

A107270053 世道天 week 3 樣本平均數 = 16.33

例 6.9

樣本標準差 = 4.29

母體未知

① 95% 信賴區間

$$1 - \alpha = 0.95$$

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

$$e = 0.01$$

$$S = 0.05$$

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

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

$$= \left(\frac{0.098}{0.01} \right)^2$$

$$= 96.04$$

$$\approx 97$$

已觀察 35 代

需再增 $97 - 35 = 62$ 代

$$1 - \alpha = 0.95 \quad \frac{\alpha}{2} = 0.025$$

$$\bar{x} \pm z_{\frac{\alpha}{2}} \frac{S}{\sqrt{n}} = 16.33 \pm z_{0.025} \frac{4.29}{\sqrt{36}}$$

$$= 16.33 \pm 1.96 \frac{4.29}{6}$$

$$= 16.33 \pm 1.4014$$

$$\rightarrow (14.9286, 17.7314)$$

② 90% 信賴區間

$$1 - \alpha = 0.9 \quad \frac{\alpha}{2} = 0.05$$

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

$$= 16.33 \pm 1.176175$$

$$\rightarrow (15.153825, 17.506175)$$

N. 樣本, 母體未知 $\rightarrow (\bar{x} - t_{\frac{\alpha}{2}}(n) \frac{S}{\sqrt{n}}, \bar{x} + t_{\frac{\alpha}{2}}(n) \frac{S}{\sqrt{n}})$

90% 信賴區間

$$\bar{x} \pm t_{\frac{\alpha}{2}}(n-1) \frac{S}{\sqrt{n}}$$

$$= 15291.67 \pm t_{0.05}(11)$$

$$= 1529.67 \pm 102.41$$

$$\rightarrow (15189.26, 15394.08)$$

$$\frac{19752}{\sqrt{2}}$$

$$(2) 1 - \alpha = 0.9$$

$$\frac{\alpha}{2} = 0.05$$

$$v = n - 1 = 12 - 1 = 11$$

$$(3) 15394.08 - 15189.26 = 204.82$$

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

$$\sqrt{\frac{\sum (x_i - 15291.67)^2}{12-1}}$$

$$= 197.52$$