ABSTRACT

COMPARISON OF REGRESSION MODELS FOR PREDICTION THE SELLING PRICES OF CAYENNE PEPPER BASED ON DAILY CLIMATE CONDITIONS (Case Study: Semarang City)

Oleh
Miko Ardian
20110011

Cayenne pepper is a type of horticultural plant that is popular in Indonesia because it is used as a cooking spice. Chili contributed to inflation of 0.15% in July 2022. An increase in selling prices caused chili inflation, this increase was caused by fluctuating selling prices. Several factors, such as climate conditions and supply and demand cause fluctuations in the price of cayenne pepper. Extreme climates result in decreased production, causing price changes. Predictions need to be made to estimate the selling price of cayenne pepper based on daily climate conditions consisting of temperature, humidity, rainfall, exposure time, and wind speed variables. Regression techniques are generally used to predict the future. The choice of regression algorithm must be adjusted to the characteristics of the data and test classical assumptions on the data used. The data used in this research is data that is not normally distributed, there is autocorrelation and there is no linearity. The XGBoost Regression, KNN Regression, and Random Forest Regression algorithms handle data with these characteristics. Evaluation of the three algorithms resulted that produced that XGBoost Regression is the best model compared to other models in making predictions using a combination of parameter values (n_estimator = 150, max_depth = 5, learning_rate = 0.1, sub_sample = 0.8, colsample_bytree = 0.8, gamma = 0.2) which produces the smallest MAE, namely 3.174, value The smallest MAPE is 8.94% which is in the very good category and the largest R2-Score is 0.92 Using the SHAP method, it is known that temperature is the variable that has the most significant contribution with an average SHAP value of +7003.8, which indicates that this variable has a positive impact on selling price predictions with an average of IDR 7,003.8. Other variables, namely wind speed and exposure time, also have a large contribution to the prediction of selling prices.

Keywords*: *Cayenne Pepper, Climate, Selling Price, Prediction, Comparison