Clases 1ra semana

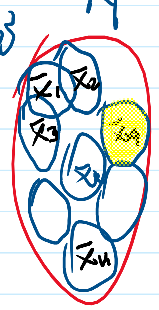
lunes, 15 de mayo de 2023 07:47 p. m.

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

Con reposición: N^n

Parámetros: $\theta \begin{cases} \mu \\ \sigma^2 \end{cases}$

N



muestreo

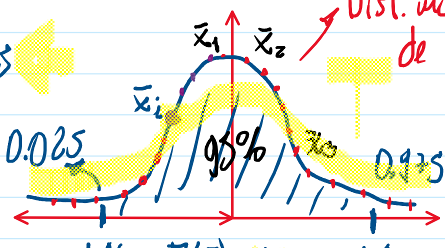
inf.

n

$\#$

Estimadores: n $\left.\begin{matrix} \boxed{\bar{x}} \\ s^2 \end{matrix}\right\} \hat{\theta}$

Dist. muestral de $\bar{x}$



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

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

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

$$\bar{x} - z_{1-\alpha/2} SE \le \mu \le \bar{x} + z_{\alpha/2} SE$$

$$\hat{\theta} - z_{1-\alpha/2} SE \le \theta \le \hat{\theta} + z_{\alpha/2} SE$$

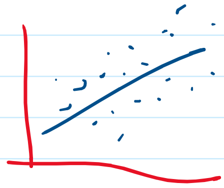
E. x int.

MAS: $\sqrt{\frac{s}{n}} = SE$

Pruebas de hipótesis *

$H_0: \beta_i = 0$

$H_a: \beta_i \neq 0$



$H_0: \mu = \mu_0$

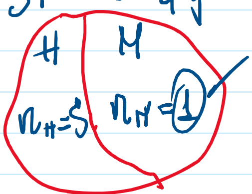
$H_a: \mu \neq \mu_0$

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

$\sqrt{\frac{s}{n}}$

Población → Conjunto finito $\begin{cases} \text{tiempo} \\ \text{espacio} \end{cases}$ Vida diaria

51 X 49



$\sigma^2 = 0$

$\sigma_H^2 > 0$

$f_{exp_H} = \frac{51}{5} \cong 10.2$

$f_{exp_M} = 49$

n_i	f_{exp}
m	49
h	10.2
h	10.2
h	⋮
h	
h	10.2
N	100

$N = 3$

$n = 2$

1 2 3

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

			$\bar{x}$	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

$\mu = 2$

insesgado $\bar{x}$

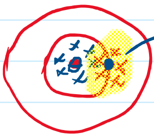
$E(\bar{x}) = 1.5(1/3) + 2(1/3) + 2.5(1/3)$

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

insesgado $\bar{x}$

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

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



Media-Alta
- Baja

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

$\cong 2$

Dominios no planificados

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

$\binom{N}{n}$ N^n

Paramt. N muest n Estimador

$\theta \begin{cases} B \\ \mu \\ \sigma \end{cases}$ inf $\begin{matrix} b \\ \bar{x} \\ s \end{matrix} \Bigg\} \hat{\theta}$

fijos V.A.

Inf.
- Est. parámetros
  - puntual: $\bar{x}$ s^2
  - interv.: $\hat{\theta} - z_{\alpha/2} SE \leq \theta \leq \hat{\theta} + z_{1-\alpha/2} SE$
- P. hipótesis

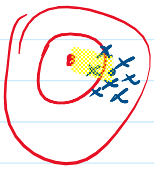
Dist. en el muestreo

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

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

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

Prop. Estimadores



-> Insesgadez

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

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

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

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

$\underbrace{1, 2, 3}$

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

$2-1$ $3^2 = 9$

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

Esperanza promedio estimaciones

$\bar{x}_i$	π_i
1	1/9
1.5	2/9
2	3/9

$\mu = 2$

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

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

σ^2 $\frac{2}{3}$

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

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

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

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

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