

Confidence Intervals

Let Y_1, \dots, Y_n be i.i.d. draws from a distribution with mean μ . A test of $H_0: \mu = 5$ vs. $H_1: \mu \neq 5$ using the usual t -statistic yields a p -value of 0.03.

1. Does the 95% confidence interval contain $\mu = 5$? Explain.

The p -value is less than the significance level, so the null hypothesis is rejected,

$$p = 0.03 < 0.05 = \alpha = 1 - 0.95$$

The confidence interval does not contain μ .

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2. Can you determine if $\mu = 6$ is contained in the 95% confidence interval? Explain.

There is not enough information to determine if $\mu = 6$ is contained in the confidence interval. We know neither the sample size n nor the variance σ^2 . The variance could be estimated, but that estimate would depend on the sample size, which is unknown.