Cloud Computing Mini Project Report

KrishiAI

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Abstract:

Determining which crop is to be grown; when the soil needs more water and fertilizers; and if the crop is infected by pests are well understood with the help of IoT sensors and the use of Machine Learning models. The proposed system aims to collect the current soil conditions to determine the water quantity and fertilizers needed by the soil. The IoT camera sensor module will help to determine if the crop is infected by pests so that the farmer will be able to take suitable actions. Soil conditions and weather conditions will be used to determine the suitable crop and will lead to maximum yield and profit. The system provides alert notifications to the farmer and other relevant information related to the crops and the soil through mobile application. It helps the farmer to take suitable actions in order to minimize the loss and maximize the crop yield.

Scope of the Project:

- The project is built for farmers.
- It aims to solve the issues of farmers by making use of modern technologies such as ML and IoT.
- The concept of cloud computing has been used to ensure the delivery of a cost effective and cost efficient solution.

Technologies Used:

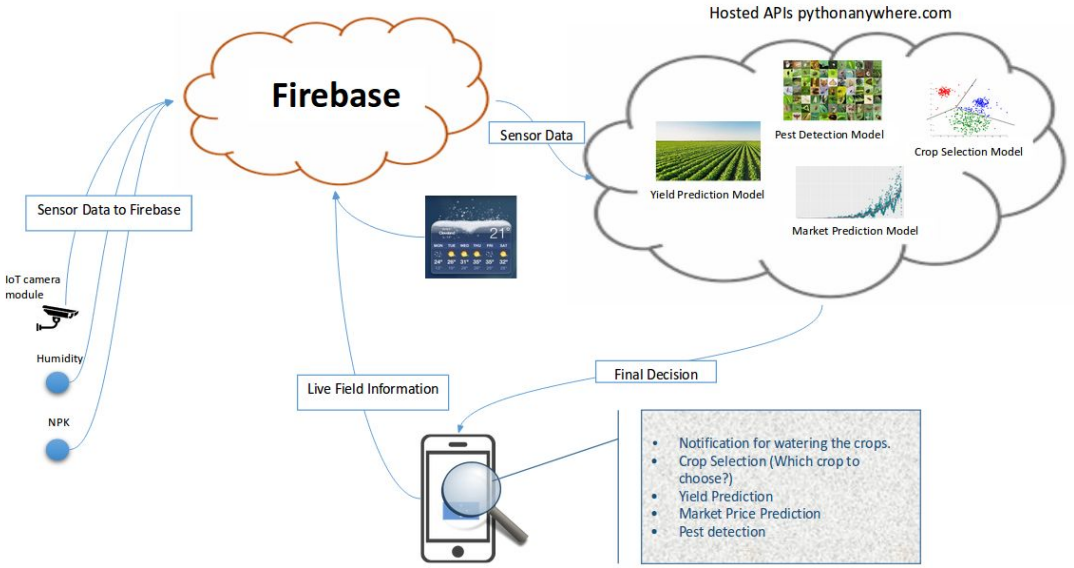
- Machine Learning
- IoT
- Android
- Pythonanywhere (Cloud)
- Firebase (Cloud based database)

Introduction:

For a crop to grow healthy and nutritious, farmers need to take care of many aspects such as soil quality, soil water content, soil temperature, amount of fertilizers, etc. Plants need different nutrient rates and ratios at different growth stages and conditions of the soil. The farmer already has to take numerous painstaking efforts in order to earn profits. Therefore, we have come up with a solution that caters to the needs of these farmers in order to reduce their efforts. We know that the water content required depends on the current moisture content of soil and weather conditions. The amount of fertilizers and pesticides to be added must be decided by current conditions. Our major objective is to propose a system which can sense and suggest the requirements to earn better profits for crops. Our system detects pests earlier so that the farmer does not incur losses. It also suggests which crop should be grown by evaluating climatic conditions, soil conditions. The market demand of the crop so as to maximize the profit.

Architecture Diagram of the System:

The architecture diagram of the system is as follows:



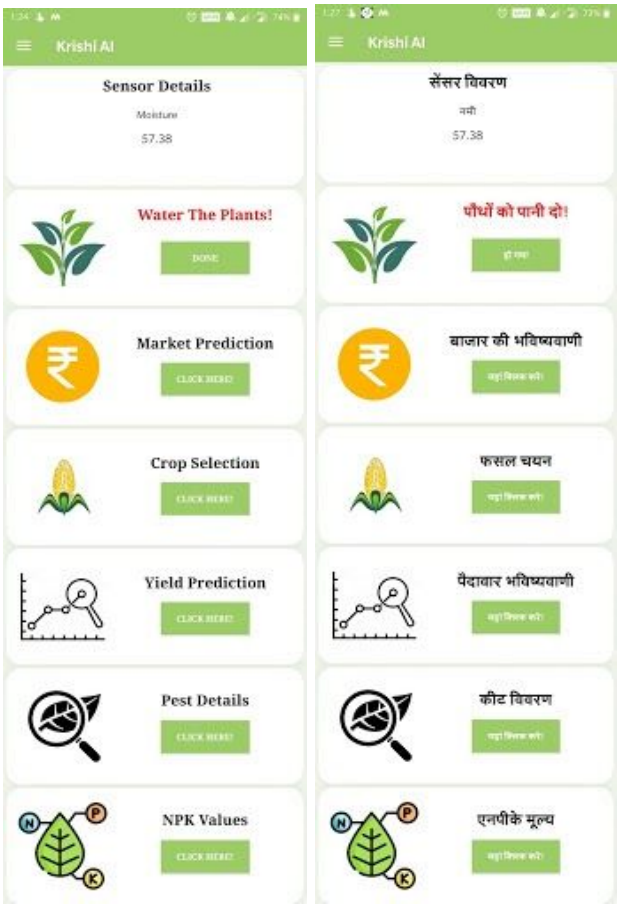
The above diagram gives a rough overview of our system. An android application is being used for accessing all the services. All the required data is being collected from the sensors which are present on the farm and then the data is being sent to a cloud based storage, Firebase.
A variety of functionalities are being provided by our application. They are:

- Pest Detection - This module tells the farmer whether a pest is present in the farm. This is achieved with the help of a camera present on the field.
- Crop Selection - This module tells the farmer which crop should be grown at a particular time so that loss can be avoided.
- Yield Prediction - This module gives a prediction of the amount of yield that would be harvested.
- Market Price Prediction - This module gives a prediction of the price of crops on the basis of the nearest markets present.
- Notification for watering the field: This module provides real time notification to the farmer on the android application if the amount of water present in the field is less.

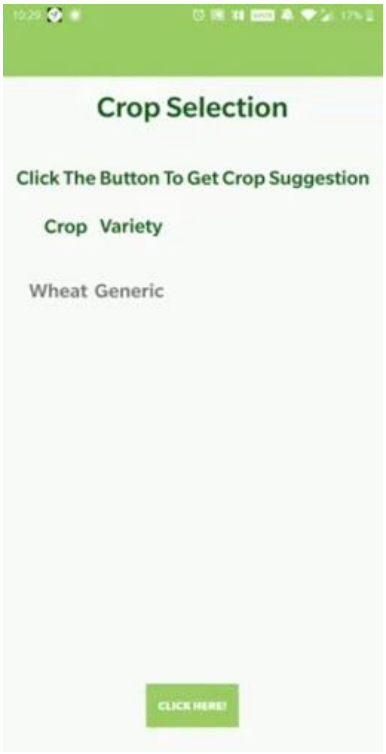
All the above services require a good amount of memory and processing power. All of this might not be available on a person's device. Hence, with the help of cloud computing all the above services have been enabled.

Output (Screenshots of the application):

- **Home Screen:**

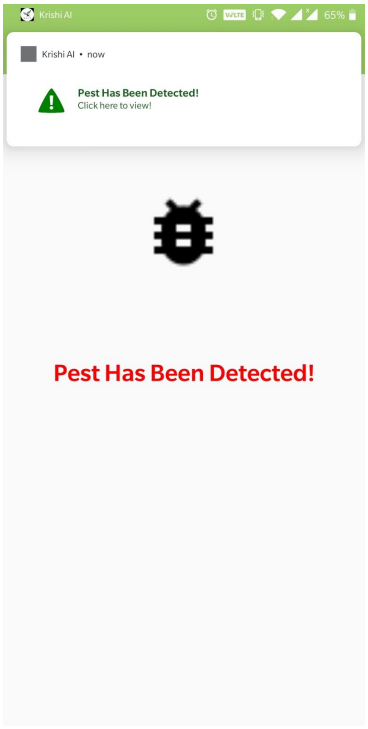


- **Crop Selection:**



- **Market Prediction:**

- **Pest Detection:**



- **Notification for Watering Plants:**