

## **Kisaan Seva- Aadhaar Linked Smart Farming Application**

**P. Joshua Reginald<sup>1</sup>, M.V. Raju<sup>2</sup>, D. Satyanarayana<sup>2</sup>, K. Mariadas<sup>3</sup>, M. Satish Kumar<sup>4</sup>**

1. Assistant Professor, Department of ECE, Vignans Foundation for Science Technology and Research, Guntur, A.P, India
2. Assistant Professor, Department of Civil Engineering, Vignans Foundation for Science Technology and Research, Guntur, A.P, India
2. Professor, Dept. of Mech. Engg., Vignans Foundation for Science Technology and Research, Guntur, A.P, India
3. Assistant Professor, Dept. of S&H, Vignans Foundation for Science Technology and Research, A.P., India
4. Professor, Department of Civil Engineering, Kallam Haranadha Reddy Institute of Technology, Guntur, A.P., India

### **ABSTRACT**

India is a country in Asia where people's main occupation is Agriculture. As country has diverse people and languages so is the soil state and climatic conditions [3]. The soil type varies with respect to geographic location and climatic condition and needs to be monitored continuously. With the rapid growth of smart phone technology, farmers in rural areas are also using the smart phones. This paper introduces Kisaan seva, Aadhaar linked smart farming system using IoT( Internet of things). It is an open discussion portal used for farmers and general public for knowing the information about various crops in the southern Indian states, and in which soil crops grow more, and the usage of fertilizers to the crops. Aadhaar number is used for authentication of the farmer [1]. This system provides convenience to the farmer as they can use app from any location to know the details of soil, crop and weather condition. Farmers can clear their doubts from concern officers. Proposed mobile app is cost effective and user friendly system and can be used for the smart farming by farmers. Apart from farmer, concern Agriculture officers can monitor farming conditions, thus making the farming easy and intelligent.

**Keywords:** Aadhaar, IoT, Smart farming, Crop, Soils

### **1. Introduction**

With the growth of modern communications and Internet, information is very easily available and accessible electronically; Usages of information technology in the farming process is not a new one but with development of advanced IoT system, smart intelligent app based guidance for farmers is one of the fast and widely accepted thing in the developing countries. In the past years, information technology was used only in specified important

applications. But, now it is used in agriculture sector [2] . There is a need for smart farming due to unpredictable climatic conditions with varied types of soil. The Information technology provides security in many aspects, one of the security model that can be adapted in India is Aadhaar number. In Kisaan seva app security and authenticity of the farmer is guaranteed by the use of his Aadhaar number. Green revolution has lead many researchers to focus on new technologies, where smart farming is in the lead race as it also suggests new farming techniques apart from conventional models. This paper discusses about the App developed for smart farming where farmers can get information about the soil conditions of the region, preferred crops and other information from government officials. The app can also be used by common man to know about the agriculture sector, soil types etc. here the officials can give farmer the suggestions time to time with the help of app [5].

This paper is organized into different sections where section 1 gives brief introduction and section II speaks about different types of soils and various crops suitable for these types of soil. In section III the proposed system explanation is given. Section IV concentrates on the components required to implement the proposed system where as Section V explains the Algorithm for the proposed system, followed by conclusion in Section VI.

## 2. Types of Soils

The Soils are the one of the chief resources of agriculture, by the fertile soils helps to mankind by producing variety of crops. It serves as the food requirements of the local as well as to the world. And the soils and its fertility were not same in all the places, it has various types based on the nutrients availability, climate and atmospheric conditions and formation of soil depends on the time [4]. All types of soils and their classification depend on soil texture and other chemical properties. Different types of Soils are as follows:

1. Black soils
2. Red soils
3. Clayey soils
4. Sandy soils
5. Loamy soils

**2.1. Black Soils:** These soils also called as black lava soils, usually rich in black in color and high content of clay. Black soils accounts as food hub for many nations and recognized as contentiously productive and fertile soils are these soils are suitable for crops of cotton, tobacco, cereals and oilseeds, etc.

**2.2. Red Soils:** These soils color is presence of iron oxide, generally it's appears as yellow in color when it has less iron and high amount of water. The soils are mixture of clay and sand, which has less in fertility and may enhance by adding during cultivation of the crops, and it's suitable for crops of groundnuts, millets, tobacco and cotton, etc.

**2.3. Clayey Soils:** These soils are containing very high percentage of clay particles and good in moisture content, and less percentage of air. It has high holding capacity of water content and high amount of organic content. The size of clay particles is less than 0.2 mm. Hence these soils support good for irrigation and suitable for crops like paddy, vegetables and others.

**2.4. Sandy Soils:** These soils are containing greater than sixty percentage of sand and remain portion has clay, which has small amount of clay, because of less content of clay, these soils are porous and size of the soils are in between 0.2 mm and 2.0 mm, and the water building capacity is not good and air presents in to it. Because of these characteristics soils are not good for plants, but it's good for water melon and coconut crops and if water availability is more near and around the soils it's suitable for irrigation of another crops of maize, millets, cactus and barley, etc.

**2.5. Loamy Soils:** These soils are containing sand, clay and silt and humus. And these soils have good water holding capacity and have sufficient aeration in soils. Hence it is suitable for irrigation with rooted crops of cotton, jute, sugarcane, what, pulse and oilseeds, etc. and also good for leafy vegetables

### **3. Proposed System**

In Kisaan seva system, Aadhaar based authentication is to be used to improve the security levels to the existing system. In this system the farmer will be able to register by giving his Aadhaar number or with help of user id and password. After registering with Aadhaar, the user can create id and password of his choice [8]. As per the Aadhaar data acquisition system, the demographics and biometrics are captured and can be used by concern government officials. This data can be used to check the authenticity, of the farmer.

#### **Aadhaar Server:**

The data from citizens is Collected, Organized, Stored and Maintained by Government of India. During the authentication transaction, the farmers' record is first selected using the Aadhaar Number linked with corresponding person's phone number [6]. Aadhaar authentication service is exposed as stateless service over hyper text transfer protocol Usage of open data format in XML and widely used protocol such as HTTP allows easy adoption

and deployment of Aadhaar authentication [7]. This gives first level security for government to authenticate the genuine farmer

#### 4. Components in the Proposed System

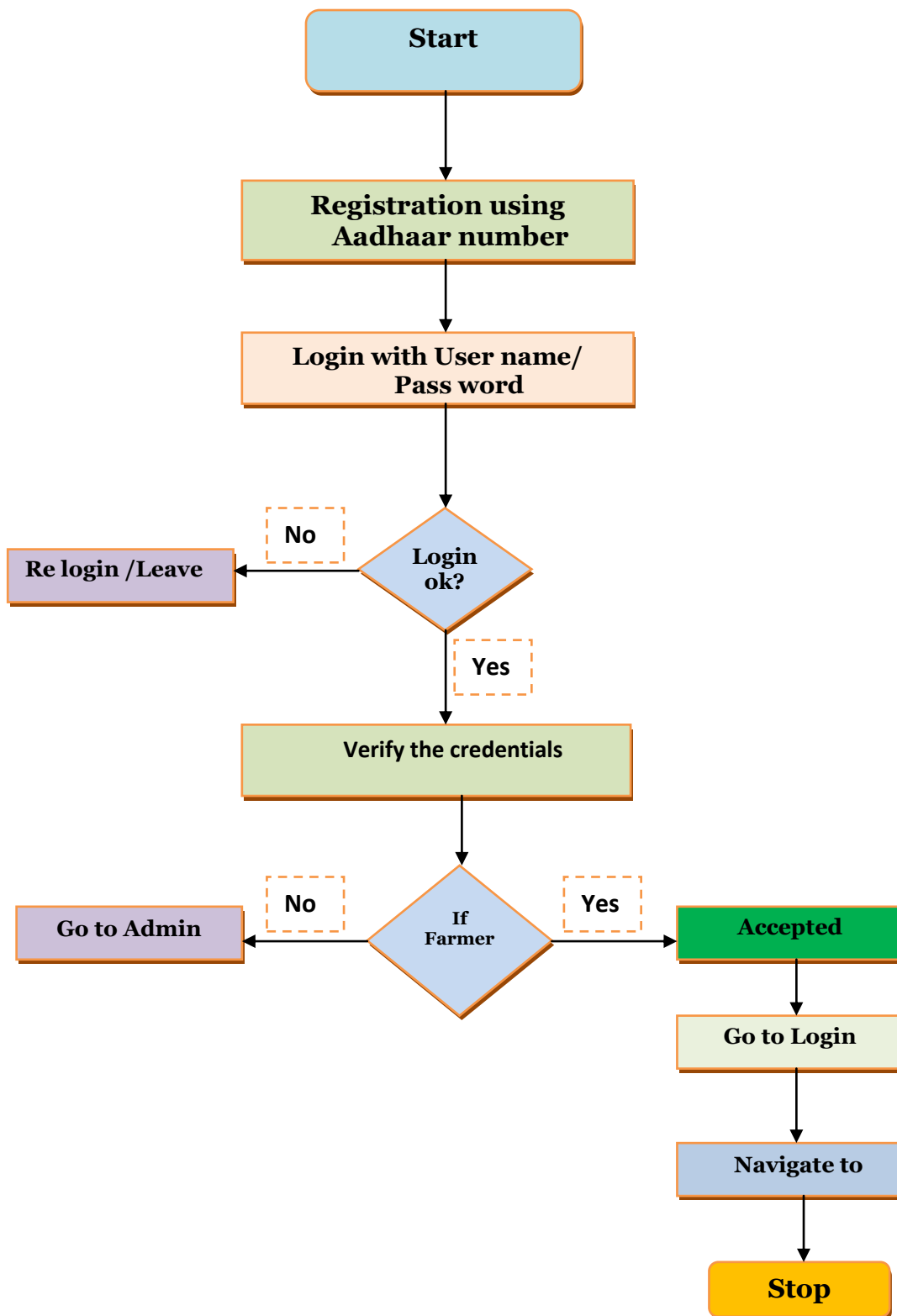
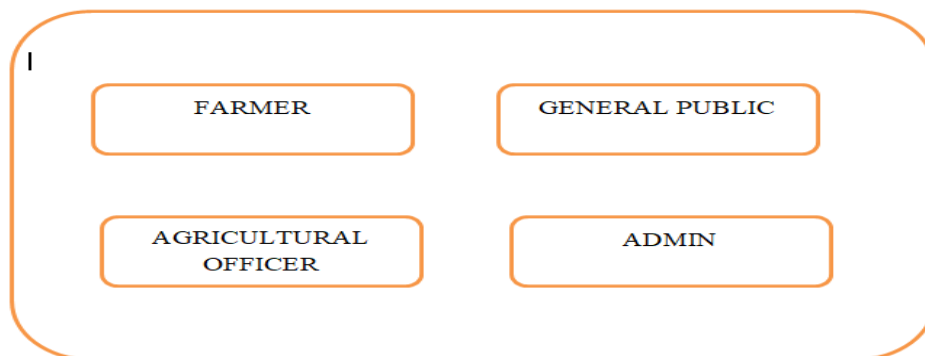


Fig. 1 Proposed System of components

#### 4.1. Home page:



A diagram showing a rounded rectangular container with four buttons arranged in a 2x2 grid. The buttons are labeled: FARMER, GENERAL PUBLIC, AGRICULTURAL OFFICER, and ADMIN.

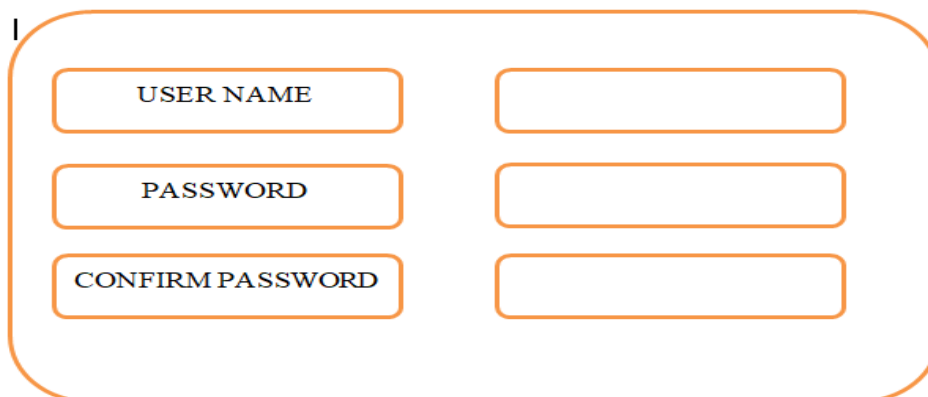
Fig. 2 Home page

#### 4.2. User Module:

First, to enter this system the users has to register and login to this system. The process is simple and can be easily created.

##### 1.2.1 Registration Process

This is the first process user needs to do, here the user will provide user name and password as shown in the below diagram



A diagram showing a rounded rectangular container with three rows of input fields. Each row has a label on the left and an empty input box on the right. The labels are: USER NAME, PASSWORD, and CONFIRM PASSWORD.

Fig. 3 Registration

##### 4.2.2 Login Process



A diagram showing a rounded rectangular container with two rows of input fields. Each row has a label on the left and an empty input box on the right. The labels are: USER NAME and PASSWORD.

Fig. 4 Login

## 2. Administrator module

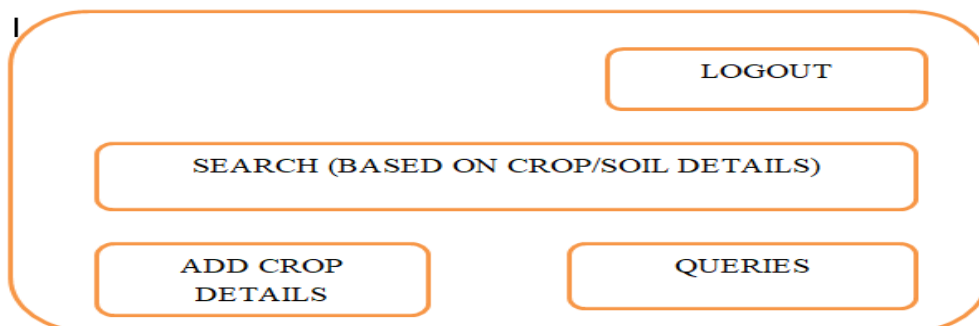
The administrator can access all the details regarding soil, climate, fertilizers and market. Administrator can also update the portal with all the above data.



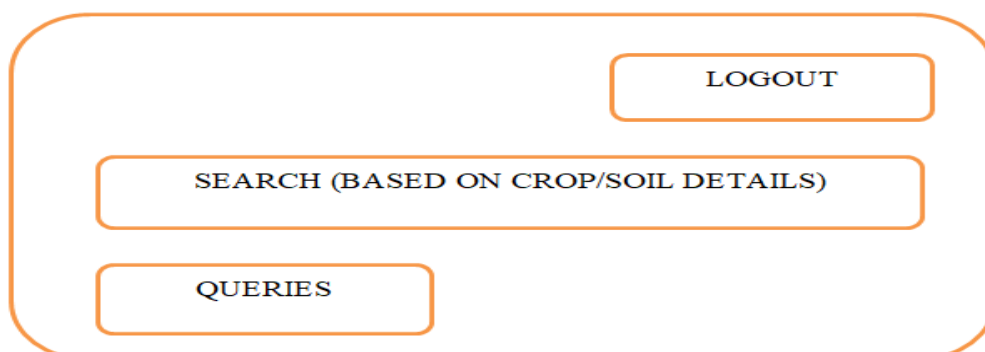
**Fig. 5 Admin module**

## 4.3. Farmer:

This module is used to maintain the various Soil Details. In this module, Farmer can add his crop details and access the soil details available. General public can only see the available soil details. Figure 5 gives the Farmer module and Figure 6 provides us the module for general public.



**Fig 6 Farmer module**



**Fig. 7 General public module**

## 5. Technology Used

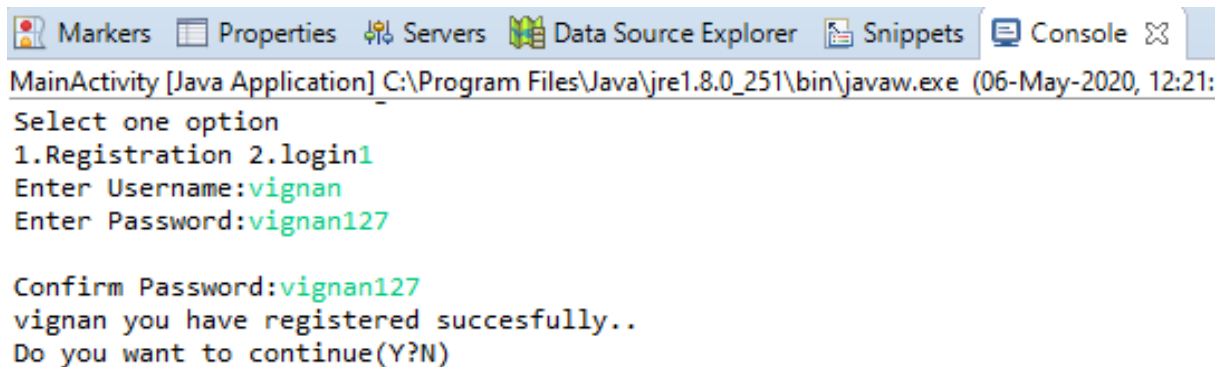
Smart Farming application is developed using core java concepts. The entire work is divided into 10 packages each specifies the working of the modules each package is again divided into different modules. Packages are as follows:

1. Home
2. Menu
3. User
4. Admin
5. Agriculture Officer
6. Farmer
7. General Public
8. Queries
9. Soils
10. Crops

### 5.1. Results

The working of the developed application yields the following results which is used to update and access the developed application.

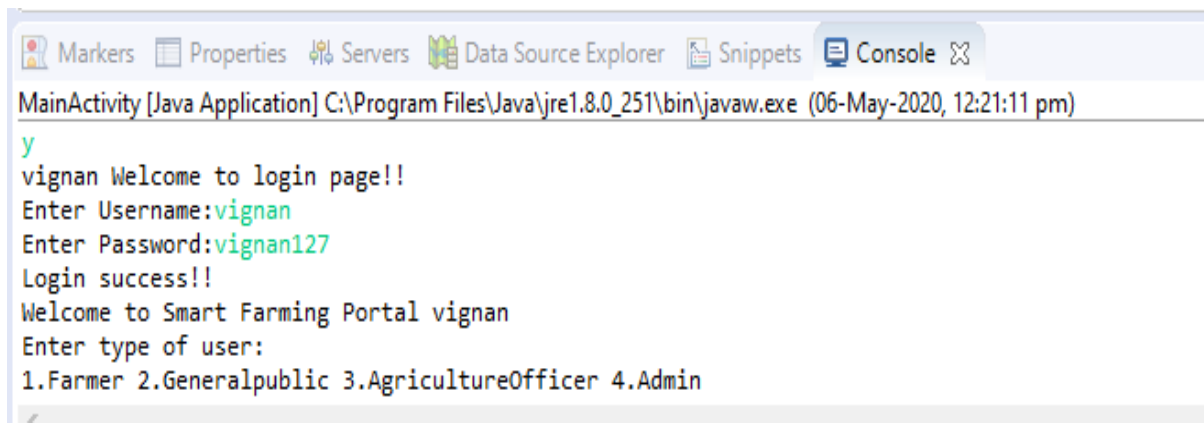
### 5.2. Registration



```
Markers Properties Servers Data Source Explorer Snippets Console
MainActivity [Java Application] C:\Program Files\Java\jre1.8.0_251\bin\javaw.exe (06-May-2020, 12:21:
Select one option
1.Registration 2.login1
Enter Username:vignan
Enter Password:vignan127

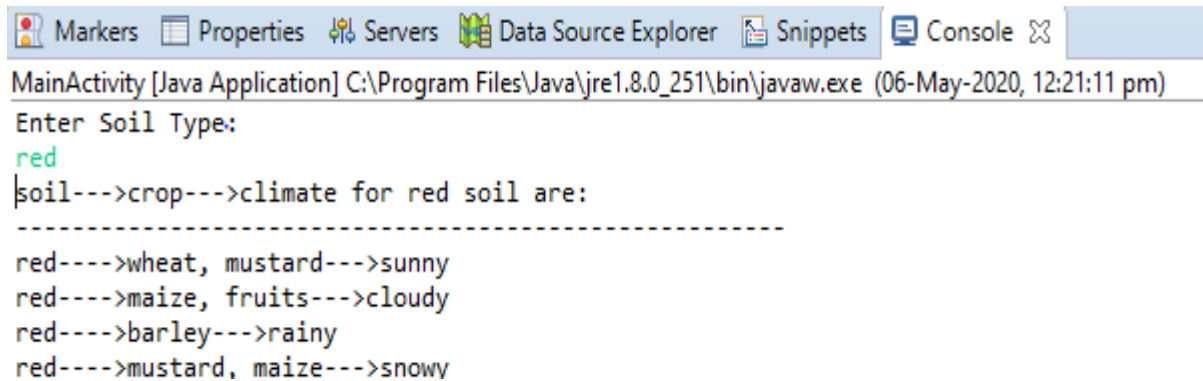
Confirm Password:vignan127
vignan you have registered succesfully..
Do you want to continue(Y?N)
```

### 5.3. Login



```
Markers Properties Servers Data Source Explorer Snippets Console
MainActivity [Java Application] C:\Program Files\Java\jre1.8.0_251\bin\javaw.exe (06-May-2020, 12:21:11 pm)
y
vignan Welcome to login page!!
Enter Username:vignan
Enter Password:vignan127
Login success!!
Welcome to Smart Farming Portal vignan
Enter type of user:
1.Farmer 2.Generalpublic 3.AgricultureOfficer 4.Admin
```

#### 5.4. Search based on soil

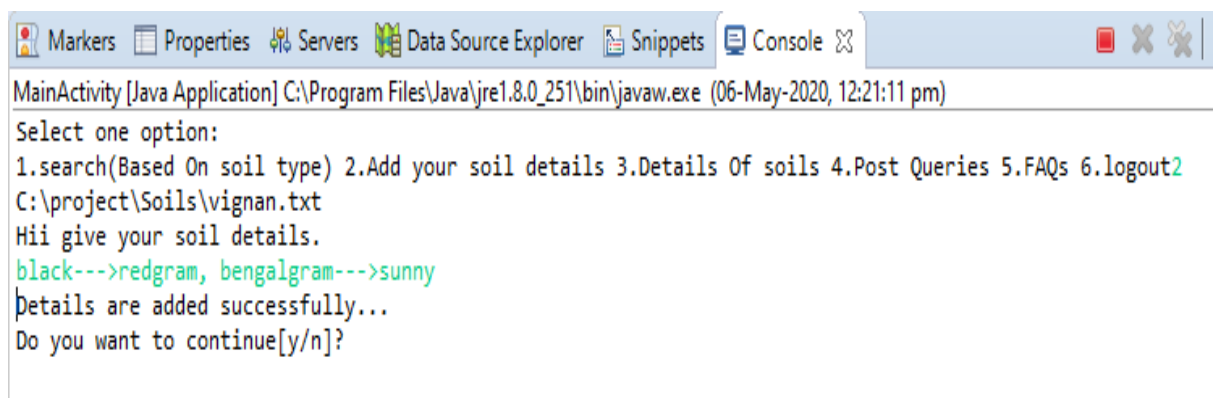


```

Markers Properties Servers Data Source Explorer Snippets Console
MainActivity [Java Application] C:\Program Files\Java\jre1.8.0_251\bin\javaw.exe (06-May-2020, 12:21:11 pm)
Enter Soil Type:
red
soil--->crop--->climate for red soil are:
-----
red---->wheat, mustard--->sunny
red---->maize, fruits--->cloudy
red---->barley--->rainy
red---->mustard, maize--->snowy

```

#### 5.5. Add your soil details



```

Markers Properties Servers Data Source Explorer Snippets Console
MainActivity [Java Application] C:\Program Files\Java\jre1.8.0_251\bin\javaw.exe (06-May-2020, 12:21:11 pm)
Select one option:
1.search(Based On soil type) 2.Add your soil details 3.Details Of soils 4.Post Queries 5.FAQs 6.logout2
C:\project\Soils\vignan.txt
Hii give your soil details.
black--->redgram, bengalgram--->sunny
details are added successfully...
Do you want to continue[y/n]?

```

#### 6. Conclusions

Kisaan seva is a Smart farming application can be used by both famers and general public to enhance the knowledge in farming by knowing about the crops and soil details, Agricultural officer facilitates users with the data and support required and Admin authenticates the users and data. This application escalates the productivity and reduces losses to the users, thus reduces dependency

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