

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY  
BELAGAVI-590018**



**A PROJECT REPORT  
ON  
“AGRICULTURE INFORMATION MANAGEMENT  
SYSTEM”  
BY**

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In the partial fulfillment of the requirement for V Sem. B. E. (CSE)

**DBMS LABORATORY WITH MINI PROJECT**

Under the guidance of

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2022-2023**

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***CERTIFICATE***

This is to certify that the project entitled **“AGRICULTURE INFORMATION MANAGEMENT SYSTEM”** is submitted in partial fulfillment for the requirement of V Sem. B.E. (Computer Science & Engineering), **“DBMS LABORATORY WITH MINI PROJECT”** during the year 2022 – 2023 is a result of bona fide work carried out by

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## **ABSTRACT**

A database management system (DBMS) refers to the technology for creating and managing databases. DBMS is a software tool used to organize (create, retrieve, update and manage) data in a database. The main aim of a DBMS is to supply a way to store up and retrieve database information that is both convenient and efficient.

**AGRICULTURE INFORMATION MANAGEMENT SYSTEM** provides its users and researchers to get online information about, the crops, fertilizers, equipments, plants and products. The trends of the crops act so that these will be pretty important to the users who access these via the Internet. The main features of the information system include information retrieval facilities for users from anywhere in the form of obtaining information about fertilizer, crops, equipments and products. In addition this provides individual information about intercrops related to main crops. The system allows the retrieving facilities but also the updating facilities to the authorized persons and gives the users an opportunity to buy the products.

# ACKNOWLEDGEMENT

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# CHAPTER 1

## INTRODUCTION

### INTRODUCTION TO DBMS

DBMS Stands for "Database Management System." In short, a DBMS is a database program. Technically speaking, it is a software system that uses a standard method of cataloging, retrieving, and running queries on data. The DBMS manages incoming data, organizes it, and provides ways for the data to be modified or extracted by users or other programs.

A DBMS makes it possible for end users to create, read, update and delete data in a database. The DBMS essentially serves as an interface between the database and end users or application programs, ensuring that data is consistently organized and remains easily accessible.

DBMS include change management, performance monitoring/tuning and backup and recovery. Many database management systems are also responsible for automated rollbacks, restarts and recovery as well as the logging and auditing of activity. The DBMS can offer both logical and physical data independence. That means it can protect users and applications from needing to know where data is stored or having to be concerned about changes to the physical structure of data (storage and hardware).

As long as programs use the application programming interface (API) for the database that is provided by the DBMS, developers won't have to modify programs just because changes have been made to the database. With relational DBMSs (RDBMSs), this API is SQL, a standard programming.

### BACKGROUND OF THE PROJECT

Agriculture Information Management provides its users and researches to get online information about, the crops, fertilizers, equipments, plants and products. The trends of the crops act so that these will be pretty important to the users who access these via the Internet. The main features of the information system includes information retrieval facilities for users from anywhere in the form of obtaining information about fertilizer, crops, equipments and products. In addition this provides individual information about Intercrops related to main crops.



The system allows the retrieving facilities but also the updating facilities to the authorized persons and gives the users an opportunity to buy the products.

## **NECESSITY OF PROJECT**

Agriculture Information Management System provides its users and researches to get online information about, the crops, fertilizers, equipments, plants and products. Helping farmers to select the most appropriate crop varieties, tools, fertilizers, and products to optimize yield and quality. It provides information on the latest research and development in crop breeding, tool design, fertilizer formulation, and products developing a user friendly agricultural Information System for the worldwide web which fulfill the Agriculture Interested People's requirements. Most of the reference information for the cultivators and decision making level people in Agricultural Field Ex. Latest fertilizers, Special chemicals etc...

## **APPLICATIONS AND ADVANTAGES**

The software is used to store the data most securely and in proper manner. This software make the work easier and faster to the users. This is even help to store all the relevant data about crops, products etc.. that are used by each people. Any users can retrieve data from Information System. All users are forbidden to make changes on the information that is provided on the software. Only data administrator unnecessary information and modify the database.

## **IMPLEMENTATION**

The Agriculture Information Management System is implemented using home page module, registration/login module, store module, admin access module, with insert, update, delete operations. MySQL which holds the database and java for the front end which displays the provided modules.

## **ORACLE**

Oracle Database (commonly referred to as Oracle RDBMS or simply as Oracle) is a multi-model database management system produced and marketed by Oracle Corporation. It is a database commonly used for running online transaction processing (OLTP), data warehousing (DW), etc. Larry Ellison and his two friends and former co-workers, Bob Miner and Ed Oates started a consultancy called Software Development and Laboratories (SDL) in 1977. SDL developed the original version of oracle.

## **MY SQL**

Agriculture administrator will manage all the details about products, users, crops etc.... Administrator have all rights to insert, update & delete operation to all the tables of particular sector. Only admin is permitted to change the details not users .The total control is under the admin. MySQL server is used for data operations like querying, sorting, filtering, grouping, modifying and joining the tables. Before learning the commonly used queries, let us look into some of the advantages of MySQL.

## **JAVA**

Java is a popular programming language. It is owned by Oracle, and more devices run Java. Java works on different platforms (Windows, Mac, Linux). It is open-source secure, fast, free and powerful. As Java is close to C++ and C#, it makes it easy for programmers to switch to Java. Java was developed in the mid-1990s by James A. Gosling, a former computer scientist with Sun Microsystems.

Java is an Object-Oriented programming language developed by James Gosling in the early 1990s. The team initiated this project to develop a language for digital devices such as set-top boxes, television, etc. Java is used in all kinds of applications like Mobile Applications (Android is Java-based), desktop applications, web applications, client-server applications, enterprise applications, and many more.

## **NETBEANS**

NetBeans is an integrated development environment (IDE) for Java. NetBeans allows applications to be developed from a set of modular software components called modules. The NetBeans Platform is a framework for simplifying the development of Java Swing desktop applications. The NetBeans IDE bundle for Java SE contains what is needed to start developing NetBeans plugins and NetBeans Platform based applications. The underlying NetBeans platform supports creation of new applications and further development of existing applications using modular software components. As an application running on the NetBeans Platform, the NetBeans IDE itself is extensible and can be extended to support new languages.

## CHAPTER 4

### REQUIREMENT SPECIFICATION

#### Hardware Requirements

- Processor: Any processor above 500 MHz
- RAM: Min 4GB
- Hard Disk: Min 256GB

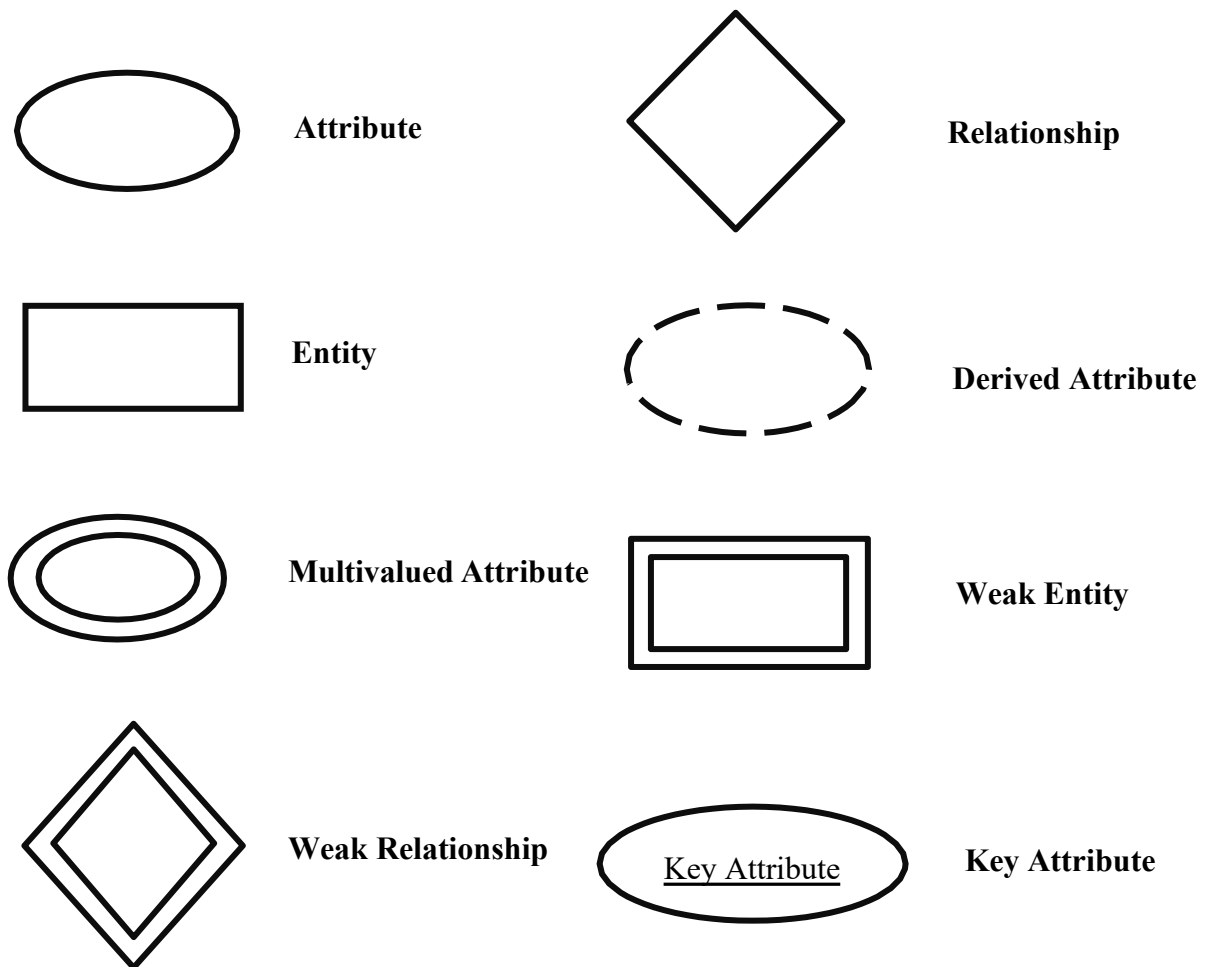
#### Software Requirements

- Backend: MYSQL
- Programming Language: Java
- IDE: NetBeans 12.6

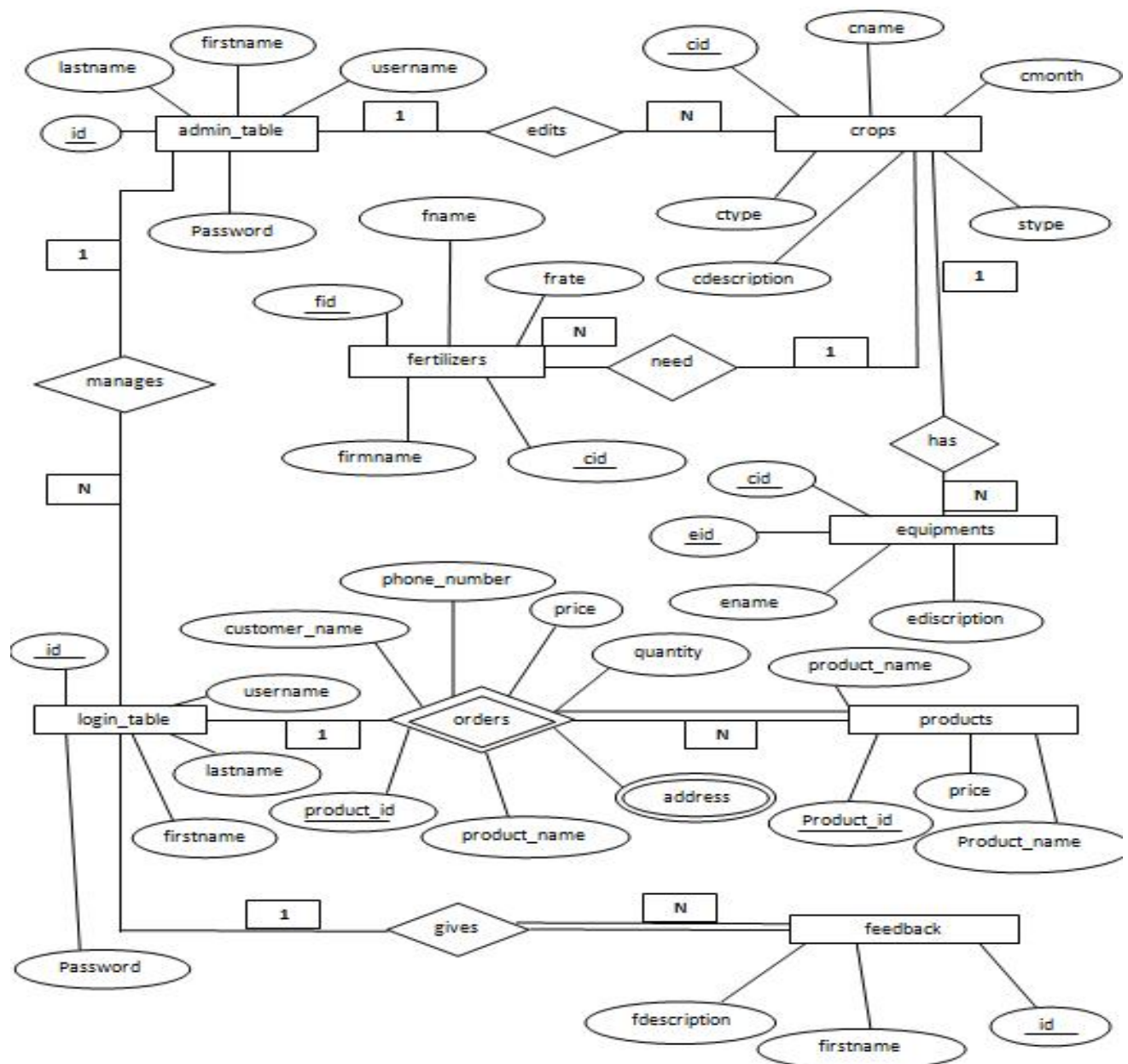
## CHAPTER 3

### 3.1 ER-diagram

An entity–relationship model describes interrelated things of interest in a specific domain knowledge. The ER Diagram of our project is shown in the **figure:3.1.1**



**Figure 3.1.1 ER NOTATION**



**Figure 3.1.2** ER Diagram of Agriculture Information Management System

## RELATIONAL SCHEMA

### Mapping From ER Diagram to Schema Diagram

1. Mapping of regular entities:-This step involves mapping all the regular entity types to tabular format by identifying their primary keys.
2. Mapping of 1:1 Relation:-In this step foreign keys are assigned using foreign key approach. The primary key of the participating relation R or S is added as primary key to second entity types by looking at the participating constraints.
3. Mapping of 1:N Relation:-Foreign key approach is used to add one sided primary key to the n sided entity at foreign key.
4. Mapping of M:N Relation :-Here we use the cross reference approach where the relationship is converted to a new relation within attributes on primary keys of both participating relation.
5. Mapping of Weak Entity :-When mapping weak entity types along with other attributes the partial key and primary key of parent entity together will form their primary key of the new relation.
6. Mapping of N-ary Relation:-For mapping N ary relationship we create a new relation with a relationship name in its attribute and primary keys of all participating entity types.
7. Mapping of Multivalued Relation :-For multivalued attributes a separate relation has to be created along with primary key of parent relation. A relational schema for a database is an outline of how data is organized.

### STEP 1: Mapping of regular entity types.

The regular entity types of our project are shown in figure

#### ADMIN\_TABLE

<u>id</u>	firstname	lastname	username	password
-----------	-----------	----------	----------	----------

#### CROPS

<u>cid</u>	cname	cmonth	ctype	Cdescription	stype
------------	-------	--------	-------	--------------	-------

#### EQUIPMENT

<u>cid</u>	ename	description	<u>cid</u>
------------	-------	-------------	------------

#### FEEDBACK

<u>id</u>	firstname	fdescription
-----------	-----------	--------------

**FERTILIZERS**

<u>fid</u>	fname	frate	firmname	<u>cid</u>
------------	-------	-------	----------	------------

**LOGIN\_TABLE**

<u>id</u>	firstname	lastname	username	password
-----------	-----------	----------	----------	----------

**ORDERS**

<u>product_id</u>	product_name	quantity	customer_name	phone_number	address	price
-------------------	--------------	----------	---------------	--------------	---------	-------

**PRODUCTS**

<u>product_id</u>	product_name	price	description
-------------------	--------------	-------	-------------

**Figure 3.2.1****STEP 2: Mapping of weak entity types**

The ERD of our project does not contain any weak entity.

**STEP 3: Mapping of binary 1:1 relation types**

The ERD of our project does not contain any 1:1 relation types.

**STEP 4: Mapping of 1: N relation types**

For every 1:N relation types identify the entity which is in the N-side. Make primary key of entity which is participating in 1 side as foreign key of entity which is N-side. If there are any attributes for the relationship add to the N-side.

The ERD of our project 1:N relation type is shown below

<u>id</u>	firstname	lastname	username	password
-----------	-----------	----------	----------	----------

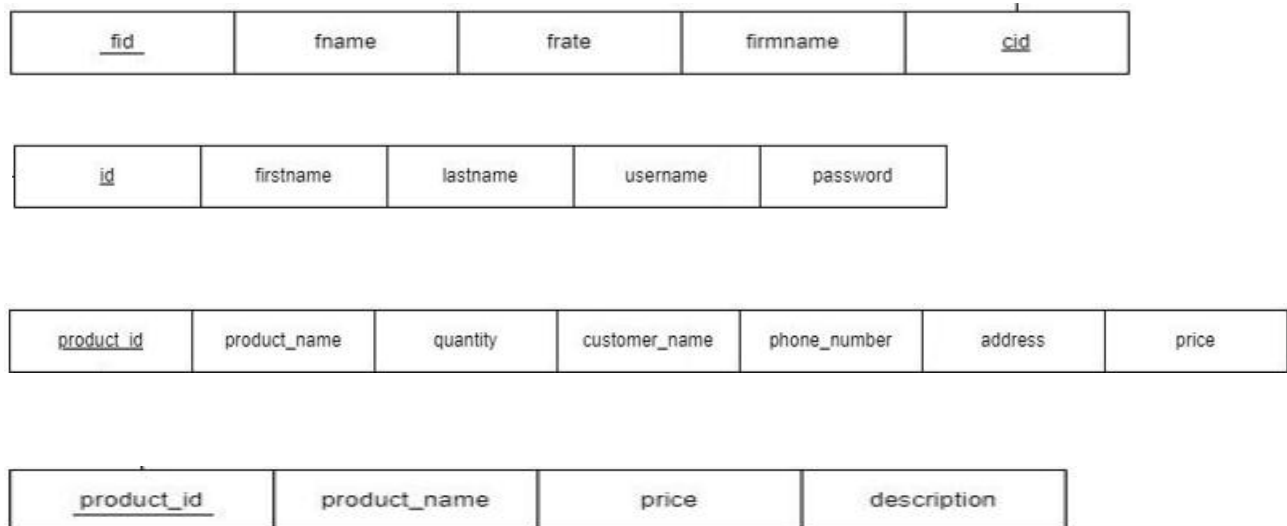
<u>cid</u>	cname	cmonth	cype	Cdescription	stye
------------	-------	--------	------	--------------	------

<u>cid</u>	ename	description	<u>cid</u>
------------	-------	-------------	------------

<u>id</u>	firstname	fdescription
-----------	-----------	--------------



**figure 3.2.2 1:N Mapping**

#### **STEP 5: Mapping of M: N relation types**

The ERD of our project does not contain any M:N relationship.

#### **STEP 6: Mapping of multivalued attributes**

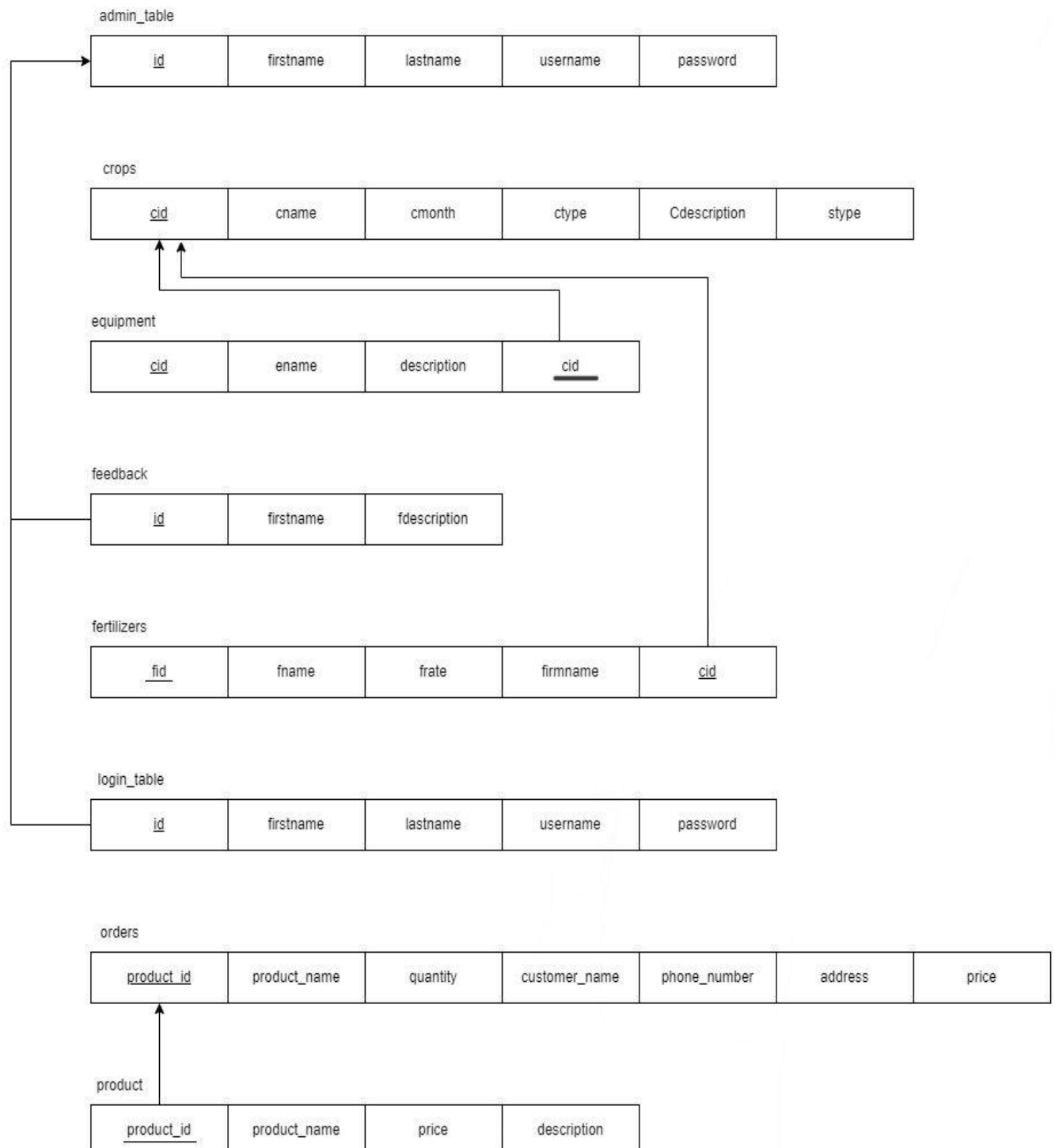
The ERD of our project does not contain any Multivalued Attributes.

#### **STEP 7: Mapping of n-ary relation types**

The ERD of our project does not contain any n-ary relations.



### 3.3 SCHEMA DIAGRAM

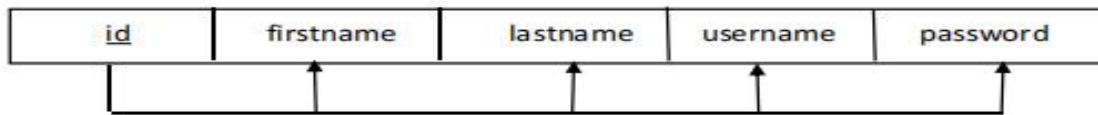


**Figure 3.2.4** Schema Diagram

## CHAPTER 4

### NORMALIZATION

#### ADMIN\_TABLE



**FD1:** ADMIN\_TABLE -> {ID, FIRSTNAME, LASTNAME, USERNAME, PASSWORD}

**1NF:** It is 1NF because there is no multivalued attributes in the relational schema

**2NF:** The relations are in 2NF since no non-key attributes are functionally dependent on part of primary key.

**3NF:** The relations are in 3NF since no non-key attributes are functionally determined by another non-key attribute. The relation is in 1st, 2nd and 3rd Normal Form.

#### CROPS

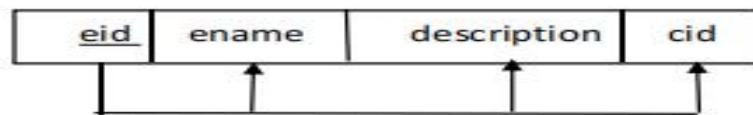


**FD2:** CROPS->{CID,CNAME,CMONTH,CTYPE,CDESCRIPTION,STYPE}

**1NF:** The relations are in 1NF since there are no multivalued attributes or nested relations.

**2NF:** The relations are in 2NF since no non-key attributes are functionally dependent on part of primary key.

**3NF:** The relations are in 3NF since no non-key attributes are functionally determined by another non-key attribute. The relation is in 1st, 2nd and 3rd Normal Form.

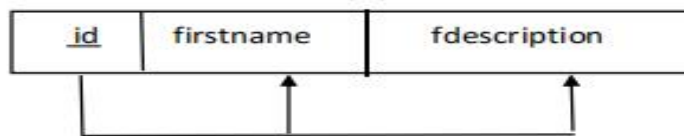
**EQUIPMENT**

**FD3:** EQUIPMENT-> {EID,ENAME,DESCRIPTION,CID}

**1NF:** It is 1NF because there is no multivalued attributes in the relational schema

**2NF:** The relations are in 2NF since no non-key attributes are functionally dependent on part of primary key.

**3NF:** The relations are in 3NF since no non-key attributes are functionally determined by another non-key attribute. The relation is in 1st, 2nd and 3rd Normal Form.

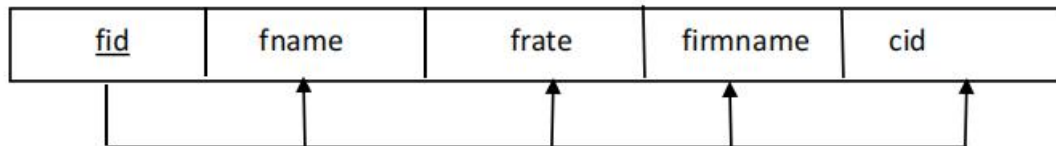
**FEEDBACK**

**FD4:** FEEDBACK-> {ID,FIRSTNAME,FDESCRIPTION}

**1NF:** The relations are in 1NF since there are no multivalued attributes or nested relations.

**2NF:** The relations are in 2NF since no non-key attributes are functionally dependent on part of primary key.

**3NF:** The relations are in 3NF since no non-key attributes are functionally determined by another non-key attribute. The relation is in 1st, 2nd and 3rd Normal Form.

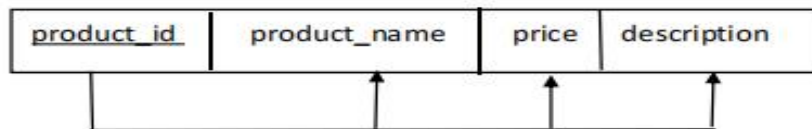
**FERTILIZER**

**FD5:** FERTILIZER-> {ID,FIRSTNAME,LASTNAME,USERNAME,PASSWORD}

**1NF:** The relations are in 1NF since there are no multivalued attributes or nested relations.

**2NF:** The relations are in 2NF since no non-key attributes are functionally dependent on part of primary key.

**3NF:** The relations are in 3NF since no non-key attributes are functionally determined by another non-key attribute. The relation is in 1st, 2nd and 3rd Normal Form.

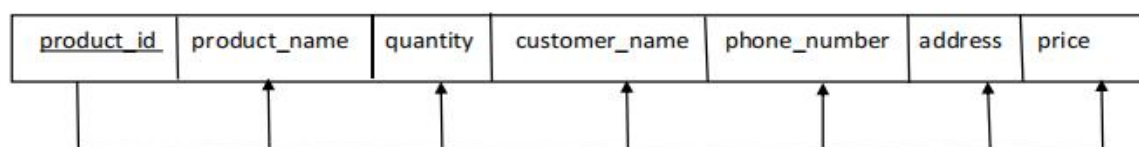
**PRODUCTS**

**FD6:** PRODUCTS-> {PRODUCT\_ID,PRODUCT\_NAME,PRICE,DESCRIPTION}

**1NF:** The relations are in 1NF since there are no multivalued attributes or nested relations.

**2NF:** The relations are in 2NF since no non-key attributes are functionally dependent on part of primary key.

**3NF:** The relations are in 3NF since no non-key attributes are functionally determined by another non-key attribute. The relation is in 1st, 2nd and 3rd Normal Form.

**ORDERS**

**FD6:** ORDERS->

{PRODUCT\_ID,PRODUCT\_NAME,QUANTITY,CUSTOMER\_NAME,PHONE\_NUMBER,ADDRESS,PRICE}

**1NF:** The relations are not in 1NF since there are multivalued attributes i.e, address.

## CHAPTER 5

### Implementation

Create Table <table name> <description>

mysql> desc crops;

Field	Type	Null	Key	Default	Extra
cid	varchar(255)	NO	PRI	NULL	
cname	varchar(255)	NO		NULL	
cmonth	varchar(255)	NO		NULL	
ctype	varchar(255)	NO		NULL	
cdescription	varchar(255)	NO		NULL	
stype	varchar(255)	NO		NULL	

mysql> desc admin\_table;

Field	Type	Null	Key	Default	Extra
id	int	NO		NULL	
firstname	varchar(255)	NO		NULL	
lastname	varchar(255)	NO		NULL	
username	varchar(255)	NO	PRI	NULL	
password	varchar(255)	NO		NULL	

mysql> desc login\_table;

Field	Type	Null	Key	Default	Extra
id	int	NO	PRI	NULL	
firstname	varchar(255)	NO		NULL	
lastname	varchar(255)	NO		NULL	
username	varchar(255)	NO		NULL	
password	varchar(255)	NO		NULL	

mysql> desc equipment;

Field	Type	Null	Key	Default	Extra
Eid	int	NO	PRI	NULL	
Ename	varchar(255)	NO		NULL	
Edescription	varchar(255)	NO		NULL	
cid	varchar(255)	NO	MUL	NULL	

mysql> desc feedback;

Field	Type	Null	Key	Default	Extra
id	int	NO	MUL	NULL	
firstname	varchar(255)	NO		NULL	
fdescription	varchar(1000)	NO		NULL	

mysql> desc fertilizers;

Field	Type	Null	Key	Default	Extra
Fid	int	NO	PRI	NULL	
Fname	varchar(255)	NO		NULL	
Frate	int	NO		NULL	
Firmname	varchar(255)	NO		NULL	
cid	varchar(255)	NO	MUL	NULL	

mysql> desc products;

Field	Type	Null	Key	Default	Extra
Product_id	int	NO	PRI	NULL	
Product_name	varchar(255)	NO		NULL	
Price	int	NO		NULL	
Description	varchar(255)	NO		NULL	

mysql> desc orders;

Field	Type	Null	Key	Default	Extra
Product_id	int	NO	MUL	NULL	
Product_name	varchar(45)	NO		NULL	
Quantity	int	NO		NULL	
Customer_name	varchar(45)	NO		NULL	
Phone_number	varchar(20)	NO		NULL	
Address	varchar(200)	NO		NULL	
Price	int	NO		NULL	

## JDBC DRIVER IS USED TO CONNECT JAVA AND MY SQL

CODE:

```
package aims;

import java.sql.Connection;

import java.sql.DriverManager;

import java.sql.SQLException;

public class connection1 {

    // TODO code application logic here

    public static Connection getConnection(){
        Connection con = null;
        try{
            Class.forName("com.mysql.cj.jdbc.Driver");
            con=
            DriverManager.getConnection("jdbc:mysql://localhost:3306/agridb","root","Rohit@2002");

        } catch(ClassNotFoundException | SQLException e){
            System.out.println(e.getMessage());
        }
        return con;
    }
}
```

Insert/update/delete option has been implemented as follows:

### UPDATE

```
String cid = jTextField1.getText();
String cname = jTextField2.getText();
String cmonth = jTextField3.getText();
String ctype = jTextField4.getText();
String cdescription = jTextArea1.getText();
String stype = jTextField5.getText();

Connection com = connection1.getConnection();

try {
```

```

        String sql = "Update crops set cname=?,cmonth=?,ctype=?,cdescription=?,stype=?
where cid = ?";
        ps = com.prepareStatement(sql);
        ps.setString(1, cname);
        ps.setString(2, cmonth);
        ps.setString(3, ctype);
        ps.setString(4,cdescription );
        ps.setString(5, stype);
        ps.setString(6, cid);
        int res = ps.executeUpdate();

        if(res==1){
            JOptionPane.showMessageDialog(rootPane, "Data updated Successfully");
        }
        else{
            JOptionPane.showMessageDialog(rootPane, "Data not Updated");
        }
        setVisible(false);
        new editcrops1().setVisible(true);
    }
    catch (HeadlessException | SQLException e) {

        JOptionPane.showMessageDialog(null, e);
    }

```

## FOR DELETING

```

ResultSet rs;

try{

    String sql = "DELETE FROM `crops` WHERE cid=?";
    ps = connection1.getConnection().prepareStatement(sql);

    ps.setString(1, jTextField1.getText());

    ps.executeUpdate();
    JOptionPane.showMessageDialog(null, "Deleted sucessful");

} catch(Exception e){

    JOptionPane.showMessageDialog(null,e);
}

fetch();

```

1) Triggers:

2) We have used the below trigger for both password and text field that should not be left empty.

```
CREATE DEFINER='root'@'localhost' TRIGGER `login_table_BEFORE_INSERT` BEFORE
INSERT ON `login_table` FOR EACH ROW BEGIN

    IF NEW.id = "or NEW.firstname=" or NEW.lastname=" or NEW.username=" or
NEW.password=" THEN

        SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT = 'Text field cannot be empty';

    END IF;

    IF LENGTH(NEW.password) < 8 THEN

        SIGNAL SQLSTATE '45000' SET MESSAGE_TEXT = 'Password must be at least 8
characters.';

    END IF;

END
```



## CHAPTER 6

### RESULTS AND DISSCUSSION

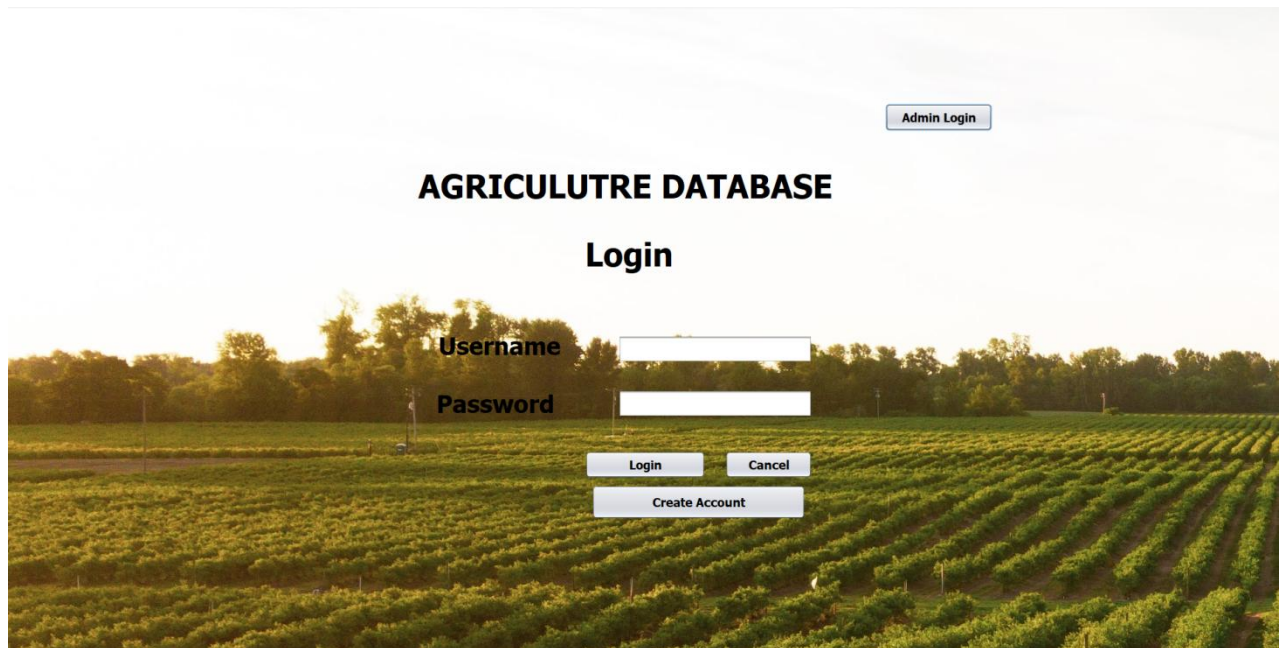


Figure6.1 Shows Login Page

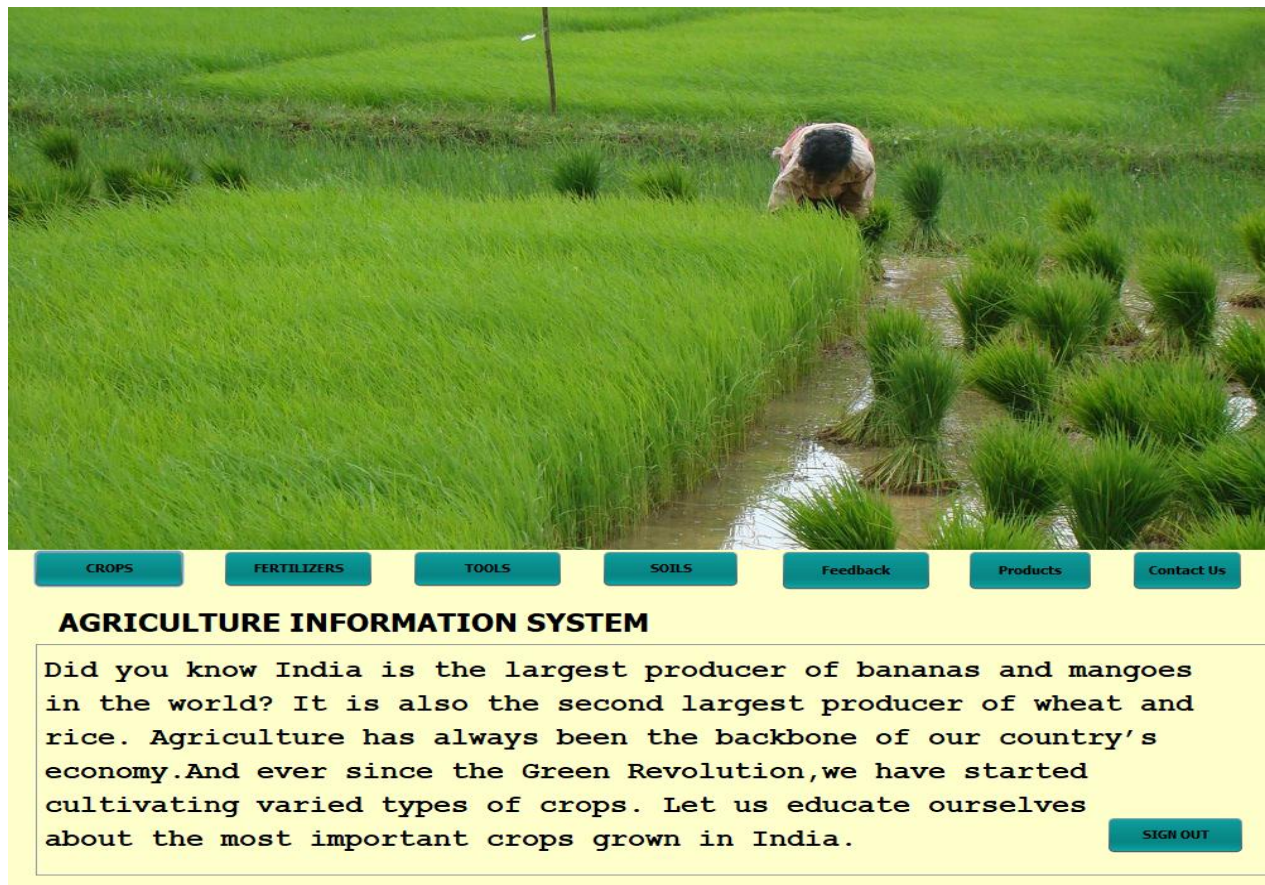
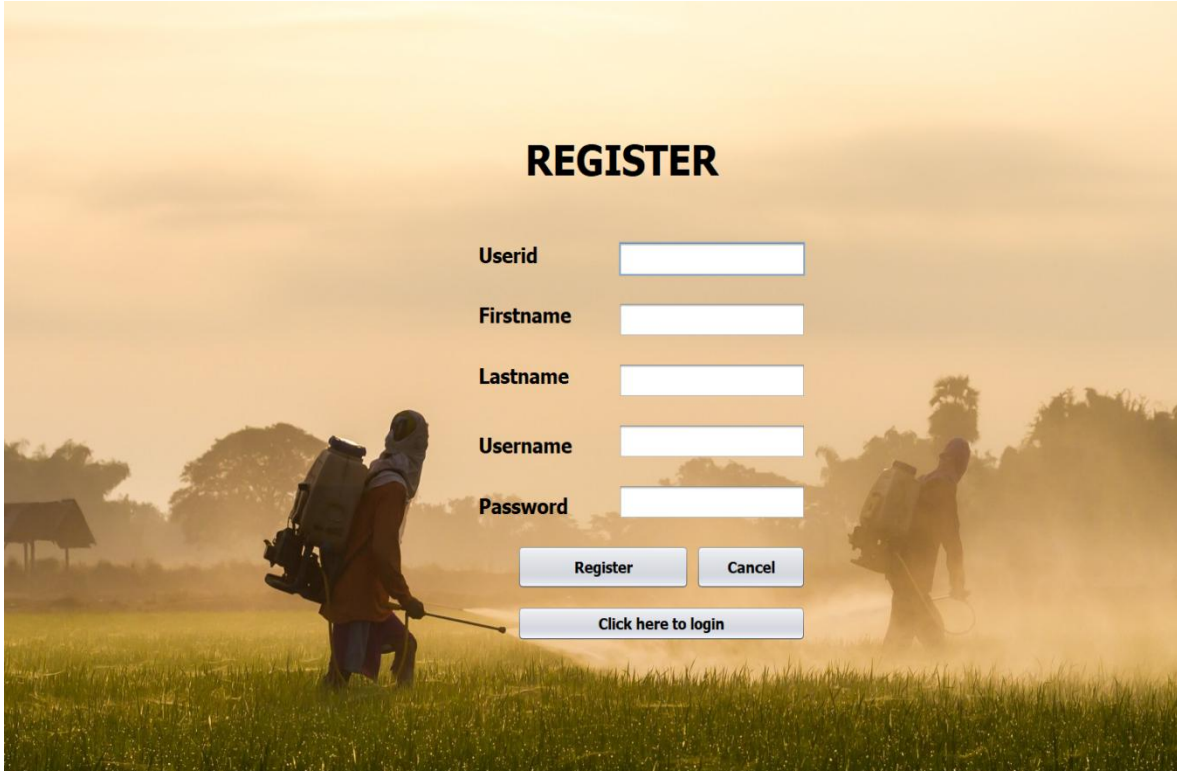


Figure 6.2 Main page



**REGISTER**

Userid

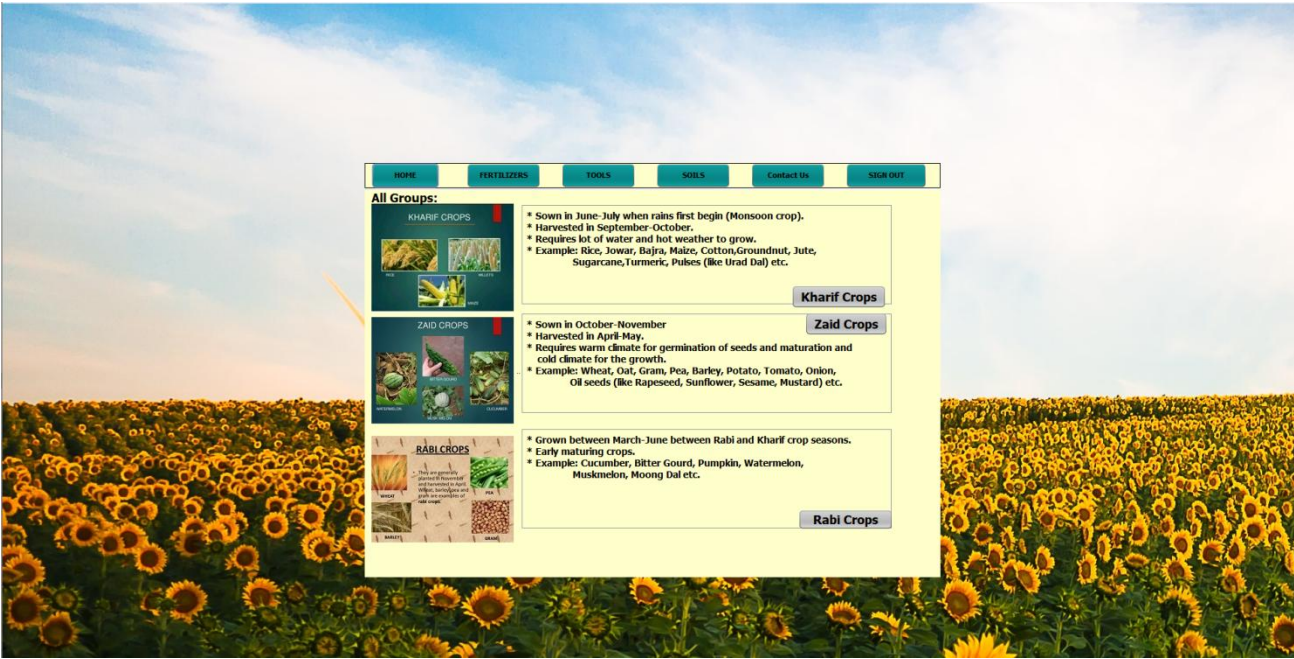
Firstname

Lastname

Username


Password

Figure 6.3 User Registration Page



HOME FERTILIZERS TOOLS SOILS Contact Us SIGN OUT


**All Groups:**



**KHARIF CROPS**

- \* Sown in June-July when rains first begin (Monsoon crop).
- \* Harvested in September-October.
- \* Requires lot of water and hot weather to grow.
- \* Example: Rice, Jowar, Bajra, Maize, Cotton, Groundnut, Jute, Sugarcane, Turmeric, Pulses (like Urad Dal) etc.


**Kharif Crops**



**ZAID CROPS**

- \* Sown in October-November
- \* Harvested in April-May.
- \* Requires warm climate for germination of seeds and maturation and cold climate for the growth.
- \* Example: Wheat, Oat, Grain, Pea, Barley, Potato, Tomato, Onion, Oil seeds (like Rapeseed, Sunflower, Sesame, Mustard) etc.

**Zaid Crops**



**RABI CROPS**

- \* Grown between March-June between Rabi and Kharif crop seasons.
- \* Early maturing crops.
- \* Example: Cucumber, Bitter Gourd, Pumpkin, Watermelon, Muskmelon, Moong Dal etc.

**Rabi Crops**

Figure 6.4 Crop details page





Figure 6.5 Fertilizer details page



Figure 6.6 Equipment details Page

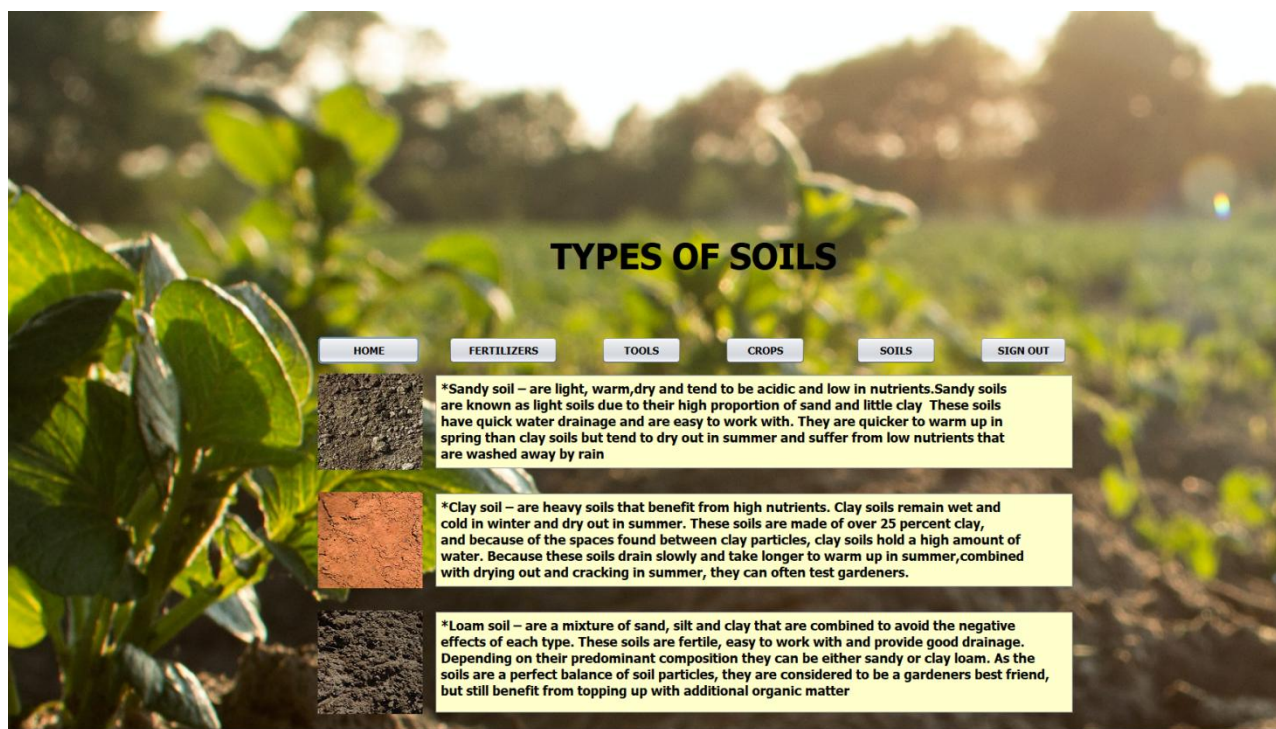


Figure 6.7 Soil details Page

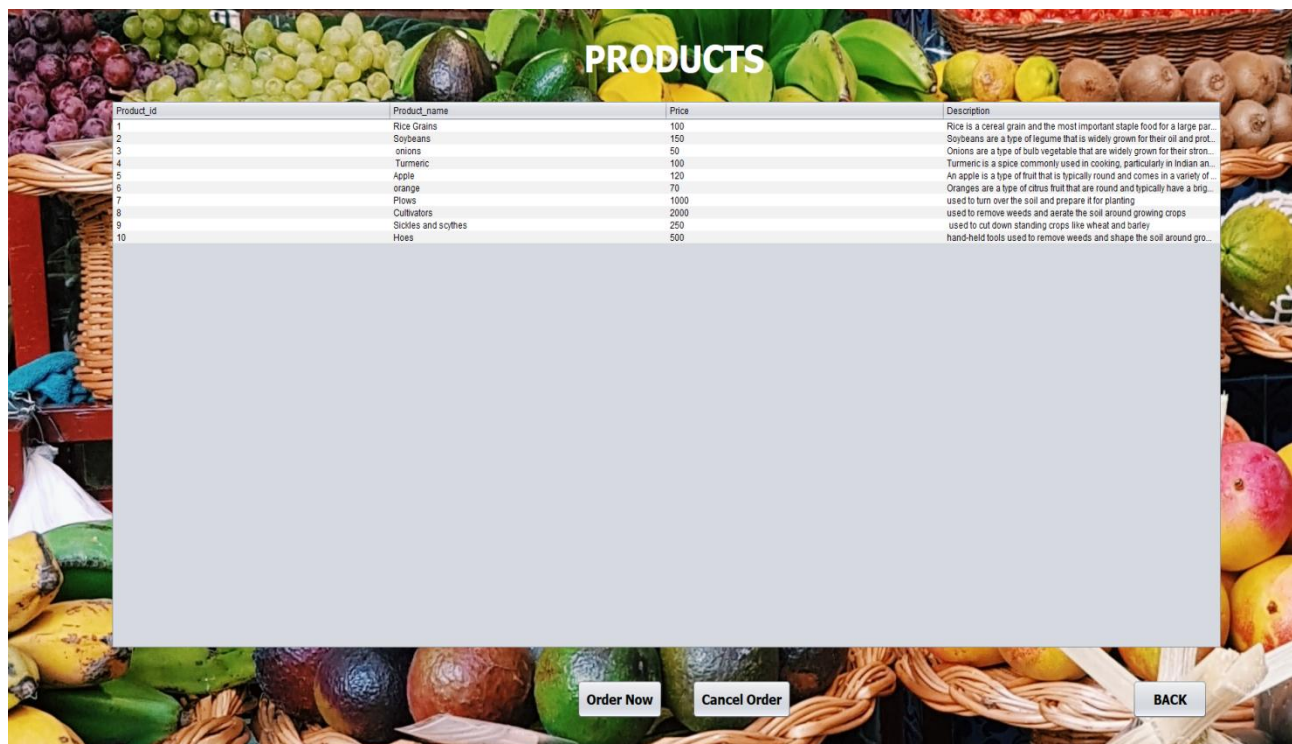


Figure 6.8 Products detail page



### ORDER DETAILS

Product Id

Product Name

Quantity

Customer Name

Phone Number

Address

Price

Figure 6.9 Order details Page

### CANCEL ORDER DETAILS

Product Id

Product Name

Quantity

Customer Name

Phone Number

Address

Price

Figure 6.10 Cancel Order Details Page



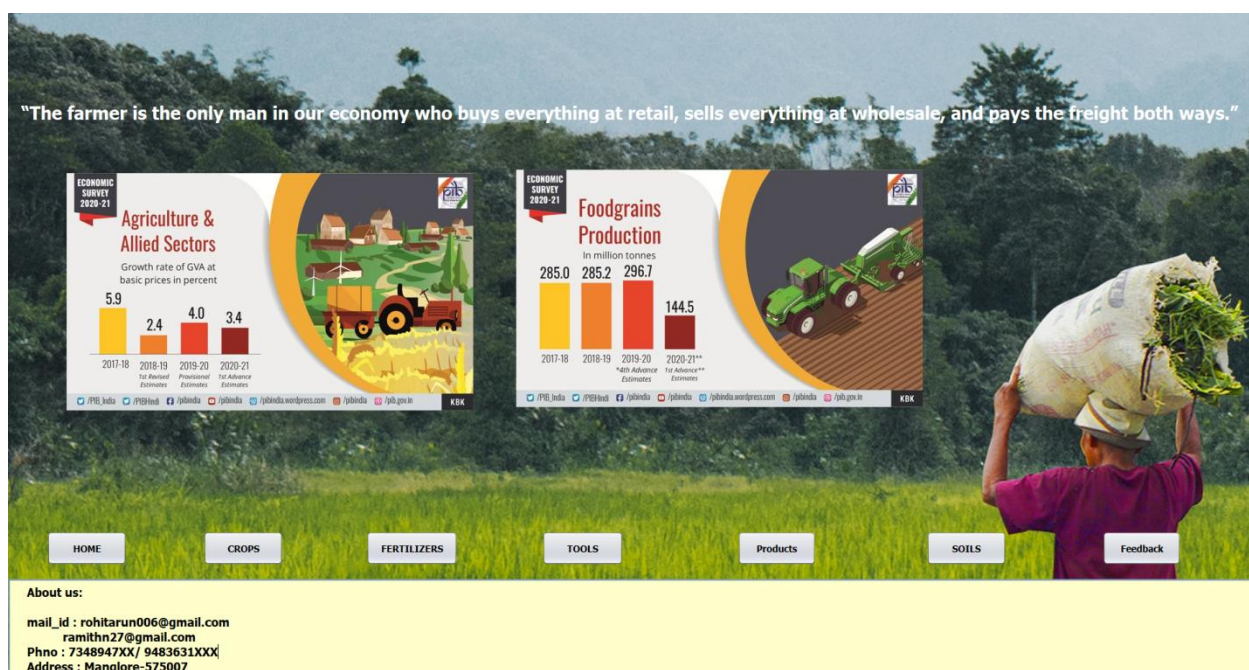


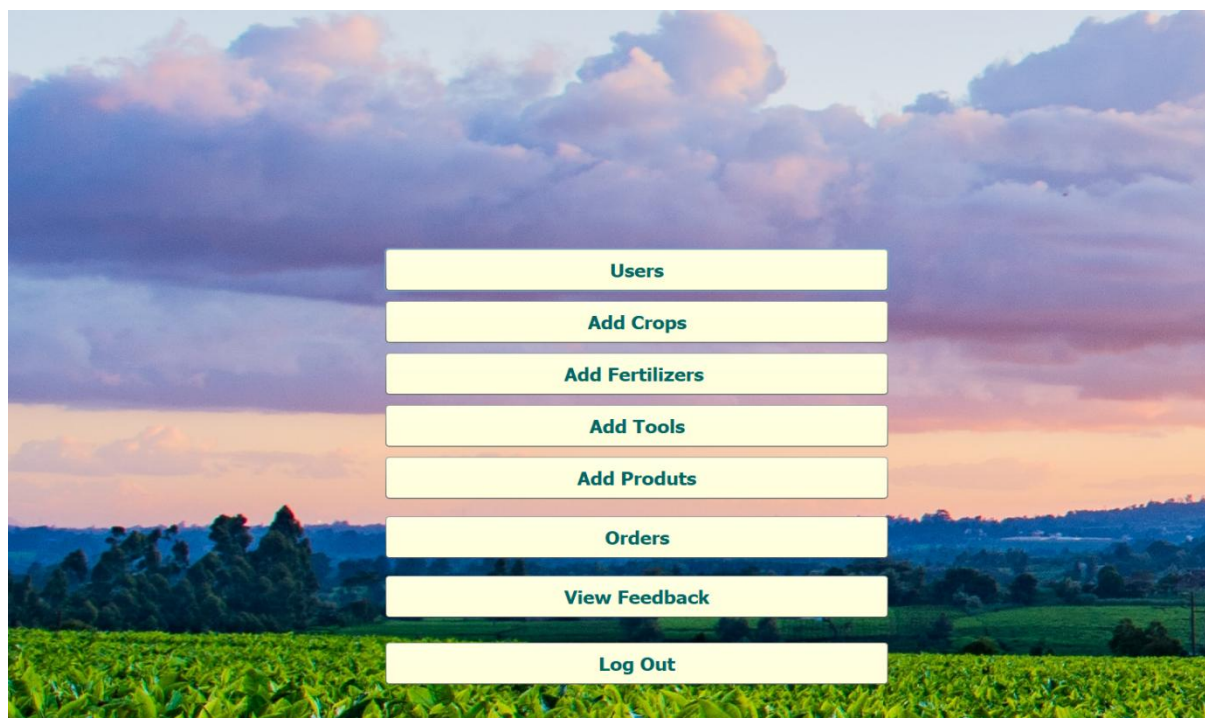
Figure 6.11 Administrator Contact details

## Admin Login

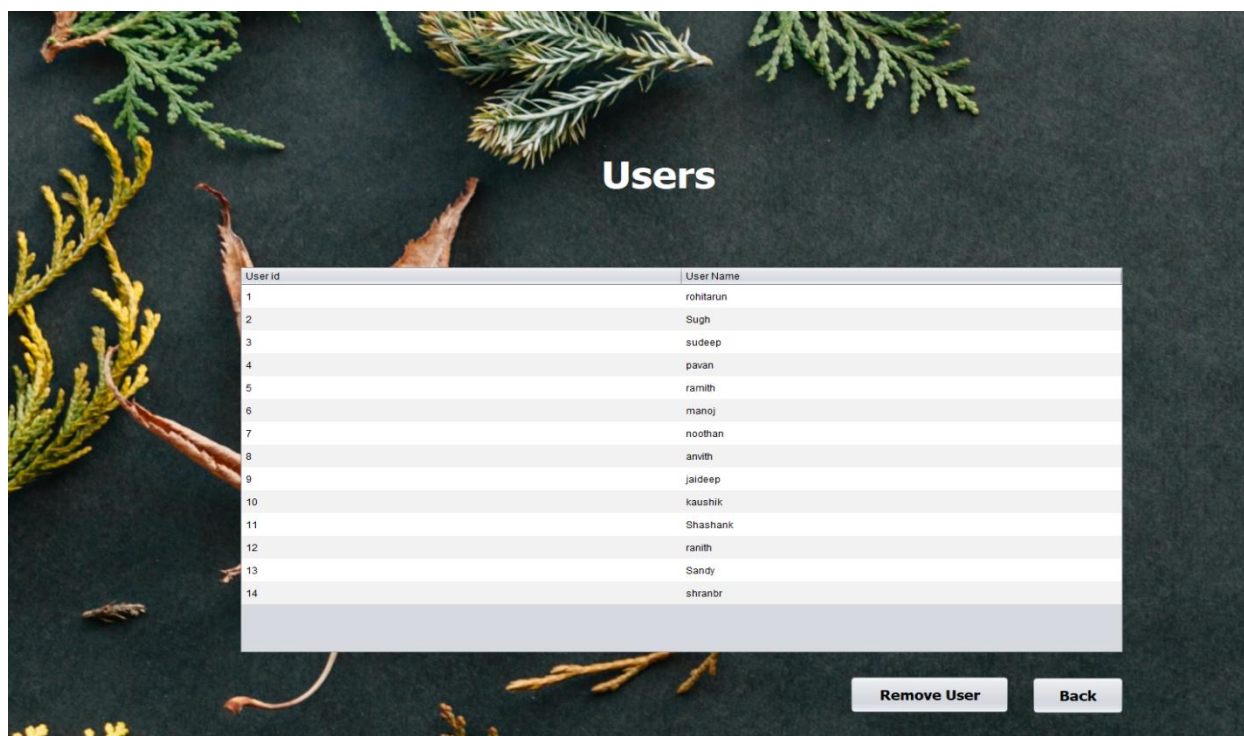
**Username**

**Password**

Figure 6.12 Administrator login



**Figure 6.13** Administrator home page



**Figure 6.14** Logged-In-Users



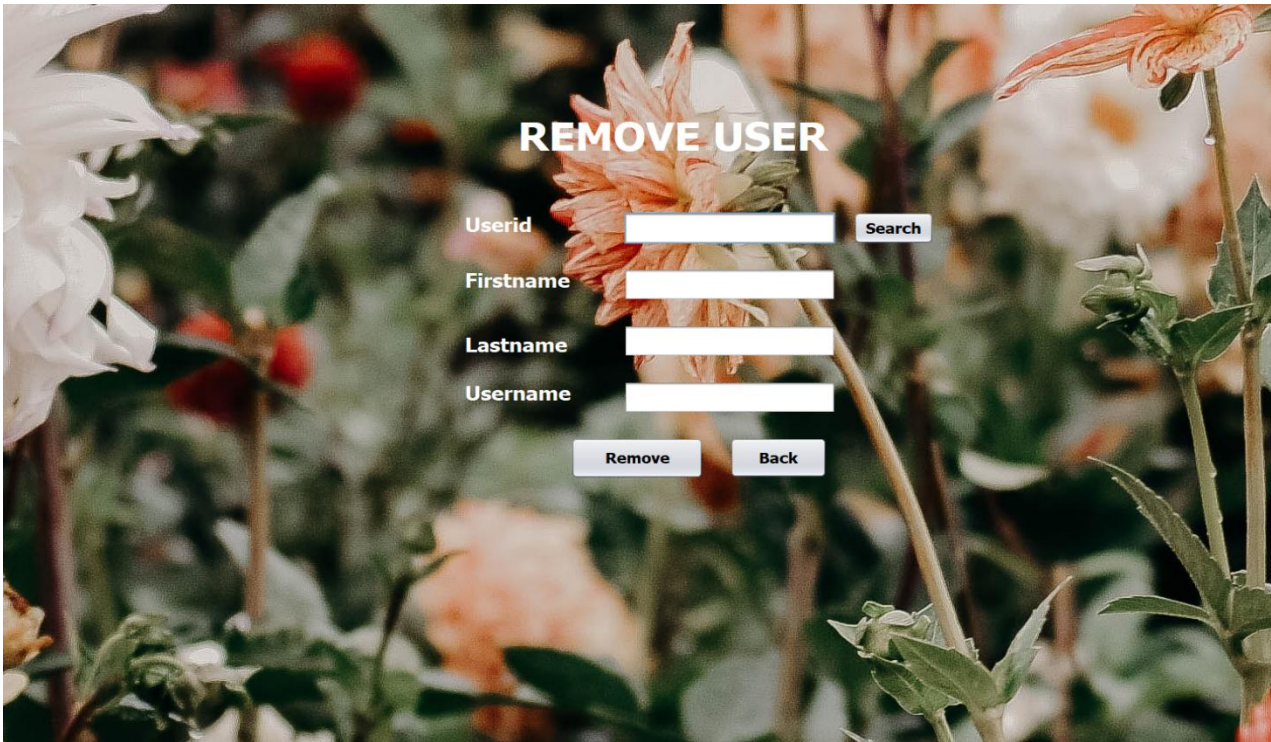


Figure 6.15 Remove Logged-In-Users

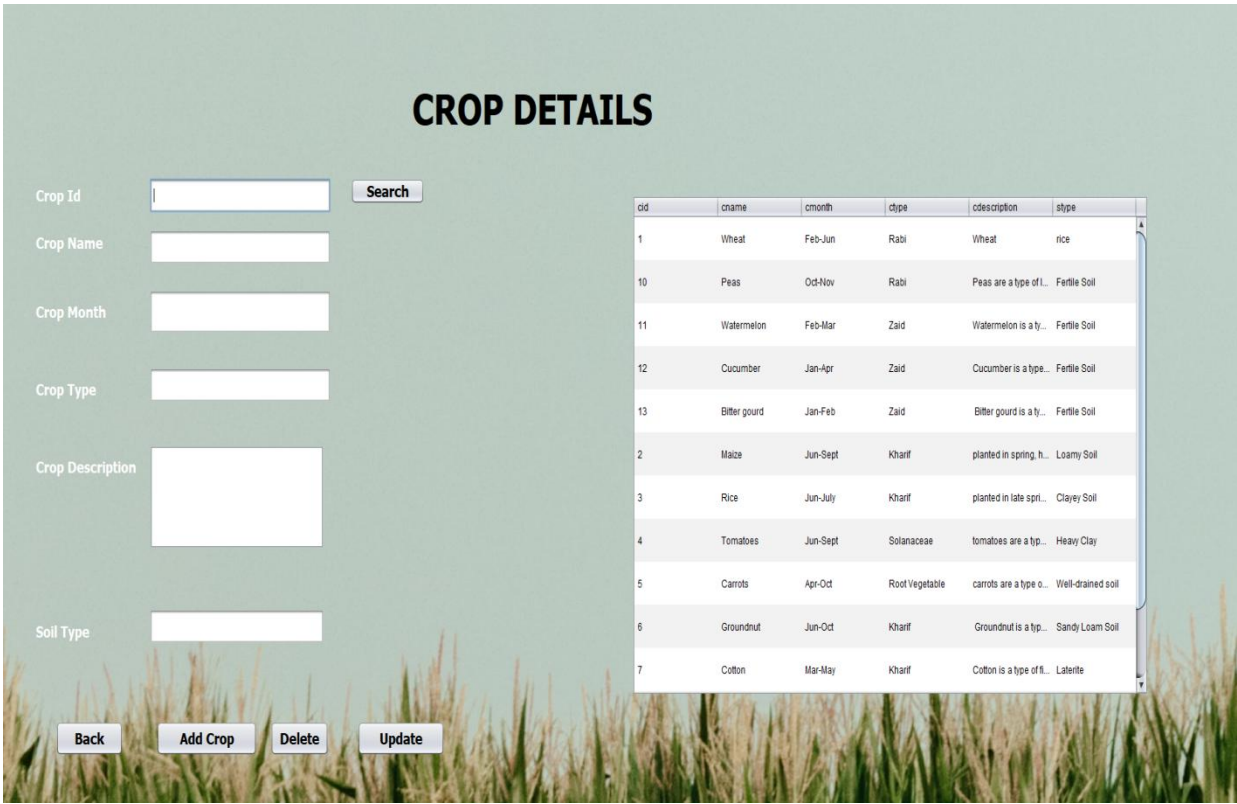


Figure 6.16 Administrator adding crop details



## FERTILIZER DETAILS

Fertilizer Id

Fertilizer Name

Fertilizer Rate

Firm Name

Crop Id

Fid	Fname	Frate	Firmname	cid
1	Nitrogen fertilizer	200	Indian Farmers Fertiliser ...	1
2	Urea	60	Rashtriya Chemicals and...	3
3	Potassium chloride	150	National Fertilizers Limited	10
4	Organic fertilizers	180	Potassium chloride	5
5	Diammonium Phosphate	250	CF Industries	7
6	Ammonium Sulfate	70	Agrium	6

Figure 6.17 Administrator adding fertilizer details

## EQUIPMENT DETAILS

Equipment Id

Equipment Name

Equipment Description

Crop Id

Eid	Ename	Edescription	cid
1	Tractors	Tractors are used to pull various ty...	1
2	Harvesters	Harvesters are used to cut and co...	3
3	Plows	Plows are used to turn over and br...	5
4	Cultivators	Cultivators are used to break up s...	7
5	Transplanters	Transplanters are used to plant s...	4
6	Sprayers	Sprayers are used to apply pestic...	8
7	Mowers	Mowers are used to cut hay, gras...	9
8	Loaders	Loaders are used to load and tran...	10

Figure 6.18 Administrator adding equipment details

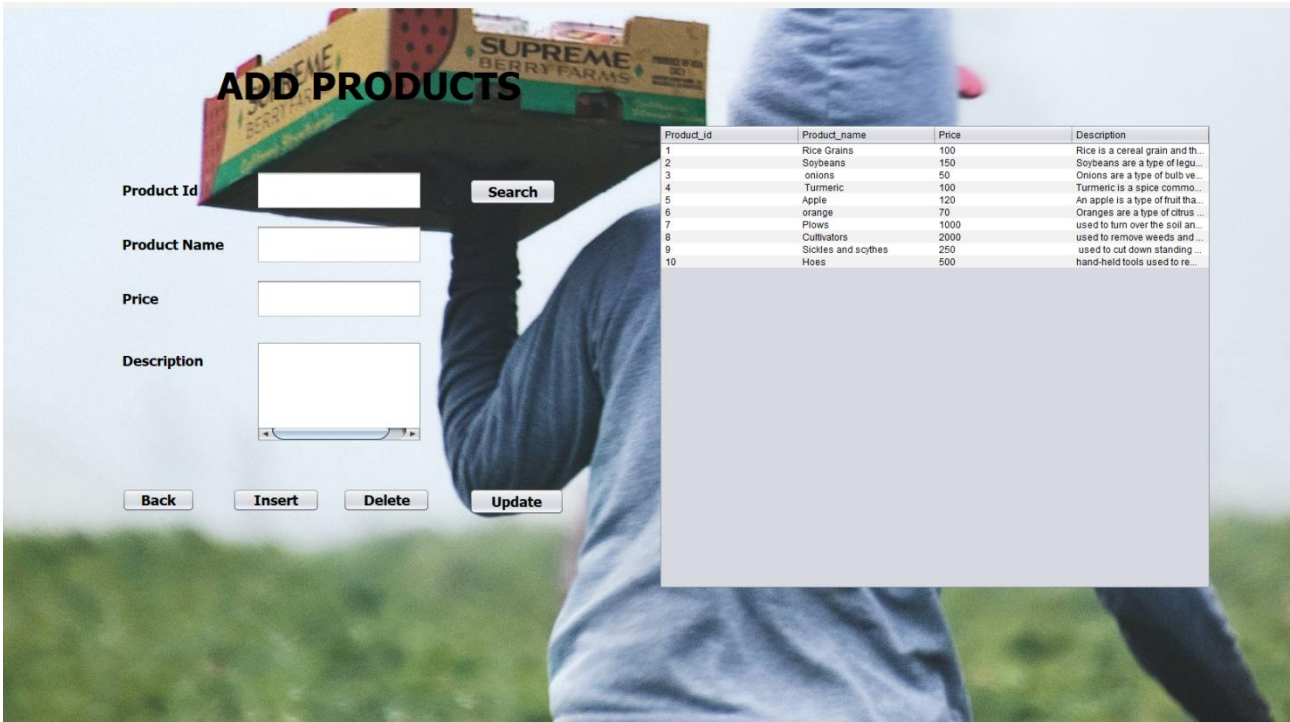


Figure 6.19 Administrator adding product details

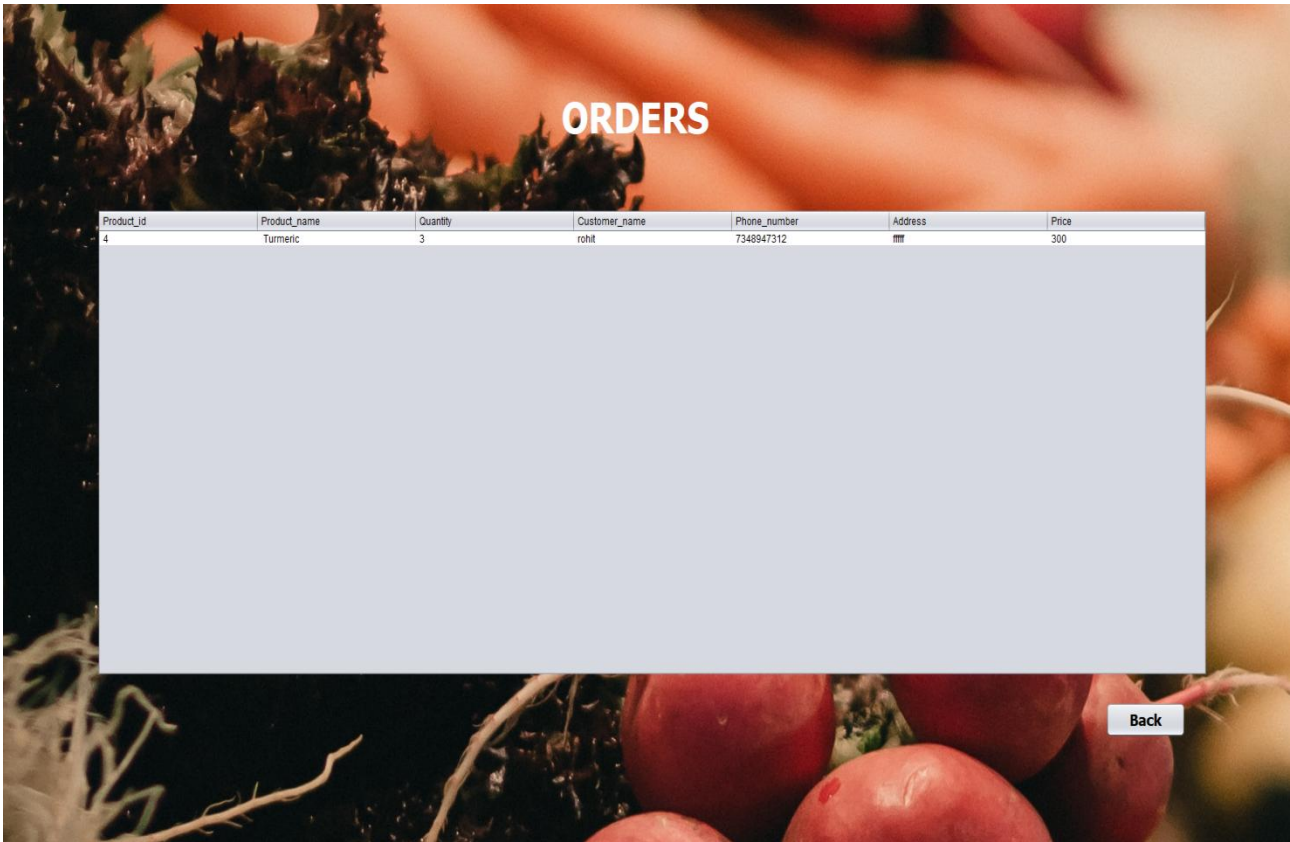


Figure 6.20 Order details



### Feedback Table

id	firstname	fdescription
1	Rohit Arun	"I've been using AIMS for a few months now and it's been a great to...
2	Sugghosh	"I've had some trouble with the system's compatibility with my equip...
6	Manoj	"The AIMS system is very user-friendly and easy to navigate. I have b...
8	Anvith	"I've been using AIMS for a few months now, and it's been a great to...
4	Pavan	it is good to use aims

[Back](#)

**Figure 6.21** Feedback Table

## CHAPTER 7

### CONCLUSION

An agriculture information management system is a collection of technologies, processes, and practices that are used to collect, store, manage, and disseminate information related to agricultural production and management. The objectives of such a system include improving crop yields and farm productivity, reducing costs and increasing efficiency, improving decision-making, and enhancing food security and sustainability. The outcomes of an agriculture information management system can include increased crop yields and farm productivity, reduced costs, improved decision-making, enhanced food security and sustainability, and better compliance and traceability. Overall, an agriculture information management system can play a vital role in improving the efficiency and productivity of agricultural operations, and in ensuring food security for communities around the world.

**Its application:** Providing farmers with information on recommended crops, tools, fertilizers, and products for their specific growing conditions, such as soil type, climate, and pests. Learnings From project are Applying and understanding the methods of using JDBC, MySQL and JAVA using NetBeans

### REFERENCES

- [1]. MYSQL: <https://dev.mysql.com/doc/refman/8.0/en/>
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- [3]. JDBC : <https://www.geeksforgeeks.org/introduction-to-jdbc/>
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- [5]. NETBEANS: <https://netbeans.apache.org/kb/docs/java-se.html>