One Sample t-Test and Confidence Interval

Use to estimate via a confidence interval or perform a hypothesis test for a population mean.

Confidence Interval for the Mean

Car Physical Data.jmp (Help > Sample Data Folder)

1. From an open JMP® data table, select **Analyze > Distribution**.
2. Select one or more continuous variables from **Select Columns**, click **Y, Columns** (continuous variables have blue triangles), and click **OK**.

   The **Upper 95% Mean** and **Lower 95% Mean** shows the 95% confidence interval for the population mean.
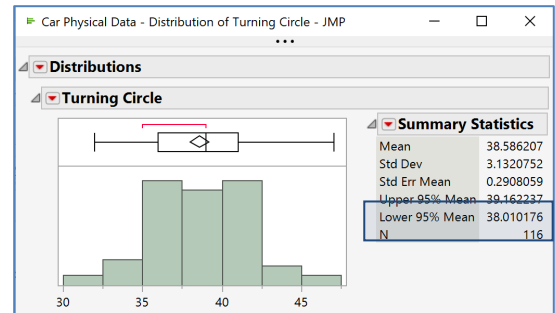
Note: To change the confidence level, request a one-sided confidence limit or specify sigma, click on the **red triangle** for the variable, select **Confidence Interval**, and select the confidence level or click **Other**.

One Sample t-Test for the Mean

1. From the Distributions report window (shown above), click on the **red triangle** for the variable and select **Test Mean**.
2. Enter the hypothesized value under **Specify Hypothesized Mean**, and click **OK**. We will test the following hypothesis:

   H_0: $\mu = 40$ vs. H_A: $\mu \neq 40$. JMP will display:

   - The **t-statistic**.
   - **P-values** for the two-tailed and one-tailed tests.
   - A graph to aid in interpreting the p-values, showing the hypothesized mean (center of the curve) and the sample mean (red line).
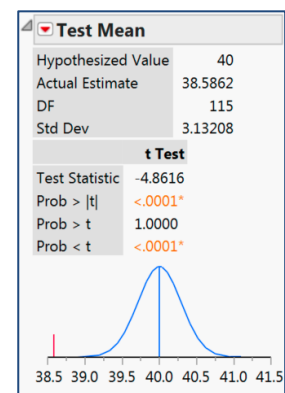
Interpretation of p-values for this example (using a significance level of 0.05):

1. **Prob > |t| is less than 0.05 - reject the null hypothesis** that the true mean is 40. This is the two-tailed test. Conclude that the true mean is not 40.

2. **Prob > t is greater than 0.05 - fail to reject the null hypothesis** that the true mean is <= 40. This is a one-tailed test. There no statistical evidence to reject the null hypothesis.

3. **Prob < t is less than 0.05 - reject the null hypothesis** that the true mean is >= 40. Conclude that the true mean is less than 40. The confidence interval (38.0 , 39.2) provides an estimate of how different the population mean is from 40.

Notes: To explore how the p-value changes as a function of the difference between the hypothesized mean and the sample mean, click on the **red triangle** next to **Test Mean** and select **PValue animation**. Use **the Power Animation tool** to examine how power changes under different scenarios.

This analysis can also be performed using the **Hypothesis Test for One Mean** and **Confidence Intervals for One Mean Calculators** under **Help > Sample Index > Calculators** or **Student > Calculators** in JMP Student Subscription.

Visit **Discovering JMP > Analyze Your Data > Analyze Distributions** and **Basic Analysis > Distributions** in **JMP Help** to learn more.