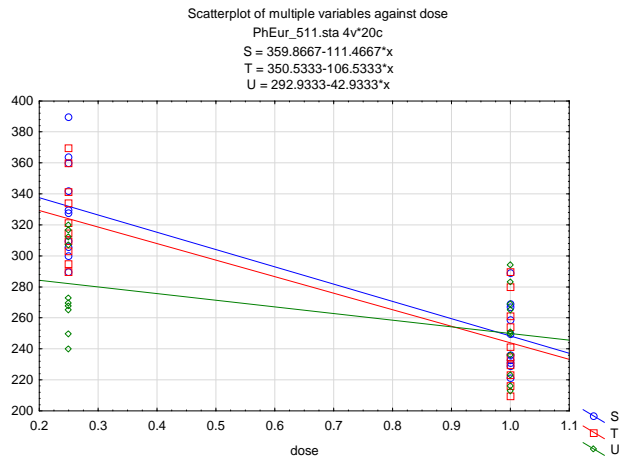


PhEur 5.1.1. Two-dose multiple assay with completely randomised design

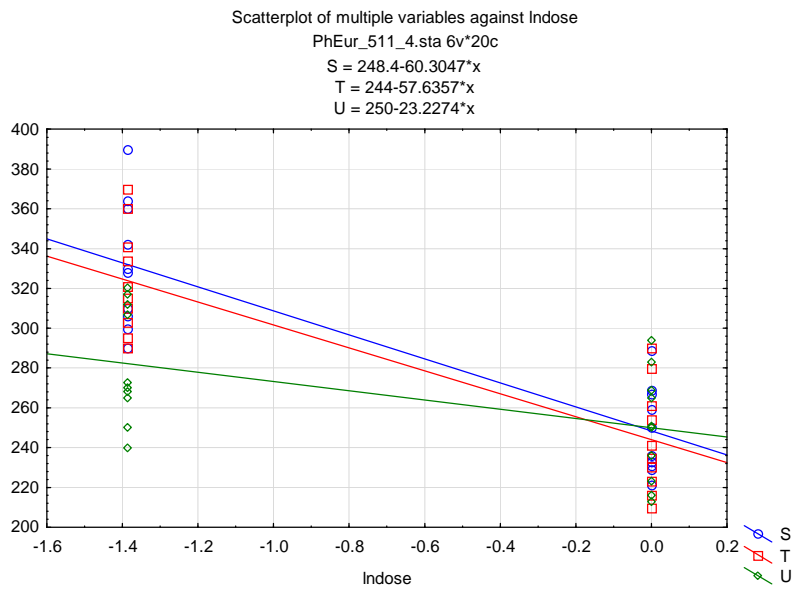
An assay of corticotrophin by subcutaneous injection in rats



két dózis, tehát a linearitás nem vizsgálható

Parallel_példák

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Parallel_példák

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Univariate Tests of Significance for y (PhEur_511_3.sta)					
Sigma-restricted parameterization					
Type I decomposition; Std. Error of Estimate: 27.66897					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	4706800.4	1	4706800.4	6148.082	0.000000
prepn	6256.6	2	3128.3	4.086	0.022258
Indose	63830.8	1	63830.8	83.377	0.000000
prepn*Indose	8218.2	2	4109.1	5.367	0.007480
Error	41340.9	54	765.6		

← párhuzamosság

Univariate Tests of Significance for y (PhEur_511_3.sta)					
Sigma-restricted parameterization					
Effective hypothesis decomposition; Std. Error of Estimate: 27.66897					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	4706800.4	1	4706800.4	6148.082	0.000000
treatment	78305.7	5	15661.1	20.457	0.000000
Error	41340.9	54	765.6		

Univariate Results for Each DV (PhEur_511_3.sta)					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	Degr. of Freedom	y SS	y MS	y F	y p
Intercept	1	4706800.4	4706800.4	6148.082	0.000000
treatment	5	78305.7	15661.1	20.457	0.000000
Error	54	41340.9	765.6		
Total	59	119646.6			

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Univariate Tests of Significance for y (PhEur_511_2.sta)					
Sigma-restricted parameterization					
Type I decomposition; Std. Error of Estimate: 27.17602					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	3296482.2	1	3296482.2	4463.536	0.000000
prepn	390.6	1	390.6	0.529	0.471766
Indose	66830.6	1	66830.6	90.491	0.000000
prepn*Indose	34.2	1	34.2	0.046	0.830771
Error	26587.3	36	738.5		

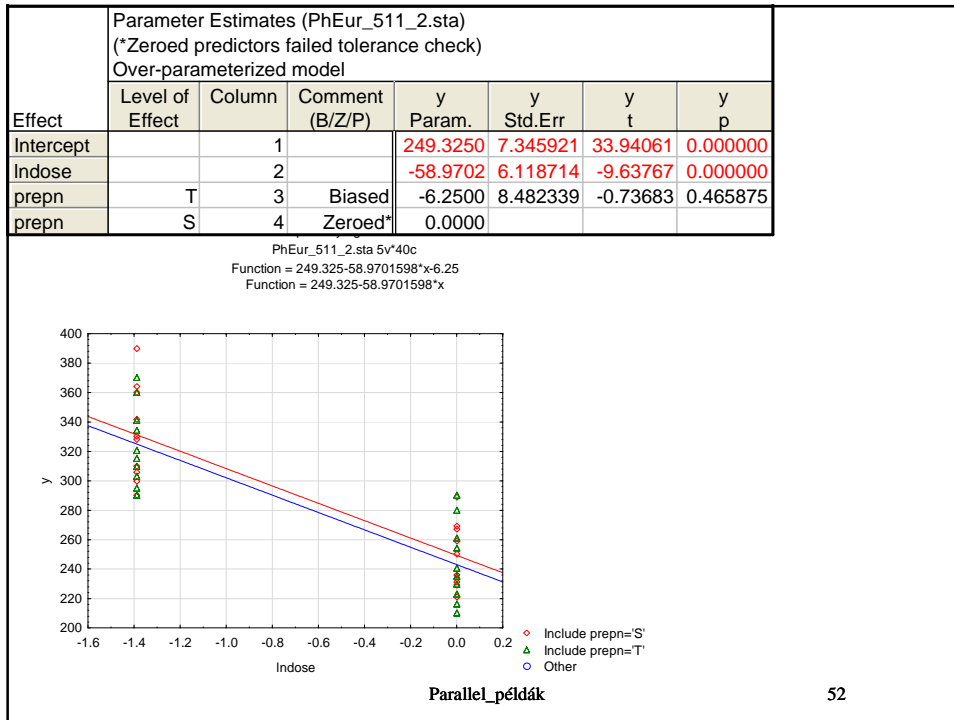
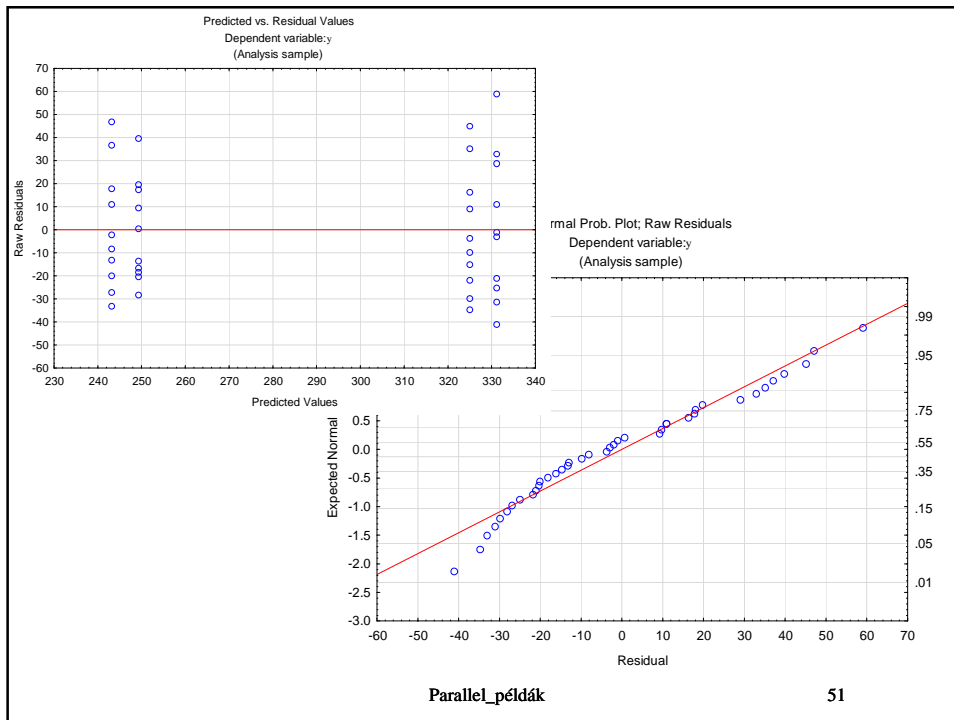
csak S és T

Univariate Tests of Significance for y (PhEur_511_2.sta)					
Sigma-restricted parameterization					
Effective hypothesis decomposition; Std. Error of Estimate: 27.17602					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	3296482.2	1	3296482.2	4463.536	0.000000
treatment	67255.5	3	22418.5	30.355	0.000000
Error	26587.3	36	738.5		

Univariate Results for Each DV (PhEur_511_2.sta)					
Sigma-restricted parameterization					
Effective hypothesis decomposition					
Effect	Degr. of Freedom	y SS	y MS	y F	y p
Intercept	1	3296482.2	3296482.2	4463.536	0.000000
treatment	3	67255.5	22418.5	30.355	0.000000
Error	36	26587.3	738.5		
Total	39	93842.8			

Parallel_példák

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$$\ln x_{\text{minta}} - \ln x_{\text{std}} = \frac{a'_{\text{minta}} - a'_{\text{std}}}{b} = \frac{-6.25}{-58.970} = 0.1060$$

$$\frac{x_{\text{minta}}}{x_{\text{std}}} = \exp(0.1060) = 0.899$$

$$\text{potency} = \frac{1}{0.899} = 1.11$$

Konfidencia-intervallum

$$CM'_T \pm \sqrt{(C-1)[C(M'_T)^2 + 2V]}$$

$$C = \frac{S_{\text{regr}}}{S_{\text{regr}} - t_{\alpha/2}^2 S_r^2}$$

$$M'_T = \ln x_{\text{minta}} - \ln x_{\text{std}}$$

$$V = \frac{S_{\text{regr}}}{b^2 dn}$$

d a dózisok száma, n az ismétlések száma

$$C = \frac{S_{\text{regr}}}{S_{\text{regr}} - t_{\alpha/2}^2 S_r^2} = \frac{66830.6}{66830.6 - 738.54 \cdot 2.028^2} = 1.0476$$

$$V = \frac{S_{\text{regr}}}{b^2 dn} = \frac{66830.6}{(-58.97)^2 \cdot 2 \cdot 10} = 0.9609$$

$$M'_T = \ln x_{\text{minta}} - \ln x_{\text{std}} = 0.1060$$

$$CM'_T \pm \sqrt{(C-1)[C(M'_T)^2 + 2V]} =$$

$$= 1.0476 \cdot 0.1060 \pm \sqrt{0.0476 \cdot [1.00476 \cdot 0.1060^2 + 2 \cdot 0.9609]} =$$

$$= 0.111 \pm 0.3034 = (-0.1924, 0.4144)$$

$$\frac{C_{0\text{minta}}}{C_{0\text{std}}} = (0.825, 1.513)$$

PhEur 5.1.2. Three-dose Latin square design

Antibiotic agar diffusion assay using a rectangular tray

	1 Col	2 Row1	3 Row2	4 Row3	5 Row4	6 Row5	7 Row6
1	1 S1	T1	T2	S3	S2	T3	
2	2 T1	T3	S1	S2	T2	S3	
3	3 T2	S3	S2	S1	T3	T1	
4	4 S3	S2	T3	T1	S1	T2	
5	5 S2	T2	S3	T3	T1	S1	
6	6 T3	S1	T1	T2	S3	S2	

	1 Col	2 Row1	3 Row2	4 Row3	5 Row4	6 Row5	7 Row6
1	1	161	160	178	187	171	194
2	2	151	192	150	172	170	192
3	3	162	195	174	161	193	151
4	4	194	184	199	160	163	171
5	5	176	181	201	202	154	151
6	6	193	166	161	186	198	182

y: inhibíciós zóna (mm) *10

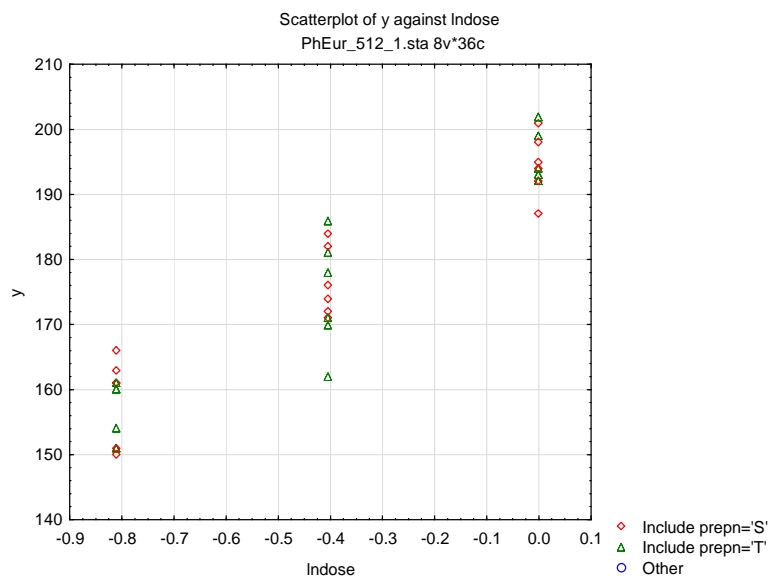
	1	2	3	4	5	6	7	8
	Row	Col	Treatment	prepn	higszer	dilution	Indose	y
1	1	1	S1	S	2	2.25	-0.811	161
2	1	2	T1	T	2	2.25	-0.811	160
3	1	3	T2	T	1	1.5	-0.405	178
4	1	4	S3	S	0	1	0.000	187
5	1	5	S2	S	1	1.5	-0.405	171
6	1	6	T3	T	0	1	0.000	194
7	2	1	T1	T	2	2.25	-0.811	151
8	2	2	T3	T	0	1	0.000	192
9	2	3	S1	S	2	2.25	-0.811	150
10	2	4	S2	S	1	1.5	-0.405	172
11	2	5	T2	T	1	1.5	-0.405	170
12	2	6	S3	S	0	1	0.000	192
13	3	1	T2	T	1	1.5	-0.405	162
14	3	2	S3	S	0	1	0.000	195
15	3	3	S2	S	1	1.5	-0.405	174

dilution==1.5^higszer Indose=log(1/dilution)

a Treatment egy szintje egy készítmény*dózis kombináció

Parallel_példák

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Parallel_példák

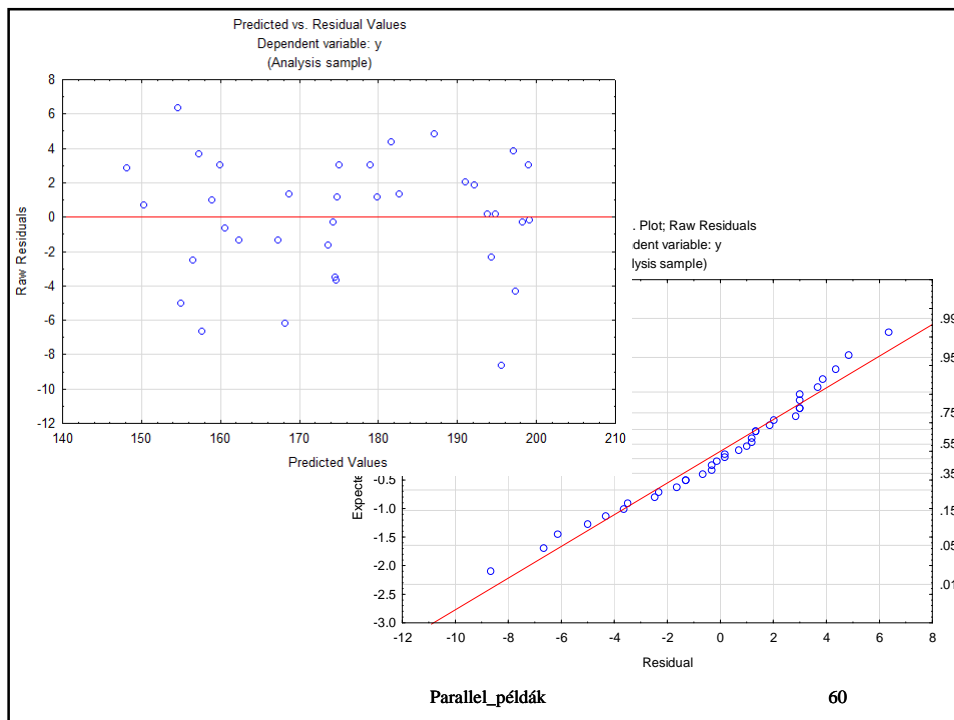
58

Main effects ANOVA

Univariate Tests of Significance for y (PhEur_512_1.sta)					
Sigma-restricted parameterization					
Effective hypothesis decomposition; Std. Error of Estimate: 4.557045					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1115136.00	1	1115136.00	53698.36	0.000000
Row	412.00	5	82.40	3.97	0.011584
Col	218.67	5	43.73	2.11	0.106919
Treatment	8510.00	5	1702.00	81.96	0.000000
Error	415.33	20	20.77		

A sorok közötti különbség szignifikáns, megérte!

Az előnye ennek a vizsgálatnak, hogy nem az illesztett egyenesekhez képest nézi az eltéréseket, tehát azok hibája nem a reziduumba (az Error sorba) kerül.



General linear models > General linear models

Select dependent vars, categorical, and continuous predictors

1 - Row 2 - Col 3 - Treatment 4 - prepn 5 - higszer 6 - dilution 7 - Indose 8 - y	1 - Row 2 - Col 3 - Treatment 4 - prepn 5 - higszer 6 - dilution 7 - Indose 8 - y	1 - Row 2 - Col 3 - Treatment 4 - prepn 5 - higszer 6 - dilution 7 - Indose 8 - y
--	--	--

GLM Between Effects: PhEur_512_1.sta

Use default effects for the between design
 Use custom effects for the between design

To build custom effects to be included in the between design, select effects and a method for building the effects.

Predictor variables Categorical: "Row" "Col" prepn Continuous: Indose	Method Add Full gross Hierarc. nest Full factorial Surface Mixture	Effects in between "Row" "Col" prepn Indose prepn*Indose
--	---	--

Parallel_példák 61

Univariate Tests of Significance for y (PhEur_512_1.sta) Over-parameterized model Type I decomposition; Std. Error of Estimate: 4.373502					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1115136.00	1	1115136	58300.067	0.000000
Row	412.00	5	82	4.308	0.006964
Col	218.67	5	44	2.286	0.081206
prepn	11.11	1	11	0.581	0.454055
Indose	8475.04	1	8475	443.081	0.000000
prepn*Indose	18.38	1	18	0.961	0.337678
Error	420.81	22	19		

Type I: ebben a sorrendben építjük föl a modellt
a párhuzamosság teljesül

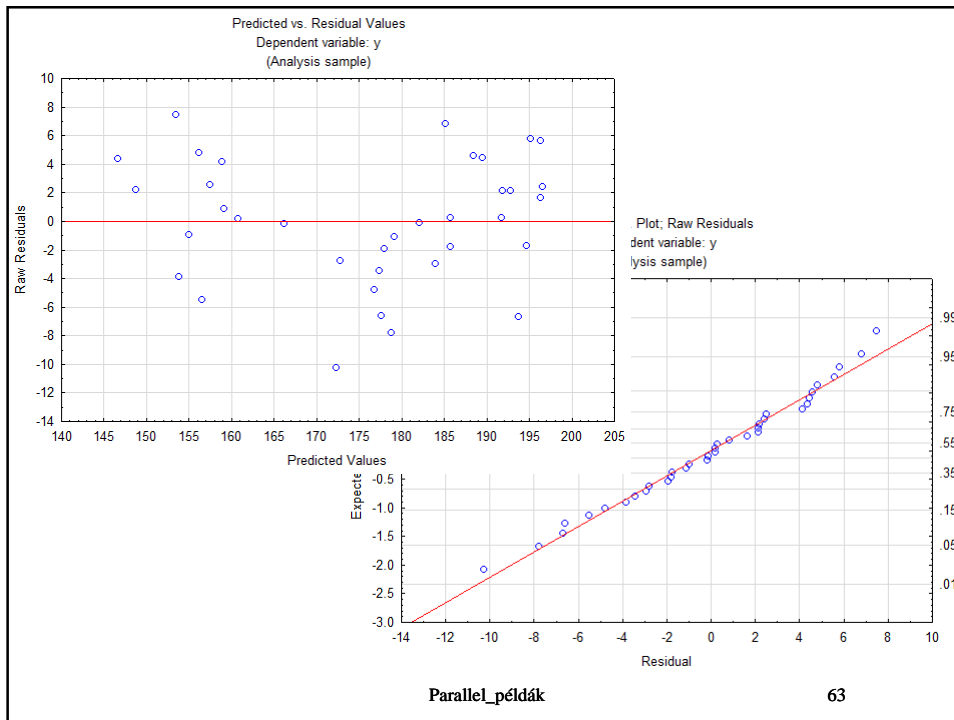
↙

Type III, részben mások az eredmények!

Univariate Tests of Significance for y (PhEur_512_1.sta) Over-parameterized model Type III decomposition; Std. Error of Estimate: 4.373502					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	546390.62	1	546390.6	28565.67	0.000000
prepn	1.47	1	1.5	0.08	0.784237
Indose	8475.04	1	8475.0	443.08	0.000000
prepn*Indose	18.38	1	18.4	0.96	0.337678
Row	412.00	5	82.4	4.31	0.006964
Col	218.67	5	43.7	2.29	0.081206
Error	420.81	22	19.1		

Type III: ha már az összes többi tag benne van, mennyit hoz, ha ezt is bevesszük

Parallel_példák 62



GLM Between Effects: PhEur_512_1.sta

Use default effects for the between design
 Use custom effects for the between design

To build custom effects to be included in the between design, select predictor effects and a method for building the effects.

Predictor variables: Method: Effects in between design

Categorical: "Row", "Col", prepn

Continuous: Indose

"Row"
 "Col"
 prepn
 Indose
 prepn*Indose
 Indose*prepn*Indose

a linearitás teljesül, a másodfokú tag nem szignifikáns

Univariate Tests of Significance for y (PhEur_512_1.sta)					
Over-parameterized model					
Type I decomposition; Std. Error of Estimate: 4.557045					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1115136.00	1	1115136.00	53698.36	0.000000
Row	412.00	5	82.40	3.97	0.011584
Col	218.67	5	43.73	2.11	0.106919
prepn	11.11	1	11.11	0.54	0.472977
Indose	8475.04	1	8475.04	408.11	0.000000
prepn*Indose	18.37	1	18.37	0.88	0.358105
prepn*Indose^2	5.47	2	2.74	0.13	0.877310
Error	415.33	20	20.77		

Parallel_példák 64

Univariate Tests of Significance for y (PhEur_512_1.sta)					
Sigma-restricted parameterization					
Effective hypothesis decomposition; Std. Error of Estimate: 4.557045					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1115136.00	1	1115136.00	53698.36	0.000000
Row	412.00	5	82.40	3.97	0.011584
Col	218.67	5	43.73	2.11	0.106919
Treatment	8510.00	5	1702.00	81.96	0.000000
Error	415.33	20	20.77		

Univariate Tests of Significance for y (PhEur_512_1.sta)					
Over-parameterized model					
Type I decomposition; Std. Error of Estimate: 4.373502					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1115136.00	1	1115136.00	58300.07	0.000000
Row	412.00	5	82.40	4.31	0.006964
Col	218.67	5	43.73	2.29	0.081206
prepn	11.11	1	11.11	0.58	0.454055
Indose	8475.04	1	8475.04	443.08	0.000000
prepn*Indose	18.38	1	18.38	0.96	0.337678
Error	420.81	22	19.13		

másik módszer a linearitás ellenőrzésére

$$S_{\text{nonlin}} = S_{\text{treatment}} - S_{\text{prepn}} - S_{\text{Indose}} - S_{\text{prepn*Indose}} =$$

$$= 8510.0 - 11.11 - 8475.04 - 18.38 = 5.47 \quad v=5-1-1-1=2$$

Parallel_példák 65

GLM Between Effects: PhEur_512_1.s

Use default effects for the between design

Use custom effects for the between design

To build custom effects to be included in the between design effects and a method for building the effects.

Predictor variables: Categorical: "Row", "Col", prepn; Continuous: Indose

Method: Add, Full gross, Hierarc. nest, Full factorial, Surface, Mixture

Effects in: "Row", "Col", prepn, Indose

meredekség →

Analysis of covariance, mert a párhuzamosság teljesült

Parameter Estimates (PhEur_512_1.sta)					
(*Zeroed predictors failed tolerance check)					
Over-parameterized model					
Effect	Level of Effect	Column	Comment (B/Z/P)	y Param.	y Std.Err
Intercept		1		196.7361	2.675921
Row	1	2	Biased	-5.8333	2.522882
Row	2	3	Biased	-9.8333	2.522882
Row	3	4	Biased	-8.3333	2.522882
Row	4	5	Biased	-2.5000	2.522882
Row	5	6	Biased	-3.5000	2.522882
Row	6	7	Zeroed*	0.0000	
Col	1	8	Biased	-0.6667	2.522882
Col	2	9	Biased	6.1667	2.522882
Col	3	10	Biased	3.6667	2.522882
Col	4	11	Biased	4.5000	2.522882
Col	5	12	Biased	1.3333	2.522882
Col	6	13	Zeroed*	0.0000	
prepn	S	14	Biased	1.1111	1.456587
prepn	T	15	Zeroed*	0.0000	
Indose		16		46.3460	2.199878

Parallel_példák 66

$$\ln x_{\text{minta}} - \ln x_{\text{std}} = \frac{a'_{\text{minta}} - a'_{\text{std}}}{b} = \frac{-1.11}{46.346} = -0.024$$

$$\frac{x_{\text{minta}}}{x_{\text{std}}} = \exp(-0.024) = 0.976$$

Konfidencia-intervallum $CM'_T \pm \sqrt{(C-1)[C(M'_T)^2 + 2V]}$

$$C = \frac{S_{\text{regr}}}{S_{\text{regr}} - t_{\alpha/2}^2 S_r^2}$$

$$M'_T = \ln x_{\text{minta}} - \ln x_{\text{std}}$$

$$V = \frac{S_{\text{regr}}}{b^2 dn}$$

d a dózisok száma, n az ismétlések száma

$$C = \frac{S_{\text{regr}}}{S_{\text{regr}} - t_{\alpha/2}^2 S_r^2} = \frac{8475.04}{8475.04 - 20.7667 \cdot 2.086^2} = 1.0108$$

$$V = \frac{S_{\text{regr}}}{b^2 dn} = \frac{8475.04}{(46.346)^2 \cdot 3 \cdot 6} = 0.2192$$

$$M'_T = \ln x_{\text{minta}} - \ln x_{\text{std}} = -0.024$$

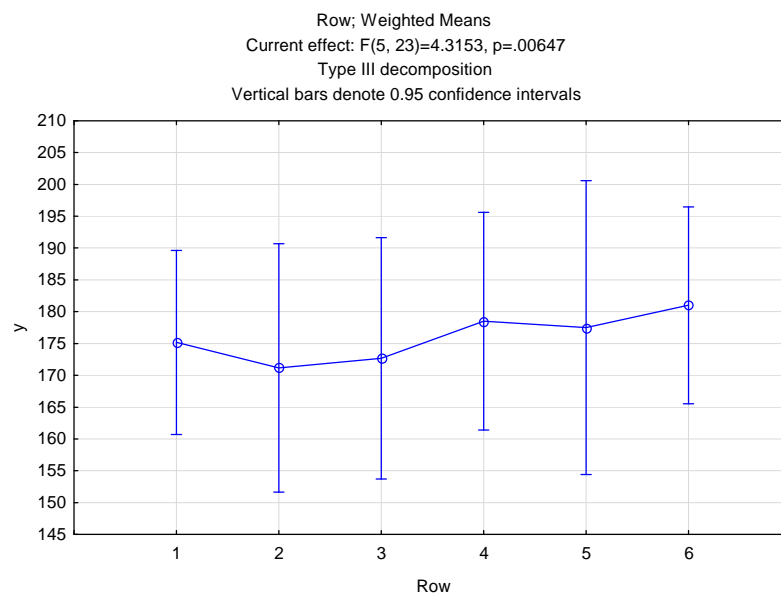
$$CM'_T \pm \sqrt{(C-1)[C(M'_T)^2 + 2V]} =$$

$$= 1.0108 \cdot (-0.024) \pm \sqrt{0.0108 \cdot [1.0108 \cdot (-0.024)^2 + 2 \cdot 0.2192]} =$$

$$= -0.024 \pm 0.0688 = (-0.0928, 0.0448)$$

$$\frac{C_{0\text{minta}}}{C_{0\text{std}}} = (0.911, 1.0458)$$

a különbség oka az eltérő modell



Kérdezhetjük, hogy a sor és oszlop hatása mint ingadozás, mekkora:

Components of Variance (PhEur_512_1.sta) Over-parameterized model Type III decomposition	
Effect	y
Row	10.55087
Col	4.10642
Error	19.09481

Univariate Tests of Significance for y (PhEur_512_1.sta) Over-parameterized model Type III decomposition; Std. Error of Estimate: 4.369760								
Effect	Effect (F/R)	SS	Degr. of Freedom	MS	Den.Syn. Error df	Den.Syn. Error MS	F	p
Intercept	Fixed	546390.6	1	546390.6	10.55313	54.27229	10067.58	0.000000
Row	Random	412.0	5	82.4	23.00000	19.09481	4.32	0.006472
Col	Random	218.7	5	43.7	23.00000	19.09481	2.29	0.079160
prepn	Fixed	11.1	1	11.1	23.00000	19.09481	0.58	0.453325
Indose	Fixed	8475.0	1	8475.0	23.00000	19.09481	443.84	0.000000
Error		439.2	23	19.1				

Parallel_példák

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Ha nem törődne a sorokkal és oszlopokkal:

Univariate Tests of Significance for y (PhEur_512_1.sta) Over-parameterized model Type III decomposition; Std. Error of Estimate: 5.693822					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	546390.6	1	546390.6	16853.71	0.000000
Indose	8475.0	1	8475.0	261.42	0.000000
prepn	11.1	1	11.1	0.34	0.562241
Error	1069.8	33	32.4		

df nagyobb ugyan, de az Error MS-be bekerül a sor és oszlop okozta különbség is, p nagyobb

Összehasonlításul a helyes földolgozás:

Univariate Tests of Significance for y (PhEur_512_1.sta) Over-parameterized model Type I decomposition; Std. Error of Estimate: 4.373502					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1115136.00	1	1115136.00	58300.07	0.000000
Row	412.00	5	82.40	4.31	0.006964
Col	218.67	5	43.73	2.29	0.081206
prepn	11.11	1	11.11	0.58	0.454055
Indose	8475.04	1	8475.04	443.08	0.000000
prepn*Indose	18.38	1	18.38	0.96	0.337678
Error	420.81	22	19.13		

Parallel_példák

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					Parameter Estimates (PhEur_512_1.sta) (*Zeroed predictors failed tolerance check) Over-parameterized model				
					Level of Effect	Column	Comment (B/Z/P)	y Param.	y Std.Err
					Effect				
					Intercept	1		196.7361	2.675921
					Row	1	2	Biased	-5.8333 2.522882
							3	Biased	-9.8333 2.522882
							4	Biased	-8.3333 2.522882
							5	Biased	-2.5000 2.522882
							6	Biased	-3.5000 2.522882
							7	Zeroed*	0.0000
							8	Biased	-0.6667 2.522882
Effect	Level of Effect	Column	Comment (B/Z/P)	y Param.	y Std.Err				
Intercept		1		194.2361	1.775361				
Indose		2		46.3460	2.866453				
prepn	S	3	Biased	1.1111	1.897941				
prepn	T	4	Zeroed*	0.0000					
					Col	5	12	Biased	1.3333 2.522882
					Col	6	13	Zeroed*	0.0000
					prepn	S	14	Biased	1.1111 1.456587
					prepn	T	15	Zeroed*	0.0000
					Indose		16		46.3460 2.199878

a becült paraméterek nem különböznek

Parallel_példák 73

Konfidencia-intervallum $CM'_T \pm \sqrt{(C-1)[C(M'_T)^2 + 2V]}$

$$C = \frac{S_{regr}}{S_{regr} - t_{\alpha/2}^2 S_r^2} \quad M'_T = \ln x_{\text{minta}} - \ln x_{\text{std}}$$

$$V = \frac{S_{regr}}{b^2 dn} \quad d \text{ a dózisok száma, } n \text{ az ismétlések száma}$$

$$C = \frac{S_{regr}}{S_{regr} - t_{\alpha/2}^2 S_r^2} = \frac{8475.04}{8475.04 - 32.4 \cdot 2.04^2} = 1.016 \quad \text{az 1.0108 helyett}$$

$$V = \frac{S_{regr}}{b^2 dn} = \frac{8475.04}{(46.346)^2 \cdot 3 \cdot 6} = 0.2192$$

Parallel_példák 74

$$M'_T = \ln x_{\text{minta}} - \ln x_{\text{std}} = -0.024$$

$$CM'_T \pm \sqrt{(C-1)[C(M'_T)^2 + 2V]} =$$

$$= 1.0108 \cdot (-0.024) \pm \sqrt{0.0108 \cdot [1.0108 \cdot (-0.024)^2 + 2 \cdot 0.2192]} =$$

$$= -0.024 \pm 0.0688 = (-0.0928, 0.0448)$$

$$= 0.984 \cdot (-0.024) \pm \sqrt{0.016 \cdot [1.016 \cdot (-0.024)^2 + 2 \cdot 0.2192]} =$$

$$= -0.0236 \pm 0.0838 = (-0.1074, 0.0602)$$

$$\frac{C_{0\text{minta}}}{C_{0\text{std}}} = (0.898, 1.062) \qquad (0.911, 1.0458) \quad \text{helyett}$$

PhEur 5.1.3. Four-dose randomised block design

Antibiotic turbidimetric assay

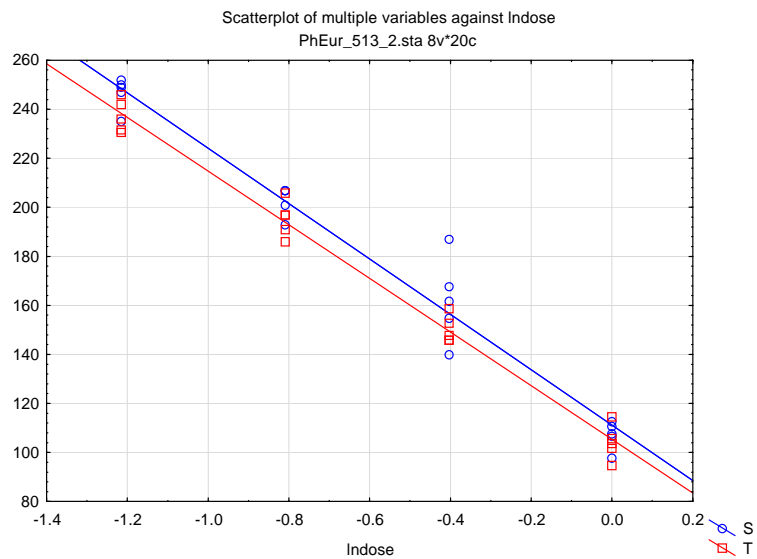
A csöveket vízfürdőbe teszik, nyolcasával, az egy blokk.

	1 Block	2 S1	3 S2	4 S3	5 S4	6 T1	7 T2	8 T3	9 T4
1	1	252	207	168	113	242	206	146	115
2	2	249	201	187	107	236	197	153	102
3	3	247	193	162	111	246	197	148	104
4	4	250	207	155	108	231	191	159	106
5	5	235	207	140	98	232	186	146	95

	1	2	3	4	5	6	7	8
	Block	prepn	higszer	dozis no	dilution	Treatment	Indose	y
1	1 S		3	1	3.375	S1	-1.2164	252
2	2 S		3	1	3.375	S1	-1.2164	249
3	3 S		3	1	3.375	S1	-1.2164	247
4	4 S		3	1	3.375	S1	-1.2164	250
5	5 S		3	1	3.375	S1	-1.2164	235
6	1 S		2	2	2.25	S2	-0.81093	207
7	2 S		2	2	2.25	S2	-0.81093	201
8	3 S		2	2	2.25	S2	-0.81093	193
9	4 S		2	2	2.25	S2	-0.81093	207
10	5 S		2	2	2.25	S2	-0.81093	207
11	1 S		1	3	1.5	S3	-0.40547	168
12	2 S		1	3	1.5	S3	-0.40547	187
13	3 S		1	3	1.5	S3	-0.40547	162
14	4 S		1	3	1.5	S3	-0.40547	155
15	5 S		1	3	1.5	S3	-0.40547	140

Parallel_példák

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Parallel_példák

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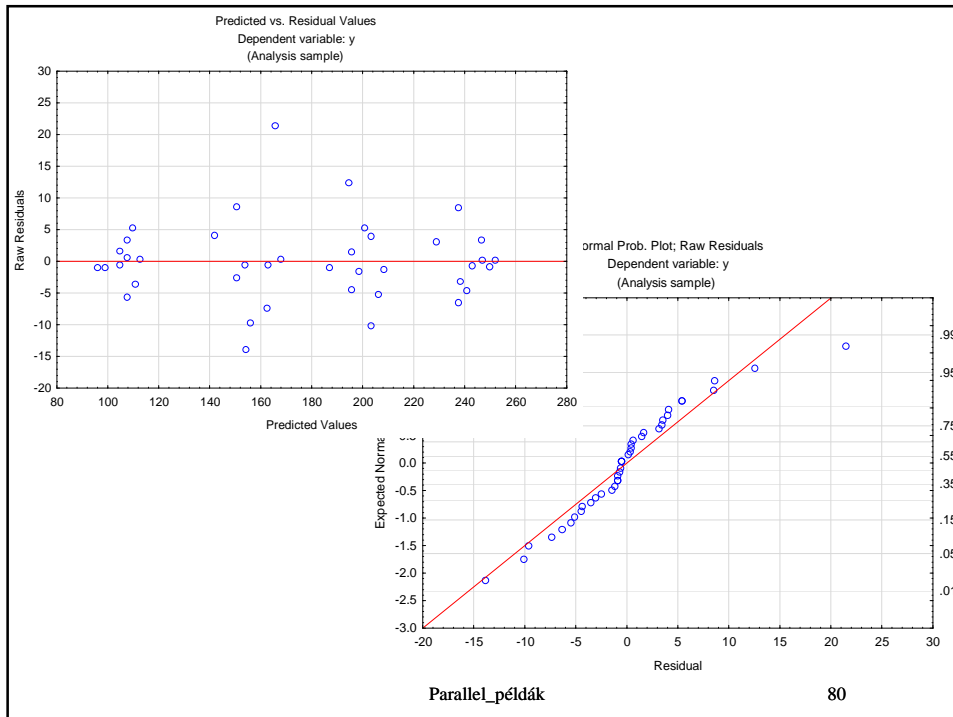
Main effects ANOVA

Univariate Tests of Significance for y (PhEur_513_1.sta)					
Sigma-restricted parameterization					
Effective hypothesis decomposition; Std. Error of Estimate: 7.342756					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1237280.63	1	1237280.63	22948.27	0.000000
Block	876.75	4	219.19	4.07	0.010099
Treatment	102661.97	7	14666.00	272.02	0.000000
Error	1509.65	28	53.92		

A blokk hatása szignifikáns.

Parallel_példák

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Parallel_példák

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General linear models > General linear models

GLM Between Effects: PhEur_513_1.sta

Use default effects for the between design

Use custom effects for the between design

To build custom effects to be included in the between design, select effects and a method for building the effects.

Predictor variables	Method	Effects in between
Categorical:	<input type="button" value="Add"/> <input type="button" value="Full cross"/> <input type="button" value="Hierarc. nest"/> <input type="button" value="Full factorial"/> <input type="button" value="Surface"/> <input type="button" value="Mixture"/>	Block prepn Indose prepn*Indose
Continuous:		
Indose		

Univariate Tests of Significance for y (PhEur_513_1.sta)					
Over-parameterized model					
Type I decomposition; Std. Error of Estimate: 7.434694					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1237280.63	1	1237280.63	22384.22	0.000000
Block	876.75	4	219.19	3.97	0.010049
prepn	632.02	1	632.02	11.43	0.001916
Indose	101745.61	1	101745.61	1840.73	0.000000
prepn*Indose	25.20	1	25.20	0.46	0.504352
Error	1768.79	32	55.27		

→ a párhuzamosság teljesül

Parallel_példák

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Univariate Tests of Significance for y (PhEur_513_1.sta)					
Sigma-restricted parameterization					
Effective hypothesis decomposition; Std. Error of Estimate: 7.342756					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1237280.63	1	1237280.63	22948.27	0.000000
Block	876.75	4	219.19	4.07	0.010099
Treatment	102661.97	7	14666.00	272.02	0.000000
Error	1509.65	28	53.92		

Univariate Tests of Significance for y (PhEur_513_1.sta)					
Over-parameterized model					
Type I decomposition; Std. Error of Estimate: 7.434694					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1237280.63	1	1237280.63	22384.22	0.000000
Block	876.75	4	219.19	3.97	0.010049
prepn	632.02	1	632.02	11.43	0.001916
Indose	101745.61	1	101745.61	1840.73	0.000000
prepn*Indose	25.20	1	25.20	0.46	0.504352
Error	1768.79	32	55.27		

$$S_{\text{nonlin}} = S_{\text{treatment}} - S_{\text{prepn}} - S_{\text{Indose}} - S_{\text{prepn*Indose}} =$$

$$= 102661.97 - 632.02 - 101745.61 - 25.21 = 259.13 \quad v=7-1-1-1=4$$

Parallel_példák

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Univariate Tests of Significance for y (PhEur_513_1.st)					
Over-parameterized model					
Type I decomposition; Std. Error of Estimate: 7.342756					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1237280.63	1	1237280.63	22948.27	0.0000
Block	876.75	4	219.19	4.07	0.0100
prepn	632.02	1	632.02	11.72	0.0019
Indose	101745.61	1	101745.61	1887.11	0.0000
prepn*Indose	25.20	1	25.20	0.47	0.4997
prepn*Indose^2	182.45	2	91.22	1.69	0.2024
prepn*Indose^3	76.69	2	38.34	0.71	0.4997
Error	1509.65	28	53.92		

a görbeség nem szignifikáns, sem másodfokú, sem harmadfokú tag nem kell

182.45+76.69=259.14

Parallel_példák 83

Analysis of covariance

Parameter Estimates (PhEur_513_1.sta)					
(*Zeroed predictors failed tolerance check)					
Over-parameterized model					
Effect	Level of Effect	Column	Comment (B/Z/P)	y Param.	y Std.Err
Intercept		1		95.735	3.255899
Block	1	2	Biased	13.750	3.686580
Block	2	3	Biased	11.625	3.686580
Block	3	4	Biased	8.625	3.686580
Block	4	5	Biased	8.500	3.686580
Block	5	6	Zeroed*	0.000	
prepn	S	7	Biased	7.950	2.331598
prepn	T	8	Zeroed*	0.000	
Indose		9		-111.255	2.571670

$$\ln x_{\text{minta}} - \ln x_{\text{std}} = \frac{a'_{\text{minta}} - a'_{\text{std}}}{b} = \frac{-7.95}{-111.255} = 0.0715$$

$$\frac{x_{\text{minta}}}{x_{\text{std}}} = \exp(0.0715) = 1.074$$

Parallel_példák 84

Konfidencia-intervallum $CM'_T \pm \sqrt{(C-1)[C(M'_T)^2 + 2V]}$

$$C = \frac{S_{regr}}{S_{regr} - t_{\alpha/2}^2 S_r^2}$$

$$M'_T = \ln x_{\text{minta}} - \ln x_{\text{std}}$$

$$V = \frac{S_{regr}}{b^2 dn}$$

d a dózisok száma, n az ismétlések száma

$$C = \frac{S_{regr}}{S_{regr} - t_{\alpha/2}^2 S_r^2} = \frac{101745.61}{101745.61 - 53.92 \cdot 2.048^2} = 1.0022$$

$$V = \frac{S_{regr}}{b^2 dn} = \frac{101745.61}{(-111.255)^2 \cdot 4 \cdot 5} = 0.411$$

$$M'_T = \ln x_{\text{minta}} - \ln x_{\text{std}} = 0.0715$$

$$CM'_T \pm \sqrt{(C-1)[C(M'_T)^2 + 2V]} =$$

$$= 1.0022 \cdot 0.0715 \pm \sqrt{0.0022 \cdot [1.0022 \cdot 0.0715^2 + 2 \cdot 0.411]} =$$

$$= 0.0715 \pm 0.0427 = (0.0288, 0.114)$$

$$\frac{c_{0\text{minta}}}{c_{0\text{std}}} = (1.029, 1.121)$$

A blokk figyelembe vétele nélkül

Univariate Tests of Significance for y (PhEur_513_1.sta)					
Sigma-restricted parameterization					
Effective hypothesis decomposition; Std. Error of Estimate: 8.496016					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	167277.2	1	167277.2	2317.427	0.000000
Indose	101745.6	1	101745.6	1409.565	0.000000
prepn	632.0	1	632.0	8.756	0.005355
Error	2670.7	37	72.2		

Univariate Tests of Significance for y (PhEur_513_1.sta)					
Sigma-restricted parameterization					
Effective hypothesis decomposition; Std. Error of Estimate: 8.635681					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1237280.63	1	1237280.63	16591.09	0.00
Treatment	102661.97	7	14666.00	196.66	0.00
Error	2386.40	32	74.57		

Parallel_példák

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$$C = \frac{S_{regr}}{S_{regr} - t_{\alpha/2}^2 S_r^2} = \frac{101745.61}{101745.61 - 74.57 \cdot 2.042^2} = 1.00307$$

$$CM'_T \pm \sqrt{(C-1)[C(M'_T)^2 + 2V]} =$$

$$= 1.00307 \cdot 0.0715 \pm \sqrt{0.00307 \cdot [1.00307 \cdot 0.0715^2 + 2 \cdot 0.411]} =$$

$$= 0.0717 \pm 0.0504 = (0.0213, 0.122)$$

$$\frac{C_{0\text{minta}}}{C_{0\text{std}}} = (1.0215, 1.130) \quad (1.029, 1.121) \quad \text{helyett}$$

Parallel_példák

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PhEur 5.1.4. Five-dose multiple assay with completely randomised design:

An in-vitro assay of three hepatitis B vaccines against a standard

	1 dilution	2 S	3 T	4 U	5 V
1	1:16000	0.043	0.097	0.086	0.082
2	1:8000	0.093	0.167	0.127	0.145
3	1:4000	0.159	0.327	0.277	0.318
4	1:2000	0.283	0.501	0.586	0.552
5	1:1000	0.514	1.140	0.957	1.037
6	1:16000	0.045	0.097	0.071	0.082
7	1:8000	0.099	0.157	0.146	0.144
8	1:4000	0.154	0.355	0.268	0.306
9	1:2000	0.295	0.665	0.489	0.551
10	1:1000	0.531	1.386	0.866	1.039
11	1:16000	0.051	0.094	0.073	0.086
12	1:8000	0.082	0.178	0.133	0.173
13	1:4000	0.166	0.345	0.269	0.316
14	1:2000	0.362	0.576	0.546	0.624
15	1:1000	0.545	1.051	1.045	1.068

mindegyik készítményből 3 független hígítási sor, abszorbanciát mérnek

Föltételezzük, hogy a hígítás hibamentes!

Parallel_példák

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Scatterplot of multiple variables against Indose

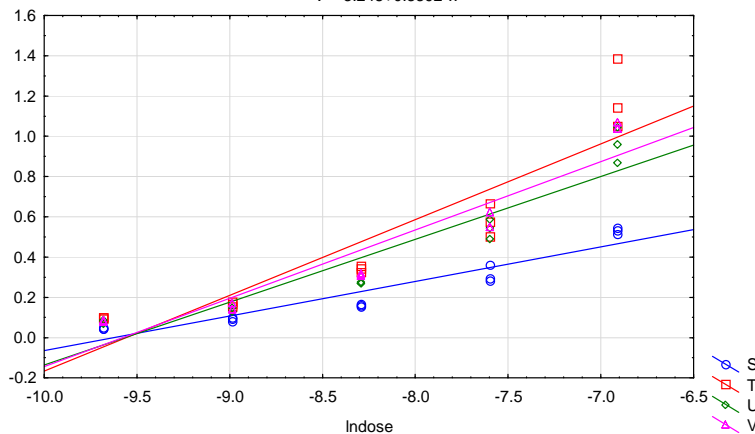
PhEur_514_1.sta 12v*15c

$$S = 1.6513 + 0.1716 \cdot x$$

$$T = 3.594 + 0.376 \cdot x$$

$$U = 2.9849 + 0.3122 \cdot x$$

$$V = 3.248 + 0.3392 \cdot x$$



Parallel_példák

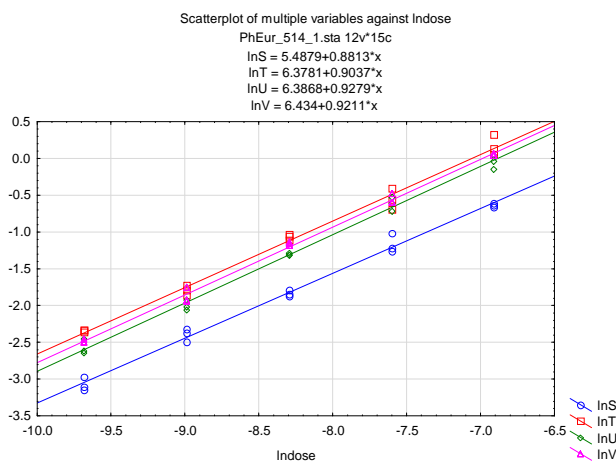
90

Univariate Tests of Significance for y (PhEur_514_2.sta)					
Sigma-restricted parameterization					
Effective hypothesis decomposition; Std. Error of Estimate: .0511321					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	8.832007	1	8.832007	3378.086	0.00
Treatment	6.739631	19	0.354717	135.673	0.00
Error	0.104580	40	0.002615		

Univariate Tests of Significance for y (PhEur_514_2.sta)					
Over-parameterized model					
Type I decomposition; Std. Error of Estimate: .1231250					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	8.832007	1	8.832007	582.5950	0.000000
prepn	0.531582	3	0.177194	11.6884	0.000006
Indose	5.179208	1	5.179208	341.6416	0.000000
prepn*Indose	0.345114	3	0.115038	7.5884	0.000266
Error	0.788308	52	0.015160		

nem párhuzamosak, de nem is lineárisak

ha logaritmáljuk az adatokat, párhuzamosak lesznek a vonalak



Univariate Tests of Significance for lny (PhEur_514_2.sta) Over-parameterized model Type I decomposition; Std. Error of Estimate: .0810198					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	111.5125	1	111.5125	16987.92	0.000000
prepn	4.4752	3	1.4917	227.25	0.000000
Indose	47.5841	1	47.5841	7249.01	0.000000
prepn*Indose	0.0187	3	0.0062	0.95	0.423875
Error	0.3413	52	0.0066		

Univariate Tests of Significance for lny (PhEur_514_2.sta) Sigma-restricted parameterization Effective hypothesis decomposition; Std. Error of Estimate: .0817170					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	111.5125	1	111.5125	16699.28	0.00
Treatment	52.1523	19	2.7449	411.05	0.00
Error	0.2671	40	0.0067		

$$S_{\text{nonlin}} = S_{\text{treatment}} - S_{\text{prepn}} - S_{\text{Indose}} - S_{\text{prepn*Indose}} =$$

$$= 52.1523 - 4.4752 - 47.5841 - 0.0187 = 0.0743 \quad v=19-3-1-3=12$$

Parallel_példák

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Tests of Homogeneity of Variances (PhEur_514_2.sta) Effect: "Treatment"					
	Hartley F-max	Cochran C	Bartlett Chi-Sqr.	df	p
lny	74.47673	0.151422	25.67918	19	0.139379

Levene's Test for Homogeneity of Variances (PhEur_514_2.sta) Effect: "Treatment" Degrees of freedom for all F's: 19, 40				
	MS Effect	MS Error	F	p
lny	0.002881	0.001362	2.114681	0.022975

nem megnyugtató

Test of Lack of Fit (PhEur_514_2.sta)								
Dependent Variable	SS Pure Err	df Pure Err	MS Pure Err	SS Lack of Fit	df Lack of Fit	MS Lack of Fit	F	p
lny	0.267107	40	0.006678	0.074232	12	0.006186	0.926374	0.530779

Parallel_példák

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ANCOVA

Univariate Tests of Significance for lny (PhEur_514_2.sta)					
Over-parameterized model					
Type I decomposition; Std. Error of Estimate: .0809068					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	111.5125	1	111.5125	17035.44	0.00
Indose	47.5841	1	47.5841	7269.29	0.00
prepn	4.4752	3	1.4917	227.89	0.00
Error	0.3600	55	0.0065		

Parameter Estimates (PhEur_514_2.sta)					
(*Zeroed predictors failed tolerance check)					
Over-parameterized model					
Effect	Level of Effect	Column	Comment (B/Z/P)	lny Param.	lny Std.Err
Intercept		1		6.329488	0.090812
Indose		2		0.908479	0.010655
prepn	S	3	Biased	-0.616018	0.029543
prepn	T	4	Biased	0.088216	0.029543
prepn	U	5	Biased	-0.103398	0.029543
prepn	V	6	Zeroed*	0.000000	

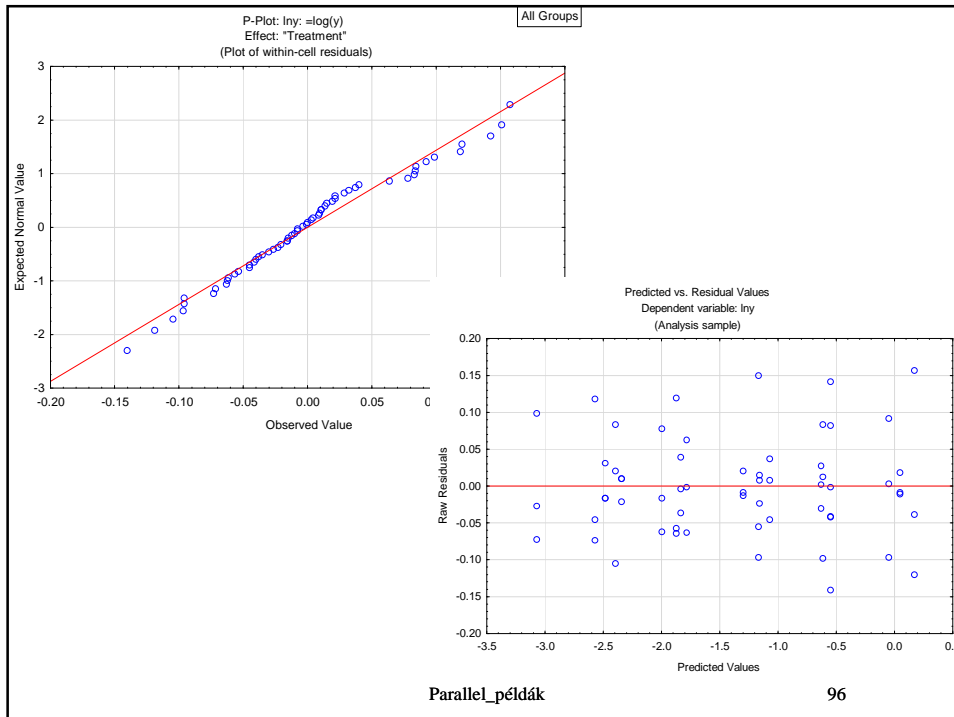
$$\frac{x_T}{x_S} = \exp(0.775) = 2.171$$

$$\frac{x_T}{x_S} = \exp(0.775) = 2.171$$

$$\ln x_T - \ln x_S = \frac{a'_T - a'_S}{b} = \frac{0.088216 + 0.616018}{0.908479} = 0.775$$

Parallel_példák

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Parallel_példák

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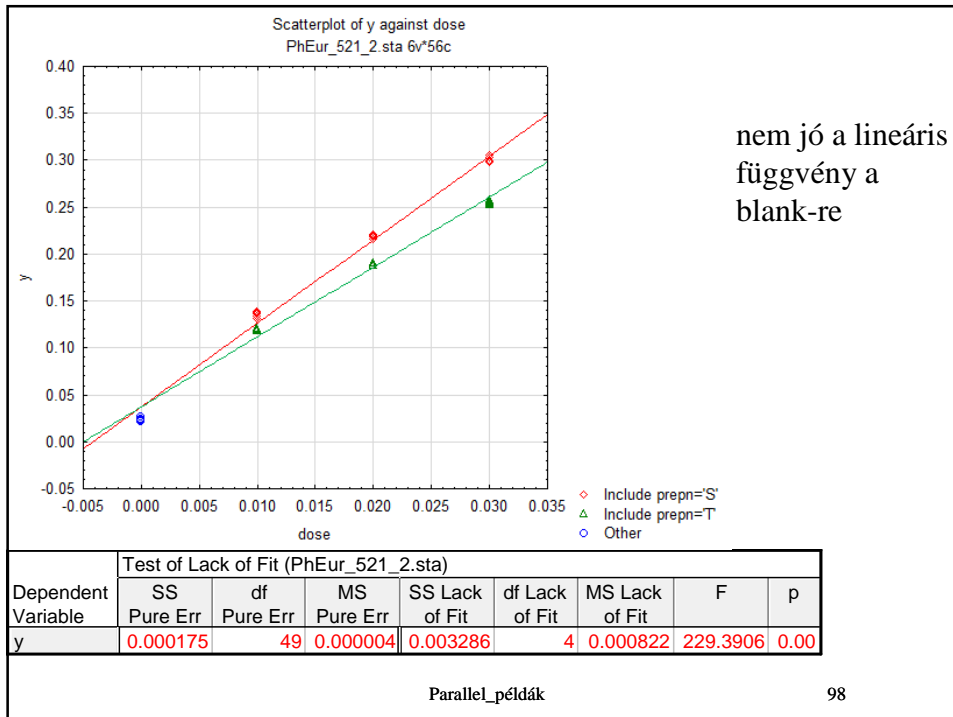
PhEur 5.2.1. A completely randomised (0,3,3) design
An assay of factor VIII

	1 B	2 S1 0.01	3 S2 0.02	4 S3 0.03	5 T1 0.01	6 T2 0.02	7 T3 0.03
1	0.022	0.133	0.215	0.299	0.120	0.188	0.254
2	0.024	0.133	0.215	0.299	0.119	0.188	0.253
3	0.024	0.131	0.216	0.299	0.118	0.190	0.255
4	0.026	0.136	0.218	0.297	0.120	0.190	0.258
5	0.023	0.137	0.220	0.297	0.120	0.190	0.257
6	0.022	0.136	0.220	0.305	0.121	0.191	0.257
7	0.022	0.138	0.219	0.299	0.121	0.191	0.255
8	0.023	0.137	0.218	0.302	0.121	0.190	0.254

abszorbancia a jel
slope ratio assay

Parallel_példák

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Blank nélkül

Test of Lack of Fit (PhEur_521_2.sta)								
Exclude condition: prepn=0								
Dependent Variable	SS Pure Err	df Pure Err	MS Pure Err	SS Lack of Fit	df Lack of Fit	MS Lack of Fit	F	p
y	0.000162	42	0.000004	0.000023	3	0.000008	1.989712	0.130142

Univariate Tests of Significance for y (PhEur_521_2.sta)					
Over-parameterized model					
Type III decomposition; Std. Error of Estimate: .0020277					
Exclude condition: prepn=0					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	0.019247	1	0.019247	4681.00	0.00
doseS	0.189381	1	0.189381	46059.63	0.00
doseT	0.128319	1	0.128319	31208.61	0.00
Error	0.000185	45	0.000004		

Univariate Tests of Significance for y (PhEur_521_2.sta)					
Sigma-restricted parameterization					
Effective hypothesis decomposition; Std. Error of Estimate: .0019639					
Exclude condition: prepn=0					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	1.976408	1	1.976408	512402.2	0.00
Treatment	0.191720	5	0.038344	9941.0	0.00
Error	0.000162	42	0.000004		

Parallel_példák 99

Parameter Estimates (PhEur_521_2.sta)		
Over-parameterized model		
Exclude condition: prepn=0		
Effect	y Param.	y Std.Err
Intercept	0.052979	0.000774
doseS	8.224107	0.038320
doseT	6.769643	0.038320

$$R = \frac{6.77}{8.22} = 0.823$$

Parallel_példák 100

PhEur 5.2.2. A completely randomised (0,4,4,4) design
 An in vitro assay of influenza vaccines

	1 conc (ug/ml)	2 SI	3 SII	4 TI	5 TII	6 UI	7 UII
1	8	18	18	15	17	15	16
2	15	23	25	23	24	20	19
3	23	30	30	29	27	24	23
4	30	36	37	34	38	27	27

haemagglutinin antigen content by radial immunodiffusion,
 zone of precipitation area mm²

Univariate Tests of Significance for y (PhEur_522_3.sta)					
Sigma-restricted parameterization					
Effective hypothesis decomposition; Std. Error of Estimate: 1.033400					
Effect	SS	Degr. of Freedom	MS	F	p
Intercept	14785.77	1	14785.77	13845.43	0.000000
Treatment	1096.20	11	99.65	93.32	0.000000
Error	12.82	12	1.07		

Test of Lack of Fit (PhEur_522_3.sta)								
Dependent Variable	SS Pure Err	df Pure Err	MS Pure Err	SS Lack of Fit	df Lack of Fit	MS Lack of Fit	F	p
y	12.81500	12	1.067917	8.539389	8	1.067424	0.999538	0.482888

PhEur 5. 4.1. Four-parameter logistic curve analysis
A serological assay of tetanus sera

	1 dose	2 Dilution	3 S1	4 S2	5 P1	6 P2
1	0.10000	10	2.912	2.917	3.017	2.987
2	0.05000	20	2.579	2.654	2.801	2.808
3	0.02500	40	2.130	2.212	2.401	2.450
4	0.01250	80	1.651	1.638	1.918	1.963
5	0.00625	160	1.073	0.973	1.364	1.299
6	0.00313	320	0.585	0.666	0.861	0.854
7	0.00156	640	0.463	0.356	0.497	0.496
8	0.00078	1280	0.266	0.234	0.340	0.344
9	0.00039	2560	0.228	0.197	0.242	0.217
10	0.00020	5120	0.176	0.215	0.178	0.125

$N=40$

A guinea-pig antiserum is assayed against a standard serum (0.4 IU/ml) using an enzyme-linked immunosorbent assay technique (ELISA). 10 two-fold dilutions of each serum were applied on a 96-well ELISA plate. Each dilution was applied twice.

Parallel_példák

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$$y = \delta + \frac{\alpha - \delta}{1 + e^{-\beta(x-\gamma)}} = \delta + \frac{\alpha - \delta}{1 + \left(\frac{dose}{EC_{50}}\right)^{-\beta}}$$

$$y = a^x = e^{bx} \quad a > 0, b = \ln a$$

lépések:

variancia konstans?

normális eloszlás?

jó-e a függvény illeszkedése?

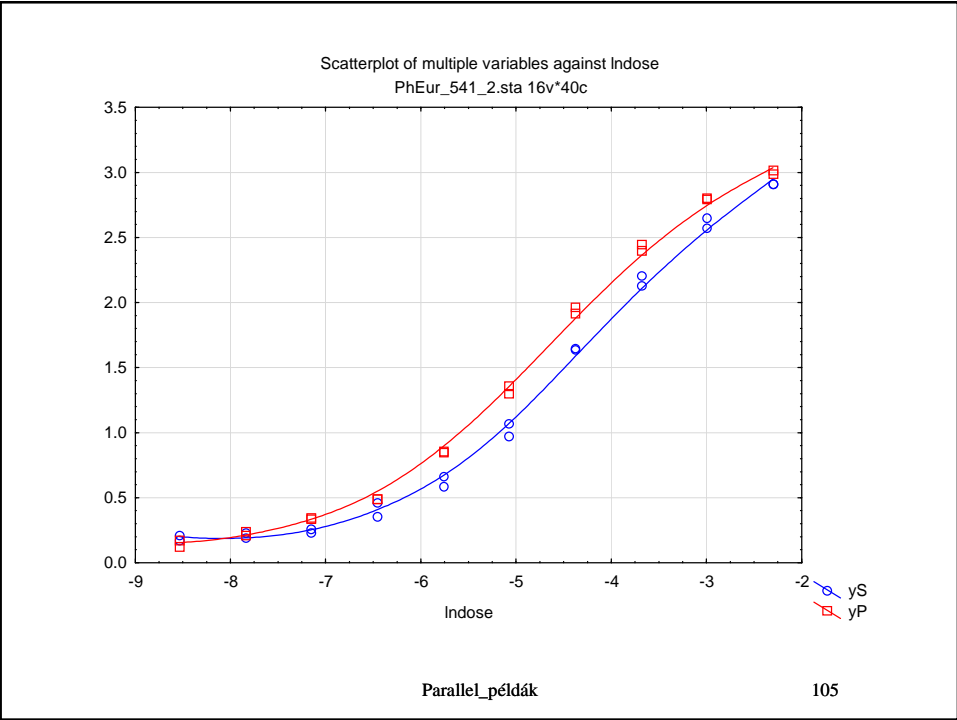
párhuzamosak-e a görbék?

RP

konf. intervallum

Parallel_példák

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	1	2	3	4	5	6
	Dilution	Indose	prepn	Se	Pe	y
1	10	-2.303 S		1	0	2.912
2	10	-2.303 S		1	0	2.917
3	20	-2.996 S		1	0	2.579
4	20	-2.996 S		1	0	2.654
5	40	-3.689 S		1	0	2.13
6	40	-3.689 S		1	0	2.212
7	80	-4.382 S		1	0	1.651
8	80	-4.382 S		1	0	1.638
9	160	-5.075 S		1	0	1.073
10	160	-5.075 S		1	0	0.973
11	320	-5.768 S		1	0	0.585
12	320	-5.768 S		1	0	0.666
13	640	-6.461 S		1	0	0.463
14	640	-6.461 S		1	0	0.356
15	1280	-7.155 S		1	0	0.266
16	1280	-7.155 S		1	0	0.234
17	2560	-7.848 S		1	0	0.228
18	2560	-7.848 S		1	0	0.197
19	5120	-8.541 S		1	0	0.176
20	5120	-8.541 S		1	0	0.215
21	10	-2.303 P		0	1	3.017
22	10	-2.303 P		0	1	2.987
23	20	-2.996 P		0	1	2.801
24	20	-2.996 P		0	1	2.808
25	40	-3.689 P		0	1	2.401
26	40	-3.689 P		0	1	2.45
27	80	-4.382 P		0	1	1.918
28	80	-4.382 P		0	1	1.963
29	160	-5.075 P		0	1	1.364
30	160	-5.075 P		0	1	1.299
31	320	-5.768 P		0	1	0.861
32	320	-5.768 P		0	1	0.854
33	640	-6.461 P		0	1	0.497
34	640	-6.461 P		0	1	0.496
35	1280	-7.155 P		0	1	0.34
36	1280	-7.155 P		0	1	0.344
37	2560	-7.848 P		0	1	0.242
38	2560	-7.848 P		0	1	0.217
39	5120	-8.541 P		0	1	0.178
40	5120	-8.541 P		0	1	0.125

Quick | Advanced | Review

Estimation method: Hooke-Jeeves and quasi-Newton

Asymptotic standard errors

Eta for finite diff. approx., 1.E- 10

Maximum number of iterations: 100

Convergence criterion: .000001

Start values: .100000 for all parameters

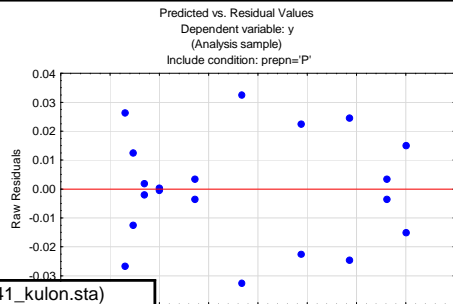
Initial step sizes: .100000 for all parameters

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külön P

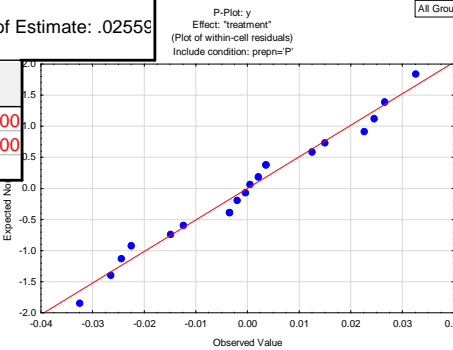
$$s_e = 0.02559$$

$$s_e^2 = 0.00065$$



Univariate Tests of Significance for y (PhEur_541_kulon.sta)
 Sigma-restricted parameterization
 Effective hypothesis decomposition; Std. Error of Estimate: .02559
 Include condition: prepn=P'

Effect	SS	Degr. of Freedom	MS	F	p
Intercept	36.8887	1	36.88871	56318.6	0.000000
treatment	22.0575	9	2.45083	3741.7	0.000000
Error	0.0065	10	0.00065		



Tests of Homogeneity of Variances
 Effect: "treatment"
 Include condition: prepn=P'

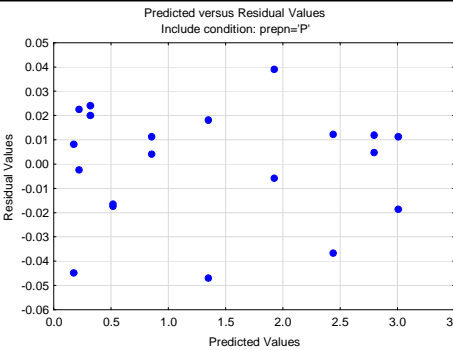
	Hartley F-max	Cochran C	Bartlett Chi-Sqr.	df	p
y	4225.00	0.32252	11.9233	9	0.2177

Parallel_peldak

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Model: $y=d+(a-d)/(1+\exp(-bP^e*(\text{Indose}-gP)))$
 Dep. var: y Loss: (OBS-PRED)**2
 Final loss: .010508182 R= .99976 Variance e
 Include condition: prepn=P'

	d	a	bP	gP
Estimate	3.22068	0.124258	-1.0905	-4.682
Std.Err.	0.03299	0.016788	0.0304	0.026
t(16)	97.63221	7.401642	-35.8268	-180.451
-95%CL	3.15075	0.088669	-1.1550	-4.737
+95%CL	3.29061	0.159847	-1.0260	-4.627
p-value	0.00000	0.000001	0.0000	0.000

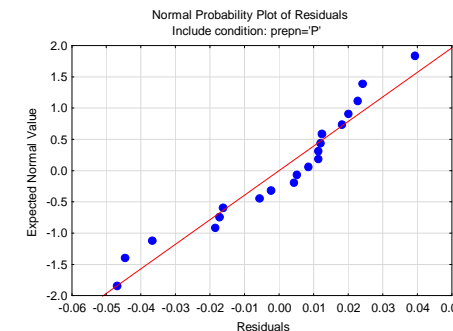


$$s_e^2 = 0.00065$$

$$s_r^2 = \frac{0.010508}{10-4} = 1.75 \cdot 10^{-3}$$

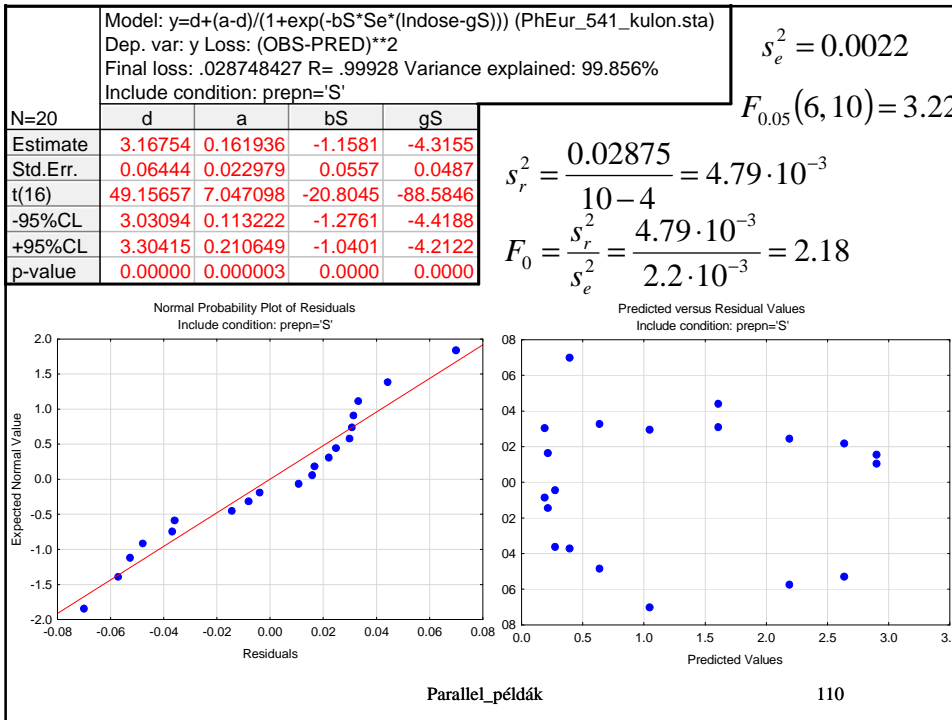
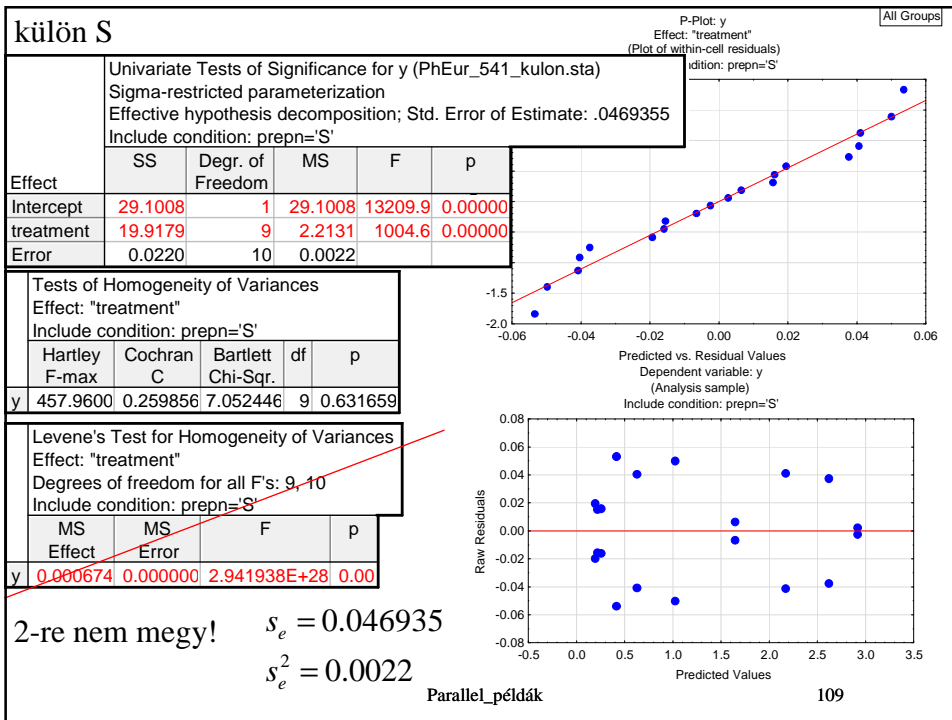
$$F_0 = \frac{s_r^2}{s_e^2} = \frac{1.75 \cdot 10^{-3}}{6.5 \cdot 10^{-4}} = 2.69$$

$$F_{0.05}(6, 10) = 3.22$$



Parallel_peldak

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eddig:

variancia konstans? ✓

normális eloszlás? ✓

jó-e a függvény illeszkedése? ✓

következik:

párhuzamosak-e a görbék (a közös meredekség és aszimptoták feltétele teljesül)?

RP

konf. intervallum

$$y = d + ((a - d) / (1 + \exp(-b * (Pe * (Indose - gP) + Se * (Indose - gS))))))$$

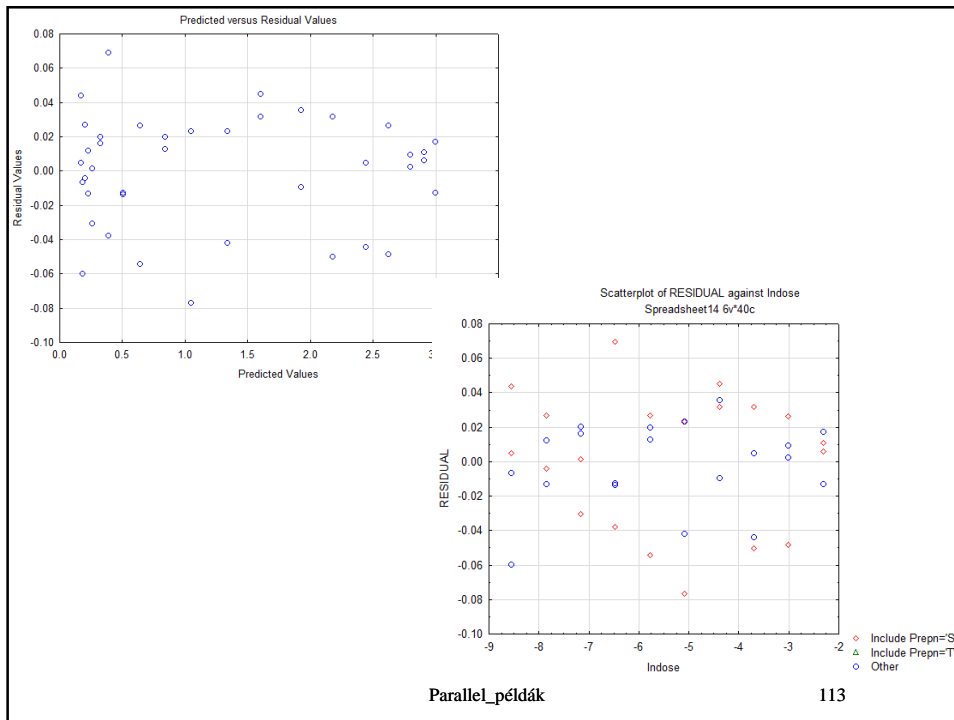
step: 0.1

$$y = \delta + \frac{\alpha - \delta}{1 + e^{-\beta(x - \gamma_j)}}$$

Model: y=d+((a-d)/(1+exp(-b*(Pe*(Indose-gP)+Se*(Indose-gS)... (PhEur_541_1.sta) Dep. var: y Loss: (OBS-PRED)**2 Final loss: .041353449 R= .99951 Variance explained: 99.902%					
N=40	d	a	b	gP	gS
Estimate	0.14546	3.19599	1.12452	-4.684	-4.307
Std.Err.	0.01428	0.03316	0.02975	0.028	0.028
t(35)	10.18397	96.39519	37.79661	-165.903	-155.675
-95%CL	0.11646	3.12868	1.06412	-4.742	-4.363
+95%CL	0.17445	3.26330	1.18492	-4.627	-4.251
p-value	0.00000	0.00000	0.00000	0.000	0.000

közös meredekség

Correlation Matrix of Parameter Estimates (PhEur_541_2.sta)					
Parameter	d	a	b	gP	gS
d	1.000	-0.483	0.712	-0.032	-0.023
a	-0.483	1.000	-0.835	0.749	0.738
b	0.712	-0.835	1.000	-0.495	-0.488
gP	-0.032	0.749	-0.495	1.000	0.697
gS	-0.023	0.738	-0.488	0.697	1.000



$y = d + \left(\frac{a-d}{1 + \exp(-Pe \cdot bP \cdot (\text{Indose} - gP) + Se \cdot bS \cdot (\text{Indose} - gS))} \right)$

Model: $y = d + \left(\frac{a-d}{1 + \exp(-Pe \cdot bP \cdot (\text{Indose} - gP) + Se \cdot bS \cdot (\text{Indose} - gS))} \right)$ (PhEur_541_2.sta)						
Dep. var: y Loss: (OBS-PRED)**2						
Final loss: .041287596 R= .99951 Variance explained: 99.902%						
N=40	d	a	bP	gP	bS	gS
Estimate	3.19647	0.14545	-1.1214	-4.684	-1.1273	-4.307
Std.Err.	0.03373	0.01448	0.0330	0.029	0.0326	0.028
t(34)	94.77563	10.04466	-33.9998	-162.993	-34.5949	-153.408
-95%CL	3.12793	0.11602	-1.1884	-4.742	-1.1935	-4.364
+95%CL	3.26501	0.17488	-1.0543	-4.626	-1.0611	-4.249
p-value	0.00000	0.00000	0.0000	0.000	0.0000	0.000

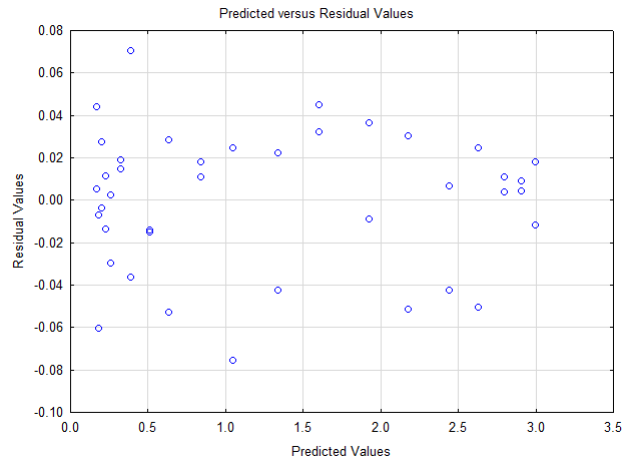
$\Delta S = 0.0413534 - 0.0412876 = 6.58 \cdot 10^{-5}$

$F_0 = \frac{6.58 \cdot 10^{-5}}{0.0412876} = 1.59 \cdot 10^{-3}$

külön meredekség

Correlation Matrix of Parameter Estimates (PhEur_541_2.sta)						
Parameter	d	a	bP	gP	bS	gS
d	1.000	-0.483	0.784	0.751	0.753	0.739
a	-0.483	1.000	-0.650	-0.033	-0.661	-0.024
bP	0.784	-0.650	1.000	0.478	0.695	0.463
gP	0.751	-0.033	0.478	1.000	0.437	0.698
bS	0.753	-0.661	0.695	0.437	1.000	0.439
gS	0.739	-0.024	0.463	0.698	0.439	1.000

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Parallel_példák

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eddig:

variancia konstans? ✓

normális eloszlás? ✓

jó-e a függvény illeszkedése? ✓

párhuzamosak-e a görbék? ✓

következik:

RP

konf. intervallum

$$\ln x_T - \ln x_S = \ln \gamma_S - \ln \gamma_T = -4.307 + 4.684 = 0.377$$

$$\frac{x_T}{x_S} = e^{0.377} = 1.458$$

Parallel_példák

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Model: $y=(Pe*dP+Se*dS)+((Pe*aP+Se*aS)-(Pe*dP+Se*dS))/(1+e... (PhEur_541_kieg.sta)$ Dep. var: y Loss: (OBS-PRED)**2 Final loss: .039256608 R= .99954 Variance explained: 99.907%								
N=40	dP	dS	aP	aS	bP	gP	bS	gS
Estimate	3.22068	3.16754	0.124258	0.161935	-1.0905	-4.682	-1.1581	-4.315
Std.Err.	0.04509	0.05324	0.022944	0.018987	0.0416	0.035	0.0460	0.040
t(32)	71.43566	59.49038	5.415649	8.528543	-26.2138	-132.033	-25.1781	-107.207
-95%CL	3.12885	3.05909	0.077522	0.123259	-1.1752	-4.755	-1.2518	-4.397
+95%CL	3.31252	3.27600	0.170994	0.200612	-1.0058	-4.610	-1.0644	-4.233
p-value	0.00000	0.00000	0.000006	0.000000	0.0000	0.000	0.0000	0.000

$$\Delta S = 0.0413534 - 0.03925661 = 2.0973 \cdot 10^{-3} \quad F_0 = \frac{2.973 \cdot 10^{-3}}{0.0412876} = 5.08 \cdot 10^{-2}$$

