AI Assisted Farming for Crop Recommendation Farm Yield Prediction Application

Team **TITAN**

INTRODUCTION

This is a Software model on AI assisted farming for crop recommendation and yield prediction using machine learning solutions.

A machine learning model with accurate prediction ability can solve the risks involved in agriculture and also predict the yield of a specified agricultural land and the crop that can be best cultivated there.

OVERVIEW

To help farmers in minimizing the risks involved in agriculture, we propose creating an application that recommends farmers about the best crops to be cultivated based on climatic parameters, nutrients and also predict the yield and revenue that would be generated for the cultivated land.

Digital Farming and Precision Agriculture allow precise utilization of inputs like seed, water, pesticides, and fertilizers at the right time to the crop for maximizing productivity, quality and yields. Most of the farmers practice traditional farming patterns to decide crops to be cultivated in a field.

Thus, the solution to this Challenge can be a crop recommendation system that helps farmers to decide the right crop to sow in their field and forecast the yield & revenue.

PROBLEM ANALYSIS

When the weather strikes or crops get affected by a disease, farmers can hardly talk about yields or when a global pandemic hits, all of a sudden it gets harder to manage various processes because most are not digital.

The global population is growing and urbanization is continuing. Consumption habits are changing and farmers are under a lot of pressure to meet the increasing demand, and they need a way to increase productivity.

We need to look for ways to help farmers minimize their risks. Implementing artificial intelligence in agriculture on a global scale is one of the most promising opportunities.

PROPOSED SOLUTION

The machine learning Model solution has been prepared which has the ability to predict results accurately. Machine learning models that can predict the yield of a particular land which can also predict the crop that is best suited to an agricultural land is created and deployed in the web application.

DATA COLLECTION

The historical **data** of various **nutrients** present in agricultural lands of different regions of the Country and the **crops** that are best suited to be cultivated in that region is also collected for training the **machine learning** model.

MACHINE LEARNING

Machine Learning model has been **trained from the collected data** From **Watson Studio**.

Snapml model for **Yield Prediction** and **Lightgbm** model for **Crop Recommendation** have been used.

ML Deployment models has been created using AutoAI in Watson studio

Graphical User Interface (GUI)

Django framework from Python has been used in this project to create the **User Interface**.Various **HTML** pages have been created styled with **CSS** and integrated with Django. Databases have also been created to keep track of the users of the app. The ML Model has been **integrated** with the Django **web-app** to have a smooth input/output interface with the Machine Learning model deployment.

FEATURES

- It predicts **each seasonal yield** estimation accurately by using the ML model along with **Amount of yield estimation**.
- **Seasonal effects** on crop production are also considered while training the ML model.
- **Over 15 years of data** is considered which can provide the ML model a high accuracy.
- **Seasonal Fruits and Vegetables and Crops recommendation** prediction can also be known by the model.

DEPLOYMENTS

Future demand can be predicted in **Food Industries.**

Accurate demand forecast can be utilized in managing of **Local Warehouses and budget prediction**.

Can help customers and sellers in the estimation of the price in future.

ADVANTAGES

1. Increased **yield** can be obtained**.**

2. **Cost estimation** can be done faster.

3. Predicted output has **high accuracy** when compared to manual calculations.

4. **Precautionary measures** can be made earlier.

DISADVANTAGES

1. **Sudden changes** affect data forecasts.

2. Predictions may vary at times of **Natural Calamities.**

FUTURE SCOPE

The demand of **Machine Learning (ML) and Artificial Intelligence (AI**) is growing in almost every industry. Fortunately for demand planners, ML can now help further improve the forecast from **40% of actual to 70% of actual**.

Machine Learning can predict crops and yield at the local level and identify how it connects to *local demand patterns*.

Machine Learning can also determine if a relationship exists between the weather changes and the demand of crops on a **real-time basis** make suggestions accordingly.

Thank You.