

sprof reference

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Type Package

Title Profiling, timing and optimization utilitites

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Description Support utilities for profiling and dynamic code analysis.

License GPL-2 | GPL-3

Suggests wordcloud, timeit, RColorBrewer

URL <http://sintro.r-forge.r-project.org>

ByteCompile FALSE

KeepSource TRUE

BuildVignettes FALSE

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sprof-package	<i>sprof: Analysis of R profiles</i>
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Description

Profiling, timing and optimization utilitites

Details

Package: sprof
 Type: Package
 Version: 0.0-6
 Date: 2013-08-02
 License: GPL-2 | GPL-3

[readRprof\(\)](#) reads a profile file from [Rprof\(\)](#) or other profilers and returns a composite structure of class sprof. The basic components of sprof are (conceptually) four data frames

info	general information and summaries
nodes	node specific information
stacks	node specific information. Stacks are random snapshots from the program execution, possibly including side in
profiles	collected records of a profile, encoded as references to stacks

To create a profile on the fly, use [sampleRprof](#).

To import profile information written by [Rprof](#) or other profilers, use [readRprof](#).

For sprof, the usual access functions are supported.

Note

Version 0.0-6 is a clean-up version. Recommendations/requests for the interface definition are requested at this point.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

Examples

```
## Not run:
data(sprof01lm)
str(sprof01lm)
plot(sprof01lm)

## End(Not run)
```

adjacency	<i>sprof to adjacency matrix</i>
-----------	----------------------------------

Description

convert node information from a sprof structure to adjacency matrix.

Usage

```
adjacency(sprof, keep.names = TRUE, rmzero=TRUE, no.name="<nn>")
```

Arguments

sprof	a sprof structure.
keep.names	boolean. Copy node names as row- and column names.
rmzero	boolean. Remove nodes with no edges.
no.name	If not null: replacement for empty strings as name.

Value

a correspondence matrix

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

References

See the vignette of package sprof.

Examples

```
data(sprof01lm)
adjacency(sprof01lm)
```

barplot_s

*Sorted Bar Plots***Description**

Creates a sorted bar plot with vertical or horizontal bars.

Usage

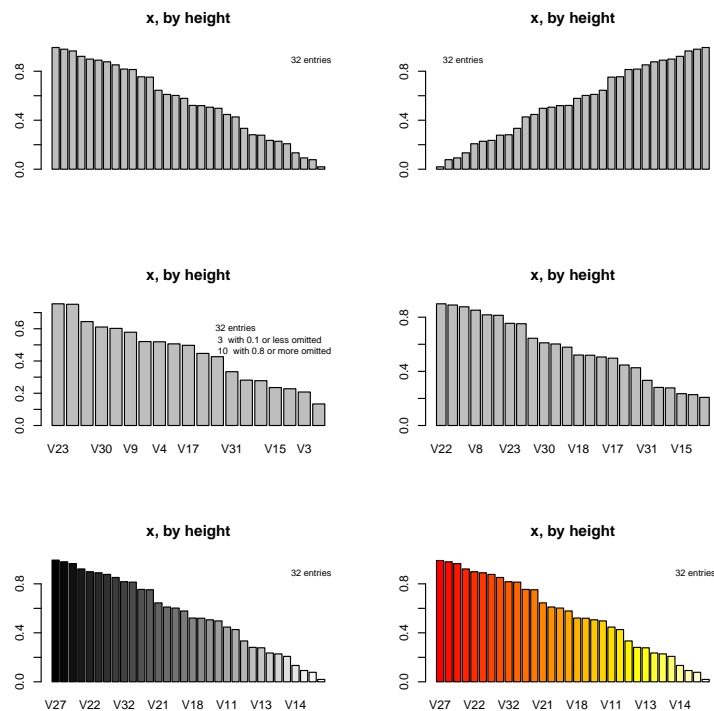
```
barplot_s(height,
sort_by,
decreasing = TRUE,
lowtrim, hightrim, trimlegend = TRUE,
col, coli, colfun,
main, ...)
```

Arguments

height	either a vector or matrix of values describing the bars which make up the plot. See barplot .
sort_by	a variable to sort by. Defaults to height.
decreasing	boolean. Sorting direction.
lowtrim	A optional lower trim value. Observations with sort_by values up to lowtrim are discarded.
hightrim	A optional upper trim value. Observations with sort_by values from lowtrim are discarded.
trimlegend	Boolean. Show a legend about trimmed values.
col	a vector of colors for the bars or bar components. By default, grey is used if height is a vector, and a gamma-corrected grey palette if height is a matrix.
coli	An index into the col table, based on original sorting.
colfun	A function to generate a col palette. grey is rescaled to 1..n.
main	overall title for the plot
...	Passed to barplot

Details

To come. Plots are from this collection:



Value

Invisible: A data frame with components

x	height
perm	the permutation applied
coli	the colour index applied
col	optional: the colours selected

Note

Part of this could go to the R base function [barplot](#).

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

See Also

[barplot](#)

Examples

```
x <- runif(100)

barplot_s(x)

x <- rnorm(100)
```

```
barplot__(x, colfun=heat.colors, lowtrim=-1)

rm(x)
```

edgematrix	<i>Expand adjacency information to an edge table</i>
------------	--

Description

Expand adjacency information from an adjacency matrix or a sprof data structure to an edge table

Usage

```
edgematrix(data, counts = TRUE, na.rm = TRUE, no.name="<nn>")
```

Arguments

data	an adjacency matrix or a sprof data structure.
counts	include a column of counts
na.rm	remove lines with a count NA.
no.name	If not null: replacement for empty strings as name.

Details

The adjacency matrix is flattened. Lines with a count zero are eliminated.

Value

A data frame.

from	Name of from node.
to	Name of to node.
count	optional. Frequencies of edges.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

list.as.matrix	<i>Convert list to matrix</i>
----------------	-------------------------------

Description

Convert list to matrix. List entries go to matrix columns, filled for equal length.

Usage

```
list.as.matrix(x, filler = NA)
```

Arguments

x	a list of numeric vectors.
filler	a value to be used as a filler

Value

A matrix with the values from x, filled to matrix shape.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

Examples

```
x <- list(x1=c(1,2,3),x2=3, x3=4:8)
list.as.matrix(x)
list.as.matrix(x,filler=0)
```

nodepackage	<i>Find a package that may contain a node</i>
-------------	---

Description

[getAnywhere\(\)](#) is used to look up x, and the package or namespace information is used to give a source package.

Usage

```
nodepackage(x)
```

Arguments

x	a character string or name, or a vector.
---	--

Details

There is no indication whether the information is from a namespace or from a package information.

No indication is given if multiple hits are encountered.

The information is based on the run time environment of this function. This may be different from the environment the object is taken from.

See the help information for [getAnywhere\(\)](#) for more warnings.

Value

a character string or a vector of strings with the package names.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

See Also

[getAnywhere\(\)](#)

Examples

```
nodepackage("getAnywhere")
```

nodescloud	<i>Nodescloud of nodes from profile data</i>
------------	--

Description

Show the nodes from a profile, with class encoded as colour and frequency encoded as size.

Usage

```
nodescloud(sprof, min.freq = 3, icol, col)
```

Arguments

sprof	A data structure as returned by readRprof .
min.freq	Minimum frequency to be included.
icol	An index vector to colour palette. Defaults to <code>sprof\$nodes\$icol</code> .
col	A colour palette.

nodesprofile

Run length matrix

Description

Extracts run length information from a sprof data structure with profiling information.

Usage

```
nodesprofile(sprof)
```

Arguments

sprof a sprof data structure with profiling information.

Details

Run lenght counts by node, level and run length.

Value

counts[node, level, run length] .

Note

This expands a sparse matrix to full. Avoid to use it.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

Examples

```
data(sprof01lm)
str(nodesprofile(sprof01lm) )
```

nodesrunlength

Marginal information for run length from profile

Description

Run length count, by node and run lenght, from profile.

Usage

```
nodesrunlength(sprof, clean=TRUE)
```

Arguments

sprof	a sprof data structure with profiling information.
clean	boolean.

Details

If clean=TRUE, zero results are removed and the nodes are sorted by average time.

If clean=TRUE, zero results and sorting are preserved. Trailing zero count nodes may have been lost in the process, and are added.

Value

A matrix count[node, run length] with additional columns

nr_runs	sum of counts over all run lengths.
total_time	sum of count*run length
avg_time	total_time / count

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

Examples

```
data(sprof01lm)
nodesrunlength(sprof01lm)
```

plot.sprof	<i>plot for profiles</i>
------------	--------------------------

Description

plot a plot for the output of class scode.

Usage

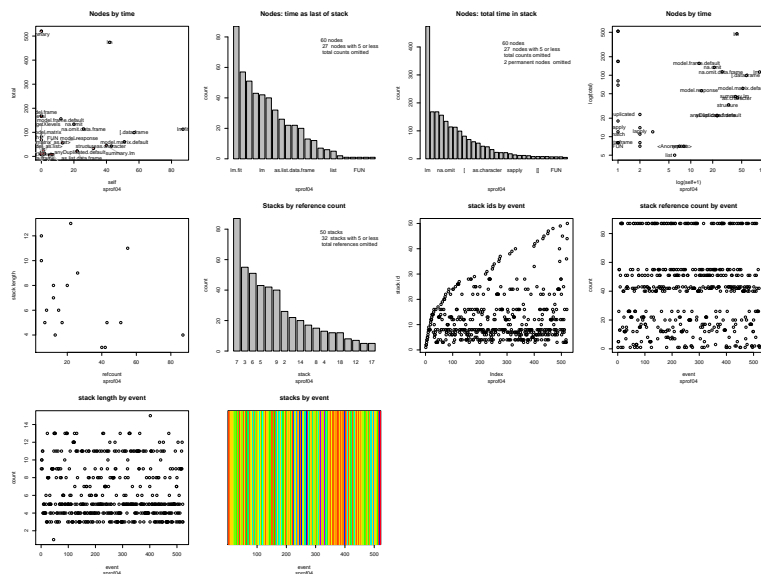
```
## S3 method for class 'sprof'
plot(x, ...)
```

Arguments

x	A data structure as returned by readRprof .
...	further arguments passed to or from other methods.

Details

These displays may be outdated. Please run the examples. Plots are from this collection:



Value

subject to change

Note

See the vignette for in-context explanations.

Displays of the graph structure are given in the vignette.

The plot.sprof method for sprof objects concatenates three plot functions. Using the plot functions one by one allows better control and will be preferred. [shownodes](#) may be a sufficient summary.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

References

<http://sintro.r-forge.r-project.org/>

See Also

[shownodes](#)

[summaryRprof](#)

[plot_nodes](#) [plot_stacks](#) [plot_profiles](#)

Examples

```
data(sprof01lm)
```

```
oldpar <- par(mfrow=c(3,4))
plot.sprof(sprof01lm)
```

```
par(oldpar)
```

plot_nodes	<i>Plot profiling information on node level.</i>
------------	--

Description

Various plots of a profile.

Usage

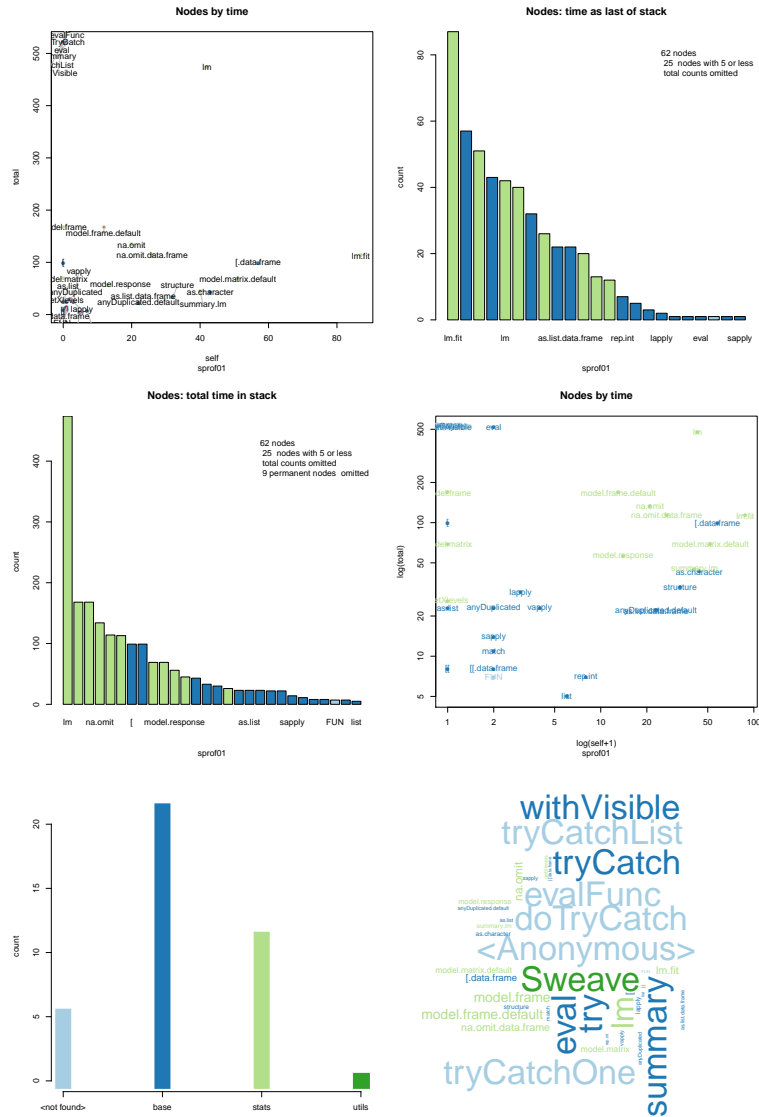
```
plot_nodes(x, which = c(1L, 2L, 3L, 4L), col = NULL,
  ask = prod(par("mfcol")) < length(which) && dev.interactive(),
  src = NULL, mincount = 5, horiz=FALSE, ...)
```

Arguments

x	preferably a sprof object. Other data structures may be extended
which	Selector of plots to show.
col	Colour table
ask	boolean. Ask for a new page?
src	String to be used as source identifier.
mincount	minimum total frequency count for node to be shown in barcharts.
horiz	draw horizontal bar plots.
...	passed.

Details

These displays may be outdated. Please run the examples. Plots are from this collection:



Value

To come.

Note

See the vignette of package spr0f.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

References

See the vignette of package spr0f.

See Also[plot.sprof](#)**Examples**

```
data(sprof01lm)
oldpar <- par(mfrow=c(2,2))
plot_nodes(sprof01lm)
par(oldpar)
```

plot_profiles	<i>Plot profiling information on profile level.</i>
---------------	---

Description

Various plots of a profile.

Usage

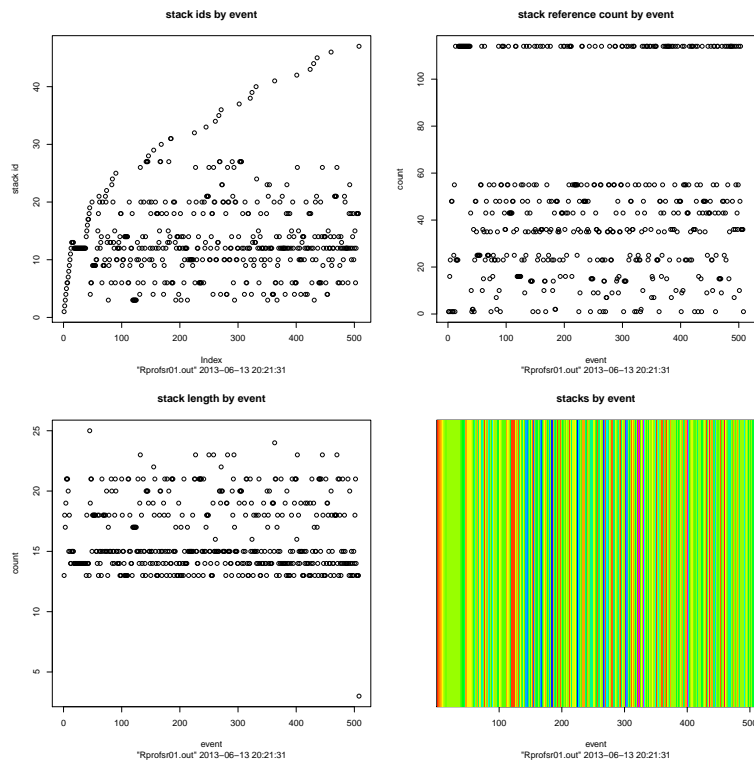
```
plot_profiles(x, which = c(1L, 2L, 3L, 4L), col,
ask = prod(par("mfcol")) < length(which) && dev.interactive(),
src = NULL, ...)
```

Arguments

x	preferably a sprof object. Other data structures may be extended
which	Selector of plots to show.
col	Colour table
ask	boolean. Ask for a new page?
src	String to be used as source identifier.
...	passed.

Details

Plots are from this collection:



Note

See the vignette of package sprof.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

References

See the vignette of package sprof.

See Also

[plot.sprof](#).

Examples

```
data(sprof01lm)
oldpar <- par(mfrow=c(2,2))
plot_profiles(sprof01lm)
par(oldpar)
```


plot_stacks

*Plot profiling information on stack level.***Description**

Various plots of a profile.

Usage

```
plot_stacks(x, which = c(1L, 2L),
ask = prod(par("mfcol")) < length(which) && dev.interactive(),
src = NULL, mincount = 5, horiz = FALSE, ...)
```

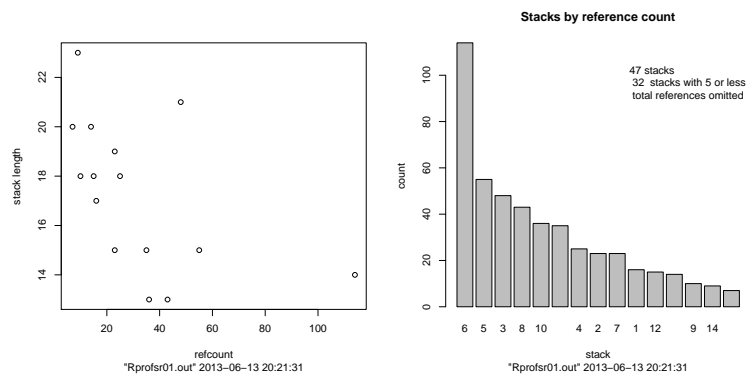
Arguments

x	preferably a sprof object. Other data structures may be extended
which	Selector of plots to show.
ask	boolean. Ask for a new page?
src	String to be used as source identifier.
mincount	minimum total frequency count for stack to be shown in barcharts.
horiz	draw horizontal bar plots.
...	passed.

Details

Note: these figures may be outdated. Please run the examples.

Plots are from this collection:

**Value**

To come.

Note

See the vignette of package sprof.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

References

See the vignette of package sprof.

See Also

[plot.sprof](#).

Examples

```
data(sprof01lm)
oldpar <- par(mfrow=c(2,2))
plot_stacks(sprof01lm)
par(oldpar)
```

print.sprof

print for profiles

Description

Print a print for the output of class scode.

Usage

```
## S3 method for class 'sprof'
print(x, ...)
```

Arguments

x	A data structure as returned by readRprof .
...	further arguments passed to or from other methods.

Value

None.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

References

<http://sintro.r-forge.r-project.org/>

See Also

[summaryRprof](#) [plot.sprof](#)

Examples

```
data(sprof01lm)
print(sprof01lm)
```

print_profiles	<i>Print profile information</i>
----------------	----------------------------------

Description

Print profile information.

Usage

```
print_profiles(x)
```

Arguments

x a sprof data structure.

Value

none

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

Examples

```
data(sprof01lm)
print_profiles(sprof01lm)
```

profiles_matrix	<i>Extract a node incidence matrix from profile information.</i>
-----------------	--

Description

Extract a node incidence matrix from profile information.

Usage

```
profiles_matrix(x)
```

Arguments

x an sprof data structure.

Value

an incidence matrix, NA filled.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

Examples

```
data(sprof01lm)
smat <- profiles_matrix(sprof01lm)
image(smat)
```

readRprof

Read [Rprof](#) Output files and Stack Logs

Description

Read a log of stack entries, such as the output of the [Rprof](#) function, and generate a more accessible representation.

Usage

```
readRprof(filename = "Rprof.out", chunksize = 5000,
interval = 0.02,
head = c("auto", "none", "Rprofmem"),
id = NULL)
```

Arguments

filename	Name of a file produced by <code>Rprof()</code> .
chunksize	Number of lines to read at a time.
interval	Real number: time interval between samples, in s. Defaults to 0.02s for consistency with <code>Rprof</code> , but shorter times should be used.
head	<code>c("auto", "none", "Rprofmem")</code> to interpret control information as provided by <code>Rprof</code> or <code>Rprofmem</code> . See details.
id	An optional identification string. Defaults to filename and date.

Details

This function reads a log file of stacks, one stack snapshot per line, stack entries separated by space.

As profiling output file could be very large, it is read in blocks of chunksize lines. Increasing chunksize will make the function run faster if sufficient memory is available.

(This data structure is subject to change.)

The input format is controlled by the head argument. Format "auto" tries to detect control lines as interspersed by `Rprof`. These lines are not included in the output.

"none" ignores all control information and includes these lines as strange stacks.

"Rprofmem" isolates headers as provided by `Rprofmem`. new page entries are encoded as malloc requests with length 0.

Value

This data structure is subject to change.

Temporarily: A list with components

info	Summary information.
nodes	A vector of node names. This may include stray entries from interspersed lines.
stacks	Stacks, represented as reference list to nodes, and stack frequencies.
profiles	Recorded data, as reference to stacks, and possibly additional data per reference.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>, based on the code of [summaryRprof](#)

References

<http://sintro.r-forge.r-project.org/>

See Also

[summaryRprof](#)

[summaryRprof](#)

[flatProfile](#) in library(proftools).

[parse_rprof](#) in library(profr).

The chapter on “Tidying and profiling R code” in “Writing R Extensions” (see the ‘doc/manual’ subdirectory of the R source tree).

[Rprof](#) is a sampling profiler.

[tracemem](#) traces copying of an object via the C function duplicate.

[Rprofmem](#) is a non-sampling memory-use profiler.

<http://developer.r-project.org/memory-profiling.html>

Examples

```
## Not run:
## Rprof() is not available on all platforms
profinterval <- 0.001
simruns <- 100

n <- 10000
x <- runif(n)
y0 <- 2 + 3 * x

sinknull <- textConnection(NULL, "w"); sink(sinknull)
Rprof(tmp <- tempfile(), interval = profinterval)
for (i in 1:simruns) {y <- y0 + rnorm(n); xxx<- summary(lm(y~x))}
Rprof()

Rprof_out <- readRprof(tmp)

unlink(tmp)
sink(); close(sinknull)
```

```
str(Rprof_out)
## End(Not run)
```

rkindex	<i>Index, based on rank.</i>
---------	------------------------------

Description

Convert x to an index in $1 \dots \text{maxindex}$

Usage

```
rkindex(x, maxindex = length(x), pwr = 1, ties.method = "random")
```

Arguments

<code>x</code>	A vector of data to covert.
<code>maxindex</code>	Maximum for result
<code>pwr</code>	See details.
<code>ties.method</code>	passed to rank.

Details

x is transformed to a rank scale, using `ties.method`. It is then rescaled to $[0,1]$, and (optionally) a power transformation is applied. In visualisation terms, this is a gamma correction. The result is rescaled to $1 \dots \text{maxindex}$.

Value

A vector of rescaled values.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

rrle	<i>Recursive run length encoding.</i>
------	---------------------------------------

Description

Encode a matrix as run-length, top down. Encoding respects previous runs, e.g line 2 encodes runs in each run of line 1.

Usage

```
rrle(x, collapseNA = FALSE)
```

Arguments

`x` a matrix.

`collapseNA` boolean. Collapse runs of NA.

Details

By default, different NA data are not considered equal. `collapseNA` collapses runs of NA in the result. For recursion however they are treated as singular data, not as runs. This may need discussion.

Value

list of run length encoded lines

Note

This could go to `rle` in package `base`.

The data structure used for `rle` would be better represented as a `data.frame`.

Run length and other compressions might be implemented in `data.frames` by default.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

See Also

[rrleb](#)

Examples

```
x <- matrix(c(
  1,1,1,2,2,
  3,3,4,4,4,
  5,5,6,6,7,
  8,9,9,0,0
),nrow=4, ncol =5, byrow=TRUE)
xrrle <- rrle(x)
xrrle

t(sapply(xrrle, inverse.rle))
```

rrleb

Recursive run length encoding bottom up.

Description

Encode a matrix as run-length, bottom up. Encoding respects previous runs, e.g line `n-1` encodes runs in each run of line `n`.

May be removed.

Usage

```
rrleb(x)
```

Arguments

x a matrix.

Value

list of run length encoded lines

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

See Also

[rle](#),

Examples

```
x <- matrix(c(
  3,3,4,4,4,
  5,5,6,6,7,
  8,9,9,0,0,
  1,1,1,2,2
),nrow=4, ncol =5, byrow=TRUE)
xrrleb <- rrleb(x)
xrrleb

t(sapply(xrrleb, inverse.rle))
```

sampleRprof

Get a sample profile

Description

Get a sample profile and return it as a sprof data structure.

Usage

```
sampleRprof(expr, runs = NULL, gcFirst = TRUE, interval = 0.001, ...)
```

Arguments

expr	an expression to be profiled.
runs	nr of runs to profile.
gcFirst	boolean. Profile GC.
interval	Real: time interval between samples, in s.
...	additional parameters, passed to Rprof

Value

A list of type sprof

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

References

<http://sintro.r-forge.r-project.org/>

Examples

```
res_lm <- sampleRprof(for (i in 1:1000) yy<- lm(runif(1000)~rnorm(1000)), runs=100)
```

shownodes

Show node information from a profile

Description

Plot node information from a profile in various plots.

Usage

```
shownodes(sprof, col)
```

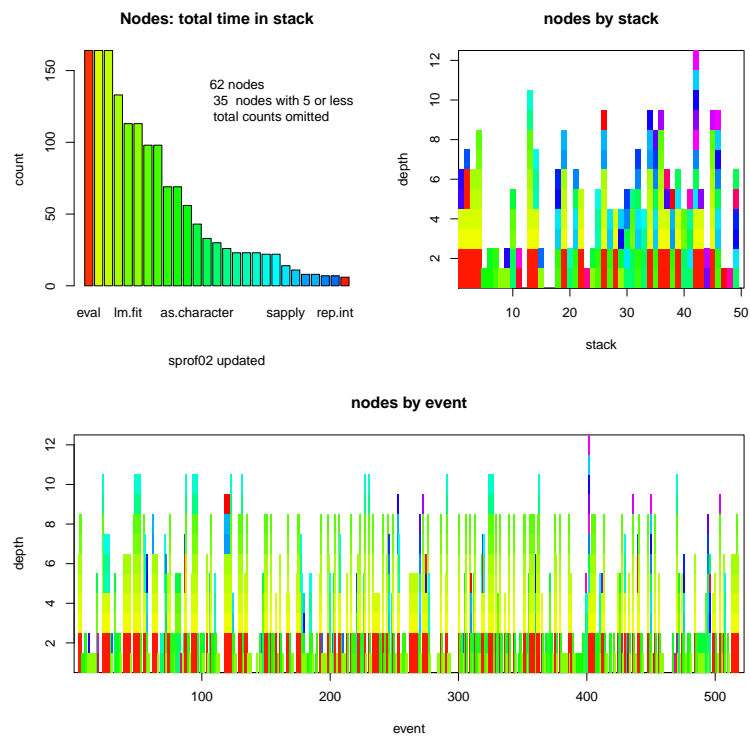
Arguments

sprof	A data structure as returned by readRprof .
col	A colour palette for the plots.

Details

Note: these figures may be outdated. Please run the examples.

Plots are from this collection:



Value

Used for the side effect of showing the plots.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

Examples

```
## Not run:
data(sprof011m)
shownodes(sprof011m)

## End(Not run)
```

sprof011m

sprof sample data

Description

An example data set for the functions in package sprof.

Usage

```
data(sprof011m)
```

Format

The format is: A List of 4 \$ info : 'data.frame': 1 obs. of 8 variables: \$ nodes : 'data.frame': 62 obs. of 5 variables: \$ stacks : 'data.frame': 50 obs. of 7 variables: \$ profiles: List of 4

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

References

See the vignette of package sprof.

Examples

```
data(sprof01lm)
str(sprof01lm)
plot(sprof01lm)
```

stackstoadj	<i>Stacks to adjacency matrix</i>
-------------	-----------------------------------

Description

convert stack information to adjacency matrix

Usage

```
stackstoadj(xstacks, xfreq, maxnode)
```

Arguments

xstacks	list of stack ids
xfreq	vector of frequencies or weights
maxnode	maximum of nodes (maybe higher then in stacks)

Value

the adjacency matrix

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

Examples

```
#
```

str_prof	<i>str for sprof objects</i>
----------	------------------------------

Description

str for sprof objects

Usage

```
str_prof(x)
```

Arguments

x an sprof object

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

Examples

```
data(sprof01lm)
str_prof(sprof01lm)
```

summary.sprof	<i>Summary for profiles</i>
---------------	-----------------------------

Description

Print a summary for the output of class scode.

Usage

```
## S3 method for class 'sprof'
summary(object, ...)
```

Arguments

object A data structure as returned by [readRprof](#).
 ... further arguments passed to or from other methods.

Value

None.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

References

<http://sintro.r-forge.r-project.org/>

See Also

[summaryRprof](#)

Examples

```
## Not run:
## Rprof() is not available on all platforms
profininterval <- 0.001
simruns <- 100

n <- 10000
x <- runif(n)
y0 <- 2 + 3 * x

sinknull <- textConnection(NULL, "w"); sink(sinknull)
Rprof(tmp <- tempfile(), interval = profinterval)
for (i in 1:simruns) {y <- y0 + rnorm(n); xxx<- summary(lm(y~x))}
Rprof()

Rprof_out <- readProf(tmp)

unlink(tmp)
sink(); close(sinknull)

summary(Rprof_out)

## End(Not run)
```

summary_terminals	<i>Tabulate leaf nodes</i>
-------------------	----------------------------

Description

Tabulate leaf nodes

Usage

```
summary_terminals(x)
```

Arguments

x an sprof data structure.

Value

A table of frequencies, bystack.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

Examples

```
data(sprof01lm)
summary_terminals(sprof01lm)
```

updateRprof

Update statistics and tables in a sprof obejct

Description

Synchronize information from profiles and stack tables, and update statistics.

Usage

```
updateRprof(sprof, id)
```

Arguments

sprof	A data structure as returned by readRprof .
id	optional. A replacement for the info\$id string .

Value

An updated sprof data structure.

Note

See the vignette of package sprof.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

writeRprof

Write profile data

Description

Write a profile data file from a sprof data structure.

Usage

```
writeRprof(sprof, filename = "Rprof.Out")
```

Arguments

sprof	a data structure from package sprof
filename	The file to be used for exporting the profiling results.

Details

writeRprof only writes the stack entries for the profile.

This can be used to export information after preprocessing with sprof to some package designed for Rprof output.

Value

An invisible list with the profile entries, headers removed.

Note

See the vignette for in-context explanations.

Displays of the graph structure are given in the vignette.

Author(s)

Günther Sawitzki <gsawitzki@users.r-forge.r-project.org>

References

<http://sintro.r-forge.r-project.org/>

Examples

```
## Not run:  
data(sprof01lm)  
writeRprof(sprof01lm)
```

```
## End(Not run)
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