Multiple Diamond Plot

statgraphics 18®
centurion

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Summary 1
Sample Data 2
Data Input 3
Analysis Summary 5
Diamond Plot 6

Summary

The **Diamond Plot** procedure creates a plot for two or more samples showing the sample observations together with confidence intervals for their respective population means.

Sample StatFolio: *diamond plot.sgp*

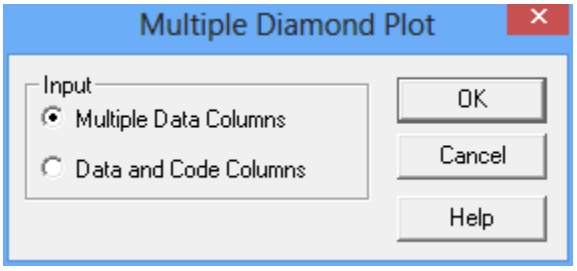
Sample Data

The file *93cars.sgd* contains information on 26 variables for *n* = 93 makes and models of automobiles, taken from Lock (1993). The table below shows a partial list of 5 columns from that file:

Make	*Model*	*Type*	*MPG City*	*MPG Highway*
Acura	Integra	Small	25	31
Acura	Legend	Midsize	18	25
Audi	90	Compact	20	26
Audi	100	Midsize	19	26
BMW	535i	Midsize	22	30
Buick	Century	Midsize	22	31
Buick	LeSabre	Large	19	28
Buick	Roadmaster	Large	16	25
Buick	Riviera	Midsize	19	27
Cadillac	DeVille	Large	16	25
Cadillac	Seville	Small	25	25
Chevrolet	Cavalier	Midsize	18	36

Data Input

When the *Multiple Diamond Plot* procedure is selected from the main menu, the first dialog box displayed asks you to specify the format in which the data have been entered:

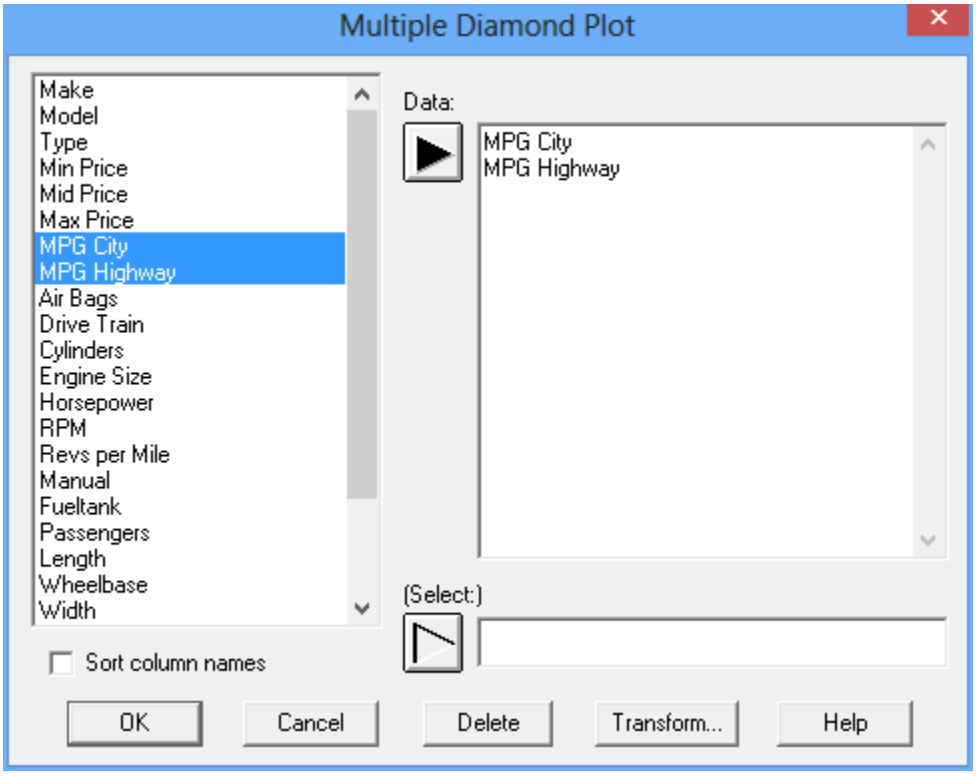


- **Multiple Data Columns**: indicates that each sample has been placed into a separate column.

- **Data and Code Columns**: indicates that all observations have been placed into a single column, with a second column indicating which sample each observation belongs to.

Multiple Data Columns

If the data have been placed in separate columns for each sample, the column names must be entered on the second dialog box:

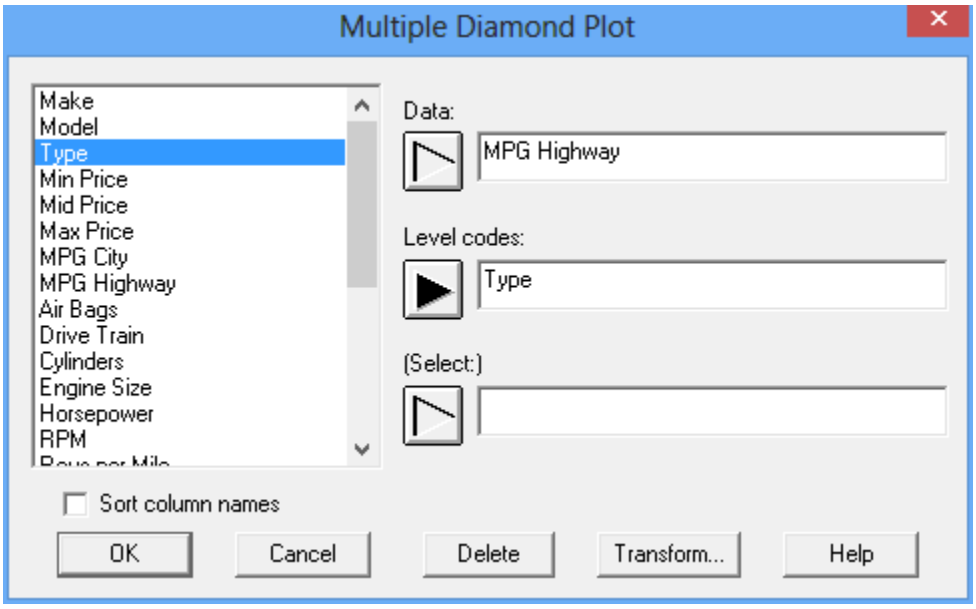


- **Data:** two or more numeric columns containing the observations, one column for each sample.

- **Select:** subset selection.

Data and Code Columns

If the data from all samples have been placed into a single column, then enter the name of that column and the column containing the group identifiers:



- **Data:** numeric column containing the observations from all samples.

- **Level codes:** numeric or non-numeric column containing an identifier for the sample corresponding to each data value.

- **Select:** subset selection.

Analysis Summary

The Analysis Summary displays selected sample statistics.

Multiple Diamond Plot
Analysis Summary

	Compact	Large	Midsize	Small	Sporty	Van
Count	16	11	22	21	14	9
Average	29.875	26.7273	26.7273	35.4762	28.7857	21.8889
Standard deviation	2.94109	1.27208	2.51058	5.60909	3.64119	1.45297
Minimum	26.0	25.0	22.0	29.0	24.0	20.0
Maximum	36.0	28.0	31.0	50.0	36.0	24.0
Lower 95% confidence limit for mean	28.3078	25.8727	25.6141	32.923	26.6834	20.772
Upper 95% confidence limit for mean	31.4422	27.5819	27.8404	38.0294	30.8881	23.0057

The output includes:

- **Count** - the sample size *n*, the number of non-missing entries in the column.

- **Average** or arithmetic **mean** (measure of central tendency) - the center of mass of the data, given by:

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} \tag{1}$$

- **Standard deviation** (measure of dispersion) - the square root of the sample variance:

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}} \tag{2}$$

- **Minimum** - the smallest data value.

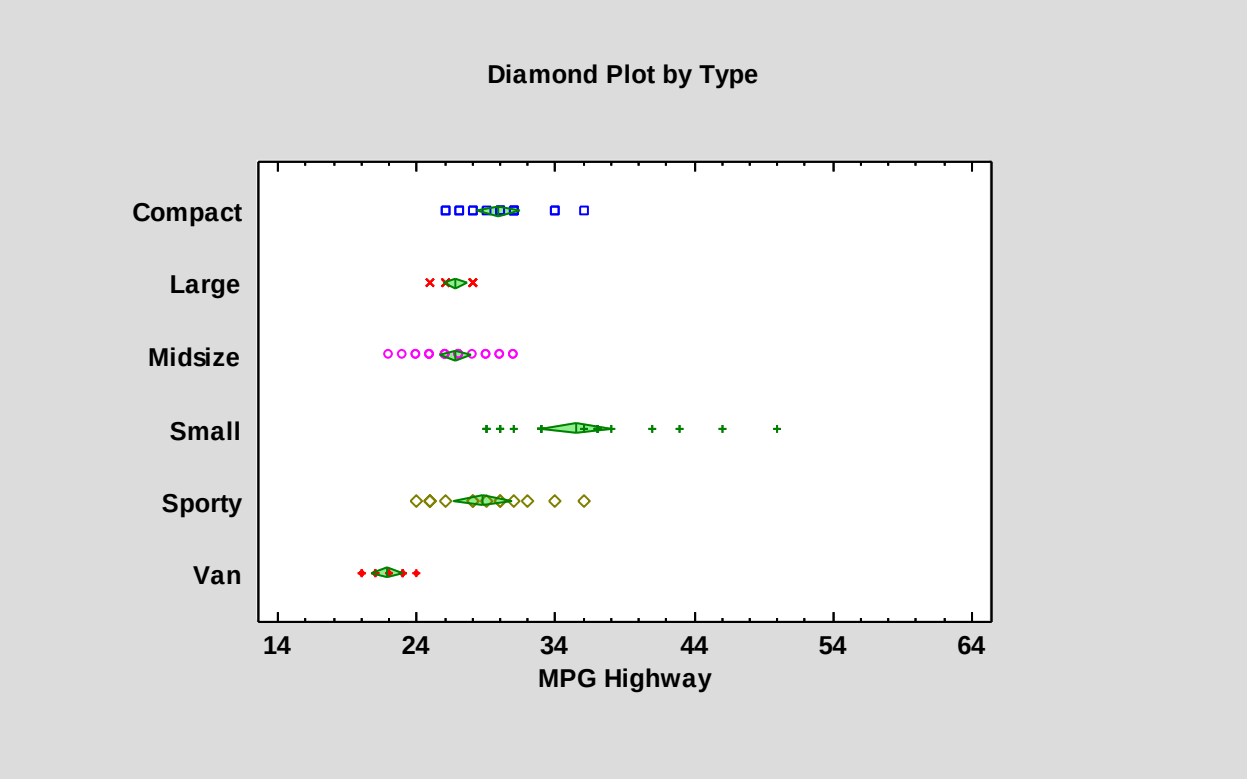
- **Maximum** - the largest data value.

- **Confidence limits for the** mean (based on Student's t distribution with *n*-1 degrees of freedom)**:**

$$\bar{x} \pm t_{\alpha/2,n-1} \frac{s}{\sqrt{n}} \tag{3}$$

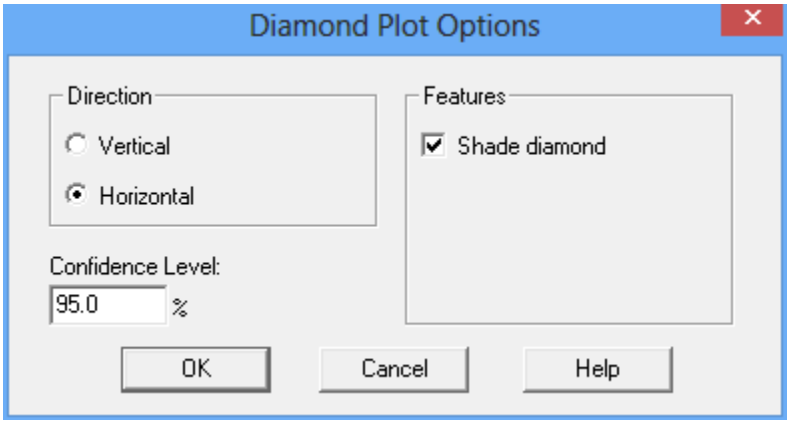
Diamond Plot

This pane displays the diamond plot:



Each of the observations is plotted using point symbols. Each diamond extends from the lower confidence limit to the upper confidence limit using its sample statistics.

Pane Options



- **Direction**: the orientation of the plot.
- **Confidence level**: the confidence level used to determine the size of the diamond.

- **Shade diamond**: if selected, the interior of the diamond will be shaded.