Universidad Nacional del Litoral

Facultad de Ingeniería y Ciencias Hídricas

Estadística

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:: Anexo ::

TABLAS DE INFERENCIA

Parámetro	Supuesto	Estimador	Distribución del estimador	Intervalo de confianza
μ	σ *conocido*	$\bar{x}$	$\bar{x} \sim N\left(\mu, \frac{\sigma}{\sqrt{n}}\right)$	$\left(\bar{x} \pm \lvert Z_{\left(1-\frac{\alpha}{2}\right)} \rvert \frac{\sigma}{\sqrt{n}}\right)$
μ	σ *desconocido*, $n > 30$	$\bar{x}$	$\bar{x} \sim N\left(\mu, \frac{S}{\sqrt{n}}\right)$	$\left(\bar{x} \pm \lvert Z_{\left(1-\frac{\alpha}{2}\right)} \rvert \frac{S}{\sqrt{n}}\right)$
μ	σ *desconocido*, $n < 30$	$\bar{x}$	$\frac{\bar{x}-\mu}{\frac{S'}{\sqrt{n}}} = t_{(n-1)}$	$\left(\bar{x} \pm \lvert t_{\left(1-\frac{\alpha}{2};n-1\right)} \rvert \frac{S'}{\sqrt{n}}\right)$
σ^2	Población normal	S^2	n>30 $\frac{n.S^2}{\sigma^2} = \chi^2_{(n-1)}$ ó $\frac{(n-1).S'^2}{\sigma^2} = \chi^2_{(n-1)}$ n<30	$\left(\frac{n.S^2}{\chi^2_{\left(1-\frac{\alpha}{2};n-1\right)}} \leq \sigma^2 \leq \frac{n.S^2}{\chi^2_{\left(\frac{\alpha}{2};n-1\right)}}\right)$
π	Población normal	p	$Z = \frac{p-\pi}{\sqrt{\frac{\pi(1-\pi)}{n}}}$	$\left(p \pm \lvert Z_{\left(1-\frac{\alpha}{2}\right)} \rvert \sqrt{\frac{\pi(1-\pi)}{n}}\right)$
$\mu_x - \mu_y$	σ_x, σ_y *conocidas*	$\bar{x}-\bar{y}$	$\bar{x}-\bar{y} \sim N\left(\mu_x - \mu_y, \sqrt{\frac{\sigma_x^2}{n_x}+\frac{\sigma_y^2}{n_y}}\right)$	$\left((\bar{x}-\bar{y}) \pm \lvert Z_{\left(1-\frac{\alpha}{2}\right)} \rvert \sqrt{\frac{\sigma_x^2}{n_x}+\frac{\sigma_y^2}{n_y}}\right)$
$\mu_x - \mu_y$	σ_x, σ_y *desconocidas* $n > 30$	$\bar{x}-\bar{y}$	$\bar{x}-\bar{y} \sim N\left(\mu_x - \mu_y, \sqrt{\frac{S_x^2}{n_x}+\frac{S_y^2}{n_y}}\right)$	$\left((\bar{x}-\bar{y}) \pm \lvert Z_{\left(1-\frac{\alpha}{2}\right)} \rvert \sqrt{\frac{S_x^2}{n_x}+\frac{S_y^2}{n_y}}\right)$

$\mu_x - \mu_y$	σ_x, σ_y *desconocidas* *pero iguales* $n < 30$	$\bar{x} - \bar{y}$	$\dfrac{\bar{x} - \bar{y} - (\mu_x - \mu_y)}{Sw \cdot \sqrt{\dfrac{1}{n_x} + \dfrac{1}{n_y}}} = t_{(n_x + n_y - 2)}$ $con \quad Sw = \sqrt{\dfrac{(n_x - 1) \cdot S'^2_x + (n_y - 1) \cdot S'^2_y}{n_x + n_y - 2}}$ $ó \quad con \quad Sw = \sqrt{\dfrac{n_x \cdot S_x^2 + n_y \cdot S_y^2}{n_x + n_y - 2}}$	$\left((\bar{x} - \bar{y}) \pm \lvert t_{\left(1 - \frac{\alpha}{2}\right)} \rvert \cdot S_w \cdot \sqrt{\dfrac{1}{n_x} + \dfrac{1}{n_y}} \right)$
$\mu_x - \mu_y$	σ_x, σ_y *desconocidas* *y distintas* $n < 30$	$\bar{x} - \bar{y}$	$\dfrac{\bar{x} - \bar{y} - (\mu_x - \mu_y)}{\sqrt{\dfrac{S'^2_x}{n_x} + \dfrac{S'^2_y}{n_y}}} = t_v$ $con \quad v = \dfrac{\left(\dfrac{S'^2_x}{n_x} + \dfrac{S'^2_y}{n_y} \right)^2}{\dfrac{\left(\dfrac{S'^2_x}{n_x} \right)^2}{n_x - 1} + \dfrac{\left(\dfrac{S'^2_y}{n_y} \right)^2}{n_y - 1}} - 2$	$\left((\bar{x} - \bar{y}) \pm \lvert t_{\left(1 - \frac{\alpha}{2}\right), \upsilon} \rvert \sqrt{\dfrac{S_x^2}{n_x} + \dfrac{S_y^2}{n_y}} \right)$
$\pi_1 - \pi_2$	*Poblaciones normales*	$p_1 - p_2$	$p_1 - p_2 \sim N \left(\pi_1 - \pi_1 ; \sqrt{\dfrac{\pi_1(1 - \pi_1)}{n_1} + \dfrac{\pi_2(1 - \pi_2)}{n_2}} \right)$	$\left(\Delta p \pm \lvert Z_{\left(1 - \frac{\alpha}{2}\right)} \rvert \ (I) \right)$ $(I) = \sqrt{\dfrac{\pi_1(1 - \pi_1)}{n_1} + \dfrac{\pi_2(1 - \pi_2)}{n_2}}$
$\dfrac{\sigma_x^2}{\sigma_y^2}$	*Poblaciones normales*	$\dfrac{s_x^2}{s_y^2}$	$F = \dfrac{\dfrac{S_x^2}{\sigma_x^2}}{\dfrac{S_y^2}{\sigma_y^2}}$	$\left(\dfrac{S_x^2}{S_y^2}(I) \le \dfrac{\sigma_x^2}{\sigma_y^2} \le \dfrac{S_x^2}{S_y^2}(II) \right)$ $(I) = \dfrac{1}{F_{\left(\frac{\alpha}{2}; n_x - 1; n_y - 1\right)}} \quad (II) = F_{\left(\frac{\alpha}{2}; n_y - 1; n_x - 1\right)}$

Parámetro	Supuesto	Estimador	Distribución del estimador	Intervalo de confianza
α	Población Normal	a	$a \sim N\left(\alpha, \sqrt{\sigma^2\left(\frac{1}{n}+\frac{\bar{x}^2}{\sum_{i=1}^{n}(x_i-\bar{x})^2}\right)}\right)$	$\left(a \pm \lvert Z_{\left(1-\frac{\alpha}{2}\right)} \rvert \sqrt{\sigma^2\left(\frac{1}{n}+\frac{\bar{x}^2}{\sum_{i=1}^{n}(x_i-\bar{x})}\right)}\right)$
β	Población Normal	b	$b \sim N\left(\beta, \sqrt{\frac{\sigma^2}{\sum_{i=1}^{n}(x_i-\bar{x})^2}}\right)$	$\left(b \pm \lvert Z_{\left(1-\frac{\alpha}{2}\right)} \rvert \sqrt{\frac{\sigma^2}{\sum_{i=1}^{n}(x_i-\bar{x})^2}}\right)$

Varianza de la Predicción	Varianza del Pronóstico
$\sigma^2\left(\hat{Y}_h\right)=\sigma^2\left(\frac{1}{n}+\frac{\left(X_h-\overline{X}\right)^2}{\sum_{i=1}^{n}\left(X_i-\overline{X}\right)^2}\right)$	$\sigma^2\left(Y_i-\hat{Y}_h\right)=\sigma^2\left(1+\frac{1}{n}+\frac{\left(X_h-\overline{X}\right)^2}{\sum_{i=1}^{n}\left(X_i-\overline{X}\right)^2}\right)$

Intervalo para la Predicción	**Intervalo para el Pronóstico**
$\left(\hat{Y}_h \pm t_{n-2;1-\frac{\alpha}{2}} \hat{\sigma}_{pred}\right)$ $\hat{\sigma}_{pred} = \hat{S}_{y/x} \sqrt{\frac{1}{n} + \frac{(x_h - \bar{x})^2}{\sum_i (x_i - \bar{x})^2}}$	$\left(\hat{Y}_h \pm t_{n-2;1\frac{\alpha}{2}} \hat{\sigma}_{pron}\right)$ $\hat{\sigma}_{pron} = \hat{S}_{y/x} \sqrt{1 + \frac{1}{n} + \frac{\left(X_h - \overline{X}\right)^2}{\sum_i \left(X_i - \overline{X}\right)^2}}$

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