Package ‘pbivnorm’

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**Title**  Vectorized Bivariate Normal CDF

**Version**  0.6.0

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**Author**  Fortran code by Alan Genz. R code by Brenton Kenkel, based on Adelchi Azzalini’s 'mnormt' package.

**Maintainer**  Brenton Kenkel <brenton.kenkel@gmail.com>

**Description**  Provides a vectorized R function for calculating probabilities from a standard bivariate normal CDF.

**License**  GPL (>= 2)

**URL**  https://github.com/brentonk/pbivnorm

**NeedsCompilation**  yes

**Repository**  CRAN

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**R topics documented:**

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<td>Standard bivariate normal CDF</td>
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**Description**

Calculate probabilities from the CDF of a standard bivariate normal distribution.

**Usage**

```
pbivnorm(x, y, rho = 0, recycle = TRUE)
```
Arguments

- **x**: vector of upper integration limits for the CDF. May also be a two-column matrix, in which case `y` should not be used.
- **y**: vector of upper integration limits.
- **rho**: correlation parameter.
- **recycle**: whether to automatically recycle the vectors `x`, `y`, and `rho` to conform to whichever is longest. If `FALSE`, all three must be the same length.

Details

This function returns values identical to those of `biv.nt.prob` in the `mnormt` package, but is vectorized to reduce the number of Fortran calls required for computation of many probabilities.

Value

Numeric vector of probabilities.

Author(s)

Fortran code by Alan Genz (see references). R interface by Brenton Kenkel (<brenton.kenkel@gmail.com>), based on code from Adelchi Azzalini’s `mnormt` package.

References


Examples

```r
x <- rnorm(10)
y <- rnorm(10)
rho <- runif(10)

pbivnorm(x, y, rho)

X <- cbind(x, y)
pbivnorm(X, rho = rho)

## rho can be a single value, unless recycling is disallowed
rho <- runif(1)
pbivnorm(x, y, rho)
```
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