例 6.11

$$(\bar{x}-\bar{y}) \pm t_{\frac{\alpha}{2}}(n_1+n_2-2)\sqrt{S_p^2\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}$$

則 $n_1=12,\ \bar{x}=36,\ S_1=5$

$n_2=16,\ \bar{y}=32,\ S_2=7$

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

$t_{\frac{\alpha}{2}}(n_1+n_2-2)=t_{0.05}(25)=1.708$

$$S_p^2=\frac{(n_1-1)S_1^2+(n_2-1)S_2^2}{n_1+n_2-2}=\frac{(12-1)5^2+(15-1)7^2}{12+15-2}=\frac{961}{25}=38.44$$

則 $\mu_1-\mu_2$ 之 90% 信賴區間為

$$(\bar{x}-\bar{y}) \pm t_{\frac{\alpha}{2}}(n_1+n_2-2)\sqrt{S_p^2\left(\frac{1}{n_1}+\frac{1}{n_2}\right)}$$

$$=(36-32) \pm 1.708\sqrt{38.44\left(\frac{1}{12}+\frac{1}{15}\right)}=4\pm 4.14 \text{ 即 } (-0.1,\ 8.1)$$