Package: correlbinom (via r-universe)

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Title Correlated Binomial Probabilities

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Author Chris Rohlfs [aut], Gary Witt [aut,cre]

Maintainer Gary Witt <gary.witt@temple.edu>

Description Calculates the probabilities of k successes given n trials of a binomial random variable with non-negative correlation across trials. The function takes as inputs the scalar values the level of correlation or association between trials, the success probability, the number of trials, an optional input specifying the number of bits of precision used in the calculation, and an optional input specifying whether the calculation approach to be used is from Witt (2014) <doi:10.1080/03610926.2012.725148> or from Kuk (2004) <doi:10.1046/j.1467-9876.2003.05369.x>. The output is a (trials+1)-dimensional vector containing the likelihoods of 0, 1, ..., trials successes.

Depends R (>= 3.2.3), Rmpfr, methods

License GPL (>= 3)

Encoding UTF-8

LazyData true

RoxygenNote 6.0.1.9000

NeedsCompilation no

Repository CRAN

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Contents

`correlbinom` *Correlated Binomial Probabilities*

Description

This function reports the likelihoods of 0, 1, ..., n successes given n trials of a binomial with a specified correlation or association between trials and success probability

Usage

```
correlbinom(rho, successprob, trials, precision = 1024, model = "witt")
```

Arguments

`rho`	The level of correlation or association between trials. In the Witt (2014) model, this parameter is the level of correlation between trials. In the Kuk (2004) model, it is the equivalent of one minus gamma from that paper, where a value of zero indicates independence. In both cases, this parameter must fall within the unit interval.
`successprob`	The likelihood of success in one trial.
`trials`	The number of trials.
`precision`	Number of bits of precision. Defaults to 1024.
`model`	Specify whether the 'kuk' or 'witt' model is to be used for calculation. Defaults to 'witt'.

References

Kuk, Anthony Y. C., 2004. A litter-based approach to risk assessment in developmental toxicity via a power family of completely monotone functions. *Journal of the Royal Statistical Society, Series C (Applied Statistics)*, *53*(2): 369-86.

Witt, Gary, 2014. A simple distribution for the sum of correlated, exchangeable binary data. *Communications in Statistics - Theory and Methods*, *43*(20): 4265-80.

Examples

```
correlbinom(0.5,0.1,5)
correlbinom(0.9,0.3,12,256)
correlbinom(0.9,0.6,12,model="kuk")
```

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