Package: drawsample (via r-universe)

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Type Package

Title Draw Samples with the Desired Properties from a Data Set

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Language en-US

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Description A tool to sample data with the desired properties.Samples can be drawn by purposive sampling with determining distributional conditions, such as deviation from normality (skewness and kurtosis), and sample size in quantitative research studies. For purposive sampling, a researcher has something in mind and participants that fit the purpose of the study are included (Etikan,Musa, & Alkassim, 2015) <doi:10.11648/j.ajtas.20160501.11>.Purposive sampling can be useful for answering many research questions (Klar & Leeper, 2019) <doi:10.1002/9781119083771.ch21>.

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Encoding UTF-8

Imports dplyr, lattice, tibble, psych, moments, readxl, shiny, shinycssloaders, shinydashboard, xlsx, utils

Suggests rmarkdown, knitr, testthat (>= 3.0.0)

LazyData true

RoxygenNote 7.2.1

URL https://github.com/atalay-k/drawsample

Depends R (>= 2.10)

BugReports https://github.com/atalay-k/drawsample/issues

Config/testthat/edition 3

NeedsCompilation no

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`drawsample-package` *Draw Samples with the Desired Properties from a Data Set*

Description

draw_sample, functions take a sample of the specified sample size,skewness, and kurtosis form a data set (dist)with or without resampling. Fleishman's power method (doi:10.1007/BF02293811) was used for the desired skewness and kurtosis level. Therefore, the coefficient of skewness can be chosen between 0 and 3.6. Although the kurtosis coefficient varies for each skewness coefficient and varies from -1.2 and 20. If convenient kurtosis and skew values are not provided, no solutions can be found and an error is given.

Author(s)

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References

Fleishman AI (1978). A Method for Simulating Non-normal Distributions. *Psychometrika, 43, 521-532*. doi:10.1007/BF02293811.

Atalay Kabasakal, K. & Gunduz, T . (2020). Drawing a Sample with Desired Properties from Population in R Package "drawsample".*Journal of Measurement and Evaluation in Education and Psychology,11*(4),405-429. doi:10.21031/epod.790449

See Also

Useful links:

- https://github.com/atalay-k/drawsample
- Report bugs at https://github.com/atalay-k/drawsample/issues

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`constants_table` *Fleishman's Power Method Transformation Constants*

Description

This table includes Fleishman's Power Method Transformation constants.

Usage

```
constants_table
```

Format

A `data.frame` with 5 columns, which are

Skew The skewness value

Kurtosis The standardized kurtosis value

b Outcome that is based on `Skew,Kurtosis`

c Outcome that is based on `Skew,Kurtosis`

d Outcome that is based on `Skew,Kurtosis`

References

Fleishman AI (1978). A Method for Simulating Non-normal Distributions. *Psychometrika, 43, 521-532.* doi:10.1007/BF02293811.

Fialkowski, A. C. (2018). SimMultiCorrData: Simulation of Correlated Data with Multiple Variable Types. R package version 0.2.2. Retrieved from https://cran.r-project.org/web/packages/SimMultiCorrData/index.html

See Also

`find_constants`

Examples

```
# First 6 rows of the table
data(constants_table)
head(constants_table)
```

draw_sample *Draw Samples with the Desired Properties from a Data Set*

Description

A function to sample data with desired properties.

Usage

```
draw_sample(
  dist,
  n,
  skew,
  kurts,
  replacement = FALSE,
  save.output = FALSE,
  output_name = c("sample", "default")
)
```

Arguments

dist	data frame:consists of id and scores with no missing
n	numeric: desired sample size
skew	numeric: the skewness value
kurts	numeric: the kurtosis value
replacement	logical:Sample with or without replacement? (default is FALSE).
save.output	logical: should the output be saved into a text file? (default is FALSE).
output_name	character: a vector of two components. The first component is the name of the output file, user can change the second component.

Details

The execution of the function may take some time since it tries to obtain the specified value for skewness and kurtosis.

Value

This function returns a `list` including following:

- a matrix: Descriptive statistics of the given data, the reference vector and the sample.
- a data frame: The id's and scores of the sample
- graph: Histograms for the "data" and the "sample"

References

Fleishman AI (1978). A Method for Simulating Non-normal Distributions. *Psychometrika, 43, 521-532.* doi:10.1007/BF02293811.

Fialkowski, A. C. (2018). SimMultiCorrData: Simulation of Correlated Data with Multiple #' Variable Types. R package version 0.2.2. Retrieved from https://cran.r-project.org/web/packages/SimMultiCorrData/index.html

Atalay Kabasakal, K. & Gunduz, T. (2020). Drawing a Sample with Desired Properties from Population in R Package "drawsample".*Journal of Measurement and Evaluation in Education and Psychology,11*(4),405-429. doi:10.21031/epod.790449

Examples

```
# Example data provided with package
data(example_data)
# First 6 rows of the example_data
head(example_data)
# Draw a sample based on Score_1(from negatively skewed to normal)
output1 <- draw_sample(dist=example_data[,c(1,2)],n=200,skew = 0,kurts = 0,
save.output=FALSE) # Histogram of the reference data set
# descriptive statistics of the given data,reference data, and drawn sample
output1$desc
# First 6 rows of the drawn sample
head(output1$sample)
# Histogram of the given data set and drawn sample
output1$graph
## Not run:
# Draw a sample based on Score_2 (from negatively skewed to positively skewed)
# draw_sample(dist=example_data[,c(1,3)],n=200,skew = 1,kurts = 1,
# output_name = c("sample", "1"))
# Draw a sample based on Score_2 (from negatively skewed to positively skewed
# with replacement)
# draw_sample(dist=example_data[,c(1,3)],n=200,skew = 0.5,kurts = 0.4,
# replacement=TRUE,output_name = c("sample", "2"))

## End(Not run)
```

`draw_sample_ir` *Sample data with individual responses*

Description

A Function to sample data close to desired characteristics with individual responses.

Usage

```
draw_sample_ir(
  dist,
  n,
  skew,
```

```
  kurts,
  replacement = FALSE,
  col_id = 1,
  col_total = numeric(),
  save.output = FALSE,
  output_name = c("sample", "1")
)
```

Arguments

`dist`	data frame:consists of id and scores with no missing
`n`	numeric: desired sample size
`skew`	numeric: the skewness value
`kurts`	numeric: the kurtosis value
`replacement`	logical:Sample with or without replacement? (default is FALSE).
`col_id`	index of column ID's
`col_total`	index of column total score
`save.output`	logical: should the output be saved into a text file? (Default is FALSE).
`output_name`	character: a vector of two components. The first component is the name of the output file, user can change the second component.

Details

The execution of the function may take some time since it tries to obtain the specified value for skewness and kurtosis.

Value

This function returns a `list` including following:

- a matrix: Descriptive statistics of the given data, the reference vector and the sample.
- a data frame: The id's and individual response of the sample.
- graph: Histograms for the "data" and the "sample"

References

Fleishman AI (1978). A Method for Simulating Non-normal Distributions. *Psychometrika, 43, 521-532.* doi:10.1007/BF02293811.

Fialkowski, A. C. (2018). SimMultiCorrData: Simulation of Correlated Data with Multiple #' Variable Types. R package version 0.2.2. Retrieved from https://cran.r-project.org/web/packages/SimMultiCorrData/index.html

Atalay Kabasakal, K. & Gunduz, T. (2020). Drawing a Sample with Desired Properties from Population in R Package "drawsample".*Journal of Measurement and Evaluation in Education and Psychology,11*(4),405-429. doi:10.21031/epod.790449

Examples

```
## Not run:
# Example data provided with package
data(likert_example)
# First 6 rows of the example_data
head(likert_example)
# Draw a sample based on total(from flattened to normal)
output3 <- draw_sample_ir(dist=likert_example,n=200,skew = 1,kurts = 1.2,
col_id=1,col_total=7,save.output = FALSE) # Histogram of the reference data set
# descriptive statistics of the given data,reference data, and drawn sample
output3$desc
# First 6 rows of the drawn sample
head(output3$sample)
# Histogram of the given data set and drawn sample
output3$graph
# Draw a sample based on total(from flattened to normal)
draw_sample_ir(dist=likert_example,n=200,skew = 0.5,kurts =0.5,
col_id=1,col_total=7,save.output = TRUE,
output_name = c("sample", "3"))

## End(Not run)
```

`draw_sample_n` *Sample data close to desired characteristics - nearest*

Description

A Function to sample data close to desired characteristics - nearest

Usage

```
draw_sample_n(
  dist,
  n,
  skew,
  kurts,
  location = 0,
  delta_var = 0,
  save.output = FALSE,
  output_name = c("sample", "default")
)
```

Arguments

`dist`	data frame:consists of id and scores with no missing
`n`	numeric: desired sample size
`skew`	numeric: the skewness value

kurts	numeric: the kurtosis value
location	numeric: the value for adjusting mean (default is 0).
delta_var	numeric: the value for adjusting variance (default is 0).
save.output	logical: should the output be saved into a text file? (Default is FALSE).
output_name	character: a vector of two components. The first component is the name of the output file, user can change the second component.

Details

The desired skewness and kurtosis values cannot be met while the function execution is faster. The attributes of kurtosis are in doubt. This is because the range of kurtosis is greater than the skewness. For `location` values can be entered to position the midpoint or mean of the distribution differently. For `delta_var` the value can be entered for how much will increase or decrease the variability of reference distribution. In other words, the reference distribution is generated as the standard normal distribution, unless the user changes the default values of the `location` and `delta_var` arguments.

Value

This function returns a `list` including following:

- a matrix: Descriptive statistics of the given data, the reference vector and the sample.
- a data frame: The id's and scores of the sample
- graph: Histograms for the "data" and the "sample"

References

Fleishman AI (1978). A Method for Simulating Non-normal Distributions. *Psychometrika, 43, 521-532.* doi:10.1007/BF02293811.

Fialkowski, A. C. (2018). SimMultiCorrData: Simulation of Correlated Data with Multiple #' Variable Types. R package version 0.2.2. Retrieved from https://cran.r-project.org/web/packages/SimMultiCorrData/index.html

Examples

```
# Example data provided with package
data(example_data)
# Draw a sample based on Score_1
output2 <- draw_sample_n(dist=example_data[,c(1,2)],n=200,skew = 0,
kurts = 0, location=0, delta_var=0,save.output=FALSE) # Histogram of the reference data set
# descriptive statistics of the given data,reference data, and drawn sample
output2$desc
# First 6 rows of the drawn sample
head(output2$sample)
# Histogram of the given data set and drawn sample
output2$graph
## Not run:
# Draw a sample based on Score_2 (location par)
# draw_sample_n(dist=example_data[,c(1,3)],n=200,skew = 1,kurts = 1,location=-0.5,delta_var=0,
# save.output=TRUE, output_name = c("sample", "2"))
# Draw a sample based on Score_2 (delta_var par)
```

```
# draw_sample_n(dist=example_data[,c(1,3)],n=200,skew = 0.5,kurts = 0.4,location=0,delta_var=0.3,
# save.output=TRUE, output_name = c("sample", "3"))

## End(Not run)
```

`draw_sample_n_ir` *Sample data close to desired characteristics with individual responses - nearest*

Description

A function to sample data with desired properties.

Usage

```
draw_sample_n_ir(
  dist,
  n,
  skew,
  kurts,
  location = 0,
  delta_var = 0,
  col_id = 1,
  col_total = numeric(),
  save.output = FALSE,
  output_name = c("sample", "default")
)
```

Arguments

`dist`	data frame:consists of id and scores with no missing
`n`	numeric: desired sample size
`skew`	numeric: the skewness value
`kurts`	numeric: the kurtosis value
`location`	numeric: the value for adjusting mean (default is 0).
`delta_var`	numeric: the value for adjusting variance (default is 0).
`col_id`	index of column ID's
`col_total`	index of column total score
`save.output`	logical: should the output be saved into a text file? (Default is FALSE).
`output_name`	character: a vector of two components. The first component is the name of the output file, user can change the second component.

Details

The desired skewness and kurtosis values cannot be met while the function execution is faster. The attributes of kurtosis are in doubt. This is because the range of kurtosis is greater than the skewness.

Value

This function returns a `list` including following:

- a matrix: Descriptive statistics of the given data, the reference vector and the sample.
- a data frame: The id's and scores of the sample
- graph: Histograms for the "data" and the "sample"

References

Fleishman AI (1978). A Method for Simulating Non-normal Distributions. *Psychometrika, 43, 521-532.* doi:10.1007/BF02293811.

Fialkowski, A. C. (2018). SimMultiCorrData: Simulation of Correlated Data with Multiple #' Variable Types. R package version 0.2.2. Retrieved from https://cran.r-project.org/web/packages/SimMultiCorrData/index.html

Atalay Kabasakal, K. & Gunduz, T. (2020). Drawing a Sample with Desired Properties from Population in R Package "drawsample".*Journal of Measurement and Evaluation in Education and Psychology,11*(4),405-429. doi:10.21031/epod.790449

Examples

```
# Example data provided with package
data(likert_example)
# First 6 rows of the example_data
head(likert_example)
# Draw a sample based on Score_1(from negatively skewed to normal)
output4 <- draw_sample_n_ir(dist=likert_example,n=200,skew = 0,kurts = 0,
location= 0,delta_var = 0,
col_id=1,col_total=7,save.output=FALSE) # Histogram of the reference data set
# descriptive statistics of the given data,reference data, and drawn sample
output4$desc
# First 6 rows of the drawn sample
head(output4$sample)
# Histogram of the given data set and drawn sample
output4$graph
## Not run:
output4 <- draw_sample_n_ir(dist=likert_example,n=200,skew = 0.5,kurts = 0.5,
location= 0,delta_var = 0,
col_id=1,col_total=7,save.output=TRUE,
output_name = c("sample", "1"))

## End(Not run)
```

---

draw_sample_rep *Multiple Sample Selection*

Description

Multiple Sample Selection

Usage

```
draw_sample_rep(
  dist,
  n,
  rep = 1,
  skew,
  kurts,
  replacement = TRUE,
  col_id = 1,
  col_total = numeric(),
  exact = FALSE
)
```

Arguments

dist	data frame:consists of id and scores with no missing
n	numeric: desired sample size
rep	numeric: replication
skew	numeric: the skewness value
kurts	numeric: the kurtosis value
replacement	logical:Sample with or without replacement? (default is FALSE).
col_id	index of column ID's
col_total	index of column total score
exact	default is FALSE conduct draw_sample_n_ir function, it is faster and nearest version of draw_sample_ir function.

Value

This function returns a `list` including following:

- a matrix: Descriptive statistics of the given data, the reference vector and the sample.
- a data frame: The id's and scores of the sample
- graph: Histograms for the "data" and the "sample"

Examples

```
# Example data provided with package
data(likert_example)
# First 6 rows of the example_data
head(likert_example)
# Draw three samples based on Score_1(from negatively skewed to normal)
# This example takes considerable computation time.
samples <- draw_sample_rep(dist=likert_example,n=200,rep=3,skew=0,
kurts=0,replacement =TRUE,  col_id = 1,
col_total = numeric(),
exact = FALSE)
# to get first sample
```

```
samples$sample[[1]]
# to get second sample
samples$sample[[2]]
## Not run:
# to export 10 samples
for(i in 1:3){
 write.csv(samples$sample[[i]],row.names = FALSE,paste("sample_",i,".csv",sep=""))
 }

## End(Not run)
```

`draw_sample_shiny` *Draw Samples with a Shiny Applications*

Description

Performing package functions with user friendly 'shiny' interface.

Usage

```
draw_sample_shiny()
```

Examples

```
## Not run:
# if(interactive()){
## Run this code for launching the 'shiny' application
#  draw_sample_shiny()
#  }
#
## End(Not run)
```

`example_data` *Example Data*

Description

The example data set is made of 500 subjects ids and total scores from two different tests.

Usage

```
data(example_data)
```

Format

A `data.frame` with 3 columns, which are

ID students' id

Score_1 Scores of test 1

Score_2 Scores of test 2

Examples

```
# First 6 rows of the example_data
data(example_data)
head(example_data)
```

---

likert_example *Likert Example Data*

Description

The example data set is made of 6669 subjects, 7 variables

Usage

```
data(likert_example)
```

Format

A `data.frame` with 7 columns, which are

CNTSTUID country ID

ST160Q01IA response of item_1

ST160Q02IA response of item_2

ST160Q03IA response of item_3

ST160Q04IA response of item_4

ST160Q05IA response of item_5

total total_score of five items

Examples

```
# First 6 rows of the likert_example
data(likert_example)
head(likert_example)
```

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