Author(s) : K.S. Kölbig
Submitter :
Language : Fortran

Library: MATHLIB
Submitted: 15.02.1989
Revised: 15.11.1995

Binomial Coefficient

Function subprograms `RBINOM` and `DBINOM` calculate the binomial coefficient

$$\binom{x}{k} = \begin{cases} x(x-1)\dots(x-k+1)/k! & (k>0) \\ 1 & (k=0) \\ 0 & (k<0) \end{cases}$$

for real x and integer k. Function subprogram `KBINOM` calculates the binomial coefficient only for integer $x = n$.
On CDC and Cray computers, the double-precision version `DBINOM` is not available.

Structure:

`FUNCTION` subprograms
User Entry Names: `RBINOM`, `DBINOM`, `KBINOM`
Obsolete User Entry Names: `BINOM` ≡ `RBINOM`
Files Referenced: `Unit 6`

Usage:

In any arithmetic expression,

`RBINOM(X,K)`, `DBINOM(X,K)` or `KBINOM(N,K)`

has the value of the binomial coefficient. `RBINOM` is of type `REAL`, `DBINOM` is of type `DOUBLE PRECISION` and `X` has the same type as the function name. `KBINOM, N` and `K` are of type `INTEGER`.

Restrictions:

Function subprogram `KBINOM` can compute only binomial coefficients which lie in the integer range of the machine.

Accuracy:

Full machine accuracy.

Error handling:

If the result of `KBINOM` would lie outside the integer range of the machine, `KBINOM` is set equal to zero and an error message is printed.
•