Contrastes paramétricos (se asume una distribución Normal de los datos)

Parámetro	Varianza conocida	Estadístico de contraste	Contraste de hipótesis	Región de aceptación de H_0	p-valor
μ	Si	$Z_o = \frac{\overline{x} - \mu_o}{\sigma/\sqrt{n}}$	$H_0: \mu = \mu_o$ vs $H_A: \mu < \mu_o$	$(-z_\alpha, +\infty)$	$P\{Z \le Z_o\}$
			$H_0: \mu = \mu_o$ vs $H_A: \mu > \mu_o$	$(-\infty, z_\alpha)$	$P\{Z \ge Z_o\}$
			$H_0: \mu = \mu_o$ vs $H_A: \mu \ne \mu_o$	$(-z_{\alpha/2}, z_{\alpha/2})$	$P\{\lvert Z\rvert \ge \lvert Z_o\rvert\} = 2P\{Z \ge \lvert Z_o\rvert\}$
	No $n \ge 30$	$Z_o = \frac{\overline{x} - \mu_o}{s/\sqrt{n}}$	$H_0: \mu = \mu_o$ vs $H_A: \mu < \mu_o$	$(-z_\alpha, +\infty)$	$P\{Z \le Z_o\}$
			$H_0: \mu = \mu_o$ vs $H_A: \mu > \mu_o$	$(-\infty, z_\alpha)$	$P\{Z \ge Z_o\}$
			$H_0: \mu = \mu_o$ vs $H_A: \mu \ne \mu_o$	$(-z_{\alpha/2}, z_{\alpha/2})$	$P\{\lvert Z\rvert \ge \lvert Z_o\rvert\} = 2P\{Z \ge \lvert Z_o\rvert\}$
	No $n < 30$	$t_o = \frac{\overline{x} - \mu_o}{s/\sqrt{n}}$	$H_0: \mu = \mu_o$ vs $H_A: \mu < \mu_o$	$(-t_{\alpha,\text{ n-1}}, +\infty)$	$P\{t \le t_o\}$
			$H_0: \mu = \mu_o$ vs $H_A: \mu > \mu_o$	$(-\infty, t_{\alpha,\text{ n-1}})$	$P\{t \ge t_o\}$
			$H_0: \mu = \mu_o$ vs $H_A: \mu \ne \mu_o$	$(-t_{\alpha/2,\text{ n-1}}, t_{\alpha/2,\text{ n-1}})$	$P\{\lvert t\rvert \ge \lvert t_o\rvert\} = 2P\{t \ge \lvert t_o\rvert\}$
p	-	$Z_o = \frac{\widehat{p} - p_o}{\sqrt{\frac{p_o(1-p_o)}{n}}}$	$H_0: p = p_o$ vs $H_A: p < p_o$	$(-z_\alpha, +\infty)$	$P\{Z \le Z_o\}$
			$H_0: p = p_o$ vs $H_A: p > p_o$	$(-\infty, z_\alpha)$	$P\{Z \ge Z_o\}$
			$H_0: p = p_o$ vs $H_A: p \ne p_o$	$(-z_{\alpha/2}, z_{\alpha/2})$	$P\{\lvert Z\rvert \ge \lvert Z_o\rvert\} = 2P\{Z \ge \lvert Z_o\rvert\}$

Siendo:

$z_{\frac{\alpha}{2}} = cuantil\left(1 - \frac{\alpha}{2}\right)$ de Z:N(0,1) $\rightarrow P\left\{Z \le z_{\frac{\alpha}{2}}\right\} = 1 - \frac{\alpha}{2}$ (Tabla A4)

$z_\alpha = cuantil(1-\alpha)$ de Z:N(0,1) $\rightarrow P\{Z \le z_\alpha\} = 1 - \alpha$ (Tabla A4)

$t_{\frac{\alpha}{2},n-1} = cuantil\left(1 - \frac{\alpha}{2}\right)$ de T: Student(n-1) $\rightarrow P\left\{T \le t_{\frac{\alpha}{2},n-1}\right\} = 1 - \frac{\alpha}{2} \rightarrow P\left\{T > t_{\frac{\alpha}{2},n-1}\right\} = \frac{\alpha}{2}$ (Tabla A5)

$t_{\alpha,n-1} = cuantil(1-\alpha)$ de T: Student(n-1) $\rightarrow P\{T \le t_{\alpha,n-1}\} = 1 - \alpha \rightarrow P\{T > t_{\alpha,n-1}\} = \alpha$ (Tabla A5)

$s^2 = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2$

Contrastes paramétricos (se asume una distribución Normal de los datos)

Diferencia de parámetros	Varianzas conocidas	Estadístico de contraste	Contraste de hipótesis	Región de aceptación de H_0	p-valor
$\mu_X - \mu_Y$ Muestras independientes	Si	$Z_o = \dfrac{\bar{x} - \bar{y} - D}{\sqrt{\frac{\sigma_X^2}{n} + \frac{\sigma_Y^2}{m}}}$	$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y < D$	$(-z_\alpha, +\infty)$	$P\{Z \leq Z_o\}$
			$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y > D$	$(-\infty, z_\alpha)$	$P\{Z \geq Z_o\}$
			$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y \neq D$	$(-z_{\alpha/2}, z_{\alpha/2})$	$P\{\lvert Z\rvert \geq \lvert Z_o\rvert\} = 2P\{Z \geq \lvert Z_o\rvert\}$
	No $n, m \geq 30$ $\sigma_X \neq \sigma_Y$	$Z_o = \dfrac{\bar{x} - \bar{y} - D}{\sqrt{\frac{s_X^2}{n} + \frac{s_Y^2}{m}}}$	$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y < D$	$(-z_\alpha, +\infty)$	$P\{Z \leq Z_o\}$
			$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y > D$	$(-\infty, z_\alpha)$	$P\{Z \geq Z_o\}$
			$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y \neq D$	$(-z_{\alpha/2}, z_{\alpha/2})$	$P\{\lvert Z\rvert \geq \lvert Z_o\rvert\} = 2P\{Z \geq \lvert Z_o\rvert\}$
	No $n, m \geq 30$ $\sigma_X = \sigma_Y$	$Z_o = \dfrac{\bar{x} - \bar{y} - D}{s_p\sqrt{\frac{1}{n} + \frac{1}{m}}}$	$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y < D$	$(-z_\alpha, +\infty)$	$P\{Z \leq Z_o\}$
			$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y > D$	$(-\infty, z_\alpha)$	$P\{Z \geq Z_o\}$
			$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y \neq D$	$(-z_{\alpha/2}, z_{\alpha/2})$	$P\{\lvert Z\rvert \geq \lvert Z_o\rvert\} = 2P\{Z \geq \lvert Z_o\rvert\}$
	No $n, m < 30$ $\sigma_X \neq \sigma_Y$	$t_o = \dfrac{\bar{x} - \bar{y} - D}{\sqrt{\frac{s_X^2}{n} + \frac{s_Y^2}{m}}}$	$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y < D$	$(-t_{\alpha,\nu}, +\infty)$	$P\{t \leq t_o\}$
			$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y > D$	$(-\infty, t_{\alpha,\nu})$	$P\{t \geq t_o\}$
			$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y \neq D$	$(-t_{\alpha/2,\nu}, t_{\alpha/2,\nu})$	$P\{\lvert t\rvert \geq \lvert t_o\rvert\} = 2P\{t \geq \lvert t_o\rvert\}$
	No $n, m < 30$ $\sigma_X = \sigma_Y$	$t_o = \dfrac{\bar{x} - \bar{y} - D}{s_p\sqrt{\frac{1}{n} + \frac{1}{m}}}$	$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y < D$	$(-t_{\alpha,\,n+m-2}, +\infty)$	$P\{t \leq t_o\}$
			$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y > D$	$(-\infty, t_{\alpha,\,n+m-2})$	$P\{t \geq t_o\}$
			$H_0: \mu_X - \mu_Y = D$ vs $H_A: \mu_X - \mu_Y \neq D$	$(-t_{\alpha/2,\,n+m-2}, t_{\alpha/2,\,n+m-2})$	$P\{\lvert t\rvert \geq \lvert t_o\rvert\} = 2P\{t \geq \lvert t_o\rvert\}$
$\mu_{(X-Y)}$ Muestras pareadas	No $n \geq 30$	$Z_o = \dfrac{\overline{(X-Y)} - D}{s_{(X-Y)}/\sqrt{n}}$	$H_0: \mu_{(X-Y)} = D$ vs $H_A: \mu_{(X-Y)} < D$	$(-z_\alpha, +\infty)$	$P\{Z \leq Z_o\}$
			$H_0: \mu_{(X-Y)} = D$ vs $H_A: \mu_{(X-Y)} > D$	$(-\infty, z_\alpha)$	$P\{Z \geq Z_o\}$
			$H_0: \mu_{(X-Y)} = D$ vs $H_A: \mu_{(X-Y)} \neq D$	$(-z_{\alpha/2}, z_{\alpha/2})$	$P\{\lvert Z\rvert \geq \lvert Z_o\rvert\} = 2P\{Z \geq \lvert Z_o\rvert\}$
	No $n < 30$	$t_o = \dfrac{\overline{(X-Y)} - D}{s_{(X-Y)}/\sqrt{n}}$	$H_0: \mu_{(X-Y)} = D$ vs $H_A: \mu_{(X-Y)} < D$	$(-t_{\alpha,\,n-1}, +\infty)$	$P\{t \leq t_o\}$
			$H_0: \mu_{(X-Y)} = D$ vs $H_A: \mu_{(X-Y)} > D$	$(-\infty, t_{\alpha,\,n-1})$	$P\{t \geq t_o\}$
			$H_0: \mu_{(X-Y)} = D$ vs $H_A: \mu_{(X-Y)} \neq D$	$(-t_{\alpha/2,\,n-1}, t_{\alpha/2,\,n-1})$	$P\{\lvert t\rvert \geq \lvert t_o\rvert\} = 2P\{t \geq \lvert t_o\rvert\}$
$p_1 - p_2$ Muestras independientes	-	$Z_o = \dfrac{\hat{p}_1 - \hat{p}_2 - D}{\sqrt{\frac{\hat{p}_1(1-\hat{p}_1)}{n} + \frac{\hat{p}_2(1-\hat{p}_2)}{m}}}$	$H_0: p_1 - p_2 = D$ vs $H_A: p_1 - p_2 < D$	$(-z_\alpha, +\infty)$	$P\{Z \leq Z_o\}$
			$H_0: p_1 - p_2 = D$ vs $H_A: p_1 - p_2 > D$	$(-\infty, z_\alpha)$	$P\{Z \geq Z_o\}$
			$H_0: p_1 - p_2 = D$ vs $H_A: p_1 - p_2 \neq D$	$(-z_{\alpha/2}, z_{\alpha/2})$	$P\{\lvert Z\rvert \geq \lvert Z_o\rvert\} = 2P\{Z \geq \lvert Z_o\rvert\}$

Siendo: $s_p = \sqrt{\frac{(n-1)s_X^2 + (m-1)s_Y^2}{n+m-2}}$ $\qquad \nu = \dfrac{\left(\frac{s_X^2}{n} + \frac{s_Y^2}{m}\right)^2}{\frac{s_X^4}{n^2(n-1)} + \frac{s_Y^4}{m^2(m-1)}}$ $\qquad s_X^2 = \frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2$ $\qquad s_Y^2 = \frac{1}{m-1}\sum_{i=1}^{m}(y_i - \bar{y})^2$