

Wine Quality Prediction using Machine Learning

Dr G Paavai Anand¹, Rithvika A D², Mangai Shreya³, Sneha Vijaykumar⁴

Assistant Professor (SG), Department of CSE¹

Students, Department of CSE(E-Tech)^{2,3,4}

SRM Institute of Science and Technology, Vadapalani, Chennai, TN, India

Abstract: *This project investigates a basic machine learning approach to predicting wine quality based on chemical properties. Using a dataset containing attributes such as acidity, sugar content, pH, and alcohol level, the study classifies wines into quality categories. Simple machine learning algorithms, including logistic regression and decision trees, were employed to develop and evaluate predictive models. To enhance performance, data preprocessing and feature selection techniques were applied. The findings highlight alcohol and volatile acidity as key predictors of wine quality, though the model's accuracy reflects the limitations of the simplified approach. This project illustrates the potential of basic machine learning methods for preliminary wine quality assessment, with opportunities for improvement through advanced techniques and larger datasets.*

Keywords: Wine quality prediction, machine learning, SMOTE, Logistic Regression, Decision Tree, Random Forest, feature selection.