

Analysis of Students Performance: A One-Page Summary

Problem: This project aimed to investigate the factors influencing student academic performance, specifically focusing on final grades (G3) in secondary education. Understanding these factors is crucial for improving educational outcomes and identifying at-risk students, potentially enabling targeted interventions.

Methodology: I utilized the "student-mat.csv" dataset, containing information about Portuguese students' demographics, social and school related features, and grades.

Our analysis involved:

Data Cleaning: Initial data exploration was conducted to ensure data quality, addressing missing values and verifying data types.

Exploratory Data Analysis: I employed descriptive statistics and visualizations to understand the distribution of final grades (G3) and explored potential relationships with categorical features such as school, gender, family size, and parental occupations. Python libraries pandas, matplotlib, and seaborn were instrumental in data manipulation and visualization.

Visualization: Key visualizations included a histogram of final grades and bar charts comparing the average G3 across different categories. These visualizations facilitated the identification of patterns and potential factors influencing academic performance.

Findings and Insights:

Distribution of Grades: Final grades (G3) exhibited a slightly left-skewed distribution, indicating a tendency towards higher scores among the student population.

School Influence: Students attending Gabriel Pereira school demonstrated higher average final grades compared to those attending Mousinho da Silveira school, suggesting a potential school-level effect on academic performance.

Parental Occupation: Students whose mothers were employed in health-related occupations tended to have lower average final grades. This finding raises questions about potential work-life balance challenges impacting student academic outcomes.

Other Factors: Several other categorical features, including student's sex, address type, family size, and parents' cohabitation status, showed notable but less significant relationships with final grades.

Conclusion:

This project provided valuable insights into factors influencing students academic performance. While school and parental occupation emerged as potential key influences, further investigation is warranted. Future work could involve statistical tests to validate these findings, incorporating additional variables like study time and absences, and exploring potential interventions to support students facing academic challenges. This project enhanced our data analysis and visualization skills and broadened our understanding of the multifaceted nature of student success.