

Table for Context and Construction of the Null and Alternative Hypotheses for the Testing of a Mean

Note₁: We will use H_0 for the Null Hypothesis and H_1 for the Alternative Hypothesis.
Some textbooks use H_a for the Alternative Hypothesis.

Note₂: I am using 100 as an arbitrary value for μ_0 , please replace this with the correct value.

For textbooks which always use equality statements for the Null Hypothesis

$H_0 : \mu = 100$ $H_1 : \mu < 100$ Claim: $\mu < 100$ less than	$H_0 : \mu = 100$ $H_1 : \mu \neq 100$ Claim: $\mu \neq 100$ not equal differs	$H_0 : \mu = 100$ $H_1 : \mu > 100$ Claim: $\mu > 100$ greater than	Strong evidence Reject Null Hypothesis Supports the claim Weak evidence Do not reject Null Hypothesis Does not support the claim
$H_0 : \mu = 100$ $H_1 : \mu < 100$ Claim: $\mu \geq 100$ at least greater than or equal to	$H_0 : \mu = 100$ $H_1 : \mu \neq 100$ Claim: $\mu = 100$ equal same as does not differ	$H_0 : \mu = 100$ $H_1 : \mu > 100$ Claim: $\mu \leq 100$ at most less than or equal to	Strong evidence Reject Null Hypothesis Refutes the claim Weak evidence Do not reject Null Hypothesis Does not refute the claim
Left-tailed Test	Two-tailed Test	Right-tailed Test	

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For textbooks which always use the complement of the Alternative Hypothesis for the Null Hypothesis

$H_0 : \mu \geq 100$ $H_1 : \mu < 100$ Claim: $\mu < 100$ less than	$H_0 : \mu = 100$ $H_1 : \mu \neq 100$ Claim: $\mu \neq 100$ not equal differs	$H_0 : \mu \leq 100$ $H_1 : \mu > 100$ Claim: $\mu > 100$ greater than	Strong evidence Reject Null Hypothesis Supports the claim Weak evidence Do not reject Null Hypothesis Does not support the claim
$H_0 : \mu \geq 100$ $H_1 : \mu < 100$ Claim: $\mu \geq 100$ at least greater than or equal to	$H_0 : \mu = 100$ $H_1 : \mu \neq 100$ Claim: $\mu = 100$ equal same as does not differ	$H_0 : \mu \leq 100$ $H_1 : \mu > 100$ Claim: $\mu \leq 100$ at most less than or equal to	Strong evidence Reject Null Hypothesis Refutes the claim Weak evidence Do not reject Null Hypothesis Does not refute the claim
Left-tailed Test	Two-tailed Test	Right-tailed Test	