

NCTPPF**PURPOSE**

Compute the non-central t percent point function with degrees of freedom parameters ν and non-centrality parameter δ .

DESCRIPTION

Given the random variable $Y = Z/\sqrt{X/\nu}$ where Z is a normal distribution with mean δ and a standard deviation of 1 and X is a central chi-square distribution with ν degrees of freedom, then Y has a non-central t distribution. The percent point function does not have a simple closed form. It is computed numerically.

SYNTAX

LET <y> = NCTPPF(<p>,<v>,<delta>) <SUBSET/EXCEPT/FOR qualification>
 where <p> is a number, variable or a parameter containing values in the interval (0,1);
 <y> is a variable or a parameter (depending on what <p> is) where the computed ppf value is stored;
 <v> is a non-negative number, parameter or variable that specifies the degrees of freedom parameter;
 <delta> 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 = NCTPPF(0.90,3,3)
LET A = NCTPPF(0.95,10,5)
LET X2 = NCTPPF(0.99,14,100)
```

NOTE 1

DATAPLOT uses a bisection method to compute the non-central t ppf value. The algorithm for the central beta distribution is given in the Kennedy and Gentle book (see the REFERENCE section below). The algorithm for the non-central t distribution is similar.

NOTE 2

DATAPLOT also supports the central t and the doubly non-central t distributions (see the documentation for TCDF and DNTCDF). The DNTCDF function can be used for the singly non-central t as well, although it uses a different algorithm. The NCTCDF can also be used for the central t cdf.

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

NCTCDF	=	Compute the singly non-central t cumulative distribution function.
DNTCDF	=	Compute the doubly non-central t cumulative distribution function.
DNTPPF	=	Compute the doubly non-central t percent point function.
TCDF	=	Compute the t cumulative distribution function.
TPDF	=	Compute the t probability density function.
TPPF	=	Compute the t percent point function.
NCFCDF	=	Compute the non-central F cumulative distribution function.
NCFPPF	=	Compute the non-central 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.

REFERENCE

"Cumulative Distribution Function for the Non-central t Distribution," Lenth, Applied Statistics, Vol. 38, No. 1, 1988, pp. 185-188

"Statistical Computing," Kennedy and Gentle, Marcel-Dekker, 1978 (chapter 5).

"Statistical Distributions," 2nd Edition, Evans, Hastings, and Peacock, 1970 (chapter 38).

APPLICATIONS

Hypothesis testing

IMPLEMENTATION DATE

94/9

PROGRAM

TITLE AUTOMATIC

X1LABEL PROBABILITY

Y1LABEL X

PLOT NCTPPF(P,10,5) FOR P = 0.01 0.01 0.99

