Clases 2da semana

lunes, 22 de mayo de 2023 07:18 p. m.

$Pob = \{U_1, U_2, \dots, U_N\}$ Muestra $= \{u_1, u_2, \dots, u_n\}$

muestra $\subseteq$ Población

Caracterist. interés $\{X_1, X_2, \dots, X_N\}$, $\{Y_1, \dots\}$, $\{Z_1, \dots, Z_N\}$ $\to U_i$

M.A.S. definir 2 maneras

1. Probabilidad elemento U_i sea seleccionado $1/N$ cualquiera extracciones n

$1/N$ $\quad$ $1/(N-1)$

$Pr(U_i \text{ en la 1ra extrac}) = \frac{1}{N}$

$P(1ra \cap 2da) \leftarrow Pr(U_i \text{ en 2da extrac}) =$

$$\sum_{j \neq i}^{N} P(U_i \text{ en 2da} \mid U_j \text{ en 1ra})\, P(U_j \text{ en 1ra})$$

$$P(A \mid B) = \frac{\overbrace{P(A \cap B)}}{P(B)}$$

$$P(A \cap B) = P(A \mid B)\, P(B)$$

$$= \frac{1}{\cancel{N-1}} \cdot \frac{\cancel{N-1}}{N} = \frac{1}{N}$$

Pr 1 elemento U_j esté incluido en muestra es n/N

$S = \{S_1, S_2, S_3, \dots, S_q\}$

u_1
u_2
$\vdots$
u_n

$$P(S_i) = \frac{1}{\binom{N}{n}}$$

$$P(u_i \in S_i) = P(U_i \text{ en 1ra} \cup U_i \text{ en 2da} \cup \dots U_i \text{ en } n\text{-ésima})$$

$$\frac{1}{N} + \frac{1}{N} + \frac{1}{N} + \dots + \frac{1}{N}$$

$$= \frac{n}{N}$$

$$\pi_i = P(u_i \in S_i) = \frac{1 \binom{N-1}{n-1}}{\binom{N}{n}} = \dots = \frac{\frac{(\cancel{N-1})!}{(\cancel{n-1})!}}{\frac{N(\cancel{N-1})!}{n(\cancel{n-1})!}} = \frac{n}{N}$$

$$f_{exp} = \pi^{-1} = \frac{N}{n}$$

Caso de la proporción

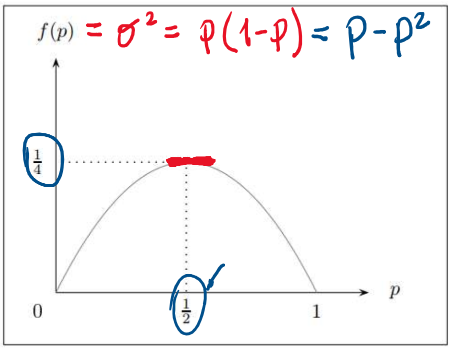
$$\frac{\partial f(p)}{\partial p} = 0$$

$$1 - 2p = 0$$

$$p = \frac{1}{2}$$

$$p = 0.5$$

$f(p) = \sigma^2 = p(1-p) = p - p^2$



$$n = \frac{pq\, z^2_{1-\alpha/2}}{\delta^2}$$

$$n = \frac{z^2_{1-\alpha/2}}{4\delta^2}$$

$$n = \frac{\cancel{2}^2}{\cancel{4}\delta^2} = \frac{1}{\delta^2}$$

$$n = \delta^{-2}$$

$\delta = 0.05$ $\quad n = 400 \cong 385$

N es grande $\rightarrow f \geq 0.05$

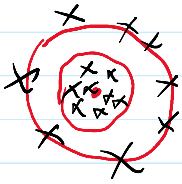
Ej: $N = 1000$ estimar proporción $\delta = 5\%$

$1-\alpha = 0.95$ $\quad n = ?$

$$n_0 = \frac{1}{\delta^2} = 400 \qquad f = \frac{n_0}{N} = \frac{400}{1000} = 0.4 \geq 0.05$$

$$n = \frac{400}{1 + \frac{400}{1000}} = \frac{400}{1.4} = 286$$

ciudad x área x ES $\rightarrow$



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C_j

$$n \frac{H_h S_h}{\sum H_h S_h}$$