

Analisis Residual



**DAN
ESTIMASI PARAMETER**

Estimasi Parameter Model

$$y_{ijk} = \mu + \tau_i + \beta_j + (\tau\beta)_{ij} + \varepsilon_{ijk}$$

Bentuk

$$\begin{aligned} L &= \sum_i^a \sum_j^b \sum_k^n e_{ijk}^2 \\ &= \sum_i^a \sum_j^b \sum_k^n (y_{ijk} - \mu - \tau_i - \beta_j - (\tau\beta)_{ij})^2 \end{aligned}$$

Tentukan $\frac{\partial L}{\partial \mu}, \frac{\partial L}{\partial \tau}, \frac{\partial L}{\partial \beta}, \frac{\partial L}{\partial \tau\beta}$ untuk menentukan

$$\hat{\mu}, \quad \hat{\tau}_i, \quad \hat{\beta}_j, \quad (\hat{\tau}\beta)_{ij}$$

$$\hat{\mu} = \bar{y}_{...}$$

$$\hat{\tau}_i = \bar{y}_{i..} - \bar{y}_{...}$$

$$\hat{\beta}_j = \bar{y}_{.j.} - \bar{y}_{...}$$

$$(\hat{\tau}\beta)_{ij} = \bar{y}_{ij.} - \bar{y}_{i..} - \bar{y}_{.j.} + \bar{y}_{...}$$

jadi

$$\hat{y}_{ijk} = \mu + \hat{\tau}_i + \hat{\beta}_j + (\hat{\tau}\beta)_{ij}$$

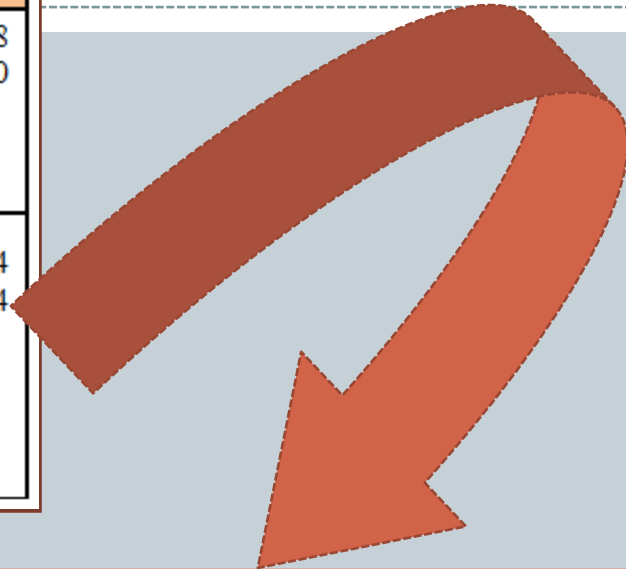
$$\hat{y}_{ijk} = \bar{y}_{ij.}$$

Residual ...

$$\begin{aligned} e_{ijk} &= y_{ijk} - \hat{y}_{ijk} \\ &= y_{ijk} - \bar{y}_{ij.} \end{aligned}$$

Contoh: prestasi vs model & aktivitas

		AKTIVITAS belajar matematika SISWA (B)											
		Tinggi (b ₁)				Sedang (b ₂)				Rendah (b ₃)			
Model Pembelajaran (A)	LC5E (a ₁)	100	96	96	88	96	92	88	88	76	72	72	68
		88	84	72		88	84	80	80	68	64	64	60
Model Pembelajaran (A)	Konvensional (a ₂)					76	76	76	76	60	60		
						76							
Model Pembelajaran (A)		92	88	88	84	84	84	80	80	84	76	76	64
		80	80	76		80	76	72	72	68	68	64	64
Model Pembelajaran (A)						72	72	68	68	56			
						68	68	68	62				



$$\hat{\mu} = \bar{y}_{...} = 77.42934$$

$$\hat{\tau}_i = \bar{y}_{i..} - \bar{y}_{...} \Rightarrow \hat{\tau}_1, \hat{\tau}_2, \hat{\tau}_3 ?$$

$$\hat{\beta}_j = \bar{y}_{.j.} - \bar{y}_{...} \Rightarrow \hat{\beta}_1, \hat{\beta}_2, \hat{\beta}_3 ?$$

$$(\hat{\tau}\hat{\beta})_{ij} = \bar{y}_{ij.} - \bar{y}_{i..} - \bar{y}_{.j.} + \bar{y}_{...}$$

	T	S	R
LC5E	89.1429	82.76923	66.4
	(7)	(13)	(10)
Konvensional	84	73.375	68.88889
	(7)	(16)	(9)
Total	173.1429	156.1442	135.2889
	(14)	(29)	(19)
rataan	86.57145	78.07212	67.64445

residual



y_{ijk}	Mod	Akt	$\bar{y}_{ij\cdot}$	Res	y_{ijk}	Mod	Akt	$\bar{y}_{ij\cdot}$	Res
100	1	1	89.1429	10.8571	80	2	1	84	-4
88	1	1	89.1429	-1.1429	88	2	1	84	4
96	1	1	89.1429	6.8571	80	2	1	84	-4
84	1	1	89.1429	-5.1429	88	2	1	84	4
96	1	1	89.1429	6.8571	76	2	1	84	-8
72	1	1	89.1429	-17.1429	84	2	1	84	0
88	1	1	89.1429	-1.1429	84	2	2	73.375	10.625
96	1	2	82.76923	13.23077	80	2	2	73.375	6.625
88	1	2	82.76923	5.23077	72	2	2	73.375	-1.375
76	1	2	82.76923	-6.76923	68	2	2	73.375	-5.375
76	1	2	82.76923	-6.76923	84	2	2	73.375	10.625
92	1	2	82.76923	9.23077	76	2	2	73.375	2.625
84	1	2	82.76923	1.23077	72	2	2	73.375	-1.375
76	1	2	82.76923	-6.76923	68	2	2	73.375	-5.375
88	1	2	82.76923	5.23077	80	2	2	73.375	6.625
80	1	2	82.76923	-2.76923	72	2	2	73.375	-1.375
76	1	2	82.76923	-6.76923	68	2	2	73.375	-5.375
88	1	2	82.76923	5.23077	68	2	2	73.375	-5.375
80	1	2	82.76923	-2.76923	80	2	2	73.375	6.625
76	1	2	82.76923	-6.76923	72	2	2	73.375	-1.375
76	1	3	66.4	9.6	68	2	2	73.375	-5.375
68	1	3	66.4	1.6	60	2	2	73.375	-11.375