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An Ensemble Approach to Predict Student Final Score Using Machine Learning Techniques.

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Abstract

Academic performance is used to measure how instructors, students, and education institution has achieved their educational goals. It's one of the critical factors which evaluates the level of education. The main problem this research addressed is how to identify a student at risk as soon as possible. The identification relies on factors like students' health status, attendance, leisure time, romantic relationships etc. Since this has to be done manually for each individual student, it is very time-consuming and laborious. To speed up this process, an early prediction approach is proposed.

Therefore, the problem was divided into two main components. Firstly, to identify factors that affect the scores and secondly to determine the proper machine learning algorithm to predict results. In this research, identify factors task is carried out from three main aspects, research past existing systems, survey and machine learning feature selection techniques. After that according to a recent study and the existing system, the ensemble learning is identifies as the best machine learning approach to address that technical problem.

Therefore, the six critical factors were identified. Students' previous grade, absences, daily alcohol consumption, health status, past failure rate and study time. Therefore, the regression ensemble model was developed using the weight average technique. The accuracy of the model was 72.95%. The overall impressions of the grade prediction system from domain and industrial experts were positive. A few domain experts suggested better approaches for ensemble model which could be taken as future enhancements.

Keywords – Final Academic Performance, Classification, Regression, Further Education, Ensemble Learning, Machine Learning