α, CI & ho relationship

$\alpha \downarrow \rightarrow$ CI $\uparrow \rightarrow$ harder to reject null hypothesis

$\alpha \downarrow \rightarrow$ defines how sure you are about your null hypothesis

So when α is low you have high confidence in null hypothesis $\rightarrow H_1$ has to be nearly impossible but still if you proove it then reject null

Z-test

$$Z_{score} \text{ (sample)} = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}}$$

Applied to average data w.r.t population data

2 things needed

(i) population standard deviation

(ii) $n \geqslant 30$

$P < \alpha \rightarrow$ reject null hypothesis

t-test

$$t = \frac{\bar{x} - \mu}{s / \sqrt{n}}$$

degree of freedom (dof) $= (n-1)$

$s \rightarrow$ Sample SD

CI $\Rightarrow \bar{x} \rightarrow$ Sample mean

$$\bar{x} \quad Z_{\alpha/2} \cdot \frac{\sigma}{\sqrt{n}}$$

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