Polla de Bioestadística II

Media

$$\mu = \frac{1}{N}\sum_{1}^{N} x_i$$

Varianza poblacional

$$\sigma^2 = \frac{\sum(x_i - \mu)^2}{N}$$

Varianza muestreal

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

Probabilidad

$$P(E) = \frac{n}{N}$$

Tipificar x a Z

$$Z = \frac{x - \mu}{\sigma}$$

Distribución derivada

$\mu x = \mu$ $\sigma^2 x = \sigma^2/n$

Error media Muestreo totalmente aleatorio

$$E = Z_{(\frac{\alpha}{2})} \cdot \frac{\sigma}{\sqrt{n}}$$

Error Varianza Muestreo totalmente aleatorio

$$\frac{(n-1)s^2}{\chi^2_{(\alpha/2)}} < \sigma^2 < \frac{(n-1)s^2}{\chi^2_{(1-\alpha/2)}}$$

Error proporciones muestro totalmente aleatorio

$$Z_{\alpha/2}\sqrt{\frac{\frac{x}{n}(1-\frac{x}{n})}{n-1}\left(\frac{N-n}{N}\right)}$$

Tamaño muestra estimación media muestreo totalmente aleatorio

$$n = [\frac{Z_{(\frac{\alpha}{2})}\sigma}{\Delta}]^2$$

Tamaño muestra estimación proporción muestreo totalmente aleatorio

$$n = \frac{N(p)(1-p)}{(N-1)\Delta - p(1-p)}$$

Pruebas Hipótesis

Una media con varianza conocida

$$Z = \frac{\bar{x} - \mu}{\sigma/\sqrt{n}}$$

$H0 = \mu_0 = \mu$
$H1 = \mu_0 \neq \mu$ $W = |Z| \geq Z_{(\alpha/2)}$

$H0 = \mu_0 = \mu$
$H1 = \mu_0 < \mu$ $W = \{Z \leq -Z_{(a)}\}$

$H0 = \mu_0 = \mu$
$H1 = \mu_0 > \mu$ $W = \{Z \geq Z_{(a)}\}$

Una media con varianza desconocida

$$t = \frac{\bar{x} - \mu}{s/\sqrt{n}} \qquad \nu = n-1$$

$H0 = m0 = \mu$
$H1 = m0 \neq \mu$ $W = |t| \geq t_{(a/2)}$

$H0 = \mu_0 = \mu$
$H1 = \mu_0 < \mu$ $W = \{t < -t_{(\alpha)}\}$

$Ho = \mu_0 = \mu$
$H1 = \mu_0 > \mu$ $W = \{t \geq t_\alpha\}$

Una varianza.-

$$\chi^2 = \frac{(n-1)s^2}{\sigma^2} \qquad \nu = n-1$$

$Ho = \sigma^2_0 = \sigma^2$
$H1 = \sigma^2_0 \neq \sigma^2$ $W = \chi^2_{(\alpha/2)} \leq \chi^2 \leq \chi^2_{(1-\alpha/2)}$

$Ho = \sigma^2_0 = \sigma^2$
$H1 = \sigma^2_0 < \sigma^2$ $W = \{\chi^2 \geq \chi^2_{(1-\alpha)}\}$

$Ho = \sigma^2_0 = \sigma^2$
$H1 = \sigma^2_0 > \sigma^2$ $W = \{\chi^2 \leq \chi^2_\alpha\}$

Una proporción.-

$$Z = \frac{p_o - p}{\sqrt{\frac{pq}{n}}}$$

$Ho: p_0 = p$
$H1: p_0 \neq p$
$W = |Z| > Z_{(\alpha/2)}$

$Ho = p_0 = p$
$H1 = p_0 < p$ $W = \{Z < -Z_{(\alpha)}\}$

$Ho = p_0 = p$
$H1 = p_0 > p$ $W = \{Z > Z_{(\alpha)}\}$

Dos Varianzas.-

$$F = \frac{s^2_1}{s^2_2} \qquad \nu_1 = n_1 - 1 \text{ y } \nu_2 = n_2 - 1$$

$Ho = \sigma^2_1 = \sigma^2_2$
$H1 = \sigma^2_1 \neq \sigma^2_2$ $W = F > F_{(\alpha/2)}$

$Ho = \sigma^2{}_1 = \sigma^2{}_2$

$H1 = \sigma^2{}_1 > \sigma^2{}_2$ $\quad W = \{F \geq F_{(\alpha)}\}$

Medias, varianzas conocidas.-

$$Z = \frac{(\bar{x}_1 - \bar{x}_2)}{\sqrt{\frac{\sigma^2{}_1}{n_1} + \frac{\sigma^2{}_2}{n_2}}}$$

$Ho = \mu_1 = \mu_2$

$H1 = \mu_1 \neq \mu_2$ $\quad W= \left| Z \right| \geq Z_{(\alpha/2)}$

$Ho = \mu_1 = \mu_2$

$H1 = \mu_1 > \mu_2$ $\quad W = \{Z \; \alpha \; Z_{(\alpha)}\}$

Medias, Varianzas desconocidas e iguales.-

$$t = \frac{\bar{x}1 - \bar{x}2}{\sqrt{\frac{(n_1-1)s^2{}_1 + (n_2-1)s^2{}_2}{n_1+n_2-2} x (\frac{1}{n_1} + \frac{1}{n_2})}} \qquad \nu = n-1$$

$Ho = \mu_1 = \mu_2$

$H1 = \mu_1 \neq \mu_2$ $\quad W= \left| t \right| \geq t_{(\alpha/2)}$

$Ho = \mu_1 = \mu_2$

$H1 = \mu_1 > \mu_2$ $\quad W = \{t \geq t_{(\alpha)}\}$

Dos proporciones independientes.-

$$Z = \frac{p_1 - p_2}{\sqrt{pq(\frac{1}{n_1} + \frac{1}{n_2})}}$$

$Ho = p1 = p2$

$H1 = p1 \neq p2$ $\quad W= \left| Z \right| \geq Z_{(\alpha/2)}$

$Ho = p1 = p2$

$H1 = p1 > p2$ $\quad W = \{Z \geq Z_{(\alpha)}\}$

Tablas de contingencia

$np_{ij} = \frac{n_{i.} \, x \, n_{.j}}{N}$ o determinar probailidad para el rango

$$\chi^2 = \sum_{i=1}^{s} \sum_{j=1}^{r} \frac{(n_{ij} - np_{ij})^2}{np_{ij}} \qquad \nu = (r-1)(s-1)$$

$W = \{\chi^2 > \chi^2{}_{(\alpha)}\}$