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

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

$=\sqrt{10,38}=3,22$

∴ σ 之点估计为 3,22

(2) $1-\alpha=0,90$, $\frac{\alpha}{2}=0,05$, $n-1=5$

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

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

∴ σ 之 90% 的信赖区间：

$\left(\sqrt{\frac{5\cdot 1,9}{11,07}},\sqrt{\frac{5\cdot 1,9}{1,15}}\right)=(2,17,6,72)$

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(1)

i) $\sigma_1^2 \neq \sigma_2^2$，自由度は

$$\nu = \frac{\left(\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}\right)^2}{\frac{\left(\frac{s_1^2}{n_1}\right)^2}{n_1 - 1} + \frac{\left(\frac{s_2^2}{n_1}\right)^2}{n_2 - 1}}$$

ii) $\mu_1 - \mu_2$ の $100(1-\alpha)\%$ 信頼区間

$$(\bar{x} - \bar{y}) \pm t_{\frac{\alpha}{2}}(\nu) \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$$

(2)

$$\left(\sqrt{\frac{(n_1 - 1)s^2}{\chi^2_{\frac{\alpha}{2}}(n_1 - 1)}}, \sqrt{\frac{(n_1 - 1)s^2}{\chi^2_{1-\frac{\alpha}{2}}(n_1 - 1)}} \right)$$

(3)

$$\left(\frac{s_2'}{s_2^2} \times \frac{1}{F_{\frac{\alpha}{2}}(n_1 - 1, n_2 - 1)}, \frac{s_1^2}{s_2^2} \times \frac{1}{F_{1-\frac{\alpha}{2}}(n_1 - 1, n_2 - 1)} \right)$$