

NCFCDF**PURPOSE**

Compute the non-central F cumulative distribution function with degrees of freedom parameters ν_1 and ν_2 and with non-centrality parameter λ .

DESCRIPTION

The central F distribution is the ratio of 2 central chi-square distributions with ν_1 and ν_2 degrees of freedom respectively. The non-central F distribution is the ratio of a non-central chi-square distribution with ν_1 degrees of freedom and non-centrality parameter λ and a central chi-square distribution with degrees of freedom parameter ν_2 . The input value should be greater than 0, the non-centrality parameter should be non-negative, and both degrees of freedom parameters should be positive.

SYNTAX

LET <y2> = NCFCDF(<y1>,<v1>,<v2>,<lambda>) <SUBSET/EXCEPT/FOR qualification>
 where <y1> is a number, variable or a parameter containing non-negative values;
 <y2> is a variable or a parameter (depending on what <y1> is) where the computed cdf value is stored;
 <v1> is a non-negative number, parameter or variable that specifies the first degrees of freedom parameter;
 <v2> is a non-negative number, parameter or variable that specifies the second degrees of freedom parameter;
 <lambda> is a non-negative number, parameter or variable that specifies the first non-centrality parameter;
 and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

```
LET A = NCFCDF(2,3,3,5)
LET A = NCFCDF(2,10,10,5)
LET Y = NCFCDF(1.1,14,15,10000)
```

NOTE 1

DATAPLOT converts the non-central F distribution to an equivalent non-central beta distribution. It then uses algorithm AS 226 (see the REFERENCE section below) obtained from the statlib archive to compute the non-central beta cdf. It uses the DBETAI and DLNGAM routines from the SLATEC library rather than the corresponding algorithms from the Applied Statistics series to compute the log gamma and incomplete beta functions.

NOTE 2

DATAPLOT also supports the central F and the doubly non-central F distributions (see the documentation for FCDF and DNFCDF). The DNFCDF function can also be used to calculate the singly non-central F (although they use different algorithms). The NCFCDF routine can be used to compute the central F distribution (set the non-centrality parameter to zero). For example, this can be used for the non-integer degrees of freedom case.

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

DNFCDF	=	Compute the doubly non-central F cumulative distribution function.
NCFPPF	=	Compute the singly non-central F percent point function.
FCDF	=	Compute the F cumulative distribution function.
FPDF	=	Compute the F probability density function.
FPPF	=	Compute the F percent point function.
NCBCDF	=	Compute the non-central beta cumulative distribution function.
NCBPPF	=	Compute the non-central beta percent point function.
NCCCDF	=	Compute the non-central chi-square cumulative distribution function.
NCCPPF	=	Compute the non-central chi-square percent point function.
NCTCDF	=	Compute the non-central t cumulative distribution function.
NCTPPF	=	Compute the non-central t percent point function.
CHSPDF	=	Compute the chi-square probability density function.
CHSPPF	=	Compute the chi-square percent point function.

CHSCDF = Compute the chi-square cumulative distribution function.
 NORCDF = Compute the normal cumulative distribution function.
 NORPDF = Compute the normal probability density function.
 NORPPF = Compute the normal percent point function.

REFERENCE

“Computing Noncentral Beta Probabilities,” Lenth, Applied Statistics, Vol. 39, No. 2, 1987, pp. 241-244.
 “Continuous Univariate Distributions - Vol. 2,” Johnson and Kotz, Wiley and Sons, 1970.
 “Statistical Distributions,” 2nd Edition, Evans, Hastings, and Peacock, 1970 (chapter 17).

APPLICATIONS

Hypothesis testing

IMPLEMENTATION DATE

94/9

PROGRAM

TITLE A NON-CENTRAL F DISTRIBUTION
 XILABEL X
 YILABEL PROBABILITY
 PLOT NCFCDF(X,3,10,5) FOR X = 0 0.1 6

