

Streaming Data Analytics Project

Topic: Student Performance Factors

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Description of the Dataset

This dataset explores the diverse factors influencing student performance, providing a foundation for identifying key drivers of academic success and areas needing improvement. The data enables a holistic analysis of academic trends and challenges faced by students. Key components include:

- **Student Demographics:** Data on school type, gender, and parental education levels allows for analysis of demographic variations in performance and engagement.
- **Study and Lifestyle Factors:** Information on hours studied, sleep patterns, and attendance provides insights into students' routines and their impact on outcomes.
- **Performance Metrics:** Exam scores serve as the primary indicator of academic success, supported by attendance data and previous performance trends.
- **Support and Resources:** Insights into access to resources, internet availability, and parental involvement help assess the role of external support in academic achievement.
- **Behavioral Insights:** Variables like motivation level, peer influence, and physical activity highlight psychological and social dynamics affecting students' academic journeys.

Objectives

The project aims to:

- **Understand Study Habits and Academic Success:** Assess how factors like hours studied, sleep patterns, and tutoring sessions contribute to exam performance.

- **Evaluate the Role of External Support:** Explore the impact of access to resources, parental involvement, and internet connectivity on students' academic outcomes.
- **Identify Demographic Trends in Performance:** Analyze variations in exam scores across gender, school types, and parental education levels to identify trends and disparities.
- **Correlate Behavioral and Psychological Factors:** Investigate how motivation levels, peer influence, and physical activity affect engagement and performance.
- **Analyze Attendance as a Success Indicator:** Understand the relationship between attendance rates and exam scores to reinforce the importance of consistent participation.
- **Promote Equity in Education:** Highlight disparities in access to resources and their effect on student outcomes, emphasizing the need for equitable opportunities.

Insights

The analysis provided the following insights into factors affecting student performance:

- **Academic Success Indicators:** The average exam score serves as a benchmark, highlighting overall performance. Improved exam scores were positively correlated with higher hours studied, sufficient sleep, and consistent attendance, reinforcing the importance of balanced habits.
- **Impact of Resources and Support:** Students with better access to resources and internet connectivity tend to perform better, showcasing the need for robust infrastructure. Parental involvement also emerged as a crucial factor, with students reporting higher motivation levels and scores when supported at home.
- **Behavioral Influences:** Motivation levels significantly influenced performance, with students reporting "High" motivation often achieving better exam outcomes. Peer influence and physical activity also showed measurable effects, underscoring the role of social and physical well-being.
- **Demographic Variations:** Private school students consistently outperformed public school peers, suggesting disparities in resource availability or teaching quality. Gender-based analysis revealed differences in tutoring utilization and outcomes, guiding tailored support strategies.
- **Attendance and Engagement:** Students with higher attendance rates exhibited stronger academic performance, confirming the importance of consistent participation in learning environments.