

習 19

標準偏差估計値

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

信頼区間

$$\left(\sqrt{\frac{(n-1)s^2}{\chi_{\frac{\alpha}{2}}^2(n-1)}}, \sqrt{\frac{(n-1)s^2}{\chi_{1-\frac{\alpha}{2}}^2(n-1)}} \right)$$

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

$$= \sqrt{\frac{\sum x_i^2 - n\bar{x}^2}{n-1}}$$

$$= \sqrt{\frac{1,284 - 6 \times 14,33^2}{5}}$$

$$= \sqrt{10,38}$$

$$= 3,22 \#$$

$$2) 1-\alpha = 0,9, \frac{\alpha}{2} = 0,05, n-1 = 5$$

$$\chi_{\frac{\alpha}{2}}^2(n-1) = \chi_{0,05}^2(5) = 11,07$$

$$\chi_{1-\frac{\alpha}{2}}^2(n-1) = \chi_{0,95}^2(5) = 1,15$$

信頼区間

$$\left[\sqrt{\frac{5 \times 10,38}{\chi_{0,05}^2(5)}}, \sqrt{\frac{5 \times 10,38}{\chi_{0,95}^2(5)}} \right] = \left[\sqrt{\frac{51,9}{11,07}}, \sqrt{\frac{51,9}{1,15}} \right]$$

$$= (2,17, 6,72) \#$$