

統計 week4 作業
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1、

$$(1) t_{0.025}(10) = 2.228$$

$$(2) t_{0.95}(8) = -1.86$$

$$(3) \chi^2_{0.05}(12) = 21.03$$

$$(4) \chi^2_{\alpha}(15) = 7.26, \alpha = 0.95$$

$$(5) \chi^2_{0.95}(10) = 3.94$$

$$(6) F_{0.05}(5, 8) = 3.69$$

$$(7) F_{0.95}(6, 7) = 0.238$$

$$(8) F_{\alpha}(6, 6) = 4.28, \alpha = 0.05$$

2、

$$(1) \hat{p} = \frac{45}{80} = 0.56 \#$$

$$(2) z_{0.025} = 1.96 \quad (1 - \hat{p}) = 1 - 0.56 = 0.44 \quad n = 80$$

$$\cancel{z_{0.025}} \quad z_{0.025} \sqrt{\frac{0.56 \times 0.44}{80}} = 1.96 \times 0.06 = 0.12 \#$$

$$(3) \hat{p} \pm z_{0.05} \sqrt{\frac{0.56 \times 0.44}{80}} = 0.56 \pm 1.645 \times \sqrt{\frac{0.56 \times 0.44}{80}} \\ = 0.56 \pm 0.1 = (0.46, 0.66) \#$$

8、設 $p_1 = \text{男性}$ $p_2 = \text{女性}$

$$\hat{p}_1 = 0.55 \quad \hat{p}_2 = 0.6 \quad Z_{0.025} = 1.96$$

$$n_1 = 100$$

$$n_2 = 100$$

$$(\hat{p}_1 - \hat{p}_2) \pm Z_{0.025} \sqrt{\frac{0.55 \times 0.45}{100} + \frac{0.6 \times 0.4}{100}}$$

$$= -0.05 \pm 1.96 \times 0.07$$

$$= -0.05 \pm 0.14$$

$$= (-0.19, 0.09)$$

21、(1) $\hat{p} = \frac{105}{250} = 0.42 \quad Z_{0.05} = 1.645$

$$0.42 \pm 1.645 \sqrt{\frac{0.42 \times 0.58}{250}}$$

$$= 0.42 \pm 0.05 = (0.37, 0.47)$$

(a)

(2) $\hat{p} = 0.3 \quad e = 0.03 \quad 1 - \alpha = 0.95$

$$e = \frac{\sigma}{n} \times z \quad n = \left(\frac{z}{e}\right)^2 \times \hat{p} \times (1 - \hat{p})$$

$$n = \left(\frac{1.96}{0.03}\right)^2 \times 0.3 \times 0.7 = 896.37 \approx 897 \#$$

$$(b) \hat{p} = 0.42 \quad h = \left(\frac{1.96}{0.03} \right)^2 \times 0.42 \times 0.58 \approx 1040 \#$$

$$(c) \hat{p} = 0.5 \quad h = \left(\frac{1.96}{0.03} \right)^2 \times 0.5 \times 0.5 = 1067.01 \approx 1068 \#$$

$$2. e = \frac{\sigma}{\sqrt{n}} \times \frac{z_{\alpha}}{2}$$

$$(1) \sigma = 3 \quad e = 0.5 \quad \alpha = 1 - 0.95$$

$$h = \left(\frac{3}{0.5} \right)^2 \times 1.96^2 = 138.3 \approx 139 \#$$

$$(2) \sigma = 0.2 \quad e = 0.03 \quad 1 - \alpha = 0.9$$

$$h = \left(\frac{0.2}{0.03} \right)^2 \times 1.645^2 = 120.27 \approx 121 \#$$

$$(3) \sigma = 0.05 \quad e = 0.02 \quad 1 - \alpha = 0.98$$

$$h = \left(\frac{0.05}{0.02} \right)^2 \times 2.326^2 = 33.8 \approx 34$$