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Fe .

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1, %;

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2, .;

•

3, 0 ;

•

4, %.

10 .
0,200

2^{n-1} , n=4

1.

= 1 2 3 4.

2.

:

1= 2 3 4;

1 2= 3 4;

2= 1 3 4;

1 3= 2 4;

3= 1 2 4;

2 3= 1 4.

4= 1 2 3;

| | | | |
|--|------|----|-------|
| | | | |
| | 1, % | 2, | 3, 0 |
| | | | 4, %. |

| | | | | |
|--|----|----|------|----|
| | 6 | 30 | 1000 | 6 |
| | 4 | 15 | 100 | 4 |
| | 10 | 45 | 1100 | 10 |
| | 2 | 15 | 900 | 2 |

2

| | | | | | | | | | | |
|---|---|---|----|----|----|----|-----|-----|-----|------|
| | | 0 | 1 | 2 | 3 | 4 | 1 2 | 1 3 | 2 3 | |
| 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 94,2 |
| 2 | 2 | 1 | -1 | 1 | 1 | -1 | -1 | -1 | 1 | 95,1 |
| 3 | 3 | 1 | 1 | -1 | 1 | -1 | -1 | 1 | -1 | 94,6 |
| 4 | 7 | 1 | -1 | -1 | 1 | 1 | 1 | -1 | -1 | 94,8 |
| 5 | 8 | 1 | 1 | 1 | -1 | -1 | 1 | -1 | -1 | 92,6 |
| 6 | 1 | 1 | -1 | 1 | -1 | 1 | -1 | 1 | -1 | 92,8 |
| 7 | 5 | 1 | 1 | -1 | -1 | 1 | -1 | -1 | 1 | 89,8 |
| 8 | 6 | 1 | -1 | -1 | -1 | -1 | 1 | 1 | 1 | 93,8 |

Math ad 14 (. 1).

Y,

($Y_i - Y$) Y, 3.

$$S_y^2 = \frac{\sum_{i=1}^n (Y_i - Y)^2}{n - 1},$$

Y 6
Y 6
n 6

Y: $S_y^2 = 0,03$.

ORIGIN := 1

$N := 2^3$ N = 8

$\alpha := \sqrt{\frac{4 \cdot N - 4}{2}}$ $\alpha = 0,91$

z1max := 10 z1min := 2 z2max := 45 z2min := 15
z3max := 1100 z3min := 900 z4max := 10 z4min := 2

$$M1 := \begin{pmatrix} 10 & 45 & 1100 & 10 & 1 & 1 & 1 & 1 \\ 2 & 45 & 1100 & 2 & -1 & 1 & 1 & -1 \\ 10 & 15 & 1100 & 2 & 1 & -1 & 1 & -1 \\ 2 & 15 & 1100 & 10 & -1 & -1 & 1 & 1 \\ 10 & 45 & 900 & 2 & 1 & 1 & -1 & -1 \\ 2 & 45 & 900 & 10 & -1 & 1 & -1 & 1 \\ 10 & 15 & 900 & 10 & 1 & -1 & -1 & 1 \\ 2 & 15 & 900 & 2 & -1 & -1 & -1 & -1 \end{pmatrix} \quad Y := \begin{pmatrix} 94,2 \\ 95,1 \\ 94,6 \\ 94,8 \\ 92,6 \\ 92,8 \\ 89,8 \\ 93,8 \end{pmatrix}$$

. 1.

3

| | Y | Y | (Y _i -Y) | (Y _i -Y) ² |
|---|------|------|---------------------|----------------------------------|
| 1 | 93,9 | 94,0 | -0,1 | 0,01 |
| 2 | 94,2 | | 0,2 | 0,04 |
| 3 | 93,9 | | -0,1 | 0,01 |
| | | | | =0,06 |

(. 2) :

-

$$b_o = \frac{\sum_{i=1}^N Y_i}{N},$$

-

$$b_i = \frac{\sum_{i=1}^N X_{ij} \times Y_i}{N},$$

-

$$b_{il} = \frac{\sum_{i=1}^N X_{ij} \times X_{il} \times Y_i}{N},$$

i, l ó

j- ; j ó ; Y_j ó ; i l j- ; N ó

- b1 = -0.662 b2 = 0.213 b3 = 1.213 b4 = -0.562
- b12 = 0.388 b13 = 0.388 b23 = -0.237
- b11 = 0 b22 = 0 b33 = 0 b44 = 0 b0 = 93.4625
- b1 = -0.662 b2 = 0.213 b3 = 1.213 b4 = -0.562
- b12 = 0.388 b13 = 0.388 b23 = -0.237
- b11 = 0 b22 = 0 b33 = 0 b44 = 0 b0 = 93.4625

. 2.

$$S_{B_i} = +\sqrt{\frac{S_y^2}{N}} = +\sqrt{\frac{0,03}{8}} = 0,061237.$$

$$= \pm t \times S = \pm 0,2633,$$

t ó

ø . t ó 5-
f = n ó 1 = 3 ó 1 = 2 4,303 [3].
b₂ b₂₃

(. 3):

Y(x1,x2,x3,x4) := b0 + b1·x1 + b2·x2 + b3·x3 + b4·x4 + b12·x1·x2 + b13·x1·x3 + b23·x2·x3

.3.

2

1 4.

ø , 15 (2)

1 4

F ó

$$F_p = \frac{S^2}{S^2}$$

4. : Y, Y,

$$S^2 = \frac{\sum_{j=1}^N (Y_{ej} - Y_{pj})^2}{N - (k + 1)}$$

F, f = 3, f = 2 [4]. 56

, F = 9,11 < F = 19,2

4

| | Y | Y | Y - Y | (Y - Y) ² |
|---|------|------|-------|----------------------|
| 1 | 94,2 | 94,2 | 0,0 | 0,00 |
| 2 | 95,1 | 95,1 | 0,0 | 0,00 |
| 3 | 94,6 | 94,6 | 0,0 | 0,00 |
| 4 | 94,8 | 94,8 | 0,0 | 0,00 |
| 5 | 92,6 | 92,2 | 0,4 | 0,16 |
| 6 | 92,8 | 92,3 | 0,5 | 0,25 |
| 7 | 89,8 | 90,3 | -0,5 | 0,25 |
| 8 | 93,8 | 94,2 | -0,4 | 0,16 |
| | | | | =0,82 |

3=1000, 4=6. (5) (): 1=6, 2=30,

3 $\hat{\epsilon}_3 = 50^0$

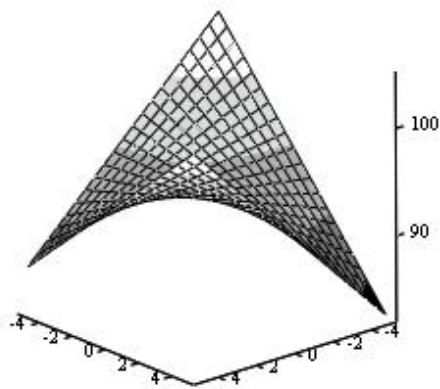
$$\Delta_i = \Delta_l \times \frac{b_i \epsilon_i}{b_l \epsilon_l}$$

$\hat{\epsilon}_l$ ó
 $\hat{\epsilon}$ ó
 b, b_l ó

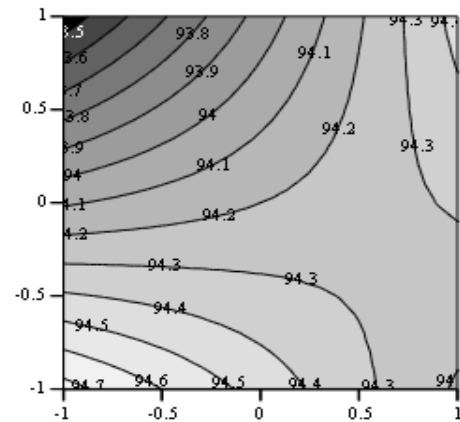
- l - ;

| | 1 | 2 | 3 | 4 | Y |
|--------------------|---------|----|--------|---------|------|
| | 6 | 30 | 1000 | 6 | |
| b | -0,6625 | - | 1,2125 | -0,5625 | |
| | 4 | - | 100 | 4 | |
| b × | -2,6500 | - | 121,25 | -2,2500 | |
| $\hat{\epsilon}_l$ | -1,09 | - | 50 | -0,93 | |
| | -1,0 | - | 50 | -1,0 | |
| | 5 | 30 | 1050 | 5 | |
| 9 | 4 | 30 | 1100 | 4 | 95,4 |
| 10 | 3 | 30 | 1100 | 3 | 96,2 |
| | 2 | 30 | 1100 | 2 | |
| 11 | 1 | 30 | 1100 | 1 | 94,2 |
| 12 | 0 | 30 | 1100 | 0 | 94,1 |
| 13 | 4 | 60 | 1100 | 4 | 95,1 |
| 14 | 3 | 60 | 1100 | 3 | 95,7 |
| 15 | 1 | 60 | 1100 | 1 | 94,8 |
| 16 | 0 | 60 | 1100 | 0 | 94,1 |

15 94% (.) . 3% (.) , 3% (.)
 1100⁰ .
 (. 4).



. 4.



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(Y , $\epsilon_2=30$ $\epsilon_2=60$).

1. . . / . . , . . // , . . . ó
2011. ó 5/6. ó . 20626.
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, . . » . ó 2010. ó 1. ó . 52657.
3. . . : / . . . ó . :
, 1996. ó 136 .
4. . . / . . . ó . :
, 1982. ó 173 .