Hypothesis Statement for Two-Way Classification:

The performance scores (e.g., exam scores) of students are influenced by both their gender and the type of high school board they attended.

Null Hypothesis (H0): There is no interaction effect between gender and type of high school board on the performance scores of students.

Alternative Hypothesis (H1): There is an interaction effect between gender and type of high school board on the performance scores of students.

Justification for Accepted and Rejected Hypotheses:

Accepted Hypothesis (H0): If the analysis of variance (ANOVA) results in a non-significant interaction effect between gender and type of high school board, it implies that there is no statistically significant difference in the performance scores among different combinations of gender and high school board type. In this case, we accept the null hypothesis (H0), suggesting that there is no interaction effect between gender and type of high school board on performance scores.

Rejected Hypothesis (H1): If the ANOVA results show a significant interaction effect between gender and type of high school board, it implies that there is a statistically significant difference in the performance scores among different combinations of gender and high school board type. In this case, we reject the null hypothesis (H0) and accept the alternative hypothesis (H1), indicating that there is an interaction effect between gender and type of high school board on performance scores.