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2C2220007

Analisis Kovarians dan Analisis Korelasi

Tugas Ancova

No	Treatment A		Treatment B	
	X	Y	X	Y
1	175	135	206	165
2	175	145	175	195
3	235	205	230	160
4	215	175	190	155
5	195	190	155	150
6	195	190	185	170

Statistik	A1	A2	Total
N	6	6	12
ΣX	1190	1190	2330
ΣX^2	238750	219900	458650
ΣY	990	995	1985
ΣY^2	167600	166275	333875
ΣXY	199150	188900	388050
$\bar{X}$	198,33	190	388,33
$\bar{Y}$	165	165,83	330,83

A. Sumber Variasi Total (Residu)

1. $JK_{yt} = \Sigma Y_t^2 - \frac{(\Sigma Y_t)^2}{N} = 333875 - \frac{(1985)^2}{12} = 5522,917$

2. $JK_{xt} = \Sigma X_t^2 - \frac{(\Sigma X_t)^2}{N} = 458650 - \frac{(2330)^2}{12} = 6291,667$

3. $JP_{xy_t} = \Sigma XY - \frac{(\Sigma X)(\Sigma Y)}{N} = 388050 - \frac{(2330)(1985)}{12} = 2629,167$

4. $\beta_t = \frac{JP_{xy_t}}{JK_{xt}} = \frac{2629,167}{6291,667} = 0,921228$

5. $JK_{regt} = \beta_t \times JP_{xy_t} = 0,921228 \times 2629,167 = 1107,98$

6. $JK_{rest} = JK_{y_t} - JK_{regt} = 5522,917 - 1107,98 = 4915,437$

B. Sumber Variasi Dalam (JK dalam residu)

1. $JK_{yd} = \Sigma Y_t^2 - \sum \frac{(\Sigma Y_A)^2}{n_A} = 333875 - \left(\frac{990^2}{6} + \frac{995^2}{6}\right) = 5520,833$

2. $JK_{xd} = \Sigma X_t^2 - \sum \frac{(\Sigma X_A)^2}{n_A} = 458650 - \left(\frac{1190^2}{6} + \frac{1190^2}{6}\right) = 6033,333$

3. $JP_{xyd} = \Sigma XY - \sum \frac{(\Sigma X_A)(\Sigma Y_A)}{n_A} = 388050 - \left(\frac{1190 \times 990}{6} + \frac{1190 \times 995}{6}\right)$

$= 2650$

4. $\beta d = \frac{JPxyd}{JKxd} = \frac{2650}{6033,333} = 0,939226$

5. $JKregd = \beta d \times JPxyd = 0,939226 \times 2650 = 1163,95$

6. $JKresd = JKyd - JKregd = 5520,833 - 1163,95 = 4356,883$

C. Sumber Variasi Antar

$JK_A = JK_{rest} - JK_{resd} = 9915,937 - 9356,883 = 58,559$

D. Menghitung Derajat Kebebasan

$DK_A = a - 1 = 2 - 1 = 1$

$DK_D = N - a - M = 12 - 2 - 1 = 9$

$DK_T = N - 1 - M = 12 - 1 - 1 = 10$

E. Menghitung Rata-rata Kuadrat (RK)

$RKA = \frac{JKA}{DKA} = \frac{58,559}{1} = 58,559$

$RKD = \frac{JKresd}{DKD} = \frac{4356,883}{9} = 484,0981$

F. Menghitung harga F hitung

$Fhitung = \frac{RKA}{RKD} = \frac{58,559}{484,0981} = 0,121$

G. Nilai Ftabel

$Ftabel = (1 - alpha, DK_A, DK_D) = 5,12$

H. Rangkuman Ancova

Statistik	JK	DK	RK	F	F tabel
Antar					
Dalam (error)					
Total (residu)					

Dari perhitungan diperoleh F < Ftabel yaitu 0,121 < 5,12 sesuai dengan kriteria pengujian maka Ho diterima. Setelah dikendalikan oleh kovariabel tidak terdapat perbedaan.

Tugas Analisis Korelasi

	Test Score (out of 10)	Hours Playing Video game Per Week	XY	X^2	y^2
	8	2	16	64	4
	3	2	6	9	4
	5	1,5	7,5	25	2,25
	7	1	7	49	1
	1	2,5	2,5	1	6,25
	2	3	6	4	9
	6	1,5	9	36	2,25
	7	2	14	49	4
	9	2	8	16	4
	9	1,5	13,5	81	2,25
Σ	52	19	89,5	334	39

$$r_{xy} = \frac{n\Sigma XY - \Sigma X \Sigma Y}{\sqrt{(n\Sigma X_i^2 - (\Sigma X_i)^2)(n\Sigma Y_i^2 - (\Sigma Y_i)^2)}}$$

$$r_{xy} = \frac{10(89,5) - (52)(19)}{\sqrt{(10(334) - (52)^2)(10(39) - (19)^2)}} = -0,685$$

Dari hasil diatas didapat korelasi negatif antara test score (X) dengan Hours Playing video games per week (Y)