



CI Examples

The little things

Examples

- What is the approximate critical value if you want to have a 99.7% Confidence Level?
 - ❖ According to the 68-95-99.7 rule, we need to go approximately three standard deviation to obtain the middle 99.7%. So the approximate z^* is 3.
- What is the true critical value if you want to have a 95% Confidence Level?
 - ❖ Since the 68-95-99.7 rule gives only approximations, we need to find the standard deviations to obtain the middle 95%. $\text{invNorm}(p)$ gives the z-score for the area with an area of p. Therefore, the z^* is 1.96 given by $\text{invNorm}(.025) \approx 1.96$

Critical Values

- **Critical values** are the factors used to calculate the Margin of Error
- **Margin of Errors** express the maximum expected difference between the true population parameter and a sample estimate of that parameter. To be meaningful, the margin of error should be qualified by a probability statement

Examples

- What is the true critical value if you want to have a
 - 99.9% Confidence Level?
 - 80% Confidence Level?
 - 75% Confidence Level?

Examples

- What is the approximate critical value if you want to have a 68% Confidence Level?
 - ❖ According to the 68-95-99.7 rule, we need to go approximately one standard deviation to obtain the middle 68%. So the approximate z^* is 1.
- What is the approximate critical value if you want to have a 95% Confidence Level?
 - ❖ According to the 68-95-99.7 rule, we need to go approximately two standard deviation to obtain the middle 95%. So the approximate z^* is 2.

Examples

- What is the true critical value if you want to have a 99.9% Confidence Level?
 - ❖ $z^* \approx 3.291$
- What is the true critical value if you want to have a 80% Confidence Level?
 - ❖ $z^* \approx 1.282$
- What is the true critical value if you want to have a 75% Confidence Level?
 - ❖ $z^* \approx 1.15$

Example

➤ Find the proportion of A's of the an Advanced Math test in Mr. B's class using an 80%, 96%, and 99.99% confidence interval:

❖ Here are 22 randomly selected test scores:

98, 81, 78, 91, 66, 77, 82, 96, 92, 81, 73

71, 86, 96, 95, 65, 75, 76, 86, 73, 85, 79