例 9.10

處理	反應值	總和	平均數
1	0.88, 0.64, 0.82, 0.76, 0.05	$T_1 = 3.15$	$\bar{y}_1 = 0.63$
2	1.54, 1.78, 1.29, 1.53, 1.91, 1.14	$T_2 = 9.19$	$\bar{y}_2 = 1.53$
3	1.98, 1.51, 1.78, 2.2, 1.72, 2.25	$T_3 = 11.44$	$\bar{y}_3 = 1.91$
		$T = 23.78$	$\bar{y} = 1.4$

$H_0: \mu_1 = \mu_2 = \mu_3$, $n = 5 + 6 + 6 = 17$

$$SST = \sum_{i=1}^{k}\sum_{j=1}^{n_i}(y_{ij} - \bar{y})^2 = \sum_{i=1}^{k}\sum_{j=1}^{n_i} y_{ij}^2 - \frac{T^2}{n}$$

$$\sum_{i=1}^{k}\sum_{j=1}^{n_i} y_{ij}^2 = 0.88^2 + 0.64^2 + 0.82^2 + \cdots + 1.72^2 + 2.25^2 = 39.159$$

$$SST = 39.159 - \frac{23.78^2}{17} = 39.159 - 33.264 = 5.895$$

$$SSTR = 5(0.63-1.4)^2 + 6(1.53-1.4)^2 + 6(1.91-1.4)^2 = 4.609$$

$$SSE = SST - SSTR = 1.286$$

變異來源	平方和	自由度	均方	F值
減肥藥	4.609	2	2.305	25.05
誤差	1.286	14	0.092	
總和	5.895	16		

$F = 25.05 > F_{0.05}(2,14) = 3.74$

故棄卻 H_0 #

* 聯合

$m = C^3_2 = 3$, $\frac{\alpha}{2m} = \frac{0.05}{6} = 0.0083$

$t_{\frac{\alpha}{2m}}(14) = t_{0.0083}(14) = 2.718$, $S = \sqrt{MSE} = \sqrt{0.092} = 0.303$

$\mu_2 - \mu_1 = (1.43 - 0.63) \pm 0.303\sqrt{\frac{1}{6}+\frac{1}{5}} = (0.401, 1.399)$ ，不包含 0

$\mu_3 - \mu_2 = (1.91 - 1.53) \pm 0.303\sqrt{\frac{1}{6}+\frac{1}{6}} = (-0.095, 0.855)$ ，包含 0

$\mu_3 - \mu_1 = (1.91 - 0.63) \pm 0.303\sqrt{\frac{1}{6}+\frac{1}{5}} = (0.781, 1.779)$ ，不包含 0

結論：2和3之間無顯著差異，而1,2和1,3間有顯著差異

例 9.12

$m = C^3_2 = 3$, $F_{0.05}(2,14) = 3.74$

$S = \sqrt{MSE} = \sqrt{0.092} = 0.303$, $\sqrt{(k-1)F} = \sqrt{(3-1)3.74} = 2.73$

$\mu_2 - \mu_1 = (1.43 - 0.63) \pm 2.73 \times 0.303 \times \sqrt{\frac{1}{6}+\frac{1}{5}} = (0.399, 1.401)$ ，不包含 0

$\mu_3 - \mu_2 = (1.91 - 1.53) \pm 2.73 \times 0.303 \times \sqrt{\frac{1}{6}+\frac{1}{6}} = (-0.098, 0.848)$ ，包含 0

$\mu_3 - \mu_1 = (1.91 - 0.63) \pm 2.73 \times 0.303 \times \sqrt{\frac{1}{6}+\frac{1}{5}} = (0.779, 1.781)$ ，不包含 0

判斷結果與多重t聯合信賴區間方法相同，但此薛法之信賴區間較寬 #