Week 3

例6.7 (1) $1-\alpha=0.95$, $\frac{\alpha}{2}=0.025$, $Z_{\frac{\alpha}{2}}=Z_{0.025}=1.96$

∴ μ 之95%信賴區間為

$$\bar{x}\pm Z_{\frac{\alpha}{2}}\frac{S}{\sqrt{n}}=16.33\pm 1.96\,\frac{4.29}{\sqrt{36}}$$

$$=16.33\pm 1.40$$

$$\Rightarrow(14.93,17.73)$$ ※

(2) $1-\alpha=0.90$, $\frac{\alpha}{2}=0.05$, $Z_{\frac{\alpha}{2}}=Z_{0.05}=1.645$

∴ μ 之90%信賴區間為

$$\bar{x}\pm Z_{\frac{\alpha}{2}}\frac{S}{\sqrt{n}}=16.33\pm 1.645\,\frac{4.29}{\sqrt{36}}=16.33\pm 1.18$$

$$\Rightarrow(15.15,17.51)$$ ※

例6.9 設 $n=12$, $\bar{x}=15291.67$, $S=\sqrt{\frac{\sum(x_i-\bar{x})^2}{(n-1)}}=197.52$

(1) μ 之點估計為 $\bar{x}=15291.67$

(2) $1-\alpha=0.90$, $\frac{\alpha}{2}=0.05$,

$n-1=12-1=11$

$t_{0.05}(11)=1.796$

μ 之90%信賴區為 $\bar{x}\pm t_{\frac{\alpha}{2}}(n-1)\frac{S}{\sqrt{n}}=15291.67\pm 1.796\,\frac{197.52}{\sqrt{12}}$

$$=15291.67\pm 102.41$$

$$\Rightarrow(15189.26,15394.08)$$ ※

例6.19 $1-\alpha=0.95$, $Z_{\frac{\alpha}{2}}=Z_{0.025}=1.96$, $e=0.01$, $S=0.05$

$$n=\left(\frac{Z_{\frac{\alpha}{2}}S}{e}\right)^2=\left(\frac{1.96\times 0.05}{0.01}\right)^2=96.04\fallingdotseq 97$$

$97-35=62$

∴ $\mu=0.95$ ※