

UNIVERSIDAD NACIONAL DE LA PLATA
Facultad de Ciencias Agrarias y Forestales



CÁLCULO ESTADÍSTICO Y BIOMETRÍA
Curso 2025

GUÍA DE TRABAJOS PRÁCTICOS

DOCENTES

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Fórmulas para la realización de los ejercicios prácticos

$$\bar{X} = \frac{\sum x_i}{n}$$

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

$$S = \sqrt{S^2}$$

$$S_{\bar{x}} = \frac{S}{\sqrt{n}}$$

$$CV = \frac{S}{\bar{X}} \cdot 100$$

$$P(C/D) = \frac{P(C \cap D)}{P(D)}$$

$$E(X) = \sum_{i=1}^N x_i \cdot p_i = \mu$$

$$V(X) = E[X - E(X)]^2$$

$$P(X=x) = C_n^x \cdot p^x \cdot q^{n-x}$$

$$P(X=x) = \frac{e^{-\lambda} \cdot \lambda^x}{x!}$$

$$Z = \frac{(X - \mu)}{\sigma}$$

$$P\left(\bar{X} - Z_0 \frac{\sigma}{\sqrt{n}} < \mu < \bar{X} + Z_0 \frac{\sigma}{\sqrt{n}}\right) = \gamma$$

$$\text{COV}(X,Y) = \sigma_{xy} = \frac{\sum (x_i - \mu_x) \cdot (y_i - \mu_y)}{n}$$

$$S_{xy} = \frac{\sum (x_i - \bar{x}) \cdot (y_i - \bar{y})}{n-1}$$

$$P(A) = \frac{n_A}{N}$$

$$t = \frac{\bar{X} - \mu}{S_{\bar{x}}}$$

$$t = \frac{\bar{X}_A - \bar{X}_B}{S_{\bar{X}_A - \bar{X}_B}}$$

$$S_{\bar{X}_A - \bar{X}_B} = \sqrt{\frac{S_A^2}{n_A} + \frac{S_B^2}{n_B}}$$

$$(\bar{X} - t S_{\bar{x}} \leq \mu \leq \bar{X} + t S_{\bar{x}})$$

$$C_r^n = \binom{n}{r} = \frac{n!}{r! \times (n-r)!}$$

$$P\left[\frac{(n-1) \cdot S^2}{\chi^2_{(\alpha/2)}} \leq \sigma^2 \leq \frac{(n-1) \cdot S^2}{\chi^2_{(1-\alpha/2)}}\right] = \gamma$$

$$\hat{Y}_i = a + b X_i + e_i$$

$$a = \frac{\sum_{i=1}^n Y_i - b \sum_{i=1}^n X_i}{n} = \bar{Y} - b \bar{X}$$

$$b_{y/x} = \frac{\sum_{i=1}^n \delta_x \delta_y}{\sum_{i=1}^n \delta_x^2} = \frac{\sum_{i=1}^n [(X - \bar{X}) \cdot (Y - \bar{Y})]}{\sum_{i=1}^n (X - \bar{X})^2} = \frac{Cov(X, Y)}{S_x^2}$$

$$R^2 = \frac{\sum (\hat{Y}_i - \bar{Y})^2}{\sum (Y_i - \bar{Y})^2} = \frac{SCE_{Exp.}}{SCT}$$

$$r = \frac{\sum_{i=1}^n \delta_x \delta_y}{\sqrt{\delta_x^2 \delta_y^2}} = \frac{\sum_{i=1}^n x_i y_i - \frac{\sum_{i=1}^n x_i \sum_{i=1}^n y_i}{n}}{\sqrt{\left[\sum_{i=1}^n x_i^2 - \frac{\left(\sum_{i=1}^n x_i \right)^2}{n} \right] \cdot \left[\sum_{i=1}^n y_i^2 - \frac{\left(\sum_{i=1}^n y_i \right)^2}{n} \right]}}$$

$$SCT = \sum_{i,j} Y_{ij}^2 - C = \sum_{i,j} Y_{ij}^2 - \frac{\left(\sum_{i,j} Y_{ij} \right)^2}{N}$$

$$SCE = \frac{Y_1^2 + \dots + Y_t^2}{r} - C$$

$$SCD = SCT - SCE$$

$$SCB = \frac{B_1^2 + \dots + B_r^2}{t} - C$$

$$C = \frac{\left(\sum_{i,j} Y_{ij} \right)^2}{N}$$

$$\Delta_{\%} = q_{\%} \cdot \frac{S}{\sqrt{r}}$$