

Leveraging Machine Learning for Predicting Student Performance

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Abstract: *Predicting student performance is a crucial challenge in the education sector. This research explores the application of machine learning techniques to forecast academic success based on historical student data, including attendance, past grades, and behavioural patterns. We developed and evaluated multiple machine learning models, including Random Forest, Decision Tree, Support Vector Machine, and Logistic Regression, to determine their effectiveness in predicting academic outcomes. Our analysis highlights that Random Forest provides the highest accuracy, while Logistic Regression offers a balance between interpretability and performance. The study aims to assist educators in identifying students at risk of underperformance, enabling timely intervention strategies.*

Keywords: Student performance, Machine learning, Educational data mining, Academic success prediction