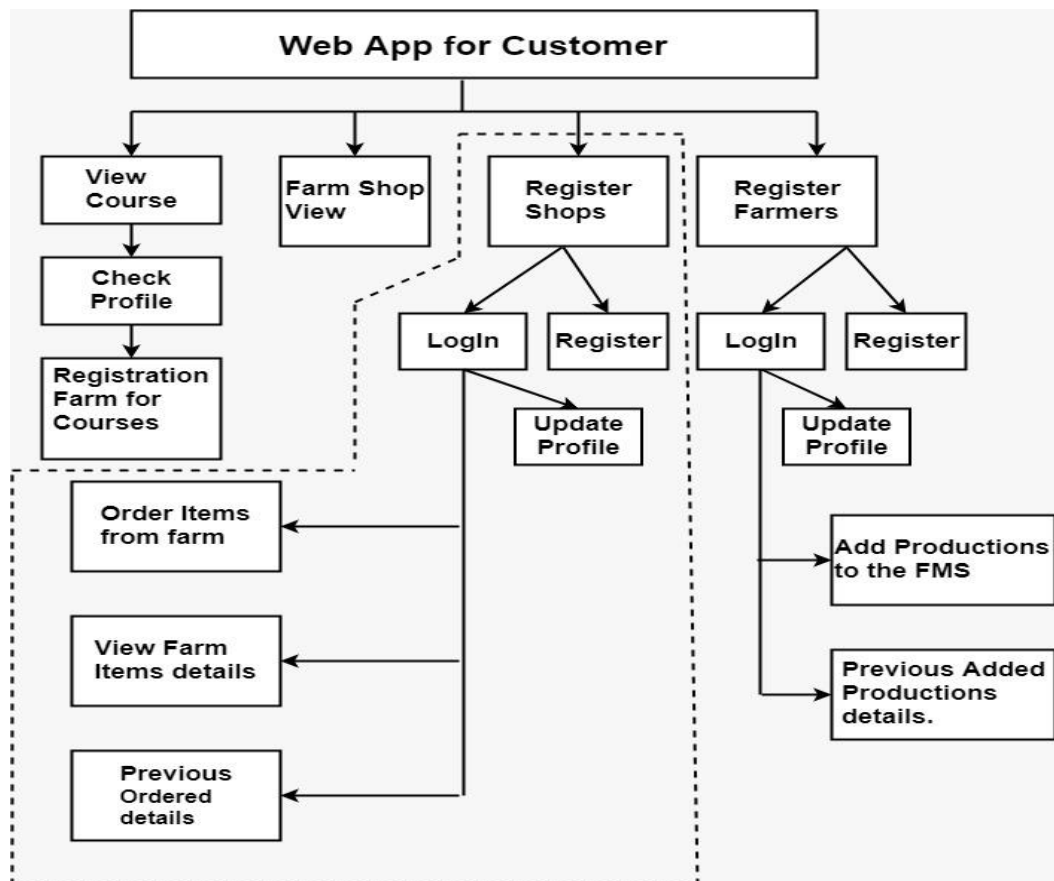
Load Items

User Interface Flow Diagrams

Admin

Other Actors

User Interfaces

Farmer Registatior

Farmer Id: Registation Number

Full Name:

Address:

NIC:

Contact:

Add Picture:

Search...........

Add	View	Update	Delete

Registation Form

Type: Select Reg Type ▼

Full Name: Registation Number

Address:

NIC:

Contact:

Gender:

Occupation:

Email:

Reg.No

Education:

☐ O/L   ☐ A/L   ☐ Graduate

Note:

Submit

Add Courses details

No :   Registation Number

Type :

Class Pay :

Time :

Fees :

Picture/Other :

App

Search...........

Add	View	Update	Delete

Report

Shop

| Farm Product |

| Course |

| Reg Farmer |

| Reg Shop |

| Bills |

Add Items Details

Code   : [_____]

Name   : [_____]

Name   :

Amount   : [_____]

Price   : [_____]

[🔍 Search...]   [ADD]

▼ No	▼ Name	▼ Picture	▼ Amount	▼ Price

View Items

[🔍 Search...]

Code   : [_____]

Name   : [_____]

Amount   : [_____]

Price   : [_____]

Supliers : [_____]

▼ code	▼ Name	▼ View
		[Click]
		[Click]

Point Of Sale

Bill No   : [_____]

Date   : [_____]

Item code   : [_____]

Price   : [_____]

Item Name   : [_____]

Amount   : [_____]   [Kg ▼]

Discount   : [_____]

Total : [_____]

[ADD List]

Bill No   :

▼ code	▼ Item Name	▼ Amount	▼ Discount	▼ Delete	▼ Update

[Bill]

L.no   :

Date   :

Farmer Id   :

Code   :

Name   :

Amount   :

Cost   :

ADD List

Date   :

Search...

▼ Code	▼ Head 2	▼ Head 3	
Cell 1	Cell 2	Cell 3	☐
Cell 4	Cell 5	Cell 6	☑
Cell 7	Cell 8	Cell 9	◯
Cell 10	Cell 11	Cell 12	◉

Loading for shop and loading for stock

L.no   :
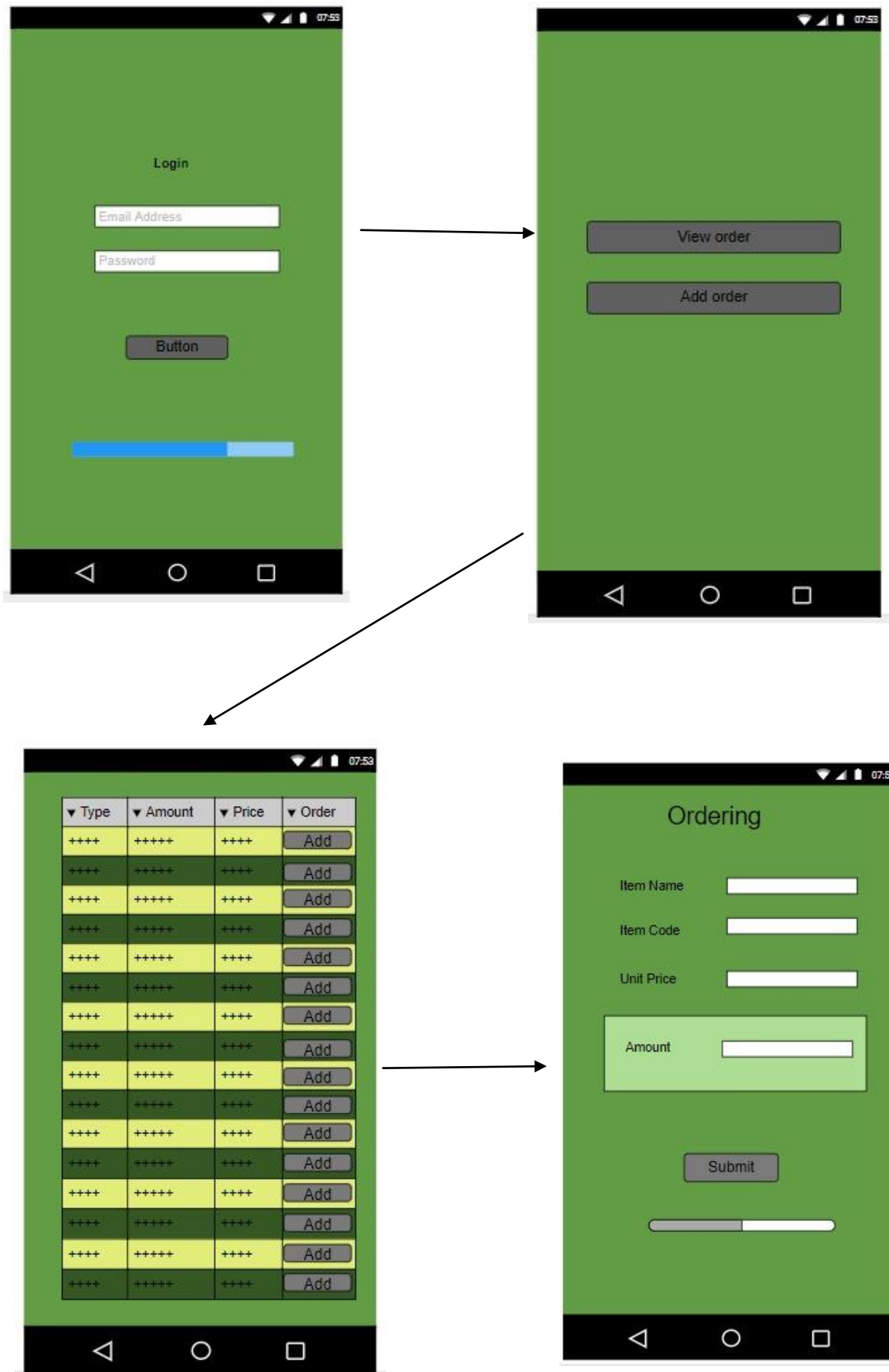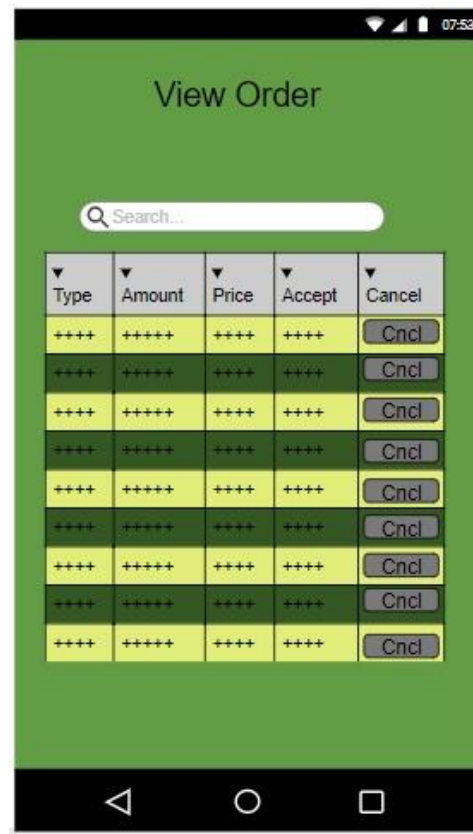
Code   :

Name   :

Price   :

Amount :   ADD

Date   :

L.no   : Search...   Date   : Search...

▼ Description	▼ Update	▼ Delete

Mobile Application for Registered Shop

Temperature and humidity detecting view of Green houses