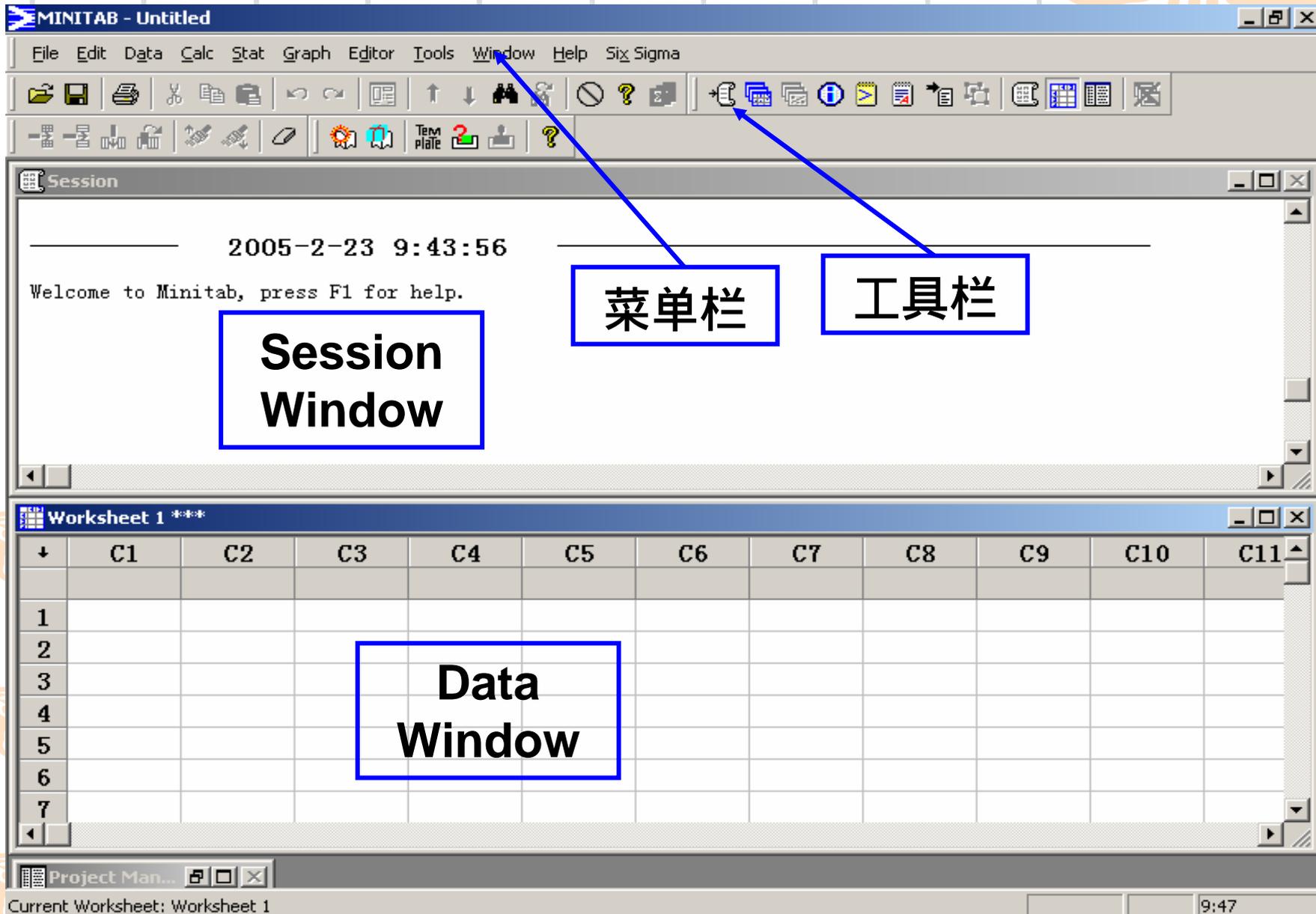
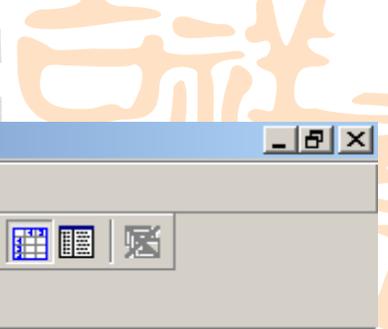


# MINITAB简易教程

**MINITAB® Release 14**  
Statistical Software

编者：段立松

# Mini tab启动画面



# Mini tab菜单介绍



 MINITAB - Untitled

File   Edit   Data   Calc   Stat   Graph   Editor   Tools   Window   Help

文件管理

基本计算

数据处理

统计

编辑器

视窗管理

参数设置

图形



# 工具栏介绍



打开PROJECT

储存PROJECT

工作簿打印

重复执行上一次命令

项目管理

工作表管理

图表管理

Session窗口

工作表窗口

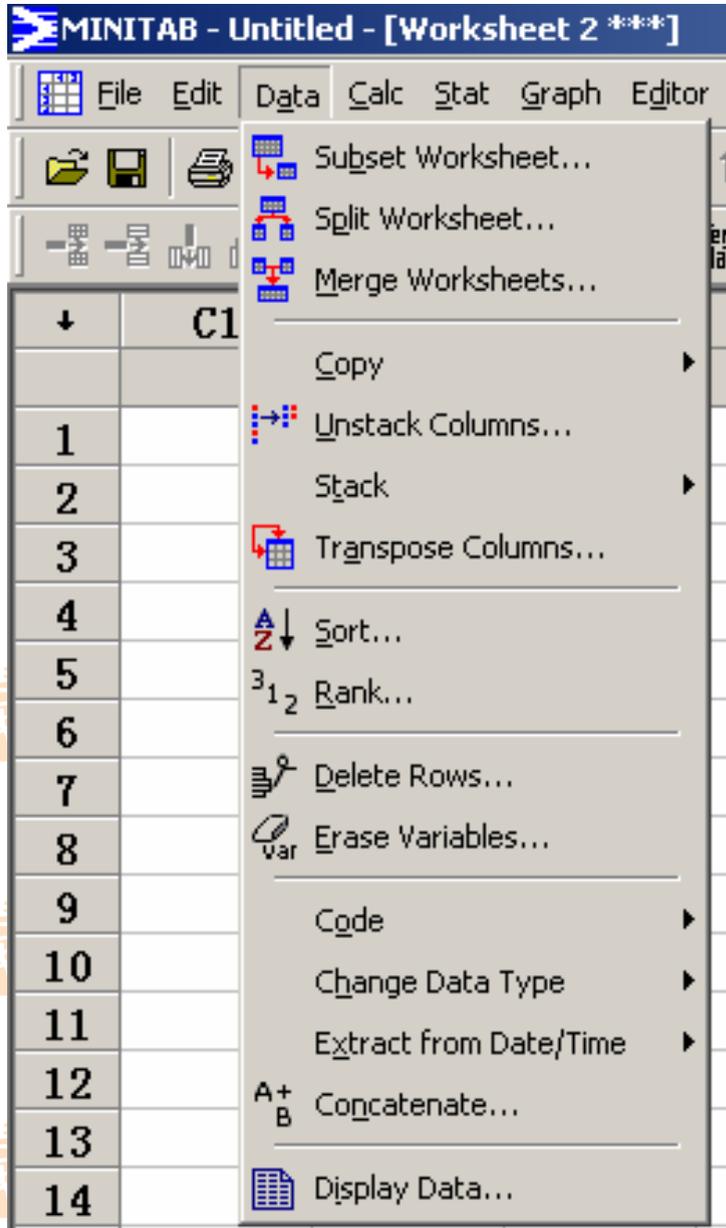


剪切  
复制

粘贴



# Data菜单介绍



## Data菜单中主要介绍：

### Unstack Columns...

- - 可将一列中的数据按要求分割为当期工作表或新工作表中的两个或多个短列。

### Stack 中部分命令

- - 可将两个或更多的列中的数据合并到当前工作表或新工作表中的一列中。

### Transpose Columns...

- - 将当前工作中的数据结构由列转换为行，以便于数据分析。

### Change Data Type中部分命令

- - 可以将一列中数据由一种格式转变为另外一种格式。

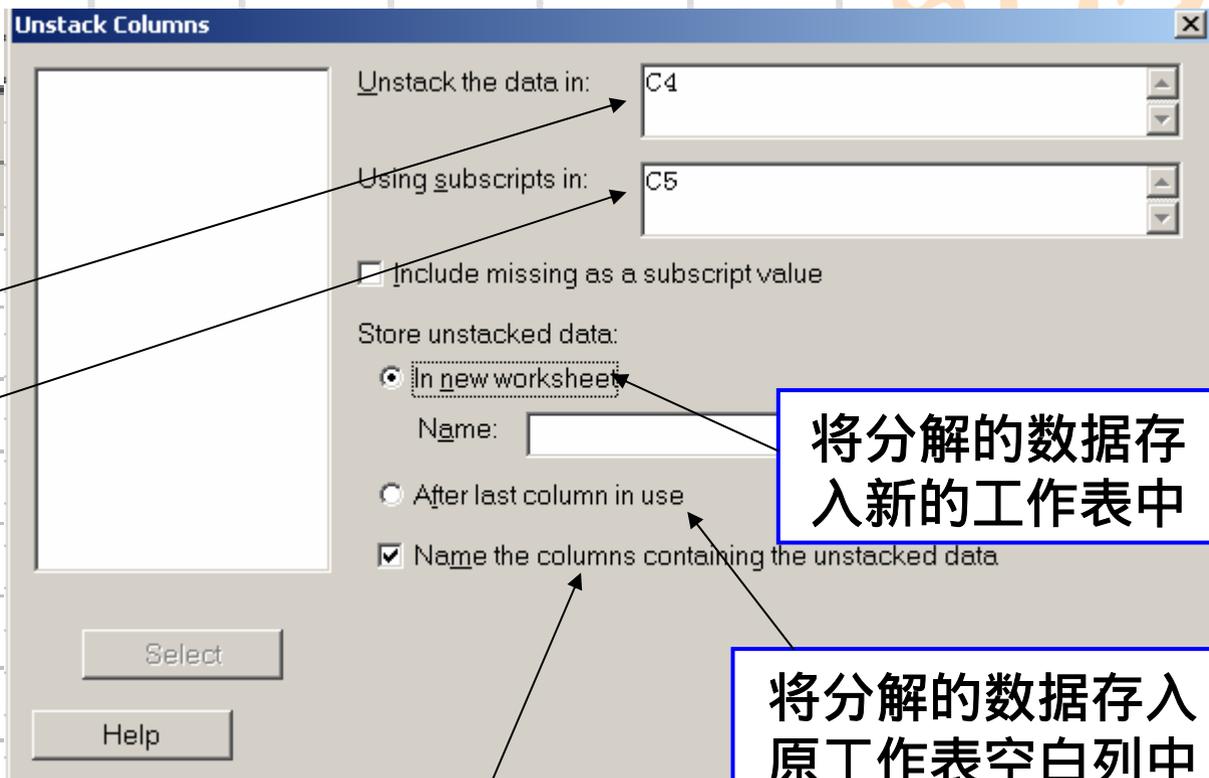
# Data菜单介绍

## ◆ Unstack Columns...

C4	C5
4.20751	1
1.91339	2
4.71196	3
3.74659	4
2.71042	1
5.54514	2
1.11227	3
5.16433	4
4.82225	1
5.71475	2

被分解数据列

分解依据列



# Data菜单介绍

## ◆ Unstack Columns...

数据分解后的结果

用分解依据列的标识命名新生成的列

分解后新生成的工作表

+	C1	C2	C3	C4
	C4_1	C4_2	C4_3	C4_4
1	4.20751	1.91339	4.71196	3.74659
2	2.71042	5.54514	1.11227	5.16433
3	4.82225	5.71475	4.55547	6.49526
4	3.28913	2.17116	4.39628	5.04263
5	4.28804	4.35457	3.77705	1.61796
6	4.32630	4.19700	5.68841	2.66671
7	3.46401	3.90109	5.41462	3.36348
8	4.56693	2.68106	5.29893	4.25874
9	5.71203	4.88147	5.07024	3.37916
10	2.27998	5.23610	4.39576	5.33613
11	2.91790	4.34670	4.26224	4.91885
12	3.71784	3.87681	3.24413	2.98150
13	4.75625	2.23629	5.43907	3.33650
14	5.17784	3.54939	4.06873	4.20850
15	3.50584	2.95502	2.42724	4.16832
16	3.48205	3.83569	3.06161	3.10620

# Data菜单介绍

## ◆ Stack > Columns...



	C1	C2	
	C4_1	C4_2	
1	4.20751	1.91339	4.
2	2.71042	5.54514	1.
3	4.82225	5.71475	4.
4	3.28913	2.17116	4.
5	4.28804	4.35457	3.
6	4.32630	4.19700	5.
7	3.46401	3.90109	5.
8	4.56693	2.68106	5.
9	5.71203	4.88147	5.
10	2.27998	5.23610	4.
11	2.91790	4.34670	4.
12	3.71784	3.87681	3.
13	4.75625	2.23629	5.
14	5.17784	3.54939	4.
15	3.50584	2.95502	2.
16	3.49205	2.82560	2.

Stack Columns

Stack the following columns:  
C1 C4\_1  
C2 C4\_2  
C3 C4\_3  
C4 C4\_4

'C4\_1' - 'C4\_4'

Store stacked data in:  
 New worksheet  
Name: (Optional)  
 Column of current worksheet: C5  
Store subscripts in: C6 (Optional)  
 Use variable names in subscript column

Select  
Help

选择需要合并的列

将合并后生成的列  
存入新的工作表中

将合并后生成的列存  
入原工作表中指定列

在生成列的后面生成  
一列标记栏，说明该  
数据来自哪一列

指定是否用原来列的  
名称来标识该数据



# Data菜单介绍

## ◆ Stack > Columns...

数据合并后的结果

原数据列

合并后生成的列

合并后生成的标识列

	C1	C2	C3	C4	C5	C6
	C4_1	C4_2	C4_3	C4_4		
1	4.20751	1.91339	4.71196	3.74659	4.20751	C4_1
2	2.71042	5.54514	1.11227	5.16433	2.71042	C4_1
3	4.82225	5.71475	4.55547	6.49526	4.82225	C4_1
4	3.28913	2.17116	4.39628	5.04263	3.28913	C4_1
5	4.28804	4.35457	3.77705	1.61796	4.28804	C4_1
6	4.32630	4.19700	5.68841	2.66671	4.32630	C4_1
7	3.46401	3.90109	5.41462	3.36348	3.46401	C4_1
8	4.56693	2.68106	5.29893	4.25874	4.56693	C4_1
9	5.71203	4.88147	5.07024	3.37916	5.71203	C4_1
10	2.27998	5.23610	4.39576	5.33613	2.27998	C4_1
11	2.91790	4.34670	4.26224	4.91885	2.91790	C4_1
12	3.71784	3.87681	3.24413	2.98150	3.71784	C4_1
13	4.75625	2.23629	5.43907	3.33650	4.75625	C4_1
14	5.17784	3.54939	4.06873	4.20850	5.17784	C4_1
15	3.50584	2.95502	2.42724	4.16832	3.50584	C4_1
16	3.48205	3.83569	3.06161	3.10620	3.48205	C4_1
17	3.81628	5.48394	2.92609	3.32960	3.81628	C4_1

# Data菜单介绍

## ◆ Transpose Columns...

	C5	C6-T	C7-T	C8	C9	C10	C11	C12	C13
			Labels	C4_1_1	C4_1_2	C4_1_3	C4_1_4	C4_1_5	C4_1_6
1	4.20751	C4_1	C5	4.20751	2.71042	4.82225	3.28913	4.28804	4.32630
2	2.71042	C4_1							
3	4.82225	C4_1							
4	3.28913	C4_1							
5	4.28804	C4_1							
6	4.32630	C4_1							
7	3.46401	C4_1							
8	4.56693	C4_1							
9	5.71203	C4_1							
10	2.27998	C4_1							
11	2.91790	C4_1							
12	3.71784	C4_1							
13	4.75625	C4_1							
14	5.17784	C4_1							
15	3.50584	C4_1							
16	3.48205	C4_1							
17	3.81628	C4_1							

**Transpose Columns**

Transpose the following columns:  
C5

Store transpose:  
 In new worksheet  
 After last column in use

Name: \_\_\_\_\_

Create variable names using column: C6 (Optional)

Select Help OK Cancel

要转换的数据列

转换后的数据列存入新的工作表中

转换后的数据列存入原工作表的后面

选择用来命名转换后数据的列

# Data菜单介绍

## ◆ Change Data Type > Text to Numeric...

	C6-T	C7
1	1	1
2	2	2
3	3	3
4	4	4
5	1	1
6	2	2
7	3	3
8	4	4
9	1	1
10	2	2
11	3	3
12	4	4
13	1	1
14	2	2
15	3	3
16	4	4
17	1	1

Text to Numeric

Change text columns:  
C6 要转换的数据列

Store numeric columns in:  
C7 转换后的数据存入列

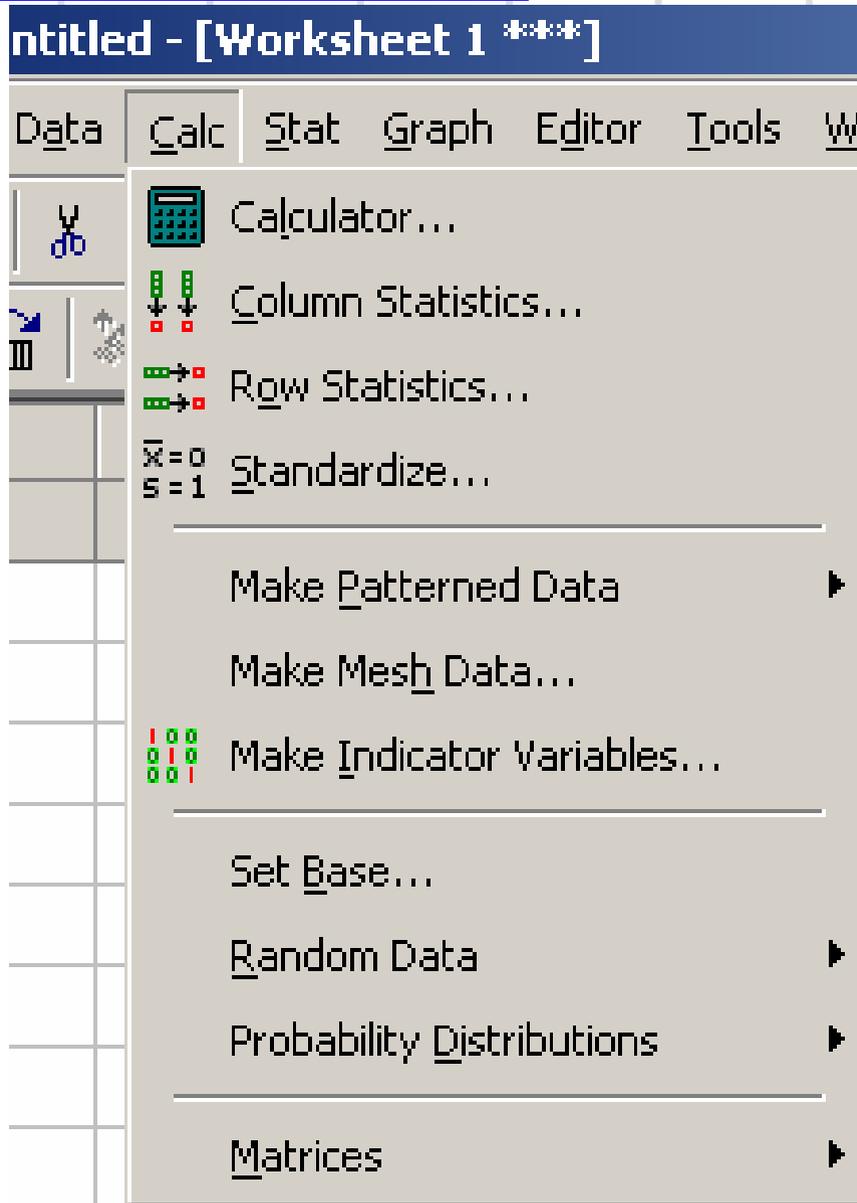
Select

Help OK Cancel

转换前的数据形式，数字居左为文本格式

转换后的数据形式，数字居右为数字格式

# Calc菜单介绍



## Calc菜单中主要介绍：

### Column Statistics...

- 可对列中的数据进行各种统计计算。

### Row Statistics...

- 可对行中的数据进行各种统计计算。

### Make Patterned Data

- 可以生成各种数据模板，如生成一组等间距的数。

### Random Data

- 可根据所选择的分布类型生成符合该分布的一组随机数。

# Calc菜单介绍

## ◆ Columns Statistics...

	C1	C2
	100	112
1	69.139	116
2	96.145	119
3	109.391	116
4	87.776	119
5	87.131	106
6	84.054	120
7	94.862	109
8	90.560	127
9	99.168	138
10	101.573	110
11	115.023	121
12	103.305	114
13	100.245	108.960
14	86.186	99.553
15	116.654	132.848
16	95.797	134.025

可计算的统计量：  
求和、  
求平均值、  
求标准偏差、  
求最小值、  
求最大值、  
求极差、  
求中位数、  
求平方和、  
求总体容量、  
求未缺失值容量、  
求缺失值容量

Column Statistics

Statistic

- Sum
- Mean
- Standard deviation
- Minimum
- Maximum
- Range
- Median
- Sum of squares
- N total
- N nonmissing
- N missing

Input variable: '100'

Store result in:

OK Cancel

要计算的数据列

Session的生成结果为：  
**Mean of 100**  
Mean of 100 = 100.435

# Calc菜单介绍

## ◆ Row Statistics...

	C1	C2	C3	C4	C5	C6
	100	120	140	160	180	STD
1	69.139	116.130	143.600	160.489	175.761	42.0098
2	96.145	119.866	114.288	166.560	192.094	39.9516
3	109.391	116.356	140.580	161.023	189.651	32.9608
4	87.776	119.512	125.456	157.649	185.455	37.4818
5	87.131	106.188	129.182	144.000	155.000	35.0000
6	84.054	120.120	134.183	162.000	170.000	38.0000
7	94.862	109.079	137.416	144.000	155.000	35.0000
8	90.560	127.630	150.000	161.000	170.000	38.0000
9	90.000	100.000	110.000	120.000	130.000	30.0000
10	100.000	110.000	120.000	130.000	140.000	32.0000
11	115.023	121.001	141.639	150.000	160.000	36.0000
12	103.305	114.101	124.124	160.000	170.000	38.0000
13	100.245	108.960	160.949	164.000	170.000	38.0000
14	86.186	99.553	142.516	169.000	170.000	38.0000
15	116.654	132.848	131.223	151.000	160.000	36.0000
16	95.797	134.025	144.052	169.000	170.000	38.0000
17	111.834	90.952	141.109	176.000	180.000	40.0000
18	103.042	120.407	141.214	176.000	180.000	40.0000
19	120.954	133.543	149.291	173.000	180.000	40.0000
20	102.054	99.378	141.459	147.000	150.000	30.0000

计算的结果列

可计算的统计量同Columns Statistics

要计算的数据列

要计算的数据列

计算结果存入列

Row Statistics

C1 100  
C2 120  
C3 140  
C4 160  
C5 180

Statistic

- Sum
- Mean
- Standard deviation
- Minimum
- Maximum
- Range
- Median
- Sum of squares
- N total
- N nonmissing
- N missing

Input variables:  
'100' '120' '140' '160' '180'

Store result in: C6

OK Cancel

# Calc菜单介绍

## ◆ Make Patterned Data > Simple Set of Numbers

**Simple Set of Numbers** 生成数据存入列

Store patterned data in: c7

From first value: 1

To last value: 3

In steps of: 1

List each value 2 times

List the whole sequence 2 times

生成数据开始点

生成数据结束点

数据间间隔

每个值列表次数

全部数据列表次数

生成结果

开始点为1

间隔为1

每个数值重复2次

结束点为3

全部数据重复2次

	C7
	1
	1
	2
	2
	3
	3
7	1
8	1
	2
	2
11	3
12	3

# Calc菜单介绍

## ◆ Make Patterned Data > Text Values

**生成文本存入列**

Store patterned data in: C8

Text values (eg. red "light blue"):  
OUR YOU HE SHE

List each value 2 times

List the whole sequence 2 times

Select Help OK Cancel

输入要列表的文本，以空格隔开

每个文本列表次数

全部文本列表次数

	C8-T
1	OUR
2	OUR
3	YOU
4	YOU
5	HE
6	HE
7	SHE
8	SHE
9	OUR
10	OUR
11	YOU
12	YOU
13	HE
14	HE
15	SHE
16	SHE

# Calc菜单介绍

## ◆ Random Data > Normal...

Normal Distribution

Generate  rows of data

Store in column(s):  
C9

Mean:

Standard deviation:

Select

Help

OK Cancel

**生成数据数**

**生成数据存入列**

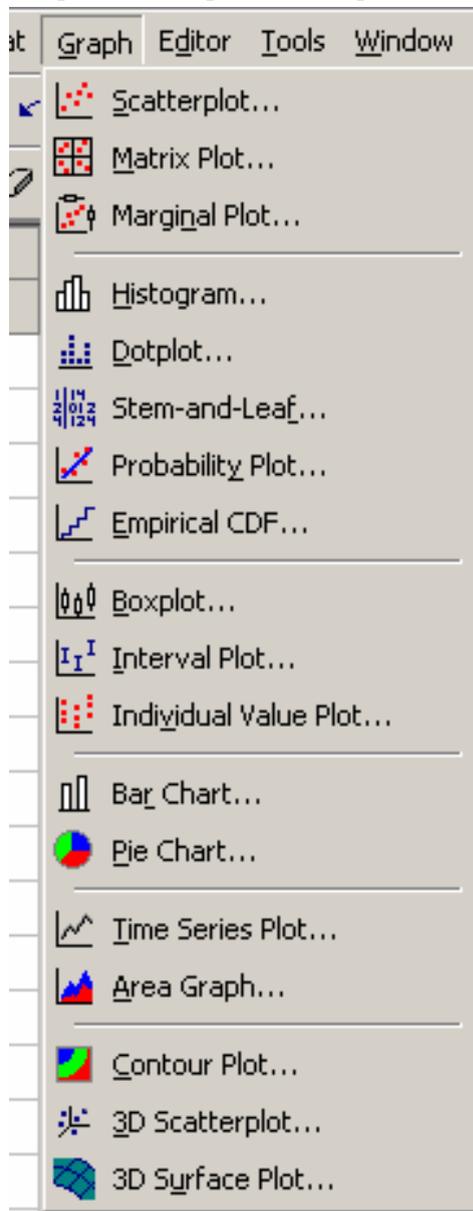
**期望生成数据的均值**

**期望生成数据的标准偏差**

	C9
1	173.499
2	186.280
3	187.331
4	182.647
5	178.059
6	161.920
7	196.759
8	181.919
9	181.759
10	176.619
11	196.198
12	163.220
13	196.124
14	176.326
15	177.797

生成结果，数据应为均值为180，标准偏差为10的正态分布

# Graph菜单介绍



## Graph菜单中主要介绍：

### Scatterplot...

- - 相关图，可反映两组数据的相关性

### Histogram...

- - 直方图，可检验一组数据的形状和分布情况。

### Dotplot...

- - 点图，用于评价和比较一组或多组数据的分布情况。

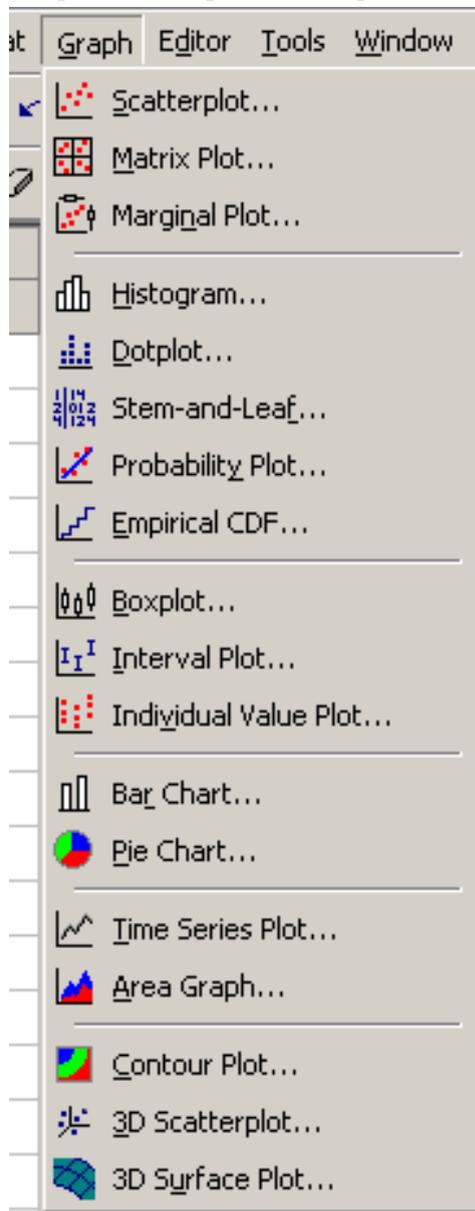
### Probability Plot...

- - 概率图，可检验一组数据的分布与哪一种情况相符或比较两组数据间分布的差异。

### Box Plot...

- - 线箱图，用于评价和比较一组或多组数据的分布情况。

# Graph菜单介绍



## Graph菜单中主要介绍：

### Interval Plot...

- - 区间图，可显示一组数据的均值及均值的置信区间。

### Bar Chart...

- - 柱形图，用柱状的形式反映每种数据的特性（如数量、均值、总和、标准偏差等）。

### Pie Chart...

- - 饼图，用来显示每种数据相对于整体的比例。

### Time Series Plot...

- - 时间序列图，分析一段时间内的数据随时间变化的趋势，对以后的情况进行预测。

# Graph菜单介绍

## ◆ Scatterplot...

+	C1	C2
	A	B
1	1.0	3.1
2	2.5	4.4
3	2.8	5.1
4	3.6	5.9
5	4.2	6.4
6	5.3	7.2
7	6.4	8.8
8	7.8	9.7
9	8.2	10.4
10	8.8	11.0
11	9.4	11.7

Scatterplots

Simple    With Groups    **With Regression**    With Regression and Groups

选择With Regression 后点击OK

Scatterplot - With Regression

	Y variables	X variables
1	B	A
2		
3		
4		
5		
6		
7		

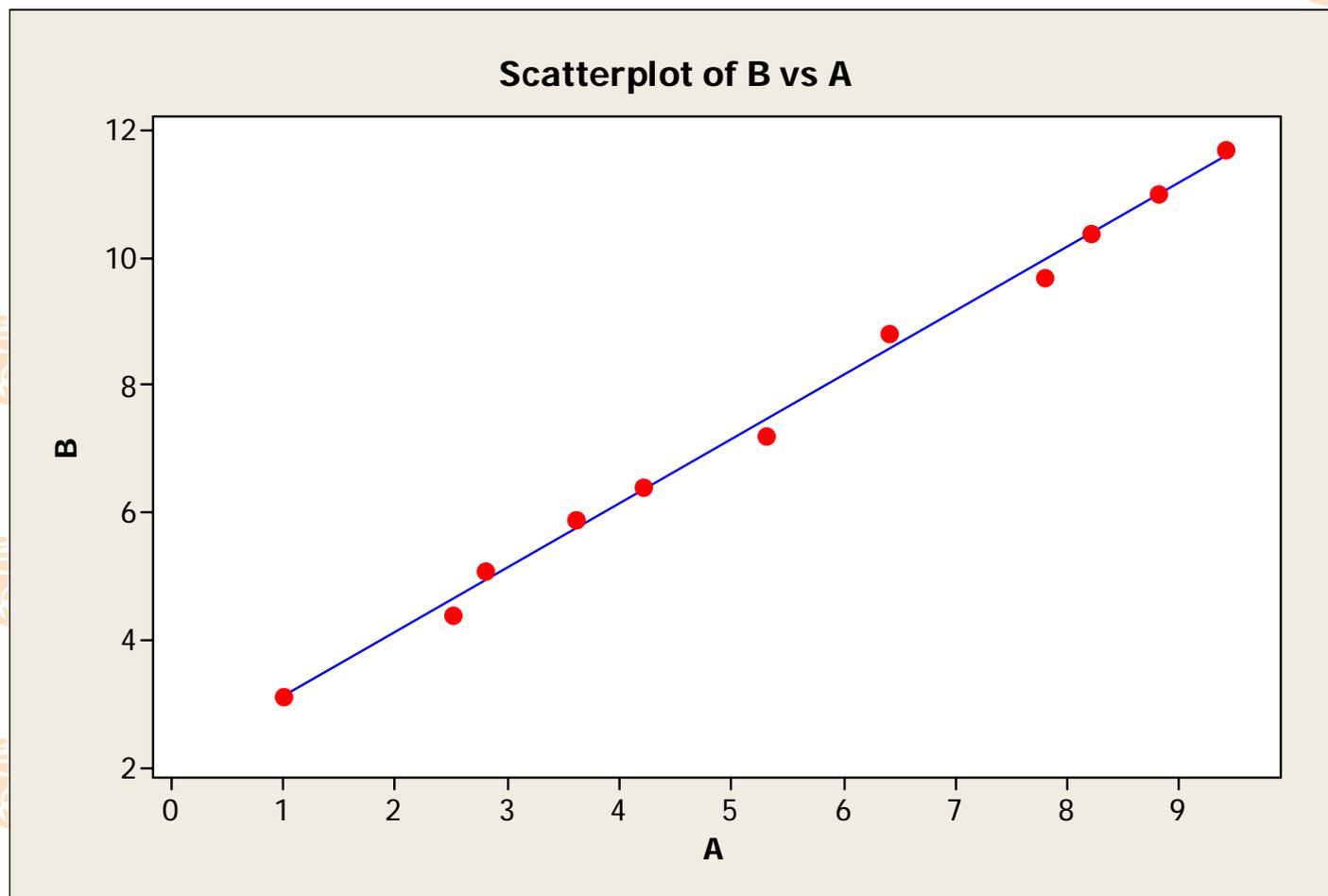
Scale...    Labels...    Data View...  
Multiple Graphs...    Data Options...  
Select  
Help    **点击OK**    OK    Cancel

分别选择要研究的两组数据作为Y和X

# Graph菜单介绍

## ◆ Scatterplot...

生成的图形如下，从图形可看出A、B两组数据呈较强的正相关。



# Graph菜单介绍

## ◆ Histogram...

+	C3
1	99.273
2	104.172
3	98.583
4	96.859
5	77.791
6	81.097
7	94.055
8	119.849
9	102.344
10	120.222
11	114.598
12	99.043
13	104.218
14	139.515
15	103.894
16	100.659
17	78.219
18	97.356
19	121.319

**Histogram - With Fit**

C1 A  
C2 B  
C3

Graph variables:  
C3

选择要研究一列数据

Scale... Labels... Data View...

Multiple Graphs... Data Options...

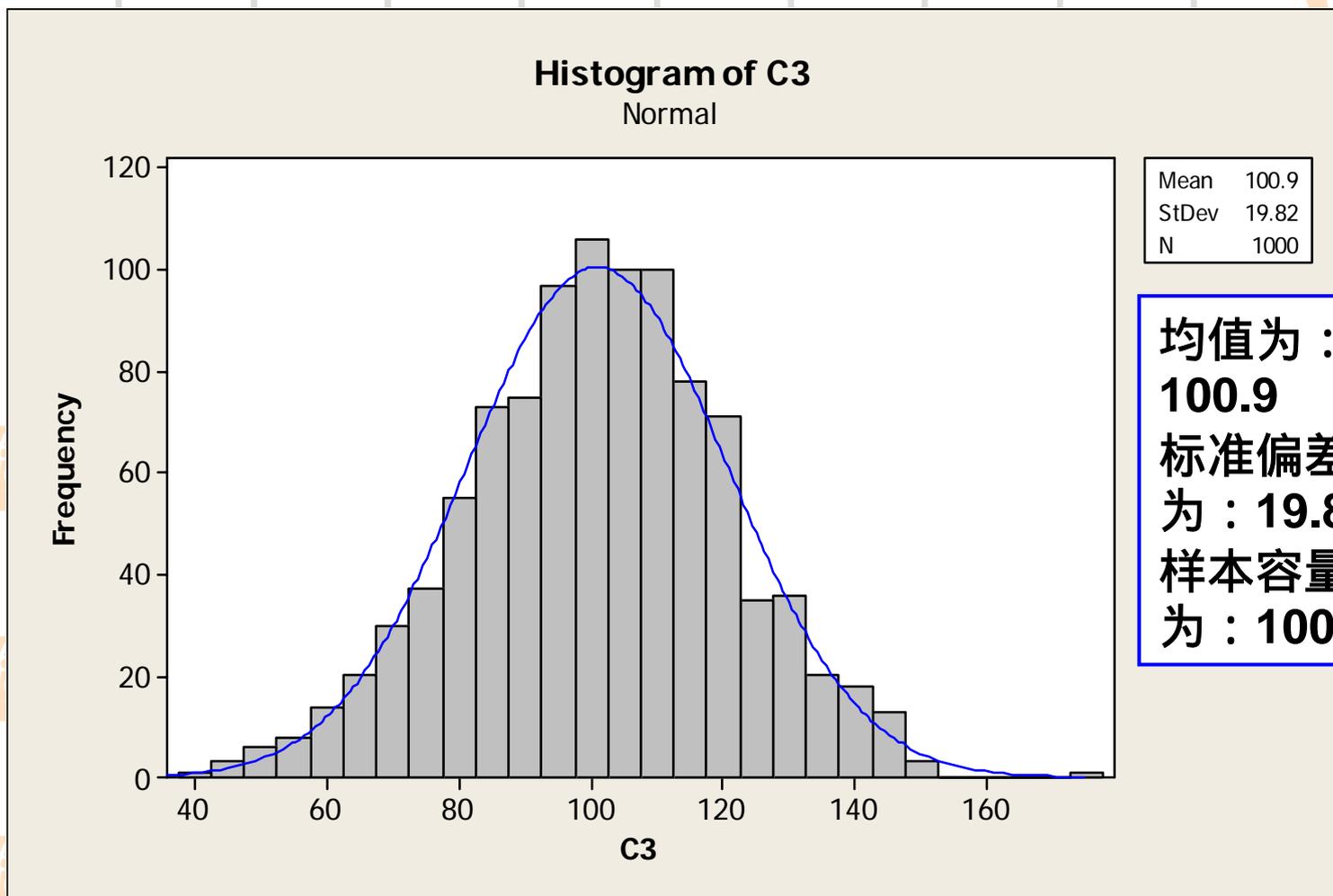
Select

Help 点击OK OK Cancel

# Graph菜单介绍

## ◆ Histogram...

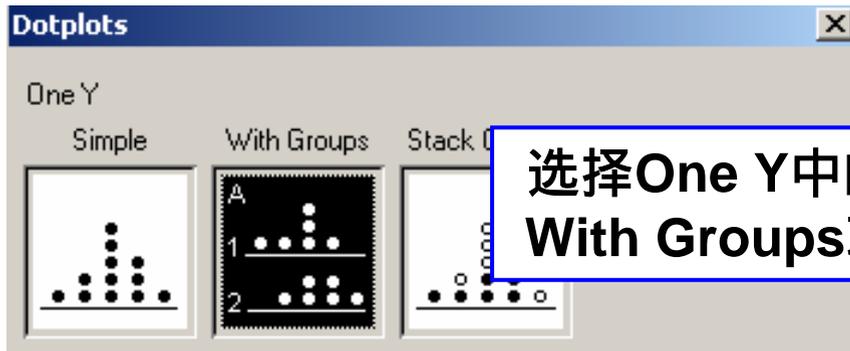
生成的图形如下，从图形可看出该组数据呈正态分布。



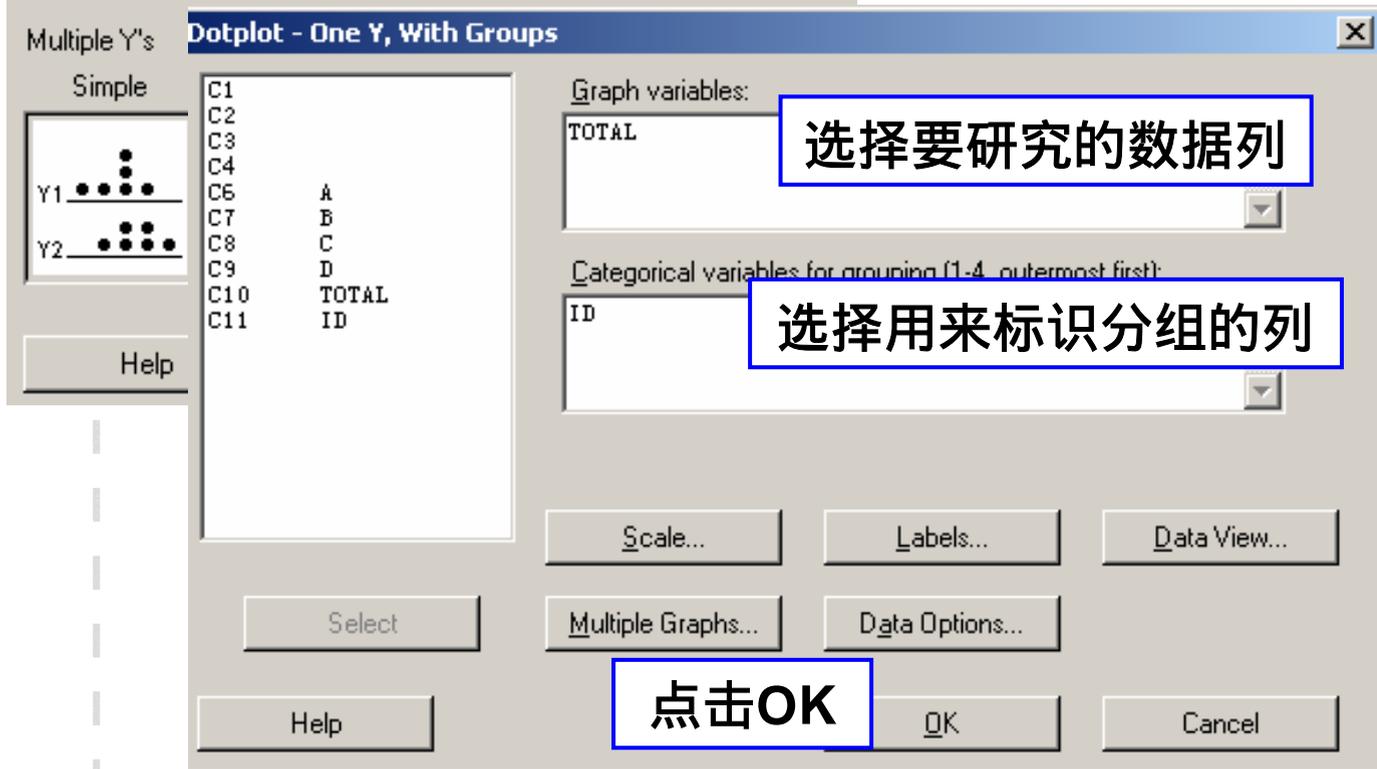
# Graph菜单介绍

## ◆ Dotplot...

C10	C11
TOTAL	ID
112.965	1
74.519	1
81.885	1
63.743	1
98.916	1
116.723	1
119.695	1
95.563	1
123.835	1
117.150	1
100.557	1
126.901	1
92.179	1
73.637	1
127.076	1
85.499	1
86.844	1
94.142	1
98.607	1
125.608	1



选择One Y中的 With Groups项



选择要研究的数据列

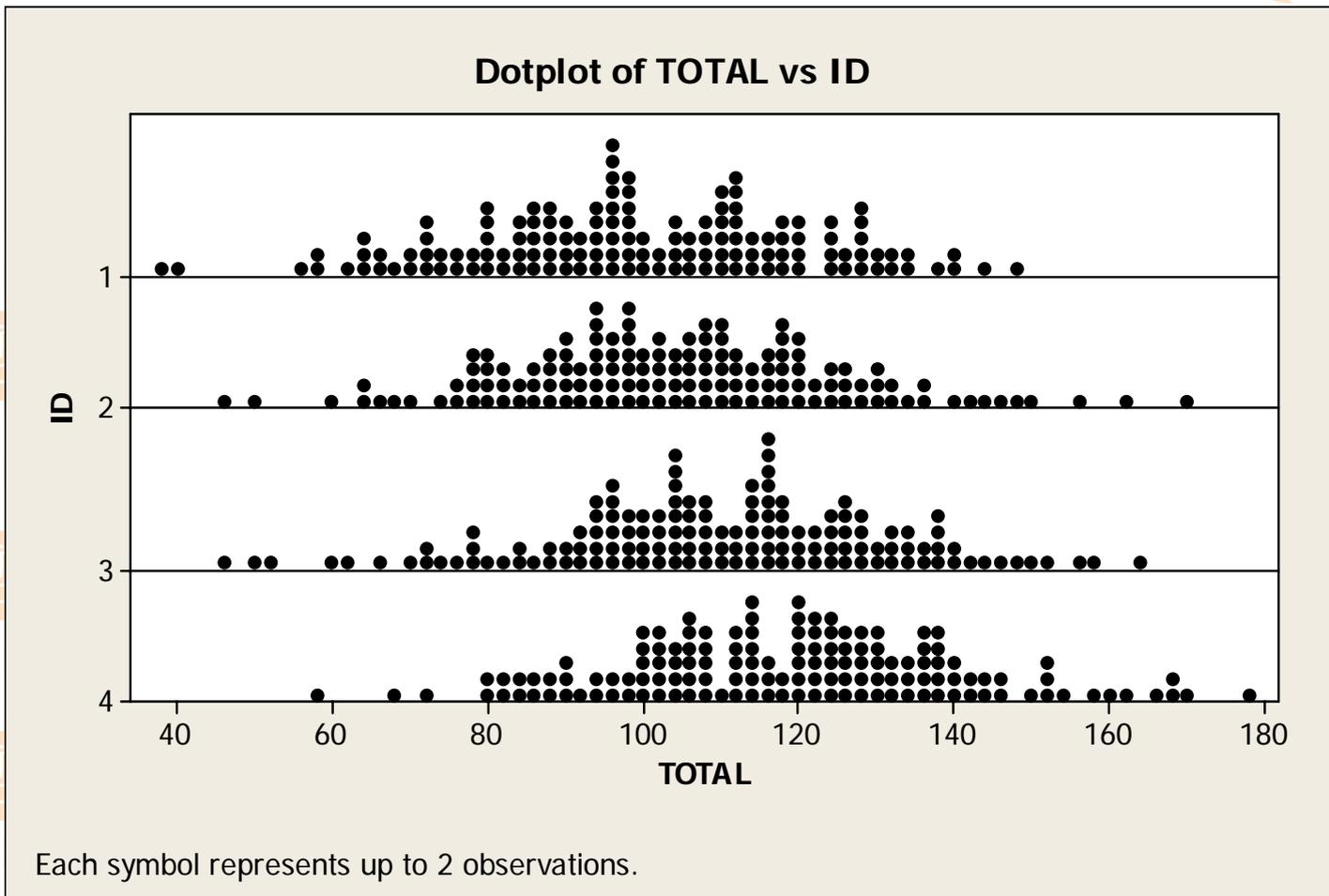
选择用来标识分组的列

点击OK

# Graph菜单介绍

## ◆ Dotplot...

生成的图形如下，从图形可看出该4组数据分布状况的差异。



# Graph菜单介绍

## ◆ Dotplot...

	C6	C7	C8	C9
	A	B	C	D
1	112.965	91.339	138.504	124.6
2	74.519	124.537	98.273	151.5
3	81.885	77.854	91.020	80.4
4	63.743	93.676	107.	
5	98.916	132.793	70.	
6	116.723	123.799	116.	
7	119.695	108.679	115.	
8	95.563	77.100	115.	
9	123.835	115.112	101.	
10	117.150	140.500	127.	
11	100.557	111.284	128.	
12	126.901	75.670	113.	
13	92.179	96.653	117.	
14	73.637	82.553	108.	
15	127.076	111.124	116.	
16	85.499	155.985	96.	
17	86.844	98.163	116.	
18	94.142	105.629	79.	
19	98.607	117.887	95.	
20	125.608	94.335	107.	

**Dotplots**

One Y  
Simple

**选择要研究的数据列**

Graph variables:  
A B C D

Scale... Labels...  
Multiple Graphs... Data Options...

Select

Help **点击OK** OK Cancel

Multiple Y's  
Simple Stack Y's With Groups Stack Groups

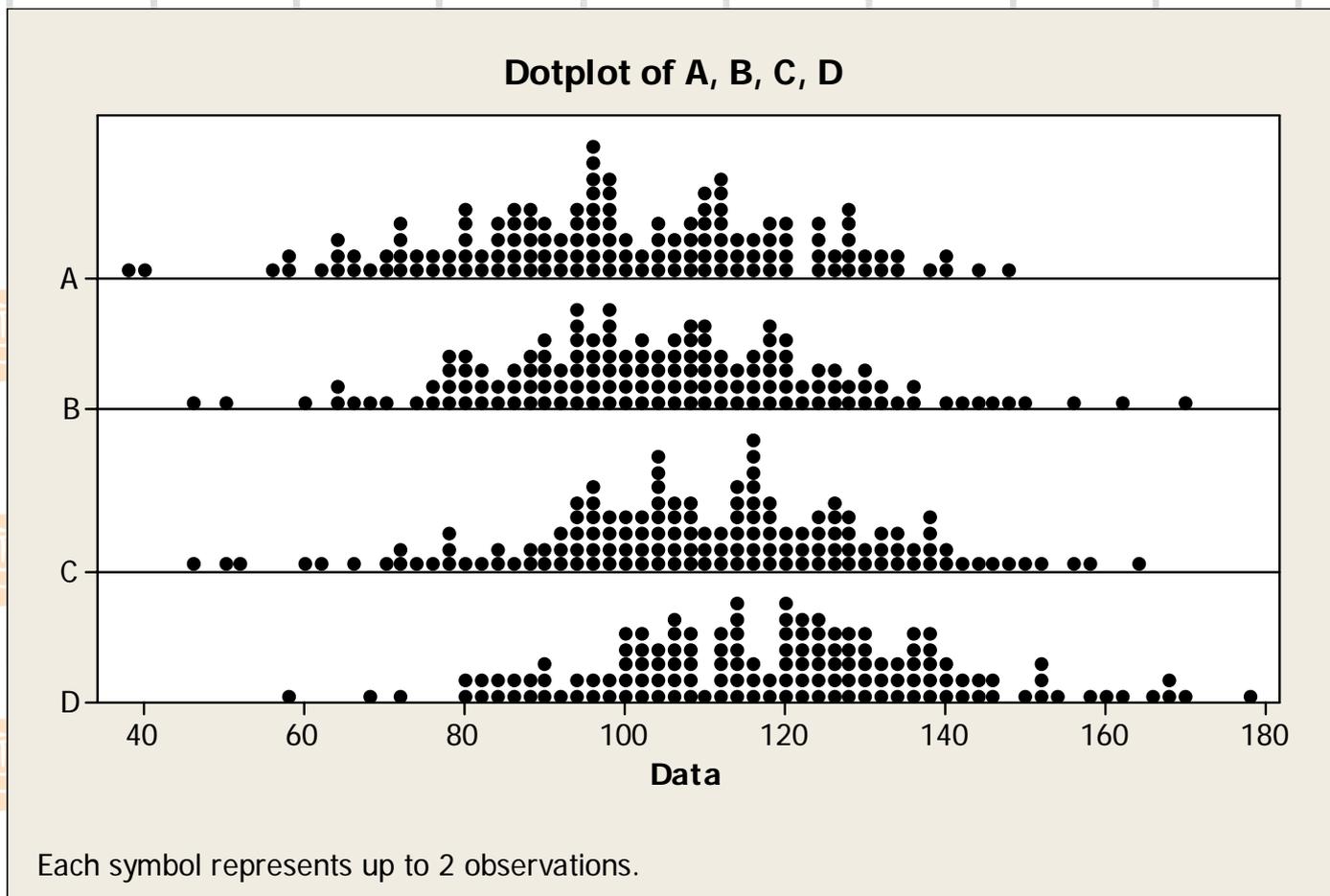
**选择Multiple Y's中的Simple项**

Help OK Cancel

# Graph菜单介绍

## ◆ Dotplot...

生成的图形如下，从图形可看出该4组数据分布状况的差异，且与上一种方法生成的图形一致。



# Graph菜单介绍

## ◆ Probability Plot...

The screenshot displays the Minitab software interface. On the left is a data table with 20 rows and one column labeled 'C1'. The data values are: 90.044, 98.100, 97.213, 109.463, 107.683, 92.063, 100.446, 97.941, 97.446, 103.896, 101.515, 103.487, 90.943, 112.301, 91.857, 100.498, 92.437, 99.827, 86.411, 96.870.

Overlaid on the interface are several dialog boxes and annotations:

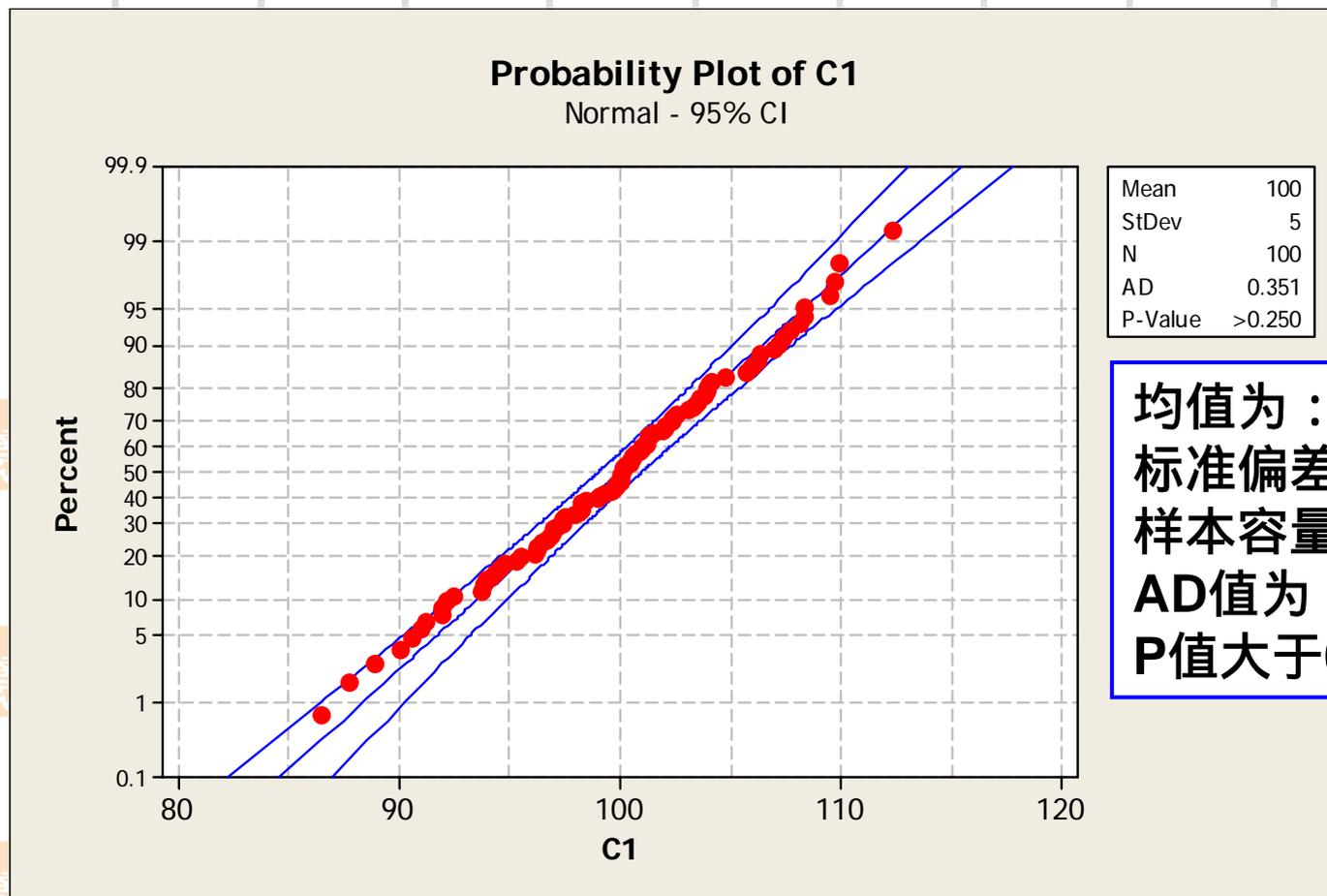
- Probability Plots** dialog box: Shows two icons for 'Single' and 'Normal'. A blue box with the text '选择 Simple' (Select Simple) points to the 'Normal' icon.
- Probability Plot - Single** dialog box: Shows 'C1' and 'C2' in the 'Graph variables:' field. A blue box with the text '选择要研究的数据列' (Select the data column to be studied) points to 'C1'.
- Probability Plot - Distribution** dialog box: Shows 'Normal' selected in the 'Distribution' dropdown. A blue box with the text '选择Normal, 及正态分布' (Select Normal, and normal distribution) points to the dropdown. Below, the 'Historical Parameters' table has 'Mean' set to 100 and 'StDev' set to 5. A blue box with the text '输入历史中心值和标准偏差' (Enter historical mean and standard deviation) points to these values.
- A blue box with the text '点击 Distribution...' (Click Distribution...) points to the 'Distribution...' button in the 'Probability Plot - Single' dialog.

	C1
1	90.044
2	98.100
3	97.213
4	109.463
5	107.683
6	92.063
7	100.446
8	97.941
9	97.446
10	103.896
11	101.515
12	103.487
13	90.943
14	112.301
15	91.857
16	100.498
17	92.437
18	99.827
19	86.411
20	96.870

# Graph菜单介绍

## ◆ Probability Plot...

生成的图形如下，从图形可看出该组数据基本在一条直线附件，P值大于0.05，该组数据符合正态分布。



均值为：100  
标准偏差为：5  
样本容量为：100  
AD值为：0.351  
P值大于0.25

# Graph菜单介绍

## ◆ Boxplot...

### Boxplot图形的理解

特殊点

75分位+ ( 1.5 × box范围 )

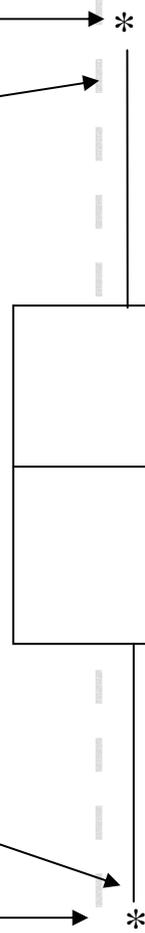
75分位

50分位(中位数)

25分位

25分位- ( 1.5 × box范围 )

特殊点



数据的中心50%  
( box范围 )

# Graph菜单介绍

## ◆ Boxplot...

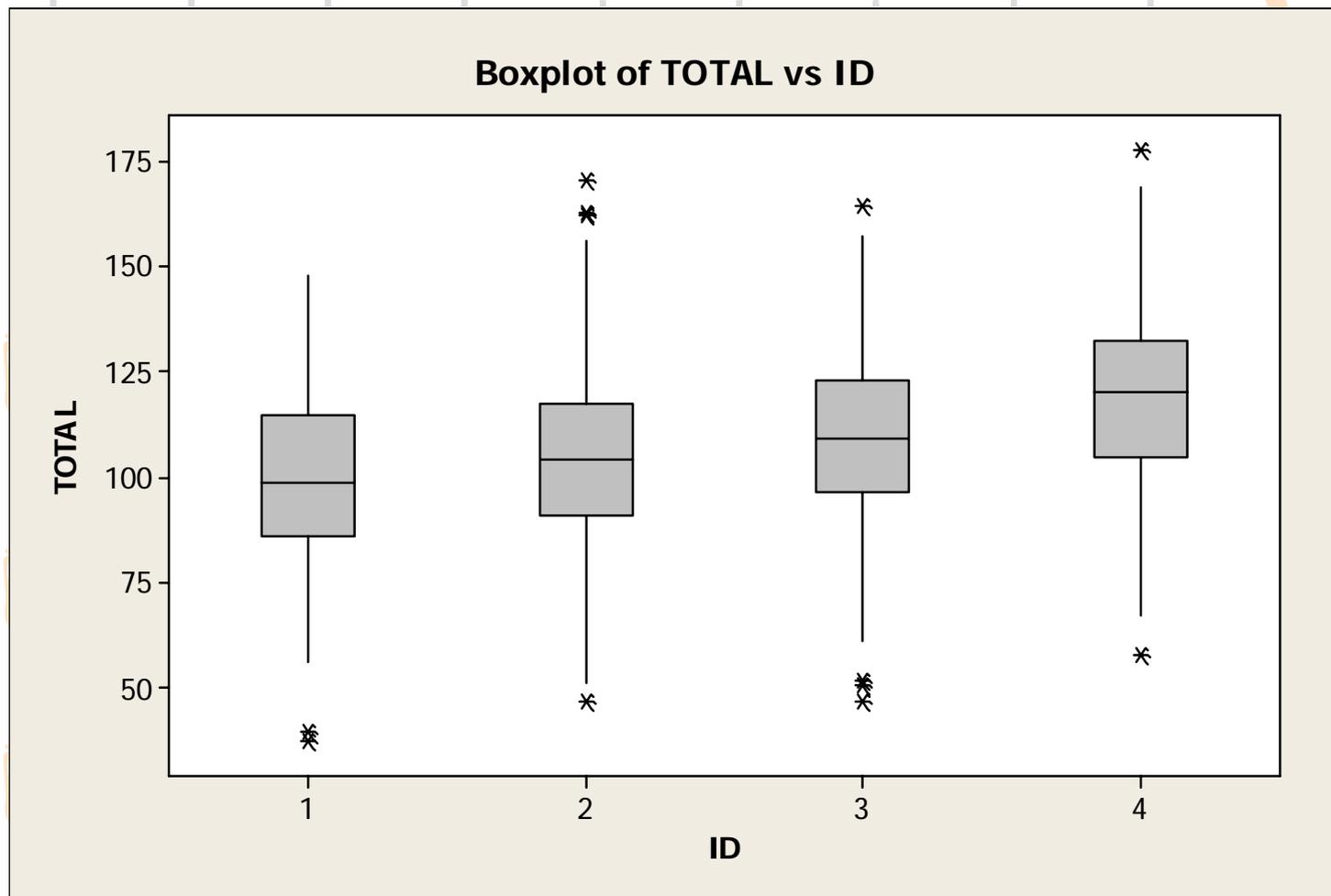
C10	C11
TOTAL	ID
112.965	1
74.519	1
81.885	1
63.743	1
98.916	1
116.723	1
119.695	1
95.563	1
123.835	1
117.150	1
100.557	1
126.901	1
92.179	1
73.637	1
127.076	1
85.499	1
86.844	1
94.142	1
98.607	1
125.608	1

The image shows the Minitab 'Boxplots' dialog box. It is divided into two main sections: 'One Y' and 'Multiple Y's'. In the 'One Y' section, the 'With Groups' option is selected, and a preview of a grouped boxplot is shown. A blue box highlights this option with the text '选择One Y中的 With Groups项'. In the 'Multiple Y's' section, the 'With G' option is selected, and a preview of a grouped boxplot is shown. A blue box highlights the 'Graph variables' field, which contains 'TOTAL', with the text '选择要研究的数据列'. Another blue box highlights the 'Categorical variables for grouping' field, which contains 'ID', with the text '选择用来标识分组的列'. At the bottom of the dialog, a blue box highlights the 'OK' button with the text '点击OK'. The 'Boxplot - One Y, With Groups' sub-dialog is also visible, showing a list of variables and a 'Select' button.

# Graph菜单介绍

## ◆ Boxplot...

生成的图形如下，从图形可看出该4组数据的均值和分布的差异。



# Graph菜单介绍

## ◆ Boxplot...

	C6	C7	C8	C9
	A	B	C	D
1	112.965	91.339	138.504	124.66
2	74.519	124.537	98.273	151.57
3	81.885	77.854	91.020	80.40
4	63.743	93.676	107.347	94.63
5	98.916	132.793	70.044	136.05
6	116.723	123.799	116.222	120.78
7	119.695	108.679	115.815	107.71
8	95.563	77.100	115.26	
9	123.835	115.112	101.45	
10	117.150	140.500	127.37	
11	100.557	111.284	128.90	
12	126.901	75.670	113.96	
13	92.179	96.653	117.15	
14	73.637	82.553	108.72	
15	127.076	111.124	116.11	
16	85.499	155.985	96.37	
17	86.844	98.163	116.26	
18	94.142	105.629	79.13	
19	98.607	117.887	95.29	
20	125.608	94.235	107.616	122.401

**Boxplot - Multiple Y's, Simple**

Graph variables:  
A B C D

**选择要研究的数据列**

Scale... Labels... Data View...  
Multiple Graphs... Data Options...

Select  
Help

**点击OK**

OK Cancel

**Boxplots**

One Y  
Simple

Multiple Y's  
Simple With Groups

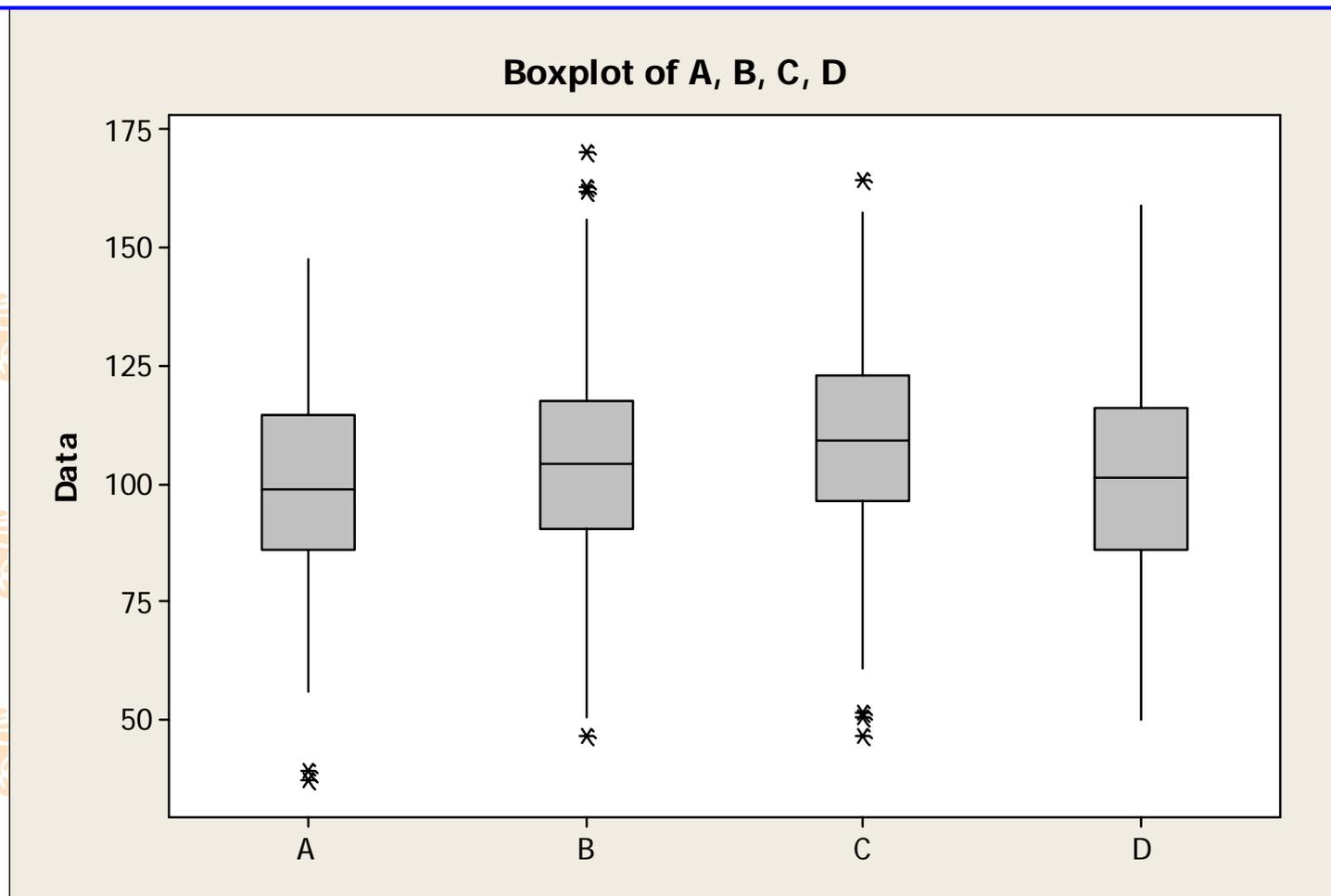
**选择Multiple Y's 中的Simple项**

Help OK Cancel

# Graph菜单介绍

## ◆ Boxplot...

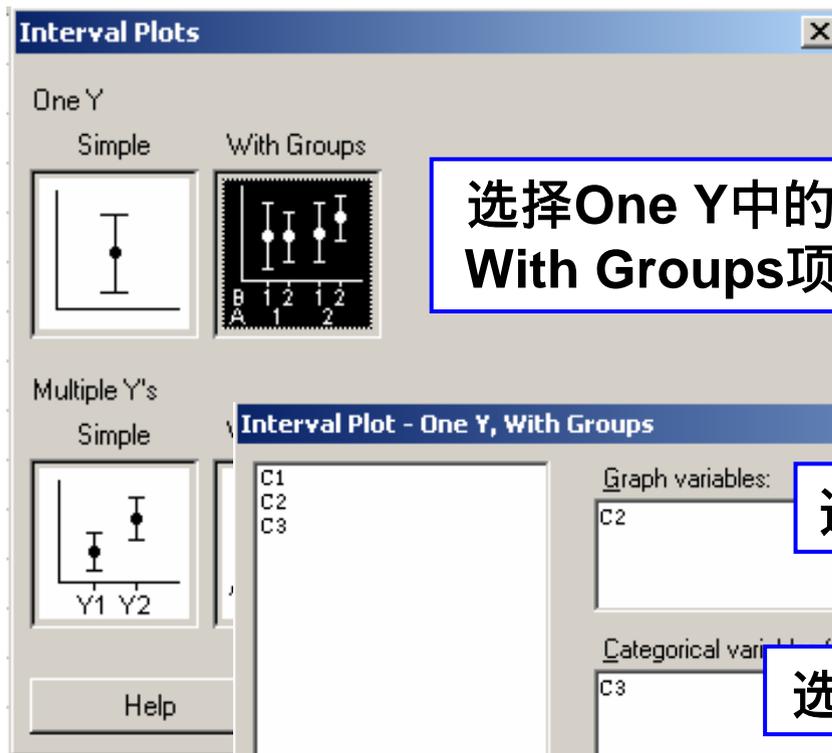
生成的图形如下，从图形可看出该4组数据的均值和分布的差异，且与上一种方法生成的图形一致。



# Graph菜单介绍

## ◆ Interval Plot...

↓	C2	C3
1	90.304	1
2	82.652	2
3	109.112	3
4	102.622	4
5	94.683	1
6	86.196	2
7	97.890	3
8	112.388	4
9	99.700	1
10	96.630	2
11	77.712	3
12	122.311	4
13	115.383	1
14	88.215	2
15	109.640	3
16	92.884	4
17	104.127	1
18	73.804	2
19	110.955	3
20	98.797	4



选择One Y中的  
With Groups项



选择要研究的数据列

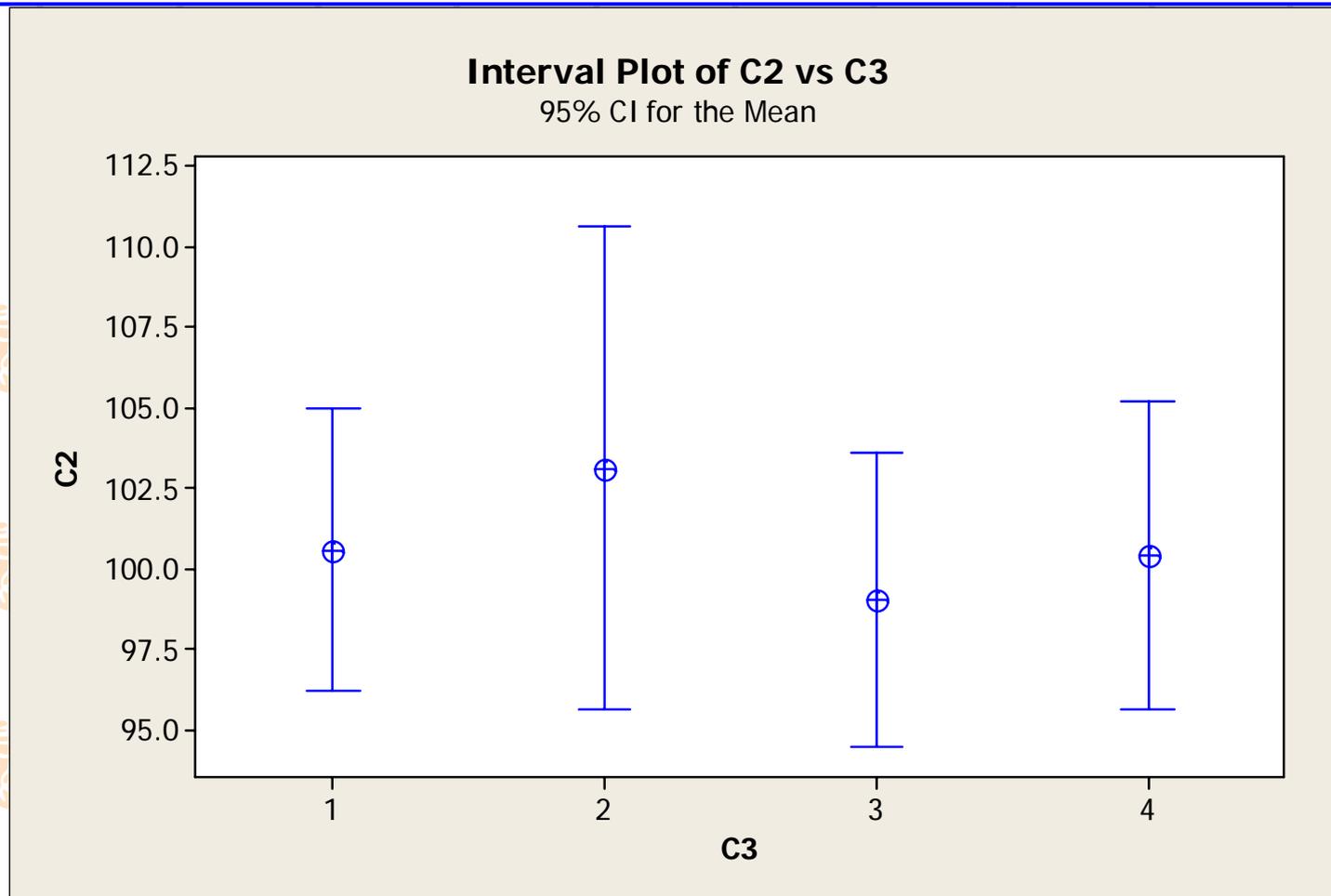
选择用来标识分组的列

点击OK

# Graph菜单介绍

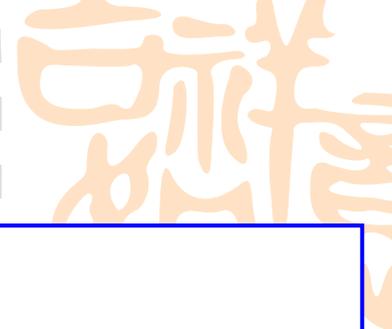
## ◆ Interval Plot...

生成的图形如下，从图形可看出该4组数据的均值和均值的95%置信区间的差异。



# Graph菜单介绍

## ◆ Bar Chart...



柱状图三类功能介绍：

### Counts of unique values

- - 统计每个数值的数量，每个柱子代表一个数值的样本数。

### A function of variable

- - 变量的某种函数统计，每个柱子代表一种变量的函数统计（如评价均、总和等）。

### Values from table

- - 变量的数值求和，每个柱子代表一种变量的总和。

每种功能都可根据数据的组合情况生成不同现状的图

Bar Charts

Bars represent:

Counts of unique values

Counts of unique values

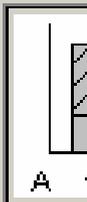
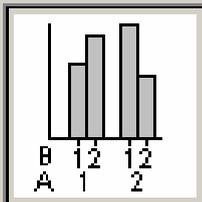
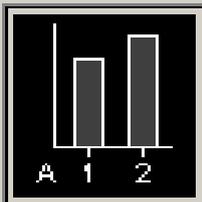
A function of a variable

Values from a table

Simple

Cluster

Stacked



Help

OK

Cancel

# Graph菜单介绍

## ◆ Bar Chart...

↓	C28	C29	C30
	LightOutput	Temperature	GlassType
1	580	100	1
2	1090	125	1
3	1392	150	1
4	568	100	1
5	1087	125	1
6	1380	150	1
7	570	100	1
8	1085	125	1
9	1386	150	1
10	550	100	2
11	1070	125	2
12	1328	150	2
13	530	100	2
14	1035	125	2
15	1312	150	2
16	579	100	2
17	1000	125	2
18	1299	150	2
19	546	100	3
20	1045	125	3
21	867	150	3
22	575	100	3
23	1053	125	3
24	904	150	3

选择A function of variable项

选择One Y中的Cluster项

选择函数类型

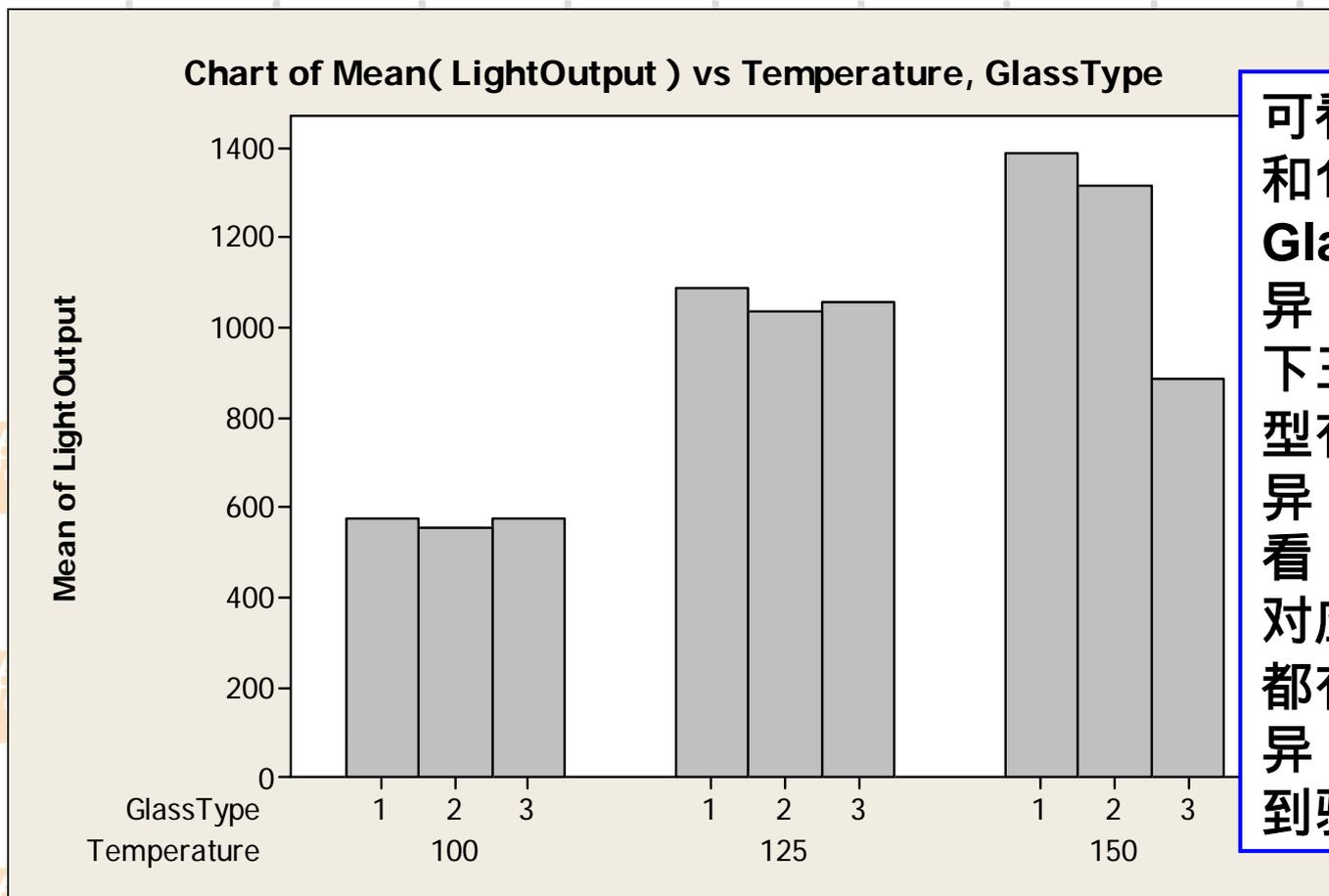
选择要研究的变量列

选择用来标识分组的列

# Graph菜单介绍

## ◆ Bar Chart...

生成的图形如下，从图形可看出在不同的温度下，不同的Glass类型的输出的平均的差异。



可看出在100度和125度下3种Glass类型无差异，而在150度下三种Glass类型有一定的差异，若反过来看，每种Glass对应的3种温度都有较大的差异，可下从页得到验证。

# Graph菜单介绍

## ◆ Bar Chart...

Bar Chart - A function of a variable, One Y, Cluster

Function: Mean

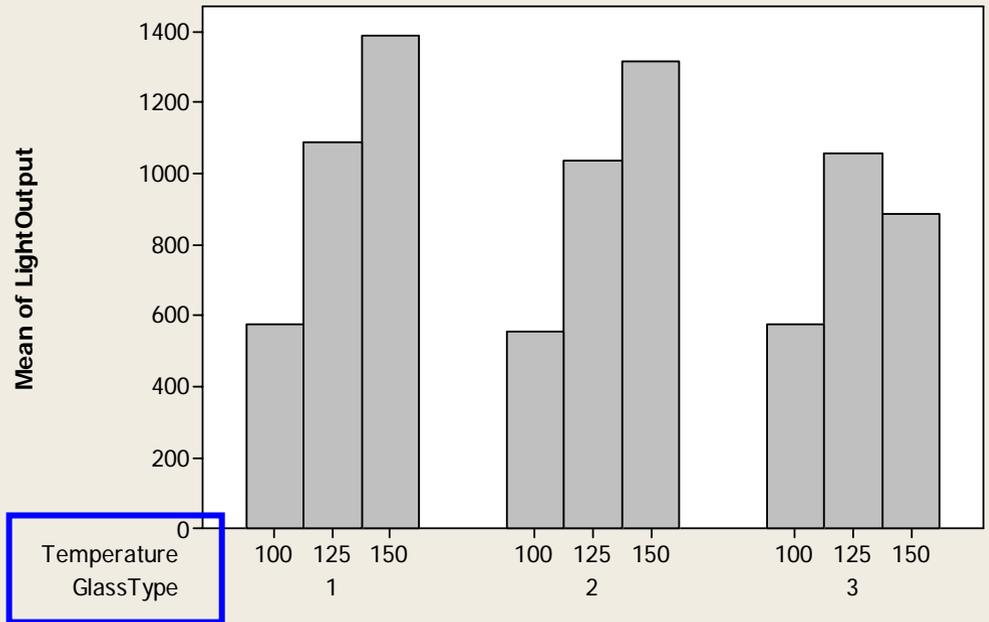
Graph variables: LightOutput

Categorical variables for groups: GlassType Temperature

Options... Data View... Help

Exchange Glass Type and Temperature selection order

Chart of Mean( LightOutput ) vs GlassType, Temperature



# Graph菜单介绍

## ◆ Bar Chart...

↓	C24-I	C25	C26	C27	C28
	Quarter	A	B	C	D
1	Q1	25	53	29	73
2	Q2	34	63	35	94
3	Q3	50	39	19	158
4	Q4	23	54	17	89

选择Values from a table项

选择要研究的变量列

选择用来标识分组的列

选择Two-way table中Cluster项

Bar Chart - Values from a table, Two-way table, Cluster

Graph variables:  
A B C D

Row labels:  
Quarter

Table Arrangement  
 Columns are outermost categories and rows are innermost  
 Rows are outermost categories and columns are innermost

Bar Chart Options... Scale... Labels...

Data View... Multiple Graphs... Data Options...

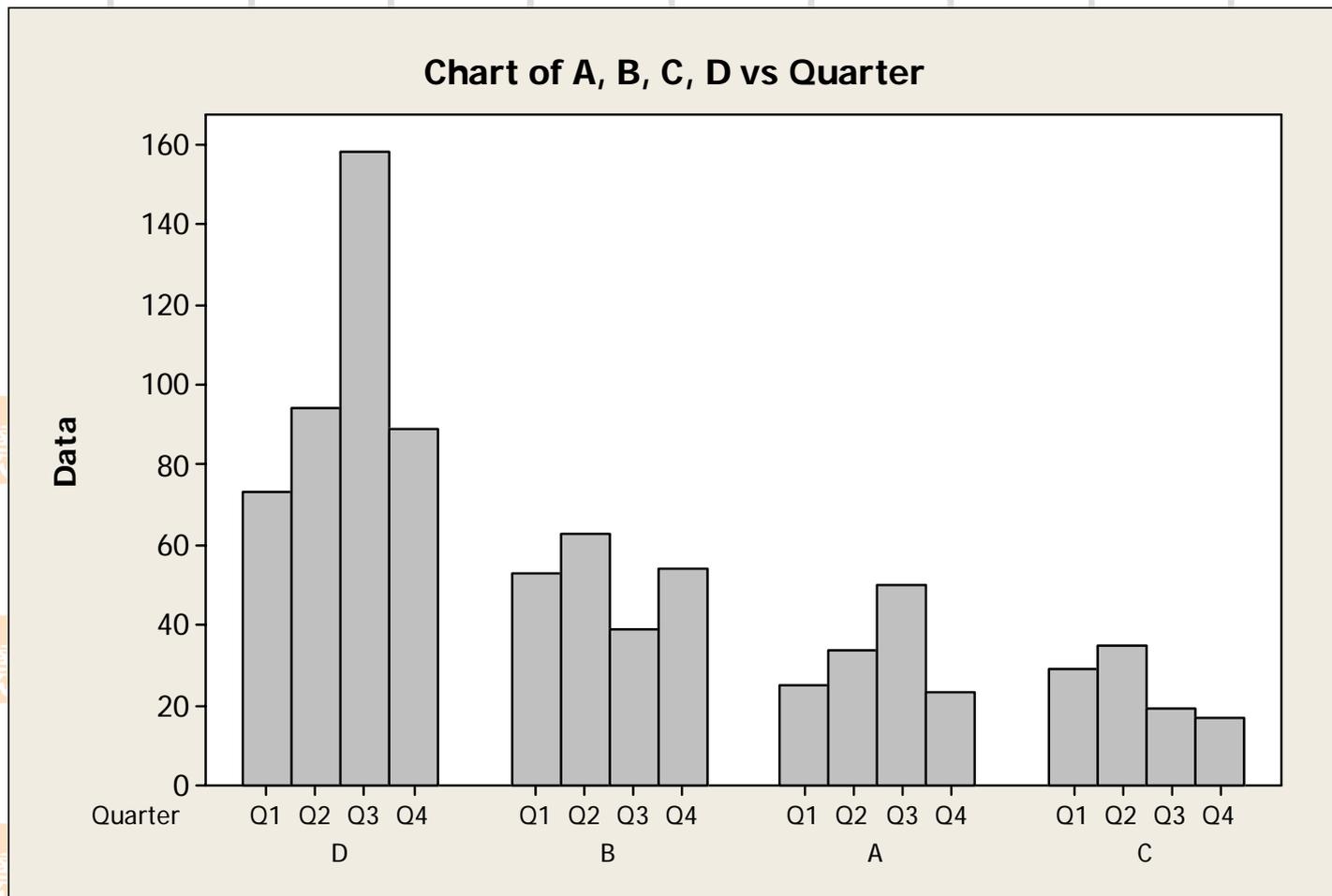
Help OK Cancel

C1 RimWidth  
C3 TreadR  
C6 SectionW  
C7 TreadW  
C8 Load  
C9 OD  
C11 Counts  
C12 Mileage  
C13 PSI  
C16 Miles  
C17 Tread  
C18 Date  
C21 Repairs  
C25 A  
C26 B  
C27 C  
C28 D  
C29 Valve Core

# Graph菜单介绍

## ◆ Bar Chart...

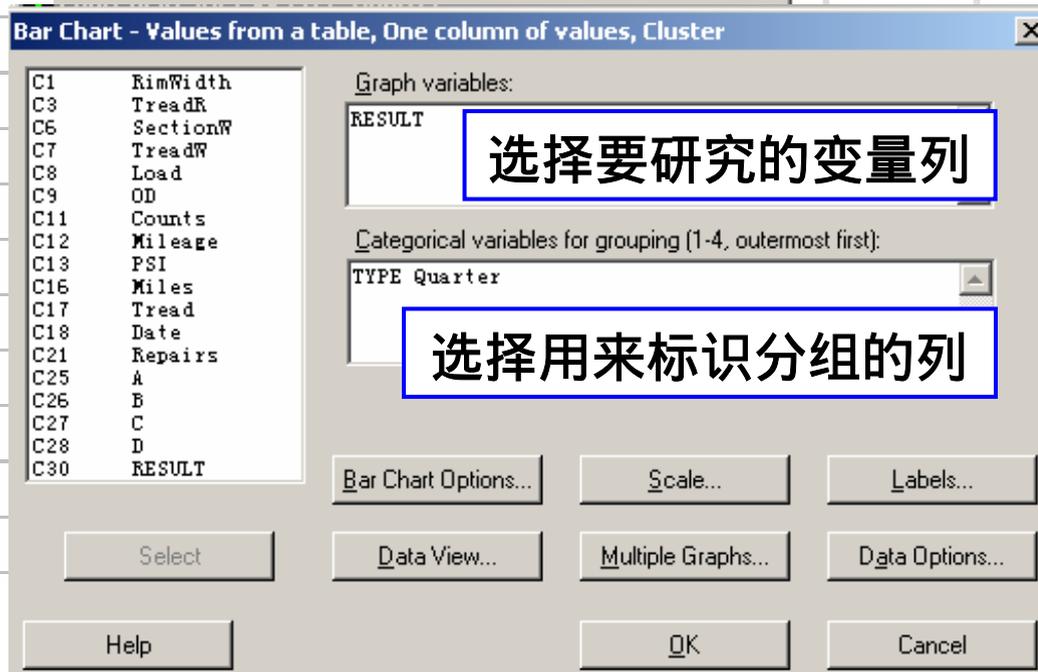
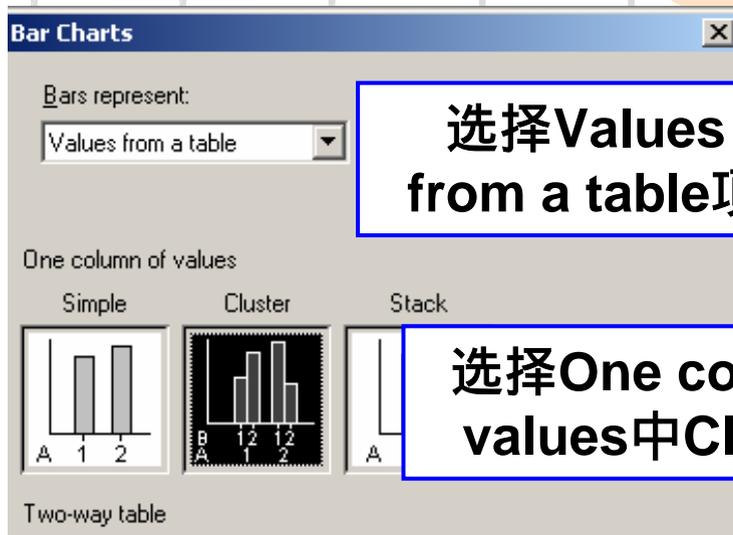
生成的图形如下，从图形可看出在A、B、C、D各种产品在每个季度的销量情况。



# Graph菜单介绍

## ◆ Bar Chart...

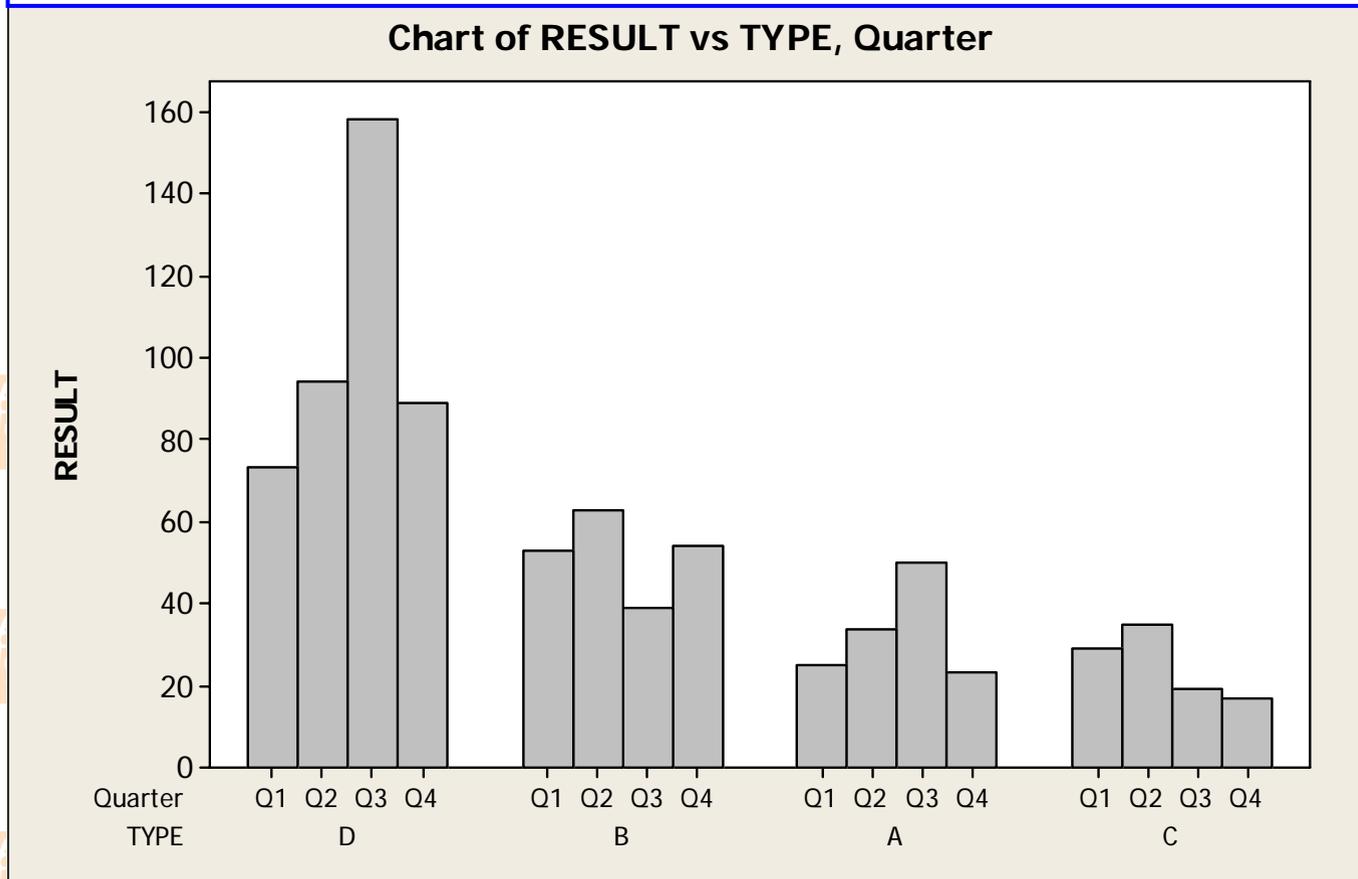
+	C30	C31-T	C32-T
	RESULT	TYPE	Quarter
1	25	A	Q1
2	34	A	Q2
3	50	A	Q3
4	23	A	Q4
5	53	B	Q1
6	63	B	Q2
7	39	B	Q3
8	54	B	Q4
9	29	C	Q1
10	35	C	Q2
11	19	C	Q3
12	17	C	Q4
13	73	D	Q1
14	94	D	Q2
15	158	D	Q3
16	89	D	Q4



# Graph菜单介绍

## ◆ Bar Chart...

生成的图形如下，从图形可看出在A、B、C、D各种产品在每个季度的销量情况。与上一操作相同，不同的数据结构，不同的命令可得出相同的结果



与上一操作相同，不同的数据结构，不同的命令可得出相同的结果

# Graph菜单介绍

## ◆ Pie Chart...

当列中的每个观测值代表一个类别的数量时

类别在一列，频数在另一列时

↓	C10-T CausesA	C11 Counts
1	Puncture	414
2	Damaged Liner	132
3	Damaged Sidewall	209
4	Valve Stem Leak	397

Pie Chart

Chart raw data  
 Chart values from a table

Categorical variable:  
CausesA

Summary variables:  
Counts

Pie Chart Options... Labels...  
Multiple Graphs... Data Options...  
OK

选择类别列

选择频数列

排序方式：  
默认  
随数值增加  
随数值减少

Order Slices By:

- Default
- Increasing volume
- Decreasing volume

Start angle: 90

Combine slices of 0.02 percent or less into one group

Help

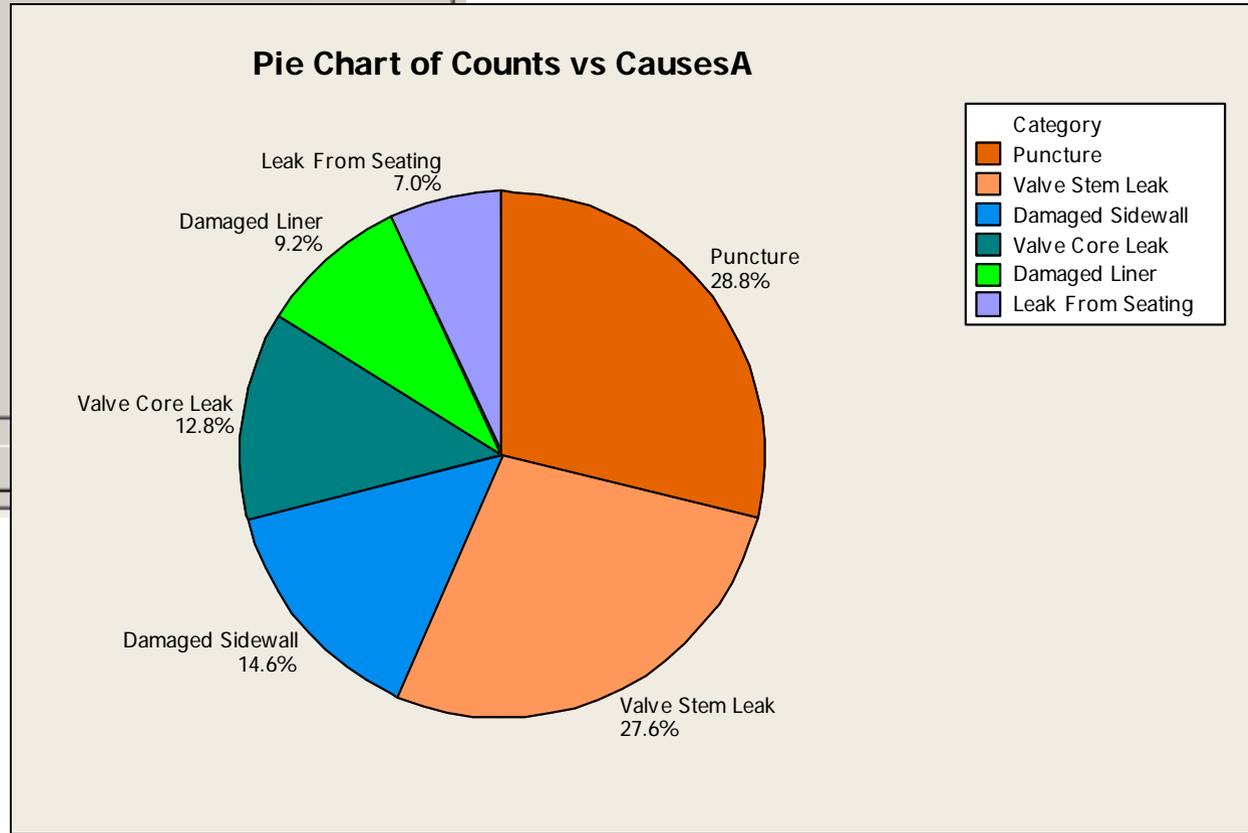
OK

Cancel

# Graph菜单介绍

## ◆ Pie Chart...

标签类型：  
类别名  
频数  
百分数

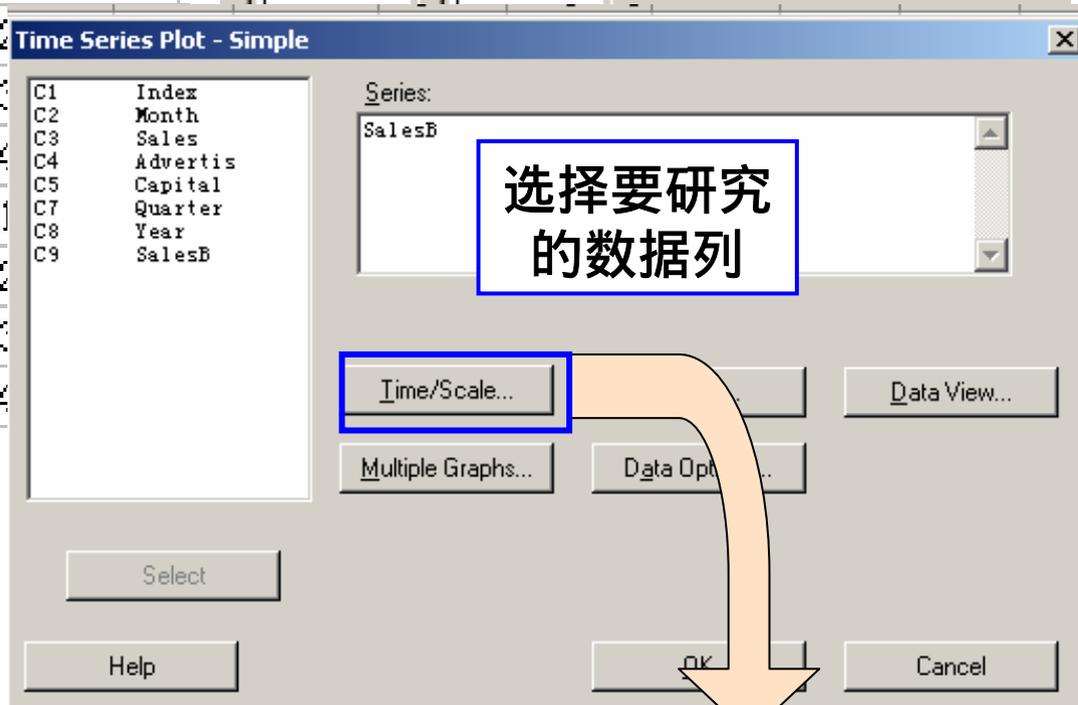
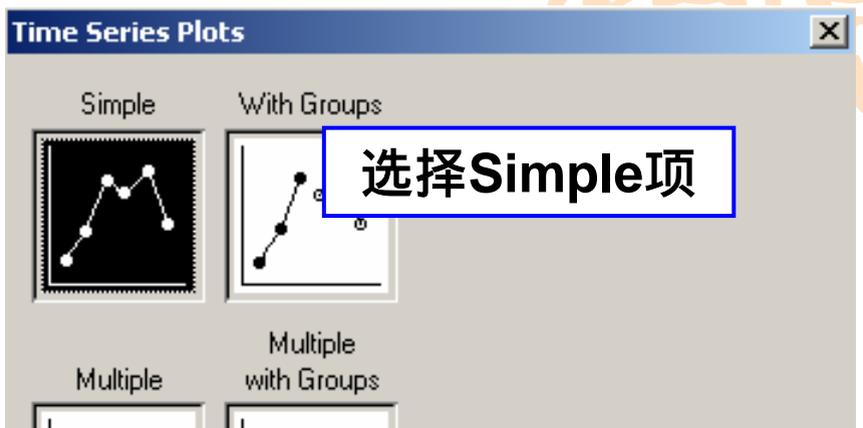


# Graph菜单介绍

## ◆ Time Series Plot...

↓	C7	C8	C9	C10-T
	Quarter	Year	SalesB	Date
1	1	2000	100	1Q00
2	2	2000	120	2Q00
3	3	2000	180	3Q00
4	4	2000	183	4Q00
5	1	2001	143	1Q01
6	2	2001	151	2Q01
7	3	2001	199	3Q01
8	4	2001	211	4Q01
9	1	2002	165	1Q02
10	2	2002	193	2Q02
11	3	2002	205	3Q02
12	4	2002	235	4Q02

Newmarket.MTW



# Graph菜单介绍

## ◆ Time Series Plot...

Time Series Plot - Time/Scale

Time | Axes and Ticks | Gridlines | Reference lines

Time Scale

Index

Calendar Quarter Year

Clock

Stamp

Start Values

One set for all variables

One set for each variable

	Quarter	Year
All	1	2000

Increment:

Help

根据时间类型  
设定开始值

一次设定所有  
变量的开始值

季度的开始  
值为1季度

Index以整数代表时间单位；  
Calendar以天、月、季、年及其组合为时间单位；  
Clock以天、时、分、秒及其组合为时间单位；  
Stamp以选定列的模式为时间单位。

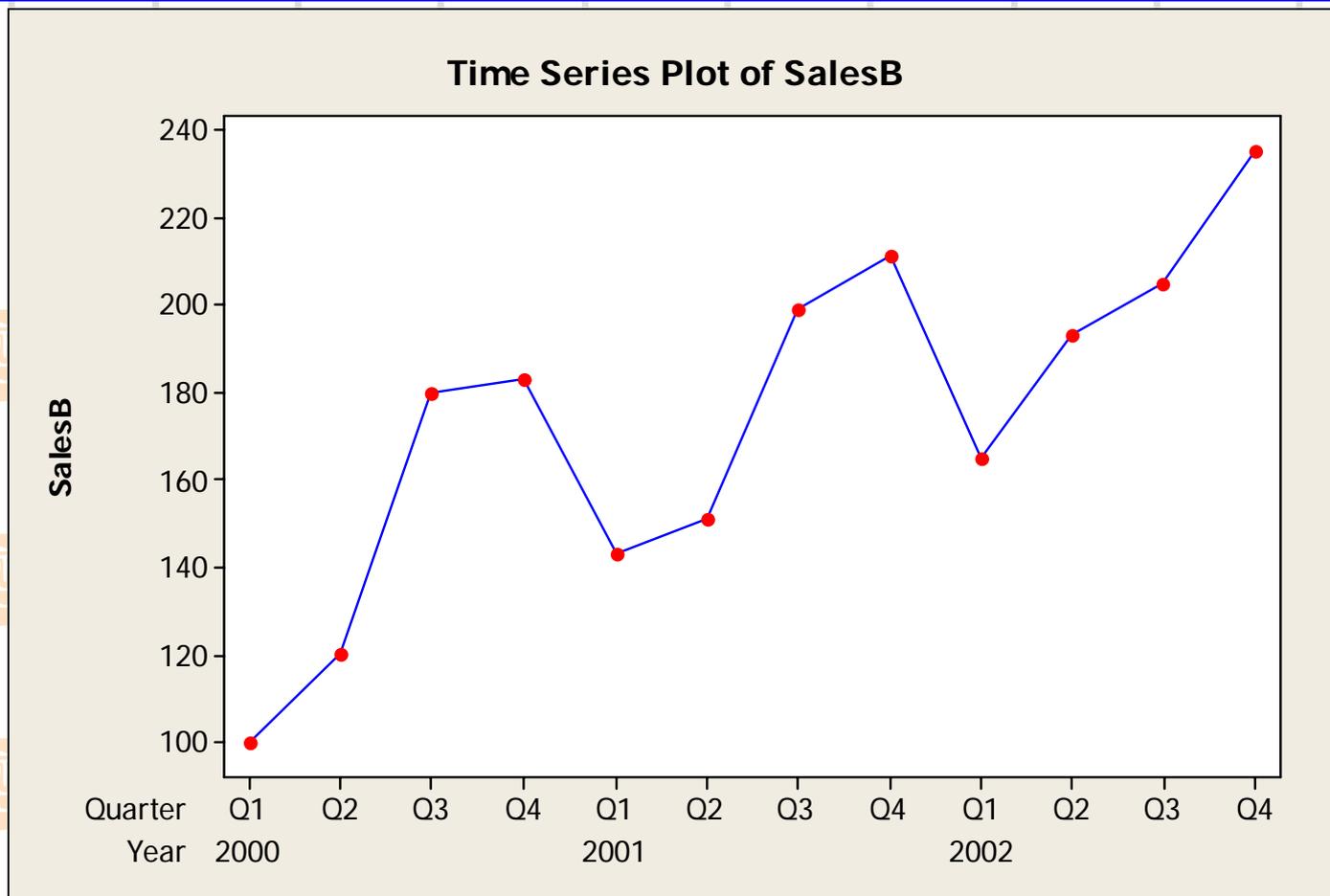
一次设定一个  
变量的开始值

年的开始值  
为2000年

# Graph菜单介绍

## ◆ Time Series Plot...

生成的图形如下，从图形可看出销量随季度的变化而变化，且每年变化的趋势相同，同时每年的总销量在增长。



# Graph菜单介绍

## ◆ Time Series Plot...

↓	C1	C2
	ABC	XYZ
1	36.25	30.00
2	37.25	31.13
3	37.75	29.63
4	38.25	29.75
5	39.88	34.25
6	40.88	32.13
7	39.13	30.88
8	40.00	39.13
9	41.50	42.38
10	38.63	35.88
11	40.13	32.00
12	41.88	46.13
13	40.50	42.88
14	42.75	47.50
15	42.88	49.25
16	42.50	46.50
17	41.13	45.25
18	43.50	54.88
19	42.88	48.88
20	43.75	56.25
21	44.88	60.13

**Time Series Plot - Multiple**

C1 ABC  
C2 XYZ

Series:  
ABC XYZ

**选择要研究的数据列**

Time/Scale... Data View...  
Multiple Graphs... Data Options...

Simple  
Multiple

Select Help

**选择Multiple项**

OK Cancel

OK Cancel

# Graph菜单介绍

## ◆ Time Series Plot...

Time Series Plot - Time/Scale

Time | Axes and Ticks | Gridlines | Reference lines

Time Scale

Index

Calendar

Clock

Stamp

Month Year

Start Values

One set for all variables

One set for each variable

	Month	Year
ABC	1	2000
XYZ	5	2000

Select

Increment: 2

Help

OK

Cancel

时间单位间的  
间隔为2

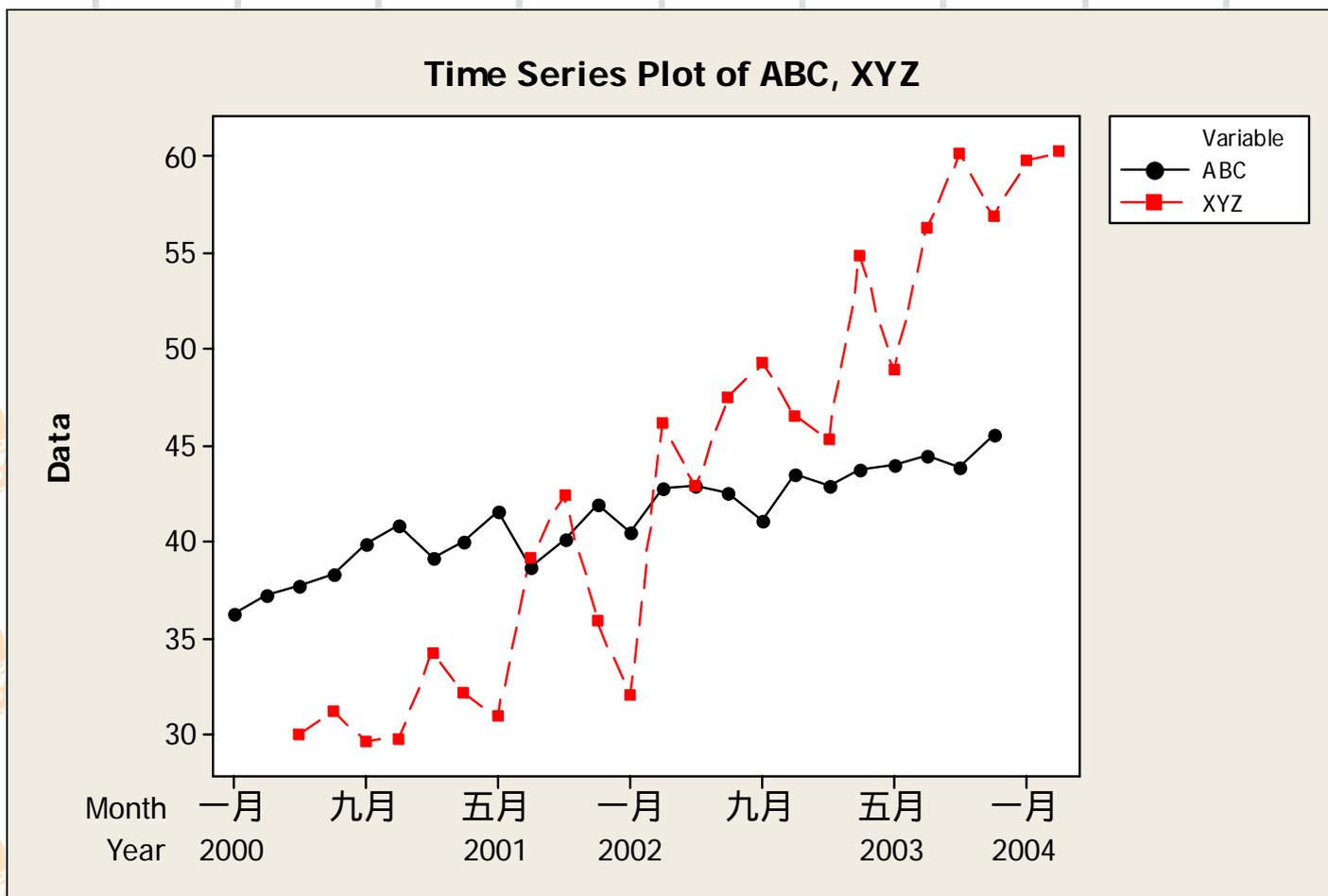
月的开始值为1月  
年的开始值为2000年

月的开始值为5月  
年的开始值为2000年

# Graph菜单介绍

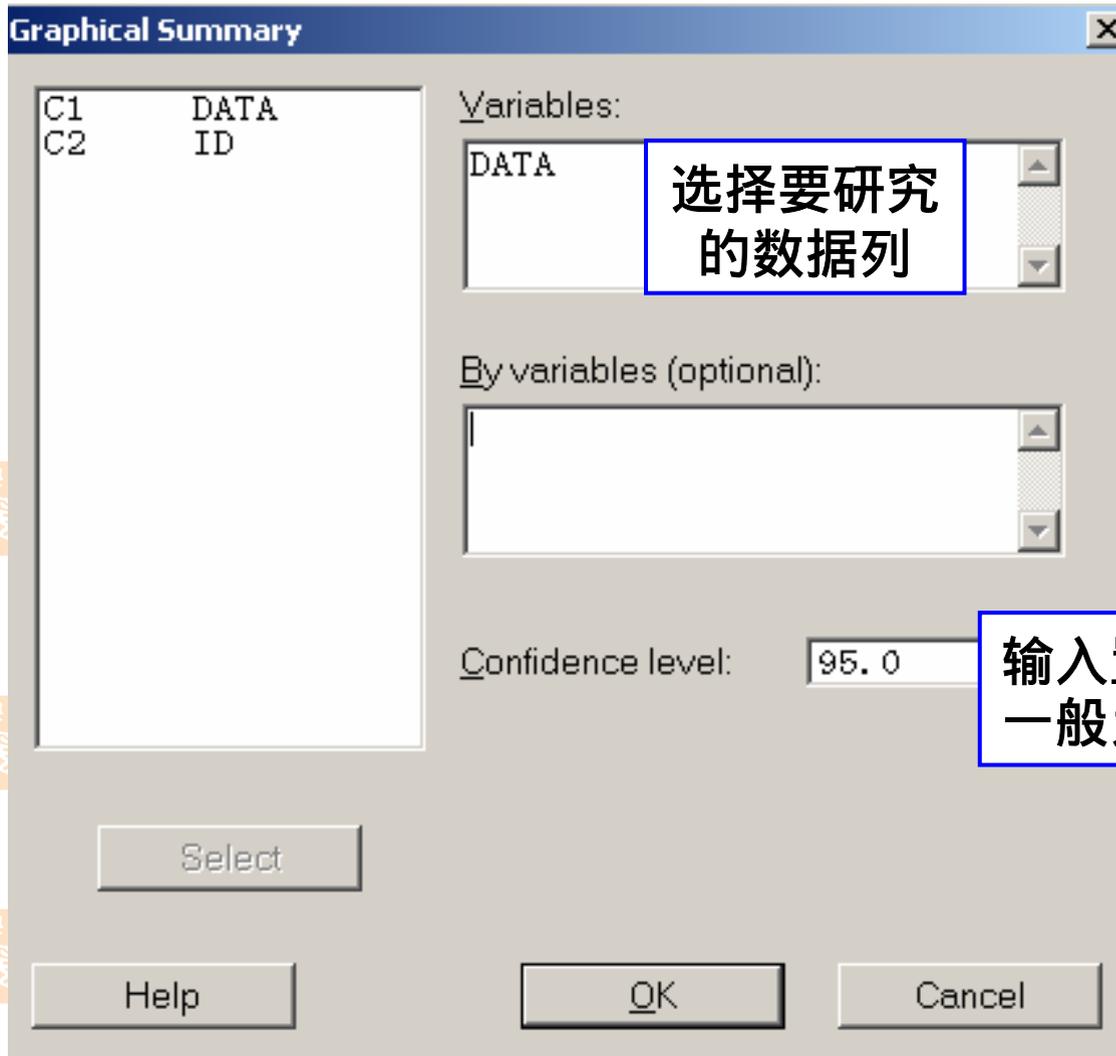
## ◆ Time Series Plot...

生成的图形如下，从图形可看出ABC和XYZ销量随的变化而变化，变化趋势及平稳性均有较大差异。



# Stat菜单介绍

## ◆ Basic Statistics > Graphical Summary



选择要研究  
的数据列

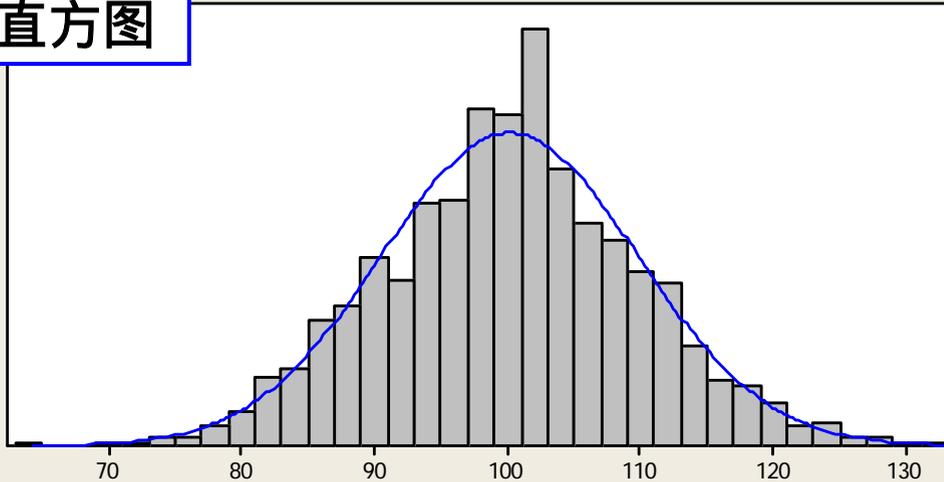
输入置信水平，  
一般为95%

# Stat菜单介绍

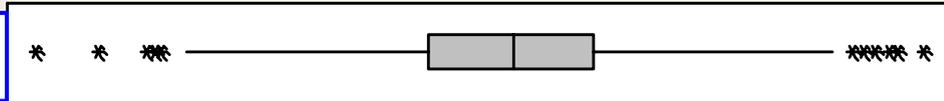
## ◆ Basic Statistics > Graphical Summary

Summary for DATA

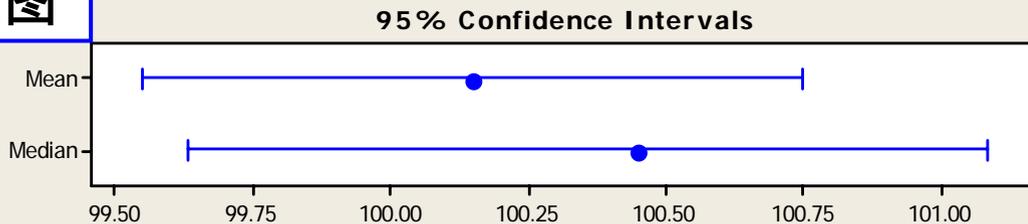
直方图



线箱图



区间图



Anderson-Darling Normality Test

A-Squared	0.58
P-Value	0.131

Mean	100.15
StDev	9.68
Variance	93.67
Skewness	0.009938
Kurtosis	0.147174
N	1000

Minimum	64.41
1st Quartile	94.02
Median	100.45
3rd Quartile	106.55
Maximum	131.32

95% Confidence Interval for Mean

99.55	100.75
-------	--------

95% Confidence Interval for Median

99.63	101.08
-------	--------

95% Confidence Interval for StDev

9.27	10.12
------	-------

该组数据的基本  
参数

# Stat菜单介绍

## ◆ Quality Tools > Pareto Chart



↓	C2-I	C3
	Defects	Counts
1	Missing Screws	274
2	Missing Clips	59
3	Defective Housi	19
4	Leaky Gasket	43
5	Scrap	4
6	Unconnected Wir	8
7	Missing Studs	6
8	Incomplete Part	10
9		

**Pareto Chart**

Chart defects data in: [ ]

BY variable in: [ ] (optional)

Default (all on one graph, same ordering of bars)

One group per graph, se

One group per graph, in

Chart defects table

Labels in: Defects

Frequencies in: Counts

Combine defects after the first 95 % into one

Select

Help

Options...

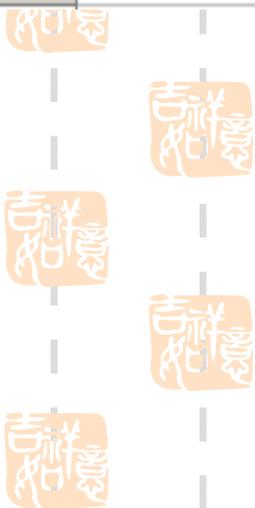
OK

Cancel

**选择名称列**

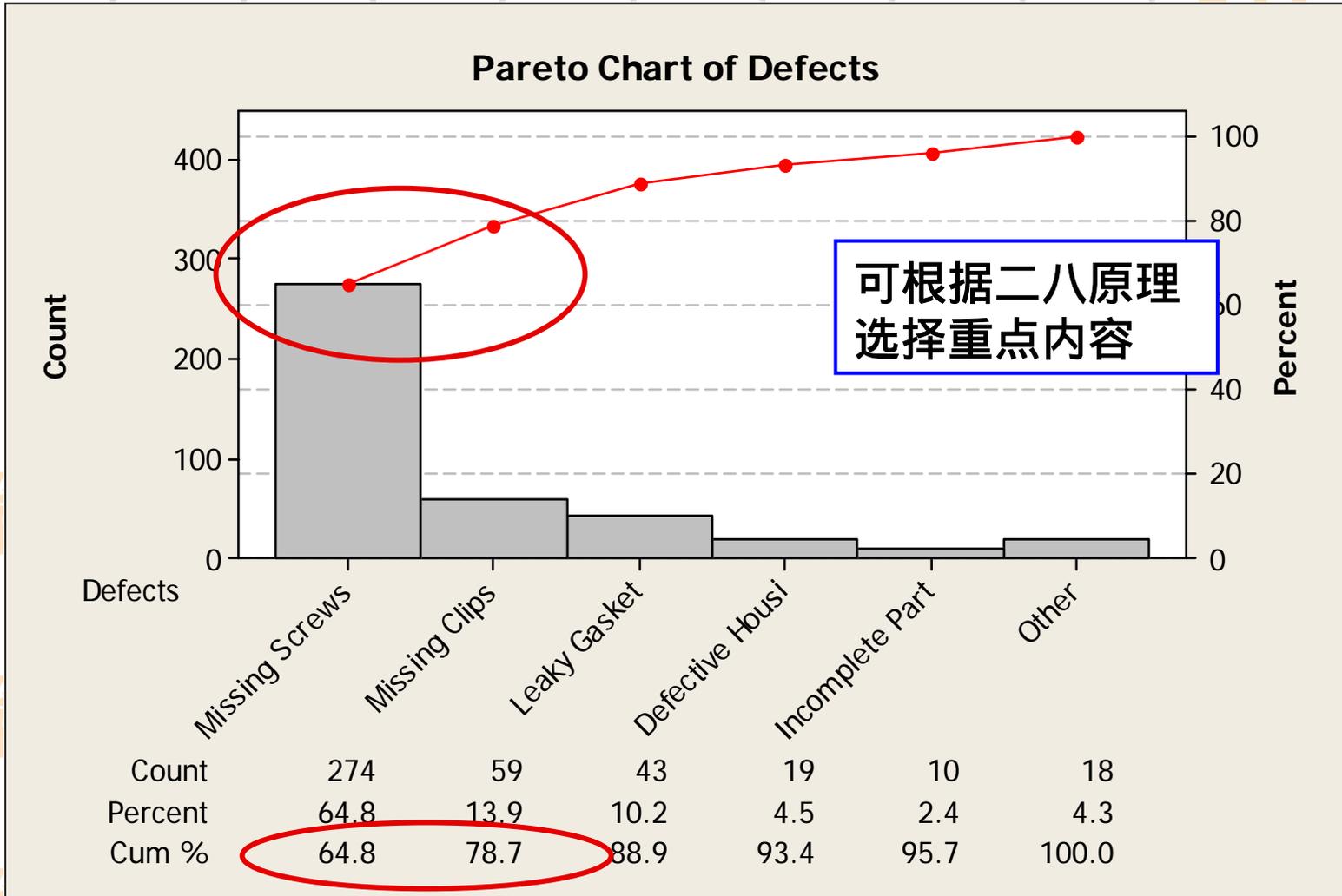
**选择频数列**

**超过95%以上的数据合并为一列**



# Stat菜单介绍

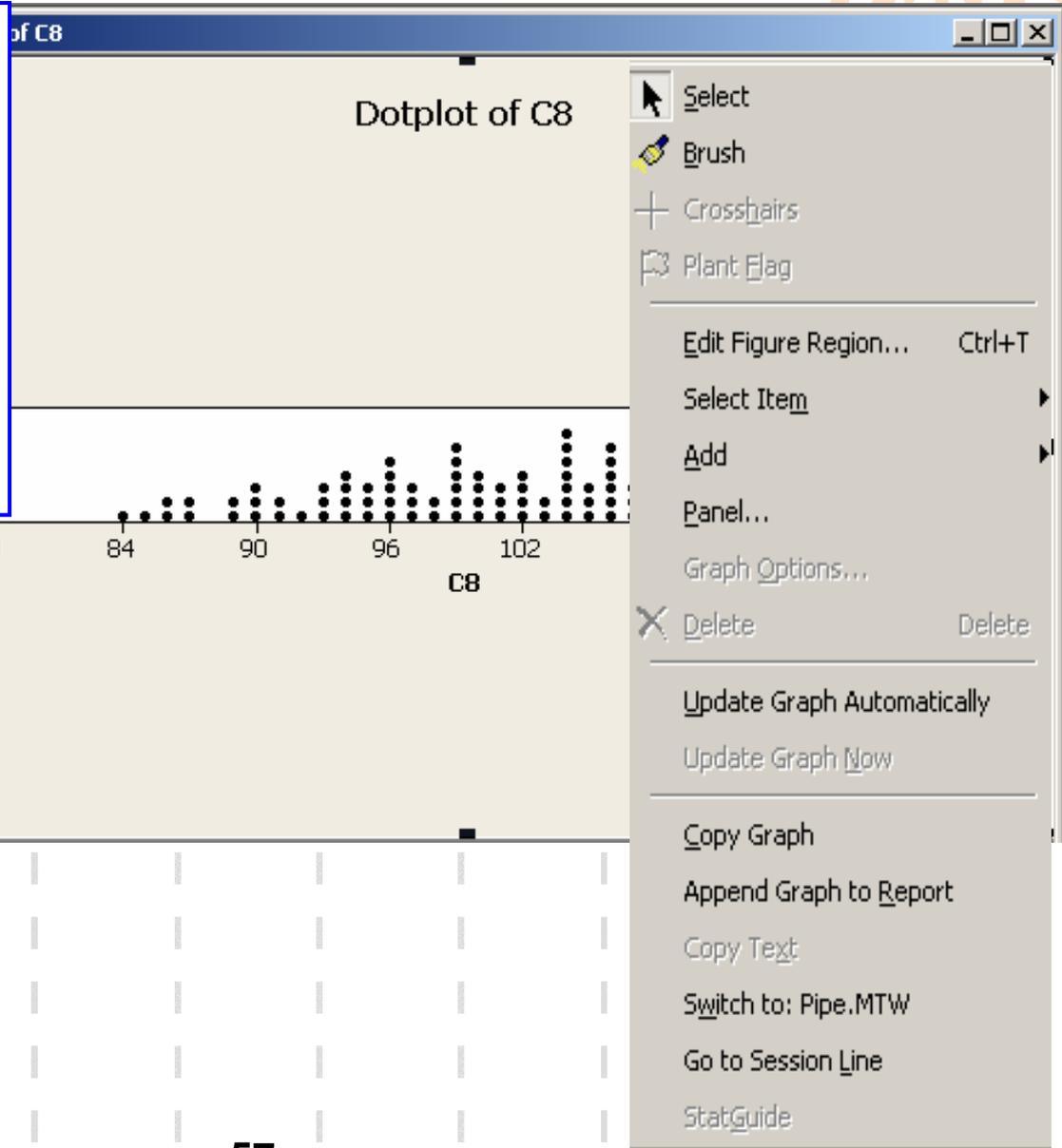
## ◆ Basic Statistics > Graphical Summary



# 图形编辑功能

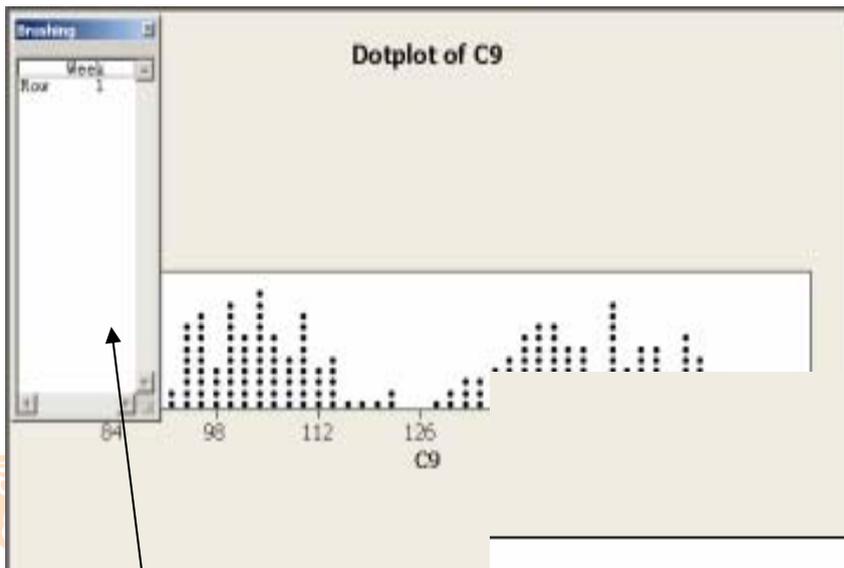
选择一个图后点击右键都会弹出一个快捷菜单，该菜单会显示一些适合该图形的命令，可对图中的标题、刻度、图形格式等所有的属性进行编辑，所有的命令在主菜单Editor中也可以找到。

现举Brush为例来说明，Brush的功能是选择数据并对选择的数据进行标识。



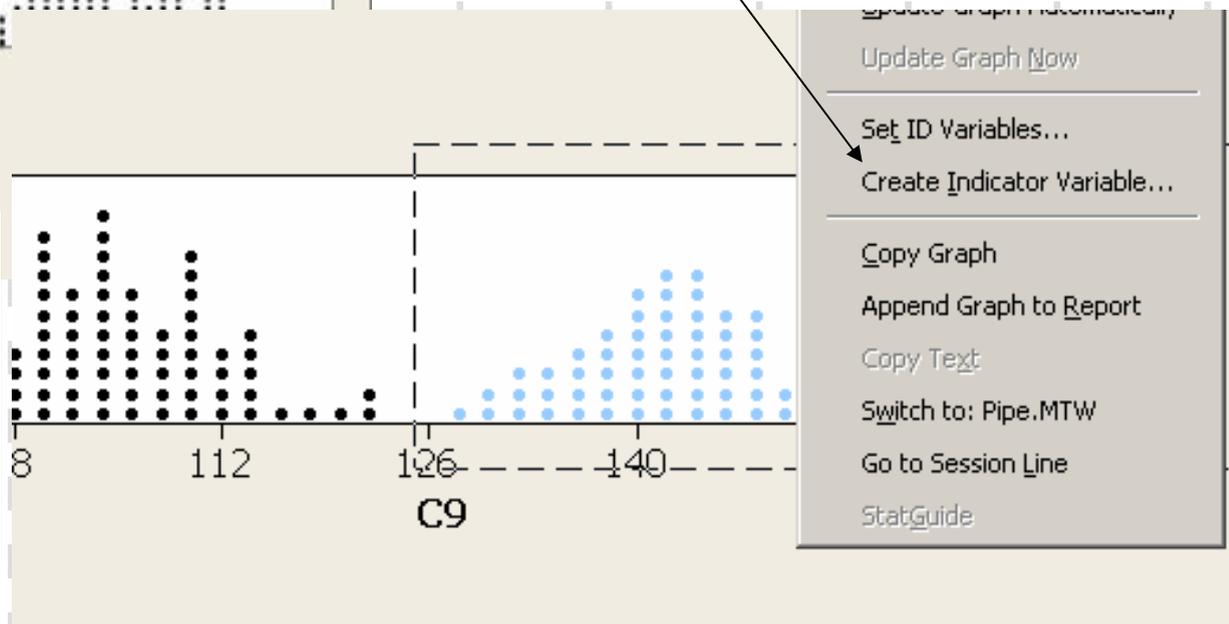
# 图形编辑功能

通过Brush功能，选择数据并对数据进行标识，然后用Unstack Columns命令对数据进行分解。



用鼠标选择数据点，在选中的点上点右键，弹出一快捷菜单，选择Create Indicator Variable命令。

在图形上点击右键后在快捷菜单中选择Brush功能，在图形的右上角出现一数据选择框，。



# 图形编辑功能

## Create Indicator Variable

Worksheet: Pipe.MTW

Column: C10

输入标识存入列

Code brushed points as zero

Update now

Update now and whenever the brushed set changes

Help

OK

Cancel

从生成的数据中可看出未被选中的数据被标识为0，被选中的数据被标识为1，且在相应的行表号前加黑点标识。

	C9	C10
95	110.859	0
96	90.026	0
97	91.277	0
98	101.379	0
99	103.209	0
100	110.362	0
◆101	144.550	1
◆102	149.372	1
◆103	162.538	1
◆104	132.578	1
◆105	140.823	1
◆106	133.923	1
◆107	149.517	1
◆108	153.113	1
◆109	158.394	1
◆110	137.351	1
◆111	147.613	1
◆112	152.325	1

# 图形编辑功能

将被标识的数据进行分解

	C9	C10	C11	C12
			C9_0	C9_1
1	99.083	0	99.083	144.550
2	95.627	0	95.627	149.372
		0	100.054	162.538
		0	104.594	132.578
		0	109.219	140.823
		0	104.247	133.923
		0	106.123	149.517
		0	108.295	153.113
		0	114.435	158.394
		0	90.449	137.351
		0	112.075	147.613
		0	101.605	152.325
		0	121.689	156.481
		0	100.266	142.644
		0	96.113	144.932
		0	95.174	141.923
		0	101.314	151.092
		0	111.459	142.567
		0	94.372	148.024
20	93.112			
21	113.147			
22	104.779	0	104.779	129.071
23	104.199	0	104.199	161.812
24	100.908	0	100.908	157.228

Unstack Columns

C1 Week 1  
C2 Week 2  
C3 Week 3  
C4 Machine  
C5 Operator  
C7  
C8  
C9  
C10

Unstack the data in: C9

Using subscripts in: C10

Include missing as a subscript value

Store unstacked data:

In new worksheet

Name: (Optional)

After last column in use

Name the columns containing the unstacked data

Select

Help

OK

Cancel

选择要分解的数据列

选择标识列

被分解的数据

吉祥

谢谢！

吉祥

吉祥

吉祥

吉祥

吉祥

吉祥