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Practice: Constructing a Confidence Interval for the Speed of Light

In this practice, you compute confidence intervals for Michelson's 100 velocity measurements using the Distribution platform from the Analyze menu. The data are found in **Michelson 1879.jmp**.

1. Construct a 95% confidence interval for the mean velocity. What is this confidence interval?

   The 95% CI for the mean is 299836 to 299868.

2. Construct a 99% confidence interval for the mean velocity. What is this confidence interval?

   The 99% CI for the mean is 299832 to 299873.

3. Explain why the 99% interval is wider than the 95% interval.

   To achieve a higher degree of confidence, the interval estimate widens to capture more possible values.

4. Compare the confidence interval to the standard speed of light accepted by the scientific community: 299,792 km/sec. We'll consider this the population mean. Did either of the confidence intervals capture the true value?

   No, neither interval captured the true mean. Michelson's method, on average, overestimated the speed of light.

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