例 6.7

(1)

$\bar{x} = 16.33$ (月)，$s = 4.29$ (公斤)

$1-\alpha = 0.95$，$\frac{\alpha}{2} = 0.025$，$z_{\frac{\alpha}{2}} = z_{0.025} = 1.96$

$$\bar{x} \pm z_{\frac{\alpha}{2}} \frac{s}{\sqrt{n}} = 16.33 \pm 1.96 \frac{4.29}{\sqrt{36}} = 16.33 \pm 1.4$$

消費者更換手機之平均時間的95%信賴區間

介於 (14.93, 17.73) 之間

(2)

$\bar{x} = 16.33$ (月)，$s = 4.29$ (公斤)

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

$$\bar{x} + z_{\frac{\alpha}{2}} \frac{s}{\sqrt{n}} = 16.33 \pm 1.645 \frac{4.29}{\sqrt{36}} = 16.33 \pm 1.18$$

消費者更換手機之平均時間的90%信賴區間

介於 (15.15, 17.51) 之間

例 6.9

設 μ 為新品牌省电燈泡之平均壽命

$n=12$，$\bar{x} = 15291.67$，$s = \sqrt{\frac{\Sigma(x_i-\bar{x})^2}{n-1}} = 197.52$

(1) μ 之点估計為 $\bar{x} = 15291.67$

(2)

$1-\alpha = 0.9$，$\frac{\alpha}{2} = 0.05$，$n-1 = 12-1 = 11$

$t_{0.05}(11) = 1.796$

$$\bar{x} \pm t_{\frac{\alpha}{2}}(n-1) \frac{s}{\sqrt{n}} = 15291.67 \pm 1.796 \frac{197.52}{\sqrt{12}}$$

$$= 15291.67 \pm 102.41$$

即 (15189.26, 15394.08)

(3)

μ 之90%的区間長度

$15394.08 - 15189.26 = 204.82$

例 6.19

$1-\alpha = 0.95$

$z_{\frac{\alpha}{2}} = z_{0.025} = 1.96$

$e = 0.01$

$s = 0.05$

$$n = \left(\frac{z_{\frac{\alpha}{2}} s}{e}\right)^2$$

$$= \left(\frac{1.96 \cdot 0.05}{0.01}\right)^2$$

$$= 96.04$$

取 $n=97$，應再抽 $97-35=62$ 袋，才能確保 μ 的估計界值不超过0.01公斤的机率為0.95