Package ‘distrSim’

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Version 2.6
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Title Simulation Classes Based on Package ‘distr’
Description S4-classes for setting up a coherent framework for simulation within the distr family of packages.
Depends R(>= 2.14.0), methods, graphics, setRNG(>= 2006.2-1), distr(>= 2.5.2)
Suggests distrEx(>= 2.2)
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Description

distrSim is to provide a conceptual treatment of simulations by means of S4 classes. The package is based on our package distr, hence uses distribution classes as introduced there to describe the distributions under which simulations are performed.
distrSim-package

Details

Package: distrSim
Version: 2.6
Date: 2016-04-23
Depends: R(>= 2.14.0), methods, graphics, setRNG(>= 2006.2-1), distr(>= 2.5.2)
Suggests: distrEx(>= 2.2)
Imports: startupmsg, stats, grDevices
LazyLoad: yes
License: LGPL-3
URL: http://distr.r-forge.r-project.org/
SVNRevision: 1090

Classes

“SeqDataFrame”
  slots: data(list[of dataframes with common column structure])

“Dataclass”
  slots: [<name>(<class>)]
    filename(vectororNULL),
    name(character),
    Data(ArrayorNULLorVectororDataFrameorSeqDataFrame),
    runs(numeric),
    samplesize(numeric),
    obsDim(numeric)

>“Simulation”
  (additional) slots: [<name>(<class>)]
    seed(list), distribution(Distribution)

>“Contsimulation”
  (additional) slots: [<name>(<class>)]
    seed(list), ind(vectororNULL), rate(numeric),
    distribution.id(Distribution),
    distribution.c(Distribution),
    Data.id(vectororNULL),
    Data.c(vectororNULL)

Methods

savedata Methods to save the data slot
  (for Simulation/Contsimulation)
simulate Methods to fill the data slot
  (for Simulation/Contsimulation)
plot-methods Methods for Function plot
  (for Simulation/Contsimulation)
print-, show-methods Methods for Function print/show
(for Simulation/Contsimulation)

summary-methods Methods for Function summary
(for Simulation/Contsimulation)

Functions

cload loads just the comment slot
(for Simulation/Contsimulation)

Slot accessors / -replacement functions

All slots are inspected / modified by corresponding accessors / -replacement functions, e.g. rate(X) for an object of class "Contsimulation".

Start-up-Banner

You may suppress the start-up banner/message completely by setting options("StartupBanner"="off") somewhere before loading this package by library or require in your R-code / R-session.

If option "StartupBanner" is not defined (default) or setting options("StartupBanner"=NULL) or options("StartupBanner"="complete") the complete start-up banner is displayed.

For any other value of option "StartupBanner" (i.e., not in c(NULL,"off","complete")) only the version information is displayed.

The same can be achieved by wrapping the library or require call into either suppressStartupMessages() or onlytypeStartupMessages(.,atypes="version").

Far-reaching Change in Design

From version 1.8 of this package on, we have changed the format how data / simulations are stored: In order to be able to cope with multivariate distributions, regression distributions and (later) time series distributions, we have switched to the common array format: samplesize x obsDim x runs; you may check the version under which an object was generated by getVersion; for saved objects from earlier versions, we provide the functions isOldVersion, and conv2NewVersion-methods to check whether the object was generated by an older version of this package and to convert such an object to the new format, respectively.

Start-up-Banner

You may suppress the start-up banner/message completely by setting options("StartupBanner"="off") somewhere before loading this package by library or require in your R-code / R-session.

If option "StartupBanner" is not defined (default) or setting options("StartupBanner"=NULL) or options("StartupBanner"="complete") the complete start-up banner is displayed.

For any other value of option "StartupBanner" (i.e., not in c(NULL,"off","complete")) only the version information is displayed.

As for general packageStartupMessage's, you may also suppress all the start-up banner by wrapping the library or require call into suppressPackageStartupMessages() from startupmsg-version 0.5 on.
Package versions

Note: The first two numbers of package versions do not necessarily reflect package-individual development, but rather are chosen for the distrXXX family as a whole in order to ease updating "depends" information.

Note

Global options controlling the plots and summaries of Dataclass and Simulation/Contsimulation objects may be inspected/set by distrSimoptions() and getdistrSimOption().

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References


A vignette for packages distr, distrSim, distrTEst, and distrEx is included into the mere documentation package distrDoc and may be called by require("distrDoc");vignette("distr").

A homepage to this package is available under
http://distr.r-forge.r-project.org/

See Also
distr-package setRNG

cload

description

loads the comment file from a saved Dataclass object

Usage

cload(filename)

Arguments

filename the filename which was declared at the instantiation of the Dataclass
Details

Uses function load to load the comment file from a saved Dataclass object.

Value

no value is returned

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See Also

Dataclass-class load savedata-methods

Examples

# see Dataclass and Evaluation for examples
## The function is currently defined as
function(filename){
    eval.parent(parse(text=paste("load("",filename",".comment""", sep = "")))
}

Description

In an object of type Contsimulation data can be simulated in any distribution and size. One part (usually the largest) of the random numbers stems from an ideal distribution, the rest from a contaminating distribution.

Objects from the Class

Objects can be created by calls of the form Contsimulation(filename, samplesize, runs, seed, distribution.id,distribution.c,rate,observation dimension is deduced from slot distribution.id). A Contsimulation-object includes a filename, the number of runs, the size of the sample, the seed, the distribution of the ideal and the contaminated data and the contamination rate. The slot Data stays empty until the method simulate has been used. The same goes for slots Data.id and Data.c.
Slots

ind: Object of class "MatrixorNULLorVector": Indicator of the same length as the data; saves whether each element of the data vector is contaminated or not

Data.id: Object of class "ArrayorNULLorVector": – the ideal data

Data.c: Object of class "ArrayorNULLorVector": – the contaminated data

rate: Object of class "numeric": the contamination rate, so the probability for each random number to be contaminated

distribution.c: Object of class "UnivariateDistribution": the distribution of the contaminated data

distribution.id: Object of class "UnivariateDistribution": the distribution of the contaminated data

seed: Object of class "list": the seed the simulation has been generated with

name: Object of class "character": a name for the Contsimulation

filename: Object of class "character": the filename the Contsimulation shall be saved

Data: Object of class "ArrayorNULLorVector": the simulated data

samplesize: Object of class "numeric": the size of the sample, so the dimension of the data

obsDim: Object of class "numeric": the observation dimension of the data

runs: Object of class "numeric": the number of runs of the data

Extends

Class "Dataclass", directly.

Methods

Data.c signature(object = "Contsimulation"): returns the contaminated data

Data.id signature(object = "Contsimulation"): returns the ideal data

Data<- signature(object = "Contsimulation"): ERROR: A modification of simulated data is not allowed.

filename signature(object = "Contsimulation"): returns the filename

filename<- signature(object = "Contsimulation"): changes the filename

name signature(object = "Contsimulation"): returns the name

name<- signature(object = "Contsimulation"): changes the name

distribution.c signature(object = "Contsimulation"): returns the distribution of the contaminated data

distribution.c<- signature(object = "Contsimulation"): changes the distribution of the contaminated data

distribution.id signature(object = "Contsimulation"): returns the distribution of the ideal data

distribution.id<- signature(object = "Contsimulation"): changes the distribution of the ideal data

seed signature(object = "Contsimulation"): returns the seed
Contsimulation-class

seed<- signature(object = "Contsimulation"): changes the seed

ind signature(object = "Contsimulation"): returns the indicator which saves which data is contaminated

initialize signature(.Object = "Contsimulation"): initialize method

rate signature(object = "Contsimulation"): returns the contamination rate

rate<- signature(object = "Contsimulation"): changes the contamination rate

obsDim signature(object = "Contsimulation"): returns the dimension of the observations

getVersion signature(object = "Contsimulation"): returns the version of this package, under which this object was generated

runs signature(object = "Contsimulation"): returns the number of runs

runs<- signature(object = "Contsimulation"): changes the number of runs

samplesize signature(object = "Contsimulation"): returns the size of the sample

samplesize<- signature(object = "Contsimulation"): changes the size of the sample

savedata signature(object = "Contsimulation"): saves the object without the data in the directory of R. (After loading the data can be reproduced by using simulate.)

simulate signature(x = "Contsimulation"): generates the random numbers for the simulation

plot signature(x = "Contsimulation"): produces a plot of the real data matrix; ; for details confer plot-methods

print signature(x = "Contsimulation"): returns filename, seed, the observation dimension, the number of runs, the size of the sample, the contamination rate and the distributions, and, if from a version > 1.8, also the package version under which the object was generated

summary signature(object = "Contsimulation"): returns filename, seed, number of runs, the size of the sample, the rate and a statistical summary for each run of the real data

Note

Changing distributions, seed, runs, samplesize or rate deletes possibly simulated data, as it would not fit to the new parameters.

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See Also

Dataclass-class Simulation-class savedata-methods plot-methods simulate-methods summary-methods getVersion-methods
Examples

```r
N <- Norm() # N is a standard normal distribution.
C <- Cauchy() # C is a Cauchy distribution
cs <- Contsimulation(filename = "csim",
  runs = 10,
  samplesize = 3,
  seed = setRNG(),
  distribution.id = N,
  distribution.c = C,
  rate = 0.1)
simulate(cs)
# Each of the 30 random numbers is ideal (N-distributed) with
# probability 0.9 and contaminated (C-distributed) with
# probability = 0.1
Data(cs)
Data.id(cs)
Data.c(cs)
ind(cs)
summary(cs)
Data(cs) # different data
savedata(cs) # saves the object in the working directory of R...
load("csim") # loads it again...
Data(cs) # ...without the data - use simulate to return it!
```

Data-methods

Methods for Function Data in Package ‘distrSim’

Description

Methods to access and change the Data-slot

Methods

- **Data** signature(object = "Dataclass"): returns the data
- **Data<-** signature(object = "Dataclass"): changes the data (does not work with a simulation or a contsimulation object)
- **Data<-** signature(object = "Simulation"): ERROR: A change of the data is not allowed.
- **Data<-** signature(object = "Contsimulation"): ERROR: A change of the data is not allowed.
### Data.c-methods

**Methods for Function Data.c in Package 'distrSim'**

**Description**

Data.c-methods

**Methods**

- `Data.c` signature(object = "Dataclass"): returns the contaminated data

### Data.id-methods

**Methods for Function Data.id in Package 'distrSim'**

**Description**

Data.id-methods

**Methods**

- `Data.id` signature(object = "Contsimulation"): returns the ideal data

### Dataclass

**Generating function for "Dataclass"**

**Description**

Generates an object of class "Dataclass".

**Usage**

```r
Dataclass(Data, ...)  
## S4 method for signature 'ArrayorNULLorVector'
Dataclass(Data, filename = NULL, name = "Data-Set")  
## S4 method for signature 'array'
Dataclass(Data, filename = NULL, name = "Data-Set")  
## S4 method for signature 'matrix'
Dataclass(Data, filename = NULL, name = "Data-Set")  
## S4 method for signature 'DataframeorSeqDataFrames'
Dataclass(Data, filename = NULL, name = "Data-Set")
```
Arguments

Data the data to be filled in
filename Object of class "character": the filename the data shall be saved
name Object of class "character": a name for the Data
... additional parameters.

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See Also

Dataclass-class

Dataclass-class Class "Dataclass"

Description

In an object of type "Dataclass" data can be saved containing any number of runs in any dimension. All information about the data is stored in a unified way.

Objects from the Class

Objects can be created by calls to the generating function, method Dataclass(Data, filename = "Data-set", name = "Data...

A Dataclass-object includes, aside from the actual data, a filename and the size of the sample, the observation dimension, and the number of runs, which give the number of rows and columns (and, if more than one run, slices) of the data array.

Slots

filename: Object of class "character": the filename the data shall be saved
name: Object of class "character": a name for the Data
Data: Object of class "ArrayorNULLorVectororDataFrameorSeqDataFrames": the actual data, either of type "NULL" (means no data) or "vector" or "array" or "Dataframe" or "SeqDataFrames"
obsdim: Object of class "numeric": the observation dimension of the data
runs: Object of class "numeric": the number of runs of the data
samplesize: Object of class "numeric": the size of the sample
version: Object of class "character": the package version under which this object was generated
Methods

**Data** signature(object = "Dataclass"): returns the actual data

**Data<-** signature(object = "Dataclass"): changes the data

**evaluate** signature(object = "Dataclass", estimator = "function"): creates an object of type "Evaluation", see there for further information

**filename** signature(object = "Dataclass"): returns the filename

**filename<-** signature(object = "Dataclass"): changes the filename

**name** signature(object = "Dataclass"): returns the name

**name<-** signature(object = "Dataclass"): changes the name

**initialize** signature(.Object = "Dataclass"): initialize method

**obsDim** signature(object = "Dataclass"): returns the dimension of the observations

**runs** signature(object = "Dataclass"): returns the number of runs

**samplesize** signature(object = "Dataclass"): returns the size of the sample

**getVersion** signature(object = "Dataclass"): returns the version slot of this object

**savedata** signature(object = "Dataclass"): saves the object in the directory of R and also a copy without data

**plot** signature(x = "Dataclass"): produces a plot of the data matrix; ; for details confer plot-methods

**print** signature(x = "Dataclass"): returns filename, the observation dimension, the number of runs and the size of the sample, and, if from a version > 1.8, also the package version under which the object was generated

**summary** signature(object = "Dataclass"): returns the same information as print, moreover a statistical summary for each run

Note

The saved Dataclass can be loaded with the usual load-command, the saved comment with the function cload.

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See Also

Simulation-class Contsimulation-class Evaluation-class plot-methods
print-methods summary-methods load cload savedata-methods getVersion-methods
distribution-methods

Examples

D66 <- DataClass(filename="N74", Data = matrix(1:36,6))
D66
#
D <- DataClass(Data = array(c(1,2,3,4,5,6),c(samplesize=2,obsdim=3,Runs=1)),
filename = "xyz.sav")
# A new object of type "Dataclass" is created.
#
isNewVersion(D) # NO!
#
savedata(D)
# creates a file called "xyz.sav" where the information is saved and a
# copy "xyz.sav.comment" without data
Data(D) <- array(c(11,12,13,14,15,16),c(samplesize=2,obsdim=3,Runs=1)) # changes the data of D
cload("xyz.sav") # loads the object without data - it is called "D.comment"
D.comment
load("xyz.sav") # loads the original object "D"
Data(D) # the original data: matrix(c(1,2,3,4,5,6),2)
#if you have distrTest available:
#evaluate(object = D, estimator = mean) # returns the mean of each variable

---

distribution-methods  Methods for Function distribution in Package ‘distrSim’

Description
distribution-methods

Methods
distribution signature(object = "Simulation"): returns the slot distribution of the simulation
distribution<- signature(object = "Simulation"): changes the slot distribution of the simulation

---

distribution.c-methods  Methods for Function distribution.c in Package ‘distrSim’

Description
distribution-methods


Methods

distribution.c  signature(object = "Contsimulation"): returns the distribution of the contaminated data
distribution.c<- signature(object = "Contsimulation"): changes the distribution of the contaminated data

distribution.id-methods

Methods for Function distribution.id in Package 'distrSim'

Description

distribution-methods

Methods

distribution.id  signature(object = "Contsimulation"): returns the distribution of the ideal data
distribution.id<- signature(object = "Contsimulation"): changes the distribution of the ideal data

distrSimMASK

Masking of/by other functions in package 'distrSim'

Description

Provides information on the (intended) masking of and (non-intended) masking by other other functions in package distrSim

Usage

distrSimMASK(library = NULL)

Arguments

library a character vector with path names of R libraries, or NULL. The default value of NULL corresponds to all libraries currently known. If the default is used, the loaded packages are searched before the libraries

Value

no value is returned
Author(s)

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Examples

distrSimMASK()

---

distrSimoptions functions to change the global variables of the package ‘distrSim’

Description

With distrSimoptions and getdistrSimOption you may inspect and change the global variables used by package `distrSim`.

Usage

```r
distrSimoptions(...) getdistrSimOption(x)
```

Arguments

- `...` any options can be defined, using `name = value` or by passing a list of such tagged values.
- `x` a character string holding an option name.

Details

Invoking `distrSimoptions()` with no arguments returns a list with the current values of the options. To access the value of a single option, one should use `getdistrSimOption("MaxNumberOfSummarizedRuns")`, e.g., rather than `distroptions("MaxNumberOfSummarizedRuns")` which is a `list` of length one.

Value

distrSimoptions() returns a list of the global options of `distrSim`.

distrSimoptions("MaxNumberOfSummarizedRuns") returns the global option `MaxNumberOfSummarizedRuns` as a list of length 1.

distrSimoptions("MaxNumberOfSummarizedRuns" = 3) sets the value of the global option `MaxNumberOfSummarizedRuns` to 3. `getdistrSimOption("MaxNumberOfSummarizedRuns")` the current value set for option `MaxNumberOfSummarizedRuns`. 
Currently available options

- **MaxNumberOfPlottedObs** maximal number of observation plotted; defaults to 4000
- **MaxNumberOfPlottedObsDims** maximal number of observation dimensions plotted in parallel; defaults to 6
- **MaxNumberOfPlottedRuns** maximal number of runs plotted in parallel; defaults to 6
- **MaxNumberOfSummarizedObsDims** maximal number of observation dimensions summarized in parallel; defaults to 6
- **MaxNumberOfSummarizedRuns** maximal number of runs summarized in parallel; defaults to 6

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See Also

- options,getOption, distroptions, getdistrOption

Examples

```r
distrSimoptions()
distrSimoptions("MaxNumberOfPlottedObsDims")
distrSimoptions("MaxNumberOfPlottedObsDims" = 5)
# or
getdistrSimOption("MaxNumberOfPlottedObsDims")
```

Description

filename-methods

Methods

- **filename** signature(object = "Dataclass"): returns the filename
- **filename<-** signature(object = "Dataclass"): changes the filename
Description

ind-methods

Methods

ind signature(object = "Contsimulation"): returns an indicator showing which data is contaminated

name-methods

Methods

name signature(object = "Dataclass"): returns the name

name<- signature(object = "Dataclass"): changes the name

obsDim-methods

Methods

obsDim signature(object = "Dataclass") or signature(object = "SeqDataFrames"): returns the number of obsDim
Methods

plot signature(x = "Dataclass", y = "missing"): produces a plot of the data matrix; optional arguments:

obs0 the indices of observations to be plotted; — of this vector runs0 maximally MaxNumberOfPlottedObs runs are plotted where MaxNumberOfPlottedObs is a global option, see distrSimoptions

runs0 the indices of runs to be plotted; — of this vector runs0 maximally MaxNumberOfPlottedRuns runs are plotted where MaxNumberOfPlottedRuns is a global option, see distrSimoptions

dims0 the indices of observation dimensions to be plotted; — of this vector dims0 maximally MaxNumberOfPlottedObsDims dimensions are plotted where MaxNumberOfPlottedObsDims is a global option, see distrSimoptions

typical plot arguments may be passed; some have slightly different meaning (compare plot.default):

ylim may be transmitted matrixwise (in a 2 x (number of dimensions) matrix)) or globally, using the usual recycling rules

col,cex,pch may be transmitted vectorwise (for the different dimensions) or globally, using the usual recycling rules

xlab,ylab,type are ignored

plot signature(x = "Simulation", y = "missing"): produces a plot of the data matrix; optional and typical plot arguments: as with signature(x = "Dataclass", y = "missing")

plot signature(x = "Contsimulation"): produces a plot of the real data matrix; optional arguments: as with signature(x = "Dataclass", y = "missing"); typical plot arguments may be passed; some have slightly different meaning (compare plot.default):

ylim as with signature(x = "Simulation", y = "missing") and signature(x = "Dataclass", y = "missing")

col,cex,pch are ignored

col.id,cex.id,pch.id as col,cex,pch for signature(x = "Dataclass", y = "missing") but only for ideal part of the data

col.c,cex.c,pch.c as col,cex,pch for signature(x = "Dataclass", y = "missing") but only for contaminated part of the data

xlab,ylab,type are ignored
**Methods for Function print/show in Package 'distrSim'**

**Description**

print and show - methods

**Methods**

- **print** signature(x = "SeqDataFrames"): extra argument short = FALSE; if TRUE the output is cut according to distrSimoptions.
- **print** signature(x = "Dataclass"): returns name, filename, the observation dimension, the number of runs and the size of the sample, and, if from a version > 1.8, also the package version under which the object was generated.
- **print** signature(x = "Simulation"): as for signature(x = "Dataclass") and, additionally, seed and the distribution.
- **print** signature(x = "Contsimulation"): as for signature(x = "Dataclass") and, additionally, seed, the contamination rate and the distributions.
- **show** signature(x = "Dataclass").signature(x = "Simulation").signature(x = "Contsimulation").signature(x = "SeqDataFrames"): as corresponding print method.

---

**Methods for Function rate in Package 'distrSim'**

**Description**

rate-methods

**Methods**

- **rate** signature(object = "Contsimulation"): returns the contamination rate.
- **rate<-** signature(object = "Contsimulation"): modifies the contamination rate.
Method for Function `runs` in Package `distrSim`

**Description**

`runs`-methods

**Methods**

- `runs` signature(object = "SeqDataFrames"): returns the number of runs
- `runs` signature(object = "Dataclass"): returns the number of runs
- `runs<-` signature(object = "Simulation"): changes the number of runs
- `runs<-` signature(object = "Contsimulation"): changes the number of runs

Method for Function `samplesize` in Package `distrSim`

**Description**

`samplesize`-methods

**Methods**

- `samplesize` signature(object = "SeqDataFrames"): returns the size[s] of the sample[s]
- `samplesize` signature(object = "Dataclass"): returns the size of the sample
- `samplesize<-` signature(object = "Simulation"): changes the size of the sample
- `samplesize<-` signature(object = "Contsimulation"): changes the size of the sample

Method for Function `savedata` in Package `distrSim`

**Description**

`savedata`-methods

**Methods**

- `savedata` signature(object = "Dataclass"): saves the object (with the data) in the directory of R
- `savedata` signature(object = "Simulation"): saves the object without the data in the directory of R (After loading the data can be reproduced by using simulate.)
- `savedata` signature(object = "Contsimulation"): saves the object without the data in the directory of R (After loading the data can be reproduced by using simulate.)
seed-methods

Note
For an example, see Simulation-class and Contsimulation-class

See Also
Dataclass-class Simulation-class Contsimulation-class Evaluation-class

seed-methods

Methods

seed signature(object = "Simulation"): returns the slot seed of an object of class "Simulation"

seed<- signature(object = "Simulation"): changes the slot seed of an object of class "Simulation"

seed signature(object = "Contsimulation"): returns the slot seed of an object of class "Contsimulation"

seed<- signature(object = "Contsimulation"): changes the slot seed of an object of class "Contsimulation"

Note
The value to which the seed is set has to be consistent with the setRNG-package; to draw a “new” simulation, use something like seed(X)<-setRNG(); simulate(X); cf. manual to this package, p.~9

SeqDataFrames-class

Class "SeqDataFrames"

Description
An object of type "SeqDataFrames" is a list of data frames, all of which with the same numbers and names of columns (ideally with the same data-types for the columns), but with possibly varying number of rows; with correponding index operators it behaves like a three-dimensional array with dimensions sample size x observation dimension x runs.

Details
There is a validity method checking for each member of the list being a data frame and for the accordance of the column structures of the data frames.
Objects from the Class

Objects can be created by calls of the form `SeqDataFrames(...)`, where the ... are a list of dataframes with according column structure.

Slots

- data: a list of data frames

Methods

- `[]` signature(x = "SeqDataFrames"): returns (slices of) the data
- `[<` signature(x = "SeqDataFrames"): modifies (slices of) the data
- `print` signature(x = "SeqDataFrames", obs0 = NULL, dims0 = NULL, runs0 = NULL, short = FALSE): slices can be printed and, if argument short = TRUE only a bounded number of dimensions is shown.
- `show` signature(object = "SeqDataFrames"): a call to `print(x)`
- `names` signature(x = "SeqDataFrames"): returns the names of the runs
- `runnames` signature(x = "SeqDataFrames"): returns the names of the runs
- `obsdimnames` signature(x = "SeqDataFrames"): returns the names of the observation dimensions
- `obsDim` signature(x = "SeqDataFrames"): returns the dimension of the observations
- `runs` signature(x = "SeqDataFrames"): returns the number of runs
- `samplesize` signature(x = "SeqDataFrames"): returns the size of the samples for each run
- `rbind` signature(x = "SeqDataFrames"): concatenates different a list of SeqDataFrames object (with the same column structure) to a new object of class SeqDataFrames to do so we mask the rbind method from package `base`

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See Also

- `[-methods print-methods summary-methods`
simulate-methods

Methods

simulate signature(object = "Simulation"): generates the random numbers for the simulation

simulate signature(object = "Contsimulation"): generates the random numbers for the simulation

Simulation-class

Class "Simulation"

Description

In an object of type Simulation data can be simulated in any distribution and size.

Objects from the Class

Objects can be created by calls of the form Simulation(filename, samplesize, runs, seed, distribution) (observation dimension is deduced from slot distribution). A Simulation-object includes a filename, a name for the simulation, the number of runs, the size of the sample, the seed and the distribution of the random numbers. The slot Data stays empty until the method simulate has been used.

Slots

seed: Object of class "list": the seed the simulation has been generated with
distribution: Object of class "UnivariateDistribution": the distribution of the random numbers
filename: Object of class "character": the filename the simulation shall be saved
name: Object of class "character": a name for the Simulation
Data: Object of class "ArrayorNULLorVector": the simulated data
samplesize: Object of class "numeric": the size of the sample
obsDim: Object of class "numeric": the dimension of the observations of the datauns: Object of class "numeric": the number of runs of the data
version: Object of class "character": the version of this package, under which this object was generated
Extends

Class "Dataclass", directly.

Methods

- **Data** signature(object = "Simulation"): returns the simulated data.
- **Data<-** signature(object = "Simulation"): ERROR: A modification of simulated data is not allowed.
- **filename** signature(object = "Simulation"): returns the the filename
- **filename<-** signature(object = "Simulation"): changes the the filename
- **name** signature(object = "Simulation"): returns the the name
- **name<-** signature(object = "Simulation"): changes the the name
- **distribution** signature(object = "Simulation"): returns the distribution
- **distribution<-** signature(object = "Simulation"): changes the distribution
- **seed** signature(object = "Simulation"): returns the seed
- **seed<-** signature(object = "Simulation"): changes the seed
- **obsDim** signature(object = "Simulation"): returns the dimension of the observations
- **getVersion** signature(object = "Simulation"): returns the version of this package, under which this object was generated
- **runs** signature(object = "Simulation"): returns the number of runs
- **runs<-** signature(object = "Simulation"): changes the number of runs
- **samplesize** signature(object = "Simulation"): returns the size of the sample
- **samplesize<-** signature(object = "Simulation"): changes the size of the sample
- **savedata** signature(object = "Simulation"): saves the object without the data in the directory of R (After loading the data can be reproduced by using simulate.)
- **initialize** signature(.Object = "Simulation"): initialize method
- **plot** signature(x = "Simulation"): produces a plot of the data matrix; for details confer **plot-methods**
- **print** signature(x = "Simulation"): returns filename, seed, the observation dimension, the number of runs, the size of the sample, the distribution generating the simulations, and, if from a version > 1.8, also the package version under which the object was generated
- **show** signature(x = "Simulation"): the same as print.
- **simulate** signature(x = "Simulation"): generates the random numbers for the simulation
- **summary** signature(object = "Simulation"): returns filename, seed, number of runs, the size of the sample and a statistical summary for each run

Note

Changing distribution, seed, runs or samplesize deletes possibly simulated data, as it would not fit to the new parameters.
**Subsetting-methods**

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**See Also**

Dataclass-class Contsimulation-class plot-methods print-methods summary-methods simulate-methods
getVersion-methods

**Examples**

N=Norm() # N is a standard normal distribution.
S=Simulation(filename="xyz",runs=10,samplesize=3,seed=setRNG(),distribution=N)
Data(S) # no data yet
simulate(S)
Data(S) # now there are random numbers
Data(S) # the same data as before because the seed has not changed
seed(S)=setRNG()
simulate(S)
Data(S) # different data
savedata(S) # saves the object in the directory of R...
load("xyz") # loads it again...
Data(S) # ...without the data - use simulate to return it!

---

**Subsetting-methods**

*Subsetting/Indexing methods for SeqDataFrames objects in Package `distrSim`*

**Description**

Operators acting on SeqDataFrames objects to extract or replace parts.

**Usage**

```r
## S4 method for signature 'SeqDataFrames'
x[i, j, k, drop = FALSE]

## S4 replacement method for signature 'SeqDataFrames'
x[i, j, k] <- value
```

**Arguments**

- `x` object of class SeqDataFrames from which to extract element(s) or in which to replace element(s).
- `i` observation index; may be missing
- `j` observation dimension index; may be missing
summary-methods

Methods

"[" signature(x = "SeqDataFrames"): access method for indices for objects of class SeqDataFrames
"[<-"] signature(x = "SeqDataFrames"): replacement method for indices for objects of class
SeqDataFrames

See Also

"["

Examples

s0 <- matrix(1:6,3,2)
d0 <- data.frame(s0)
d1 <- data.frame(s0 + 3)
SF <- SeqDataFrames(d0, d1)
SF[1,2,1]

Methods

summary signature(object = "Dataclass"): returns the same information as print, moreover
a statistical summary for each run; optional arguments:

runs0 the indices of runs to be summarized; — of this vector runs0 maximally MaxNumberofSummarizedRuns
runs are summarized where MaxNumberofSummarizedRuns is a global option, see distrSimoptions
dims0 the indices of observation dimensions to be summarized; — of this vector dims0 maxi-

mally MaxNumberofSummarizedObsDims dimensions are summarized where MaxNumberofSummarizedObsDims
is a global option, see distrSimoptions

summary signature(object = "Simulation"): returns name, filename, seed, number of runs,
the size of the sample and a statistical summary for each run; optional arguments: as with
signature(object = "Dataclass")

summary signature(object = "Contsimulation"): returns name, filename, seed, number of runs,
the size of the sample, the rate and a statistical summary for each run of the real data;
optional arguments: as with signature(object = "Dataclass")
Classes "vectororNULL", "MatrixorNULLorVector", "ArrayorNULL-LorVectororDataframeorSeqDataFrame" and "ArrayorNULLorVectororDataframeorSeqDataFrames"

Description

auxiliary classes; may contain either a vector or NULL, [or a matrix, or an array, respectively], cf. J. Chambers, "green book".

Objects from the Classes

these classes are all virtual: No objects may be created from it.

Methods

No methods defined with classs "vectororNULL", "MatrixorNULLorVector", and "ArrayorNULL-LorVectororDataframeorSeqDataFrames" in the signature. However, the generating function Dataclass dispatches according to "DataframeorSeqDataFrames" or "ArrayorNULLorVector".

Note

Dataclass-class can save data either of type "NULL" (means no data) or "vector" or "array" or "data.frame"

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See Also

Dataclass-class

Version Management

Methods for Version Management in Package ‘distrSim’

Description

Version-Management-methods
Usage

```r
## S4 method for signature 'Dataclass'
getVersion(object)
## S4 method for signature 'Dataclass'
conv2NewVersion(object)
```

Arguments

- `object`: object of class "Dataclass" (or subclasses)

Far-reaching Change in Design

From version 1.8 of this package on, we have changed the format how data / simulations are stored: In order to be able to cope with multivariate distributions, regression distributions and (later) time series distributions, we have switched to the common array format: samplesize x obsDim x runs; for saved objects from earlier versions, we provide the functions `isOldVersion` (from package `distr`) and `conv2NewVersion` to check whether the object was generated by an older version of this package and to convert such an object to the new format, respectively.

Methods

- `getVersion` signature(`object = "Dataclass"`): returns slot `version` of an object of class "Dataclass".
- `conv2NewVersion` signature(`object = "Dataclass"`): changes an object with format `runs x samplesize` (old format) to `samplesize x obsDim x runs` (new format)

See Also

- `isOldVersion`, `conv2NewVersion`
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