Confidence Intervals

Objectives

1. Determine confidence intervals for population mean
2. Determine confidence intervals for population proportion
3. Determine the necessary sample size

How Close Are We to the Population Mean?

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That is where confidence intervals come into play.

How Confident Are We?

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Typical confidence levels are 90%, 95%, 98%, and 99%.

Confidence Interval Setup

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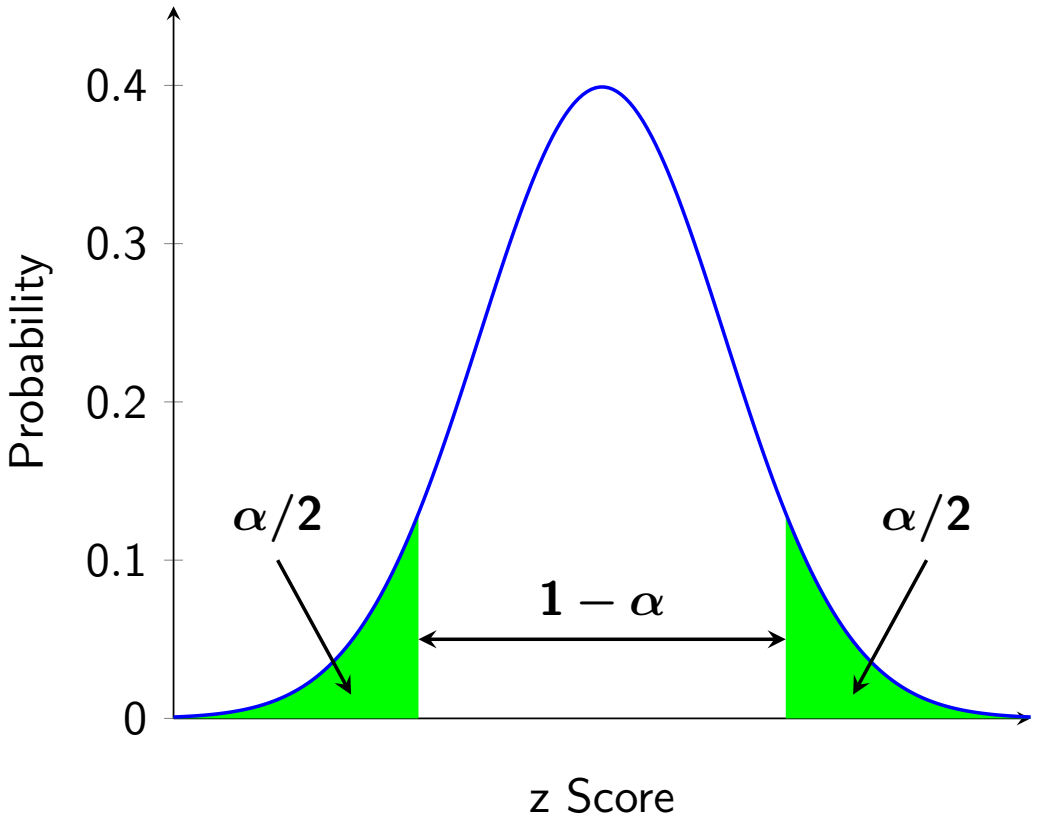
The margin of error is in the form

$$\text{critical value} \times \text{standard error}$$

Critical Values

Critical values are typically in the form $z_{\alpha/2}$ where



Common Critical Values of $z_{\alpha/2}$

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Notice the higher the confidence level, the further away from $z = 0$ the critical value is.

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The standard error is still $\frac{\sigma}{\sqrt{n}}$

Example 1

The waiting time of a sample of 100 patients at a hospital is 3.5 minutes. Construct a 95% confidence interval for the mean waiting time of all patients at the hospital. Assume $\sigma = 0.75$ minutes.

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Error Bars

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However, be advised that some graphs use standard deviation for their error bars.

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