Package ‘poibin’

October 14, 2022

Version 1.5
Date 2020-01-01
Title The Poisson Binomial Distribution
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Maintainer Yili Hong <yilihong@vt.edu>

Description Implementation of both the exact and approximation methods for computing the cdf of the Poisson binomial distribution as described in Hong (2013) <doi:10.1016/j.csda.2012.10.006>. It also provides the pmf, quantile function, and random number generation for the Poisson binomial distribution. The C code for fast Fourier transformation (FFT) is written by R Core Team (2019)<https://www.R-project.org/>, which implements the FFT algorithm in Singleton (1969) <doi:10.1109/TAU.1969.1162042>.

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The Poisson Binomial Distribution
Description


Details

Package: poibin
Version: 1.5
Date: 2020-01-01
Title: The Poisson Binomial Distribution
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Maintainer: Yili Hong <yilihong@vt.edu>
Description: Implementation of both the exact and approximation methods for computing the cdf of the Poisson binomial distribution. The C code for fast Fourier transformation (FFT) is written by R Core Team (2019)<https://www.R-project.org/>, which implements the FFT algorithm in Singleton (1969) <doi: 10.1109/TAU.1969.1162042>.
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Author(s)

Yili Hong [aut, cre], R Core Team [aut, cph]
Maintainer: Yili Hong <yilihong@vt.edu>

References


Examples

```
kk=0:10
pp=c(.1,.2,.3,.4,.5)
ppoibin(kk=kk, pp=pp, method = "DFT-CF",wts=rep(2,5))
ppoibin(kk=kk, pp=pp, method = "RF",wts=rep(2,5))
ppoibin(kk=kk, pp=pp, method = "RNA",wts=rep(2,5))
```
The Poisson Binomial Distribution.

Description

The cdf, pmf, quantile function, and random number generation for the Poisson binomial distribution.

Usage

```r
ppoibin(kk, pp, method = "DFT-CF", wts=NULL)
dpoibin(kk, pp, wts=NULL)
qpoibin(qq, pp, wts=NULL)
rpoibin(m, pp, wts=NULL)
```

Arguments

- `kk`: The values where the cdf or pmf to be evaluated.
- `pp`: The vector for $p_j$'s which are the success probabilities for indicators.
- `method`: "DFT-CF" for the DFT-CF method, "RF" for the recursive formula, "RNA" for the refined normal approximation, "NA" for the normal approximation, and "PA" for the Poisson approximation.
- `wts`: The weights for $p_j$'s.
- `qq`: The values where the quantile function to be evaluated.
- `m`: The number of random numbers to be generated.

Details

See the reference for computational details.

Value

Returns the entire cdf, pmf, quantiles, and random numbers.

Author(s)

Yili Hong [aut, cre], R Core Team [aut, cph]

References

Examples

```r
kk=0:10
pp=c(1,2,3,4,5)
ppoibin(kk=kk, pp=pp, method = "DFT-CF", wts=rep(2,5))
ppoibin(kk=kk, pp=pp, method = "RF", wts=rep(2,5))
ppoibin(kk=kk, pp=pp, method = "RNA", wts=rep(2,5))
ppoibin(kk=kk, pp=pp, method = "NA", wts=rep(2,5))
ppoibin(kk=kk, pp=pp, method = "PA", wts=rep(2,5))
dpoibin(kk=kk, pp=pp, wts=rep(2,5))
qpoibin(qq=0:10/10, pp=pp, wts=rep(2,5))
rpoibin(m=2, pp=pp, wts=rep(2,5))
```
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