CPK PLOT

PURPOSE

Generates a subsample C_{pk} versus subsample index plot.

DESCRIPTION

The subsample C_{pk} index is the C_{pk} index of the data in the subsample. The Cpk plot is used to answer the question: "Does the subsample C_{pk} index change over different subsamples?" The plot consists of:

    Vertical   axis   =   subsample Cpk index;
    Horizontal axis   =   subsample index.

In addition, a horizontal line is drawn representing the full sample C_{pk} value. As usual, the appearance of the 2 traces is controlled by the first 2 settings of the LINES, CHARACTERS, SPIKES, BARS, and similar attributes.

The C_{pk} statistic is used as an alternative to the C_P statistic when the specification limits are not symmetric about the mean.

SYNTAX

CPK PLOT <y> <x>   <SUBSET/EXCEPT/FOR qualification>
where <y> is the response (= dependent) variable;
     <x> is the subsample identifier variable (this variable appears on the horizontal axis);
and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

CPK PLOT Y X
CPK PLOT Y X1 SUBSET X1 > 3

NOTE 1

The process capability index measure the performance (i.e., the capability) of an industrial process and is defined as follows:

    CPK = (MINIMUM(USL - M),(M - LSL))/(3S)

where M is the sample mean, S is the sample standard deviation and where USL and LSL are user specified upper and lower specification limits. The specification limits define the range within which a product is considered acceptable (values outside this range indicate that a product is defective). Values less than 1 indicate that there are still some defectives.

NOTE 2

Recall that Chebychev's thereom states that at least 75% of the variables data must fall within plus or minus 2 standard deviations of the mean and that at least 88% must fall within plus or minus 3 standard deviations. This is for any distribution. For a normal distribution, these numbers are 95.4% and 99.7% respectively.

NOTE 3

The upper and lower specification limits must be specified by the user as follows:

    LET LSL = <value>
    LET USL = <value>

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

CHARACTERS =	=	Sets the type for plot characters.
LINES =	=	Sets the type for plot lines.
CAPABILITY ANALYSIS	=	Performs a capability analysis.
CPK	=	Computes the C_{pk} statistic,
CP PLOT =	=	Generates a C_p plot.
EXPECTED LOSS PLOT =	=	Generates an expected loss plot.
PERCENT DEFECTIVE PLOT =	=	Generates a percent defective plot.
BOX PLOT =	=	Generates a box plot.

| XBAR CHART = | = | Generates an xbar control chart. |
| PLOT = | = | Generates a data or function plot. |

APPLICATIONS
>   Quality Control

IMPLEMENTATION DATE
>   93/10

PROGRAM
>   SKIP 25
>   READ GEAR.DAT DIAMETER BATCH
>   TITLE CASE ASIS
>   LABEL CASE ASIS
>   TITLE Gear Diameter Analysis
>   Y1LABEL CPK
>   X1LABEL Batch
>   LEGEND 1 Process Capability
>   LEGEND 2 CPK Plot
>   XTIC OFFSET 0.5 0.5
>   CHARACTER X BLANK
>   LINE BLANK SOLID
>   LET LSL = 0.98
>   LET USL = 1.02
>   .
>   CPK PLOT Diameter Batch