Interpretation Report: Study Time vs Exam Scores

This study examines the relationship between students' study time and their exam scores using statistical techniques relevant to data science. The dataset consists of 11 observations, where study hours are treated as the independent variable and exam scores as the dependent variable.

Exploratory data analysis was conducted using scatter plots and histograms. The scatter plot showed a clear positive trend, indicating that exam scores increase as study hours increase. The histograms of study hours and exam scores showed a reasonable distribution of data without significant outliers.

The Pearson correlation coefficient was calculated to measure the strength of the relationship between the variables. The correlation value obtained was **0.981**, indicating a very strong positive relationship between study time and exam scores. This suggests that students who study for more hours tend to achieve higher marks.

To validate this relationship statistically, a hypothesis test was performed at a significance level of **0.05**. The null hypothesis stated that there is no significant relationship between study time and exam scores, while the alternative hypothesis stated that a significant relationship exists. The p-value obtained was $\mathbf{1.0 \times 10^{-7}}$, which is much lower than 0.05. Therefore, the null hypothesis was rejected.

In conclusion, the analysis confirms that **study time has a statistically significant and positive impact on exam performance**. Increased study hours are strongly associated with higher exam scores, demonstrating the importance of consistent study habits and the effectiveness of statistical analysis in data science.