

DEX SIGN PLOT

PURPOSE

Generates a dex sign plot.

DESCRIPTION

A dex sign 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. Qualitative levels are coded as indices (e.g., 1 for process A, 2 for process B). A separate subplot is drawn for each factor with the subplot for factor k plotted horizontally at x=k. Then within each subplot, the plot consists of:

- Vertical axis = value of the response variable with each level within a factor plotted as a separate trace.
- Horizontal axis = factor id (i.e., factor 1 at x=1, factor 2 at x=2, etc.).

This plot graphically shows the following:

1. How the response variable varies with the level of the factor;
2. How the response variable varies between factors.

The most common use of this plot is when all factor variables have exactly two levels. The lower level is plotted with a minus sign and the upper level is plotted with a plus sign (this is where the term DEX SIGN PLOT comes from).

SYNTAX

```
DEX SIGN 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;
 and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

```
DEX SIGN PLOT Y X1 X2
DEX SIGN PLOT Y X1 X2 X3
DEX SIGN PLOT Y X1 X2 X3 X4
DEX SIGN PLOT Y X1 TO X4
```

NOTE 1

This command is similar to the DEX SCATTER PLOT command. There are two distinctions. First, the levels of the factor variables are plotted with different traces. This allows the levels to be clearly identified. Second, the levels of a factor are plotted at the same horizontal axis value.

NOTE 2

The CHARACTER and LINE settings can be used to control the appearance of the plot. If NLEVELS is the maximum number of levels in a factor, then the first NLEVELS traces are typically drawn with a blank line and with a unique character identifier. Typically, if there are exactly 2 levels for each factor, the characters are set to a minus and plus sign respectively. If there are more than 2 levels, using 1, 2, 3, etc. works well. The NLEVELS+1 trace draws a horizontal line at the overall mean. 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).

NOTE 3

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

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

LINES	=	Sets the type for plot lines.
CHARACTER	=	Sets the type for plot characters
DEX SCATTER PLOT	=	Generates a dex scatter plot.
DEX ... PLOT	=	Generates a dex plot for a statistic.

DEX ... PARETO PLOT = Generates a Pareto dex plot for a statistic.
 DEX ... YOUDEN PLOT = Generates a Youden 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.

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
CHARACTERS - + BLANK; LINE BLANK BLANK SOLID
YLIMITS 50 90
YILABEL PERCENT CONVERSION
YTIC OFFSET 5 5
XLIMITS 1 4
XTIC OFFSET 0.5 0.5
XILABEL FACTORS
MAJOR XTIC MARK NUMBER 4
MINOR XTIC MARK NUMBER 0
XTIC MARK LABEL FORMAT ALPHA
XTIC MARK LABEL CONTENT CATALYST TEMPERATURE PRESSURE CONCENTRATION
DEX SIGN PLOT Y X1 TO X4
  
```

