Procedures of Testing Hypothesis for Population Mean and Proportion

Created by C. Peng

Population parameters
$$\mu, \ \sigma^2, \ p$$

Sample statistics:
$$\bar{x}, \ s, \ n, \ \hat{p}$$

$n > 30$

$n \leq 30$
normal pop.

Proportion p

np > 5
and
n(1-p) > 5

Mean μ

σ is given

σ is unknown

$$\hat{p} \rightarrow N\left(p, \sqrt{\frac{pq}{n}}\right)$$

$$\bar{X} \rightarrow N(\mu, \sigma/\sqrt{n})$$

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$$\frac{\bar{X} - \mu}{s/\sqrt{n}} \rightarrow t_{n-1}$$

$$TS = (\hat{p} - p_0)\Big/ \sqrt{\frac{\hat{p}\hat{q}}{n}}$$

$$TS = (\bar{X} - \mu_0)\Big/ \frac{s}{\sqrt{n}}$$

$$TS = (\bar{X} - \mu_0)\Big/ \frac{\sigma}{\sqrt{n}}$$

$$TS = (\bar{X} - \mu_0)\Big/ \frac{s}{\sqrt{n}}$$

Critical Value(s)
Z_α: right-tailed test – Rejection Region (RR) on the right tail
$-Z_\alpha$: left-tailed test – Rejection Region (RR) on the left tail
$\pm Z_{\alpha/2}$: two-tailed test – Rejection Region (RR) on both tail

Critical Value(s)
$t_{n-1,\alpha}$: right-tailed test
$-t_{n-1,\alpha}$: left-tailed test
$\pm t_{n-1,\alpha/2}$: two-tailed test

Statistical Decision Rule: If TS is in the RR, we reject Ho; otherwise, fail to reject Ho