One-Sided Test
& One Sided Confidence Bounds on \( \mu \)

I. One-Sided Test on Mean

In JMP-IN, a one-sided test for the mean is conducted in the same way as a two-sided test. The first step is to create a histogram over the variable of interest.

In the Distribution window, click on the red triangle next to your variable, and choose “Test Mean.” Specify the hypothesized mean and click OK.

When we click OK, a new table “Test Mean-Value” pops up. We have seen this table before when we did two-sided tests for the mean. Specify the hypothesized mean and click OK. JMP-IN calculates the test statistic and the p-values corresponding to the test.

For one-sided tests, our critical value of \( t \) is different than for two-sided tests. Since we are looking at only one of the tails in the t-distribution, our \( t_{\text{crit}} \) is \( t_{\alpha} \), rather than \( t_{\alpha/2} \). For an upper one-sided test, our rejection region is to the right of \( t_{\text{crit}} \). For a lower one-sided test, our rejection region is to the left of \( -t_{\text{crit}} \). Reject \( H_0 \) if your test statistic falls in the rejection region.

JMP also gives the p-values for one-sided tests. For an upper one-sided test, the p-value is labeled “Prob > t,” while for a lower one-side test the p-value is labeled “Prob < t.” Reject the null hypothesis if the p-value is less than the chosen \( \alpha \).

Remember that before running the test, you have to check the assumption of normality.

II. One-Sided Confidence Bound on Mean

Unfortunately, JMP-IN does not automatically generate one-sided confidence bounds. However, there is an easy way to get around this.

For a 90% two-sided test, the true mean, \( \mu \), will fall above the upper confidence limit 5% of the time. It will also fall below the lower confidence limit 5% of the time. Hence, to get an upper (one-sided) 95% bound on \( \mu \), take the upper limit from a 90% two-sided confidence limit on \( \mu \). Similarly, to get a lower 95% bound on \( \mu \), take the lower limit from a 90% two-sided confidence limit on \( \mu \). We already know how to create two-side confidence intervals.
I. Test on Proportion

A two-sided test can easily be carried out in JMP-IN. For proportions, the first step is to create a frequency table on the data. Once you are in the Distribution window and you have your frequency table, click on the red triangle next to the variable. Specify the hypothesized probabilities for both categories in the table that appears. Note that the probabilities have to add up to one. If you enter something that does not add up to one, JMP-IN will change the given hypothesized probabilities.

The p-value we are using is the p-value for the Pearson statistic, which mathematically agrees with the two-sided z-test p-value. Note that the halving this p-value gives the p-value for a one-sided test. Reject the null hypothesis if the p-value is less than the chosen $\alpha$.

As always, no test is valid unless the assumptions hold. The z-test is based on a large sample approximation. A simple rule of thumb is that if $np(1-p) \geq 5$, then the test can be considered valid.

II. One-Sided Confidence Bounds on Proportion

There is no direct way to calculate one-sided bounds on the proportions. However, you can use the trick described for one-way confidence bounds for the mean.