STATISTICAL INFERENCE FOR MEANS AND PROPORTIONS

PARAMETER	$C\%$ CONFIDENCE INTERVAL ENDPOINTS	TEST STATISTIC H_0: Parameter = value	DISTRIBUTION OF TEST STATISTIC WHEN H_0 TRUE
μ (σ known)	$\overline{x} \pm z^* \frac{\sigma}{\sqrt{n}}$	$z = \frac{\overline{x} - \mu_0}{\sigma/\sqrt{n}}$	$N(0,1)$
μ (σ unknown)	$\overline{x} \pm t^* \frac{s}{\sqrt{n}}$	$t = \frac{\overline{x} - \mu_0}{s/\sqrt{n}}$	t with $n-1$ df
p	$\tilde{p} \pm z^* \sqrt{\frac{\tilde{p}(1-\tilde{p})}{n+4}}$ Wilson: Add two successes and two failures; get $\tilde{p}$.	$z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$	approx $N(0,1)$
$\mu_1 - \mu_2$ (σ_1, σ_2 known)	$(\overline{x}_1 - \overline{x}_2) \pm z^* \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$	$z = \frac{\overline{x}_1 - \overline{x}_2 - (\mu_1 - \mu_2)}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$	$N(0,1)$
$\mu_1 - \mu_2$ (σ_1, σ_2 unknown)	$(\overline{x}_1 - \overline{x}_2) \pm t^* \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$	$t = \frac{\overline{x}_1 - \overline{x}_2 - (\mu_1 - \mu_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$	approx t with df $= \frac{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}\right)^2}{\frac{1}{n_1-1}\left(\frac{s_1^2}{n_1}\right)^2 + \frac{1}{n_2-1}\left(\frac{s_2^2}{n_2}\right)^2}$
$\mu_1 - \mu_2$ ($\sigma_1 = \sigma_2$ unknown)	$(\overline{x}_1 - \overline{x}_2) \pm t^* \sqrt{s_p^2 \left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$ $s_p^2 = ((n_1-1)s_1^2 + (n_2-1)s_2^2)/(n_1+n_2-2)$	$t = \frac{\overline{x}_1 - \overline{x}_2 - (\mu_1 - \mu_2)}{\sqrt{s_p^2\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$	t distribution with df $= n_1 + n_2 - 2$
$p_1 - p_2$	$(\tilde{p}_1 - \tilde{p}_2) \pm z^* \sqrt{\frac{\tilde{p}_1(1-\tilde{p}_1)}{n_1+2} + \frac{\tilde{p}_2(1-\tilde{p}_2)}{n_2+2}}$ Wilson: Add one success and one failure in each sample.	$z = \frac{\hat{p}_1 - \hat{p}_2 - (0)}{\sqrt{\hat{p}(1-\hat{p})(\frac{1}{n_1} + \frac{1}{n_2})}}$ where $\hat{p} = \frac{x_1 + x_2}{n_1 + n_2}$	approx $N(0,1)$ if $H_0: p_1 = p_2$.