PROJECT SYNOPSIS

Students name and USN: Aishwarya K L – 4MO21IS003

Sinchana G – 4MO21IS041

Deepak D R – 4MO21IS014

Kiran U – 4MO21IS025

Department: Information Science and Engineering

Semester: 7th Sem

Submitted to: Prof.JAYARAM C V

Department of Computer Science

Project Title: "InteliCrop - Farmers Help Desk for Major Cropping Pattern Prediction Using Machine Learning Techniques"
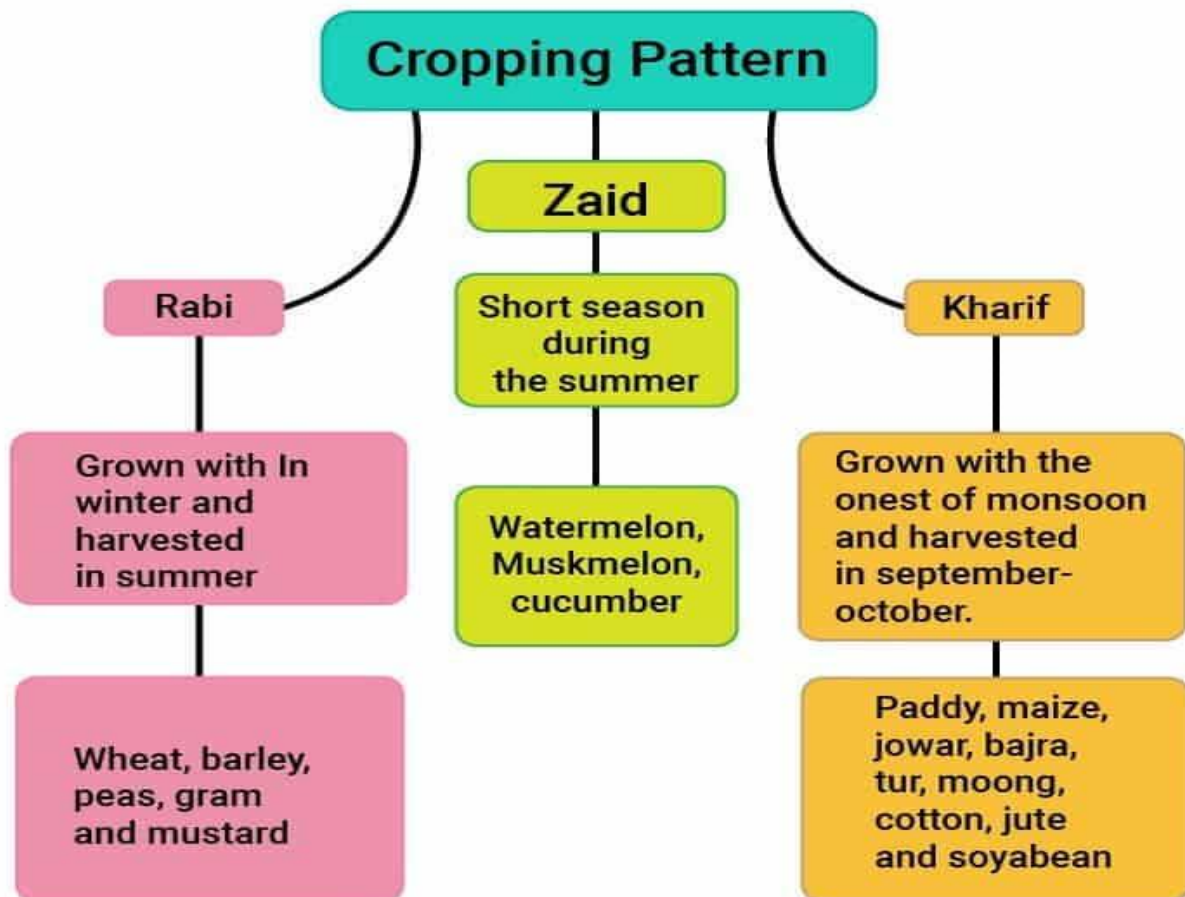
Abstract

The cultivation of crops on land periodically throughout the year is a cropping pattern. This proposed work aims at prediction of major cropping patterns through only the cultivation-related factors like land, soil, and climate data using Machine Learning techniques. On a suitable land, farmers can grow many types of crops and there is a need of knowing the right cropping patterns to attain best profits. In the current agriculture sector there are the changes of reduction in crop yield, crop damages if farmer choose the random method of cropping. This is because proper crop yield depends on many agriculture parameters like temperature, rainfall, soli type, season etc... Machine learning unsupervised learning algorithms applied to process the

agriculture data and to predict the cropping patterns. Algorithms like Apriori algorithm, Eclat algorithm or SFIT algorithms used. The primary objective of this project work is to identify the best algorithm for predicting cropping pattern. Very less existing works on this pattern prediction, all existing works uses ready libraries for prediction and only model developed. Existing works uses static datasets for prediction. Existing works cannot be applied in real time. So in our proposed system we collect datasets manually and we build an automation for cropping pattern prediction useful for farmers and agriculture departments. System developed using tools such as Visual Studio front end tool and SQL Server as back end tool and we use more compatible and real time application supportive programming language C#.

Introduction

Cropping pattern refers to the proportion of land under cultivation of different crops at different points of time. This indicates the time and arrangement of crops in a particular land area. India is a country where agriculture and agriculture related industries are the major source of living for the people. Agriculture is a major source of economy of the country. It is also one of the country which suffer from major natural calamities like drought or flood which damages the crop. This leads to huge financial loss for the farmers thus leading to the suicide. Predicting the suitable crops to cultivate and suggesting suitable cropping patterns to improvise crop yield well in advance prior to its harvest can help the farmers and Government organizations to make appropriate planning like storing, selling, fixing minimum support price, importing/exporting etc. Predicting a cropping patterns well in advance requires a systematic study of huge data coming from various variables like soil quality ,pH ,EC,N,P,K etc. As Prediction of cropping patterns deals with large set of database thus making this prediction system a perfect candidate for application of data science. Through data science we extract the knowledge from the huge size of data. This system presents the study about the various machine learning techniques used for predicting the cropping patterns. The success of any cropping patterns prediction system heavily relies on how accurately the features have been extracted and how unsupervised learning algorithms have been employed.

Cropping Pattern

- **Rabi**
  - Grown with In winter and harvested in summer
  - Wheat, barley, peas, gram and mustard
- **Zaid**
  - Short season during the summer
  - Watermelon, Muskmelon, cucumber
- **Kharif**
  - Grown with the onest of monsoon and harvested in september-october.
  - Paddy, maize, jowar, bajra, tur, moong, cotton, jute and soyabean

Machine learning algorithms applied to analyze data and to predict cropping patterns in advance for the good profits. Data-sets collected from agriculture departments. System developed as real time application which is useful for agriculture departments and farmers. We use suitable technology to work with real time application, that is "*visual studio*" as front end technology and "*SQL server*" as back end technology. These technologies are preferred because it supports more suitable libraries, tools and concepts required to work with real time application compared to other technologies. Proposed system helps farmers to cultivate right type of crops in right time and also helps farmers to increase crop yield and crop quality. Major population in India will benefit from this application.

Existing System

In real time it is very important to know the cropping patterns for the farmers to earn good profits. Current system is manual system where based on the previous crop cultivations and experience farmers will decide the crop types to grow. Sometimes farmers may get good crop yield and profits but sometimes crop selection may lead to poor crop yield and loss to the farmers. Many research papers worked on this topic where they mainly concentrated on crop prediction using machine learning but not cropping patterns prediction which proposed system does. All existing works are just models but not real time implementation. We require a system that can automatically predicts the cropping patters and helps farmers to know the right crop types to grow to get better yield and profits.

Drawbacks of Existing System

❖ Only crop prediction not cropping patterns prediction
❖ Manual process
❖ Previous results and experience considered
❖ Leads to wrong estimations.
❖ Loss to farmers
❖ Less crop yield
❖ No real time implementations done

Problem Statement

It is crucial for the farmers to know what all different types of crops can be cultivated in his/her land so as to get good crop quality and yield. As current system is the manual system which needs more time, experience and proper judgements which may lead to less crop yield and loss to farmers. There are important relationship between different types of crops so as to get better crop yields. As we do not have the proper system to find the cropping patters, we require a automation for cropping patterns prediction to help farmers to grow better crops types for better yield and profits.

Proposed System

- ❖ System is an automation for cropping patterns prediction to know right crops to grow in the available land.
- ❖ System will predict the priority of crops to grow in order to get better crop yields.
- ❖ System helps the farmers in deciding better crops for cultivation.
- ❖ System is a real time application meant for agriculture departments and farmers.
- ❖ System is a GUI based browser based application where users of the application can access using browsers such as chrome, Firefox, Opera, Edge etc...
- ❖ System uses the datasets collected from agriculture departments.
- ❖ System uses all crop types such as Kharif, Zaid and Rabi.
- ❖ System uses efficient machine learning algorithms such as apriori algorithm, FP algorithm or Eclat algorithm for cropping patterns prediction.
- ❖ 2 algorithms will be used for processing datasets and results will be compared to identify better algorithm.
- ❖ System developed using Full stack development technologies such as Visual Studio, SQL Server, HTML, CSS, JS, and JQuery.

Methodology

Unsupervised learning algorithms used

Step 1: Raw data and Weather Statistics

This is the first step in the prediction process where we collect agriculture data.

Step 2: Extract and Segment Data (Data Preprocessing)

Here agriculture data analyzed and only relevant data extracted. The data required for processing extracted and segmented according to the different regions. Required data extraction is done because entire agriculture data not required for processing.

Step 3: Train Data

Once required data extracted and segmented, we need to train the data, train means converting the data into the required format such as numerical values or binary or string etc...

Step 4: Unsupervised Learning Algorithms

Efficient machine learning algorithms such as apriori algorithm, FP algorithm or Eclat algorithm for cropping patterns prediction.

Step 5: Cropping Patterns

Step 6: Location and Year Based

The cropping patterns prediction done based on the region wise as well as year wise.

Step 7: Results

2 algorithms will be used for processing datasets and results will be compared to identify better algorithm.

Step 8: Visual Representation

Cropping patterns for the farmers on GUI. When users gets login to the application system recommends suitable and high profit crops for the farmers on a GUI.

System Requirements

Hardware Requirements

❖ RAM: **4GB**

❖ Processor: **Intel Dual Core on wards**

❖ Processor Speed: **2.4ghz**

❖ Hard Disk: **500GB**

Software Requirements

❖ IDE: **Visual Studio** (efficient tool used for the development of real time applications, Microsoft technology which supports more libraries, tools and concepts required to work

with real time application compared to other technologies, we can design very good UI designs)

❖ Programming Language: **C#/C++** (programming language which is used for processing purpose, similar to C++, more compatible and supportive with visual studio, supports all required libraries to build real time applications)

❖ Back End – **MS SQL Server** (used to store the data, Microsoft technology more compatible with visual studio)

❖ Front end – HTML, CSS, JS, JQuery