SYNOPSIS

1. **Title of the project:** [42S_BE_1953]
   CROP YIELD AND RAINFALL PREDICTION IN TUMAKURU DISTRICT USING MACHINE LEARNING

2. **Name of College and Department:**
   CHANNAVASAVESHWARA INSTITUTE OF TECHNOLOGY and COMPUTER SCIENCE & ENGINEERING.

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4. **Keywords:** Machine Learning, Predictive analysis, Support Vector Machine (SVM).

5. **Introduction:**
   Agriculture gave birth to civilization in India. India is an agrarian country and its economy largely based upon crop productivity. Thus agriculture is the backbone of all business in India. Our aim is to increase the net yield rate of the crop, based on rainfall. This helps use to predict the crop yield and suggest the best crop
thereby improving the quality and profitability of the agriculture sector by processing the datasets. This prediction will help the farmers to choose whether the particular crop is suitable for specific rainfall and crop price values. This prediction can be carried out by using various machine learning algorithms like linear regression, support vector machine, K-NN method and decision tree where high accuracy and speed can be achieved.

Nowadays if the farmers get more yield for their crop but the market price for that crop will be less, in that case farmers get loss for their product and in vice versa if market price is more but crop yield will be less and poor quality, for that situation also they get less profit. Particularly when growing new crops, farmers face the risks of both market price and production problems. Day by day technologies are improving even though there are no useful technologies to help the farmers about market price, crop production and rainfall prediction information thus they fail in their production and also in marketing. This project is aiming to assist the farmer in selecting the crops based on predicted rainfall values.

6. **Objective:**

The main objective of this project is to develop an application that suggest the crops for farmers in Tumakuru district based on predictive analysis. This project is aiming to assist the farmer in selecting the crops based on predicted rainfall values. Our aim is to increase the net yield rate of the crop, based on rainfall. This helps use to predict the crop yield and suggest the best crop thereby improving the quality and profitability of the agriculture sector by processing the datasets. This prediction will help the farmers to choose whether the particular crop is suitable for specific rainfall and crop price values.

7. **Methodology:**

The below figure shows the architecture of proposed system.
**Data collection**: It is the well-ordered method for collecting and measuring data from different fields to get approximate and full image of required area.

**Data pre-processing**: It is a data mining process that involves cleaning the needed data, integration the data, data transformation, reduction of selected data and discretization of dataset.

**Classification**: In machine learning, classification is a method in which prediction of the training dataset group is done and are used to recognize the class names on generated dataset.

**Logistic regression**: Regression is a process of learning a function that categorize a dataset to a predicted values. The prediction can be carried out by using various machine learning algorithms like linear regression, support vector machine, K-NN method and decision tree.

**Linear Regression**: Linear regression was the first method in regression analysis which can be studied rigorously, and to be used widely in practical application. This is because models which are non-linearly related to their parameters are difficult to fit than models which depend linearly on their unknown parameters.

**K-Nearest Neighbors**: K-nearest neighbors is a simple algorithm which can be used for classification and regression. In statistical estimation and pattern recognition a KNN has been used as a nonparametric technique. In both classification and regression cases, the input consist of k closest training examples in the feature space and output depends on whether k-NN is used for classification or regression.

**Decision Tree**: Decision tree is a supervised learning method used for classification and regression. The main aim is to create a model that predicts the value of a targeted variable by learning simple decision rules indirect from the data features.

**Support Vector Machine**: SVM can prioritize the correctness of classifying while maximizing the margin, but also perform as other learning algorithm. If there is a point that can’t be classified correctly, in that case retain its largest margin, SVM will treat it as outliers and can securely ignore the points.

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**8. Results and Conclusions**:

The outcome of this project will help the farmers to choose whether the particular crop is suitable for specific rainfall and crop price values and which crop yield in which season will give more profit in market price. This approach
is to increase the net yield rate of the crop, based on rainfall. The predictive analysis technique can be implemented in several government sectors like APMC, kissan call center etc., by which the government and farmers can get the information of the future rainfall, crop yield and the market price.

In this project, we have performed the predictive analysis using real time data collected from agricultural department and government website. By applying predictive analysis on the collected data, we can help the farmers to choose whether the particular crop is suitable for specific rainfall and crop price values.

**9. Scope for future work:**

In this project we have performed the predictive analysis using some real time data collected from agricultural department and some government website. By applying predictive analysis on the collected data we can suggest the farmers about crop yield and rainfall.

In future enhancement, using deep learning technology and image processing technique we will implement for crop disease prediction [5] by collecting images of leaves, crops etc., which still improves the net yield of crop production. This project is very useful for the government sectors and farmers. In future planned to develop a mobile application since now a days all are using smart phones so it will very efficient way to reach the people.