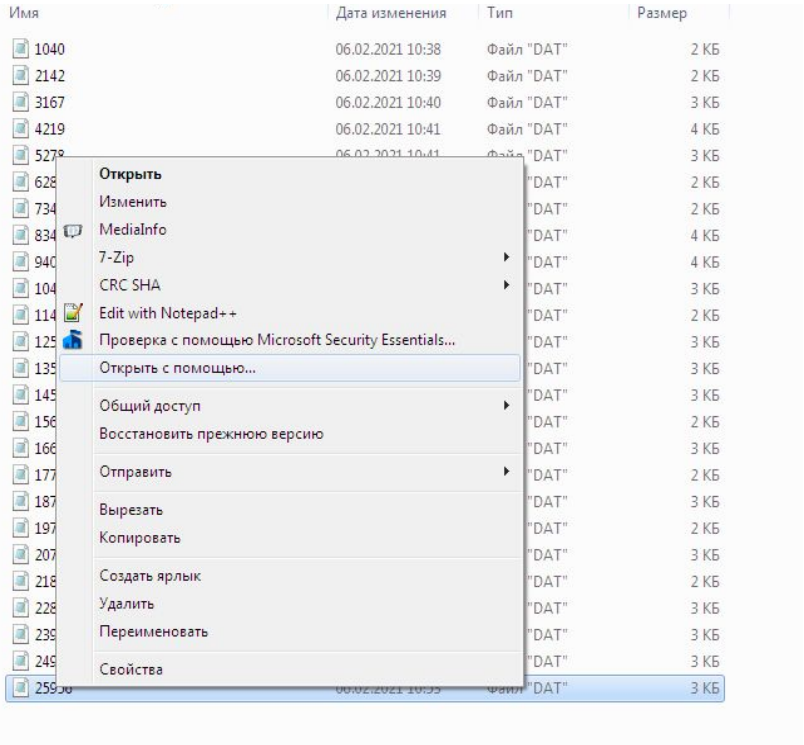
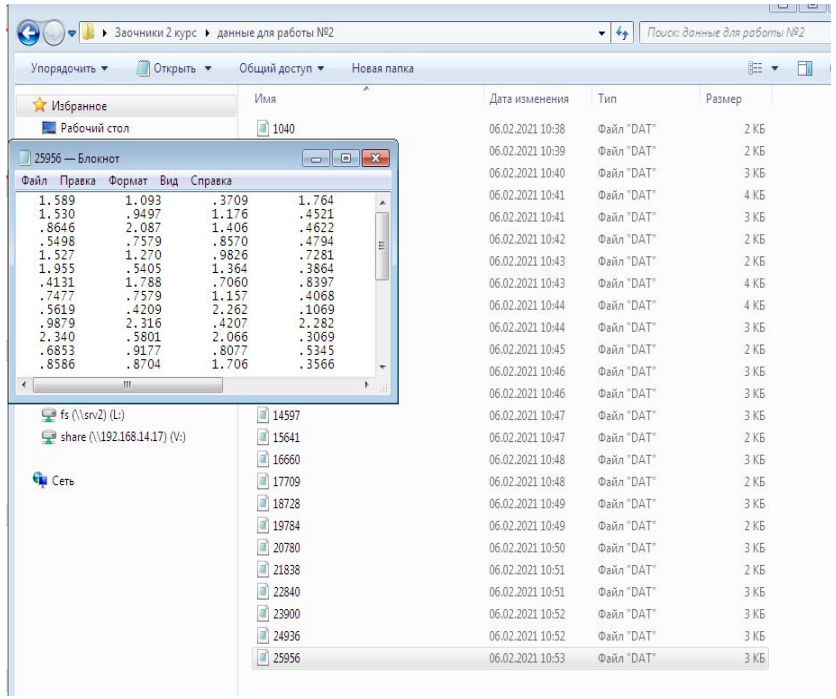
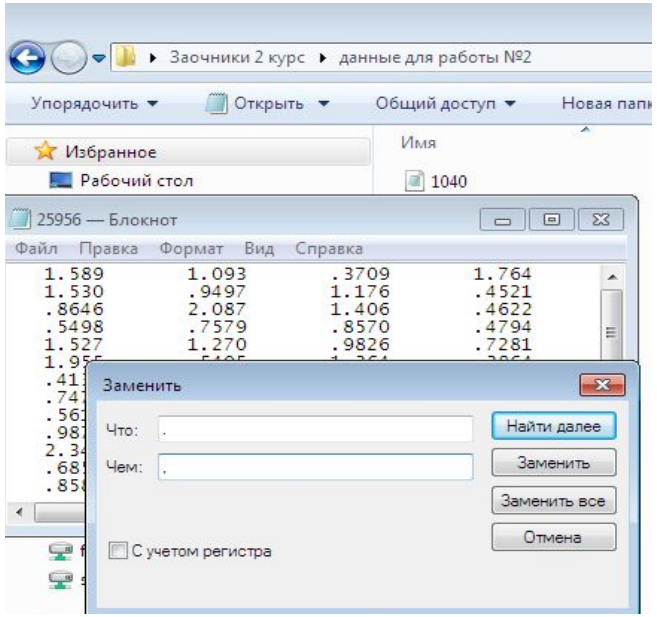
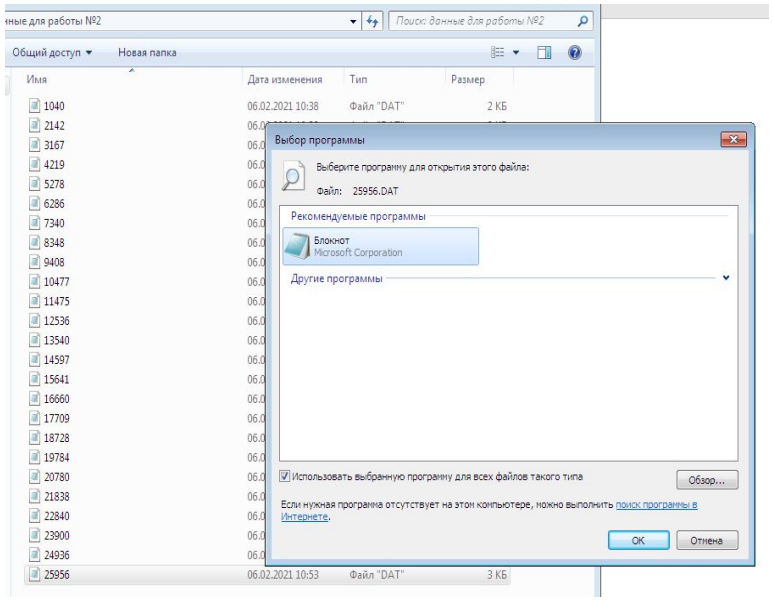
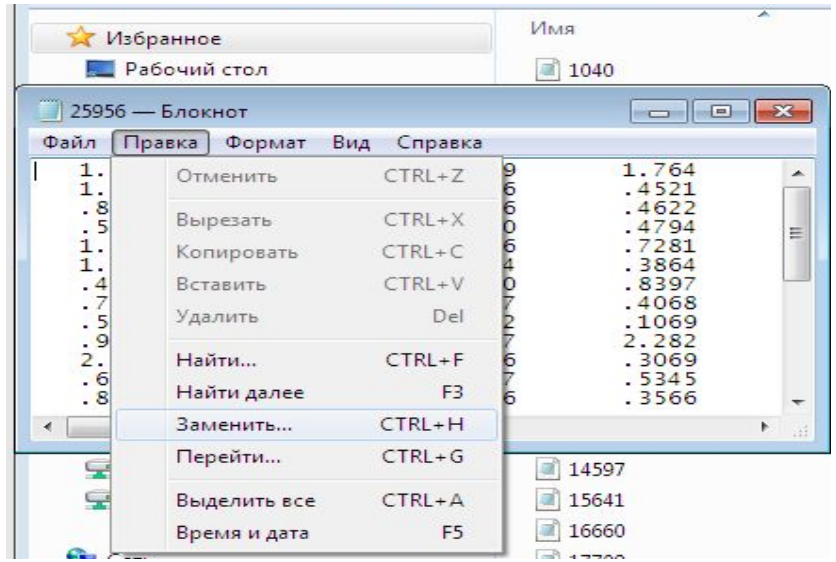
Компьютерная обработка результатов эксперимента

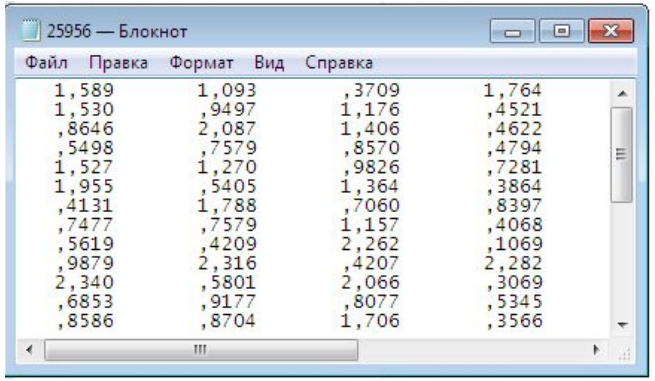


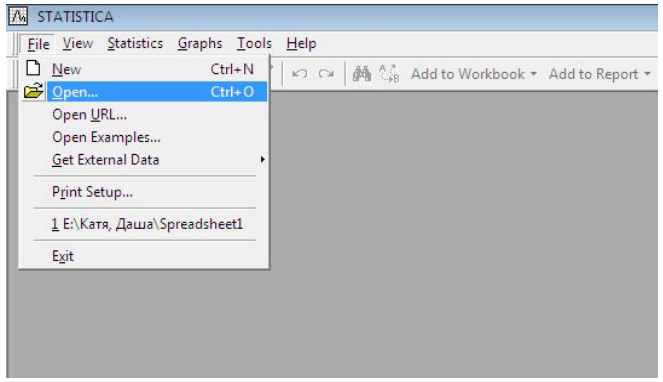


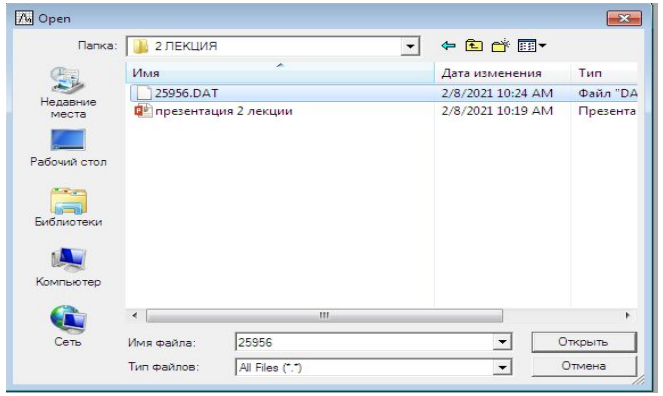









STATISTICA
File View Statistics Graphs Tools Help
New Ctrl+N
Open... Ctrl+O
Open URL...
Open Examples...
Get External Data
Print Setup...
1 E:\Катя, Даша\Spreadsheet1
Exit
Add to Workbook
Add to Report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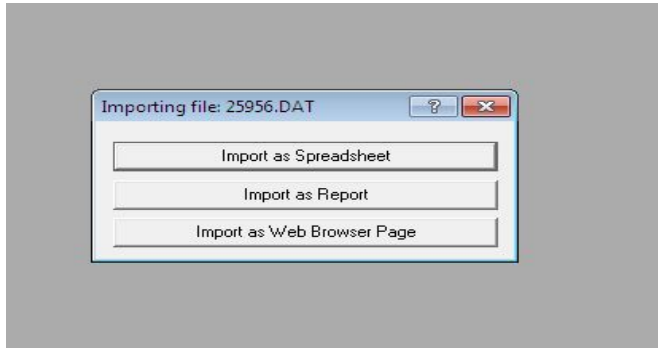
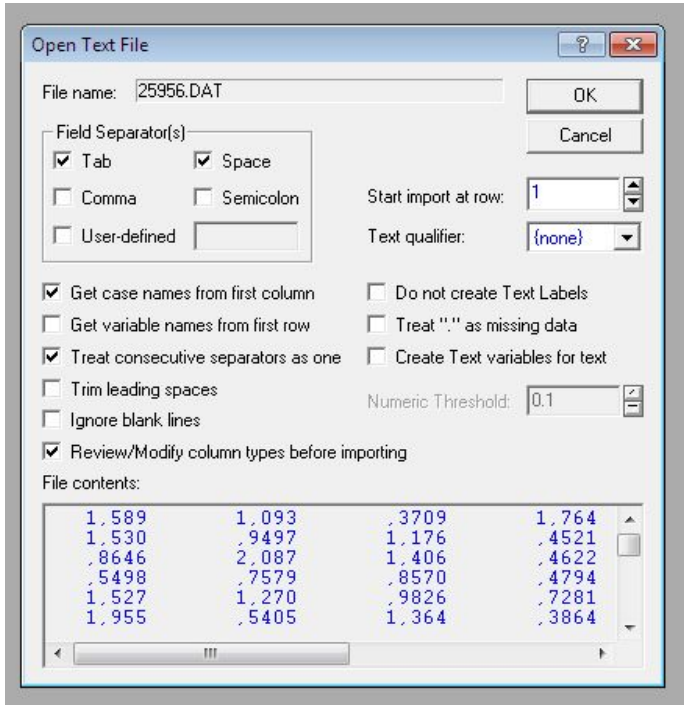
Имя
Дата изменения
Тип
25956.DAT 2/8/2021 10:24 AM Файл "DA
презентация 2 лекции 2/8/2021 10:19 AM Презента
Недавние места
Рабочий стол
Библиотеки
Компьютер
Сеть
Имя файла: 25956
Тип файлов: All Files (*.*)
Открыть
Отмена


Importing file: 25956.DAT
Import as Spreadsheet
Import as Report
Import as Web Browser Page


Open Text File
File name: 25956.DAT
OK
Cancel
Field Separator(s)
Tab
Space
Comma
Semicolon
User-defined
Start import at row: 1
Text qualifier: {none}
Get case names from first column
Get variable names from first row
Treat consecutive separators as one
Trim leading spaces
Ignore blank lines
Review/Modify column types before importing
Do not create Text Labels
Treat "." as missing data
Create Text variables for text
Numeric Threshold: 0.1
File contents:
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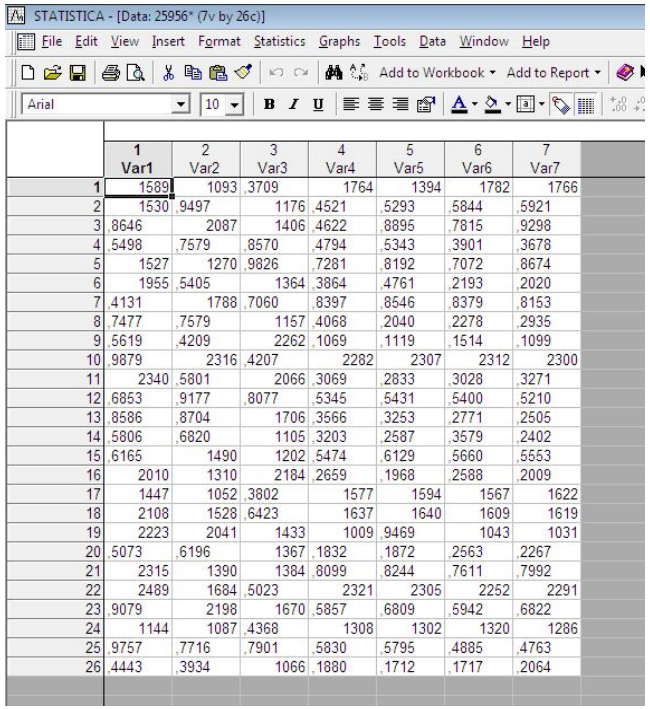
1,530 ,9497 1,176 ,4521
,8646 2,087 1,406 ,4622
,5498 ,7579 ,8570 ,4794
1,527 1,270 ,9826 ,7281
1,955 ,5405 1,364 ,3864


STATISTICA - [Data: 25956* (7v by 26c)]
File Edit View Insert Format Statistics Graphs Tools Data Window Help
Add to Workbook
Add to Report
Arial
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1 Var1 2 Var2 3 Var3 4 Var4 5 Var5 6 Var6 7 Var7
1 1589 1093 ,3709 1764 1394 1782 1766
2 1530 ,9497 1176 ,4521 ,5293 ,5844 ,5921
3 ,8646 2087 1406 ,4622 ,8895 ,7815 ,9298
4 ,5498 ,7579 ,8570 ,4794 ,5343 ,3901 ,3678
5 1527 1270 ,9826 ,7281 ,8192 ,7072 ,8674
6 1955 ,5405 1364 ,3864 ,4761 ,2193 ,2020
7 ,4131 1788 ,7060 ,8397 ,8546 ,8379 ,8153
8 ,7477 ,7579 1157 ,4068 ,2040 ,2278 ,2935
9 ,5619 ,4209 2262 ,1069 ,1119 ,1514 ,1099
10 ,9879 2316 ,4207 2282 2307 2312 2300
11 2340 ,5801 2066 ,3069 ,2833 ,3028 ,3271
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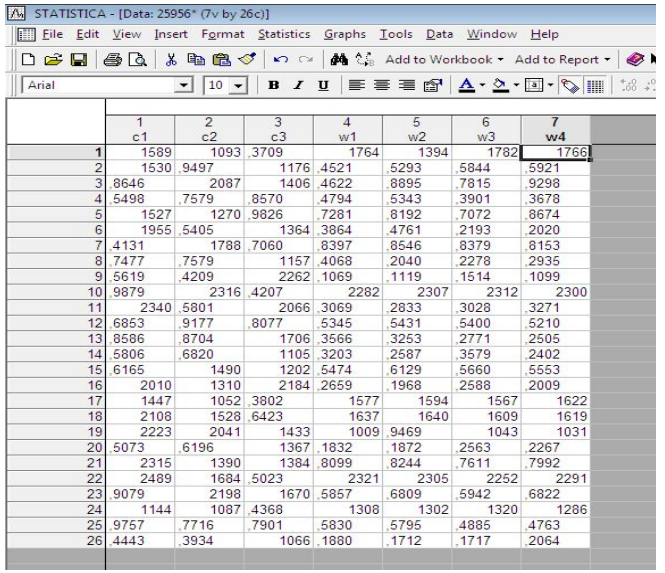
13 ,8586 ,8704 1706 ,3566 ,3253 ,2771 ,2505
14 ,5806 ,6820 1105 ,3203 ,2587 ,3579 ,2402
15 ,6165 1490 1202 ,5474 ,6129 ,5660 ,5553
16 2010 1310 2184 ,2659 ,1968 ,2588 ,2009
17 1447 1052 ,3802 1577 1594 1567 1622
18 2108 1528 ,6423 1637 1640 1609 1619
19 2223 2041 1433 1009 ,9469 1043 1031
20 ,5073 ,6196 1367 ,1832 ,1872 ,2563 ,2267
21 2315 1390 1384 ,8099 ,8244 ,7611 ,7992
22 2489 1684 ,5023 2321 2305 2252 2291
23 ,9079 2198 1670 ,5857 ,6809 ,5942 ,6822
24 1144 1087 ,4368 1308 1302 1320 1286
25 ,9757 ,7716 ,7901 ,5830 ,5795 ,4885 ,4763
26 ,4443 ,3934 1066 ,1880 ,1712 ,1717 ,2064


STATISTICA - [Data: 25956* (7v by 26c)]
File Edit View Insert Format Statistics Graphs Tools Data Window Help
Add to Workbook
Add to Report
Arial
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1 c1 2 c2 3 c3 4 w1 5 w2 6 w3 7 w4
1 1589 1093 ,3709 1764 1394 1782 1766
2 1530 ,9497 1176 ,4521 ,5293 ,5844 ,5921
3 ,8646 2087 1406 ,4622 ,8895 ,7815 ,9298
4 ,5498 ,7579 ,8570 ,4794 ,5343 ,3901 ,3678
5 1527 1270 ,9826 ,7281 ,8192 ,7072 ,8674
6 1955 ,5405 1364 ,3864 ,4761 ,2193 ,2020
7 ,4131 1788 ,7060 ,8397 ,8546 ,8379 ,8153
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11 2340 ,5801 2066 ,3069 ,2833 ,3028 ,3271
12 ,6853 ,9177 ,8077 ,5345 ,5431 ,5400 ,5210
13 ,8586 ,8704 1706 ,3566 ,3253 ,2771 ,2505
14 ,5806 ,6820 1105 ,3203 ,2587 ,3579 ,2402
15 ,6165 1490 1202 ,5474 ,6129 ,5660 ,5553
16 2010 1310 2184 ,2659 ,1968 ,2588 ,2009
17 1447 1052 ,3802 1577 1594 1567 1622
18 2108 1528 ,6423 1637 1640 1609 1619
19 2223 2041 1433 1009 ,9469 1043 1031
20 ,5073 ,6196 1367 ,1832 ,1872 ,2563 ,2267
21 2315 1390 1384 ,8099 ,8244 ,7611 ,7992
22 2489 1684 ,5023 2321 2305 2252 2291
23 ,9079 2198 1670 ,5857 ,6809 ,5942 ,6822
24 1144 1087 ,4368 1308 1302 1320 1286
25 ,9757 ,7716 ,7901 ,5830 ,5795 ,4885 ,4763
26 ,4443 ,3934 1066 ,1880 ,1712 ,1717 ,2064

Присвоение имен и расчет новых переменных

Для удобства работы с данными переменным следует присвоить имена в соответствии с таблицей результатов эксперимента: **C1, C2, …, Cn, W1, W2, …, Wn. Кроме того, для перехода к линейной регрессии и для анализа результатов необходимо добавить в таблицу новые переменные и рассчитать значения переменных по формулам, указанным в скобках:**

Y1, Y2,...,YL – логарифмы скорости реакции в параллельных опытах (*Yi*=log(*Wi*);*i*=1…*L*);

Y – среднее значение логарифмов скорости: =*mean*(*Y*1:*YL*);

X1, X2, …, Xn –логарифмы концентраций: *Xi*=log(*Ci*);*i*=1…*n*;

S2Y – дисперсия логарифмов скорости: =(*stdev*(*Y*1:*YL*))^2;

GMAX, S2VOS – критерий Кохрена и дисперсия воспроизводимости ;

S2OST, FISH – остаточная дисперсия и критерий Фишера;

К – константа скорости химической реакции.

Расчёт переменных **GMAX, S2VOS, S2OST, FISH, К будет выполнен позже. Подготовленную таблицу для расчета следует сохранить.**

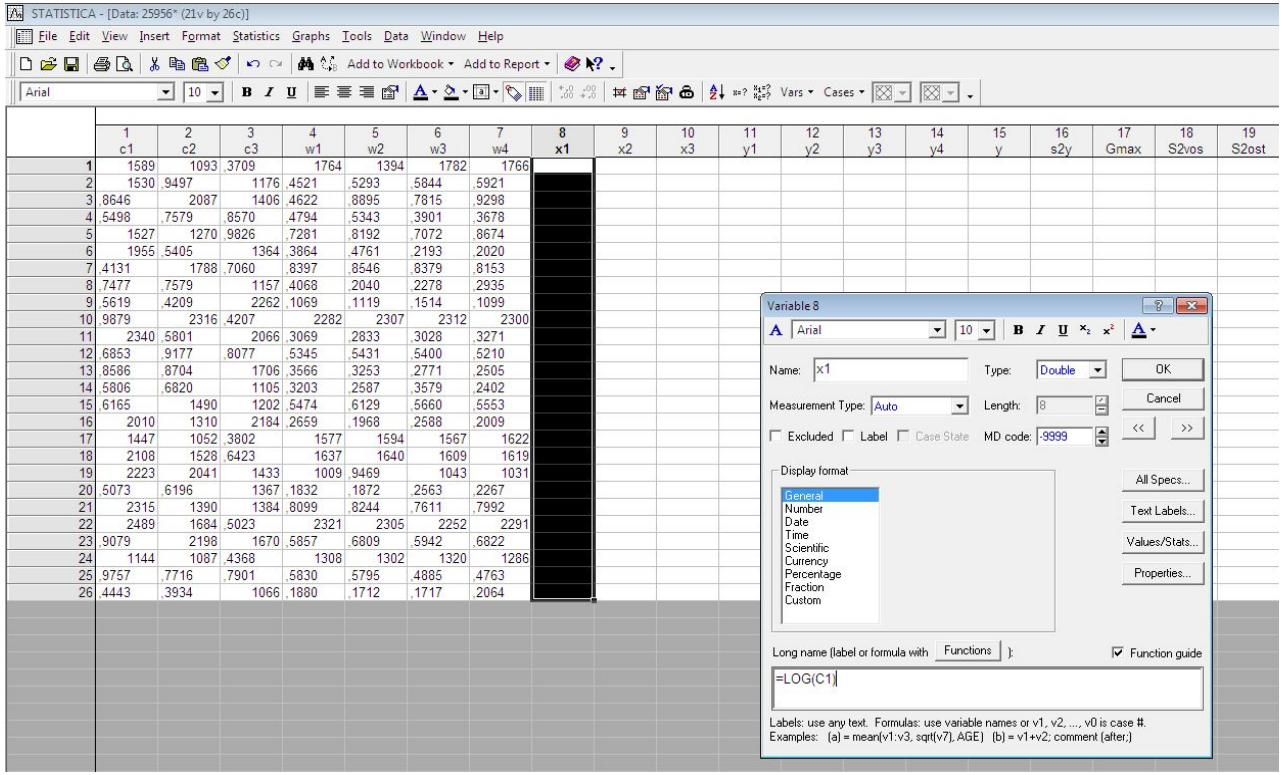
STATISTICA - [Data: 25956* (21v by 26c)]

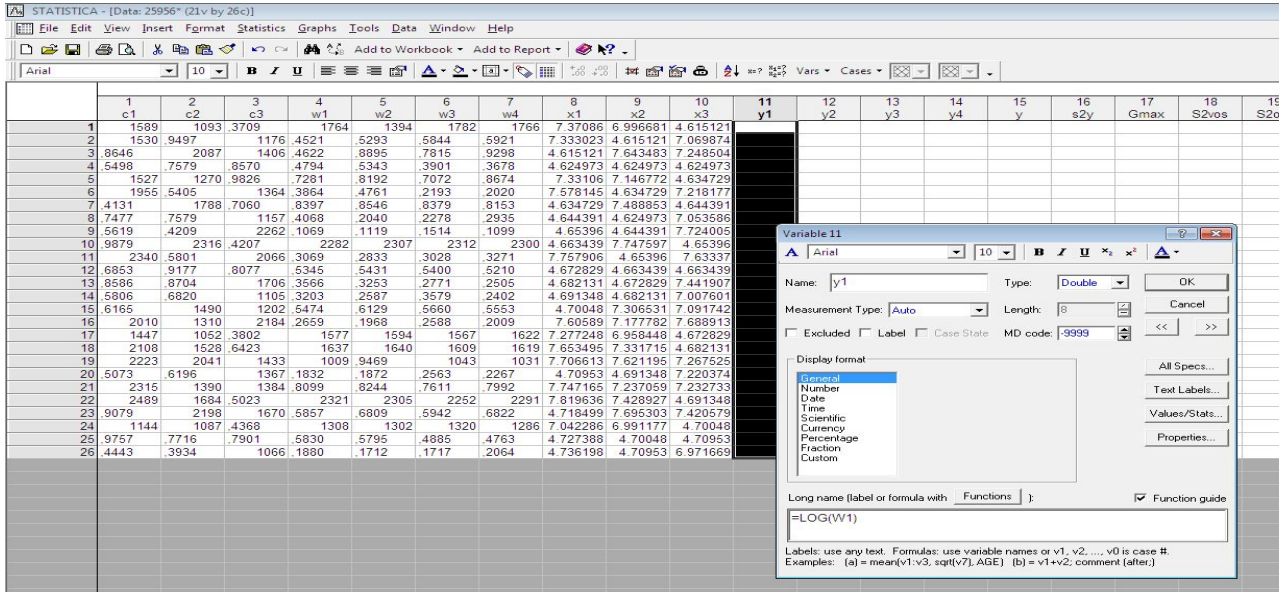
File Edit View Insert Format Statistics Graphs Tools Data Window Help

Add to Workbook Add to Report

Arial 10 Vars Cases

	1 c1	2 c2	3 c3	4 w1	5 w2	6 w3	7 w4	8 x1	9 x2	10 x3	11 y1	12 y2	13 y3	14 y4	15 y	16 s2y	17 Gmax	18 S2vos	19 S2ost	20 Fish	21 K
1	1589	1093	,3709	1764	1394	1782	1766														
2	1530	,9497	1176	,4521	,5293	,5844	,5921														
3	,8646	2087	1406	,4622	,8895	,7815	,9298														
4	,5498	,7579	,8570	,4794	,5343	,3901	,3678														
5	1527	1270	,9826	,7281	,8192	,7072	,8674														
6	1955	,5405	1364	,3864	,4761	,2193	,2020														
7	,4131	1788	,7060	,8397	,8546	,8379	,8153														
8	,7477	,7579	1157	,4068	,2040	,2278	,2935														
9	,5619	,4209	2262	,1069	,1119	,1514	,1099														
10	,9879	2316	,4207	2282	2307	2312	2300														
11	2340	,5801	2066	,3069	,2833	,3028	,3271														
12	,6853	,9177	,8077	,5345	,5431	,5400	,5210														
13	,8586	,8704	1706	,3566	,3253	,2771	,2505														
14	,5806	,6820	1105	,3203	,2587	,3579	,2402														
15	,6165	1490	1202	,5474	,6129	,5660	,5553														
16	2010	1310	2184	,2659	,1968	,2588	,2009														
17	1447	1052	,3802	1577	1594	1567	1622														
18	2108	1528	,6423	1637	1640	1609	1619														
19	2223	2041	1433	1009	,9469	1043	1031														
20	,5073	,6196	1367	,1832	,1872	,2563	,2267														
21	2315	1390	1384	,8099	,8244	,7611	,7992														
22	2489	1684	,5023	2321	2305	2252	2291														
23	,9079	2198	1670	,5857	,6809	,5942	,6822														
24	1144	1087	,4368	1308	1302	1320	1286														
25	,9757	,7716	,7901	,5830	,5795	,4885	,4763														
26	,4443	,3934	1066	,1880	,1712	,1717	,2064														


STATISTICA - [Data: 25956* (21v by 26c)]
File Edit View Insert Format Statistics Graphs Tools Data Window Help
Add to Workbook Add to Report
Vars Cases
Variable 8
Name: x1
Type: Double
OK
Cancel
Measurement Type: Auto
Length: 8
Excluded Label Case State MD code: -9999
Display format
General
Number
Date
Time
Scientific
Currency
Percentage
Fraction
Custom
All Specs...
Text Labels...
Values/Stats...
Properties...
Long name (label or formula with Functions):
Function guide
=LOG(C1)
Labels: use any text. Formulas: use variable names or v1, v2, ..., v0 is case #.
Examples: (a) = mean(v1:v3, sqrt(v7), AGE) (b) = v1+v2; comment (after;)


STATISTICA - [Data: 25956* (21v by 26c)]
File Edit View Insert Format Statistics Graphs Tools Data Window Help
Add to Workbook Add to Report
Vars Cases
Variable 11
Name: y1
Type: Double
OK
Cancel
Measurement Type: Auto
Length: 8
Excluded Label Case State MD code: -9999
Display format
General
Number
Date
Time
Scientific
Currency
Percentage
Fraction
Custom
All Specs...
Text Labels...
Values/Stats...
Properties...
Long name (label or formula with Functions):
Function guide
=LOG(W1)
Labels: use any text. Formulas: use variable names or v1, v2, ..., v0 is case #.
Examples: (a) = mean(v1:v3, sqrt(v7), AGE) (b) = v1+v2; comment (after;)

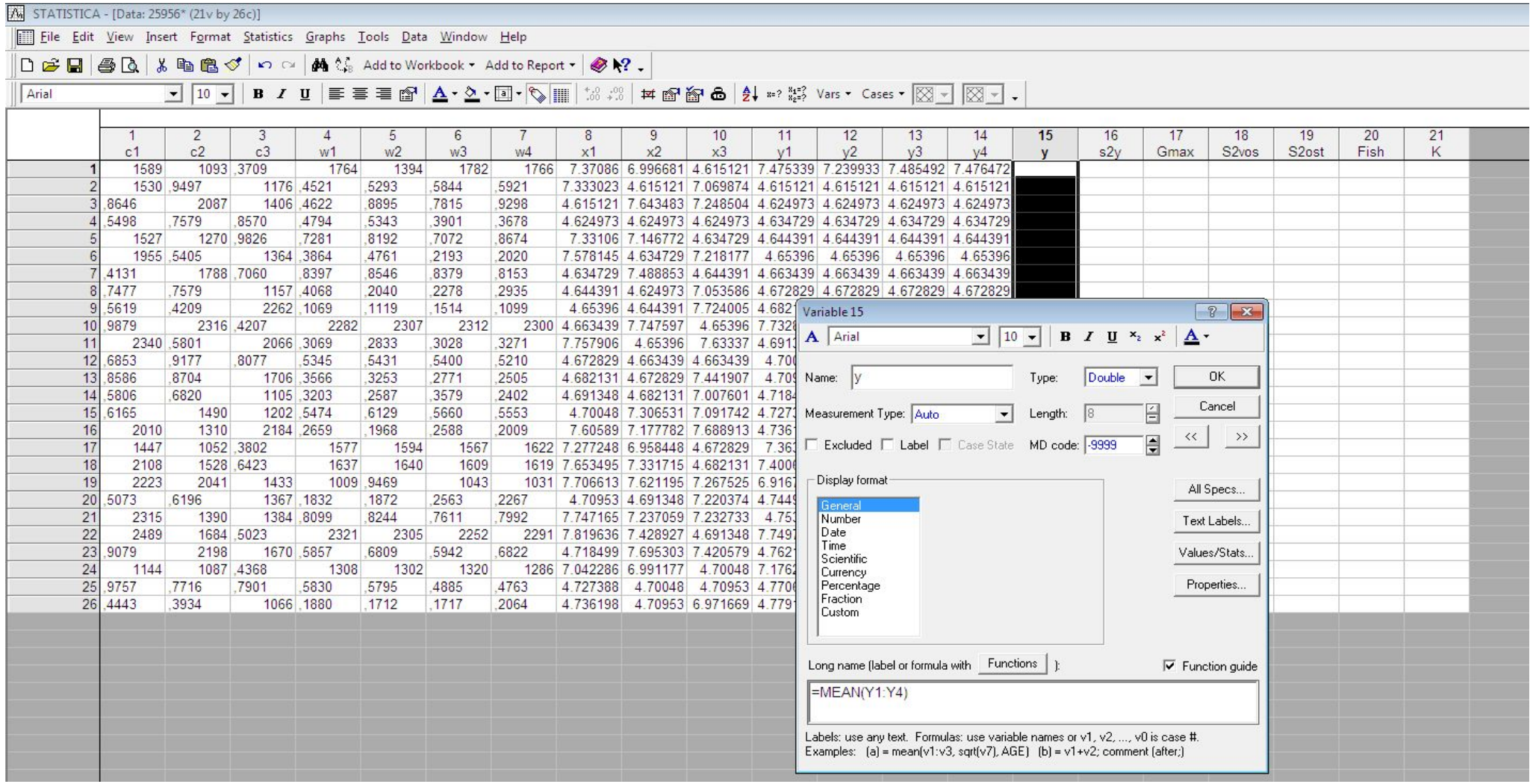
STATISTICA - [Data: 25956* (21v by 26c)]

File Edit View Insert Format Statistics Graphs Tools Data Window Help

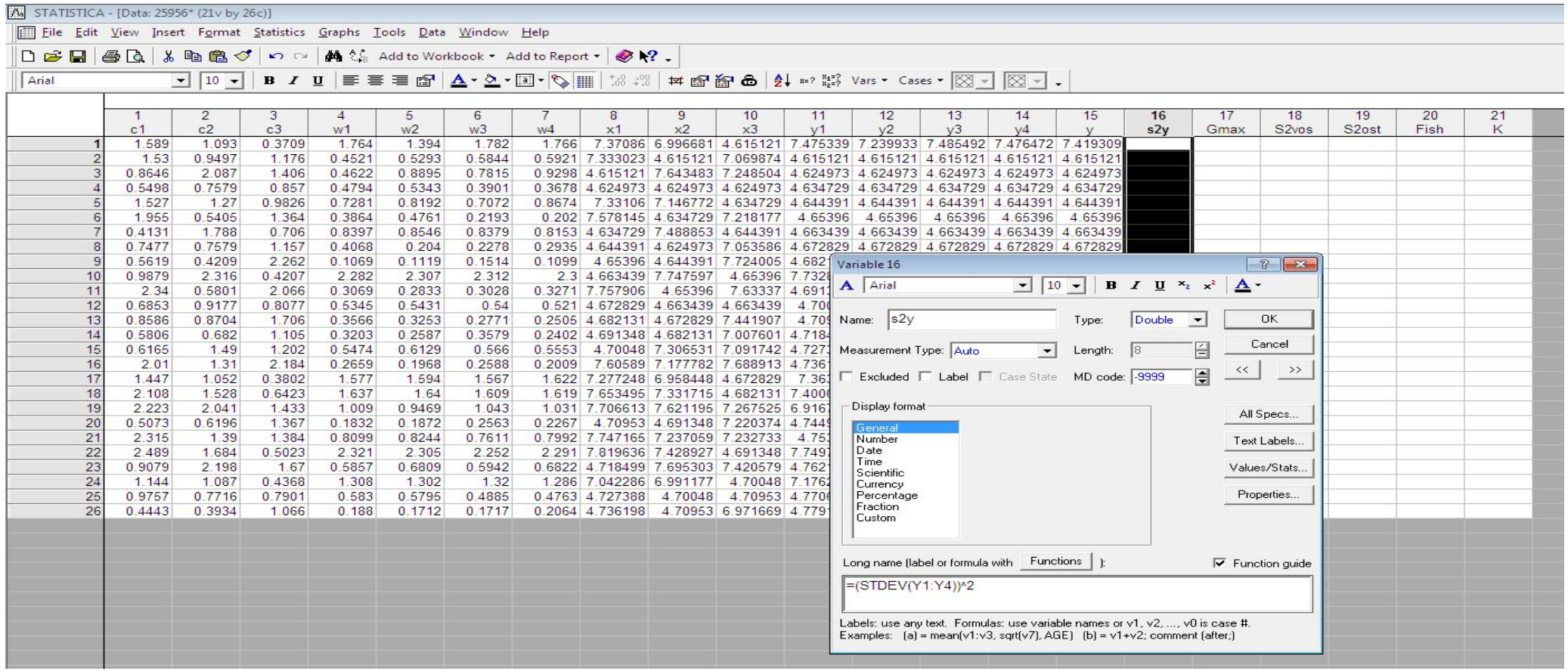
Add to Workbook Add to Report

Arial 10 B I U Vars Cases

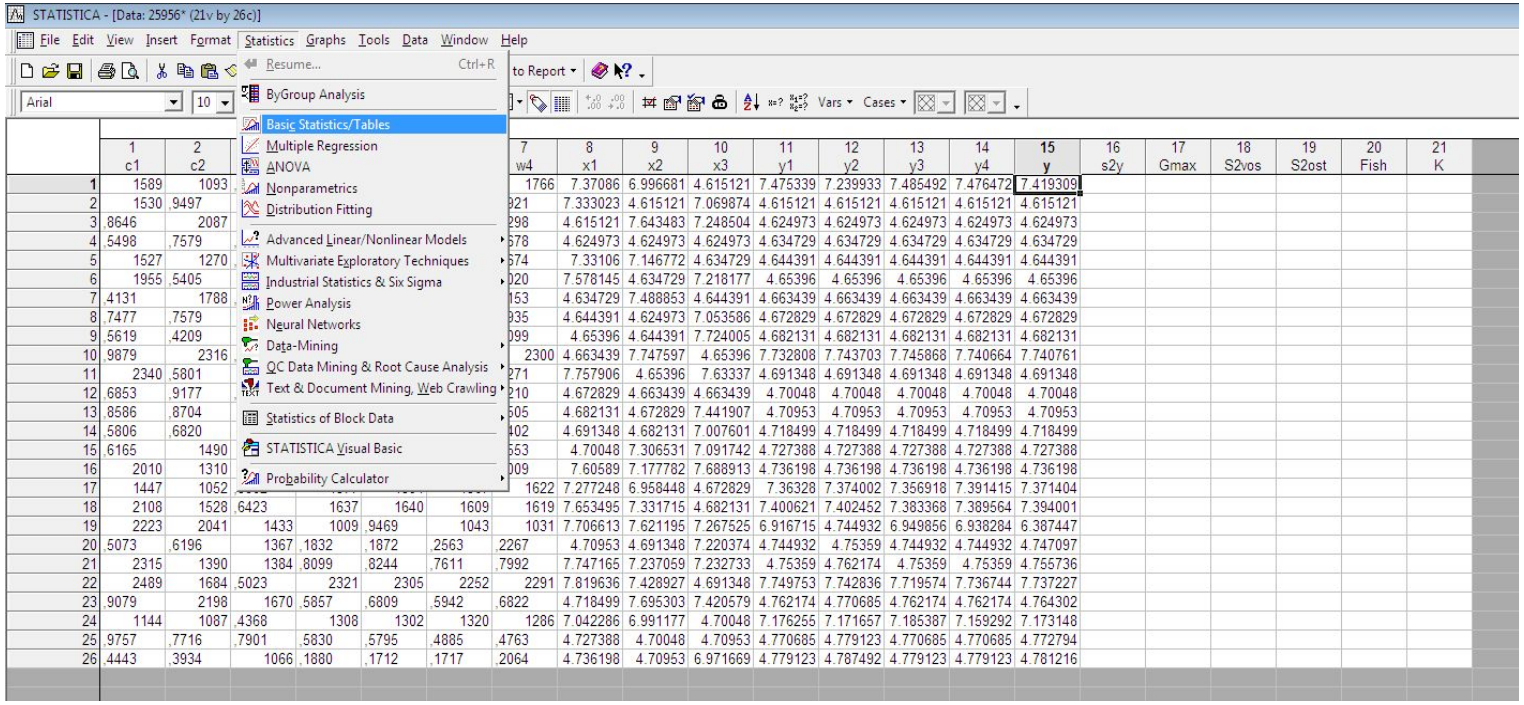
	1 c1	2 c2	3 c3	4 w1	5 w2	6 w3	7 w4	8 x1	9 x2	10 x3	11 y1	12 y2	13 y3	14 y4	15 y	16 s2y	17 Gmax	18 S2vos	19 S2ost	20 Fish	21 K
1	1589	1093	,3709	1764	1394	1782	1766	7.37086	6.996681	4.615121	7.475339	7.239933	7.485492	7.476472							
2	1530	,9497	1176	,4521	,5293	,5844	,5921	7.333023	4.615121	7.069874	4.615121	4.615121	4.615121	4.615121							
3	,8646	2087	1406	,4622	,8895	,7815	,9298	4.615121	7.643483	7.248504	4.624973	4.624973	4.624973	4.624973							
4	,5498	,7579	,8570	,4794	,5343	,3901	,3678	4.624973	4.624973	4.624973	4.634729	4.634729	4.634729	4.634729							
5	1527	1270	,9826	,7281	,8192	,7072	,8674	7.33106	7.146772	4.634729	4.644391	4.644391	4.644391	4.644391							
6	1955	,5405	1364	,3864	,4761	,2193	,2020	7.578145	4.634729	7.218177	4.65396	4.65396	4.65396	4.65396							
7	,4131	1788	,7060	,8397	,8546	,8379	,8153	4.634729	7.488853	4.644391	4.663439	4.663439	4.663439	4.663439							
8	,7477	,7579	1157	,4068	,2040	,2278	,2935	4.644391	4.624973	7.053586	4.672829	4.672829	4.672829	4.672829							
9	,5619	,4209	2262	,1069	,1119	,1514	,1099	4.65396	4.644391	7.724005	4.682131	4.682131	4.682131	4.682131							
10	,9879	2316	,4207	2282	2307	2312	2300	4.663439	7.747597	4.65396	7.732808	7.743703	7.745868	7.740664							
11	2340	,5801	2066	,3069	,2833	,3028	,3271	7.757906	4.65396	7.63337	4.691348	4.691348	4.691348	4.691348							
12	,6853	,9177	,8077	,5345	,5431	,5400	,5210	4.672829	4.663439	4.663439	4.70048	4.70048	4.70048	4.70048							
13	,8586	,8704	1706	,3566	,3253	,2771	,2505	4.682131	4.672829	7.441907	4.70953	4.70953	4.70953	4.70953							
14	,5806	,6820	1105	,3203	,2587	,3579	,2402	4.691348	4.682131	7.007601	4.718499	4.718499	4.718499	4.718499							
15	,6165	1490	1202	,5474	,6129	,5660	,5553	4.70048	7.306531	7.091742	4.727388	4.727388	4.727388	4.727388							
16	2010	1310	2184	,2659	,1968	,2588	,2009	7.60589	7.177782	7.688913	4.736198	4.736198	4.736198	4.736198							
17	1447	1052	,3802	1577	1594	1567	1622	7.277248	6.958448	4.672829	7.36328	7.374002	7.356918	7.391415							
18	2108	1528	,6423	1637	1640	1609	1619	7.653495	7.331715	4.682131	7.400621	7.402452	7.383368	7.389564							
19	2223	2041	1433	1009	,9469	1043	1031	7.706613	7.621195	7.267525	6.916715	4.744932	6.949856	6.938284							
20	,5073	,6196	1367	,1832	,1872	,2563	,2267	4.70953	4.691348	7.220374	4.744932	4.75359	4.744932	4.744932							
21	2315	1390	1384	,8099	,8244	,7611	,7992	7.747165	7.237059	7.232733	4.75359	4.762174	4.75359	4.75359							
22	2489	1684	,5023	2321	2305	2252	2291	7.819636	7.428927	4.691348	7.749753	7.742836	7.719574	7.736744							
23	,9079	2198	1670	,5857	,6809	,5942	,6822	4.718499	7.695303	7.420579	4.762174	4.770685	4.762174	4.762174							
24	1144	1087	,4368	1308	1302	1320	1286	7.042286	6.991177	4.70048	7.176255	7.171657	7.185387	7.159292							
25	,9757	,7716	,7901	,5830	,5795	,4885	,4763	4.727388	4.70048	4.70953	4.770685	4.779123	4.770685	4.770685							
26	,4443	,3934	1066	,1880	,1712	,1717	,2064	4.736198	4.70953	6.971669	4.779123	4.787492	4.779123	4.779123							

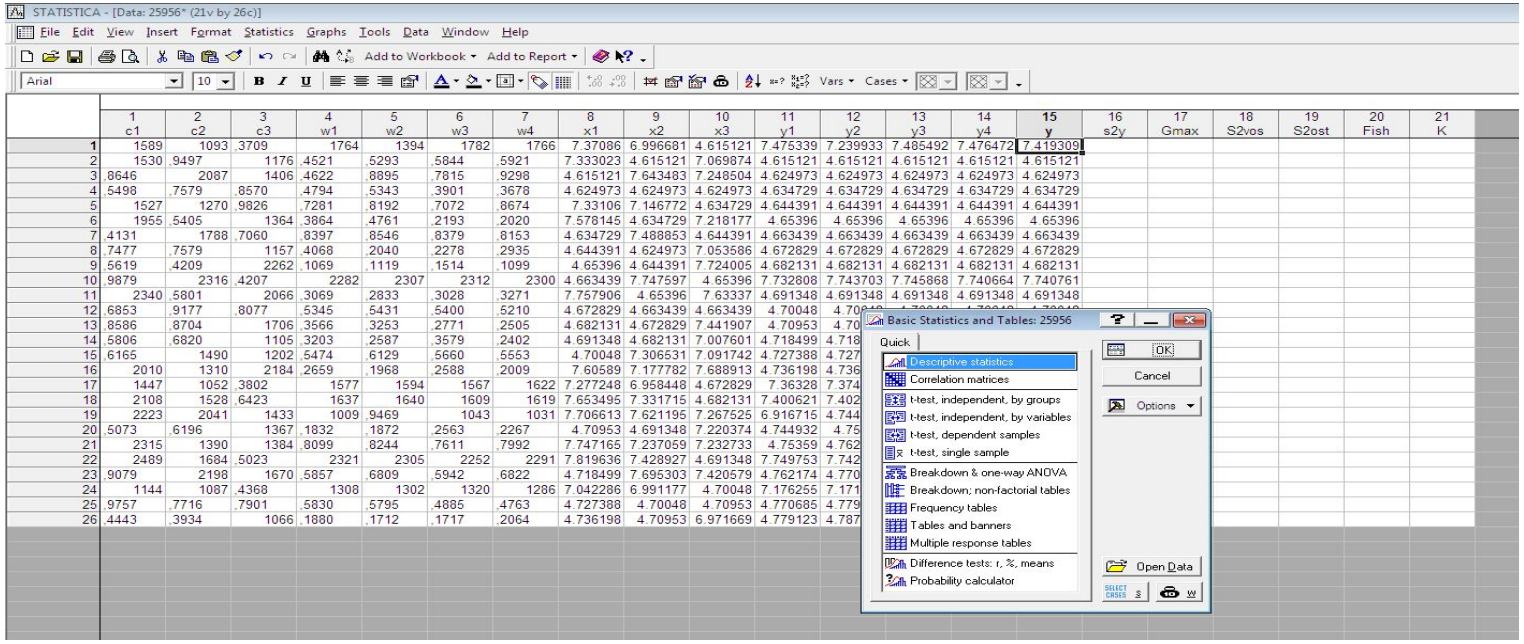


	1 c1	2 c2	3 c3	4 w1	5 w2	6 w3	7 w4	8 x1	9 x2	10 x3	11 y1	12 y2	13 y3	14 y4	15 y	16 s2y	17 Gmax	18 S2vos	19 S2ost	20 Fish	21 K
1	1589	1093	,3709	1764	1394	1782	1766	7.37086	6.996681	4.615121	7.475339	7.239933	7.485492	7.476472							
2	1530	,9497	1176	,4521	,5293	,5844	,5921	7.333023	4.615121	7.069874	4.615121	4.615121	4.615121	4.615121							
3	,8646	2087	1406	,4622	,8895	,7815	,9298	4.615121	7.643483	7.248504	4.624973	4.624973	4.624973	4.624973							
4	,5498	,7579	,8570	,4794	,5343	,3901	,3678	4.624973	4.624973	4.624973	4.634729	4.634729	4.634729	4.634729							
5	1527	1270	,9826	,7281	,8192	,7072	,8674	7.33106	7.146772	4.634729	4.644391	4.644391	4.644391	4.644391							
6	1955	,5405	1364	,3864	,4761	,2193	,2020	7.578145	4.634729	7.218177	4.65396	4.65396	4.65396	4.65396							
7	,4131	1788	,7060	,8397	,8546	,8379	,8153	4.634729	7.488853	4.644391	4.663439	4.663439	4.663439	4.663439							
8	,7477	,7579	1157	,4068	,2040	,2278	,2935	4.644391	4.624973	7.053586	4.672829	4.672829	4.672829	4.672829							
9	,5619	,4209	2262	,1069	,1119	,1514	,1099	4.65396	4.644391	7.724005	4.682										
10	,9879	2316	,4207	2282	2307	2312	2300	4.663439	7.747597	4.65396	7.732										
11	2340	,5801	2066	,3069	,2833	,3028	,3271	7.757906	4.65396	7.63337	4.691										
12	,6853	,9177	,8077	,5345	,5431	,5400	,5210	4.672829	4.663439	4.663439	4.70										
13	,8586	,8704	1706	,3566	,3253	,2771	,2505	4.682131	4.672829	7.441907	4.709										
14	,5806	,6820	1105	,3203	,2587	,3579	,2402	4.691348	4.682131	7.007601	4.718										
15	,6165	1490	1202	,5474	,6129	,5660	,5553	4.70048	7.306531	7.091742	4.727										
16	2010	1310	2184	,2659	,1968	,2588	,2009	7.60589	7.177782	7.688913	4.736										
17	1447	1052	,3802	1577	1594	1567	1622	7.277248	6.958448	4.672829	7.36										
18	2108	1528	,6423	1637	1640	1609	1619	7.653495	7.331715	4.682131	7.400										
19	2223	2041	1433	1009	,9469	1043	1031	7.706613	7.621195	7.267525	6.916										
20	,5073	,6196	1367	,1832	,1872	,2563	,2267	4.70953	4.691348	7.220374	4.744										
21	2315	1390	1384	,8099	,8244	,7611	,7992	7.747165	7.237059	7.232733	4.75										
22	2489	1684	,5023	2321	2305	2252	2291	7.819636	7.428927	4.691348	7.749										
23	,9079	2198	1670	,5857	,6809	,5942	,6822	4.718499	7.695303	7.420579	4.762										
24	1144	1087	,4368	1308	1302	1320	1286	7.042286	6.991177	4.70048	7.176										
25	,9757	,7716	,7901	,5830	,5795	,4885	,4763	4.727388	4.70048	4.70953	4.770										
26	,4443	,3934	1066	,1880	,1712	,1717	,2064	4.736198	4.70953	6.971669	4.779										



	1 c1	2 c2	3 c3	4 w1	5 w2	6 w3	7 w4	8 x1	9 x2	10 x3	11 y1	12 y2	13 y3	14 y4	15 y	16 s2y	17 Gmax	18 S2vos	19 S2ost	20 Fish	21 K
1	1.589	1.093	0.3709	1.764	1.394	1.782	1.766	7.37086	6.996681	4.615121	7.475339	7.239933	7.485492	7.476472	7.419309						
2	1.53	0.9497	1.176	0.4521	0.5293	0.5844	0.5921	7.333023	4.615121	7.069874	4.615121	4.615121	4.615121	4.615121	4.615121						
3	0.8646	2.087	1.406	0.4622	0.8895	0.7815	0.9298	4.615121	7.643483	7.248504	4.624973	4.624973	4.624973	4.624973	4.624973						
4	0.5498	0.7579	0.857	0.4794	0.5343	0.3901	0.3678	4.624973	4.624973	4.624973	4.634729	4.634729	4.634729	4.634729	4.634729						
5	1.527	1.27	0.9826	0.7281	0.8192	0.7072	0.8674	7.33106	7.146772	4.634729	4.644391	4.644391	4.644391	4.644391	4.644391						
6	1.955	0.5405	1.364	0.3864	0.4761	0.2193	0.202	7.578145	4.634729	7.218177	4.65396	4.65396	4.65396	4.65396	4.65396						
7	0.4131	1.788	0.706	0.8397	0.8546	0.8379	0.8153	4.634729	7.488853	4.644391	4.663439	4.663439	4.663439	4.663439	4.663439						
8	0.7477	0.7579	1.157	0.4068	0.204	0.2278	0.2935	4.644391	4.624973	7.053586	4.672829	4.672829	4.672829	4.672829	4.672829						
9	0.5619	0.4209	2.262	0.1069	0.1119	0.1514	0.1099	4.65396	4.644391	7.724005	4.682										
10	0.9879	2.316	0.4207	2.282	2.307	2.312	2.3	4.663439	7.747597	4.65396	7.732										
11	2.34	0.5801	2.066	0.3069	0.2833	0.3028	0.3271	7.757906	4.65396	7.63337	4.691										
12	0.6853	0.9177	0.8077	0.5345	0.5431	0.54	0.521	4.672829	4.663439	4.663439	4.70										
13	0.8586	0.8704	1.706	0.3566	0.3253	0.2771	0.2505	4.682131	4.672829	7.441907	4.70										
14	0.5806	0.682	1.105	0.3203	0.2587	0.3579	0.2402	4.691348	4.682131	7.007601	4.718										
15	0.6165	1.49	1.202	0.5474	0.6129	0.566	0.5553	4.70048	7.306531	7.091742	4.727										
16	2.01	1.31	2.184	0.2659	0.1968	0.2588	0.2009	7.60589	7.177782	7.688913	4.736										
17	1.447	1.052	0.3802	1.577	1.594	1.567	1.622	7.277248	6.958448	4.672829	7.36										
18	2.108	1.528	0.6423	1.637	1.64	1.609	1.619	7.653495	7.331715	4.682131	7.400										
19	2.223	2.041	1.433	1.009	0.9469	1.043	1.031	7.706613	7.621195	7.267525	6.916										
20	0.5073	0.6196	1.367	0.1832	0.1872	0.2563	0.2267	4.70953	4.691348	7.220374	4.744										
21	2.315	1.39	1.384	0.8099	0.8244	0.7611	0.7992	7.747165	7.237059	7.232733	4.75										
22	2.489	1.684	0.5023	2.321	2.305	2.252	2.291	7.819636	7.428927	4.691348	7.749										
23	0.9079	2.198	1.67	0.5857	0.6809	0.5942	0.6822	4.718499	7.695303	7.420579	4.762										
24	1.144	1.087	0.4368	1.308	1.302	1.32	1.286	7.042286	6.991177	4.70048	7.176										
25	0.9757	0.7716	0.7901	0.583	0.5795	0.4885	0.4763	4.727388	4.70048	4.70953	4.770										
26	0.4443	0.3934	1.066	0.188	0.1712	0.1717	0.2064	4.736198	4.70953	6.971669	4.779										





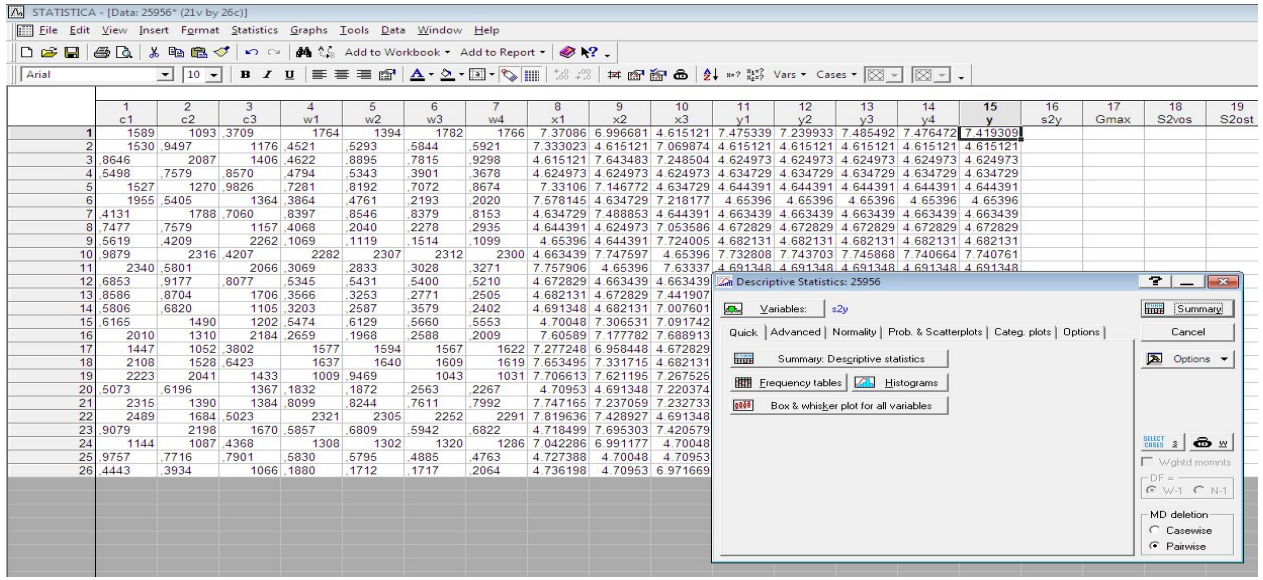
Предварительная обработка результатов эксперимента

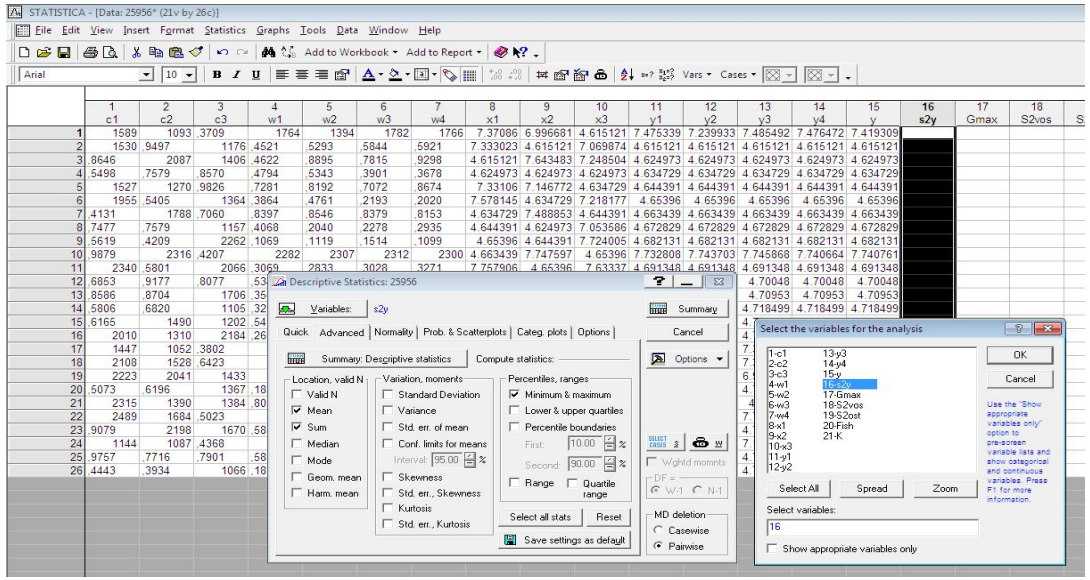
в меню команды **Statistics выбираете Basic Statistics / Tables;**

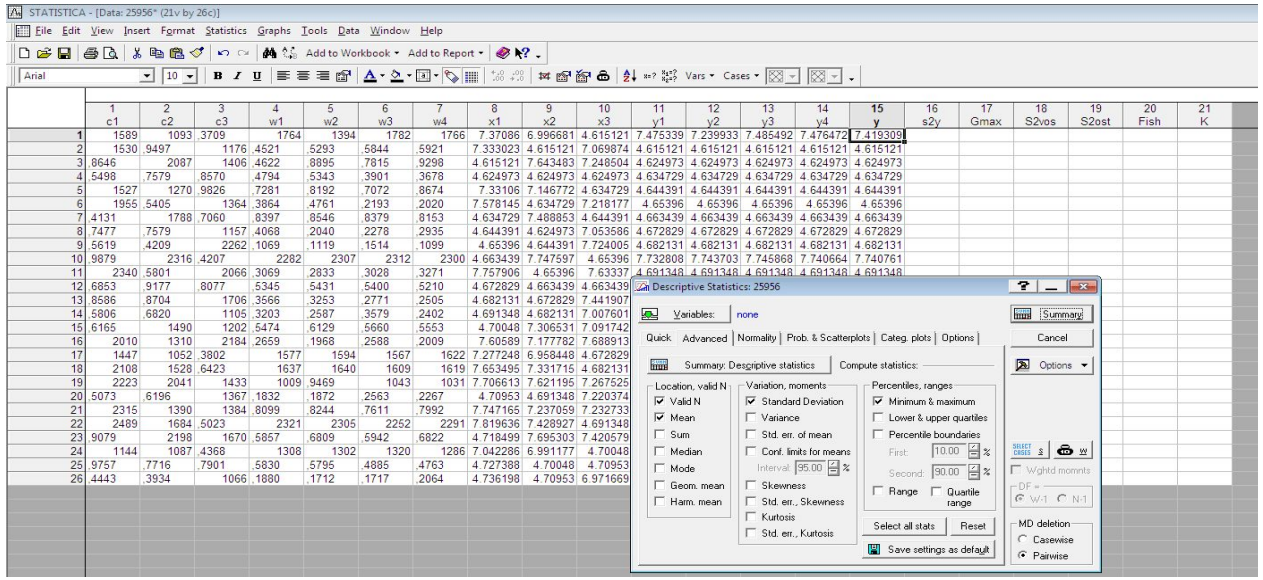
в окне **Basic Statistics and Tables выбираете Descriptive Statistics;**

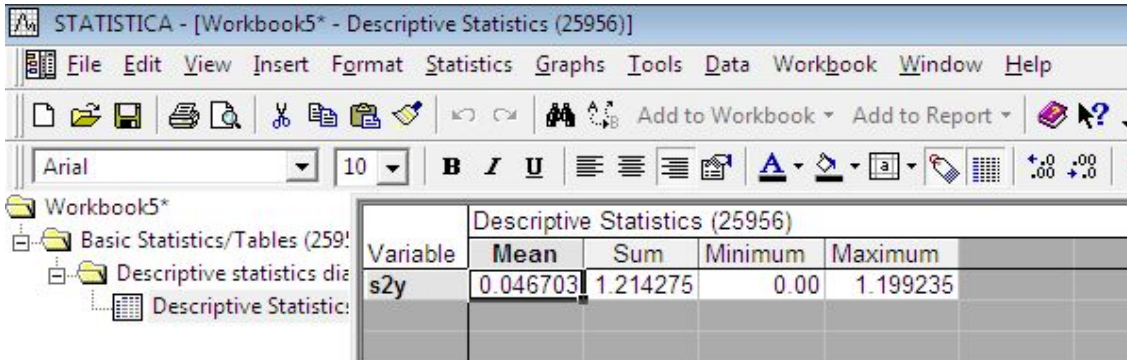
в окне **Descriptive Statistics статистики щёлкаете Variables и из списка переменных выбрать S2Y, OK;**

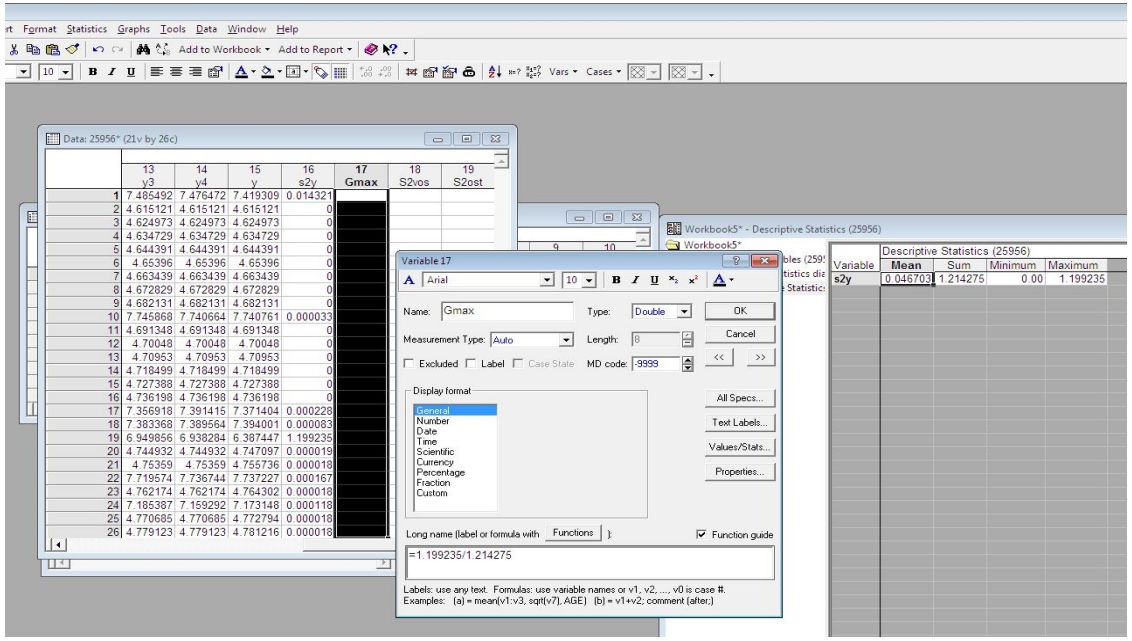
выбираете закладку **Advanced, в списках отмечаете Mean, Sum, Minimum & Maximum; снимаете флажки с Valid N и Standard Deviation; щёлкаете Summary;**


STATISTICA - [Data: 25956* (21v by 26c)]
File Edit View Insert Format Statistics Graphs Tools Data Window Help
Add to Workbook Add to Report
Descriptive Statistics: 25956
Variables: s2y
Summary
Cancel
Options
Quick Advanced Normality Prob. & Scatterplots Categ. plots Options
Summary: Descriptive statistics
Frequency tables
Histograms
Box & whisker plot for all variables
Wghtd momnts
DF = W-1 N-1
MD deletion
Casewise
Pairwise


STATISTICA - [Data: 25956* (21v by 26c)]
File Edit View Insert Format Statistics Graphs Tools Data Window Help
Add to Workbook Add to Report
Descriptive Statistics: 25956
Variables: s2y
Summary
Cancel
Options
Quick Advanced Normality Prob. & Scatterplots Categ. plots Options
Summary: Descriptive statistics
Compute statistics:
Location, valid N
Valid N
Mean
Sum
Median
Mode
Geom. mean
Harm. mean
Variation, moments
Standard Deviation
Variance
Std. err. of mean
Conf. limits for means
Interval: 95.00
Skewness
Std. err., Skewness
Kurtosis
Std. err., Kurtosis
Percentiles, ranges
Minimum & maximum
Lower & upper quartiles
Percentile boundaries
First: 10.00
Second: 90.00
Range
Quartile range
Select all stats
Reset
Save settings as default
Wghtd momnts
DF = W-1 N-1
MD deletion
Casewise
Pairwise
Select the variables for the analysis
1-c1
2-c2
3-c3
4-w1
5-w2
6-w3
7-w4
8-x1
9-x2
10-x3
11-y1
12-y2
13-y3
14-y4
15-y
16-s2y
17-Gmax
18-S2vos
19-S2ost
20-Fish
21-K
OK
Cancel
Use the "Show appropriate variables only" option to pre-screen variable lists and show categorical and continuous variables. Press F1 for more information.
Select All
Spread
Zoom
Select variables:
16
Show appropriate variables only


STATISTICA - [Data: 25956* (21v by 26c)]
File Edit View Insert Format Statistics Graphs Tools Data Window Help
Add to Workbook Add to Report
Descriptive Statistics: 25956
Variables: none
Summary
Cancel
Options
Quick Advanced Normality Prob. & Scatterplots Categ. plots Options
Summary: Descriptive statistics
Compute statistics:
Location, valid N
Valid N
Mean
Sum
Median
Mode
Geom. mean
Harm. mean
Variation, moments
Standard Deviation
Variance
Std. err. of mean
Conf. limits for means
Interval: 95.00
Skewness
Std. err., Skewness
Kurtosis
Std. err., Kurtosis
Percentiles, ranges
Minimum & maximum
Lower & upper quartiles
Percentile boundaries
First: 10.00
Second: 90.00
Range
Quartile range
Select all stats
Reset
Save settings as default
Wghtd momnts
DF = W-1 N-1
MD deletion
Casewise
Pairwise





Оценка качества выполненного эксперимента

Расчет дисперсий и их анализ был выполнен в статистическом модуле Descriptive Statistics. Полученные результаты:

Расчетный критерий Кохрена:

$$G_{max} = S^2_{y_{max}} \Big/ \sum_{i=1}^{m} S^2_{y_i}$$

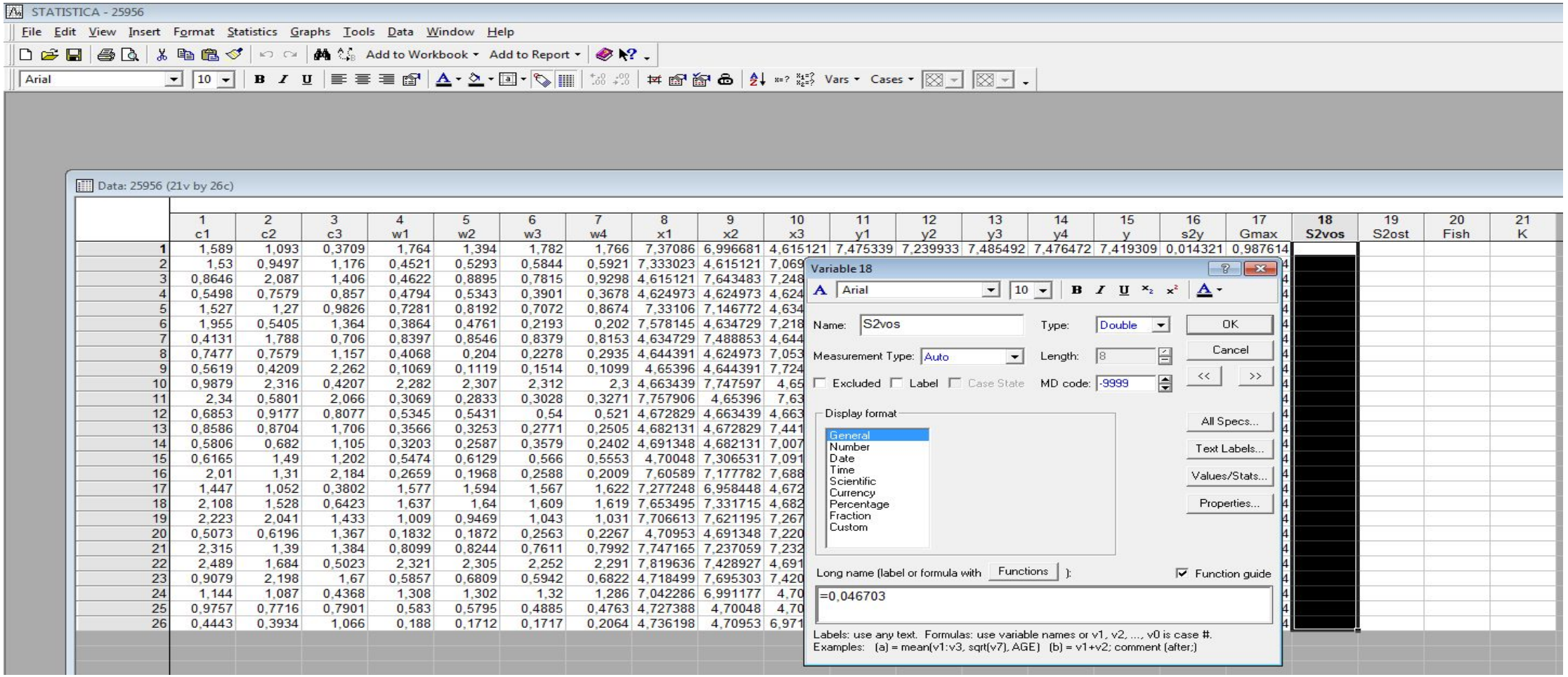
STATISTICA - [Data: 25956* (21v by 26c)]

File Edit View Insert Format Statistics Graphs Tools Data Window Help

Add to Workbook Add to Report

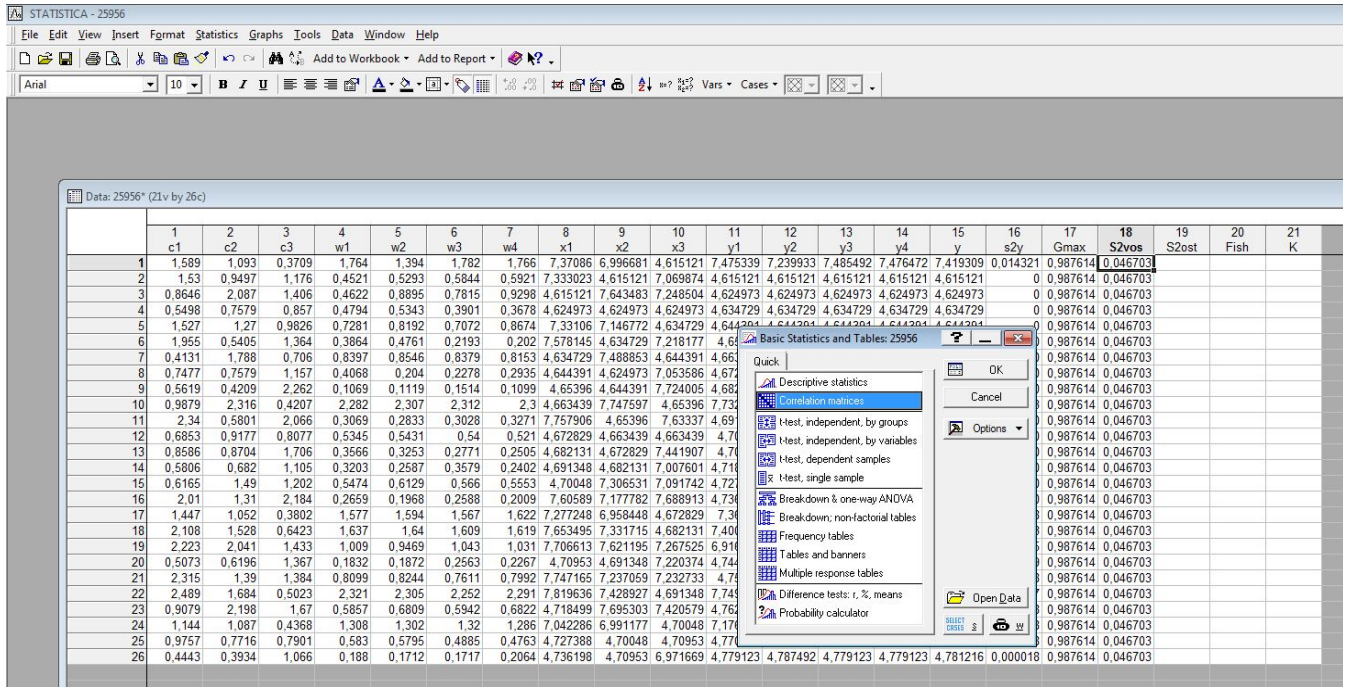
Arial 10 Vars Cases

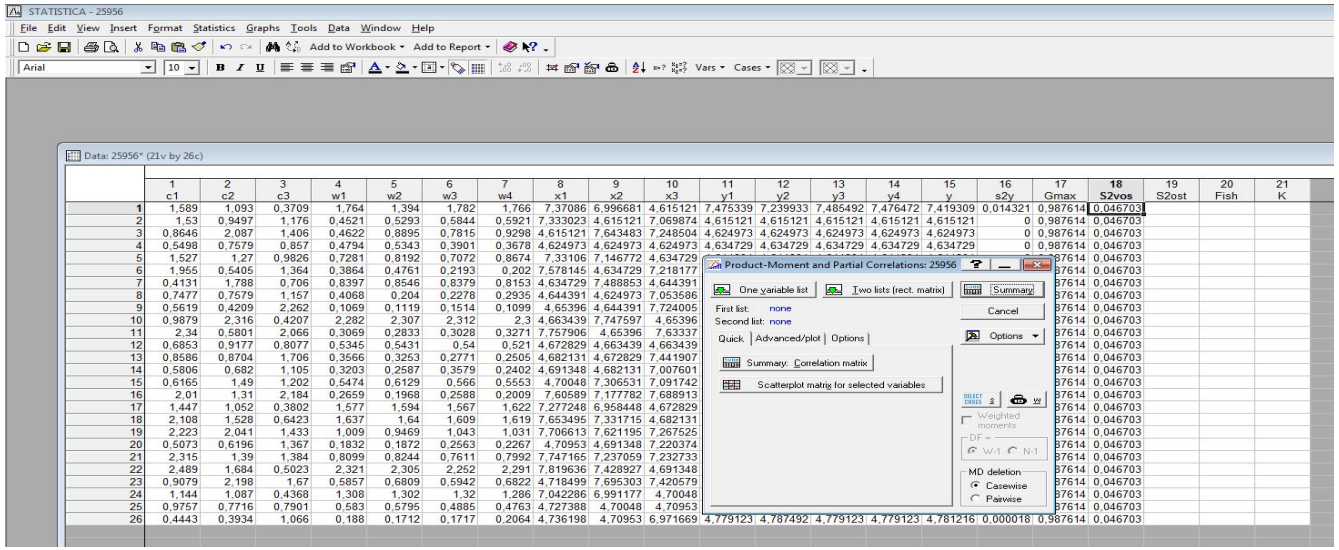
	1 c1	2 c2	3 c3	4 w1	5 w2	6 w3	7 w4	8 x1	9 x2	10 x3	11 y1	12 y2	13 y3	14 y4	15 y	16 s2y	17 Gmax	18 S2vos	19 S2ost	20 Fish	21 K
1	1.589	1.093	0.3709	1.764	1.394	1.782	1.766	7.37086	6.996681	4.615121	7.475339	7.239933	7.485492	7.476472	7.419309	0.014321	0.987614				
2	1.53	0.9497	1.176	0.4521	0.5293	0.5844	0.5921	7.333023	4.615121	7.069874	4.615121	4.615121	4.615121	4.615121	4.615121	0	0.987614				
3	0.8646	2.087	1.406	0.4622	0.8895	0.7815	0.9298	4.615121	7.643483	7.248504	4.624973	4.624973	4.624973	4.624973	4.624973	0	0.987614				
4	0.5498	0.7579	0.857	0.4794	0.5343	0.3901	0.3678	4.624973	4.624973	4.624973	4.634729	4.634729	4.634729	4.634729	4.634729	0	0.987614				
5	1.527	1.27	0.9826	0.7281	0.8192	0.7072	0.8674	7.33106	7.146772	4.634729	4.644391	4.644391	4.644391	4.644391	4.644391	0	0.987614				
6	1.955	0.5405	1.364	0.3864	0.4761	0.2193	0.202	7.578145	4.634729	7.218177	4.65396	4.65396	4.65396	4.65396	4.65396	0	0.987614				
7	0.4131	1.788	0.706	0.8397	0.8546	0.8379	0.8153	4.634729	7.488853	4.644391	4.663439	4.663439	4.663439	4.663439	4.663439	0	0.987614				
8	0.7477	0.7579	1.157	0.4068	0.204	0.2278	0.2935	4.644391	4.624973	7.053586	4.672829	4.672829	4.672829	4.672829	4.672829	0	0.987614				
9	0.5619	0.4209	2.262	0.1069	0.1119	0.1514	0.1099	4.65396	4.644391	7.724005	4.682131	4.682131	4.682131	4.682131	4.682131	0	0.987614				
10	0.9879	2.316	0.4207	2.282	2.307	2.312	2.3	4.663439	7.747597	4.65396	7.732808	7.743703	7.745868	7.740664	7.740761	0.000033	0.987614				
11	2.34	0.5801	2.066	0.3069	0.2833	0.3028	0.3271	7.757906	4.65396	7.63337	4.691348	4.691348	4.691348	4.691348	4.691348	0	0.987614				
12	0.6853	0.9177	0.8077	0.5345	0.5431	0.54	0.521	4.672829	4.663439	4.663439	4.70048	4.70048	4.70048	4.70048	4.70048	0	0.987614				
13	0.8586	0.8704	1.706	0.3566	0.3253	0.2771	0.2505	4.682131	4.672829	7.441907	4.70953	4.70953	4.70953	4.70953	4.70953	0	0.987614				
14	0.5806	0.682	1.105	0.3203	0.2587	0.3579	0.2402	4.691348	4.682131	7.007601	4.718499	4.718499	4.718499	4.718499	4.718499	0	0.987614				
15	0.6165	1.49	1.202	0.5474	0.6129	0.566	0.5553	4.70048	7.306531	7.091742	4.727388	4.727388	4.727388	4.727388	4.727388	0	0.987614				
16	2.01	1.31	2.184	0.2659	0.1968	0.2588	0.2009	7.60589	7.177782	7.688913	4.736198	4.736198	4.736198	4.736198	4.736198	0	0.987614				
17	1.447	1.052	0.3802	1.577	1.594	1.567	1.622	7.277248	6.958448	4.672829	7.36328	7.374002	7.356918	7.391415	7.371404	0.000228	0.987614				
18	2.108	1.528	0.6423	1.637	1.64	1.609	1.619	7.653495	7.331715	4.682131	7.400621	7.402452	7.383368	7.389564	7.394001	0.000083	0.987614				
19	2.223	2.041	1.433	1.009	0.9469	1.043	1.031	7.706613	7.621195	7.267525	6.916715	4.744932	6.949856	6.938284	6.387447	1.199235	0.987614				
20	0.5073	0.6196	1.367	0.1832	0.1872	0.2563	0.2267	4.70953	4.691348	7.220374	4.744932	4.75359	4.744932	4.744932	4.747097	0.000019	0.987614				
21	2.315	1.39	1.384	0.8099	0.8244	0.7611	0.7992	7.747165	7.237059	7.232733	4.75359	4.762174	4.75359	4.75359	4.755736	0.000018	0.987614				
22	2.489	1.684	0.5023	2.321	2.305	2.252	2.291	7.819636	7.428927	4.691348	7.749753	7.742836	7.719574	7.736744	7.737227	0.000167	0.987614				
23	0.9079	2.198	1.67	0.5857	0.6809	0.5942	0.6822	4.718499	7.695303	7.420579	4.762174	4.770685	4.762174	4.762174	4.764302	0.000018	0.987614				
24	1.144	1.087	0.4368	1.308	1.302	1.32	1.286	7.042286	6.991177	4.70048	7.176255	7.171657	7.185387	7.159292	7.173148	0.000118	0.987614				
25	0.9757	0.7716	0.7901	0.583	0.5795	0.4885	0.4763	4.727388	4.70048	4.70953	4.770685	4.779123	4.770685	4.770685	4.772794	0.000018	0.987614				
26	0.4443	0.3934	1.066	0.188	0.1712	0.1717	0.2064	4.736198	4.70953	6.971669	4.779123	4.787492	4.779123	4.779123	4.781216	0.000018	0.987614				



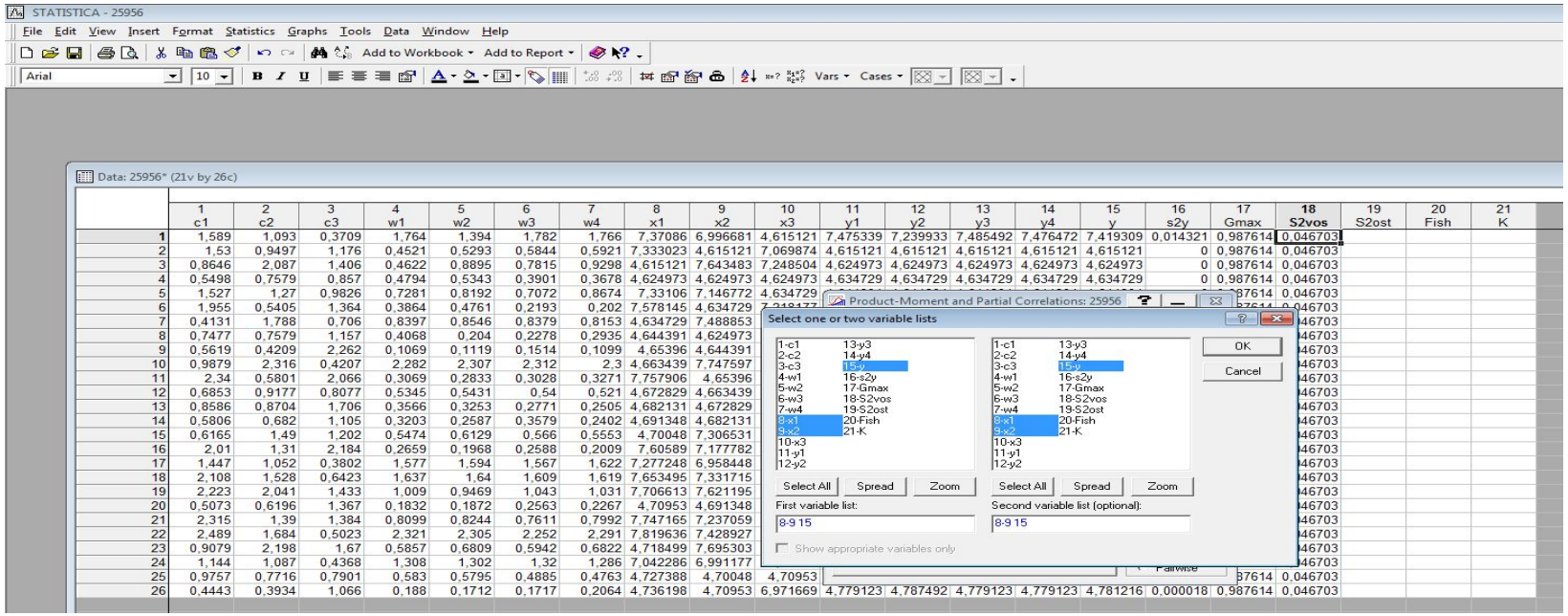
	1 c1	2 c2	3 c3	4 w1	5 w2	6 w3	7 w4	8 x1	9 x2	10 x3	11 y1	12 y2	13 y3	14 y4	15 y	16 s2y	17 Gmax	18 S2vos	19 S2ost	20 Fish	21 K
1	1,589	1,093	0,3709	1,764	1,394	1,782	1,766	7,37086	6,996681	4,615121	7,475339	7,239933	7,485492	7,476472	7,419309	0,014321	0,987614				
2	1,53	0,9497	1,176	0,4521	0,5293	0,5844	0,5921	7,333023	4,615121	7,069											
3	0,8646	2,087	1,406	0,4622	0,8895	0,7815	0,9298	4,615121	7,643483	7,248											
4	0,5498	0,7579	0,857	0,4794	0,5343	0,3901	0,3678	4,624973	4,624973	4,624											
5	1,527	1,27	0,9826	0,7281	0,8192	0,7072	0,8674	7,33106	7,146772	4,634											
6	1,955	0,5405	1,364	0,3864	0,4761	0,2193	0,202	7,578145	4,634729	7,218											
7	0,4131	1,788	0,706	0,8397	0,8546	0,8379	0,8153	4,634729	7,488853	4,644											
8	0,7477	0,7579	1,157	0,4068	0,204	0,2278	0,2935	4,644391	4,624973	7,053											
9	0,5619	0,4209	2,262	0,1069	0,1119	0,1514	0,1099	4,65396	4,644391	7,724											
10	0,9879	2,316	0,4207	2,282	2,307	2,312	2,3	4,663439	7,747597	4,65											
11	2,34	0,5801	2,066	0,3069	0,2833	0,3028	0,3271	7,757906	4,65396	7,63											
12	0,6853	0,9177	0,8077	0,5345	0,5431	0,54	0,521	4,672829	4,663439	4,663											
13	0,8586	0,8704	1,706	0,3566	0,3253	0,2771	0,2505	4,682131	4,672829	7,441											
14	0,5806	0,682	1,105	0,3203	0,2587	0,3579	0,2402	4,691348	4,682131	7,007											
15	0,6165	1,49	1,202	0,5474	0,6129	0,566	0,5553	4,70048	7,306531	7,091											
16	2,01	1,31	2,184	0,2659	0,1968	0,2588	0,2009	7,60589	7,177782	7,688											
17	1,447	1,052	0,3802	1,577	1,594	1,567	1,622	7,277248	6,958448	4,672											
18	2,108	1,528	0,6423	1,637	1,64	1,609	1,619	7,653495	7,331715	4,682											
19	2,223	2,041	1,433	1,009	0,9469	1,043	1,031	7,706613	7,621195	7,267											
20	0,5073	0,6196	1,367	0,1832	0,1872	0,2563	0,2267	4,70953	4,691348	7,220											
21	2,315	1,39	1,384	0,8099	0,8244	0,7611	0,7992	7,747165	7,237059	7,232											
22	2,489	1,684	0,5023	2,321	2,305	2,252	2,291	7,819636	7,428927	4,691											
23	0,9079	2,198	1,67	0,5857	0,6809	0,5942	0,6822	4,718499	7,695303	7,420											
24	1,144	1,087	0,4368	1,308	1,302	1,32	1,286	7,042286	6,991177	4,70											
25	0,9757	0,7716	0,7901	0,583	0,5795	0,4885	0,4763	4,727388	4,70048	4,70											
26	0,4443	0,3934	1,066	0,188	0,1712	0,1717	0,2064	4,736198	4,70953	6,971											

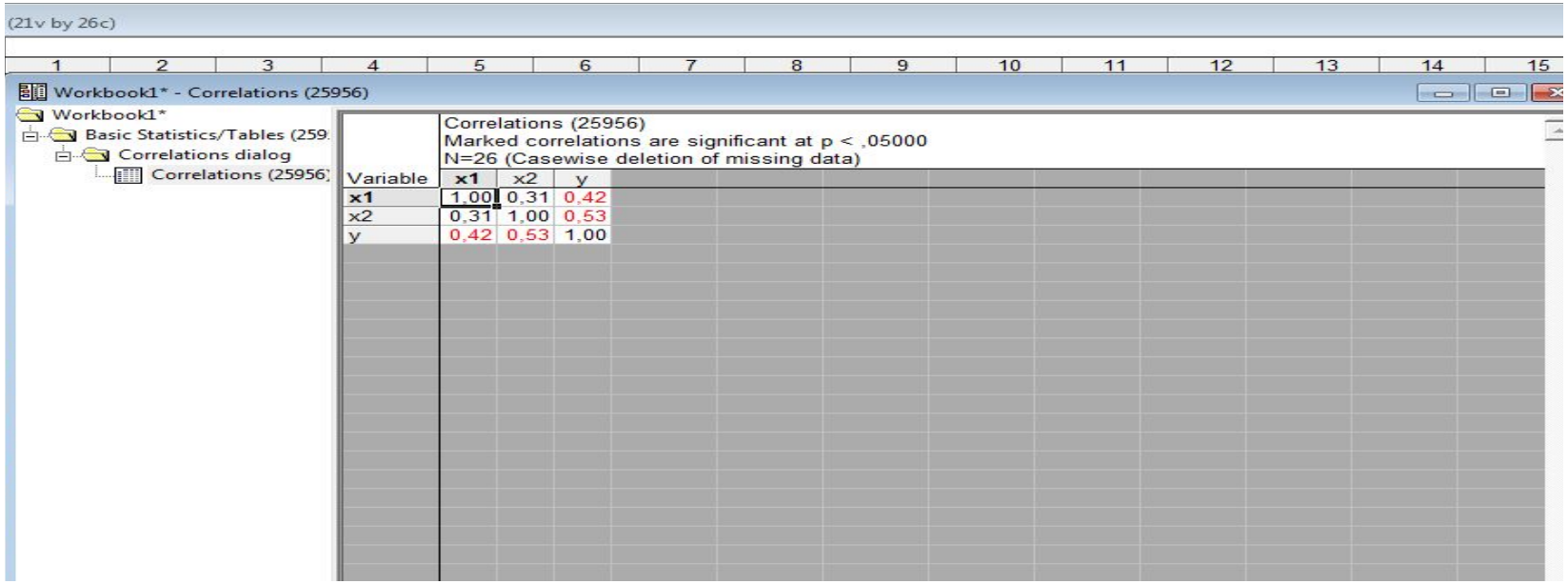
После сравнения, несмотря на результат, переменной **S2VOS присваиваете полученное выше значение Mean.**





Вычисление корреляционной матрицы:
вернуться в стартовую панель модуля **Basic Statistics / Tables;**
в окне **Basic Statistics / Tables выбираем Correlation Matrices;**
в окне **Product Moment and Partial Correlations щёлкаем кнопку Two list (react. matrix), в открывшемся окне выбрать переменные для анализа (Y и все X), Summary;**
в окне **Product Moment and Partial Correlations щёлкаем ОК.**



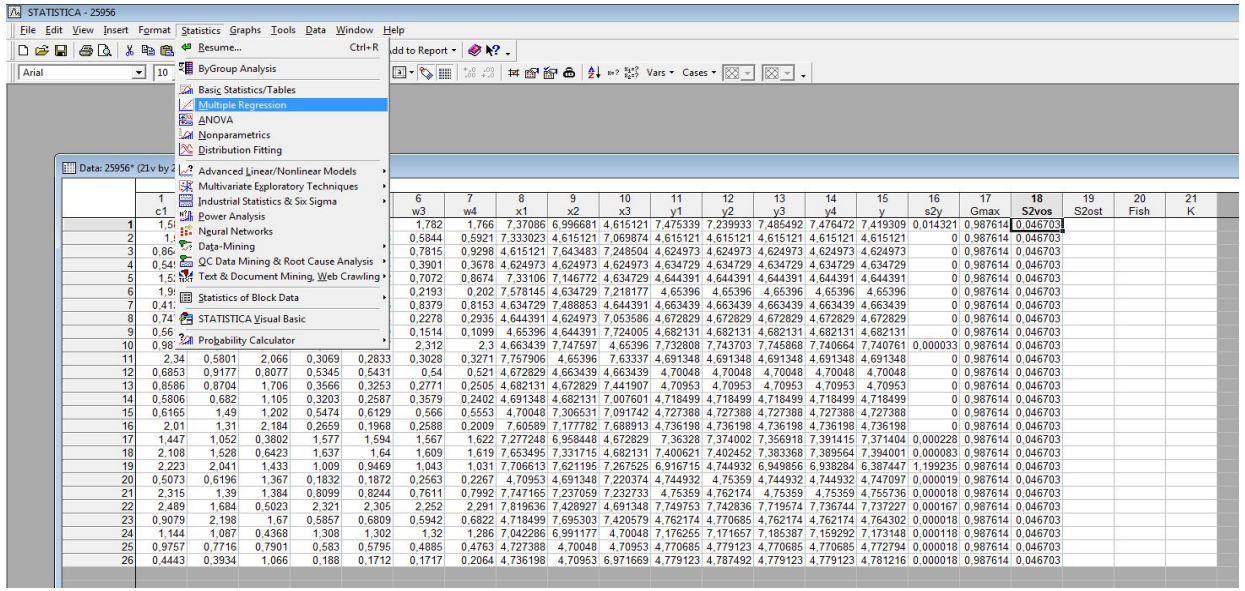


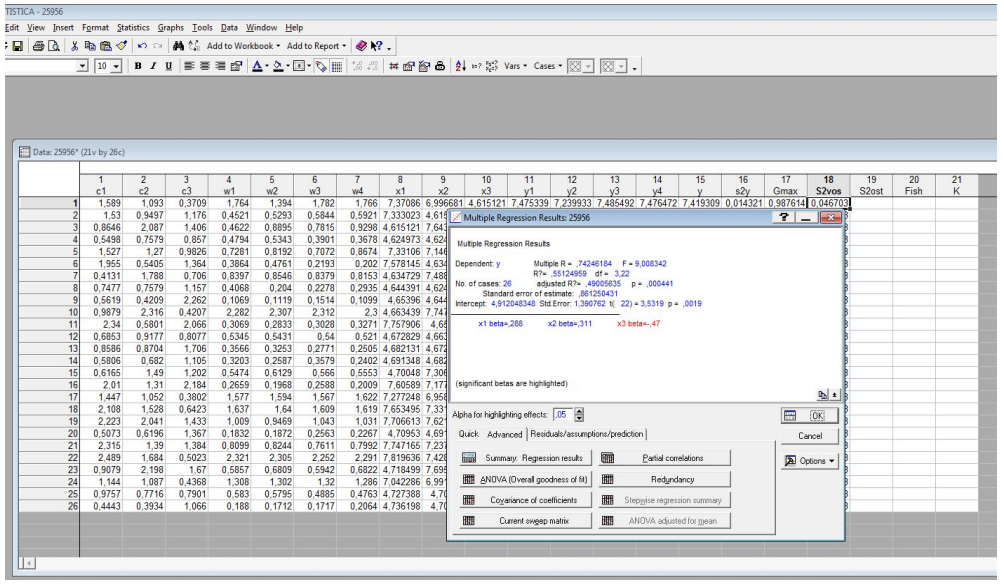
Оценка тесноты связи между факторами и откликом

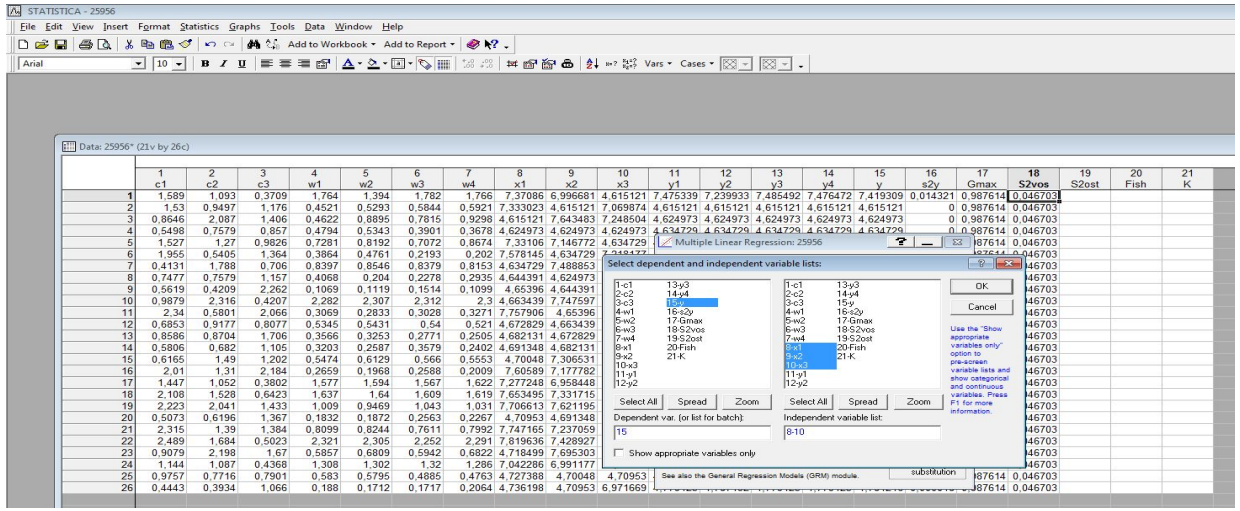
Получена следующая матрица:

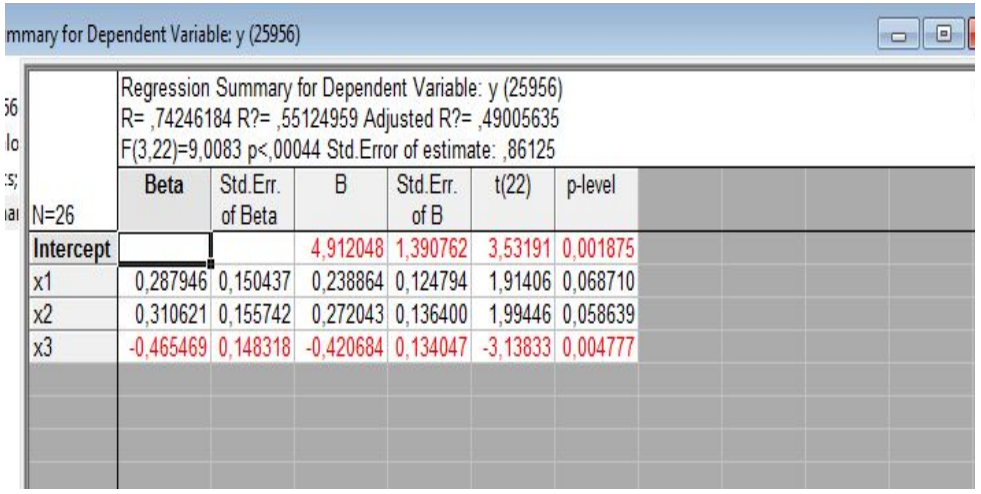
Оценка коэффициентов линейной регрессии

Расчет выполняется в модуле **Multiple Regression. Зависимая (Y) и независимые (X1, X2,…, Xn) переменные назначаются в соответствии с регрессией (2.8). Из таблицы результатов (Regression Summary) в лабораторный журнал не переписываем столбцы Beta и Str.Err of Beta. Из статистической «шапки» необходимо переписать только St.Err.ofEstimate.**









N=26	Beta	Std.Err. of Beta	B	Std.Err. of B	t(22)	p-level
Intercept			4,912048	1,390762	3,53191	0,001875
x1	0,287946	0,150437	0,238864	0,124794	1,91406	0,068710
x2	0,310621	0,155742	0,272043	0,136400	1,99446	0,058639
x3	-0,465469	0,148318	-0,420684	0,134047	-3,13833	0,004777

Расчет оценок коэффициентов регрессии

Уравнение регрессии: $\hat{Y}$=b0+b1X1+b2X2+b3X3+b4X4 Полученные результаты:

К анализу остатков и выявлению выбросов

Для выявления возможных выбросов в окне **Multiple Regression Results выбираем закладку Residuals/assumptions/prediction и щёлкаем Perform residual analysis. В окне Residual analysis выбираем закладку Residuals и щёлкаем Casewise plot of residuals. Слева от таблицы звёздочками показано расположение остатков в интервале [0 ±3σ]. Если обнаружен опыт, в котором есть выброс, его номер записывается в лабораторный журнал.**

Для удаления выброса из обработки необходимо выполнить следующие действия:

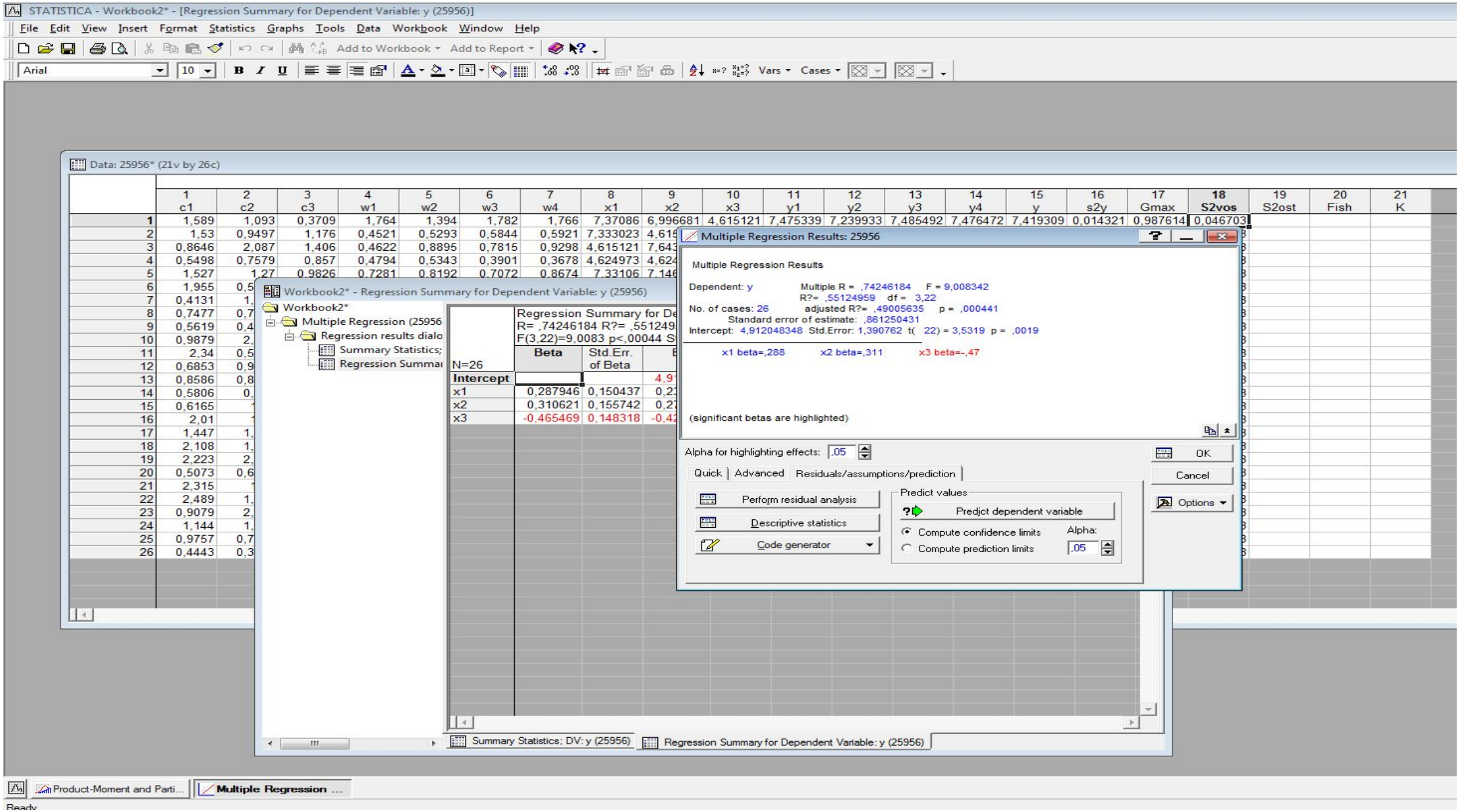
восстанавливаем окно **Residual analysis щелчком по соответствующей кнопке на панели анализа, щёлкаем Cancel;**

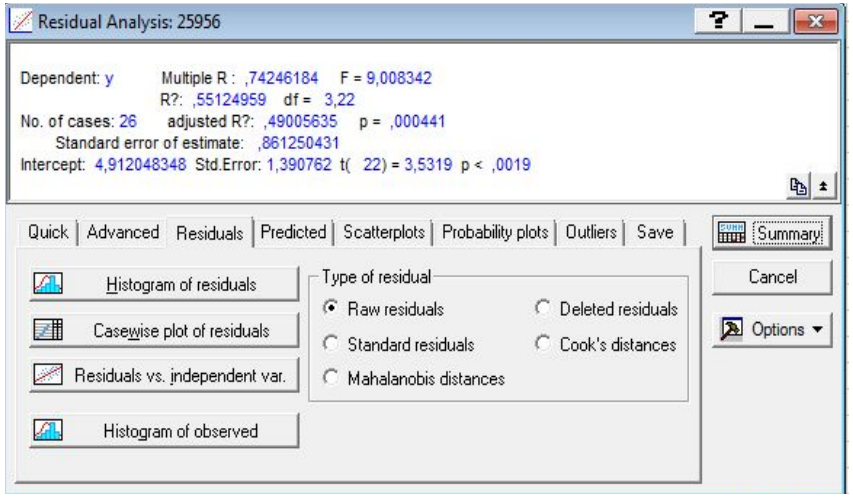
в окне **Multiple Regression Results щёлкаем кнопку Select Cases.**

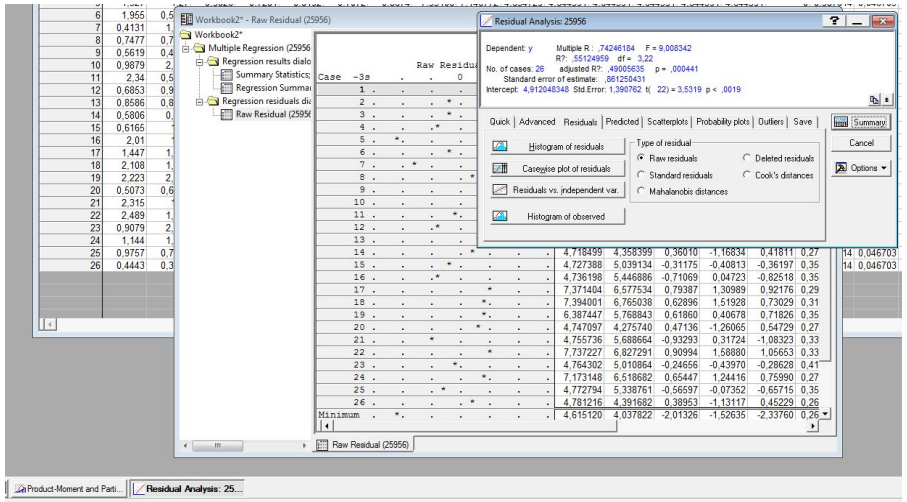
в окне **Analysis / Graph Case Selection Conditions включаем Enable Select Conditions;**

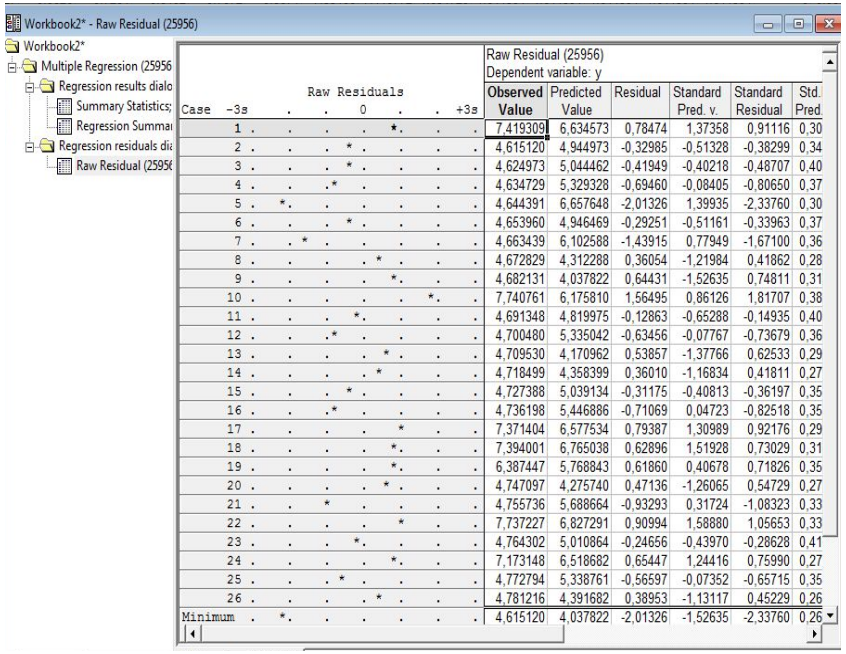
в разделе **Exclude cases в поле or case numbers вписываете номер выброса; если вам необходимо ввести несколько точек или диапазон вписывайте их через точку с запятой / тире соответственно; кликаете OK;**

получаете новую таблицу **Regression Summary и снова полностью переписываете её в лабораторный журнал.**

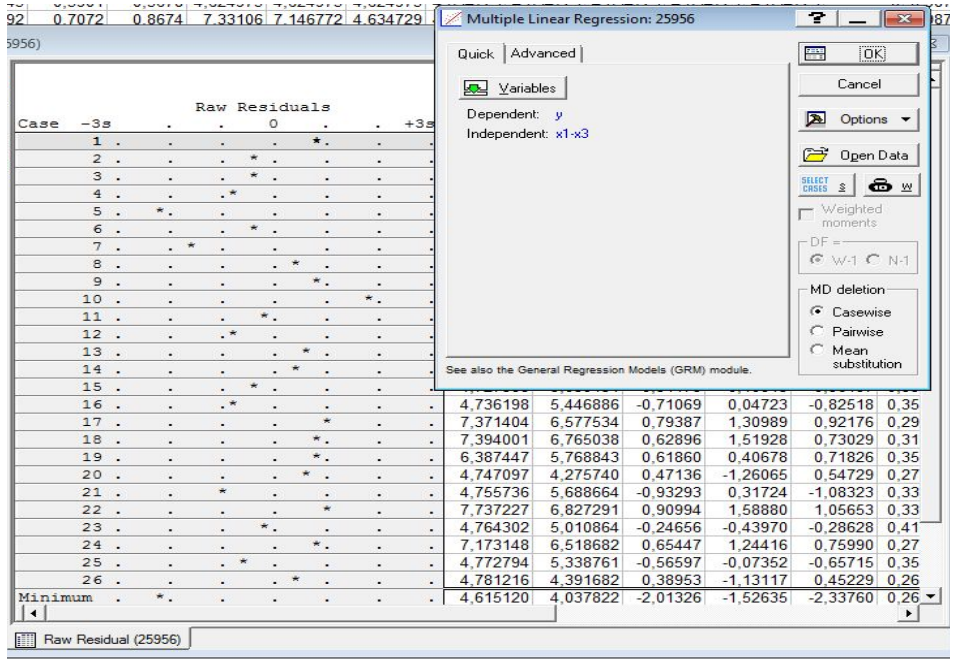

STATISTICA - Workbook2* - [Regression Summary for Dependent Variable: y (25956)]
File Edit View Insert Format Statistics Graphs Tools Data Workbook Window Help
Add to Workbook
Add to Report
Arial
10
Vars
Cases
Data: 25956* (21v by 26c)
1 c1 2 c2 3 c3 4 w1 5 w2 6 w3 7 w4 8 x1 9 x2 10 x3 11 y1 12 y2 13 y3 14 y4 15 y 16 s2y 17 Gmax 18 S2vos 19 S2ost 20 Fish 21 K
1 1,589 1,093 0,3709 1,764 1,394 1,782 1,766 7,37086 6,996681 4,615121 7,475339 7,239933 7,485492 7,476472 7,419309 0,014321 0,987614 0,046703
2 1,53 0,9497 1,176 0,4521 0,5293 0,5844 0,5921 7,333023 4,615
3 0,8646 2,087 1,406 0,4622 0,8895 0,7815 0,9298 4,615121 7,643
4 0,5498 0,7579 0,857 0,4794 0,5343 0,3901 0,3678 4,624973 4,624
5 1,527 1,27 0,9826 0,7281 0,8192 0,7072 0,8674 7,33106 7,146
6 1,955 0,5
7 0,4131 1,
8 0,7477 0,7
9 0,5619 0,4
10 0,9879 2,
11 2,34 0,5
12 0,6853 0,9
13 0,8586 0,8
14 0,5806 0,
15 0,6165
16 2,01
17 1,447 1,
18 2,108 1,
19 2,223 2,
20 0,5073 0,6
21 2,315
22 2,489 1,
23 0,9079 2,
24 1,144 1,
25 0,9757 0,7
26 0,4443 0,3
Multiple Regression Results: 25956
Multiple Regression Results
Dependent: y Multiple R = ,74246184 F = 9,008342
R?= ,55124959 df = 3,22
No. of cases: 26 adjusted R?= ,49005635 p = ,000441
Standard error of estimate: ,861250431
Intercept: 4,912048348 Std.Error: 1,390762 t(22) = 3,5319 p = ,0019
x1 beta=,288 x2 beta=,311 x3 beta=-,47
(significant betas are highlighted)
Alpha for highlighting effects: ,05
OK
Cancel
Options
Quick Advanced Residuals/assumptions/prediction
Perform residual analysis
Descriptive statistics
Code generator
Predict values
Predict dependent variable
Compute confidence limits
Compute prediction limits
Alpha: ,05
Workbook2* - Regression Summary for Dependent Variable: y (25956)
Workbook2*
Multiple Regression (25956
Regression results dialo
Summary Statistics;
Regression Summar
Regression Summary for De
R= ,74246184 R?= ,551249
F(3,22)=9,0083 p<,00044 S
N=26 Beta Std.Err. of Beta
Intercept 4,9
x1 0,287946 0,150437 0,2
x2 0,310621 0,155742 0,2
x3 -0,465469 0,148318 -0,4
Summary Statistics; DV: y (25956)
Regression Summary for Dependent Variable: y (25956)
Product-Moment and Parti...
Multiple Regression ...
Ready



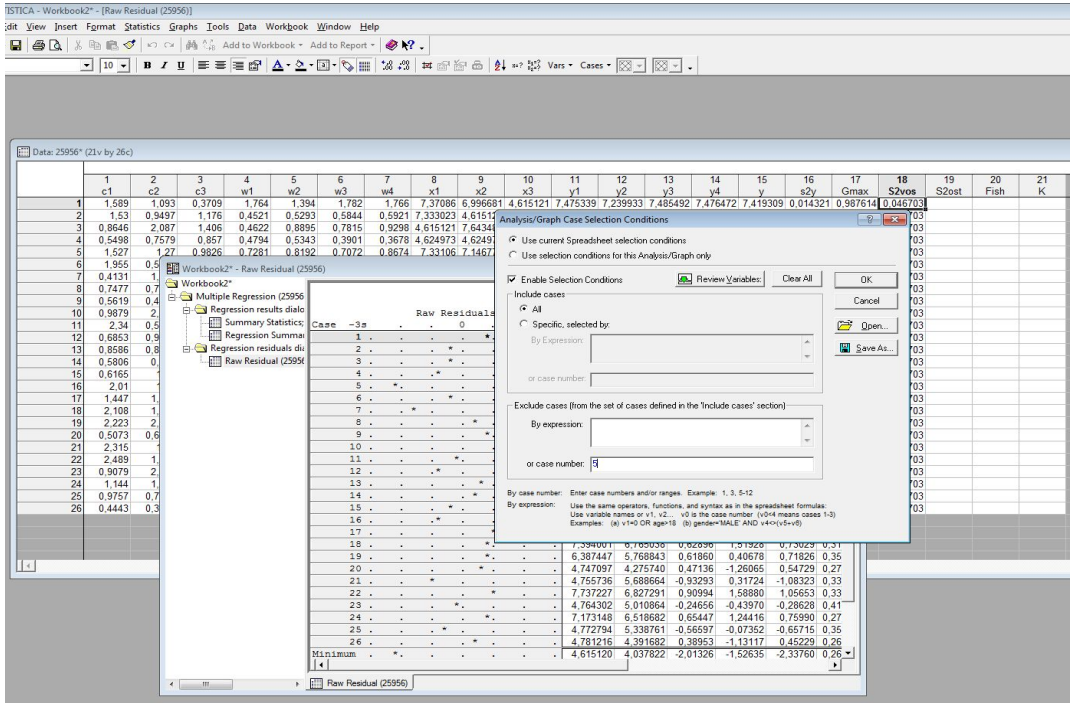


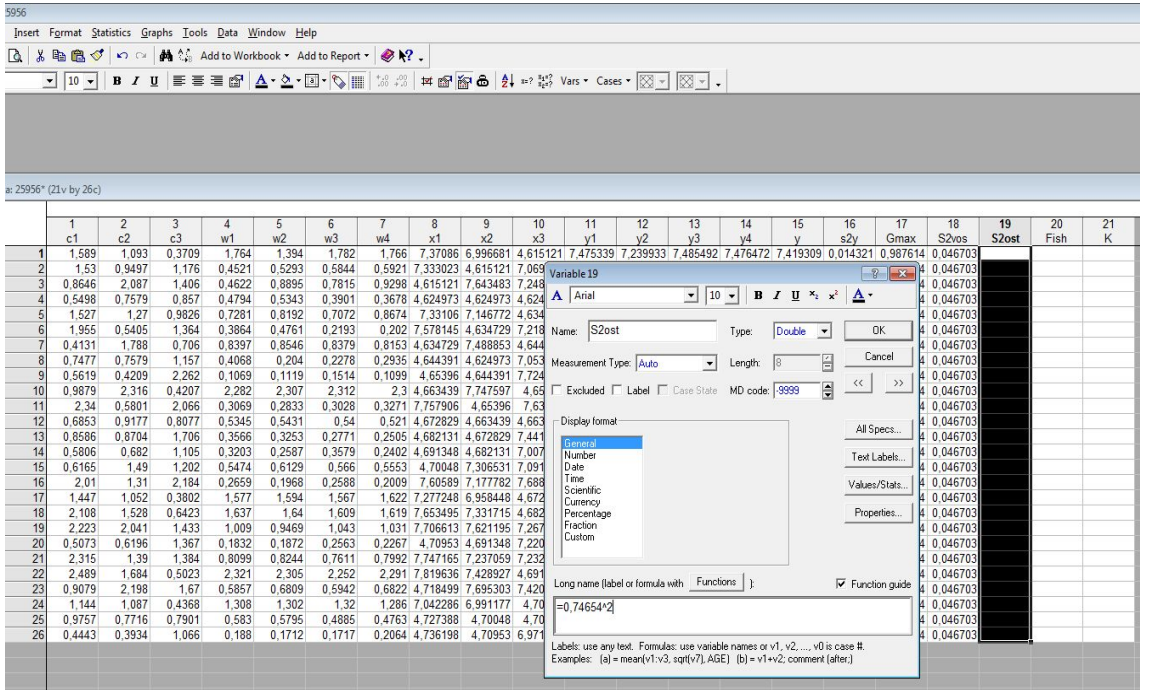


Case	-3s	+3s	Observed Value	Predicted Value	Residual	Standard Pred. v.	Standard Residual	Std. Pred.
1		*	7,419309	6,634573	0,78474	1,37358	0,91116	0,30
2		*	4,615120	4,944973	-0,32985	-0,51328	-0,38299	0,34
3		*	4,624973	5,044462	-0,41949	-0,40218	-0,48707	0,40
4		*	4,634729	5,329328	-0,69460	-0,08405	-0,80650	0,37
5	*		4,644391	6,657648	-2,01326	1,39935	-2,33760	0,30
6		*	4,653960	4,946469	-0,29251	-0,51161	-0,33963	0,37
7	*		4,663439	6,102588	-1,43915	0,77949	-1,67100	0,36
8		*	4,672829	4,312288	0,36054	-1,21984	0,41862	0,28
9		*	4,682131	4,037822	0,64431	-1,52635	0,74811	0,31
10		*	7,740761	6,175810	1,56495	0,86126	1,81707	0,38
11		*	4,691348	4,819975	-0,12863	-0,65288	-0,14935	0,40
12		*	4,700480	5,335042	-0,63456	-0,07767	-0,73679	0,36
13		*	4,709530	4,170962	0,53857	-1,37766	0,62533	0,29
14		*	4,718499	4,358399	0,36010	-1,16834	0,41811	0,27
15		*	4,727388	5,039134	-0,31175	-0,40813	-0,36197	0,35
16		*	4,736198	5,446886	-0,71069	0,04723	-0,82518	0,35
17		*	7,371404	6,577534	0,79387	1,30989	0,92176	0,29
18		*	7,394001	6,765038	0,62896	1,51928	0,73029	0,31
19		*	6,387447	5,768843	0,61860	0,40678	0,71826	0,35
20		*	4,747097	4,275740	0,47136	-1,26065	0,54729	0,27
21		*	4,755736	5,688664	-0,93293	0,31724	-1,08323	0,33
22		*	7,737227	6,827291	0,90994	1,58880	1,05653	0,33
23		*	4,764302	5,010864	-0,24656	-0,43970	-0,28628	0,41
24		*	7,173148	6,518682	0,65447	1,24416	0,75990	0,27
25	*		4,772794	5,338761	-0,56597	-0,07352	-0,65715	0,35
26		*	4,781216	4,391682	0,38953	-1,13117	0,45229	0,26
Minimum	*		4,615120	4,037822	-2,01326	-1,52635	-2,33760	0,26



Case	-3s	+3s					
1		*	4,736198	5,446886	-0,71069	0,04723	-0,82518	0,35
2		*	7,371404	6,577534	0,79387	1,30989	0,92176	0,29
3		*	7,394001	6,765038	0,62896	1,51928	0,73029	0,31
4		*	6,387447	5,768843	0,61860	0,40678	0,71826	0,35
5	*		4,747097	4,275740	0,47136	-1,26065	0,54729	0,27
6		*	4,755736	5,688664	-0,93293	0,31724	-1,08323	0,33
7		*	7,737227	6,827291	0,90994	1,58880	1,05653	0,33
8		*	4,764302	5,010864	-0,24656	-0,43970	-0,28628	0,41
9		*	7,173148	6,518682	0,65447	1,24416	0,75990	0,27
10		*	4,772794	5,338761	-0,56597	-0,07352	-0,65715	0,35
11		*	4,781216	4,391682	0,38953	-1,13117	0,45229	0,26
Minimum	*		4,615120	4,037822	-2,01326	-1,52635	-2,33760	0,26





mary for Dependent Variable: y (25956)

Regression Summary for Dependent Variable: y (25956)
R= ,82020859 R?= ,67274213 Adjusted R?= ,62599100
F(3,21)=14,390 p<,00003 Std.Error of estimate: ,74654
Exclude cases: 5

N=25	Beta	Std.Err. of Beta	B	Std.Err. of B	t(21)	p-level
Intercept			5,050679	1,206493	4,18625	0,000416
x1	0,342954	0,130691	0,287277	0,109474	2,62416	0,015853
x2	0,327529	0,134640	0,287930	0,118362	2,43262	0,024017
x3	-0,532931	0,128784	-0,491495	0,118771	-4,13817	0,000467

В начале рассчитываем значение переменной S2OST, как квадрат величины St.Err.ofEstimate: =St.Err.ofEstimate^2.

Проверка адекватности регрессии

Расчетный критерий Фишера:

$$F = \frac{S^2_{ocm}}{S^2_{eocn}} =$$

Обратный переход к исходному уравнению кинетики

Ур-е регрессии: $\widehat{Y} = -1{,}029 + 0{,}257 * X_1 - 0{,}738 * X_2 - 0{,}763 * X_3 + 0{,}598 * X_4$

Константа скорости: $k = e^{b_0} = e^{-1{,}029} = 0{,}357$

Ур-е кинетики: $W = 0{,}357 * C_1^{0{,}257} * C_2^{-0{,}738} * C_3^{-0{,}763} * C_4^{0{,}598}$