

AGRO - COMMODITY PRICE PREDICTION

Mr.Sagar Gore*,Miss.Shivani Mangrule*,Miss.Akanksha Pawar*,Miss. Aboli Salunkhe*

Computer Engineering, Savitribai Phule Pune UniversitySVPM,S College Of Engineering, Malegaon, Baramati

Abstract:

It has been a challenging effort for farmers to plan their crops for the upcoming season because it is difficult to forecast the metrics of pricing that their produce would fetch in a given season, which will typically be depending on dynamic weather conditions. Farmers are then unable to accurately estimate agricultural prices, which causes them to make poor crop choices or sell their harvests too soon without storing it, earning less money than the same crop would have in the future. This issue could be solved by a machine learning (ML) model that forecasts crop prices in advance, providing farmers with accurate crop analysis and a future scenario.

Keywords—Prediction, Random Forest Regression, Decision Tree Regression

1. Introduction

The main economic pillar in our nation is agriculture. Families are typically reliant on agriculture. Agriculture accounts for a significant portion of the nation's GDP. To support the needs of the local population, more than half of the land is used for agriculture. To achieve the strict standards, farming practices must be modernised. In order to guarantee farmers' incomes, our research strives to more effectively resolve the problem of product price forecast. It applies machine learning techniques to many types of data to get better answers. By this application, productivity can be increased by comprehending and anticipating product pricing. Farmers may be given opportunities by an effective system of product price forecasting that will benefit more people overall. Their production costs are especially owing to the lack of previous design. This causes changes in both the market value and the demand for a product. Consumers will suffer as a result of the high cost of agricultural products once their value increases and farmers suffer investment losses as a result of a value decline. Farmers are unaware of the need inside the

newly developing agricultural market. One of the uses of artificial intelligence (AI) that has produced excellent prediction models in a variety of areas, including the stock market, weather, business choices, and in our case, the prices of agricultural products, is machine learning. At the end, the results are made accessible to farmers through a web application.

2. Motivation and Objective

Agriculture and related fields account for around 55% of working professionals in our country, but we still lag behind in terms of analysis based on circumstances and produce as well as sophisticated methods for higher price forecast. By choosing the most profitable crop, we can assist farmers greatly enhance their profits by utilising technology and its potential to do a test to see if machine learning can be applied for: utilising machine learning to predict the modal price of the chosen products at 14- and 30-day intervals in the chosen Maharashtra. Determine confidence levels for the accuracy of price forecasts by estimating their accuracy at various time intervals.

3. Literature Survey

Several ways have been used to boost agricultural product financial output. When building our system, we investigated and considered certain prominent systems.

[1] The information for this system is gathered from local markets and online questionnaires, and machine learning models are developed using this dataset. Prices are predicted using algorithms such as Artificial Neural Networks, Partial Least Squares, and Autoregressive Integrated Moving Average. According to results from the usage of the aforementioned algorithms on recent data, partial least squares and artificial neural networks outperform other algorithms for both short- and long-term prediction.

[2] The purpose of this research was to help farmers make decisions based on a ranking of a crop's adaptability to a certain place. For prediction and ranking, supervised machine learning methods such as the K nearest neighbour regression algorithm and decision tree learning are used.

[3] The Multiple Linear Regression procedure of the chosen region is used in this paper's brief investigation of crop yield projections.

4. Methodology

A linear regression model is one that assumes a linear connection between the input variables and a single output variable. The output variable can be calculated using a linear combination of the input variables. When there is only one input variable (x), the procedure is known as simple linear regression. When there are several input variables, the term "multiple linear regression" arises frequently in statistical literature. The Random Forest Regressor is a tree-based system that uses the properties of numerous decision trees to create decisions. It integrates the results of numerous decision trees to provide a final decision output. The dataset will be examined with the two models mentioned above, and the model with the highest accuracy will be used.

5. Algorithm

1. XGB Regressor: XG Boost minimises a regularised objective function that incorporates a convex loss function and a model complexity penalty term.

2. Extra Tree Classifier: Like the random forests technique, the extra trees algorithm generates a large number of decision trees, but the sampling for each tree is random and without replacement.

3. Random Forest Regressor: During training, the algorithm creates a large number of decision trees and outputs the mean/mode of prediction of the individual trees.

4. Microsoft's LGB Regressor is a free and open-source distributed gradient-boosting platform for machine learning.

5. Gradient Booster Regressor: This regressor boosts the gradient. The difference between the present forecast and the known correct target value is calculated through regression.

6. Cat Boost Regressor: The basic principle behind boosting is to successively merge multiple weak models in order to generate a strong competitive prediction model through greedy search.

6. System Architecture

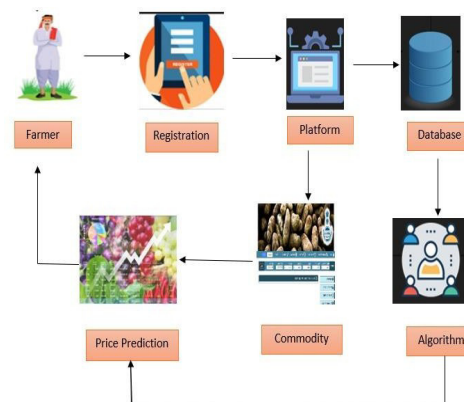


Fig.1

6.ExperimentalResult

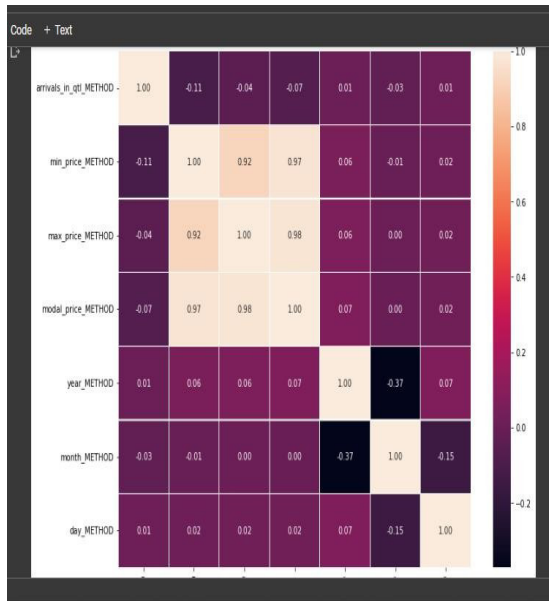


Fig:2

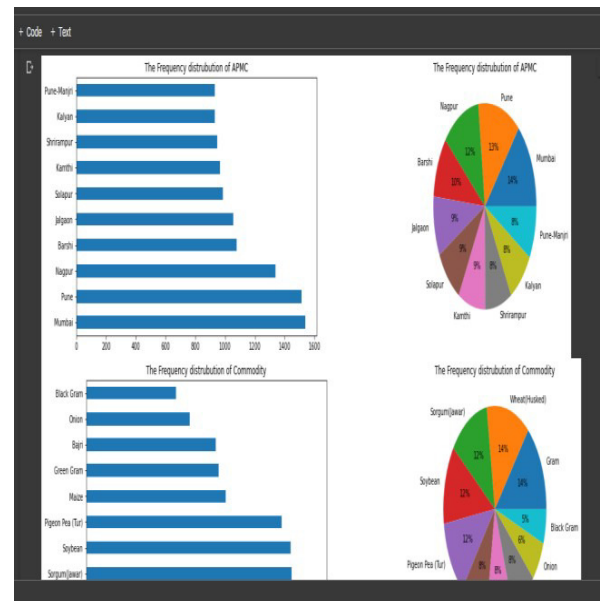


Fig:4

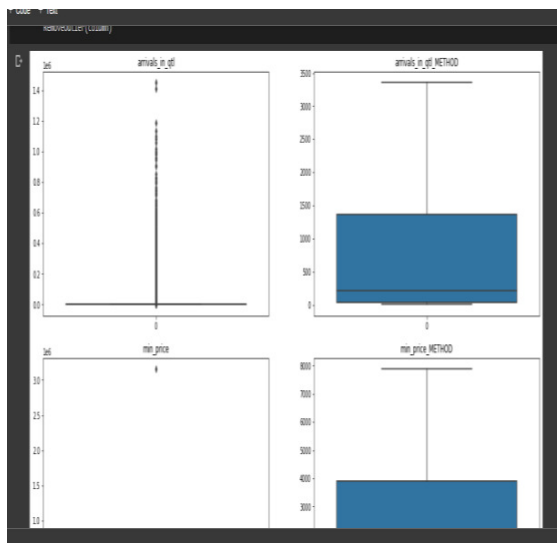


Fig:3

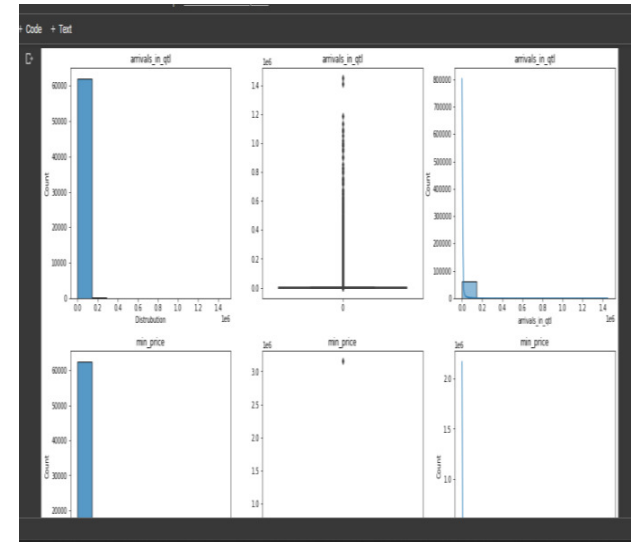


Fig:5

7. Conclusion

It is advised in this article to anticipate agricultural prices for the next 12 months. The data is delivered via a flask web page and is powered by efficient machine learning methods and algorithms, with a generally user-friendly interface. Many techniques, including XGB regressor, LGB regressor, Extra tree classifier, Random Forest Regressor, Gradient Boosting regressor, Cat Boost regressor, etc., can be used to predict crop prices. The proposed model was created to assist farmers in choosing the crop that will work best for them at the desired time of sowing and location, providing the farmer with helpful information before the agricultural process begins. Our system forecasts the yield and cost of the selected crop.

8. Reference

- [1] An intelligent Crop Price Prediction using suitable Machine Learning Algorithm Ishita Ghutake¹, Ritesh Verma¹, Rohit Chaudhari¹, and Vidhate Amarsinh¹
¹ Department of Computer Engineering, Ramrao Adik Institute of Technology, Nerul, Navi Mumbai, India ITM Web of Conferences 40, 03040, 2021.
- [2] Agricultural Crop Commodities Price Prediction Using Machine Learning Techniques Prashantha S,² Shraavan C Y,³ Bharath B,⁴ Bharghavachar B N,⁵ Prof. Shilpa B L^{1,2,3,4} Student, Dept. of Computer Science and Engineering, Vidya Vikas Institute of Engineering and Technology, Mysore-570028, Karnataka, India, 2020.
- [3] Crop price prediction using supervised machine learning algorithms Ranjani Dhanapal¹, A Ajan Raj¹, S Balavinayagapragathish, J Balaji¹
¹ Department of Information Technology, Sri Krishna College of Technology, Coimbatore, India, 2021.