Clases 1ra semana

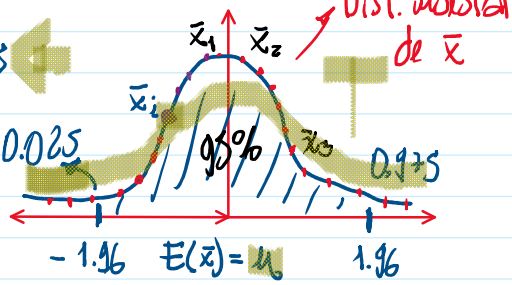
lunes, 15 de mayo de 2023 07:47 p. m.

Sin reposición $C_n^N = \binom{N}{n} = \frac{N!}{(N-n)!\,n!}$

Con reposición N^n

Parámetros θ { μ, σ^2 } — N — muestreo → n — Estimadores $\hat{\theta}$ { $\bar{x}$, s^2 }

Dist. muestral de $\bar{x}$



V.A. X $\hat{\beta}$

$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$ Estim. Puntual

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

$\bar{x} - z_{\alpha/2}\,SE \le \mu \le \bar{x} + z_{\alpha/2}\,SE$

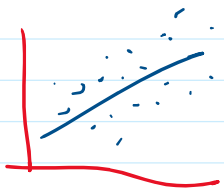
$\hat{\theta} - z_{\alpha/2}\,SE \le \theta \le \hat{\theta} + z_{\alpha/2}\,SE$

E. x int. MAS: $\sqrt{\frac{\Delta}{n}} = SE$

Pruebas de hipótesis *

$H_0: \beta_i = 0$

$H_a: \beta_i \neq 0$

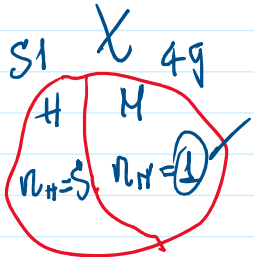


$H_0: \mu = \mu_0$

$H_a: \mu \neq \mu_0$

$t_{\alpha/2,\,n-1} = \frac{\bar{x} - \mu_0}{SE}$ $\sqrt{\frac{\Delta}{n}}$

Población → Conjunto finito { tiempo, espacio } Vida diaria



$\sigma^2 = 0$

$\sigma_H^2 > 0$

$f_{exp_H} = \frac{S1}{5} \cong 10.2$

$f_{exp_A} = 49$

n_i	fexp
u	49
u	10.2
u	10.2
u	⋮
u	⋮
u	10.2
N	100

$N = 3$ 1 2 3

$n = 2$

$\binom{3}{2} = \frac{3!}{(3-2)!\,2!} = \frac{3 \times 2!}{2!} = 3$

			$\bar{x}$	π_i
n_1	1	2	1.5	1/3
n_2	1	3	2	1/3
n_3	2	3	2.5	1/3

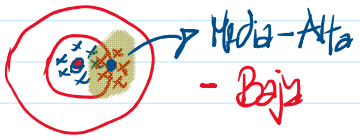
$\mu = 2$

$E(\bar{x}) = 1.5(1/3) + 2(1/3) + 2.5(1/3)$

insesgado $\bar{x}$

insesgado $E(\bar{x}) = 1.5(1/3) + 2(1/3) + 2.5(1/3)$

$\bar{x}$ → θ $E(\bar{x}) = 2$

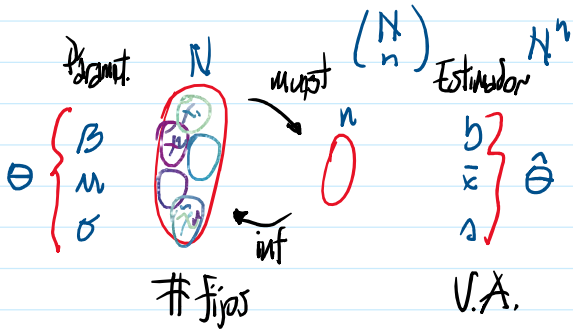


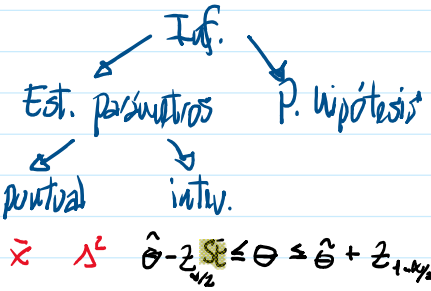
$Eff = \frac{V(\hat{\theta}_{comp})}{V(\hat{\theta}_{MAS})} \geq 1$

$\cong 2$

Dominios no planificados

$CV(\hat{\theta}) \leq x\%$; $n \geq 200$





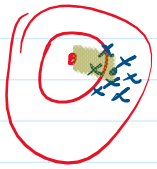
Dist. en el muestreo

Media dist. estimador $\hat{\theta}$ $\quad E(\hat{\theta}) = \sum_{i=1}^{N} \hat{\theta}_i \pi_i$

$V(\hat{\theta}) = (\hat{\theta}_i - E(\hat{\theta}))^2 \pi_i$ $\quad EE(\hat{\theta}) = \sqrt{V(\hat{\theta})}$

$CV = \frac{EE(\hat{\theta})}{E(\hat{\theta})}$

Prop. Estimadores



→ Insesgadez

$B(\hat{\theta}) = E(\hat{\theta}) - \theta$

$0 = E(\hat{\theta}) - \theta$

$E(\hat{\theta}) = \theta$ $\quad$ y $\quad E(\bar{x}) = \mu$

$\sigma^2 = \frac{1}{N} \sum (x_i - \bar{x})^2$ $\quad 1, 2, 3$

* $s^2 = \frac{1}{n-1} \sum_{i=1}^{n} (x_i - \bar{x})^2$ $\quad N^n$ $\quad s^2 = 9$

$n-1$

n_i	$\bar{x}_i$	$\sum(x_i - \bar{x})^2/(n-1) = s_i^2$
1,1	1	$(1-1)^2 + (1-1)^2 = 0$
1,2	1.5	$(1-1.5)^2 + (2-1.5)^2 = 0.5$
1,3	2	$= 2$
2,1	1.5	$= 0.5$
2,2	2	$= 0$
2,3	2.5	$= 0.5$
3,1	2	$= 2$
3,2	2.5	$= 0.5$
3,3	3	$= 0$

$E(s^2) = E(\hat{\sigma}^2) = \sigma^2$

$\sigma^2 = \frac{1}{3}[(1-2)^2 + (2-2)^2 + (3-2)^2]$

Poblacional $\sigma^2 = \frac{2}{3}$

Muestral $E(s^2) = \frac{6}{9} = \frac{2}{3}$

Esperanza promedio estimaciones

$\bar{x}_i$	π_i
1	1/9
1.5	2/9
2	3/9

$\mu = 2$

$E(\bar{x}) = 2$

$V(\hat{\theta}) = (\hat{\theta}_i - E(\hat{\theta}))^2 \pi_i$

$\sigma^2 \quad \frac{2}{3}$

1	1/9
1.5	2/9
2	3/9
2.5	2/9
3	1/9

$E(\bar{x}) = 2$

$V(\hat{\theta}) = (\hat{\theta}_i - E(\hat{\theta}))^2 \pi_i$

$V(\bar{X}) = \frac{\sigma^2}{n}$ $\quad \frac{2}{3} = \frac{1}{3}$

Ninguna	Primaria	Secundaria	Superior
1	0	0	0
0	1	0	0
0	0	1	0
0	0	0	1

A	3
M	2
B	1

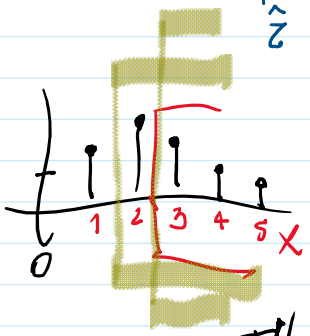
$\hat{f}$ $\bar{x}$ s^2 $\hat{p}$ $\hat{\beta}$ $\hat{z}$

factor( )

100
200

$P(X \geq 3) = 1 - F(X \leq 2)$

$= 1 - \sum_{i=0}^{2} f(x)$



$F(X > 2)$

$= 1 - [f(0) + f(1) + f(2)]$

$= 1 - \left[\binom{25}{0} 0.05^0 (1-0.05)^{25} + \binom{25}{1} 0.05^1 0.95^{24} + \binom{25}{2} 0.05^2 0.95^{23} \right]$

$X \sim Poisson(5)$

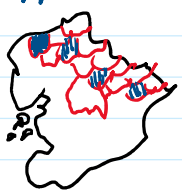
$P(X = 8) =$

$P(X \leq 4) = \sum_{x=0}^{4} f(x) =$

Marcos de muestreo

M. Lista *

M. Áreas



M. Múltiples

- M. Lista
- M. Áreas