

# Executive Summary – Student Performance Analysis

- The dataset comprises **6,607 student records** with academic, behavioral, socio-economic, and environmental attributes; missing categorical values were handled using an “**Unknown**” category to preserve data integrity.
- **Exam scores** are predominantly concentrated between **60–70**, indicating a common performance band across the student population.
- **Hours studied, attendance, and previous academic scores** exhibit a strong positive correlation with exam performance, making them the most influential predictors of success.
- **Consistent attendance** emerges as a critical factor, with higher classroom participation directly associated with improved exam outcomes.
- Students with **higher parental involvement and higher parental education levels** tend to achieve better average scores, highlighting the role of family support.
- **Motivation level, adequate sleep, and moderate physical activity** positively influence cognitive performance and academic stability.
- Access to **internet resources, tutoring sessions, and high-quality teachers** significantly improves median exam scores and reduces score variability.
- **Private school students** show a slightly higher median performance compared to public school students.
- **Positive peer influence and participation in extracurricular activities** are associated with competitive academic performance across genders.
- **Gender distribution is nearly balanced**, ensuring fairness and representativeness in performance comparisons.
- **Distance from home** shows minimal direct impact on exam scores, suggesting limited influence on academic outcomes.