

## Tugas Ancova

No	Treatment A		Treatment B	
	X	Y	X	Y
1	175	135	205	165
2	175	145	175	195
3	235	205	230	160
4	215	175	190	155
5	195	140	155	150
6	195	190	185	170

(Tabel Statistik)

Statistik	Treatment A	Treatment B	Total
N	6	6	12
$\sum X$	1.190	1.140	2.330
$\sum X^2$	238.750	219.900	458.650
$\sum Y$	990	995	1985
$\sum Y^2$	167.600	166.275	333.875
$\sum XY$	199.150	188.900	388.050
$\bar{X}$	198,3	190	388,3
$\bar{Y}$	165	165,8	330,8

Langkah-langkah Perhitungan

A. Sumber Variansi Total (Residu)

$$1. JK_{-1} = \sum Y_i^2 - \frac{(\sum Y_i)^2}{N}$$

$$= 333.875 - \frac{(1985)^2}{12}$$

$$= 5522,91$$

$$\begin{aligned}
 2. JK_{xt} &= \sum x_t^2 = \sum x_t^2 - \frac{(\sum x_t)^2}{N} \\
 &= 458.650 - \frac{(2330)^2}{12} \\
 &= 6241,66
 \end{aligned}$$

$$\begin{aligned}
 3. JP_{xyt} &= \sum xy = \sum xy - \frac{(\sum x)(\sum y)}{N} \\
 &= 388050 - \frac{(2330)(1985)}{12} \\
 &= 2629,16
 \end{aligned}$$

$$\begin{aligned}
 4. \beta_{eta_t} &= \frac{\sum xy}{\sum x_t^2} \\
 &= \frac{2629,16}{6241,66} = 0,42
 \end{aligned}$$

$$\begin{aligned}
 5. JK_{regt} &= \beta \times \sum xy \\
 &= 0,42 \times 2629,16 \\
 &= 1104,24
 \end{aligned}$$

$$\begin{aligned}
 6. JK_{resid} &= JK_{yt} - JK_{regt} \\
 &= 5522,91 - 1104,24 \\
 &= 4418,67
 \end{aligned}$$

B. Sumber Variasi Dalam (JK dalam residu)

$$\begin{aligned}
 1. \text{JK}_{y_d} &= \sum y_i^2 = \sum y_i^2 - \frac{(\sum Y_A)^2}{n_A} \\
 &= 333075 - \frac{(990)^2}{6} + \frac{(995)^2}{6} \\
 &= 5520,83
 \end{aligned}$$

$$\begin{aligned}
 2. \text{JK}_{x_d} &= \sum x_i^2 = \sum x_i^2 - \frac{(\sum X_A)^2}{n_A} \\
 &= 458650 - \frac{(1190)^2}{6} + \frac{(1140)^2}{6} \\
 &= 6033,33
 \end{aligned}$$

$$\begin{aligned}
 3. \text{JK}_{x \cdot y_d} &= \sum x \cdot y = \sum x \cdot y - \frac{(\sum X_A)(\sum Y_A)}{n_A} \\
 &= 388050 - \left( \frac{1190 \times 990}{6} + \frac{1140 \times 995}{6} \right) \\
 &= 2650
 \end{aligned}$$

$$\begin{aligned}
 4. \text{Beda} &= \frac{\sum x \cdot y}{\sum x_i^2} \\
 &= \frac{2650}{6033,33} \\
 &= 0,43
 \end{aligned}$$

$$\begin{aligned}
 5. \text{JK}_{\text{regid}} &= \text{Beda} \times \sum x \cdot y \\
 &= 0,43 \times 2650 \\
 &= 1139,5
 \end{aligned}$$



$$\begin{aligned}
 b. \text{JK}_{\text{res}} &= \text{JK}_{\text{td}} - \text{JK}_{\text{regal}} \\
 &= 5520,83 - 1139,5 \\
 &= 4381,33
 \end{aligned}$$

c. Sumber Variasi Antar

$$\begin{aligned}
 \text{JK}_A &= \text{JK}_{\text{res}_a} - \text{JK}_{\text{res}_d} \\
 &= 4418,67 - 4381,33 \\
 &= 37,34
 \end{aligned}$$

d. Menghitung Derajat Kebebasan

$$\begin{aligned}
 \text{DK}_A &= a - 1 \\
 &= 2 - 1 = 1
 \end{aligned}$$

$$\begin{aligned}
 \text{DK}_T &= N - 1 - M \\
 &= 12 - 1 - 1 = 10
 \end{aligned}$$

$$\begin{aligned}
 \text{DK}_D &= N - a - M \\
 &= 12 - 2 - 1 = 9
 \end{aligned}$$

e. Menghitung Rata-rata kuadrat (RK)

$$\begin{aligned}
 \text{RK}_A &= \frac{\text{JK}_A}{\text{DK}_A} \\
 &= \frac{37,34}{1} = 37,34
 \end{aligned}$$

$$\begin{aligned}
 F^* &= \frac{\text{RK}_A}{\text{RK}_D} \\
 &= \frac{37,34}{486,81} \\
 &= 0,07
 \end{aligned}$$

$$\begin{aligned}
 \text{RK}_D &= \frac{\text{JK}_D}{\text{DK}_D} \\
 &= \frac{4381,33}{9} = 486,81
 \end{aligned}$$

## Rangkuman Ancova 1 faktor

Statistik	JK	DK	RK	F	F tabel
Antar	37,34	1	37,34	0,07	5,12
Dalam (error)	4381,33	9	486,81	-	
Total (residu)	4418,67	10	-	-	

Per  $F$  hitung = 0,07 dan  $F$  tabel  $1-0,05 ; 1:9 = 5,12$

Maka  $F$  hitung  $<$   $F$  tabel, ialah  $H_0$  diterima.

## Tugas Analisis korelasi

Test score (out of 10)	Hours playing vid games per week
8	2
3	2
5	1,5
7	1
1	2,5
2	3
6	1,5
7	2
4	2
9	1,5

## Perhitungan

NO	$x_i$	$y_i$	$x_i y_i$	$x_i^2$	$y_i^2$
1	8	2	16	64	4
2	3	2	6	9	4
3	5	1,5	7,5	25	2,25
4	7	1	7	49	1
5	1	2,5	2,5	1	6,25
6	2	3	6	4	9
7	6	1,5	9	36	2,25
8	7	2	14	49	4
9	4	2	8	16	4
10	9	1,5	13,5	81	2,25
sum	52	19	89,5	334	39



$$r_{xy} = \frac{n \sum x_i y_i - \sum x_i \sum y_i}{\sqrt{(n \sum x_i^2 - (\sum x_i)^2)(n \sum y_i^2 - (\sum y_i)^2)}}$$

$$\begin{aligned} r_{xy} &= \frac{10(895) - 52 \cdot 19}{\sqrt{10(334)^2 - (52)^2 \cdot (10(39) - (19)^2)}} \\ &= \frac{(895) - (988)}{\sqrt{(636)(29)}} \\ &= \frac{-93}{\sqrt{18444}} \\ &= \frac{-92}{135,80} \\ &= -0,68 \end{aligned}$$