HFNCDF

PURPOSE

Compute the standard half-normal cumulative distribution function.

DESCRIPTION

The standard half-normal probability density function is:

$$f(x) = \frac{2e^{\frac{-x^2}{2}}}{\sqrt{2\pi}} \qquad \text{for } x \geq 0 \qquad \textbf{(EQ 8-233)}$$

The standard half-normal cumulative distribution function is:

$$F(x) = 2\Phi(x) - 1 \qquad \text{for } x \geq 0 \qquad \textbf{(EQ 8-234)}$$

where Φ is the standard normal cumulative distribution function. The half-normal distribution is the distribution of the variable X=ABS(Z) where Z is a normally distributed variable.

SYNTAX

LET <y2> = HFNCDF(<y1>) <SUBSET/EXCEPT/FOR qualification>
where <y1> is a non-negative variable, a number, or a parameter;
<y2> is a variable or a parameter (depending on what <y1> is) where the computed half-normal cdf value is stored;
and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

LET A = HFNCDF(3)
LET Y = HFNCDF(X1)

NOTE

The general half-normal cumulative distribution function is:

$$f(x) = \frac{2e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2}}{\sigma\sqrt{2\pi}} \qquad \text{for } x \geq \mu \qquad \textbf{(EQ 8-235)}$$

where μ is a location parameter and σ is a scale parameter. See topic (3) under the General considerations section at the beginning of this chapter for a discussion of generating cdf values for the general form of the distribution.

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

HFNPDF	=	Compute the half-normal probability density function.
HFNPPF	=	Compute the half-normal percent point function.
NORCDF	=	Compute the normal cumulative distribution function.
NORPDF	=	Compute the normal probability density function.
NORPPF	=	Compute the normal percent point function.
LGNCDF	=	Compute the lognormal cumulative distribution function.
LGNPDF	=	Compute the lognormal probability density function.
LGNPPF	=	Compute the lognormal percent point function.

REFERENCE

"Use of Half-Normal Plots in Interpreting Factorial Two-Level Experiments," Daniel, Technometrics, 1, 1959 (pp. 311-341).

"Continuous Univariate Distributions - 1," Johnson and Kotz, Houghton Mifflin, 1970 (chapter 13).

APPLICATIONS

Data Analysis

IMPLEMENTATION DATE

94/4

PROGRAM

```
YLIMITS 0 1
MAJOR YTIC NUMBER 6
MINOR YTIC NUMBER 1
YTIC DECIMAL 1
XLIMITS 0 3
XTIC OFFSET 0.2 0.6
TITLE AUTOMATIC
X1LABEL X
Y1LABEL PROBABILITY
PLOT HFNCDF(X) FOR X = 0 0.01 3.5
```