

EXPSF**PURPOSE**

Compute the standard form of the exponential sparsity function.

DESCRIPTION

The standard form of the exponential probability density function is:

$$f(x) = e^{-x} \quad \text{for } x \geq 0 \quad \text{(EQ 8-203)}$$

The standard form of the exponential sparsity function is:

$$\text{sf}(p) = \frac{1}{1-p} \quad \text{(EQ 8-204)}$$

The input value is a real number between 0 and 1.

SYNTAX

LET <y2> = EXPSF(<y1>) <SUBSET/EXCEPT/FOR qualification>

where <y1> is a variable, a number, or a parameter in the range 0 to 1;

<y2> is a variable or a parameter (depending on what <y1> is) where the computed exponential sf value is stored; and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

LET A = EXPSF(0.9)

LET Y = EXPSF(X1)

NOTE

The general form of the exponential probability density function is:

$$f(x) = \left(\frac{1}{\beta}\right)e^{-\left(\frac{x-\mu}{\beta}\right)} \quad \text{for } x \geq \mu \quad \text{(EQ 8-205)}$$

The parameter μ is a location parameter and the parameter β is a scale parameter. The general form of the exponential sparsity function is:

$$\text{sf}(p) = \frac{\beta}{1-p} \quad \text{(EQ 8-206)}$$

See topic (3) under the General considerations section at the beginning of this chapter for a discussion of generating sparsity function values for the general form of the distribution.

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

| | | |
|--------|---|--|
| EXPCDF | = | Compute the exponential cumulative distribution function. |
| EXPPDF | = | Compute the exponential probability density function. |
| EXPPPF | = | Compute the exponential percent point function. |
| DEXCDF | = | Compute the double exponential cumulative distribution function. |
| DEXPDF | = | Compute the double exponential probability density function. |
| DEXPPF | = | Compute the double exponential percent point function. |
| WEICDF | = | Compute the Weibull cumulative distribution function. |
| WEIPDF | = | Compute the Weibull probability density function. |
| WEIPPF | = | Compute the Weibull percent point function. |
| EVICDF | = | Compute the extreme value type I cumulative distribution function. |

EV1PDF = Compute the extreme value type I probability density function.
EV1PPF = Compute the extreme value type I percent point function.

REFERENCE

“Continuous Univariate Distributions - 1,” Johnson and Kotz, Houghton Mifflin, 1970 (chapter 18).

“Handbook of Mathematical Functions, Applied Mathematics Series, Vol. 55,” Abramowitz and Stegun, National Bureau of Standards, 1964 (page 930).

“Statistical Distributions,” 2nd. Edition, Evans, Hastings, and Peacock, John Wiley and Sons (chapter 13).

APPLICATIONS

Reliability Analysis

IMPLEMENTATION DATE

94/4

PROGRAM

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XLIMITS 0 1  
MAJOR XTIC NUMBER 6  
MINOR XTIC NUMBER 1  
XTIC DECIMAL 1  
TITLE AUTOMATIC  
X1LABEL X  
Y1LABEL PROBABILITY  
PLOT EXPSF(X) FOR X = 0.01 0.01 0.99
```

