# sprof internal

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**Encoding** UTF-8

**Type** Package

**Title** Profiling, timing and optimization utilitites

**Version** 0.0-5

**Date** 2013-07-23

**Author** Günther Sawitzki

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

**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

## R topics documented:

---

sprof-package *sprof: Analysis of R profiles*

---

## Description

Profiling, timing and optimization utilitites

## Details

| | |
|---|---|
| Package: | sprof |
| Type: | Package |
| Version: | 0.0-5 |
| Date: | 2013-07-23 |
| 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.

## Author(s)

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

## Examples

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

## End(Not run)

---

adjacency *sprof to adjacency matix*

---

### Description

convert node information from a sprof structure to adjacancy matrix.

### Usage

adjacency(sprof, keep.names = TRUE, rmzero=TRUE)

### Arguments

| | |
|---|---|
| sprof | a sprof structure. |
| keep.names | boolean. Copy node names as row- and column names. |
| rmzero | boolean. Remove nodes with no edges. |

### Value

a correspondency matrix

### Author(s)

Günther Sawitzki <gsawitzki@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

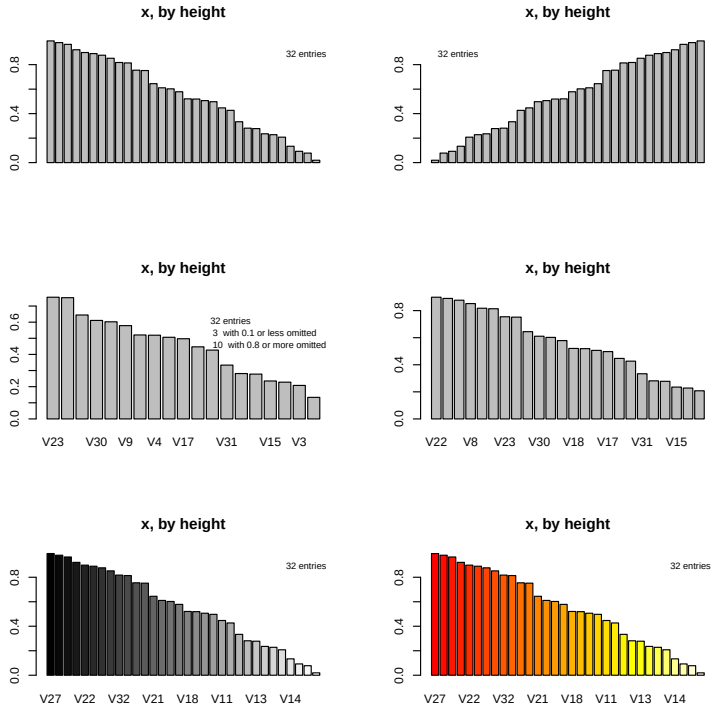
```
barplot_s(height,
sort_by, decreasing = TRUE,
lowtrim, hightrim, trimlegend = TRUE,
col, coli, colfun,
main, ...)
```

## 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@r-forge.r-project.org>

### See Also

barplot

### Examples

```
x <- runif(10)
barplot_s(x)
rm(x)
```

---

## list.as.matrix *Convert list to matrix*

---

### 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@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)
```

---

nodescloud *Nodescloud of nodes fromrpofile data*

---

### Description

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

### Usage

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

### Arguments

| | |
|---|---|
| sprof | A data structure as returned by readRprof. |
| min.freq | Minimum frequency to be included. |
| col | A colour palette. |

### Details

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

Plots are from this collection:

### Value

Used for the side effect of showing the plots.

### Note

See the vignette of package sprof.

### Author(s)

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

### Examples

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

## End(Not run)
```

---

plot.sprof *plot for profiles*

---

### 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. |

### Value

subject to change

### Note

See the vignette for in-context explanations.

Displays of the graph structure are given in the vignette.

### References

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

## See Also

summaryRprof

plot_profiles

plot_nodes plot_stacks

## Examples

```
data(sprof01lm)

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

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

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

---

plot_nodes *Plot profiling information on node level.*

---

## Description

Various plots of a profile.

## Usage

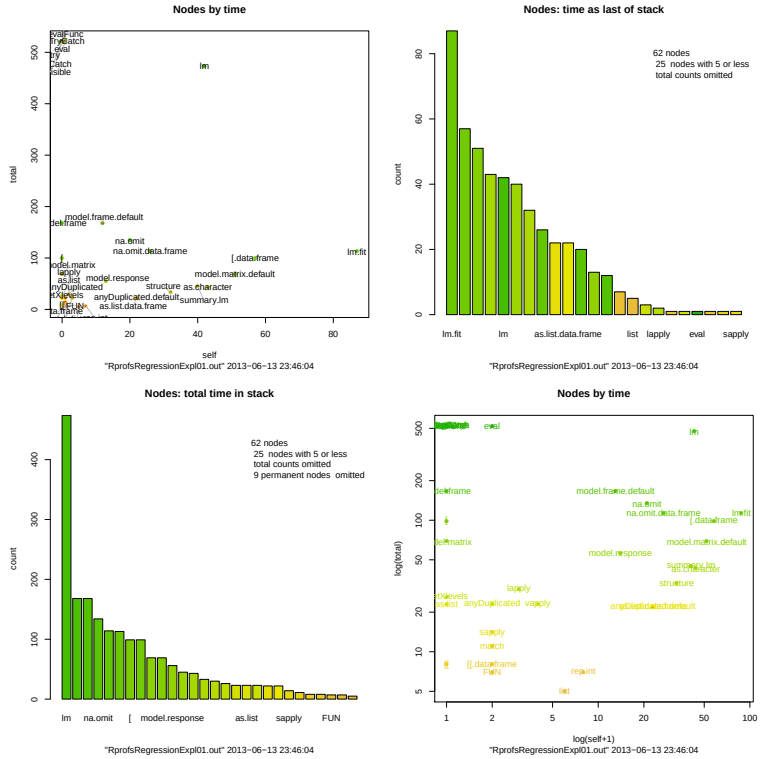
```
plot_nodes(x, which = c(1L, 2L, 3L, 4L), col = NULL,
ask = prod(par("mfcol")) < length(which) && dev.interactive(),
src = NULL, mincount = 5, horiz=FALSE, ...)
```

## 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

Plots are from this collection:




## Value

To come.

## Note

See the vignette of package sprof.

## Author(s)

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

## References

See the vignette of package sprof.

## See Also

See Also as plot.sprof, ~~~

## Examples

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

plot_profiles *Plot profiling information on profile level.*

## Description

Various plots of a profile.

## Usage

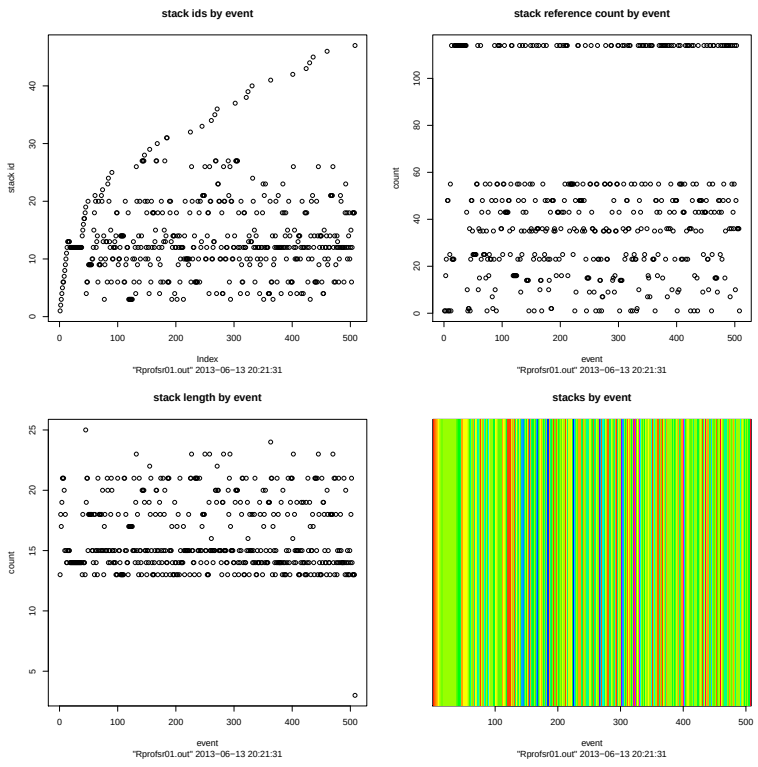
```
plot_profiles(x, which = c(1L, 2L, 3L, 4L), col,
ask = prod(par("mfcol")) < length(which) && dev.interactive(),
src = NULL, ...)
```

## 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@r-forge.r-project.org>

### References

See the vignette of package sprof.

### See Also

See Also as 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, ...)
```

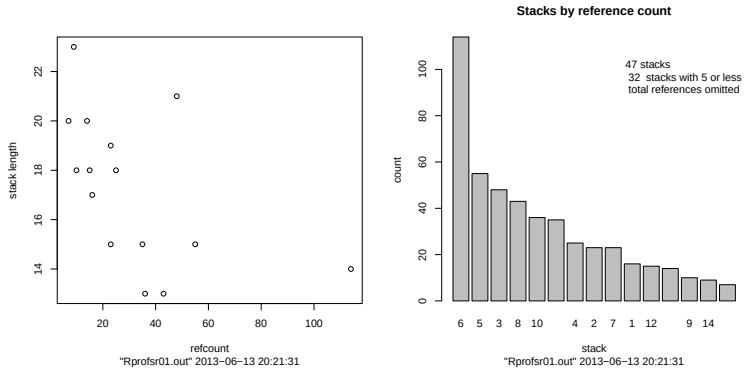
### Arguments

| | |
|---|---|
| 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@r-forge.r-project.org>

## References

See the vignette of package sprof.

## See Also

See Also as 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.

## References

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

## See Also

summaryRprof plot.sprof

## Examples

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

print_profiles *Print profile information*

## Description

Print profile information.

## Usage

```
print_profiles(x)
```

## Arguments

| | |
|---|---|
| x | a sprof data structure. |

### Value

none

### Author(s)

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

### Examples

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

---

profiles_matrix *Extract a node incidence matrix from profile information.*

---

### 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@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 Rprof(). |
| chunksize | Number of lines to read at a time. |
| interval | Real: time interval between samples, in s. |
| head | c("auto", "none", "Rprofmem") to interpret control information as provided by Rprof or Rprofmem. 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.

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" igores 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

| | |
|---|---|
| firstline | A verbatim copy of the first line of the input file. Typically this contains timing or formatting information. |
| nodes | A vector of node names. This may include stray entries from interperspersed lines. |
| stacks | A vector of unique stacks found in input, stored as verbatim copies. |
| stacksrenc | A list of unique stacks in top down order (top first), encoded as vectors or references to stacks. |
| data | A vector encoding the data file as referenes to stacks. |

| | |
|---|---|
| timesRLE | Vector of sampling intervals, in miliseconds. Run-length encoded. |
| freq | A frequency table summarizing data. |

## Author(s)

Günther Sawitzki <gsawitzki@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)
```

rrle *Recursive run length encoding.*

## Description

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

## Usage

```
rrle(x)
```

## Arguments

| | |
|---|---|
| x | a matrix. |

## Value

list of run length encoded lines

## Author(s)

Günther Sawitzki <gsawitzki@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 rns 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@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@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)
```

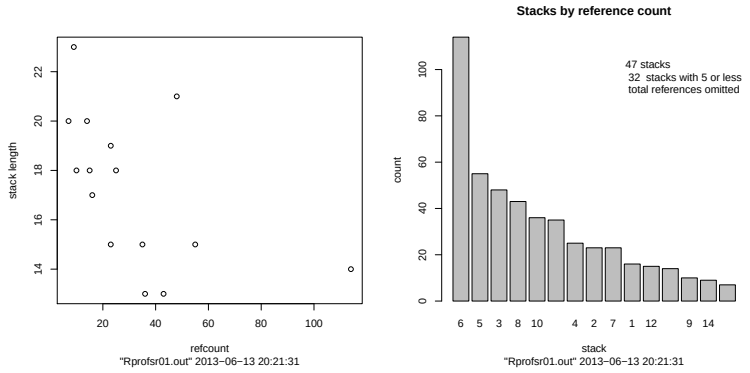
## Arguments

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

## Details

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

Plots are from this collection:




## Value

Used for the side effect of showing the plots.

## Author(s)

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

## Examples

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

## End(Not run)
```

---

sprof01lm *sprof sample data*

---

## Description

An example data set for the functions in package sprof.

## Usage

```
data(sprof01lm)
```

## 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

## References

See the vignette of package sprof.

### Examples

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

---

stackstoadj *Stacks to adjacency matrix*

---

### 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@r-forge.r-project.org>

### Examples

```
#
```

---

str_prof *str for sprof objects*

---

### Description

str for sprof objects

### Usage

```
str_prof(x)
```

### Arguments

| | |
|---|---|
| x | an sprof object |

### Author(s)

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

### Examples

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

---

summary.sprof *Summary for profiles*

---

### 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.

### References

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

### See Also

summaryRprof

### 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 <- readProf(tmp)

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

summary(Rprof_out)

## End(Not run)
```

---

summary_terminals *Tabulate leaf nodes*

---

## 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@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)
```

### Arguments

| | |
|---|---|
| sprof | A data structure as returned by readRprof. |

### Value

An updated sprof data structure.

### Note

See the vignette of package sprof.

### Author(s)

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

## References

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

## Examples

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

## End(Not run)
```

# Index