Student t-test (Small Sample)

Test	Null Hypothesis	Alternative Hypothesis	Test Statistic	Degrees of freedom
Single Mean	$H_0 : \mu = \mu_0$	$H_1 : \mu \neq \mu_0$ (two tailed) (or) $\mu > \mu_0$ (or) $\mu < \mu_0$ } one-tailed	SD given: $t_{cal} = \frac{\bar{x} - \mu}{(SD/\sqrt{n-1})}$ SD not given $t_{cal} = \frac{\bar{x} - \mu}{(s/\sqrt{n})}$ $\bar{x} = \frac{1}{n} \Sigma x_i$ $s^2 = \frac{1}{n-1} \Sigma (x_i - \bar{x})^2$	$\nu = n-1$
Difference of Means	$H_0 : \mu_1 = \mu_2$	$H_1 : \mu_1 \neq \mu_2$ (two tailed) or $\mu_1 > \mu_2$ or $\mu_1 < \mu_2$ } one-tailed	$t_{cal} = \frac{\bar{x}_1 - \bar{x}_2}{s\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$ $s^2 = \frac{\Sigma (x_1 - \bar{x}_1)^2 + \Sigma (x_2 - \bar{x}_2)^2}{n_1 + n_2 - 2}$ (or) $s^2 = \frac{1}{n_1 + n_2 - 2} (n_1 s_1^2 + n_2 s_2^2)$	$\nu = n_1 + n_2 - 2$

F - Test

Test	Null Hypothesis	Alternative Hypothesis	Test Statistic	Degrees of freedom
F - Test	$H_0 : \sigma_1^2 = \sigma_2^2$ (or) $H_0 : s_1^2 = s_2^2$	—	$F_{cal} = \frac{S_1^2}{S_2^2}$ (if $S_1^2 > S_2^2$) $F_{cal} = \frac{S_2^2}{S_1^2}$ (if $S_2^2 > S_1^2$) $S_1^2 = \frac{\Sigma (x - \bar{x})^2}{n_1 - 1}$ $S_2^2 = \frac{\Sigma (y - \bar{y})^2}{n_2 - 1}$	$\nu_1 = n_1 - 1$ $\nu_2 = n_2 - 1$
Result:		Calculated < tabulated → accept H_0 calculated > tabulated → Reject H_0		