Package 'NormGen'

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Type Package

Title An Efficient and Precise Quantile Mapping for Normal Pseudo-Random Number Generation

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Description
High-performance pseudo-normal random generator using an optimized quantile mapping algorithm. It provides fast generation of normal pseudo-random numbers based on precise mathematical approximations. The package features Rnorm() for efficient single-threaded generation and PRnorm(), a high-performance, multithreaded variant powered by 'RcppParallel' and Intel 'TBB'. Package compilation flags are optimized to support multi-core parallel processing.

Depends R (>= 3.5.0)

Imports Rcpp (>= 1.0.0), RcppParallel

LinkingTo Rcpp, RcppParallel

Suggests testthat (>= 3.0.0), knitr, rmarkdown

VignetteBuilder knitr

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NeedsCompilation yes

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PRnorm *Multi-threaded Pseudo-Normal Random Number Generator*

Description

Generates pseudo-random numbers from a normal distribution using multiple threads.

Usage

```
PRnorm(n, mean = 0, sd = 1, seed = 12345L)
```

Arguments

n	number of samples to generate
mean	distribution mean (default is 0.0)
sd	distribution standard deviation (default is 1.0)
seed	random number generator seed (default is 12345)

Value

A numeric vector of length n containing pseudo-random numbers from the specified normal distribution.

Examples

```
# Generate 100,000 parallel random samples
samples <- PRnorm(100000, mean = 0, sd = 1)
summary(samples)

# Generate with a custom seed for reproducibility
samples_repro <- PRnorm(50000, mean = 10, sd = 2, seed = 999)
mean(samples_repro)
sd(samples_repro)
```

Rnorm *Single-threaded Pseudo-Normal Random Number Generator*

Description

Original single-threaded implementation of the NormGen quantile mapping algorithm.

Usage

```
Rnorm(n, mean = 0, sd = 1)
```

Arguments

n	number of samples to generate
mean	distribution mean (default is 0.0)
sd	distribution standard deviation (default is 1.0)

Value

A numeric vector of length n containing pseudo-random numbers from the specified normal distribution.

Examples

```
# Generate 100,000 single-threaded random samples
samples_single <- Rnorm(100000, mean = 0, sd = 1)
summary(samples_single)
```

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