

		1	2	...	r	$T_{i.}$	$T_{i.}^2$
A_1		x_{11}	x_{12}	...	x_{1r}	$T_{1.}$	$T_{1.}^2$
A_2		x_{21}	x_{22}	...	x_{2r}	$T_{2.}$	$T_{2.}^2$
\vdots		\vdots	\vdots	\vdots	\vdots	\vdots	\vdots
A_k		x_{k1}	...	...	x_{kr}	$T_{k.}$	$T_{k.}^2$
$T_{.j}$		$T_{.1}$	$T_{.2}$	...	$T_{.r}$	T	$\sum_{i=1}^k T_{i.}^2$
$T_{.j}^2$		$T_{.1}^2$	$T_{.2}^2$	...	$T_{.r}^2$	$\sum_{j=1}^r T_{.j}^2$	

$H_0^A : \mu_1^A = \mu_2^A = \dots = \mu_k^A$ $H_0^B : \mu_1^B = \mu_2^B = \dots = \mu_r^B$

$H_1^A : \mu_i^A$ $H_1^B : \mu_j^B$

μ : $MO\Delta = \frac{\sum_{i=1}^k \sum_{j=1}^r x_{ij}^2}{kr} - \frac{T^2}{kr-1}$

$MM\Delta_A = \frac{\sum_{i=1}^k T_{i.}^2}{r} - \frac{T^2}{kr}$ $\therefore k-1$ ($\mu \mu \mu \mu r$) $\mu \mu$ k

$MM\Delta_B = \frac{\sum_{j=1}^r T_{.j}^2}{k} - \frac{T^2}{kr}$ $\therefore r-1$ ($\mu \mu \mu k$) $\mu \mu$ B r

μ : $ME\Delta = MO\Delta - MM\Delta_A - MM\Delta_B$ $\therefore (k-1)(r-1)$

• $F = \frac{MM\Delta_A / (k-1)}{ME\Delta / (k-1)(r-1)} > F_{k-1, (k-1)(r-1), \alpha}$ H_0^A

• $F = \frac{MM\Delta_B / (r-1)}{ME\Delta / (k-1)(r-1)} > F_{r-1, (k-1)(r-1), \alpha}$ H_0^B

μ : $\mu_1, \mu_2, \mu_3, \mu_4$ (μ = 0.05)

μ_1	13	16	16	45 (2025)
μ_2	14	12	14	40 (1600)
μ_3	19	17	19	55 (3025)
μ_4	24	30	26	80 (6400)
	70 (4900)	75 (5625)	75 (5625)	220 (48400)

$\sum_{i=1}^{12} x_i^2 = 4380$

$f_{4,6,0.025}^U = 6.23, f_{3,6,0.05}^U = 4.76, f_{2,6,0.05}^U = 5.14$

$H_0^A : \mu_1^A = \mu_2^A = \mu_3^A = \mu_4^A$

$H_0^B : \mu_1^B = \mu_2^B = \mu_3^B$

$H_1^A : \mu_i^A$

$H_1^B : \mu_j^B$

$MO\Delta = 4380 - \frac{220^2}{4 \cdot 3} = 346.67$

$MM\Delta_A = \frac{2025 + 1600 + 3025 + 6400}{3} - \frac{220^2}{4 \cdot 3} = 4350 - 4033.33 = 316.67$

$MM\Delta_B = \frac{4900 + 5625 + 5625}{4} - 4033.33 = 4037.5 - 4033.33 = 4.17$

$ME\Delta = 346.67 - 316.67 - 4.17 = 25.83$

$F = \frac{MM\Delta_A / (k - 1)}{ME\Delta / (k - 1)(r - 1)} = \frac{316.67 / 3}{25.83 / 6} = 24.52 > F_{3,6,0.05} = 4.76 \Rightarrow H_0^A$

$F = \frac{MM\Delta_B / (r - 1)}{ME\Delta / (k - 1)(r - 1)} = \frac{4.17 / 2}{25.83 / 6} = 0.484 < F_{2,6,0.05} = 5.14 \Rightarrow H_0^B$

μ μ μ μ .

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