4.6: Summary

Questions about the differences between two samples can be answered in several ways: hypothesis test, p-value approach, or confidence interval approach. In all cases, you must clearly state your question, the selected level of significance and the conclusion.

If you choose the hypothesis test approach, you need to compare the critical value to the test statistic. If the test statistic falls in the rejection zone set by the critical value, then you will reject the null hypothesis and support the alternative claim.

If you use the p-value approach, you must compute the test statistic and find the area associated with that value. For a two-sided test, the p-value is two times the area of the absolute value of the test statistic. For a one-sided test, the p-value is the area to the left or right of the test statistic. The decision rule states: If the p-value is less than α(level of significance), reject the null hypothesis and support the alternative claim.

The confidence interval approach constructs an interval about the difference of the means or proportions. If the interval contains zero, then you can conclude that there is no difference between the two groups. If the interval contains all positive values, you can conclude that group 1 is significantly greater than group 2. If the interval contains all negative numbers, you can conclude that group 2 is significantly greater than group 1.

In all approaches, a clear and concise conclusion is required. You MUST answer the question being asked by stating the results of your approach.