



A Predictive Machine Learning Model for Student Grade Evaluation

Ismaeel Yousaf^{1*}

¹Department of Information Technology, Bahauddin Zakariya University, Multan

*Corresponding Author. Email: rajaismaeelbzu@gmail.com

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Abstract: This research paper presents the development of an innovative machine learning-based solution with a dual focus: accurately predicting student grades on an individual and course level, and aiding academic institutions in identifying struggling students promptly for targeted support. The system harnesses the strengths of Python and Rstudio programming languages, capitalizing on their robust data analysis, regression, and clustering capabilities. By leveraging diverse factors such as attendance records, examination scores, class participation and historical grades, the system provides a comprehensive assessment of student performance.

The integration of this approach empowers educators to offer timely feedback and targeted interventions, fostering student improvement not only in academic outcomes but also in their overall approach to learning. The implementation of this system holds the potential to substantially enhance student success rates, ultimately contributing to an enriched educational journey that benefits both students and teachers alike. Through predictive insights and personalized support, the proposed solution offers a transformative opportunity to elevate the quality of education and create a more conducive environment for effective learning.

Keywords: Classification; Machine Learning; Student Performance; Grade Prediction; Regression Analysis; Data Analysis; Academic Success.