

例 6.7

 $\because n=36 > 30$ 且 \bar{x} 近似常態分配得 $\bar{x}=16.33$ (月), $s=4.29$ (kg) $\therefore 1-\alpha=0.95, \frac{\alpha}{2}=0.025, z_{\frac{\alpha}{2}}=z_{0.025}=1.96$

(1) 95% 信賴區間: $\bar{x} \pm z_{\frac{\alpha}{2}} \frac{s}{\sqrt{n}} = 16.33 \pm 1.96 \frac{4.29}{\sqrt{36}}$
 $= 16.33 \pm 1.40$

故消費者更換手機的平均時間為

 $(14.93, 17.73)$ 之間 ✕

(2) $1-\alpha=0.9, \frac{\alpha}{2}=0.05, z_{\frac{\alpha}{2}}=z_{0.05}=1.645$

得 90% 的信賴區間 $\bar{x} \pm z_{\frac{\alpha}{2}} \frac{s}{\sqrt{n}} = 16.33 \pm 1.645 \frac{4.29}{\sqrt{36}}$
 $= 16.33 \pm 1.18$

故消費者更換手機的平均時間為

 $(15.15, 17.51)$ 之間 ✕

例 6.9

$$n=12, \bar{x}=15,291.67, s=\sqrt{\sum (x_i - \bar{x})^2 / (n-1)} = 197.52$$

(1) μ 的點估計為 $\bar{x} = 15,291.67$ (2) $1-\alpha=0.9, \frac{\alpha}{2}=0.05$, 自由度 $n-1=12-1=11$ 查表: $t_{0.05}(11) = 1.796$ $\therefore \mu$ 的 90% 信賴區間

$$\begin{aligned} \bar{x} \pm t_{\frac{\alpha}{2}}(n-1) \frac{s}{\sqrt{n}} &= 15,291.67 \pm 1.796 \frac{197.52}{\sqrt{12}} \\ &= 15,291.67 \pm 102.41 \end{aligned}$$

即 $(15,189.26, 15,394.08)$ (3) μ 的 90% 的區間長度為

$$15,394.08 - 15,189.26 = 204.82$$

$$\begin{aligned} \text{或 } 2t_{\frac{\alpha}{2}}(n-1) \frac{s}{\sqrt{n}} &= 2 \times t_{0.05}(11) \frac{197.52}{\sqrt{12}} \\ &= 2 \times 1.796 \times \frac{197.52}{\sqrt{12}} \\ &= 2 \times 102.41 \\ &= 204.82 \end{aligned}$$

例 6.19

$$1 - \alpha = 0.95, \quad Z_{\frac{\alpha}{2}} = Z_{0.025} = 1.96, \quad e = 0.01$$

$$S = 0.05$$

$$\therefore n = \left(\frac{Z_{\frac{\alpha}{2}} S}{e} \right)^2 = \left(\frac{1.96 \times 0.05}{0.01} \right)^2 = 96.04$$

故取 $n = 97$, $97 - 35 = 62$ (袋)得 样本数应取 62 袋