

DEX ... YOUDEN PLOT

PURPOSE

Generates a dex Youden plot for a given statistic.

DESCRIPTION

A dex Youden plot is a graphical method for representing a design of experiment problem. The first variable is a response variable while the remaining variables (must be at least one) represent levels of factors. For the Youden plot, all factors must have exactly 2 levels. The Youden plot computes the given statistic for each level of each factor. The plot then consists of:

Vertical axis = value of the computed statistic for the lower level in the factor;
Horizontal axis = value of the computed statistic for the higher level in the factor.

This plot graphically shows if the value of the computed statistic is dependent on the level of the factor and additionally if it is dependent on the factor.

SYNTAX 1

DEX <stat> YOUDEN PLOT <y> <x1> ... <xn> <SUBSET/EXCEPT/FOR qualification>

where <y> is the response variable;

<x1> ... <xn> are a sequence of variables representing factors in a designed experiment;

<stat> is one of the following statistics:

MEAN (or AVERAGE), MIDMEAN, MEDIAN, TRIMMED MEAN, WINDSORIZED MEAN,
SUM, PRODUCT, SIZE (or NUMBER or COUNT), MINIMUM, MAXIMUM,
STANDARD DEVIATION (or SD), VARIANCE,
STANDARD DEVIATION OF MEAN (or SDM), VARIANCE OF MEAN (or VM),
RELATIVE STANDARD DEVIATION (or RELSD),
RELATIVE VARIANCE (or RELV or COEFFICIENT OF VARIATION),
RANGE, MIDRANGE, LOWER HINGE, UPPER HINGE, LOWER QUARTILE, UPPER QUARTILE,
<FIRST/SECOND/THIRD/FOURTH/FIFTH/SIXTH/SEVENTH/EIGHTH/NINTH> DECILE (or 1DEC, 2DEC,
3DEC, 4DEC, 5DEC, 6DEC, 7DEC, 8DEC, 9DEC),
SKEWNESS, KURTOSIS, PROPORTION,
AUTOCORRELATION, AUTOCOVARANCE,
SINE FREQUENCY, SINE AMPLITUDE,
CP, CPK, EXPECTED LOSS, PERCENT DEFECTIVE,
SINE FREQUENCY, SINE AMPLITUDE,
TAGUCHI SN, TAGUCHI SN+, TAGUCHI SN-, TAGUCHI SN00;

and where the <SUBSET/EXCEPT/FOR qualification> is optional.

This syntax is used for statistics that only require a single variable to compute.

SYNTAX 2

DEX <stat> YOUDEN PLOT <y> <x> <x1> ... <xn> <SUBSET/EXCEPT/FOR qualification>

where <y> is the response variable;

<x> is a second variable used in calculating the statistic (e.g., a linear fit is computed between <y1> and <x>);

<x1> ... <xn> are a sequence of variables representing factors in a designed experiment;

<stat> is one of the following statistics:

LINEAR INTERCEPT, LINEAR SLOPE, LINEAR RESSD, LINEAR CORRELATION,

and where the <SUBSET/EXCEPT/FOR qualification> is optional.

This syntax is used for statistics that require two variables to compute.

EXAMPLES

DEX MEAN YOUDEN PLOT Y X1 X2
DEX SD YOUDEN PLOT Y X1 X2 X3
DEX RANGE YOUDEN PLOT Y X1 X2 X3 X4
DEX RANGE YOUDEN PLOT Y X1 TO X4

NOTE

This plot is normally done for a location parameter (typically the mean or median) or a spread parameter (typically the standard deviation or range). The other statistics are less often used.

NOTE 1

The TO syntax is allowed for the list of factor variables (see the EXAMPLES above).

NOTE 2

The following program example shows how to put the factor labels on the X axis.

NOTE 3

The CHARACTER, BAR, SPIKE, and LINE settings can be used to control the appearance of the plot. The first trace is typically drawn with a blank line and some type of character set (the choice of character is a matter of user preference). The second trace draws a diagonal line on the plot. This is typically drawn with a blank character and a solid line (some analysts may prefer a dashed or dotted line). In any event, the user must explicitly set character and line settings (they default to all lines solid and all characters blank).

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

LINES	=	Sets the type for plot lines.
CHARACTER	=	Sets the type for plot characters
PLOT	=	Generates a data or function plot.
DEX SCATTER PLOT	=	Generates a dex scatter plot.
DEX SIGN PLOT	=	Generates a dex sign plot.
DEX ... PLOT	=	Generates a dex plot for a statistic.
DEX ... PARETO PLOT	=	Generates a Pareto dex plot for a statistic.
DEX ... EFFECTS PLOT	=	Generates a dex effects plot for a statistic.
DEX ... PARETO EFFECTS PLOT	=	Generates a Pareto effects dex plot for a statistic.
DEX ... ABSOLUTE EFFECTS PLOT	=	Generates an absolute effects dex plot for a statistic.
DEX ... PARE ABSO EFFECTS PLOT	=	Generates a Pareto absolute effects dex plot for a statistic.
DEX WIDTH	=	Specifies the width of levels in a dex plot.

REFERENCE

"Statistics for Experimenters," Box, Hunter, and Hunter, Wiley and Sons, 1978.

APPLICATIONS

Design of Experiments

IMPLEMENTATION DATE

89/12

PROGRAM

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SKIP 25
READ BOXCHEM.DAT Y X1 X2 X3 X4
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CHARACTERS 1 2 3 4
LINE BLANK BLANK BLANK BLANK DOTTED
X1LABEL HIGH LEVEL
Y1LABEL LOW LEVEL
.
MULTIPLY 2 2
MULTIPLY CORNER COORDINATES 0 0 100 100
TITLE MEAN
YTIC OFFSET 5 0
DEX MEAN YOUDEN PLOT Y X1 TO X4
TITLE MEDIAN
YTIC OFFSET 5 0
DEX MEDIAN YOUDEN PLOT Y X1 TO X4
TITLE STANDARD DEVIATION
YTIC OFFSET 0 0
DEX SD YOUDEN PLOT Y X1 TO X4
TITLE RANGE
YTIC OFFSET 0 5
DEX RANGE YOUDEN PLOT Y X1 TO X4
END OF MULTIPLY
    
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