BINCDF

PURPOSE

Compute the binomial cumulative distribution function.

DESCRIPTION

The binomial distribution is used when there are exactly two mutually exclusive outcomes of a trial. These outcomes are often called successes and failures. The binomial probability distribution is the probability of obtaining x successes in n trials. It has the following cumulative distribution function:

$$\text{bincdf}(x;p,n) = \sum_{k=0}^{x} \binom{n}{k} p^k (1-p)^{(n-k)} \qquad \textbf{(EQ 8-116)}$$

where p is the probability of a success on a single trial and (n x) is the combinatorial function of n things taken x at a time. It has the formula:

$$\binom{n}{x} = \frac{n!}{x!(n-x)!} \qquad \textbf{(EQ 8-117)}$$

SYNTAX

LET <y2> = BINCDF(<y1>,<p>,<n>) <SUBSET/EXCEPT/FOR qualification>

where <y1> is an integer variable, number, or parameter between 0 and <n> (a warning message is printed if it is not);
<y2> is a variable or a parameter (depending on what <y1> is) where the computed binomial cdf value is stored;
<p> is a number or parameter that is the probability of success on a single trial (it should be between 0 and 1);
<n> is the number of trials;

and where the <SUBSET/EXCEPT/FOR qualification> is optional.

EXAMPLES

LET A = BINCDF(3,0.5,10)
LET Y = BINCDF(X1,0.3,25))

DEFAULT

None

SYNONYMS

None

RELATED COMMANDS

BINPDF	=	Compute the binomial probability density function.
BINPPF	=	Compute the binomial percent point function.
POIPDF	=	Compute the Poisson probability density function.
POICDF	=	Compute the Poisson cumulative distribution function.
POIPPF	=	Compute the Poisson percent point function.
NBCDF	=	Compute the negative binomial cumulative distribution function.
NBPDF	=	Compute the negative binomial probability density function.
NBPPF	=	Compute the negative binomial percent point function.
GEOCDF	=	Compute the geometric cumulative distribution function.
GEOPDF	=	Compute the geometric probability density function.
GEOPPF	=	Compute the geometric percent point function.

REFERENCE

"Discrete Univariate Distributions," Johnson and Kotz, Houghton Mifflin, 1969 (chapter 3).

APPLICATIONS

Data Analysis

IMPLEMENTATION DATE

94/4

PROGRAM

```
YLIMITS 0 1
MAJOR YTIC NUMBER 6
MINOR YTIC NUMBER 1
YTIC DECIMAL 1
XLIMITS 0 50
XTIC OFFSET 0.5 0.5
LINE BLANK
SPIKE ON
SPIKE THICKNESS 0.3
TITLE AUTOMATIC
X1LABEL NUMBER OF SUCCESSES
Y1LABEL PROBABILITY
PLOT BINCDF(X,0.5,50) FOR X = 0 1 50
```