Package 'LikertMakeR'

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Version 0.1.5

Type Package

Title Synthesise and Correlate Rating-Scale Data

Description Synthesise and correlate rating-scale data with
predefined first & second moments and, optionally, predefined
correlation matrix.
The function, `lexact()`, uses the 'DEoptim'
<https://CRAN.R-project.org/package=DEoptim> package, described in
Mullen, Ardia, Gil, Windover, & Cline (2011) <doi:10.18637/jss.v040.i06>,
to synthesise a vector of discrete values with predefined mean and
standard deviation exact to two decimal places, if feasible.
The function, `lfast()`, draws a random sample from a _Beta_ distribution
which is rescaled to give a vector with approximate first and second moments.
It is much faster than `lexact()` but not as precise.
The function, `lcor()`, systematically swaps values within each column of a
data-frame so that they are correlated to fit a predefined correlation matrix.

URL https://github.com/WinzarH/LikertMakeR

BugReports https://github.com/WinzarH/LikertMakeR/issues

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Encoding UTF-8

Language en-GB

VignetteBuilder knitr

Depends R (>= 4.2.0)

Imports DEoptim (>= 2.2-0),

Suggests knitr, testthat

RoxygenNote 7.2.3

Config/testthat/edition 3

NeedsCompilation no

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R topics documented:

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lcor   *Rearrange columns in a data-frame to fit a predefined correlation matrix*

Description

lcor() rearranges values in each column of a data-frame so that columns are correlated to match a predefined correlation matrix.

Usage

```
lcor(data, target)
```

Arguments

data	beginning data-frame that is to be rearranged
target	target correlation matrix - should be a symmetric (square) k*k matrix

Details

Values in a column do not change, so univariate statistics remain the same.

Value

Returns a data-frame whose column-wise correlations approximate a user-specified correlation matrix

Examples

```
## generate uncorrelated synthetic data

n <- 32
x1 <- lfast(n, 3.5, 1.0, 1, 5, 5)
x2 <- lfast(n, 1.5, 0.75, 1, 5, 5)
x3 <- lfast(n, 3.0, 2.0, 1, 5, 5)
```

```
mydat3 <- cbind(x1, x2, x3) |> data.frame()

cor(mydat3)

## describe a target correlation matrix
tgt3 <- matrix(
  c(
    1.00, 0.50, 0.75,
    0.50, 1.00, 0.25,
    0.75, 0.25, 1.00
  ),
  nrow = 3
)

## apply lcor function
new3 <- lcor(mydat3, tgt3)

cor(new3) |> round(3)
```

| lexact | *Generate rating-scale data with only Mean and Standard Deviation* |

Description

lexact() generates rating-scale values with predefined first and second moments.

Usage

```
lexact(n, mean, sd, lowerbound, upperbound, items = 1, seed)
```

Arguments

n	(positive, int) the number of observations to simulate
mean	(real) target mean
sd	(real) target standard deviation
lowerbound	(positive, int) a lower bound for the data to be generated
upperbound	(positive, int) an upper bound for the data to be generated
items	(positive, int) number of items in the Likert scale. Default = 1
seed	(real) optional seed for reproducibility

Details

If feasible, moments are exact to two decimal places.

Value

a vector with user-specified parameters

Examples

```
x <- lexact(
  n = 16,
  mean = 3.25,
  sd = 1.00,
  lowerbound = 1,
  upperbound = 5,
  items = 4
)
```

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lfast   *Rating scale data (e.g. Likert scale) from a Scaled Beta Distribution*

Description

`lfast()` generates random discrete values from a (scaled Beta distribution) so the data replicate a rating scale - for example,a 1-5 scale made from 5 items (questions) or 0-10 likelihood-of-purchase scale.

Usage

```
lfast(n, mean, sd, lowerbound, upperbound, items = 1, seed)
```

Arguments

n	(positive, int) number of observations to generate
mean	(real) target mean
sd	(real) target standard deviation
lowerbound	(positive, int) lower bound (e.g. '1' for a 1-5 rating scale)
upperbound	(positive, int) upper bound (e.g. '5' for a 1-5 rating scale)
items	(positive, int) number of items in the rating scale. Default = 1
seed	(real) optional seed for reproducibility

Value

a vector of simulated data approximating user-specified conditions.

Examples

```
x <- lfast(
  n = 256,
  mean = 4.0,
  sd = 1.0,
```

```
    lowerbound = 1,
    upperbound = 7,
    items = 6
)

x <- lfast(256, 2, 1.8, 0, 10)
```

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