STUDENTS MATHEMATICS PERFORMANCE ANALYSIS REPORT

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INTRODUCTION

This report analyzes the academic performance of secondary school students in mathematics. The goal is to identify factors affecting student performance and provide data-driven recommendations for improving success rates.

EXECUTIVE SUMMARY

This report analyzes the academic performance of secondary school students in mathematics, identifying key factors that influence success and failure rates. The findings reveal that parental education, internet access, family and school support, study habits, and gender significantly impact student outcomes.

Key Findings:
- **Parental Education:** Students with highly educated parents perform better, while those whose parents have only primary education experience higher failure rates.
- **Internet Access:** Lack of internet access is linked to significantly higher failure rates (78%).
- **Family Support:** Students with family support have lower failure rates, highlighting the importance of parental involvement.
- **School Support:** Academic interventions from schools contribute to lower failure rates.
- **Study Habits:** Moderate study time (around 2 hours) yields the best results, whereas excessive studying (4+ hours) or minimal studying (1 hour) leads to lower performance.
- **Gender Disparities:** Males have a slightly higher failure rate than females, suggesting potential differences in study habits and engagement.

PROBLEM STATEMENT

The academic performance of secondary school students in mathematics varies due to multiple factors, including parental education, internet access, family and school support, study habits, and gender. However, the extent of these influences is not well understood. This analysis seeks to **identify the key factors affecting student success or failure in mathematics** and provide **data-driven insights** to improve student outcomes.

Key Questions:
- How does **parental education** impact student performance?
- Does **internet access** influence academic success?
- What role do **family and school support programs** play in reducing failure rates?
- How do **study habits and study time** affect performance?
- Are there **gender disparities** in student performance?

Objective:
To provide actionable recommendations that **educators, parents, and policymakers** can use to enhance student learning experiences and reduce failure rates in mathematics.

METHODOLOGY

To analyze the factors affecting student performance in mathematics, the following methodology was used:

1. Data Collection

•The dataset consists of **secondary school students' academic records**, including:

Parental education levels

•**Internet access availability**

•**Family and school support programs**

•**Study time and habits**

•**Gender distribution**

•**Student failure rates in mathematics**

The data was sourced from **school records, surveys, and academic performance reports**

Data Cleaning & Preprocessing

•Missing values were identified and handled appropriately.

•Data types were standardized for numerical and categorical variables.

Outliers were examined to ensure data integrity.

Data Analysis & Visualization (Power BI)

- **Descriptive Statistics:** Used to summarize student performance trends.

- **Bar Charts:** To compare average student scores by parental education.

- **Failure Rate Analysis:** Comparing students based on gender, internet access, and support programs.

- **. Interpretation of Insights**

- Trends were analyzed to determine **which factors had the strongest impact** on student success.

- Comparisons were made between students with different levels of support and resources.

- Insights were extracted to guide recommendations.

- **5. Recommendations & Action Plan**

- Based on the findings, strategic recommendations were proposed to improve student outcomes.

- The recommendations focus on **parental involvement, internet accessibility, school support, and effective study habits**.
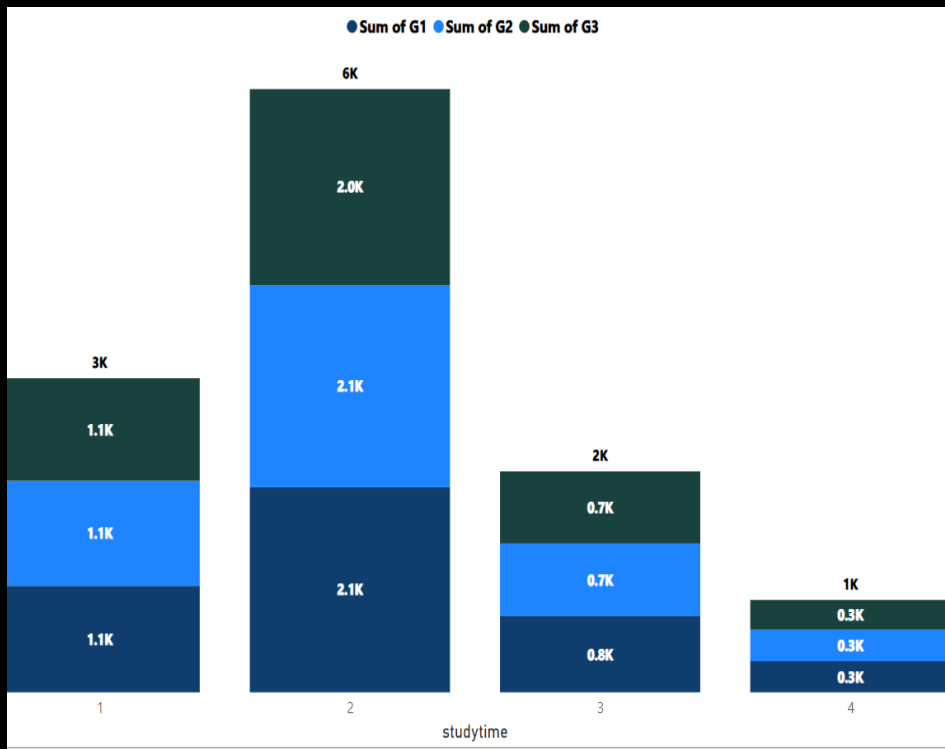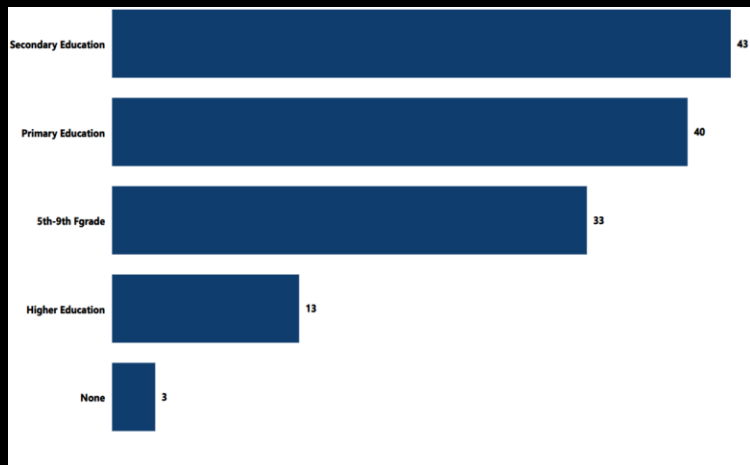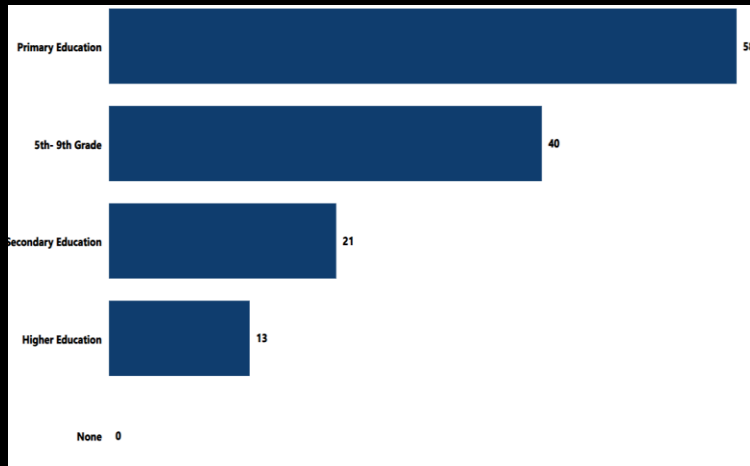
KEY ISIGHTS
 Study Time vs. Performance
- Students who study *around 2 hours perform the best (6K total score).
- Both excessive studying (4+ hours) and minimal studying (1 hour) result in lower performance.
- *Insight: Balanced study habits are more effective than excessive cramming.

Key Insights from the Analysis

- Parental Education and Student Performance
- Students whose *parents have only primary education have the highest failure rates* (58 for fathers, 40 for mothers).
- Students with parents who have higher education fail less (only 13 failures).

- Insight: Higher parental education levels positively impact student success due to better academic support.
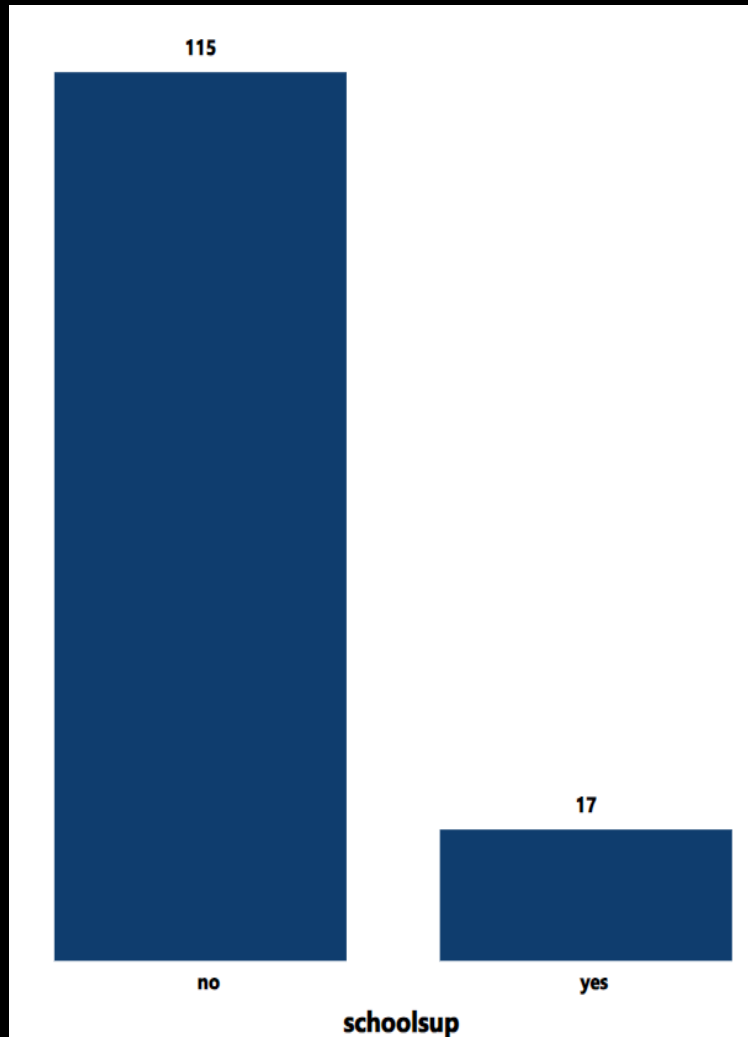
School Support and Failures

- Students without school support fail significantly more (115 failures) compared to those with support (17 failures).

- Insight: School-provided academic interventions help reduce failure rates.
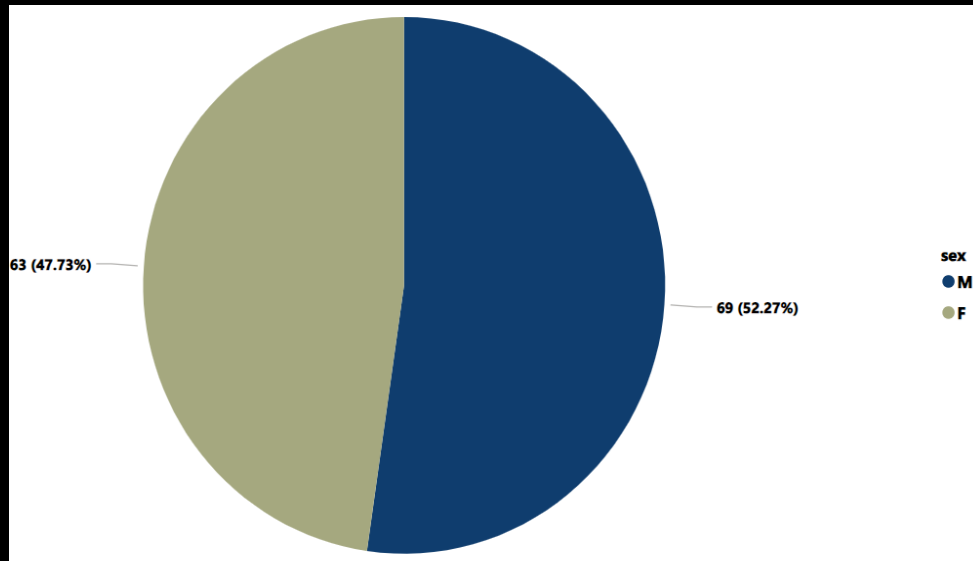
Gender and Failure Rates

- Male students (69 failures) have a slightly higher failure rate than females (63 failures).

- Insight: This suggests differences in study habits, engagement, or external support systems.
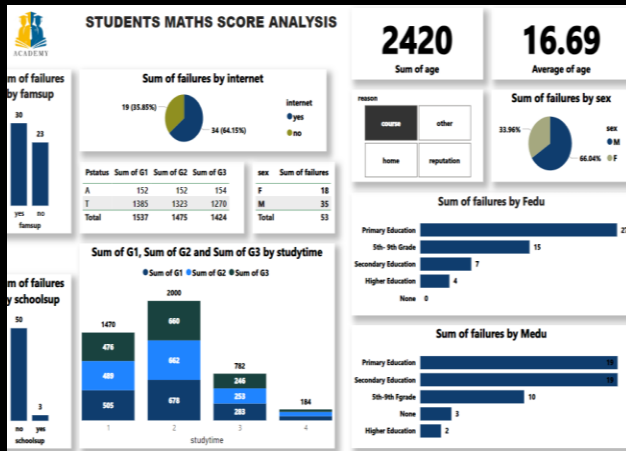
REASON OF FAILURE

- Average age of student who failed as a result of the course is 16.69. This could be from the teacher or the students.
- Average age of student who failed as a result of home influence is 16.73. Home influence could be as a result of over tasking the child, peer pressure or emotional trauma.
- Average age of student who failed as a result of other reason is 16.81. Home influence could be as a result of over tasking the child, peer pressure or emotional trauma.

RECOMMENDATIONS

Based on the insights above, the following steps are recommended to improve student performance:

- Encourage Parental Involvement:
  - Organize workshops to educate parents on supporting their children's studies.
  - Implement mentorship programs for students from low-education backgrounds.

- Improve Internet Access:
  - Provide subsidized or free internet access to students in need.
  - Encourage digital learning resources and online tutoring.

- Enhance School Support Programs:
  - Increase access to tutoring and academic assistance.
  - Offer remedial classes and study groups for struggling students.

- Promote Balanced Study Habits:
  - Educate students on effective study techniques.
  - Encourage structured study plans to avoid over- or under-studying.

- Address Gender-Based Performance Gaps:
  - Introduce personalized learning strategies to engage male students.
  - Provide mentoring programs targeting underperforming groups.

CONCLUSION

This analysis highlights the *strong impact of parental education, internet access, family and school support, study habits, and gender on student performance* in mathematics. Implementing the above recommendations will help schools create a more effective learning environment and improve student outcomes.