"Hypothesis testing"

Hypothesis ⟶ statement (question)

i) H_0 : ⟶ original hypothesis

H_A : ⟶ Alternative hypothesis

ii) Level of significance : $\alpha = 0.05$

iii) Test - Statistic :

formula to calculate

iv) Computation :

Substitute the values in test-statistics (formula).

v) Critical region :

↳ Rejection Region (a table value) (a probability value)

vi) Conclusion :

Accept H_0

or

Reject H_0

Type I error:

true null hypothesis is rejected.

Type II error:

false null hypothesis is accepted.

	Conditions of H_0	
	True	False
accept H_0	Correct	Type II error
Reject H_0	Type I error	correct

"Revision"

	$n < 30$	$n \geq 30$
σ known	$Z = \frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$	$Z = \frac{\bar{x}-\mu}{\sigma/\sqrt{n}}$
σ unknown = s	$t = \frac{\bar{x}-\mu}{s/\sqrt{n}}$	$Z = \frac{\bar{x}-\mu}{s/\sqrt{n}}$

P values: → Probability values

↳ how unusual sample results are, given that the null hypothesis is true.

probability of not confiden

↓

P value is the smallest value of α for which we can reject a null hypothesis.

Hypothesis Testing about a single population Mean (i.e; μ):

i) $H_0: \mu \leq \mu_0$ $\quad$ $H_0: \mu \geq \mu_0$ $\quad$ $H_0: \mu = \mu_0$

$H_A: \mu > \mu_0$ $\quad$ $H_A: \mu < \mu_0$ $\quad$ $H_A: \mu \neq \mu_0$

(a) $\quad$ (b) $\quad$ (c)

ii) Level of Significance: α =

iii) Test - Statistics:

$$Z = \frac{\bar{X} - \mu_0}{\sigma / \sqrt{n}}$$

or

$$Z = \frac{\bar{X} - \mu_0}{s / \sqrt{n}}$$

or

$$t = \frac{\bar{X} - \mu_0}{s / \sqrt{n}}$$

iv) Computations:

$n = ?$ $\quad \bar{X} = ?$ $\quad \mu_0 = ?$

$S = ?$ or $\sigma = ?$

v) Critical region:

Case a: $Z > Z_{1-\alpha}$

or

$t > t_{1-\alpha}$

Case b: $Z < -Z_{1-\alpha}$

or

$t < -t_{1-\alpha}$

Case c: $|Z| > Z_{1-\alpha/2}$

i.e; $Z < -Z_{1-\alpha/2}$ or $Z > Z_{1-\alpha/2}$

or

$|t| > t_{1-\alpha/2}$

i.e; $t < -t_{1-\alpha/2}$ or $t > t_{1-\alpha/2}$.