**SEMINAR ABSTRACT**

**CROP PREDICTION USING RANDOM FOREST**

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**CROP PREDICTION USING RANDOM FOREST**

A key component of contemporary agriculture is crop recommendation, which aims to maximize yields and resource efficiency. Algorithms for machine learning, in particular Random Forest, have shown tremendous promise in this area. This data is processed by the Random Forest algorithm, an ensemble learning technique, to forecast the crops that would thrive in a certain environment also there are many algorithm for implement this other than Random Forest, including decision tree, Naïve Bayes, SVM, XGBoost, Logistic Regression. Numerous studies and extensive research have demonstrated Random Forest's excellent accuracy and usefulness in crop recommendation, making it an important tool for farmers. Putting this strategy into practice helps farmers choose the best crops for the conditions at hand, which promotes sustainable agriculture.

The basic steps implement using Random Forest are,

* Data Collection and Preparation:

Gather the dataset containing features and corresponding labels. Preprocess the data by handling missing values, encoding categorical variables, and scaling if necessary.

* Splitting Data:

Divide the dataset into training and testing sets to evaluate the model's performance. Typically, 70-80% for training and 20-30% for testing is a good split.

* Import Libraries:

Import the necessary libraries, including scikit-learn (for Random Forest), and other relevant libraries for data manipulation and evaluation.

* Create the Random Forest Classifier:

Initialize a Random Forest classifier, setting hyperparameters like the number of trees, max depth, and other settings.

* Model Training:

Train the Random Forest classifier using the training data. Use the fit() function to fit the model to the training data.

* Model Prediction:

Use the trained model to make predictions on the test dataset using the predict() function.

* Model Evaluation:

Evaluate the model's performance using metrics like accuracy, precision, recall, F1-score, and confusion matrix to assess its effectiveness in classification.

* Deployment:

Once satisfied with the model's performance, deploy it for making predictions on new unseen data.