Student academic performance has long been a focal point in educational research, as it reflects not only individual learning outcomes but also the overall effectiveness of the educational system. However, student performance is not determined solely by classroom instruction or cognitive ability; rather, it is influenced by a complex interplay of multiple external and internal factors. This study explores a wide range of variables—including attendance, parental support, access to internet, participation in extracurricular activities, sleep duration, motivation, tutoring, family income, type of school, peer influence, gender, and exam scores—to assess their impact on student performance.

The research utilizes a structured dataset containing student-related information and applies statistical techniques such as correlation analysis, multiple regression, and machine learning-based feature importance ranking to identify the most significant predictors of academic achievement. The study also employs visualization tools to represent relationships and trends in a clear and interpretable manner, enhancing the usability of the insights for educators and decision-makers.

Findings from the analysis suggest that variables like regular attendance, strong parental involvement, adequate sleep, and consistent motivation significantly correlate with higher academic performance. In contrast, factors such as gender or school type showed minimal direct impact in the dataset studied. These insights emphasize the importance of a supportive home environment and healthy personal habits in shaping student success.

This research holds practical value for educators, policymakers, and parents, offering actionable insights that can inform targeted interventions and personalized learning strategies. Furthermore, the study underscores the need for a holistic, data-driven approach to education that considers not only academic inputs but also the social and emotional well-being of students. Future work may expand this model by integrating mental health metrics, longitudinal data, and cultural context to create a more comprehensive framework for understanding and improving student performance.