Minitab Statistical Software Introduction

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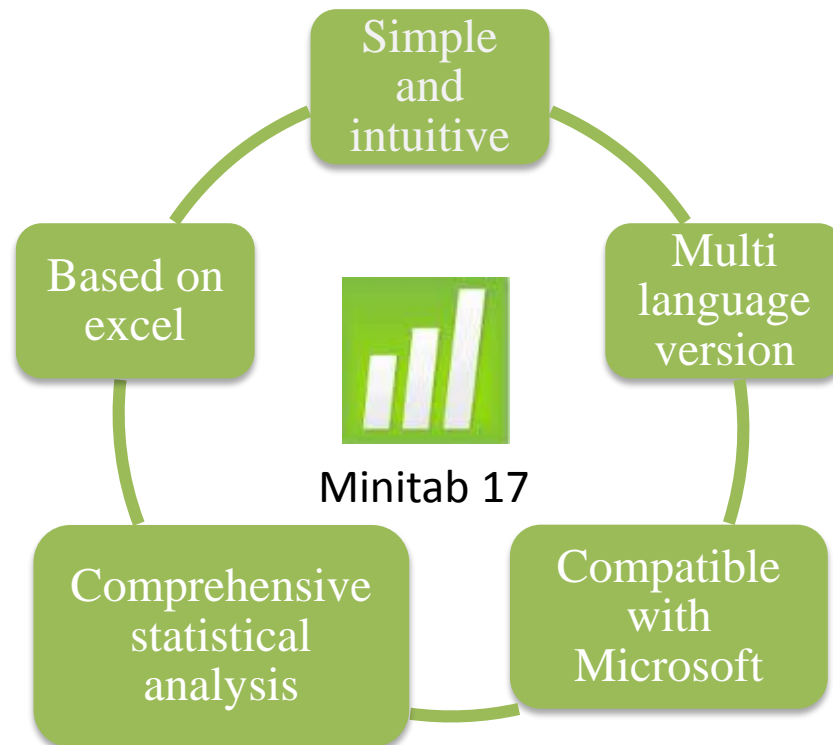
University of Tsukuba

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Minitab® 17

**Getting Started with Minitab 17**

Introduction

- Minitab is a statistics software that often combined with the implementation of Six sigma, CMMI (Capability Maturity Model Integration) and other statistics-based process improvement methods.

Minitab 17

The relationship between Minitab and 6 Sigma

- In the 1980s, Motorola begin within the company to introduce 6 sigma, and using Minitab statistical software to do the maximum limit development.

- The MAIC (Measure, Analyze, Improve and Control)step in 6 sigma, a lot of analyze and statistic can finish in Minitab software in a simple way.

Multi language version
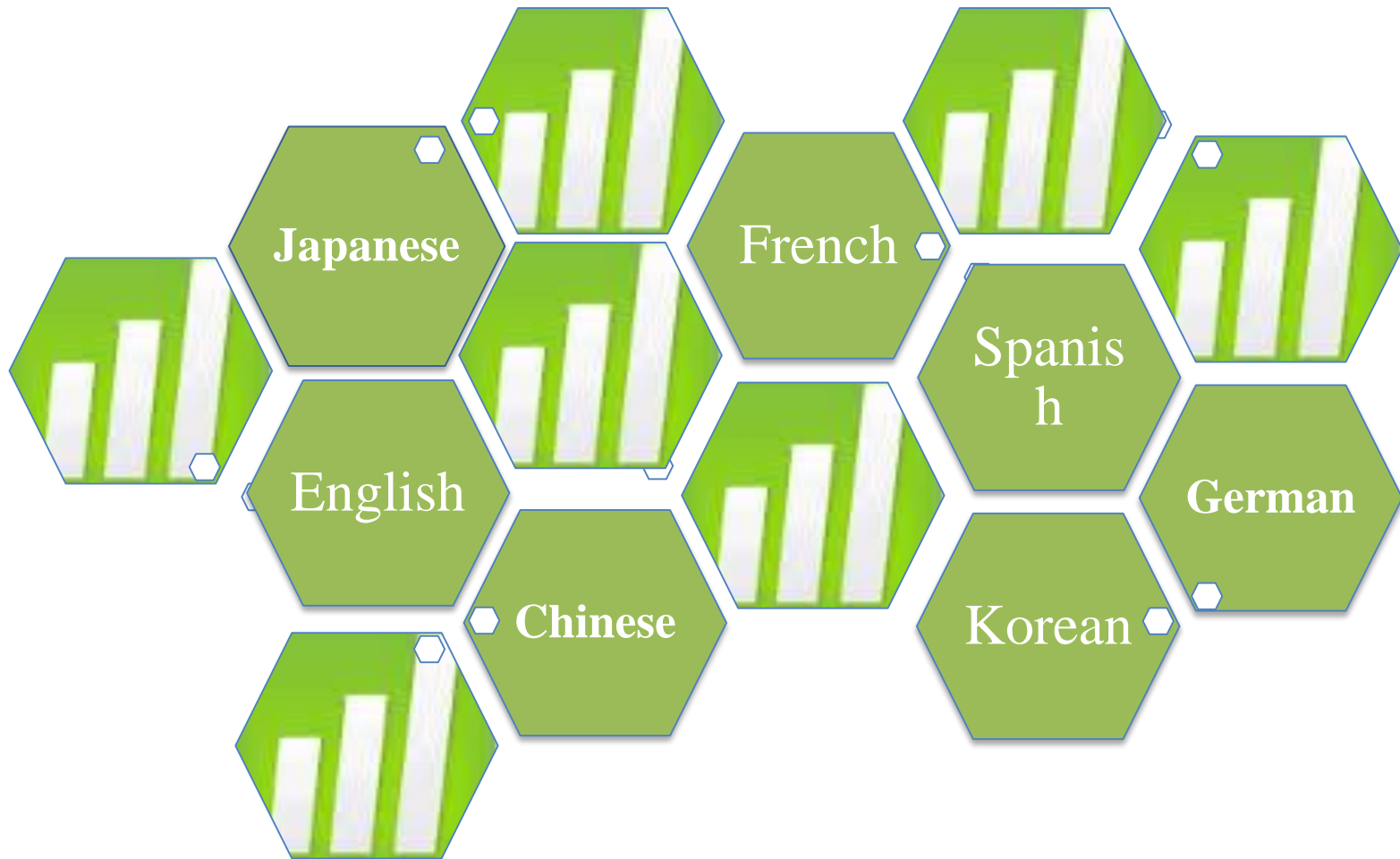
Japanese

French

Japanese

English

Spanis
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Chinese

Korean

German

About download

About download

Power Couple.

The software and the knowledge you need to analyze your data.

Minitab® 17

Nine out of 10 Fortune 100 companies choose Minitab Statistical Software. Try it free for 30 days and see why.
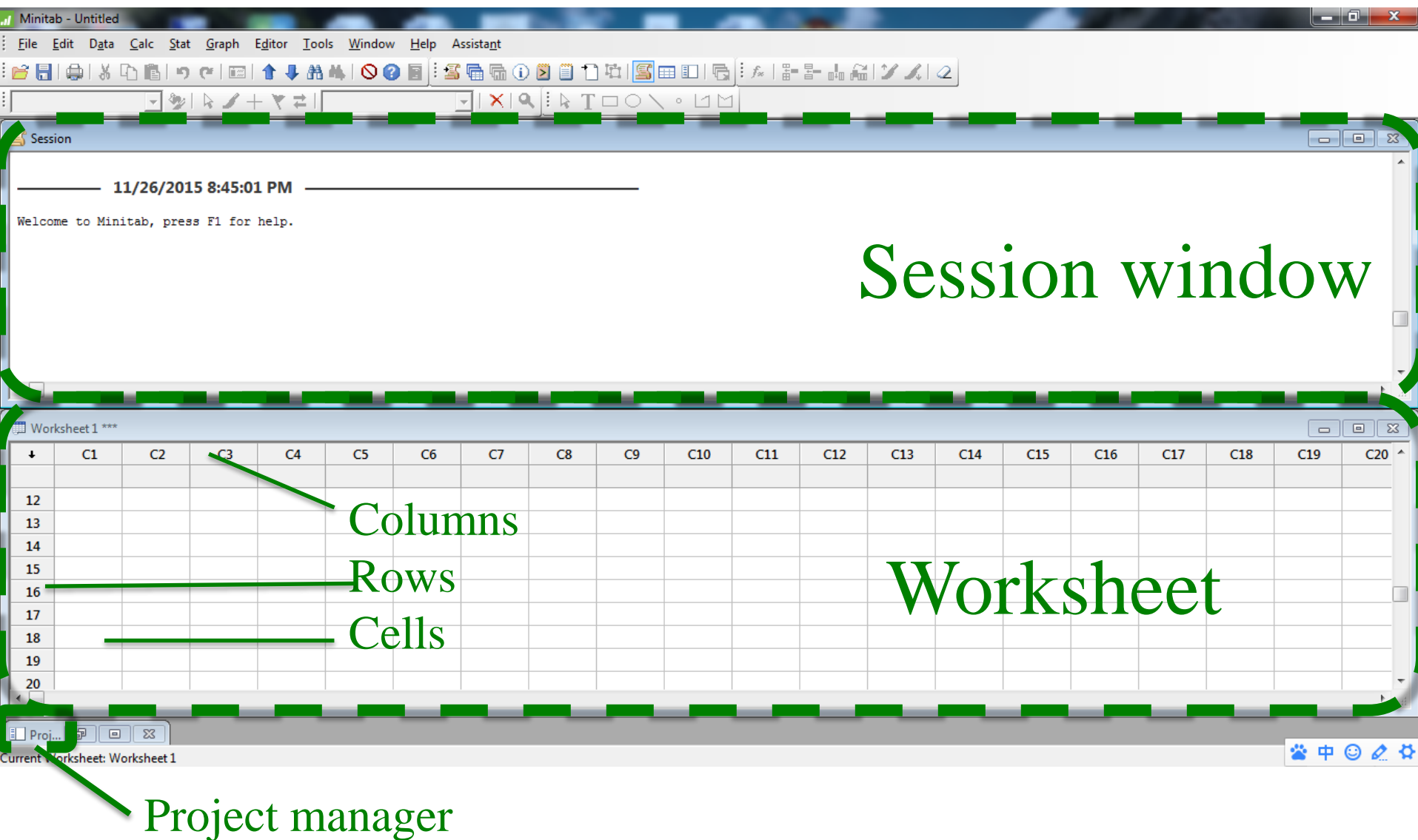
DOWNLOAD THE FREE TRIAL

Quality Trainer®

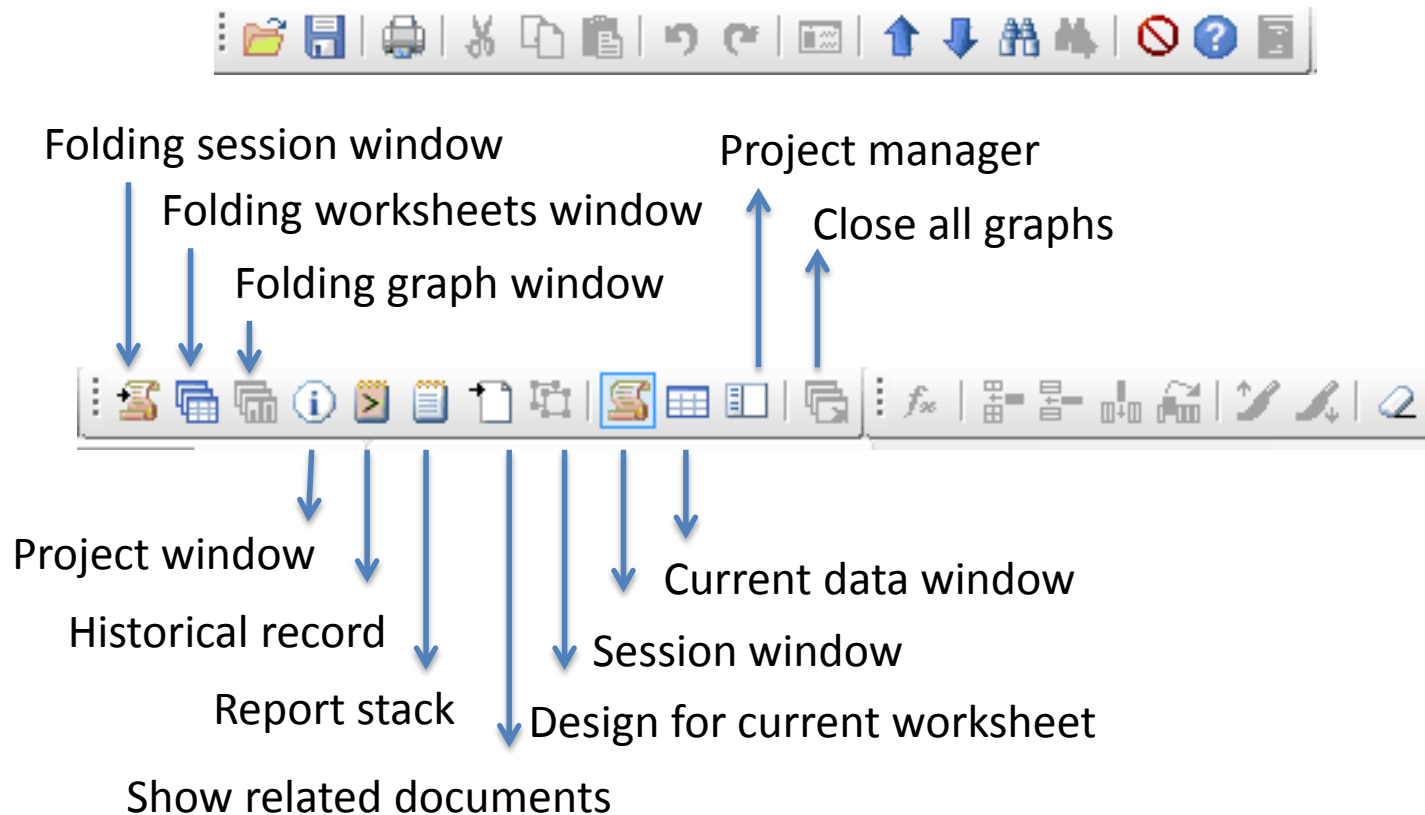Our e-learning course is ideal for Minitab users, whether you're new to statistics or just need a refresher.

ATTEND THE FREE WEBINAR

Minitab user interface

Toolbar introduction

Folding session window

Folding worksheets window

Folding graph window

Project manager

Close all graphs

Project window

Historical record

Report stack

Show related documents

Design for current worksheet
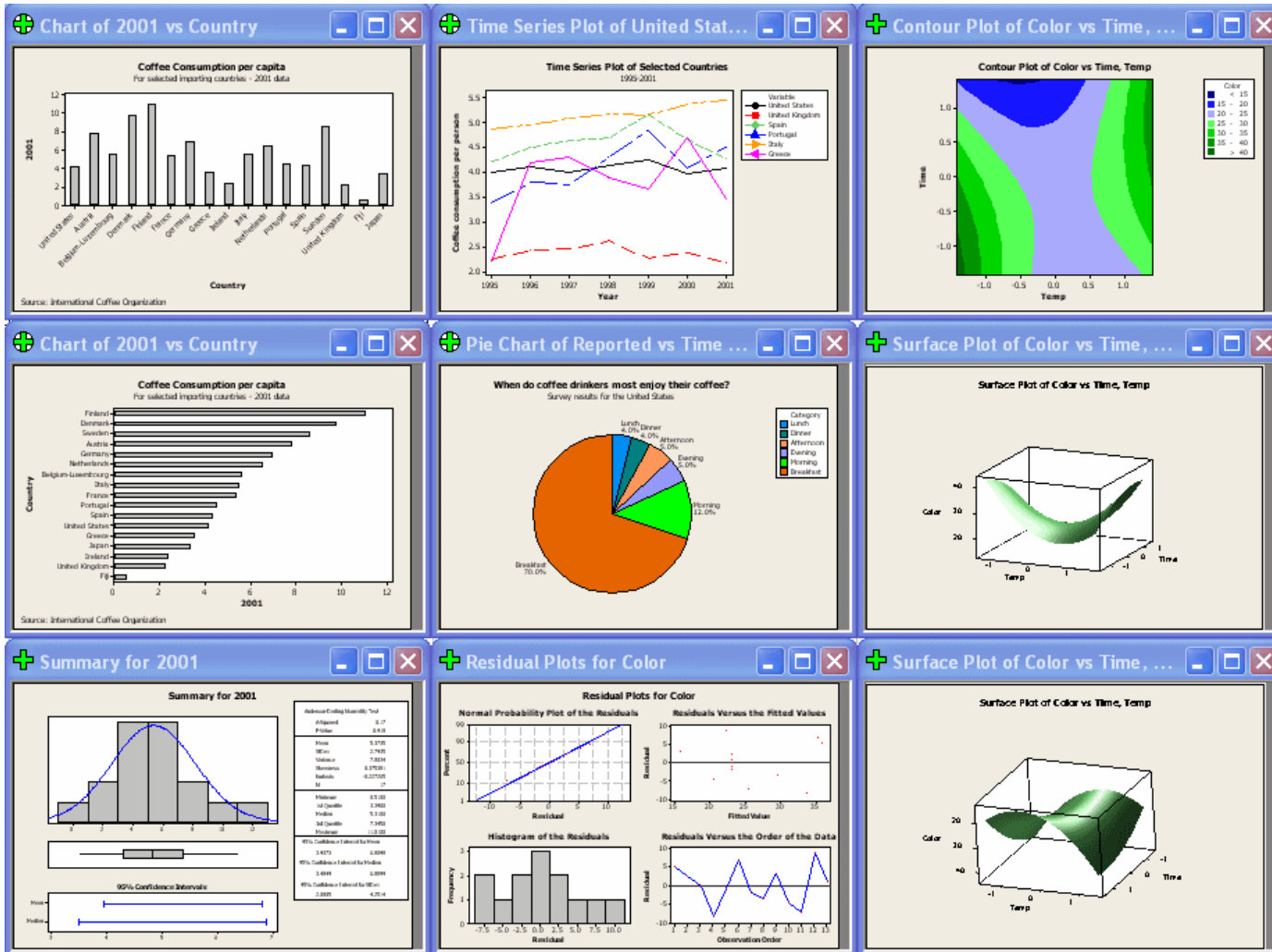
Session window

Current data window

Function

- Computation function
- Calculator function
- Generating data function
- Probability distribution function
- Matrix operation

Function

- Data analysis function
- Statistic
- Regression analysis
- Variance analysis
- Multivariable analysis
- Non-parametric estimation
- ......

Function

- Graphic analysis

Using Minitab
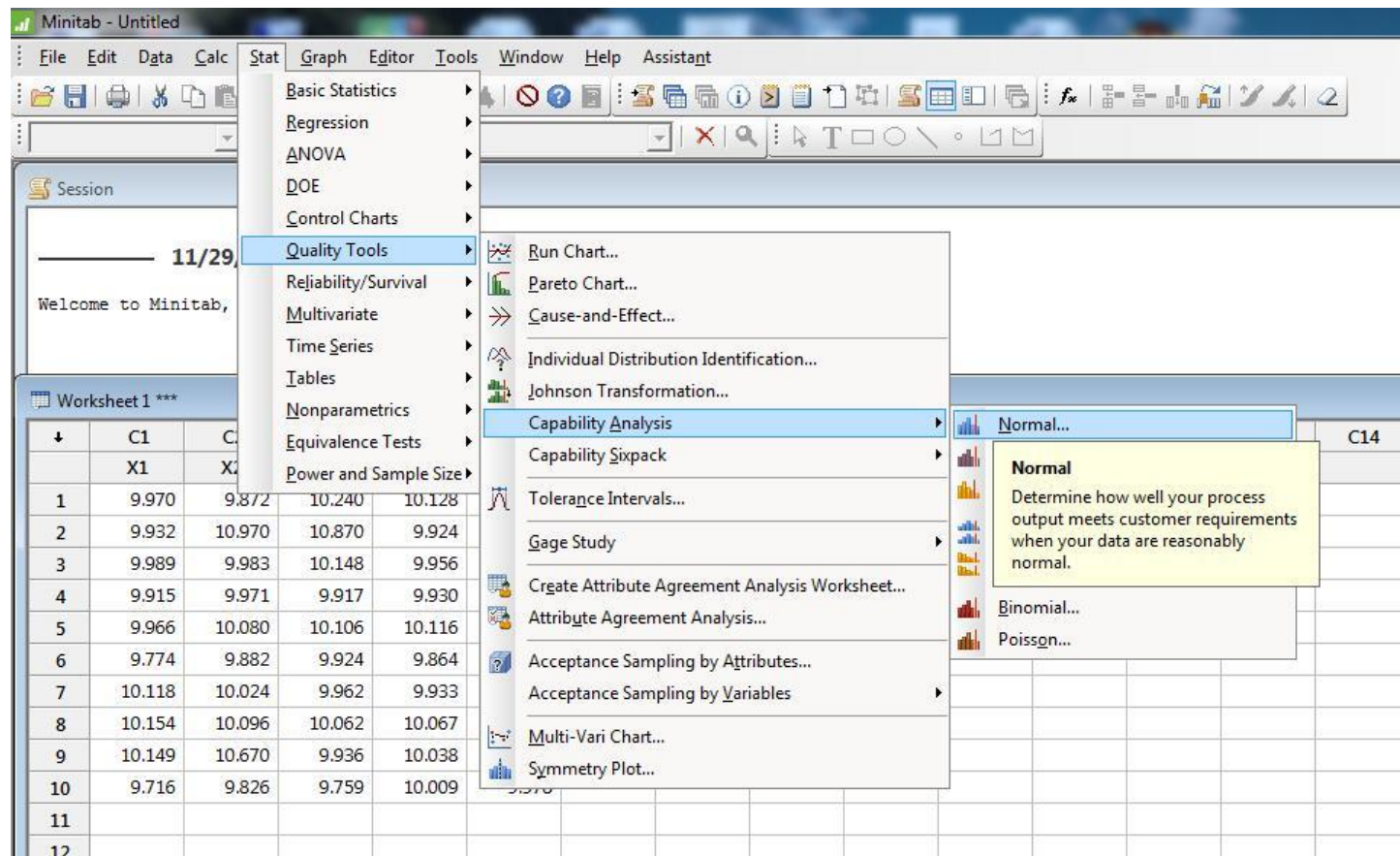
Normal distribution histogram

- Capability Analysis (Normal)
- Capability Analysis (Between/Within)
- Capability Analysis (Non Normal)
- Capability Analysis (Multiple Variable Normal)
- Capability Analysis (Multiple Variable Non normal)
- ......

Example 1

	C2	C3	C4	C5	C6	C7	C8
	X2	X3	X4	X5			
1	9.872	10.024	10.128	10.120			
2	10.097	10.087	9.924	9.821			
3	9.983	10.148	9.956	10.090			
4	9.971	9.917	9.930	9.880			
5	10.080	10.106	10.116	10.045			
6	9.882	9.924	9.864	9.873			
7	10.024	9.962	9.933	9.991			
8	10.096	10.062	10.067	10.049			
9	10.067	9.936	10.038	10.210			
10	9.826	9.759	10.009	9.978			
11							
12							
13							
14							
15							

Worksheet 1 ***

Input data and analysis

- Select : Stat—Quality Tools—Capability Analysis (Normal)

Input option

Output result
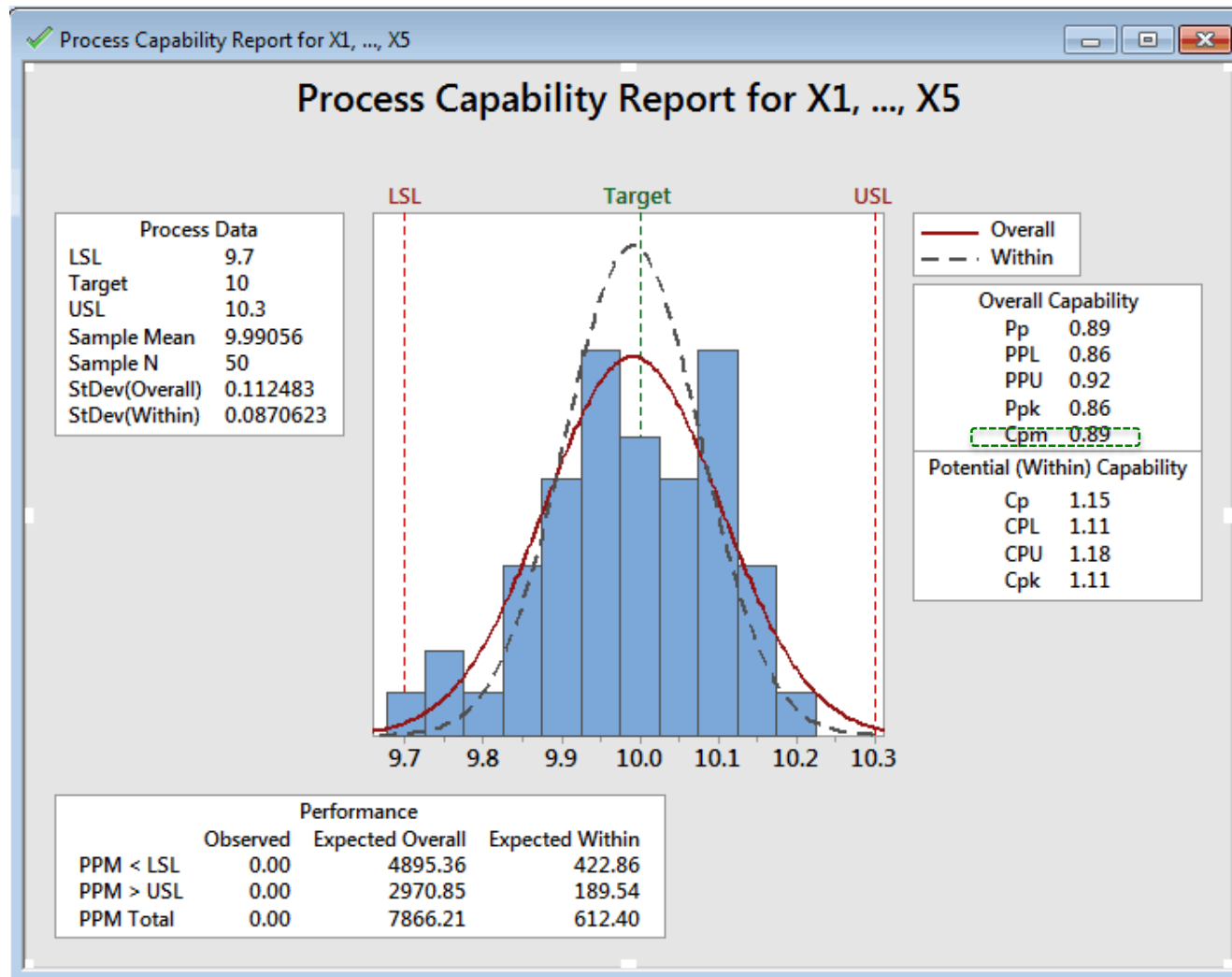
Example 2
Multiple Linear Regression

Dependent Variable y_i

Independent Variable X_1

Independent Variable X_2

......

Independent Variable X_n
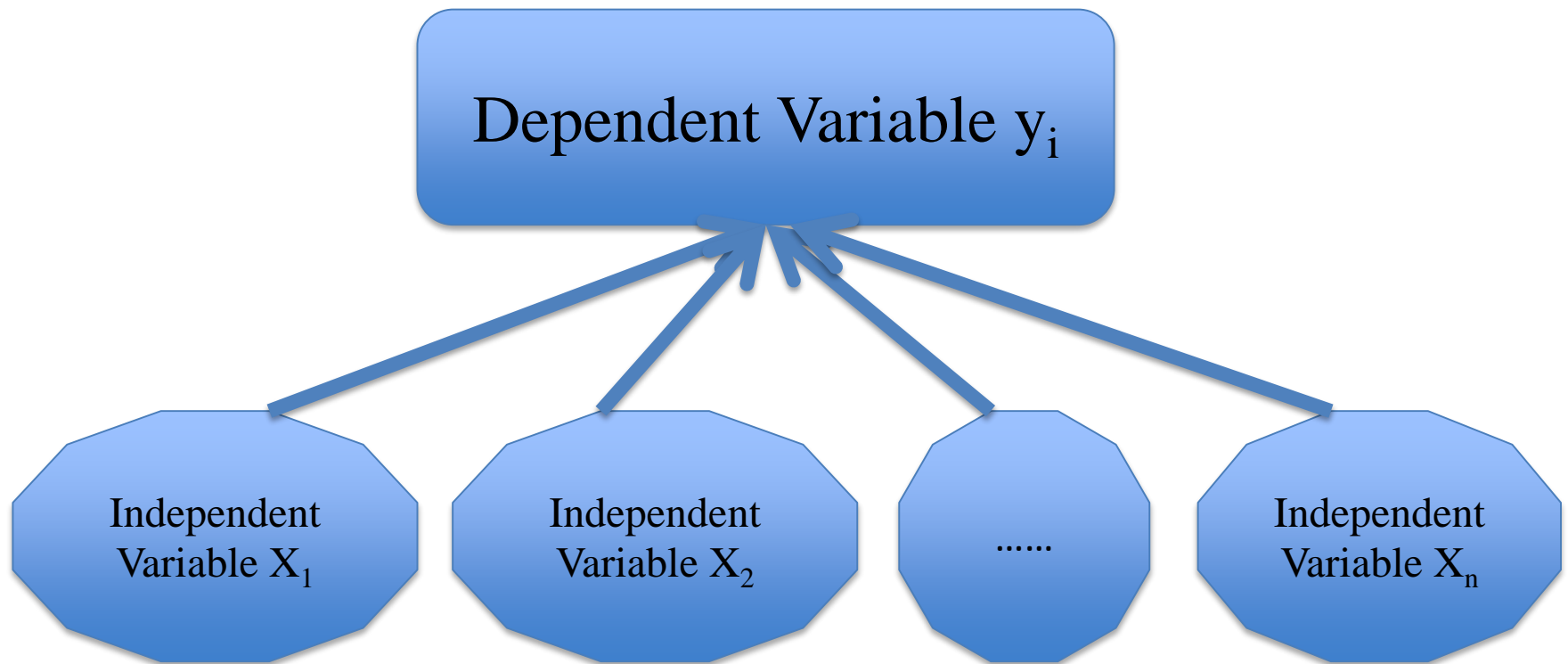
演習 7.4

下の表は，25 から 34 歳の健康な女性の被験者から得た，体脂肪量と，その説明変数として上腕三頭筋での皮下脂肪量，太股周囲，中腕周囲のデータである (Neter et al., 1990, p.271).

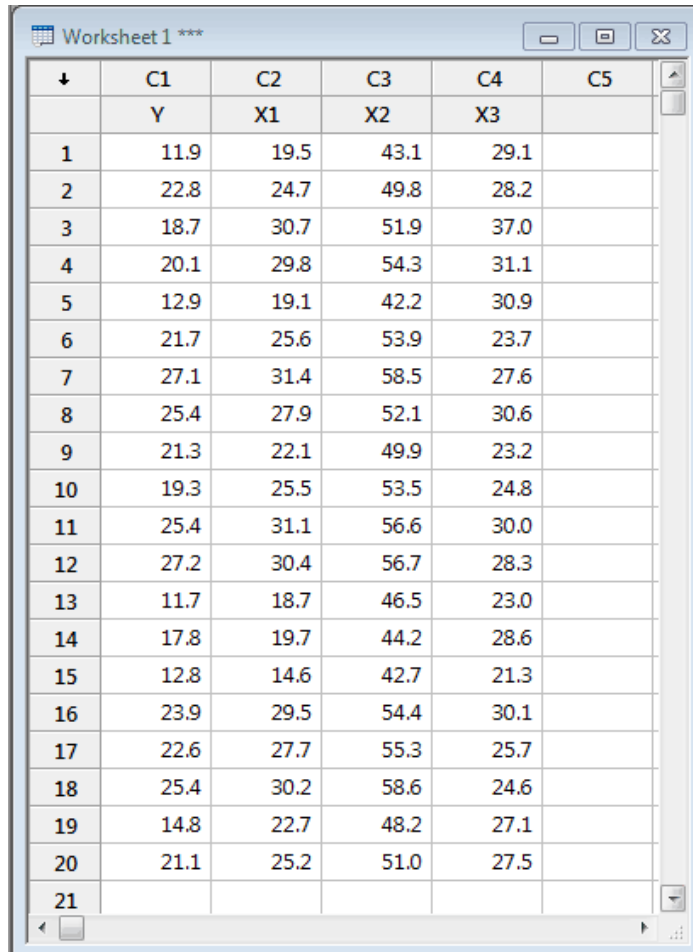| 番号	皮下脂肪量 x_{i1}	太股周囲 x_{i2}	中腕周囲 x_{i3}	体脂肪量 y_i
1	19.5	43.1	29.1	11.9
2			3.2	22.8
5	19.1	42.		
6	25.6	53.9	23.7	21.7
7	31.4	58.5	27.6	27.1
8	27.9	52.1	30.6	25.4
9	22.1	49.9	23.2	21.3
10	25.5	53.5	24.8	19.3
11	31.1	56.6	30.0	25.4
12	30.4	56.7	28.3	27.2
13	18.7	46.5	23.0	11.7
14	19.7	44.2	28.6	17.8
15	14.6	42.7	21.3	12.8
16	29.5	54.4	30.1	23.9
17	27.7	55.3	25.7	22.6
18	30.2	58.6	24.6	25.4
19	22.7	48.2	27.1	14.8
20	25.2	51.0	27.5	21.1

Input data

|	C1	C2	C3	C4	C5
	Y	X1	X2	X3	
1	11.9	19.5	43.1	29.1	
2	22.8	24.7	49.8	28.2	
3	18.7	30.7	51.9	37.0	
4	20.1	29.8	54.3	31.1	
5	12.9	19.1	42.2	30.9	
6	21.7	25.6	53.9	23.7	
7	27.1	31.4	58.5	27.6	
8	25.4	27.9	52.1	30.6	
9	21.3	22.1	49.9	23.2	
10	19.3	25.5	53.5	24.8	
11	25.4	31.1	56.6	30.0	
12	27.2	30.4	56.7	28.3	
13	11.7	18.7	46.5	23.0	
14	17.8	19.7	44.2	28.6	
15	12.8	14.6	42.7	21.3	
16	23.9	29.5	54.4	30.1	
17	22.6	27.7	55.3	25.7	
18	25.4	30.2	58.6	24.6	
19	14.8	22.7	48.2	27.1	
20	21.1	25.2	51.0	27.5	
21					

- Observe
- Conjecture
- Make a trend graph

Graph
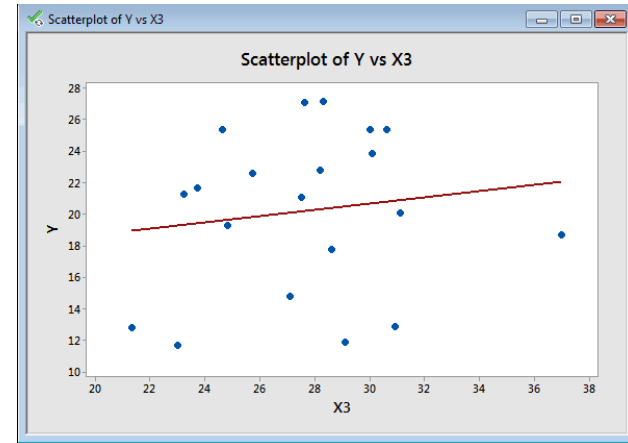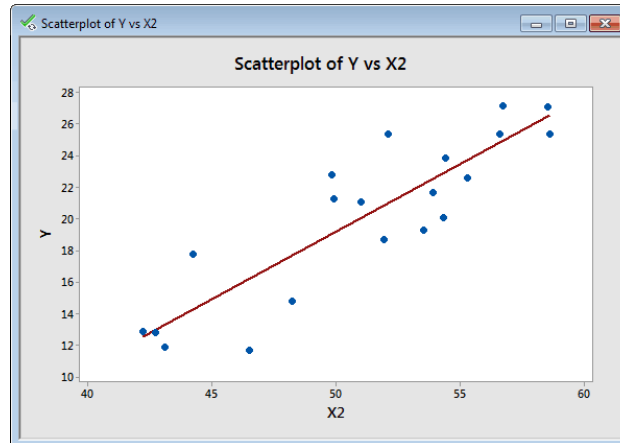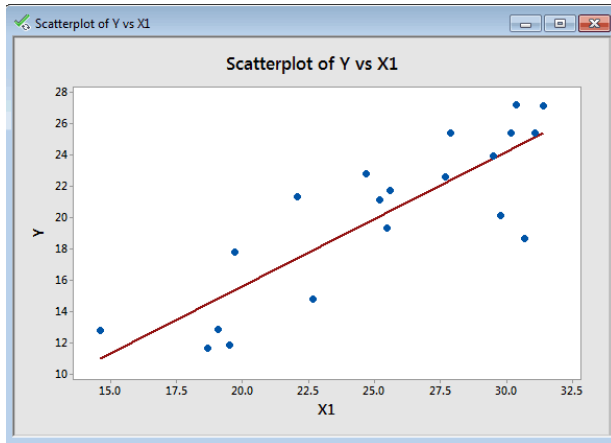
Straight line relationship

Multiple Linear Regression
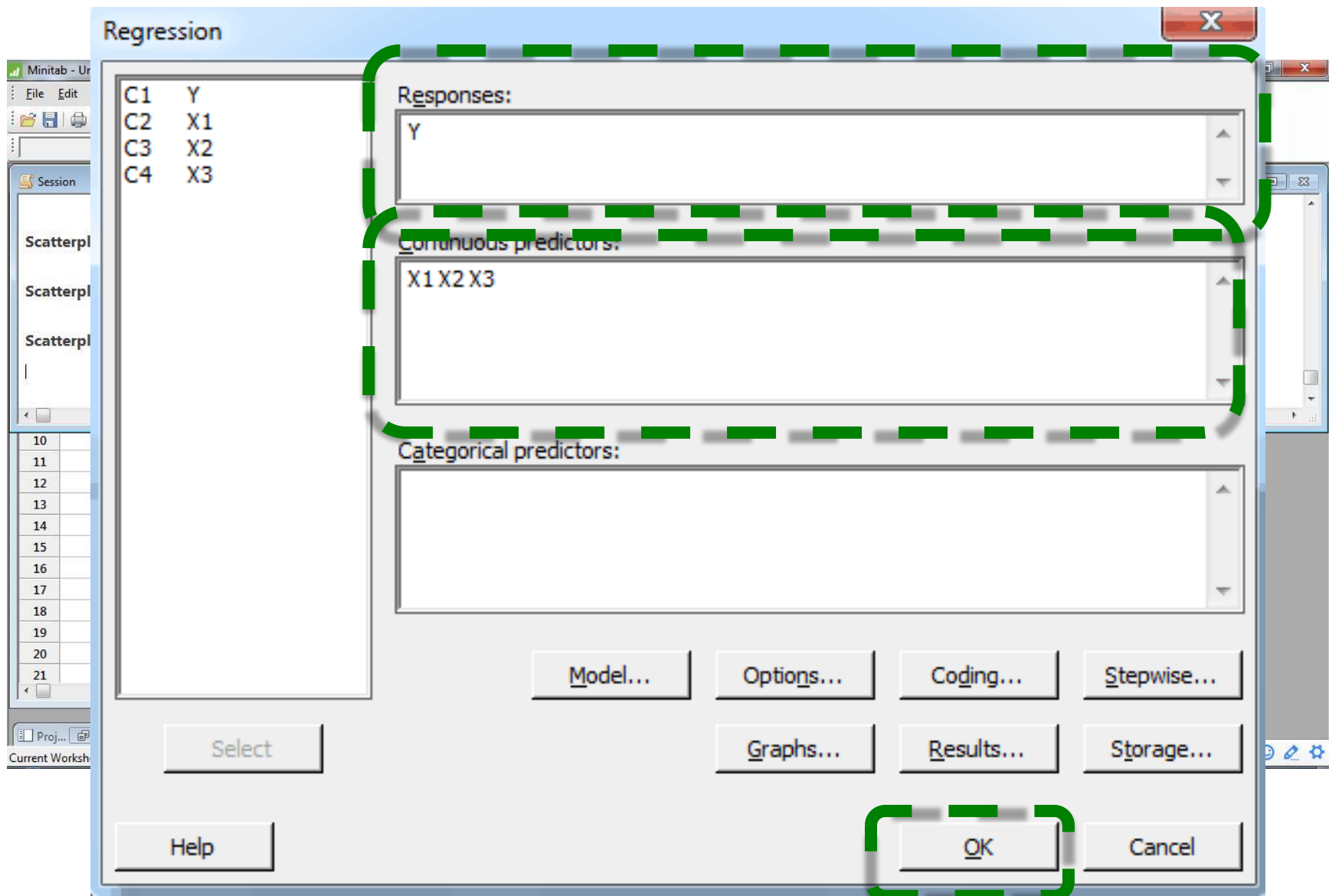
Result

Session

Regression Analysis: Y versus X1, X2, X3

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	3	396.985	132.328	21.52	0.000
X1	1	12.705	12.705	2.07	0.170
X2	1	7.529	7.529	1.22	0.285
X3	1	11.546	11.546	1.88	0.190
Error	16	98.405	6.150		
Total	19	495.390			

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
2.47998	80.14%	76.41%	67.55%

Coefficients

| Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	117.1	99.8	1.17	0.258	
X1	4.33	3.02	1.44	0.170	708.84
X2	-2.86	2.58	-1.11	0.285	564.34
X3	-2.19	1.60	-1.37	0.190	104.61

Regression Equation

$Y = 117.1 + 4.33\ X1 - 2.86\ X2 - 2.19\ X3$

Example 3

	A	B	C	D	E
1	単価	都心への距離	西安駅への距離	最寄の駅への距離	湖・河への距離
2	p	DC	DSX	DS	DR
3	15000	3696.225	3651.184	3176.661	1058.783
4	13500	3317.964	5420.036	1355.202	1361.400
5	10000	3477.717	5644.176	5795.306	910.277
6	9200	1861.331	3652.733	6430.258	2118.246
7	8300	2625.098	4771.291	5702.002	1442.394
8	8000	8641.163	7031.109	5749.564	1569.389
9	8000	8376.362	9262.884	6936.573	59.631
10	8000	2043.691	3902.764	6541.992	937.043
11	7600	2502.974	4656.049	6922.689	1494.375
12	7500	3390.111	3283.824	6623.809	432.308
13	7500	3827.049	4408.196	5876.849	33.132
14	7300	5479.409	6895.845	5788.674	781.508
15	7200	6577.199	8830.867	7025.689	498.054
16	7200	4573.061	6317.351	5876.754	1553.855
17	7200	2819.377	4444.599	6387.785	646.413
18	7000	4612.474	4898.263	7023.031	1266.340
19	7000	5662.153	5746.182	15733.240	594.650
20	6900	2050.840	3905.942	5735.519	327.345
21	6800	4391.769	5894.358	3486.596	1777.159
22	6800	4687.955	5073.837	1629.170	580.376
23	6800	9892.944	10727.653	1783.404	1392.083
24	6700	2866.634	3140.405	505.384	2105.712
25	6700	6628.695	8205.092	1564.426	2798.097
26	6600	5051.707	5075.783	2097.639	116.653
27	6500	3606.377	3942.086	1473.440	1055.676
28	6500	4123.435	5080.724	633.551	876.520
29	6400	10896.189	11757.555	2025.096	2072.591
30	6300	12320.176	13040.951	1044.569	1401.574
31	6300	8114.362	9381.890	737.462	1452.124
32	6000	9399.406	10645.290	2027.774	96.767
33	5980	9923.037	10746.473	1777.240	714.888
34	5800	8917.927	10188.074	1303.850	1157.744
35	5600	5843.423	6357.170	1181.583	483.170
36	5400	10590.086	11396.153	193.082	2160.847
37	5200	5048.922	5118.843	924.531	1094.841
38	5000	9434.010	10365.045	813.996	2536.960

Graph
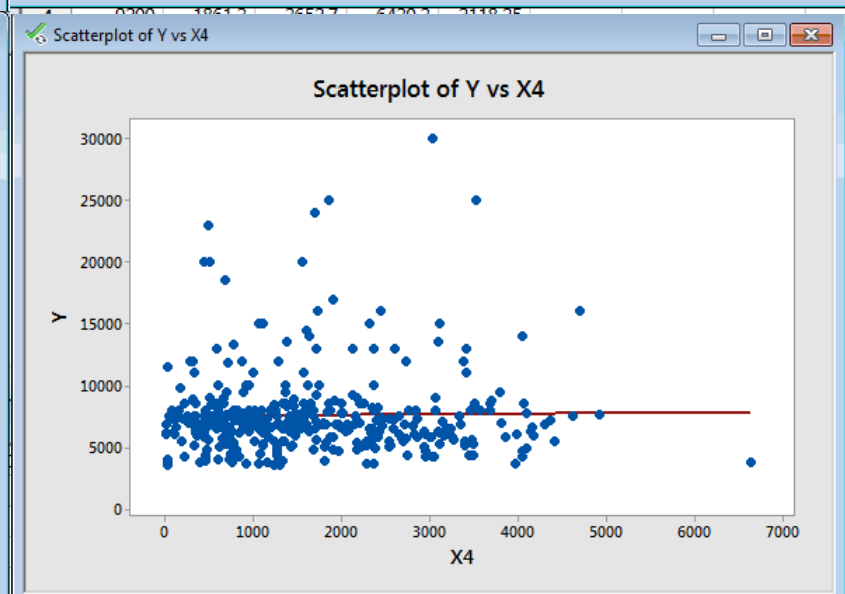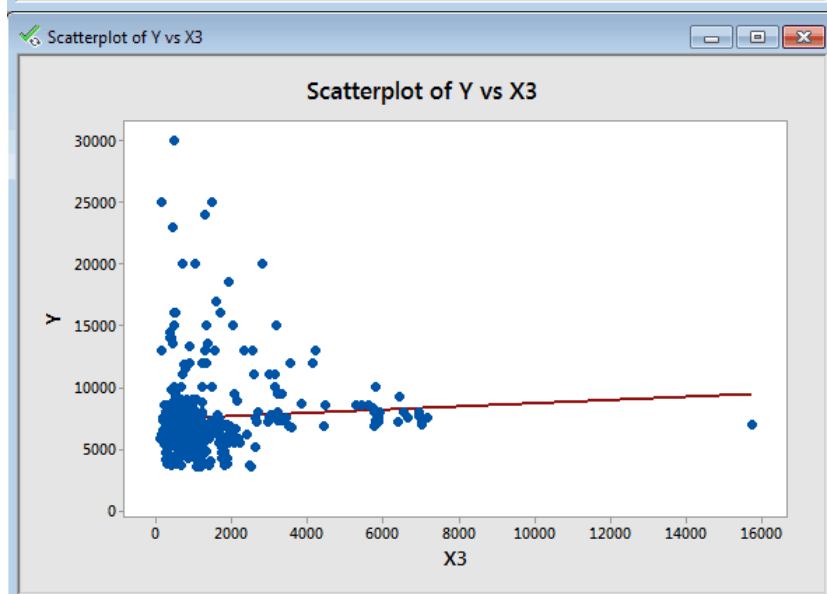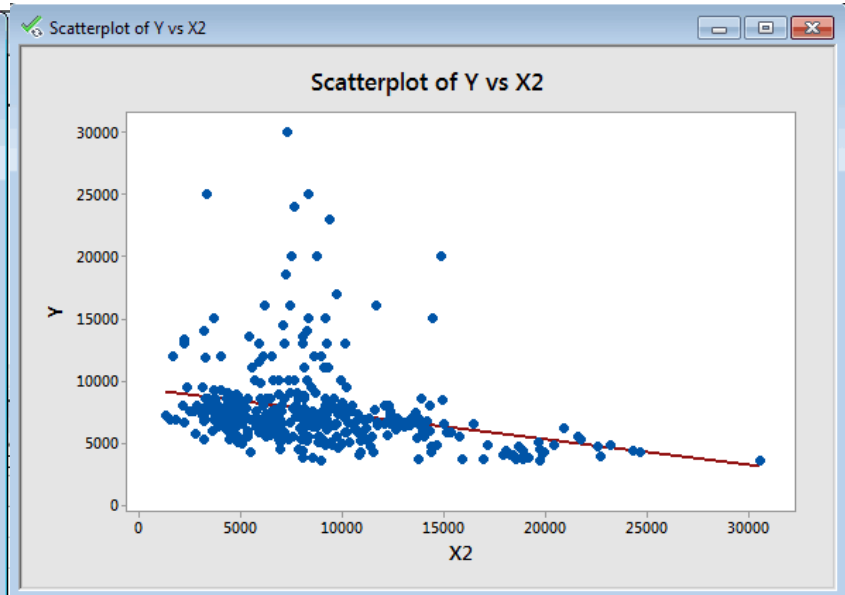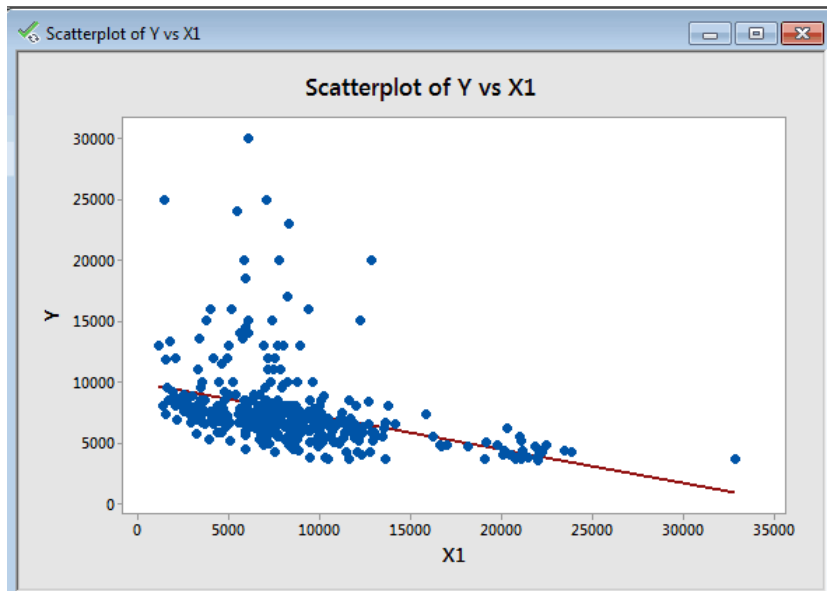
Result

Session

Regression Analysis: Y versus X1, X2, X3, X4

Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	4	944625780	236156445	25.96	0.000
X1	1	573985348	573985348	63.09	0.000
X2	1	252625472	252625472	27.77	0.000
X3	1	5353760	5353760	0.59	0.444
X4	1	14040689	14040689	1.54	0.215
Error	373	3393652412	9098264		
Total	377	4338278192			

Model Summary

S	R-sq	R-sq(adj)	R-sq(pred)
3016.33	21.77%	20.94%	20.15%

Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	9363	428	21.89	0.000	
X1	-0.7333	0.0923	-7.94	0.000	8.41
X2	0.4977	0.0945	5.27	0.000	8.26
X3	-0.077	0.101	-0.77	0.444	1.08
X4	0.171	0.137	1.24	0.215	1.03

Regression Equation

Session

Regression Equation

$Y = 9363 - 0.7333\ X1 + 0.4977\ X2 - 0.077\ X3 + 0.171\ X4$

Fits and Diagnostics for Unusual Observations

Obs	Y	Fit	Resid	Std Resid	
1	15000	8405	6595	2.20	R
17	7000	6955	45	0.02	X
41	14000	7153	6847	2.28	R
72	24000	9372	14628	4.87	R
80	7500	8940	-1440	-0.49	X
83	16000	9558	6442	2.15	R
84	16000	9086	6914	2.32	R
179	25000	10579	14421	4.83	R
180	16000	9858	6142	2.05	R
225	13000	6748	6252	2.08	R
240	30000	9076	20924	6.97	R
241	25000	8566	16434	5.46	R
242	23000	8042	14958	4.98	R
243	20000	8049	11951	3.98	R
244	18500	8588	9912	3.30	R
245	17000	8370	8630	2.87	R
246	15000	8792	6208	2.06	R
276	20000	9037	10963	3.65	R
319	15000	7733	7267	2.42	R
333	20000	7249	12751	4.26	R
368	3800	4310	-510	-0.18	X
373	3600	491	3109	1.07	X

R   Large residual
X   Unusual X

Thanks for your attention.

Wang Ruci 2015 12 03