ABSTRAK

PERAMALAN VOLUME PANEN AIR NIRA AREN IKM GULA SEMUT MENGGUNAKAN ALGORITMA *MACHINE LEARNING*

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Gula merupakan salah satu bahan makanan pokok masyarakat Indonesia, contohnya gula semut. Gula semut merupakan produk yang dihasilkan dari kristalisasi air nira pohon aren (Arenga pinata). Produksi gula semut bersifat fluktuatif dikarenakan ketidakpastian cuaca dan faktor berpengaruh lainnya seperti suhu, ketinggian tanah, dan lain-lain. Bahan baku yang fluktuatif bisa mempengaruhi inventori, jumlah pekerja, bahkan produksi gula itu sendiri. Oleh karena itu diperlukan adanya peramalan volume panen air nira aren sehingga bisnis dapat berjalan lancar. Peramalan dilakukan menggunakan enam metode *machine learning*. Enam metode tersebut adalah *Support Vector Regression* (SVR), *Bayesian Ridge Regression* (BRR), *Decision Tree Regressor* (DTR), *Multi Layer Perceptron Regressor* (MLP), *K-nearest Neighbor Regressor* (KNR), dan *Ordinary Least Squares* (OLS). Masing-masing metode akan dibandingkan menggunakan metrik evaluasi seperti *Mean Absolute Error* (MAE), *Mean Percentage Error* (MAPE), dan *Mean Squared Error* (MSE) untuk mendapatkan model terbaik. Setelah dilakukan perbandingan metode, didapatkan bahwa metode DTR merupakan metode terbaik dengan nilai MSE, MAE, dan MAPE sebesar 1,11; 0,87; dan 0,12.

Kata Kunci: Peramalan, prediksi, Algoritma ML

ABSTRACT

FORECASTING THE VOLUME OF PALM SUGAR SAP USING MACHINE LEARNING ALGORITHM (INDONESIAN PALM SUGAR SME CASE STUDY)

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Sugar is one of the staple foods in Indonesian society, such as palm sugar. Palm sugar is a product derived from the crystallization of sap from the aren tree (Arenga pinata). The production of palm sugar fluctuates due to weather uncertainties and other influencing factors such as temperature, soil elevation, and so on. Fluctuating raw materials can affect inventory, the number of workers, and even sugar production itself. Therefore, forecasting the volume of palm sap harvest is necessary for the business to run smoothly. Forecasting is done using six machine learning methods These six methods are Support Vector Regression (SVR), Bayesian Ridge Regression (BRR), Decision Tree Regressor (DTR), Multi-Layer Perceptron Regressor (MLP), K-Nearest Neighbor Regressor (KNR), and Ordinary Least Squares (OLS). Each method will be compared using evaluation metrics such as Mean Absolute Error (MAE), Mean Percentage Error (MAPE), and Mean Squared Error (MSE) to obtain the best model. After comparing the methods, it was found that the DTR method is the best, with MSE, MAE, and MAPE values of 1.11; 0.87; and 0.12, respectively.

Keywords: Forecast, prediction, ML Algorithm