檢定各

Week14

9.10

1	2	3
0.88	1.54	1.98
0.64	1.78	1.51
0.82	1.29	1.78
0.76	1.53	2.20
0.05	1.91	1.72
3.15/5	1.14	2.25
=0.63	9.19/6	11.44/6
	=1.53	=1.91

$y = 0.88+0.64+0.82+\cdots+2.2+1.72+2.25 = 23.78$

$\bar{y} = \frac{23.78}{17} = 1.40$

$\begin{cases} H_0: \mu_1=\mu_2=\mu_3 \\ H_1: \mu_i \text{不全等} \end{cases}$

變異來源	平方和	自由度	均方	F檢定值
減肥藥	SSTR=4.61	3-1=2	MSTR = 2.305	$F=\frac{MSTR}{MSE}$
隨機誤差	SSE=1.285	17-3=14	MSE = 0.092	$=\frac{2.305}{0.09}=25.05$
總和	SST=5.895	17-1=16	$F=25.05 > F_{0.05}(2,14)=3.74$ 拒絕 H_0（影響有明顯差異）	

$\sum_{i=1}^{k}\sum_{j=1}^{n_i} Y_{ij}^2 = (0.88)^2+(0.64)^2+(0.82)^2+(0.76)^2+(0.05)^2+\cdots+(2.2)^2+(1.72)^2+(2.25)^2 = 39.159$

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

$\sum_{i=1}^{k}\left(\frac{T_i^2}{n_i}\right) = \frac{(3.15)^2}{5}+\frac{(9.19)^2}{6}+\frac{(11.44)^2}{6} = 37.87$

$SSTR = 37.87 - 33.264 = 4.61$

$SSE = SST - SSTR = 5.895 - 4.61 = 1.285$

9.12

$m = \binom{3}{2} = 3$

$F_{0.05}(3-1, 17-3) = 3.74$ $\quad \frac{\alpha}{2m} = \frac{0.05}{2\times 3} = 0.0083$

$t_{\frac{\alpha}{2m}}(14) = t_{0.0083}(14) = 2.718$

$S = \sqrt{MSE} = \sqrt{0.092} = 0.303$

$\sqrt{(k-1)F} = \sqrt{(3-1)3.74} = \sqrt{7.48} = 2.73$

$\mu_2-\mu_1$：$(1.53-0.63) \pm 2.73 \times 0.303 \times \sqrt{\frac{1}{6}+\frac{1}{5}}$ （0.827）

$= (0.399, 1.401) \rightarrow$ 不包含0 → 減肥藥1與2有明顯差異

$\mu_3-\mu_2$：$(1.91-1.53) \pm 0.827 \times \sqrt{\frac{1}{6}+\frac{1}{6}}$

$= (-0.098, 0.858) \rightarrow$ 包含0 → 減肥藥2與3無差異

$\mu_3-\mu_1$：$(1.91-0.63) \pm 0.827 \times \sqrt{\frac{1}{6}+\frac{1}{5}}$

$= (0.779, 1.781) \rightarrow$ 不包含0 → 減肥藥1與3有明顯差異