

EX 6.10. 令 μ_1 為有裝有線電視台

μ_2 為無裝有線電視台

$$n_1 = 50, \bar{x} = 14.5, s_1 = 3.5, n_2 = 180, \bar{y} = 20.8, s_2 = 3.8$$

$\mu_1 - \mu_2$ 之點估計值為 $\bar{x} - \bar{y} = 14.5 - 20.8 = -6.3$ (小時)

$$1 - \alpha = 0.98, \frac{\alpha}{2} = 0.01, z_{\frac{\alpha}{2}} = z_{0.01} = 2.327$$

$\mu_1 - \mu_2$ 的 98% 信賴區間為:

$$(\bar{x} - \bar{y}) \pm z_{\frac{\alpha}{2}} \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$$

$$= (14.5 - 20.8) \pm 2.327 \sqrt{\frac{(3.5)^2}{50} + \frac{(3.8)^2}{180}}$$

$$= (-6.3) \pm 0.84$$

$$\Rightarrow (-7.14, -5.46)$$

EX 6.11 令 μ_1 表示大公司

μ_2 表示小公司

$$n_1 = 12, \bar{x} = 36, s_1 = 5, n_2 = 15, \bar{y} = 32, s_2 = 7, 1 - \alpha = 0.9$$

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

$$s_p^2 = \frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2} = \frac{(12 - 1)5^2 + (15 - 1)7^2}{12 + 15 - 2} = 38.44$$

$\therefore \mu_1 - \mu_2$ 90% 信賴區間:

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

$$= (36 - 32) \pm 1.708 \sqrt{38.44 \left(\frac{1}{12} + \frac{1}{15} \right)}$$

$$= 4 \pm 4.10$$

$$\Rightarrow (-0.10, 8.10)$$