



CROP PREDICTION USING RANDOM FOREST ALGORITHM

Ashna Karim

PG Scholar

Amal Jyothi College of Engineering,
Kanjirappally, Kerala

Jetty Benjamin

Assistant Professor

Amal Jyothi College of Engineering,
Kanjirappally, Kerala



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01

Introduction



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Introduction

- The state's economy frequently depends greatly on the performance of agriculture, which serves as the foundation of several regions. Fertile land has been put to use for commercial purposes recently due to the rising demand for agricultural land brought on by industrialization, infrastructure growth, urbanization and other triggers.
- This is having an impact on the overall agricultural output in addition to reducing the amount of cultivable land. It is crucial to maximize agricultural output by accurate forecasts when the amount of arable land available decreases, especially in light of how unpredictable weather patterns can be.



02

Literature Survey



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Literature Survey 1

Reference	Content
S. Veenadhari, Dr Bharat Misra, Dr CSingh.2019."Machine learning approach for forecasting crop yield based on climatic parameters."	<ul style="list-style-type: none">• Predicts the crop based on the user's preferences by providing local climatic information.• Decision trees are used in this situation. They considered wheat, paddy, maize, soybean in a particular district and have 75% accuracy.• The variables used here are rainfall, temperature, the cloud cover, wet day frequencyIn the present study only the climatic parameters were considered in predicting the crop yield.



Literature Survey 2

Reference	Content
Girish L, Gangadhar S, Bharath T R, Balaji K S, Abhishek K T “Crop Yield and Rainfall Prediction in Tumakuru District using Machine Learning	<ul style="list-style-type: none">• Here uses a machine learning mechanism to analyze crop yield and rainfall.• They addressed a variety of machine learning methodologies for forecasting agricultural production and rainfall in this study, as well as the effectiveness of several machine learning algorithms such as liner regression, SVM, KNN method & decision tree. They conclude that SVM is the most successful strategy for forecasting rainfall.



Literature Survey 3

Reference	Content
Sangeeta, Shruthi G, “Design And Implementation Of Crop Yield Prediction Model In Agriculture”,2020	<ul style="list-style-type: none">• By comparing various machine learning algorithms predicts the crop yield.• The paper concludes that between all three algorithms Random forest gives a better yield prediction as related to other algorithms.



Literature Survey 4

Reference	Content
Rakesh Kumar, M.P. Singh, Prabhat Kumar and J.P. Singh (2015), “ Crop Selection Method to Maximize Crop Yield Rate using Machine Learning Technique “ International Conference on Smart Technologies and Management for Computing, Communication, Controls, Energy and Materials (ICST)	<ul style="list-style-type: none">• In their research, they propose a strategy called CSM for deciding the sequence of harvests to be produced over the course of the planting season.• The proposed method resolves selection of crop based on prediction yield rate influenced by parameters (e.g. weather, soil type, water density, crop type).



Literature Survey 5

Reference	Content
T. Banavlikar, A. Mahir, M. Budukh, S. Dhodapkar, "Crop recommendation system using Neural Networks," International Research Journal of Engineering and Technology (IRJET)	<ul style="list-style-type: none">• Developed an extensive, precise, and robust yield suggestion framework that uses neural networks.• Temperature and soil are considered, and sensors for soil moisture, mugginess, and temperature are given to measure the amount of vapor in the surrounding air and the amount of water in the soil.



03

Methodology



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Methodology

- The aim of this study is to build a machine learning model using the available dataset, can accurately forecast a crop's ability to grow in accordance with the input parameters supplied by the user.

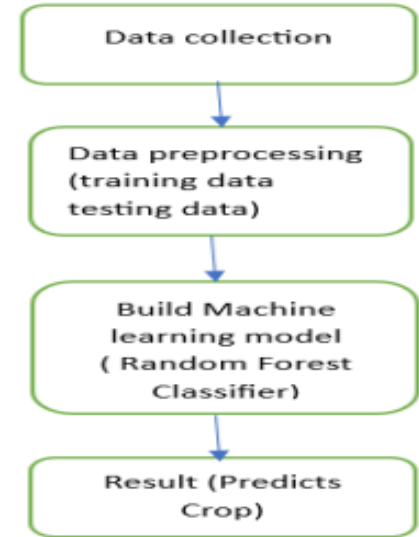


Fig 1. Methodology



Methodology

A. Data Collection

- Gather a diverse dataset of Crops and its suitable conditions.
- Dataset
<https://www.kaggle.com/datasets/siddharthss/crop-recommendation-dataset>

B. Data Preprocessing

- The dataset is divided into training and testing sets in an 80-20 split ratio to facilitate model training and evaluation.



Methodology

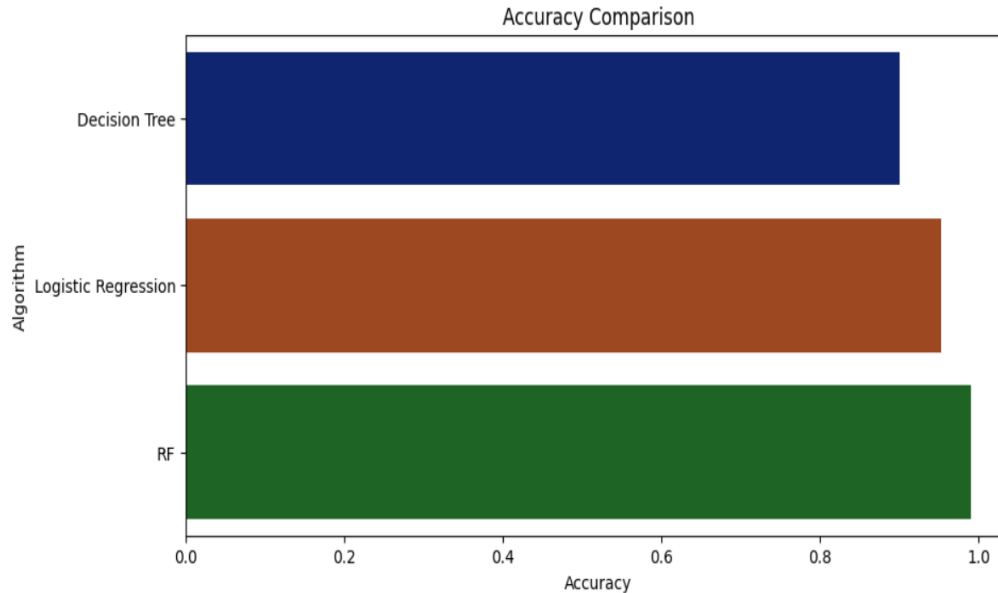
C. Build Model

- In this study the algorithm is choosing based on the comparative evaluation of accuracy.
- For that here using decision tree, logistic regression and random forest classifier.



Methodology

Accuracy Comparison of Decision tree, Logistic Regression and Random Forest



Decision Tree --> 0.9
Logistic Regression --> 0.9522727272727273
RF --> 0.990909090909091



04

Result



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Result

Crop Recommendation

Enter the following parameters:

Nitrogen (N)

90

Phosphorous (P)

30

Potassium (K)

45

Temperature(in Celcius)

27

Humidity

20

pH

6.7

Rainfall

45

Predict

Best Crop for your field: kidneybeans



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05

Conclusion & Discussion



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Conclusion

- A crop recommendation system that considers the crop recommendation dataset with regard to the selected crops has been developed.
- After preprocessing the crop recommendation dataset, by using the ensemble technique this classifies the specific crops which is obtained by providing soil attributes such as Nitrogen, Phosphorus, Potassium, pH and humidity, rainfall, temperature.
- Comparative analysis shows Random forest have high accuracy than other methods(decision tree, logistic regression)
- Random forest classifier gives accurate result and which has the high accuracy than other algorithms (99.09%). This helps the farmers to choose best crop to plant. By adding more crops this study can be extended in future.



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References



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References

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THANK YOU
