Package: roundr (via r-universe)

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Title Incorporate Rounding for Discrete Data Modeling

Version 1.0.0

Description Provides density, distribution and random number generator functions to account for discretization in data where recorded values mask the underlying measurement process. Details on methodology are described in Glazer et al. (2026) <doi:10.1080/00031305.2025.2604812>.

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Contents

`drdald` *Returns the probability mass function for the rounded asymmetric Laplace distribution*

Description

Returns the probability mass function for the rounded asymmetric Laplace distribution

Usage

```
drdald(
  x,
  mu = 0,
  sigma = 1,
  tau = 0.5,
  n.quad = 7,
  thresh = 1e-20,
  log = FALSE
)
```

Arguments

`x`	Vector of quantiles.
`mu`	Vector of location parameters.
`sigma`	Vector of scale parameters.
`tau`	Vector of skewness parameters.
`n.quad`	Numeric. The degree of a Legendre polynomial used for approximation.
`thresh`	Numeric. Threshold used to truncate small probability values before taking logarithms when `log.p = TRUE`.
`log`	Logical. If TRUE, probabilities p are given as log(p).

Value

A vector of densities.

Examples

```
drdald(-1)

drdald(x = 0, mu = 2, sigma = 2, tau = .3)

x = -3:3
mu = 1
sigma = 1
tau = 0.5
drdald(x = x, mu = mu, sigma = sigma, tau = tau, log = TRUE)
```

drdnorm *Returns the probability mass function for the rounded normal distribution*

Description

Returns the probability mass function for the rounded normal distribution

Usage

```
drdnorm(x, mu = 0, sigma = 1, n.quad = 7, thresh = 1e-20, log = FALSE)
```

Arguments

x	Vector of quantiles.
mu	Vector of means.
sigma	Vector of standard deviations.
n.quad	Numeric. The degree of a Legendre polynomial used for approximation.
thresh	Numeric. Threshold used to truncate small probability values before taking logarithms when log.p = TRUE.
log	Logical. If TRUE, probabilities p are given as log(p).

Value

A vector of densities.

Examples

```
drdnorm(x = 1)

drdnorm(x = -1, mu = 1, sigma = 4)

y <- c(-1, 0, 1, 2, 3)
mu <- 1.5
sigma <- 2
drdnorm(x = y, mu = mu, sigma = sigma, log = TRUE)
```

drpald *Returns the Cumulative Distribution Function for the rounded asymmetric Laplace distribution*

Description

Returns the Cumulative Distribution Function for the rounded asymmetric Laplace distribution

Usage

```
drpald(
  q,
  mu = 0,
  sigma = 1,
  tau = 0.5,
  lower.tail = TRUE,
  log.p = FALSE,
  n.quad = 7,
  thresh = 1e-20,
  tails = 35
)
```

Arguments

q	Vector of quantiles.
mu	Vector of location parameters.
sigma	Vector of scale parameters.
tau	Vector of skewness parameters.
lower.tail	Logical. If TRUE, probabilities are $P\{X \leq x\}$ otherwise, $P\{X > x\}$.
log.p	Logical. If TRUE, probabilities p are given as log(p).
n.quad	Numeric. The degree of a Legendre polynomial used for approximation.
thresh	Numeric. Threshold used to truncate small probability values before taking logarithms when log.p = TRUE.
tails	Numeric. Threshold used to generate probabilities for sampling.

Value

A vector of cumulative probability densities

Examples

```
drpald(0)

drpald(q = 0.5, mu = 0, sigma = 1, tau = 0.75, log.p = TRUE)
```

```
q = -1:3
mu = 1
sigma = 2
tau = 0.5
drpald(q = q, mu = mu, sigma = sigma, tau = tau, lower.tail = FALSE)
```

---

drpnorm *Returns the Cumulative Distribution Function for the rounded normal distribution*

Description

Returns the Cumulative Distribution Function for the rounded normal distribution

Usage

```
drpnorm(
  q,
  mu = 0,
  sigma = 1,
  lower.tail = TRUE,
  log.p = FALSE,
  n.quad = 7,
  thresh = 1e-20,
  tails = 10
)
```

Arguments

q	Vector of quantiles.
mu	Vector of means.
sigma	Vector of standard deviations.
lower.tail	Logical. If TRUE, probabilities are $P\{X \leq x\}$ otherwise, $P\{X > x\}$.
log.p	Logical. If TRUE, probabilities p are given as log(p).
n.quad	Numeric. The degree of a Legendre polynomial used for approximation.
thresh	Numeric. Threshold used to truncate small probability values before taking logarithms when log.p = TRUE.
tails	Numeric. Threshold used to generate probabilities for sampling.

Value

Vector of cumulative probability densities for the given quantiles.

Examples

```
drpnorm(2)

drpnorm(q = 0, mu = 1, sigma = 1)

q <- c(1, 2, 3)
mu <- 3
sigma <- 2

drpnorm(q = q, mu = mu, sigma = sigma, lower.tail = FALSE)
```

`drrald` *Returns randomly generated values from the rounded asymmetric Laplace distribution*

Description

Returns randomly generated values from the rounded asymmetric Laplace distribution

Usage

```
drrald(
  n,
  type = c("floor", "ceil", "nearest"),
  mu = 0,
  sigma = 1,
  tau = 0.5,
  tails = 35
)
```

Arguments

`n`	Number of observations. When `length(n) > 1`, the number of observations is taken as the length of `n`.
`type`	Character. Type of rounding applied to the latent variable. One of `"floor"`, `"ceil"`, or `"nearest"`.
`mu`	Vector of values for the location parameter.
`sigma`	Vector of values for the scale parameter.
`tau`	Vector of values to for the skewness parameter.
`tails`	Numeric. Threshold used to generate probabilities for sampling.

Value

A vector of numbers randomly generated from a rounded asymmetric Laplace distribution.

Examples

```
drrald(1, "floor")

drrald(n = 5, type = "ceil", mu = 5, sigma = 4, tau = 0.5)

mu = c(1, 4)
sigma = c(1, 2)
tau = c(0.3, 0.5)
drrald(n = 7, type = "nearest", mu = mu, sigma = sigma, tau = tau)
```

---

drrnorm *Returns randomly generated values from the rounded normal distribution*

Description

Returns randomly generated values from the rounded normal distribution

Usage

```
drrnorm(n, type = c("floor", "ceil", "nearest"), mu = 0, sigma = 1, tails = 10)
```

Arguments

n	Number of observations. When length(n) > 1, the number of observations is taken as the length of n.
type	Character. Type of rounding applied to the latent variable. One of "floor", "ceil", or "nearest".
mu	Vector of means.
sigma	Vector of standard deviations.
tails	Numeric. Threshold used to generate probabilities for sampling.

Value

A vector of numbers randomly generated from a rounded normal distribution.

Examples

```
drrnorm(1, "floor")

drrnorm(n = 10, type = "nearest", mu = 4, sigma = 2)

mu <- c(0, 5)
sigma <- c(1, 4)
drrnorm(n = 20, "ceil", mu = mu, sigma = sigma)
```

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