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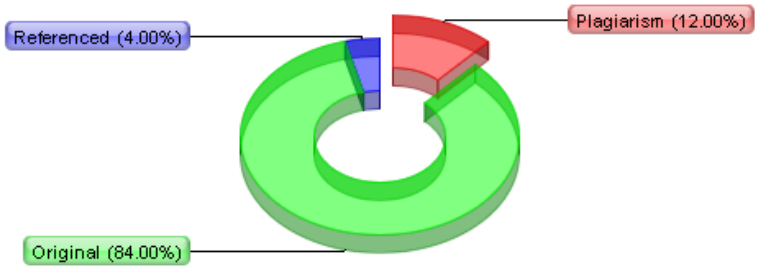

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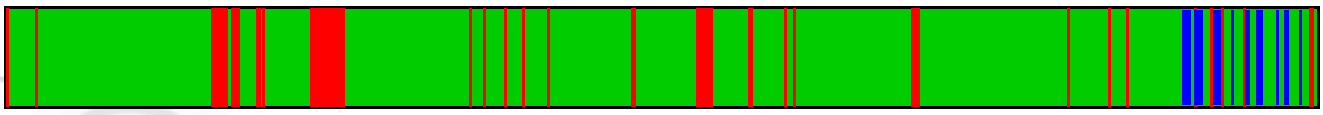

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PREDICTION OF CROP YIELD AND COST USING MACHINE LEARNING APPROACH

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partment of Computer Science and Engineering,Kathir college of Engineering, Coimbatore, IndiaABSTRACT:

Among worldwide, agriculture has the major responsibility for improving the economic contribution of the nation. However, still the most agricultural fields are under

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loyment of ecosystem control technologies. Due to these problems, the crop production is not improved which affects the agriculture economy. To prevent this problem, Agricultural sectors

have to predict the best crop using machine learning techniques. Therefore, this study investigates the different machine learning algorithms and compares the results using different performance metrics. Hence a development of agricultural productivity is enhanced based on the Crop yield & cost prediction. A comparative study between machine learning algorithms had been carried out in order to determine which algorithm is the most accurate in predicting the best crop. A GUI based application have been proposed to help farmers to independently predict the best crop by providing some inputs such as location, estimated cost, temperature, humidity.KEYWORDS: Dataset, Machine learning-Classification method. I.INTRODUCTIONIn farming countries, development is considered as the huge wellspring of pay for certain people. Right now, the green improvement is secured by a couple of progressions, circumstances, techniques and city foundations. Additionally, the utilization of information advancement may change the condition of dynamic and thusly farmers may yield the best way. For dynamic procedure, information mining methods identified with the farming are utilized. Information mining is a procedure of extricating the most noteworthy and significant information from the gigantic measure of datasets. Nowadays, we used AI approach with made in gather or plant yield estimate since agribusiness has different data like soil data, crop data, and atmosphere data. Plant improvement desire is proposed for watching the plant yield sufficiently through the AI methods. It is likewise relevant for the robotized procedure of cultivating is the start of another time that will be reasonable for the ranchers who look for specialists to take recommendation about the proper harvest on specific location of their land and don't want to forget any step of the cultivation throughout the process. Although, the opinion from experts is the most convenient way, this application is designed to give accurate solution in fastest manner possible. This research's main objective is to bring farming process a step closer to the digital platform. II . LITERATURE SURVEYKim, NariLee and Yang-Won's AI procedure is another approach to manage crop yield estimation. It portrayed the corn yield estimation in Iowa State utilizing four AI moves close, for example, RF (Random Forest), ERT (Extremely Randomized Trees) and DL (Deep Learning). The differences between the conjectures and USDA (United States Department of Agriculture) estimations were around 6-8 %, which shows the AI approaches can be a possible decision for crop yield illustrating.According to the investigation of Ainong Li, Shunlin Liang, Angsheng Wang, and Jun Qinin 2007 counterfeit neural system (ANN) is utilized to assess and anticipate corn and soybean yields on a province by-district premise, in the "corn belt" zone in the Midwestern and Great Plains locales of the United States. P. S. Vijayabaskar, Sreemathi.R in 2017 in her paper a model for testing the dirt fruitfulness. It in like manner proposes the gather which must be planted depending on the value gained from the sensor. It furthermore proposes the fertilizer which must be added to the dirt so as to amass the yield efficiency. It asks the rancher to isolate the luxury of their yard and plant the better accumulate to create their profitability and bit of leeway.Niketa Gandhi ,Leisa J. Armstrong ,Owaiz Petkar, Amiya Kumar Tripathy breaks down the starter results got by applying SMO classifier utilizing the WEKA device on the dataset of 27 zones of Maharashtra state, India. The dataset considered for the rice crop yield want was sourced from transparently accessible Indian Government records. The parameters considered for the evaluation were precipitation, least temperature, customary temperature, most conspicuous temperature and reference crop evapotranspiration, district, creation and yield for the Kharif season (June to November) for the years 1998.I II. EXSISTING SYSTEMThe Model presents crop/weeds course of action approach reliant on a three-advance strategy. The underlying advance is a healthy pixel-wise division (i.e., soil/plant) and picture patches containing plants are removed in the resulting advance. The third step, a significant CNN for crop/weed game plan is used. The removed masses in the secured picture containing plants information are dealt with to a CNN classifier subordinate on an adjusted model of VGG-16 exploiting the ability of deep CNN in object classification and to reduce the limitations of CNNs in generalizing when a limited amount of data is available. The classification step can then be specialized to the types of plants needed by the application scenario. Experimental results demonstrate that it can achieve good classification results on challenging data. Accuracy agribusiness is increasing expanding consideration in light of the conceivable decrease of horticultural sources of info (e.g., manures and pesticides) that can be gotten by utilizing innovative gear, including robots. To portray a profound learning based strategy to permit a robot to play out a precise weed/crop grouping utilizing a succession of two Convolutional Neural Networks (CNNs) applied to RGB pictures. The primary system, in light of encoder-decoder division engineering, plays out a pixel insightful, plant-type freethinker, division among vegetation and soil that empowers to separate a lot of associated masses speaking to plant occurrences.I V. PROPOSED SYSTEMIn

today's world agriculture plays a major role. Agriculture for years but the results are never satisfying due to various factors that affect the crop yield. The aim of this project relies on predicting the best crop for particular area based on several features. Machine learning approaches are used for building the model for the prediction Crop Yield and cost estimation. Five different algorithms are used to classify the given data set. All the algorithms are well known for its ability to classify complex data. The dataset used in this project contains 13 Essential features that help to predict the crop yield with high accuracy. The Data sets that are going to be used will involves a couple of states Crop Yield Data. Among which basic features will be given to plan and test the model. Likewise, data will be assembled into 70 % train data and 30% test data. Again the 30% train data will be readied. A couple of Algorithms, for instance, Logistic regression; neural network, Decision tree and Random forest will be applied to find the most imperative precision, f1 score and survey, etc. Relationship of all computations will be showed up. GUI based application will be given to help the farmers to predict the best Crop yield subject to the assessed cost.V. SYSTEM ARCHITECTURE The dataset gathered will be Cleaned and approved. Furthermore, Past information will be put away in the Database. What's more, Model will be prepared and Tested with the past Dataset. Also, on Trained information distinctive Machine Learning calculations will be applied. Diverse Machine Learning Algorithms will be looked at dependent on their Accuracy, Precision, review, F1-score and so forth. To assist the ranchers with predicting the best harvest and cost Estimation, GUI based application is proposed so that once the farmers gives the vital data like State name, Cost of yield, Humidity, temperature and furthermore need to choose which calculation they need to utilize at that point dependent on it the Best yield will be shown with exactness. So by utilizing this application ranchers can undoubtedly anticipate the best yield for the evaluated cost.VI. MODULE DESCRIPTION Data validation and pre-processing technique Exploration data analysis of visualization and training a model by given attributes Comparison of SMLT for crop yield and cost prediction.GUI based prediction of crop yield and yield cost 1. DATA VALIDATION AND PRE-PROCESSING TECHNIQUE Data Preprocessing is a technique that is used to convert the raw data into a clean data set. To achieving better results from the applied model in Machine Learning method of the data has to be in a proper manner. Some specified Machine Learning model needs information in a specified format; for example, Random Forest algorithm does not support null values. Therefore, to execute random forest algorithm null values have to be managed from the original raw data set. And another aspect is that data set should be formatted in such a way that more than one Machine Learning and Deep Learning algorithms are executed in given dataset. Table 1 Features of Crop Yield DataSet 2. EXPLORATION DATA ANALYSIS OF VISUALIZATION AND TRAINING A MODEL BY GIVEN ATTRIBUTES Data visualization provides an important suite of tools for gaining a qualitative understanding. This can be helpful when exploring and getting to know a dataset and can help with identifying patterns, corrupt data, outliers, and much more. Training Data Set: Training set is the portion of data in which the model is trained. In this study, 70 percent of data was used for training. Test Data Set:T he test set is the portion of data where the model is tested, it is often the dependent variable of the data. In this study, 30 percent of the data was used for testingFig. Density diagram for each column3. COMPARISON OF SMLT FOR CROP YIELD AND COST PREDICTIONIt is important to compare the performance of multiple different machine learning algorithms consistently and it will discover to create a test harness to compare multiple different algorithms. It can use this test harness as a template on our own machine learning problems and add more and different algorithms to compare. Each model will have different performance characteristics. Using resampling methods like cross validation, we can get an estimate for how accurate each model may be on unseen data. Upon comparison of Algorithms for predicting the crop yield and cost random forest and decision tree have shown high accuracy results.4. GUI BASED PREDICTION OF CROP YIELD AND YIELD COST Tkinter is a python library for creating GUI (Graphical User Interfaces). Farmers can utilize the UI to anticipate the harvest yield and cost by giving the vital data sources, for example, Farmer name, Village name, state name, season details, temperature level, humidity level and so forth.VII. ALGORITHM EXPLANATIONS: https://en.wikipedia.org/wiki/Logistic_regression LOGISTIC REGRESSION:It is a measurable strategy for investigating an informational collection in which there is at least one free factor that decides a result. The objective of strategic relapse is to locate the best fitting model to depict the connection between the dichotomous quality of intrigue (subordinate variable = reaction or result variable) and a lot of autonomous (indicator or illustrative) factors.https://www.geeksforgeeks.org/decision-tree/ DECISION TREE:Choice tree fabricates order or relapse models as a tree structure. It separates an informational index into littler and

littler subsets while simultaneously a related choice tree is steadily evolved. SUPPORT VECTOR MACHINES (SVM): A classifier that sorts the informational collection by setting an ideal hyper plane between information. I picked this classifier as it is fantastically flexible in the quantity of various kernelling capacities that can be applied and this model can yield a high consistency rate. RANDOM FOREST: Arbitrary timberlands or irregular choice woodlands are an outfit learning strategy for grouping, relapse and different assignments, that work by building a large number of choice trees at preparing time and yielding the class that is the method of the classes (order) or mean expectation (relapse) of the individual trees. Arbitrary choice timberlands right for choice trees' propensity for over fitting to their preparation set.K - NEAREST NEIGHBOR (KNN):K -Nearest Neighbor is a managed AI calculation which stores all examples relate to preparing information focuses in n-dimensional space. At the point when obscure discrete information is gotten, it investigates the nearest k number of occurrences spared (closest neighbors) and returns the most widely recognized class as the forecast and for genuine esteemed information it restores the mean of k closest neighbors.NAIVE BAYES ALGORITHM: The Naive Bayes calculation is a natural technique that utilizes the probabilities of each ascribes having a place with each class to make a forecast. It is the administered learning approach you would think of on the off chance that you needed to display a prescient demonstrating issue probabilistically.VII I RESULT AND DISCUSSIONThe aim of the entire project was to test which algorithm predicts the best crop and cost with higher accuracy. This section includes all the results obtained from the study and introduces the best performer according to various performance metrics.Performance measurements of crop yield production cost: Fig Comparison of machine learning algorithms for crop yield. Comparison of machine learning accuracy values: Comparison of machine learning parameter results: Performance measurements of crop yield: Fig Comparison of machine learning algorithms for crop yield. Comparison of machine learning accuracy values: Comparison of machine learning parameter results: IX . FUTURE ENHANCEMENTThere are several directions for our feature research work in this study. First, we want to evaluate our proposed system using additional appropriate data sets which preferably have a large number of data records. Can automate the detecting the yield crops from eligibility process in real time. To automate this process by show the prediction result in web application or desktop application and to optimize the work to implement in Artificial Intelligence environment. X. CONCLUSIONThe proposed system was to compare the algorithms with different performance metrics using machine learning. All data were pre-processed and used for the prediction. Random Forest and Decision Tree are the likely model to work best in the dataset used in this study. Different sources such as 'Sensors', used to capture the essential features based on which Crop yield can be predicted. With further research machine learning can also be used to predict the Crop yield better than the human experts can do. The analytical process started from data cleaning and processing, missing value, exploratory analysis and finally model building and evaluation. Finally, we predict the crop using machine learning algorithm with different results. The best accuracy on public test set is higher accuracy score by Machine learning method from calculating cross validation checking, Precision, recall and F1score in future. This brings some of the following insights about crop prediction. As maximum types of crops will be covered under this system, farmer may get to know about the crop which may never have been cultivated and lists out all possible crops, it helps the farmer in decision making of which crop to cultivate. Also, this system takes into consideration the past production of data which will help the farmer get insight into the demand and the cost of various crops in market. X I.REFERENCES[1]. Becker-Reshef, E. Vermote, M. 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