UNIVERSIDAD NACIONAL DE LA PLATA

Facultad de Ciencias Agrarias y Forestales

CÁLCULO ESTADÍSTICO Y BIOMETRÍA

Curso 2020

FORMULAS PARA T.P.

DOCENTES

Profesora Titular: Ing. Agr. María Inés Urrutia

Profesor Adjunto: Ing. Agr. Martín E. Delucis

Jefe de Trabajos Prácticos: Lic. Pablo Rodrigo Altamirano
Lic. Humberto Chaves Segarra

Ayudantes Diplomados: Dra. Noelia Ferrando
Dr. Adrian Jauregui
Mgr. Laura Maly
Dra. Marina Pifano

Fórmulas para la realización de los ejercicios prácticos

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

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

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

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

$$CV = \frac{S}{\overline{X}} \bullet 100$$

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

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

$$V(X) = E\left[x - E(X)\right]^2$$

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

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

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

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

$$t = \frac{\overline{X} - \mu}{s_{\overline{x}}}$$

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

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

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

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

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

$$\left(\overline{X} - t\, S_{\overline{x}} \le \mu \le \overline{X} + t\, S_{\overline{x}}\right)$$

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

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

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

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

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

$$R^2 = \frac{\sum(\hat{Y}_i - \overline{Y})^2}{\sum(Y_i - \overline{Y})^2} = \frac{SCExp.}{SCT}$$

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

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

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

$$SCD = SCT - SCE$$

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

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

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