STATISTIK MA’LUMOTLAR ASOSIDA MA’LUM BIR OILANING BIR OYLIK ENERGIYA SARFINI BASHORAT QILUVCHI MODEL YARATISH

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Annotatsiya: ushbu maqolada bir oilaning bir oy mobaynidagi elektr energiya iste'moli va shu oila yashaydigan uydagi xonalar soni o'rtasidagi bog'liqlik statistik tahlil qilingan. 5 ta model qurilib, har biri uchun korelogramma va uning tahlili ko’rsatilgan, ular ichidan regression tahlil natijalari asosida eng yaxshi modeltaklif etilgan.

Kirish: statistika nazariyasi barcha tarmoq statistikasining metodologik asosi hisoblanadi. Iqtisodiy statistika makroiqtisodiy ko‘rsatkichlarni ishlab chiqadi va tahlil qiladi. Iqtisodiyot, ijtimoiy takror ishlab chiqarish tarmoqlari va elementlarining tuzilishi, nisbati, o‘zaro bog‘liqligi, ishlab chiqaruvchi kuchlarni taqsimlash, moddiy, mehnat va moliyaviy resurslarning tarkibi va ulardan foydalanish xususiyatlarini ko'rib chiqadi. O‘z sohalari bo‘yicha statistik ko‘rsatkichlarni ishlab chiqish barcha tarmoq statistik xodimlarining vazifasidir.

Maqola va asosiy qism: iqtisodiy-ijtimoiy jarayonlarni ifodalovchi statistic ma’lumotlar asosida matematik modellar qurish va ushbu modellar yordamida bashorat ko’rsatkichlarini olib tegishli xulosalar chiqarishni quyidagi masala misolida ko’rib chiqamiz.

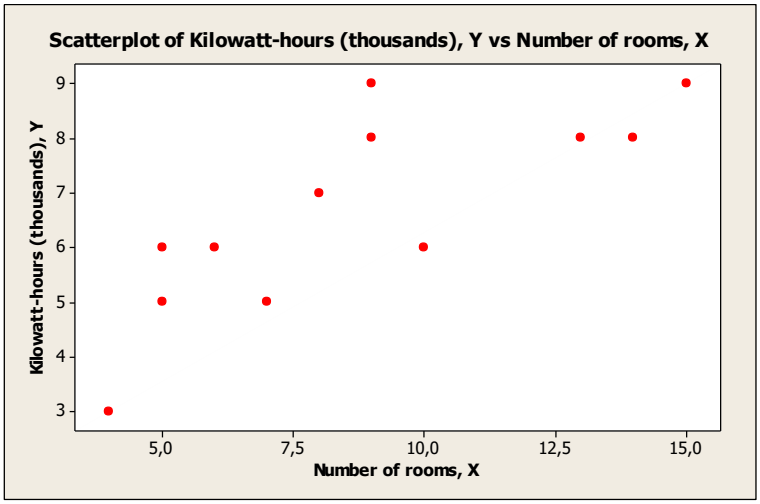
Y	X
8	13
6	10
9	15
5	7
8	9
5	5
7	8
9	9
3	4
6	6
8	14

6	5

1. Masalaning qo'yilishi:

Bir oilaning bir oy mobaynidagi elektr energiya iste'moli va shu oila yashaydigan uydagi xonalar soni o'rtasidagi bog'liqlikni statistik tahlil qilish.

2.Korelogramma va uning tahlili.



Xulosa, uydagi xonalar soni bilan shu uyda bir oy mabaynida ishlatilgan elektr energiya miqdori orasida kuchsiz, chiziqli, musbat bog'lanish bor. Quyidagi modellarni taklif qilish mumkin: chiziqli model, parabolik model, kubik model, to'rtinchi to'rtinchi tartibli model, giperbola, logarifmik modellarni taklif etish mumkin.

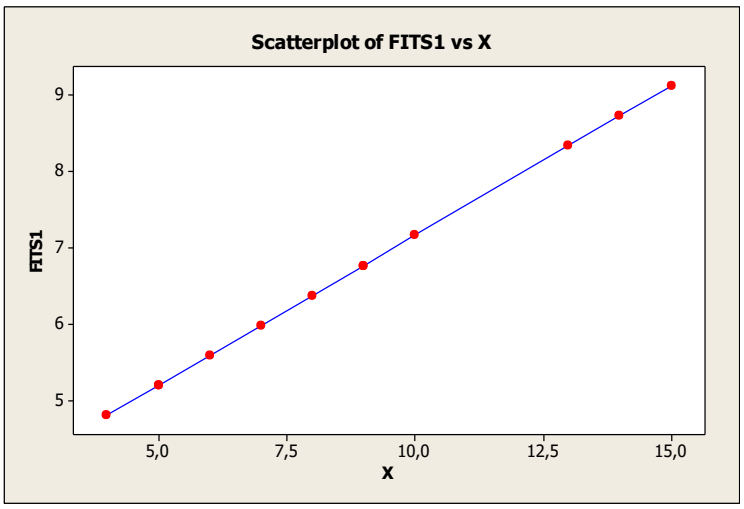
3.Chiziqli model.

Regression Analysis: Y versus X

The regression equation is

Y = 3,24 + 0,391 X

Y	X	$Y_{chiziqli} = 3{,}24 + 0{,}391\ X$
8	13	8,32940
6	10	7,15571
9	15	9,11186
5	7	5,98201
8	9	6,76447
5	5	5,19955
7	8	6,37324
9	9	6,76447
3	4	4,80832
6	6	5,59078
8	14	8,72063
6	5	5,19955



12 cases used, 1 cases contain missing values

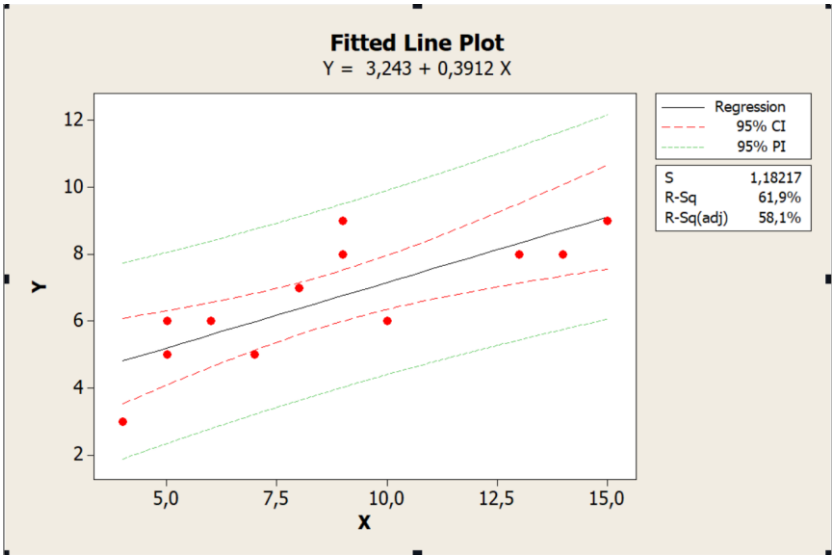
Predictor	Coef	SE Coef	T	P
Constant	3,2434	0,9155	3,54	0,005
X	0,39123	0,09709	4,03	0,002

S = 1,18217 R-Sq = 61,9% R-Sq(adj) = 58,1%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	22,691	22,691	16,24	0,002
Residual Error	10	13,975	1,398		
Total	11	36,667			

3.Chiziqli model. (2-usul)



Regression Analysis: Y versus X

The regression equation is

Y = 3,243+ 0,3912 X

S = 1,18217 R-Sq = 61,9% R-Sq(adj) = 58,1%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	22,6914	22,6914	16,24	0,002
Residual Error	10	13,9753	1,3975		
Total	11	36,6667			

Xulosa, chiziqli modelda R-Sq = 61,9% R-Sq(adj) = 58,1% ekanligiga ko'ra bashorat sifatini oshirish uchun egri chiziqli modellarni o'rganish kerak.

4.Parabolik model. (1-usul)

Polynomial Regression Analysis: Y versus X

The regression equation is

Y = - 0,284 + 1,256 X - 0,04541 X**2

S = 1,10974 R-Sq = 69,8% R-Sq(adj) = 63,1%

Analysis of Variance

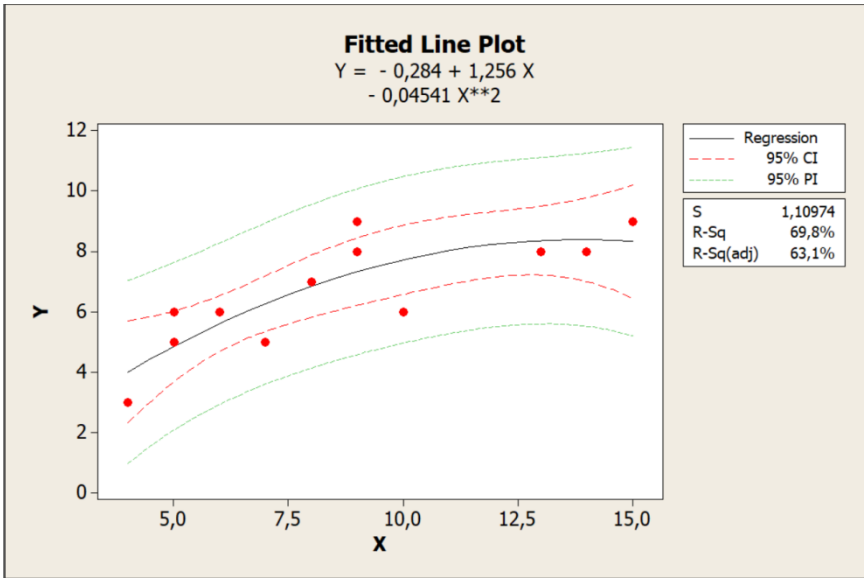
Source	DF	SS	MS	F	P

Regression	2	25,5830	12,7915	10,39	0,005
Error	9	11,0837	1,2315		
Total	11	36,6667			

Sequential Analysis of Variance

Source	DF	SS	F	P
Linear	1	22,6914	16,24	0,002
Quadratic	1	2,8916	2,35	0,160

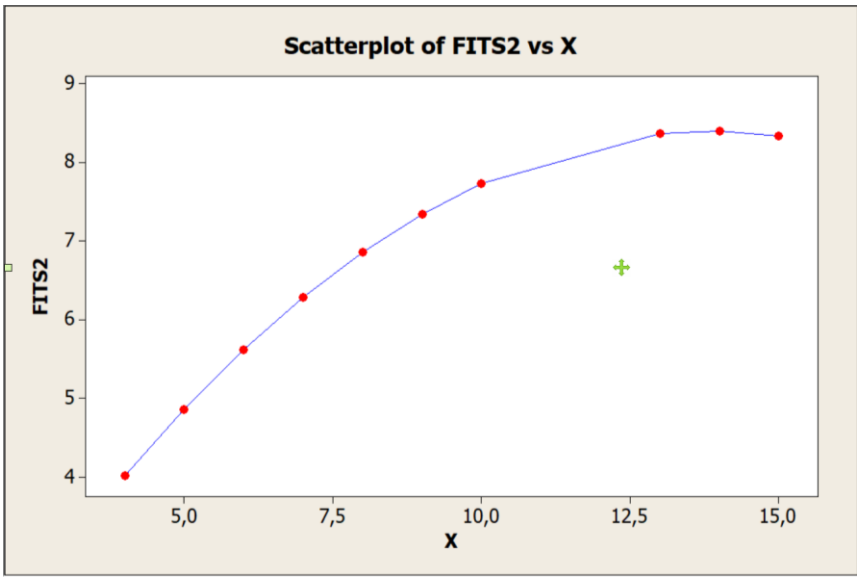
Fitted Line: Y versus X



Y	X	$Y_{chiziqli}$ = 3,24 + 0,391 X	$Y_{parabolik}$ = - 0,284 + 1,256 X - 0,04541 X**2
8	13	8,32940	8,36748
6	10	7,15571	7,73317
9	15	9,11186	8,33628
5	7	5,98201	6,28151
8	9	6,76447	7,34010

5	5	5,19955	4,85967
7	8	6,37324	6,85621
9	9	6,76447	7,34010
3	4	4,80832	4,01252
6	6	5,59078	5,61600
8	14	8,72063	8,39729
6	5	5,19955	4,85967

4.Parabolik model. (2-usul)



Regression Analysis: Y versus X; X^2

The regression equation is

Y = - 0,28 + 1,26 X - 0,0454 X^2

12 cases used, 1 cases contain missing values

Predictor	Coef	SE Coef	T	P
Constant	-0,284	2,457	-0,12	0,910
X	1,2558	0,5715	2,20	0,056
X^2	-0,04541	0,02963	-1,53	0,160

S = 1,10974 R-Sq = 69,8% R-Sq(adj) = 63,1%

Analysis of Variance

Source	DF	SS	MS	F	P

Regression	2	25,583	12,791	10,39	0,005
Residual Error	9	11,084	1,232		
Total	11	36,667			

Source	DF	Seq SS
X	1	22,691
X^2	1	2,892

Xulosa, R-Sq = 61,9% R-Sq(adj) = 58,1% (chiziqli)
R-Sq = 69,8% R-Sq(adj) = 63,1% (parabolik)
Demak, chiziqli modeldan parabolik modelga o'tish ma'noga ega.

3.Kubik model.

Polynomial Regression Analysis: Y versus X

The regression equation is
Y = - 8,512 + 4,456 X - 0,4201 X**2 + 0,01337 X**3

S = 1,09407 R-Sq = 73,9% R-Sq(adj) = 64,1%

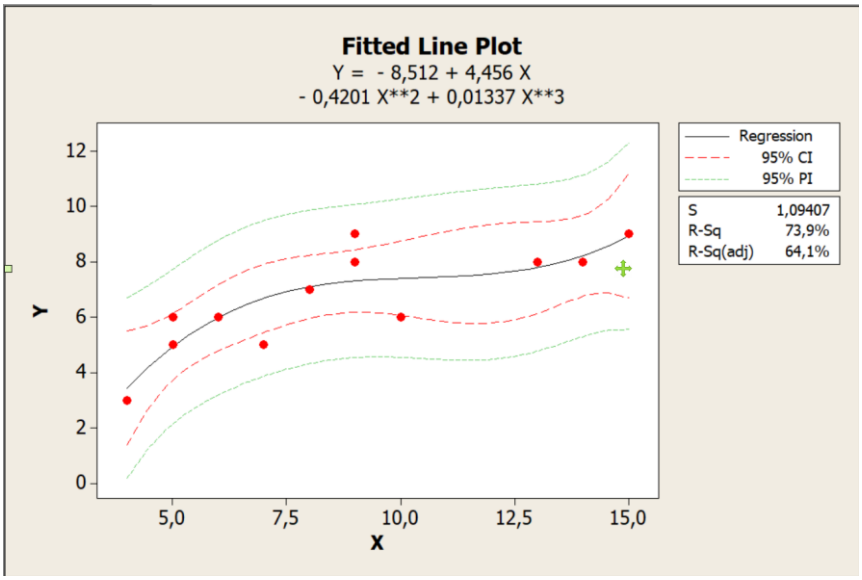
Analysis of Variance

Source	DF	SS	MS	F	P
Regression	3	27,0908	9,03026	7,54	0,010
Error	8	9,5759	1,19698		
Total	11	36,6667			

Sequential Analysis of Variance

Source	DF	SS	F	P
Linear	1	22,6914	16,24	0,002
Quadratic	1	2,8916	2,35	0,160
Cubic	1	1,5078	1,26	0,294

Fitted Line: Y versus X



Y	X	$Y_{chiziqli}$ = 3,24 + 0,391 X	$Y_{parabolik}$ = - 0,284 + 1,256 X - 0,04541 X**2	Y_{kubik} = - 8,512 + 4,456 X - 0,4201 X**2 + 0,01337 X**3
8	13	8,32940	8,36748	7,78506
6	10	7,15571	7,73317	7,40309
9	15	9,11186	8,33628	8,91857
5	7	5,98201	6,28151	6,67812
8	9	6,76447	7,34010	7,30649
5	5	5,19955	4,85967	4,93482
7	8	6,37324	6,85621	7,09157
9	9	6,76447	7,34010	7,30649
3	4	4,80832	4,01252	3,44456
6	6	5,59078	5,61600	5,98594
8	14	8,72063	8,39729	8,21046
6	5	5,19955	4,85967	4,93482

Xulosa, R-Sq = 69,8% R-Sq(adj) = 63,1% (parabolik)
R-Sq = 73,9% R-Sq(adj) = 64,1% (kubik)
Demak, parabolik modeldan kubik modelga o'tish ma'noga ega.

4. To'rtinchi tartibli polinomial model.

Regression Analysis: Y versus X; X^2; X^3; X^4

The regression equation is

Y = - 7,8 + 4,1 X - 0,36 X^2 + 0,009 X^3 + 0,00013 X^4

12 cases used, 1 cases contain missing values

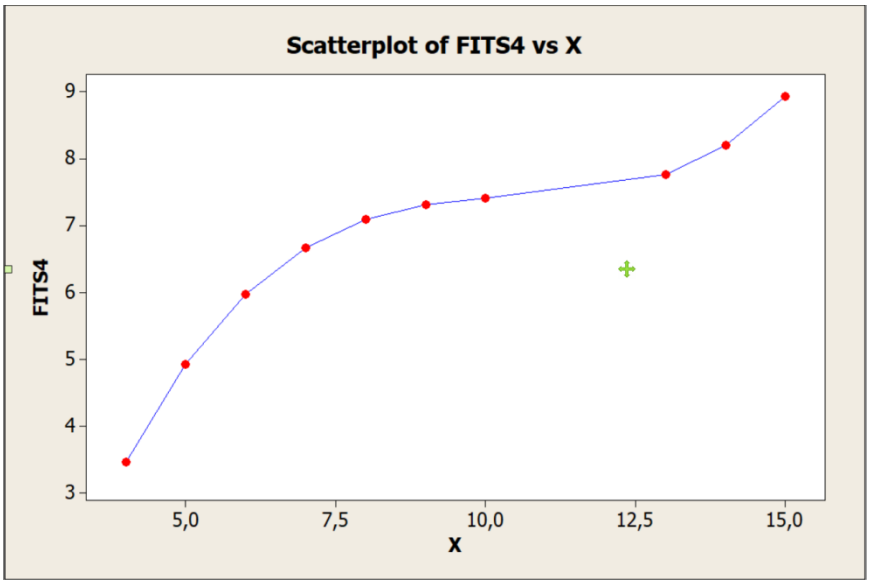
Predictor	Coef	SE Coef	T	P
Constant	-7,80	21,79	-0,36	0,731
X	4,09	10,77	0,38	0,715
X^2	-0,355	1,874	-0,19	0,855
X^3	0,0085	0,1375	0,06	0,952
X^4	0,000127	0,003616	0,04	0,973

S = 1,16950 R-Sq = 73,9% R-Sq(adj) = 59,0%

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	4	27,092	9,03026	4,95	0,033
Residual Error	7	9,574	1,19698	6,773	
Total	11	36,667	1,368		

Source	DF	Seq SS
X	1	22,691
X^2	1	2,892
X^3	1	1,508
X^4	1	0,002



Y	X	$Y_{chiziqli}$ = 3,24 + 0,391 X	$Y_{parabolik}$ = - 0,284 + 1,256 X - 0,04541 X**2	Y_{kubik} = - 8,512 + 4,456 X - 0,4201 X**2 + 0,01337 X**3	$Y_{4-darajalipolinomial}$ = - 7,8 + 4,1 X - 0,36 X^2 + 0,009 X^3 + 0,00013 X^4
8	13	8,32940	8,36748	7,78506	7,76804
6	10	7,15571	7,73317	7,40309	7,41228
9	15	9,11186	8,33628	8,91857	8,93423
5	7	5,98201	6,28151	6,67812	6,67251
8	9	6,76447	7,34010	7,30649	7,31648
5	5	5,19955	4,85967	4,93482	4,92563
7	8	6,37324	6,85621	7,09157	7,09564
9	9	6,76447	7,34010	7,30649	7,31648
3	4	4,80832	4,01252	3,44456	3,46265
6	6	5,59078	5,61600	5,98594	5,97289
8	14	8,72063	8,39729	8,21046	8,19755
6	5	5,19955	4,85967	4,93482	4,92563

Xulosa, R-Sq = 73,9% R-Sq(adj) = 64,1% (kubik)

R-Sq = 73,9% R-Sq(adj) = 59,0% (to’rtinchi tartibli polinomial model)

Demak, kubik modeldan to'rtinchi tartibli polinomial modelga o'tish ma'noga ega emas.

5.Giperbolik model.

Regression Analysis: Y versus 1/X

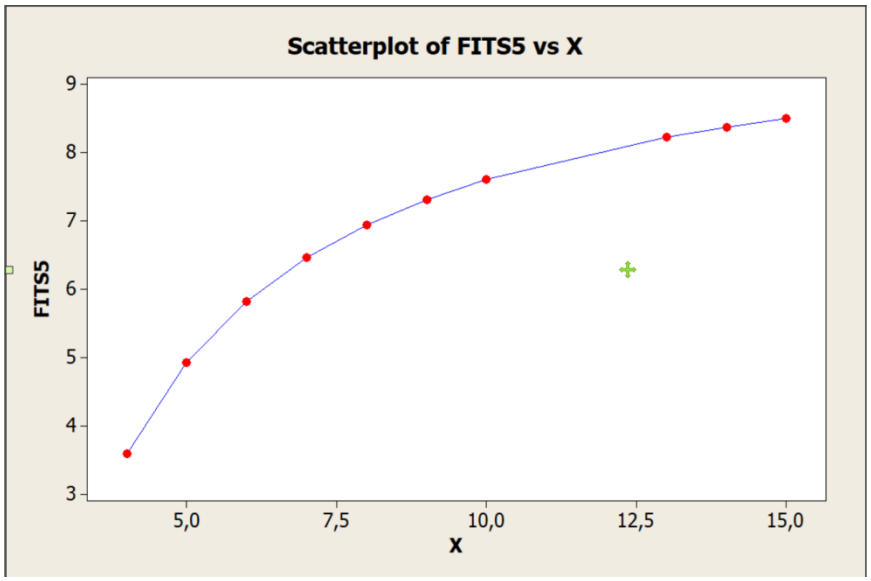
The regression equation is
Y = 10,3 - 26,7 1/X

Predictor	Coef	SE Coef	T	P
Constant	10,2793	0,7579	13,56	0,000
1/X	-26,731	5,184	-5,16	0,000

S = 1,00110 R-Sq = 72,7% R-Sq(adj) = 69,9%
Analysis of Variance

Source	DF	SS	MS	F	P
Regression	1	26,645	26,645	26,59	0,000
Residual Error	10	10,022	1,002		
Total	11	36,667			

Scatterplot of FITS5 vs X



Xulosa, R-Sq = 73,9% R-Sq(adj) = 64,1% (kubik model)
R-Sq = 72,7% R-Sq(adj) = 69,9% (Giperbolik model)

Demak, kubik modeldan giperbolik modelga o'tish ma'noga ega emas.

Umumiy xulosa: berilgan ma'lumotlar o'rganib chiqilganda bir oy mobaynidagi bir oilaning elektr sarfi shu oila yashaydigan xonalar soni bilan

Y = - 8,512 + 4,456 X - 0,4201 X**2 + 0,01337 X**3 ko'rinishidagi bog'liqlikka juda yaqin.

Foydalanilgan adabiyotlar.

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