Estadística

Inferencias con muestras grandes

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Grupo: Miércoles – Matutino.

Analisis
"Promedio"

$n = 50$
$y = 2160$
$\sigma = 575$

Ev. Tamaño
$n \geq 30$
$50 \geq 30$

Estimador
$\bar{y} = \mu$
$\mu = 2160$

Intervalo de confianza
$(1-\alpha)$ 95%
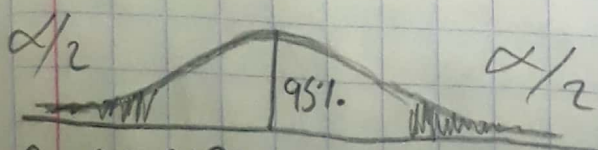$\alpha = .05$
$\alpha/2 = 0.025$
$\alpha/2 = 0.025$
$1 - 0.025 = 0.975$

$\quad z\alpha/2 = 1.96$
$\bar{y} \pm z\alpha/2 \; \sigma/\sqrt{n}$

$2160 \pm 1.96 (81.3172)$
2160 ± 159.3817

$\alpha/2$

2,000.6183 $\alpha/2$
                2319.3817

Desviacion estandar
$\sigma_{\bar{y}} = \sigma/\sqrt{n}$

$\sigma_{\bar{y}} = \dfrac{575}{\sqrt{50}}$

$= 81.3172$

Cota o varianza del error
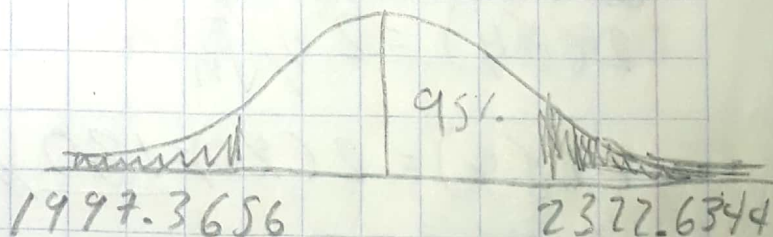$2\sigma_y = 2\sigma/\sqrt{n}$

$= 2(81.3172)$

$= 162.6344$

Intervalo Cota
$\mu \pm 2\sigma_{\bar{y}}$

2160 ± 162.6344
1997.3656 a 2322.6344

95%
1997.3656   2322.6344

Ejercicio 8.3 pag. 200

Datos

$n = 100$

$\bar{y} = 4.5$

$S = 5.13$

Tamaño

$n \geq 30$

$100 \geq 30$

Estimador

$\bar{y} = \mu = 4.5$

Desviación estander

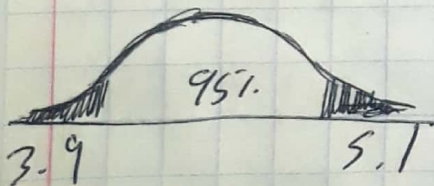$$\sigma_{\bar{y}} = \frac{\sigma}{\sqrt{n}} = \frac{1.3}{\sqrt{100}} = .3$$

Cota

$$2(\sigma_{\bar{y}}) = 2(.3) = 0.6$$

Intervalo para la cota

$\mu \pm 2\sigma_{\bar{y}}$
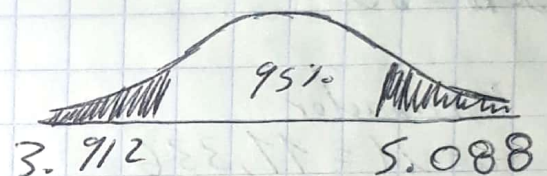
4.5 ± 0.6

3.9 a 5.1

95%

3.9 — 5.1

Intervalo de confianza

$$\bar{y} \pm Z\,\alpha/2 \,(\sigma/\sqrt{n})$$

$4.5 \pm 1.96 \,(0.3)$

4.5 ± 0.588

3.912 a 5.088

95%

3.912 — 5.088

Análisis
"Promedio"

Datos
$n = 64$
$\bar{y} = 836$
$\sigma = 178$

90%

Ev. tamaño
$n \geq 30$
$64 \geq 30$

Estimador
$\bar{y} = \mu$
$\mu = 64$

Intervalo de confianza
$90/100 = 0.9$
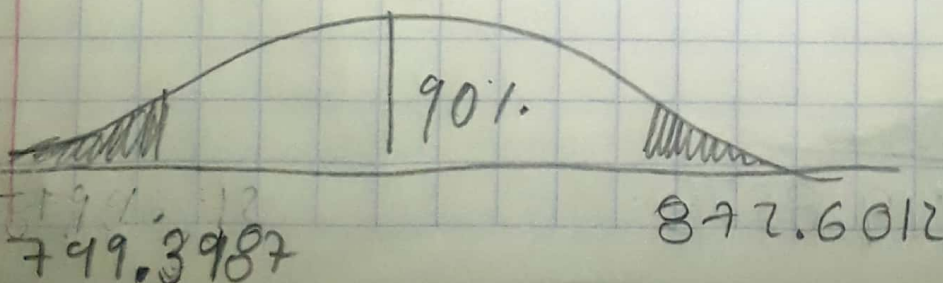$1 - 0.9 = 0.1$
$\alpha = 0.1 \quad \alpha/2 = 0.05$
$(1.64 + 1.65)/2$

$1 - 0.05 = 0.95$
$Z^{\alpha/2} = 1.645$
$\bar{y} \pm Z^{\alpha/2}(22.25)$
836 ± 36.60125

90%

749.3987

Ejercicio 8.5

Desviación estándar
$$\sigma_{\bar{y}} = \sigma/\sqrt{n}$$

$$= \frac{178}{\sqrt{64}}$$

$$= 22.25$$

Cota de varianza o error
$2\sigma_{\bar{y}} = 2\sigma/\sqrt{n}$

$$= 2(22.25)$$

$$= 44.5$$

Intervalo de la cota
$$\mu \pm 2\sigma_{\bar{y}}$$
$$836 \pm 44.5$$
$$791.5 \quad a \quad 880.5$$

95%

791.5   880.5

872.6012
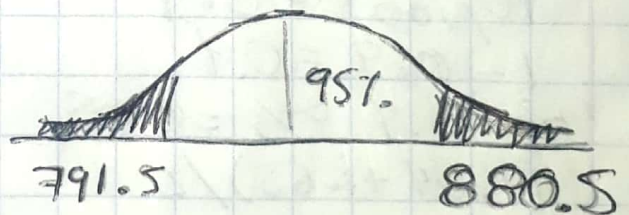
Analisis
"promedio"

Datos
$n = 50$
$\bar{y} = 8.71\% = 871$
$\delta = 2.1\% = 210$

Ev. Tamaño
$n = 30$
$50 \geq 30$

Estimador
$\bar{y} = \mu$
$\mu = 871$

Intervalo de Confianza
$(90/100) = 0.9$
$1 - 0.9 = 0.1$
$\alpha = 0.1 \quad \alpha/2 = 0.05$
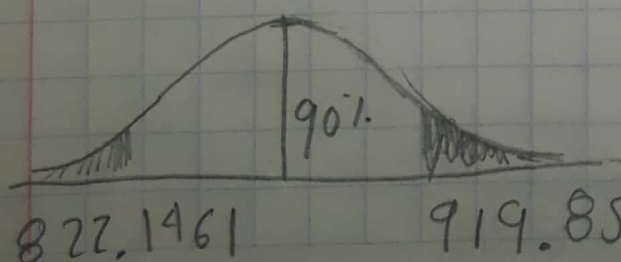$(1.64 + 1.65)/2$
$1 - 0.05 = 0.95$
$\therefore Z\alpha/2 = 1.645$
$\bar{y} \pm Z\alpha/2 \, \delta/\sqrt{n}$

$871 \pm 1.645 (29.6984)$

822.1461   919.8538

Desviacion estandar
$\delta\bar{y} = \delta/\sqrt{n}$

$= 210/\sqrt{50} = 29.6984$

Cota de varianza
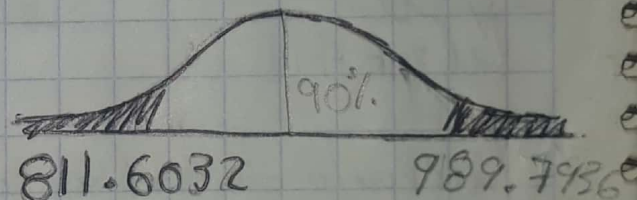$2\delta\bar{y} = 2\delta/\sqrt{n}$

$= 2(29.6984)$
$= 59.3968$

Intervalo de cota
$\mu \pm 2\delta\bar{y}$
871 ± 59.3968

811.6032   989.7956

Ejercicio 8.7 pag. 205

Datos
$n = 60$
$\bar{y} = 147.95$
$S = 511.60$

Ev. tamaño
$n \geq 30$
$60 \geq 30$

Estimador
$\bar{y} = \mu = 147.45$

Desviación estandar
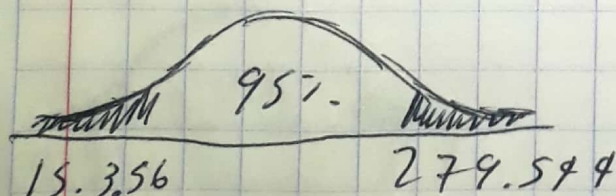$\delta_{\bar{y}} = \sigma / \sqrt{n} = \dfrac{511.60}{\sqrt{60}} = 66.047$

Cota
$2(\delta_{\bar{y}}) = 2(66.047) = 132.094$

Intervalo de la cota
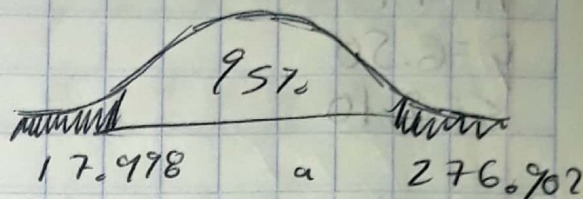$\mu \pm 2 \delta_{\bar{y}}$
147.45 ± 132.094

15.356 a 279.544

95%

15.356 279.544

Intervalo de confianza

95%

17.998 a 276.902

$\bar{y} \pm z_{\alpha/2} \left(\sigma / \sqrt{n} \right)$

$141.45 \pm 1.96 (66.047)$
147.45 ± 129.425
17.998 a 276.902

1) Analisis
   "Promedio

2) Datos   Ev. tamaño
   $n = 100$ $n \geq 30$
   $\bar{y} = 17.5$ $100 \geq 30$
   $s = 6.75$

3) Estimador
   $\bar{y} = \mu$
   $\mu = 17.5$

4) Intervalo de confianza
   $(1-\alpha)$ 95%   → 1 - alfa
   $\alpha = .05$
   $\alpha/2 = 0.025$
   $1 - 0.025 = 0.975$
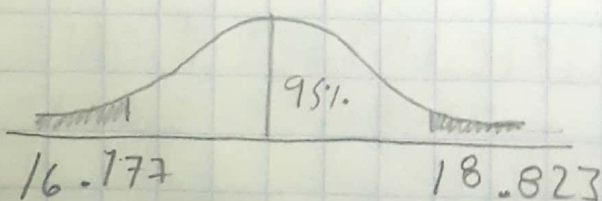 $Z\alpha/2 = 1.96$ se saca z
   IC
   $\bar{y} \pm Z\alpha/2 \; \sigma/\sqrt{n}$ se resta

   $17.5 \pm 1.96 (0.675)$ y, y SP   suma
   17.5 ± 1.323

   95%
   16.777   18.823

5) Desviacion estandar
   $\sigma \bar{y} = \sigma / \sqrt{n}$

   $\sigma y = 6.75 / \sqrt{100} = 0.675$

   $\sigma y = 0.675$ ✗

6) Cota ó varianza del error

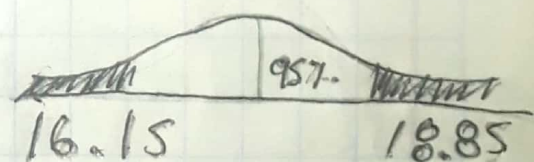 $2 \sigma y = 2 \sigma / \sqrt{n}$

   $= 2 (0.675)$
   $= 1.35$ ✗

7) Intervalo de la cota
   $\mu \pm 2\sigma\bar{y}$
   17.5 ± 1.35
   16.15 a 18.85

   95%
   16.15   18.85

Ejercicio 8.36   pag. 235

Datos=

n = 500
y = 11,336
s = 1,951

Ev. tamaño
n ≥ 30
500 ≥ 30

Estimador
$y = \mu = 11,336$

Desviación estandar
$\delta y = \delta/\sqrt{n} = \dfrac{1,951}{\sqrt{500}} = 87.251$

Cota
$2(\delta \bar{y}) = 2(87.251) = 174.502$

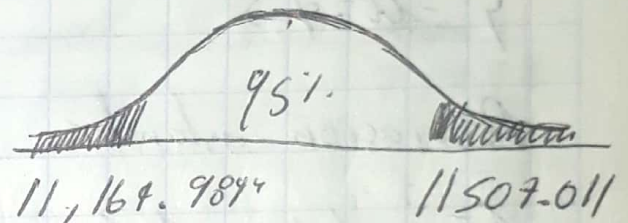Intervalo de cota
$\mu \pm 2\delta \bar{y}$
$11,336 \pm 174.502$

95%

11,161.498 a   11,510.502
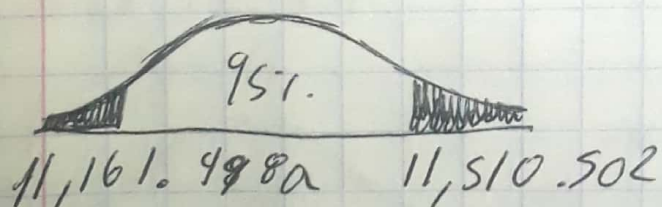
Intervalo confianza

$\bar{y} \pm z\alpha/2 (\delta/\sqrt{n})$

error $11,336 \pm 171.011$

$11,336 \pm 171.011$

$11,164.9399$ a 11507.011

95%

11,164.9844   11507.011

Ejercicio 8.41 pag. 235.

Datos

$n = 49$

$\bar{y} = 6.50$

$S = 2.10$

Ev. Tamaño

$49 \geq 30$

Estimador

$\bar{y} = \mu = 6.50$

Desviación estandar

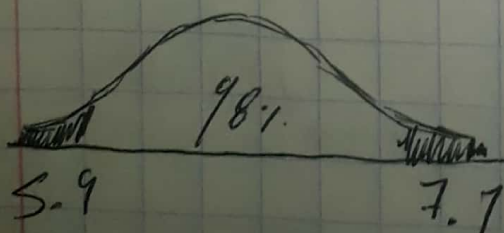$\sigma_{\bar{y}} = \sigma/\sqrt{n} = \dfrac{2.10}{\sqrt{49}} = 0.3$

Cota de error

$2(\sigma_{\bar{y}}) = 2(0.3) = 0.6$

Intervalo para la cota

$\mu \pm 2\sigma_{\bar{y}}$

$6.5 \pm 2\sigma_{\bar{y}}$

5.9 a 7.1

98%
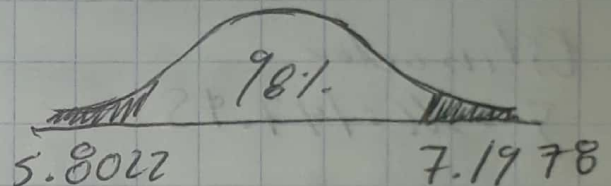
5.9   7.1

Intervalo de Confianza

$\bar{y} \pm Z_{1/2}(\sigma/\sqrt{n})$

$6.50 \pm 2.326\,(0.3)$

6.50 ± 0.6978

5.8022 a 7.1978

98%

5.8022   7.1978

Ejercicio 8.51

Datos
$n = 256$
$\bar{y} = 4800$
$s = 400$

Ev. tamaño
$n \geq 30$
$256 \geq 30$

Desviacion
$\sigma_y = \sigma/\sqrt{n}$

$= 900/\sqrt{256}$

$= 25$

Cota
$2\sigma_y = 2(\sigma/\sqrt{n})$
$= 2(25)$
$= 50$

Estimador
$y = \mu$
$\mu = 4800$

Intervalo p/cota
$\mu \pm 2\sigma_y$
4800 ± 50
4750 a 4850

4750 4850

valor
$(1 \pm \alpha) = 95\%$
$\alpha = 0.05$
$\alpha/2 = 0.025$
$1 - 0.025 = 0.975$
$Z\alpha/2 = 1.96$

Intervalo de Confianza
$y \pm 1.96 (25)$
4800 ± 49

4751 a 4849
LiC   LSC

Grafica IC

4751 4849
LiC   LSC

Escaneado con CamScanner