

Week 6 A107270053 黃賀喬

$$9. (1) S = \sqrt{\frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}} = \sqrt{\frac{\sum x_i - nx^2}{n-1}}$$

$$= \sqrt{\frac{1284 - 6 \times 14.33^2}{5}} = \sqrt{10.38}$$

$$(2) 1-\alpha = 0.9 \quad \frac{\alpha}{2} = 0.05 \quad n-1 = 5$$

$$\bar{x}^2 \frac{\alpha}{2} (n-1) = \bar{x}^2 0.05 (5) = 11.07$$

$$\bar{x}_{1-\alpha}(n-1) = \bar{x}^2 0.95 (5) = 1.15$$

$$\left( \sqrt{\frac{(n-1)S^2}{\frac{\alpha}{2}(n-1)}}, \sqrt{\frac{(n-1)S^2}{\bar{x}^2_{1-\frac{\alpha}{2}(n-1)}}} \right) = \left( \sqrt{\frac{5 \times 10.38}{11.07}}, \sqrt{\frac{5 \times 10.38}{1.15}} \right)$$

$$= (2.17, 6.72)$$

$$20. (1) V = \frac{\left( \frac{S_1^2}{n_1} + \frac{S_2^2}{n_2} \right)^2}{\frac{(n_1-1)}{(n_1-1)} \frac{(n_2-1)}{(n_2-1)}} \quad n_1 = 9, \bar{x} = 7.67, S_1 = 9.27$$

$$n_2 = 9, \bar{y} = 6.78, S_2 = 21.15$$

$$V = \frac{\left( \frac{9.27^2}{9} + \frac{21.15^2}{9} \right)^2}{\frac{(9.27^2)}{9} + \frac{(21.15^2)}{9}} = 10.96 \div 11$$

$$\bar{x} - \bar{y} + t_{\frac{\alpha}{2}} (V) \sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}} = (7.67 - 6.78) \pm t_{0.05}(11) \sqrt{\frac{9.27^2}{9} + \frac{21.15^2}{9}}$$

$$= 0.89 \pm 16.95$$

$$(2) \left( \sqrt{\frac{8 \times 9,27^2}{\chi_{0,05}^2(8)}}, \sqrt{\frac{8 \times 9,27^2}{\chi^2_{0,9518}}} \right) = \left( \sqrt{\frac{687,46}{15,51}}, \sqrt{\frac{687,46}{2,73}} \right) \\ = (6,66, 15,87)$$

$$(3) \left( \frac{s_1^2}{s_2^2} \times \frac{1}{F_{\frac{\alpha}{2}}(n_1-1, n_2-1)}, \frac{s_1^2}{s_2^2} \times \frac{1}{1-F_{\frac{\alpha}{2}}(n_1-1, n_2-1)} \right) \\ = \left( \frac{9,27^2}{21,15^2} \times \frac{1}{3,44}, \frac{9,27^2}{21,15^2} \times \frac{1}{\frac{1}{3,44}} \right) = (0,06, 0,66)$$