

# CROP RECOMMENDATION SYSTEM (CROPIFICATION)

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# Introduction

- 1).Develop a machine learning system to forecast crop yield and recommend suitable crops considering economic viability and environmental sustainability in Indian agriculture.
- 2).Empower farmers with accurate predictive insights, enabling them to make informed decisions amidst challenges like declining soil health and fluctuating market prices. This approach fosters sustainable agricultural practices and enhances overall productivity.
- 3).Implementation of this system holds the potential to revolutionize farming practices, contributing to the resilience of Indian agriculture while safeguarding the livelihoods of millions of farmers.

# Objectives

- This project aims at predicting the crop yield at a particular weather conditions and thereby recommending suitable crops for that field. It involves the following steps
  - Collection of Datasets.(<https://www.kaggle.com/datasets>)
  - Pre processing (Noise Removal)
  - Feature Extraction.
  - Applied Various Machine Learning Algorithms.
    - (like decision tree,Svm,random forest).
  - Recommendation System.
  - Recommended Crop.

# Experimental Set-up

## **SOFTWARE REQUIREMENT FOR PRESENTING THE PROJECT**

1. HTML ,CSS AND JAVASCRIPT
2. PYTHON
3. NUMPY
4. PANDAS
5. SEABORN
6. SCIKIT LEARN
7. MATPLOTLIB
8. ANACONDA
9. VS CODE

# Sequence Diagram

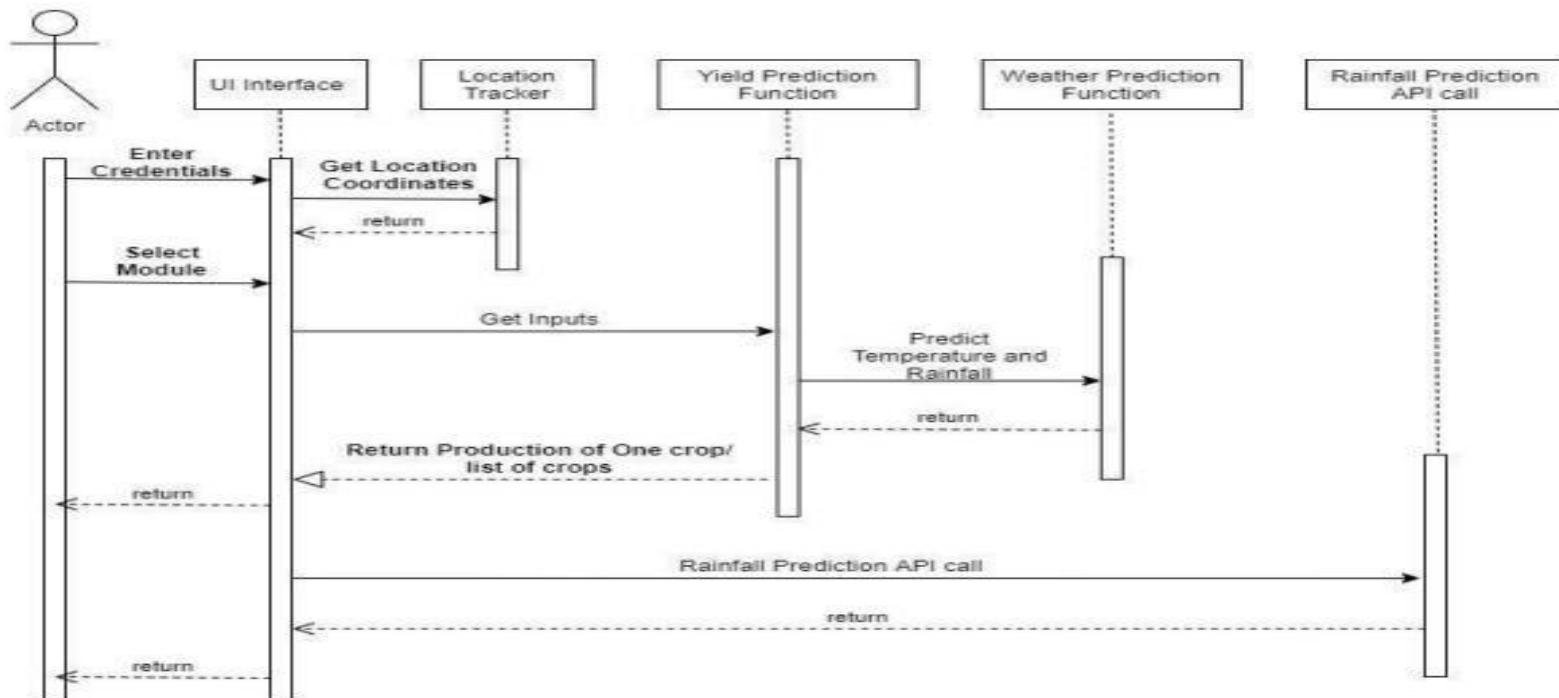


Fig 1. Sequence diagram

# Proposed Model

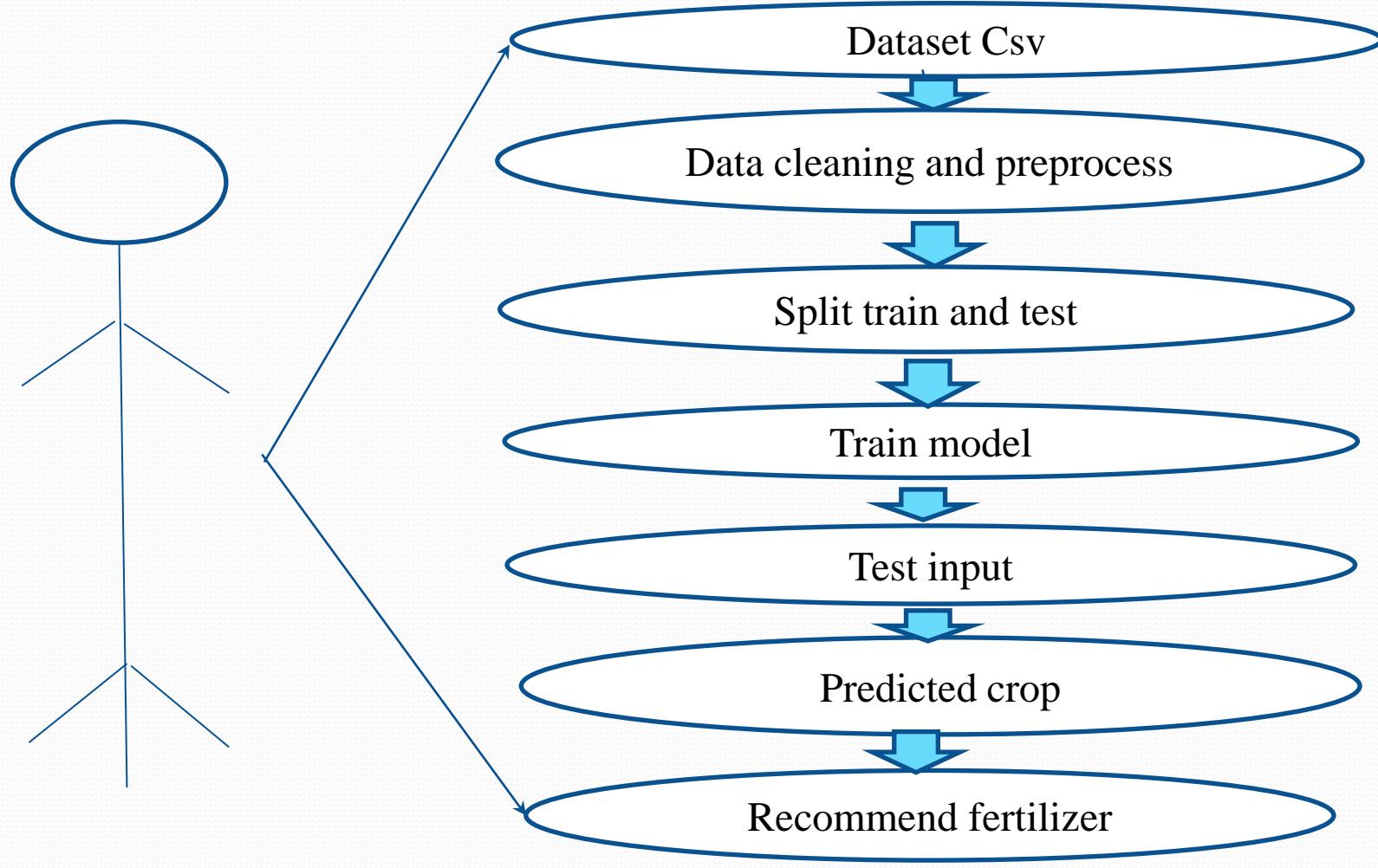


Fig 3. flow diagram

# Result: Example



**CROPIFICATION**  
With Technology Helping Farmer For Planting

Here Are Some Questions We'll Answer:

1. What crop to plant here?
2. What fertilizer to use?
3. Which disease do your crop have?
4. How to cure the disease?

Get informed advice on fertilizer based on soil

Nitrogen

Phosphorous

Potassium

Crop you want to grow

**Predict**

Find out the most suitable crop to grow in your farm

Nitrogen

Phosphorous

Potassium

ph level

Rainfall (in mm)

State

City

Find out which disease has been caught by your plant

Please Upload The Image  
 No file chosen

**Predict**

# Result Analysis



Home Crop Fertilizer Disease

Find out the most suitable crop to grow in your farm

Nitrogen  
40

Phosphorus  
50

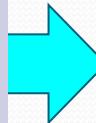
Potassium  
60

ph level  
8

Rainfall (in mm)  
250

State  
Bihar

City



Home Crop Fertilizer Disease

You should grow papaya in your farm



Home Crop Fertilizer Disease

Get informed advice on fertilizer based on soil

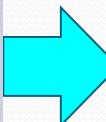
Nitrogen  
50

Phosphorus  
60

Potassium  
70

Crop you want to grow  
rice

**Predict**



The K value of your soil is high.

Please consider the following suggestions:

1. Loosen the soil deeply with a shovel, and water thoroughly to dissolve water-soluble potassium. Allow the soil to fully dry, and repeat digging and watering the soil two or three more times.
2. Sift through the soil, and remove as many rocks as possible, using a soil sifter. Minerals occurring in rocks such as mica and feldspar slowly release potassium into the soil slowly through weathering.
3. Stop applying potassium-rich commercial fertilizer. Apply only commercial fertilizer that has a '0' in the final number field. Commercial fertilizers use a three number system for measuring levels of nitrogen, phosphorous and potassium. The last number stands for potassium. Another option is to stop using commercial fertilizers all together and to begin using only organic matter to enrich the soil.
4. Mix crushed eggshells, crushed seashells, wood ash or soft rock phosphate to the soil to add calcium. Mix in up to 10 percent of organic compost to help amend and balance the soil.
5. Use NPK fertilizers with low K levels and organic fertilizers since they have low NPK values.
6. Grow a cover crop of legumes that will fix nitrogen in the soil. This practice will meet the soil's needs for nitrogen without increasing phosphorus or potassium.

# Result Analysis

 Home Crop Fertilizer Disease

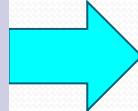
Find out which disease has been caught by your plant

Please Upload The Image

Choose File: OIP.jpeg



Predict



Crop: Corn(maize)  
Disease: Common Rust

Cause of disease:

Common corn rust, caused by the fungus *Puccinia sorghi*, is the most frequently occurring of the two primary rust diseases of corn in the U.S., but it rarely causes significant yield losses in Ohio field (dent) corn. Occasionally field corn, particularly in the southern half of the state, does become severely affected when weather conditions favor the development and spread of rust fungus

How to prevent/cure the disease

1. Although rust is frequently found on corn in Ohio, very rarely has there been a need for fungicide applications. This is due to the fact that there are highly resistant field corn hybrids available and most possess some degree of resistance.

2. However, no corn and sweet corn can be quite susceptible. In seasons where considerable



# Limitation

- While crop recommendation systems offer many benefits, there are also some limitations that need to be considered. Here are some potential limitations of crop recommendation systems:
- Data Availability: The accuracy of recommendations depends on the quality and quantity of data available, and in some cases, data may not be available or may be incomplete.
- Infrastructure: A crop recommendation system requires infrastructure, such as sensors and weather stations, which may not be readily available in all areas, particularly in remote or developing regions.
- Human Factors: A crop recommendation system may not take into account human factors, such as farmer preferences, cultural practices, and land tenure systems, which can affect decision-making.

# Conclusions & Future Scope

The prediction of crop yield based on location and proper implementation of algorithms has proved that a higher crop yield can be achieved. From the above work, I conclude that for soil classification Random Forest & Naive Bayes is good with an accuracy of 99.09% compared to the Support Vector Machine, Decision Tree & Logistic Regression. A web application can be built to help farmers by uploading images of farms. Crop disease detection using image processing in which users get pesticides based on disease images. Implement Smart Irrigation System for farms to get higher yields. This system is proposed to deal with the increasing rate of farmer suicides and to help them to grow financially stronger. The Crop Recommender system helps farmers to predict the yield of a given crop and also helps them to decide which crop to grow. Moreover, it also tells the user the right time to use the fertilizer.

# References

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- [5] E. Manjula and S. Djodiltachoumy (2017). "Data Mining Technique to Analyze Soil Nutrients Based on Hybrid Classification."



*Thank You!*