AISSMS
INSTITUTE OF INFORMATION TECHNOLOGY
ADDING VALUE TO ENGINEERING
An Autonomous Institute Affiliated to Savitribai Phule Pune University
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SYNOPSIS

TITLE: Crop Recommendation System using machine learning.

GROUP NO. : 11

ACADEMIC YEAR: 2022-2023

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1. INTRODUCTION

- The project's goal is to increase the diversity of crops that may be cultivated in our region throughout the seasons. We are primarily focused on the following scenarios to assist farmers in choosing a good crop depending on rainfall and soil type.
- A farmer's decision regarding which crop to cultivate is normally affected by his judgment and other irrelevant variables such as making quick profits, being unaware of market demand, underestimating a soil's ability to sustain a specific crop, and so on. A particularly poor judgment on the farmer's behalf might put an immense pressure on his family's financial circumstances. Perhaps this is one of the numerous contributing factors to the countless farmer suicides that we hear about.

2. LITERATURE SURVEY:

1] They used Regularized Greedy Forest to determine an appropriate crop sequence at a given time stamp

2] T.R. Lekhaa, The use of several algorithms like K-Nearest Neighbors ,and Regularized Greedy Forest is demonstrated.

3] Jay Gholap, Anurag Ingole, Jayesh Gohil, Shailesh Gargade and Vahida Attar Issue 3 For the prediction of soil attributes such as phosphors content. Here, the authors make use of different classification techniques like Naïve Bayes, C4.5, Linear Regression and Least Median Square to achieve high prediction accuracy.

4] SHILPA MANGESH PANDE [suggests the methods for minimizing farm produce wastage. One of the recent works, S. Pavani et.al. Presented a model where the crop yield is predicted using KNN algorithms by making the clusters. It has been shown that KNN clustering proved much better than SVM or regression.]

5] Reddy, D. Anantha, Bhagyashri Dadore, and Aarti Watekar[This proposed system worked on three parameters: soil characteristics, soil types and crop yield data collection based on these parameters suggesting the farmer suitable crop to be cultivated. This proposed system worked on different machine learning algorithms like random forest, CHAID, K-Nearest Neighbour and Naïve Bayes.]

6] N. H. Kulkarni, G. N. Srinivasan, B. M. Sagar and N. K. Cauvery.[The independent base learners used in the ensemble model are Random Forest, Naive Bayes, and Linear SVM. Each classifier provides its own set of class labels with an acceptable accuracy.]

7] K. Priyadharshini, R. Prabavathi, V. B. Devi[This paper proposes a novel method that would deliver suitable support vectors for a SVM classification based on auxiliary information. This optimized method is applied to a real time agricultural application situation which utilize accuracy classification in turn aid production management.]

3. SUMMURY OF LITERATURE SURVEY:

According to the literature review mentioned above, agricultural systems may be suggested using Machine learning by taking into account the soil and rainfall factors. One drawback we found in all these important published papers was that each paper's authors focused on only one factor (weather or soil) to determine whether crops would grow well. To make the greatest and most accurate prediction, we believe that both of these aspects should be taken into account simultaneously. This According to the literature review mentioned above, agricultural systems may be suggested using is due to the fact that even while a specific soil type may be able to sustain a certain crop, the yield may decline if the local climatic circumstances are unfavorable to that crop. In the same way, there can be a situation. Similarly, there may be a case where the weather conditions are favorable but soil characteristics are not.

4. PROBLEM STATEMENT:

To develop a recommendation system using machine learning for crop growth by taking all the factors like weather, water utility and soil type to build a simpler mechanism to predict the crops that are suitable to be grown in that soil.

5. OBECTIVES:

A: Predict crop sustainability to assist farmers in growing a good crop based on soil conditions.

B. to predict the expected rainfall during the months between the sowing and harvest season.

5. METHODOLOGY:

- **Classifier**

selecting the most important attributes from the dataset, the classification algorithm is applied to the reduced dataset, using techniques like the k-Nearest Neighbors, Nave Bayes, Decision Tree, Support Vector Machine, Random Forest, and Bagging. Before applying the classifier algorithm, the optimized dataset is split into training and testing datasets. The classifier algorithm is trained with the training dataset, and the trained classifier is applied in the testing phase. The obtained result is used to predict the crop for a specific area of land.

3. Crop prediction procedure

The basic crop prediction procedure is given below. Soil parameters and environmental conditions are given as inputs and the predicted crop as output.

Step 1: A crop dataset is given as input, and the set of data is imported.

Step 2: The attributes used in the set of data are transformed into a particular range, bringing the set of data into a consistent state, thus avoiding anomalies. Any missing values are removed and normalization is used to standardize the data. Redundancy is minimized once the dataset is structured, and it also helps to make efficient data for the prediction processing.

Step 3: The reduced dataset is split so that it can be used for training and testing.

Step 4: First, 70% of the samples from the reduced dataset are taken as training samples.

Step 5: The classification algorithm is applied to the training samples.

Step 6: The classification algorithm is trained with the entire training dataset to predict a suitable crop.

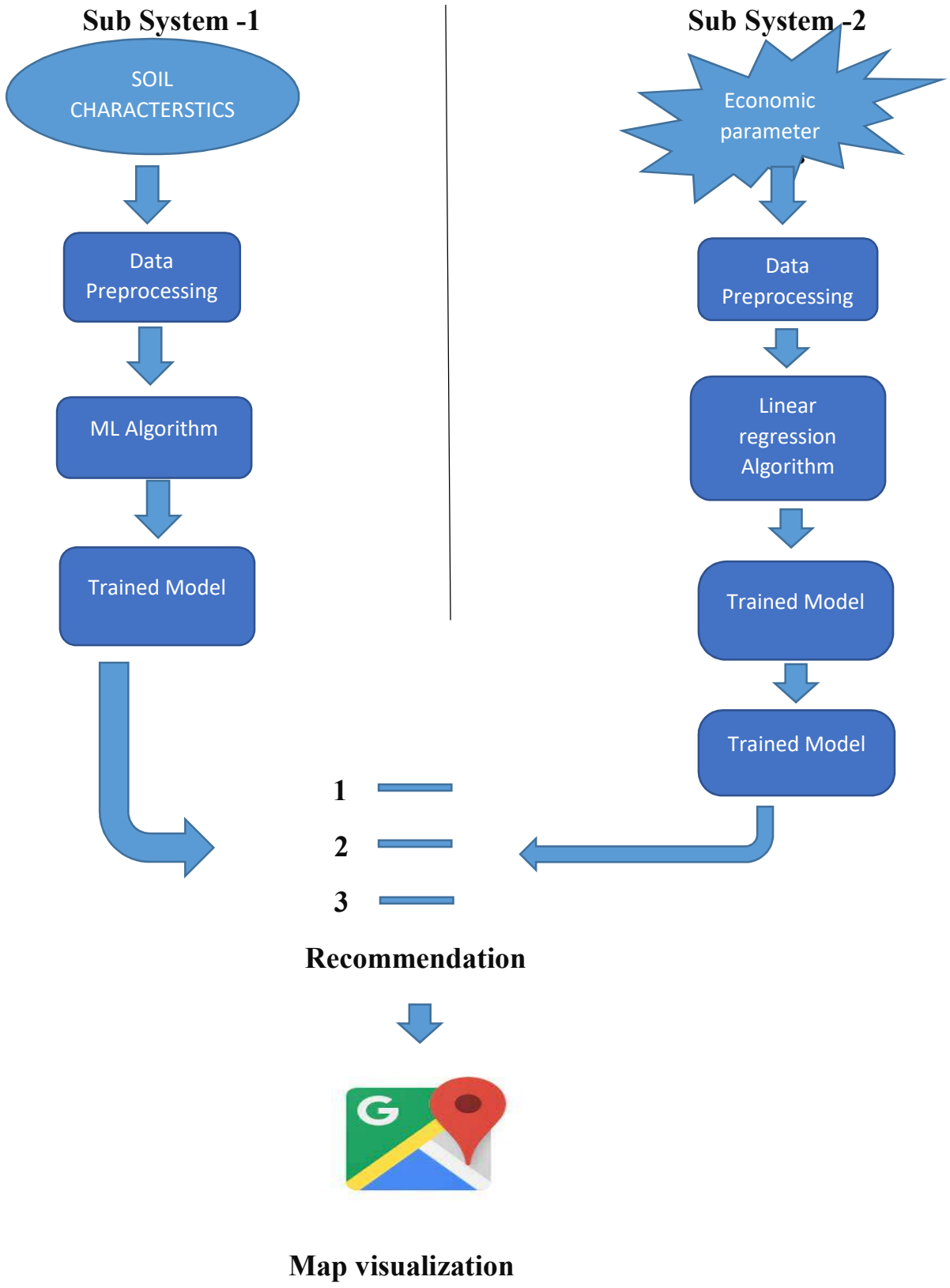
Step 7: Of the samples, 30% are taken from the reduced dataset as testing samples.

Step 8: The trained classifier is applied to the test samples to predict the most suitable crop for cultivation on a particular piece of land.

Step 9: The target label for new instances is found by the trained classifier so as to identify a suitable crop.

Step 10: Finally, a suitable crop for cultivation is recommended by the result

6. BLOCK DIAGRAM:



7. EXPECTED RESULTS:

To find accurate soil and environmental characteristics for predicting a suitable crop for improved cultivation. Classification methods are used to find the most suitable crop for a particular stretch of land. The techniques are evaluated thereafter, using parameters such as attribute selection, accuracy, and error rate. The expected accuracy of this system is 85 % or above.

TIME SCHEDULE FOR COMPLETION OF PROJECT

MONTH	WORK
JULY-AUG	Literature survey
SEP-OCT	Data Acquisition , Data Cleaning
NOV-DEC	Model Training
DEC-JAN	Model Testing
JAN-FEB	Deployment

REFERENCES

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3. T.R. Lekhaa, “Efficient Crop Yield and Pesticide Prediction for improving Agricultural Economy using Data Mining Techniques”, international Journal of Modern Trends in Engineering and Science (IJMTES)
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7. K. Priyadharshini, R. Prabavathi, V. B. Devi, P. Subha, S. M. Saranya and K. Kiruthika, "An Enhanced Approach for Crop Yield Prediction System Using Linear Support Vector Machine Model," 2022 International Conference on Communication, Computing and Internet of Things (IC3IoT), 2022, pp. 1-5, doi: 10.1109/IC3IOT53935.2022.9767994.

DR.V.V.KALE

STUDENT SIGN **(GUIDE SIGN)**