**DATA ANALYSIS REPORT ON STUDENT PERFORMANCE FACTORS**

**1. OVERVIEW OF DATA**

* **Average Score:** 67.24
* **Pass Rate:** 25% (0.25)

This dataset describes student performance, including exam scores, parental involvement, and factors influencing academic outcomes such as study hours and sleep. Overall, the average score is 67.24, and the pass rate is 25%, indicating that a significant portion of students did not achieve good results.

**2. ANALYSIS BY SCHOOL TYPE**

The pie chart showing the distribution of students by school type reveals:

* **Public Schools:** 2.01K students (30.41%)
* **Private Schools:** 4.6K students (69.59%)

This suggests that there are more students in private schools compared to public schools, which could reflect parental preferences and access to educational resources in different school systems.

**3. TOTAL EXAM SCORE BY PARENTAL EDUCATION LEVEL**

The bar chart summarizes exam scores by parental education level:

* **High School:** 221.63K
* **College:** 133.89K
* **Postgraduate:** 88.70K

It is evident that students with parents who have a high school education have the highest total exam scores. As parental education level increases, the total exam score tends to decrease, which could be related to socioeconomic factors or other external influences.

**4. RELATIONSHIP BETWEEN SLEEP HOURS AND EXAM SCORES**

The line chart displaying the relationship between sleep hours and exam scores shows:

* **4 hours of sleep:** 67.63
* **5 hours of sleep:** 67.30
* **6 hours of sleep:** 67.19
* **7 hours of sleep:** 67.24
* **8 hours of sleep:** 67.22
* **9 hours of sleep:** 67.15
* **10 hours of sleep:** 67.14

There is no significant variation in exam scores based on the number of hours slept, suggesting that sleep duration within the range of 4 to 10 hours does not greatly impact exam performance. However, the quality of sleep and other factors like health and psychological well-being could still play a role.

**5. SCATTER PLOT ANALYSIS: HOURS STUDIED AND EXAM SCORES**

The scatter plot illustrates the relationship between study hours and exam scores:

* **Trend:** A positive linear relationship is evident, indicating that as study hours increase, exam scores tend to improve.
* **Data Distribution:**
  + **Low Scores (60-70):** Often found in students who study fewer than 10 hours per week.
  + **Medium Scores (70-85):** Common among students who study between 10 and 25 hours per week.
  + **High Scores (85-100):** Recorded in students who study 25+ hours per week.
* **Outliers:** Some students who study over 30 hours still score poorly, possibly due to ineffective study methods, health issues, or stress. On the other hand, some students study fewer than 5 hours but achieve high scores, potentially due to natural aptitude or effective study strategies.

**6. PARENTAL INVOLVEMENT BY GENDER**

The line chart on parental involvement by gender shows:

* **Medium Involvement:**
  + Female: 1,975
  + Male: 1,387
* **High Involvement:**
  + Female: 1,066
  + Male: 842
* **Low Involvement:**
  + Female: 773
  + Male: 564

Female students tend to have higher parental involvement at all levels (medium, high, and low) compared to male students, which may reflect different societal or cultural expectations regarding gender and academic engagement.

**7. ATTENDANCE BY PASS/FAIL STATUS**

The bar chart showing attendance by pass/fail status reveals:

* **Fail:** 0.38 million days
* **Pass:** 0.15 million days

Students who failed attended more school days than those who passed, which may indicate that students who fail have lower engagement in their studies or may face other barriers to success. Further investigation is needed to better understand this relationship.

**8. CONCLUSIONS AND RECOMMENDATIONS**

* **Study Hours:** Students should focus on increasing their study time to improve their exam scores. However, it is also essential to consider the quality of study and study techniques.
* **Parental Involvement:** Parental involvement is crucial, especially for female students. Parents should increase their engagement in their children's learning processes to support academic success.
* **Sleep:** While sleep duration within the given range does not show a strong correlation with exam performance, ensuring quality sleep is still important for overall well-being and academic performance.
* **Attendance:** Students who failed have higher attendance, which may indicate issues with engagement or effectiveness of attendance. Improving student motivation and support may help address these issues.