Package 'miscFuncs'

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Title Miscellaneous Useful Functions Including LaTeX Tables, Kalman
Filtering and Development Tools

Type Package

LazyLoad yes

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Description Implementing various things including functions for LaTeX tables,
the Kalman filter, web scraping, development tools, relative risk and odds
ratio.

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Imports stats

RoxygenNote 5.0.1

NeedsCompilation no

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R topics documented:

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bin   *bin function*

Description

A function to convert decimal to binary

Usage

```
bin(n)
```

Arguments

n   a non-negative integer

Value

the binary representation stored in a vector.

EKFadvance   *EKFadvance function*

Description

A function to perform one iteration of ther EKF. Currently UNDER DEVELOPMENT.

Usage

```
EKFadvance(obs, oldmean, oldvar, phi, phi.arglist, psi, psi.arglist, W, V,
  loglik = FALSE, na.rm = FALSE)
```

Arguments

obs	observations
oldmean	old mean
oldvar	old variance
phi	Function computing a Taylor Series approximation of the system equation. Can include higher (ie 2nd order and above) terms.
phi.arglist	arguments for function phi
psi	Function computing a Taylor Series approximation of the observation equation. Can include higher (ie 2nd order and above) terms.
psi.arglist	arguments for function psi
W	system noise matrix
V	observation noise matrix
loglik	whether or not to compute the pseudo-likelihood
na.rm	logical, whether or not to handle NAs. Defult is FALSE. Set to TRUE if there are any missing values in the observed data.

Value

list containing the new mean and variance, and if specified, the likelihood

---

generic	*generic function*

Description

A function to generate roxygen templates for generic funtions and associated methods.

Usage

```
generic(gen, methods = NULL, sp = 3, oname = "obj")
```

Arguments

gen	character string giving the name of an S3 generic.
methods	character vector: a list of methods for which to provide templates
sp	the amont of space to put in between functions
oname	name of the generic object

Value

roxygen text printed to the console.

---

getstrbetween   *getstrbetween function*

Description

A function used in web scraping. Used to simplify the searching of HTML strings for information.

Usage

```
getstrbetween(linedata, start, startmark, endmark, include = FALSE)
```

Arguments

linedata	a string
start	integer, where to start looking in linedata
startmark	character string. a pattern identifying the start mark
endmark	character string. a pattern identifying the end mark
include	include the start and end marks?

Value

the first string after start and between the start and end marks

---

getwikicoords   *getwikicoords function*

Description

A function to return the lat/lon coordinates of towns in the UK from Wikipedia. Does not always work. Sometimes the county has to be specified too.

Usage

```
getwikicoords(place, county = NULL, rmslash = TRUE)
```

Arguments

place	character, ther name of the town
county	character, the county it is in
rmslash	remove slash from place name. Not normally used.

Value

The lat/lon coordinates from Wikipedia

KFadvance *KFadvance function*

Description

A function to compute one step of the Kalman filter. Embed in a loop to run the filter on a set of data.

Usage

```
KFadvance(obs, oldmean, oldvar, A, B, C, D, E, F, W, V, marglik = FALSE,
    log = TRUE, na.rm = FALSE)
```

Arguments

obs	Y_t
oldmean	mu_t-1
oldvar	Sigma_t-1
A	matrix A
B	column vector B
C	matrix C
D	matrix D
E	column vector E
F	matrix F
W	state noise covariance
V	observation noise covariance
marglik	logical, whether to return the marginal likelihood contribution from this observation
log	whether or not to return the log of the likelihood contribution.
na.rm	na.rm logical, whether or not to handle NAs. Defult is FALSE. Set to TRUE if there are any missing values in the observed data.

Details

The model is: (note that Y and theta are COLUMN VECTORS)

theta_t = A*theta_t-1 + B + C*W (state equation)

Y_t = D*theta_t + E + F*V (observation equation)

W and V are the covariance matrices of the state and observation noise. Prior is normal,

N(mu_t-1,Sigma_t-1)

Result is the posterior, N(mu_t,Sigma_t), together with the likelihood contribution Prob(Y_t|Y_t-1)

Value

list containing the new mean and variance, and if specified, the likelihood

---

KFadvanceAR2   *KFadvanceAR2 function*

Description

A function to compute one step of the Kalman filter with second order AR state evolution. Embed in a loop to run the filter on a set of data.

Usage

```
KFadvanceAR2(obs, oldmean, oldermean, oldvar, oldervar, A, A1, B, C, D, E, F, W,
  V, marglik = FALSE, log = TRUE, na.rm = FALSE)
```

Arguments

obs	Y_t
oldmean	mu_t-1
oldermean	mu_t2
oldvar	Sigma_t-1
oldervar	Sigma_t-2
A	A matrix A
A1	A matrix A1
B	column vector B
C	matrix C
D	matrix D
E	column vector E
F	matrix F
W	state noise covariance
V	observation noise covariance
marglik	logical, whether to return the marginal likelihood contribution from this observation
log	whether or not to return the log of the likelihood contribution.
na.rm	na.rm logical, whether or not to handle NAs. Defult is FALSE. Set to TRUE if there are any missing values in the observed data.

Details

The model is: (note that Y and theta are COLUMN VECTORS)

theta_t = A*theta_t-1 + A1*theta_t-2 + B + C*W (state equation)

Y_t = D*theta_t + E + F*V (observation equation)

W and V are the covariance matrices of the state and observation noise. Priors are normal,

N(mu_t-1,Sigma_t-1) and N(mu_t-2,Sigma_t-2)

Result is the posterior, N(mu_t,Sigma_t), together with the likelihood contribution Prob(Y_t|Y_t-1)

Value

list containing the new mean and variance, and if specified, the likelihood

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KFtemplates	*KFtemplates function*

Description

A function to print KFfit and KFparest templates to the console. See vignette("miscFuncs") for more information

Usage

```
KFtemplates()
```

Value

Tust prints to the console. This can be copied and pasted into a text editor for further manipulation.

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latexformat	*latexformat function*

Description

A function to format text or numeric variables using scientific notation for LaTeX documents.

Usage

```
latexformat(x, digits = 3, scientific = -3, ...)
```

Arguments

x	a numeric, or character
digits	see ?format
scientific	see ?format
...	other arguments to pass to the function format

Value

...

`latextable`	*latextable function*

Description

A very useful function to create a LaTeX table from a matrix. Rounds numeric entries and also replaces small numbers with standard index form equivalents.

Usage

```
latextable(x, digits = 3, scientific = -3, colnames = NULL,
  rownames = NULL, caption = NULL, narep = " ", laststr = "", ...)
```

Arguments

x	a matrix, or object that can be coerced to a matrix. x can include mixed character and numeric entries.
digits	see help file for format
scientific	see help file for format
colnames	optional column names set to NULL (default) to automatically use column names of x. NOTE! if rownames is not NULL present, colnames must include an entry for the rownames i.e. it should be a vector of length the number of columns of x plus 1.
rownames	optional row names set to NULL (default) to automatically use row names of x
caption	optional caption, not normally used
narep	string giving replacement for NA entries in the matrix
laststr	string to write at end, eg note the double backslash!!
...	additional arguments passed to format

Details

To get a backslash to appear, use a double backslash

Just copy and paste the results into your LaTeX document.

Value

prints the LaTeX table to screen, so it can be copied into reports

Examples

```
latextable(as.data.frame(matrix(1:4,2,2)))
```

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method   *method function*

Description

A function to generate a roxygen template for a method of a generic S3 function. Normally, this would be called from the function generic, see ?generic

Usage

```
method(meth, gen, oname = "obj")
```

Arguments

meth   character, the name of the method

gen   character the associated generic method

oname   name of object

Value

a roxygen template for the method.

---

print22   *print22 function*

Description

A function to print details of the 2 by 2 table for use with the function twotwoinfo.

Usage

```
print22()
```

Value

prints the names of the arguments of twotwofunction info to screen in their correct place in the 2 by 2 table

See Also

twotwoinfo

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roxbc	*roxbc function*

Description

A function to build and check packages where documentation has been compiled with roxygen. Probably only works in Linux.

Usage

```
roxbc(name, checkflags = "--as-cran")
```

Arguments

name	package name
checkflags	string giving optional check flags to R CMD check, default is –as-cran

Value

builds and checks the package

---

roxbuild	*roxbuild function*

Description

A function to build packages where documentation has been compiled with roxygen. Probably only works in Linux.

Usage

```
roxbuild(name)
```

Arguments

name	package name

Value

builds and checks the package

---

roxtext   *roxtext function*

Description

A function to generate roxygen documentation templates for functions for example,

Usage

```
roxtext(s)
```

Arguments

s   a string enclosed in quotes

Details

would generate a template for this function. Note that functions with default arguments that include quotes will throw up an error at the moment, just delete these bits from the string, and if shold work.

Value

minimal roxygen template

---

timeop   *timeop function*

Description

A function to time an operation in R

Usage

```
timeop(expr)
```

Arguments

expr   an expression to evaluate

Value

The time it took to evaluate the expression in seconds

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twotwoinfo   *twotwoinfo function*

Description

A function to compute and diplay information about 2 by 2 tables for copying into LaTeX documents. Computes odds ratios and relative risks together with confidence intervals for 2 by 2 table and prints to screen in LaTeX format. The funciton will try to fill in any missing values from the 2 by 2 table. Type print22() at the console to see what each argument refers to.

Usage

```
twotwoinfo(e1 = NA, u1 = NA, o1t = NA, e2 = NA, u2 = NA, o2t = NA,
  et = NA, ut = NA, T = NA, lev = 0.95, LaTeX = TRUE, digits = 3,
  scientific = -3, ...)
```

Arguments

e1	type print22() at the console
u1	type print22() at the console
o1t	type print22() at the console
e2	type print22() at the console
u2	type print22() at the console
o2t	type print22() at the console
et	type print22() at the console
ut	type print22() at the console
T	type print22() at the console
lev	significance level for confidence intervals. Default is 0.95
LaTeX	whether to print the 2 by 2 information as LaTeX text to the screen, including the table, odds ratio, relative risk and confidence intervals
digits	see ?format
scientific	see ?format
...	other arguments passed to function format

Value

Computes odds ratios and relative risks together with confidence intervals for 2 by 2 table and prints to screen in LaTeX format.

See Also

print22

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vdc   *vdc function*

Description

A function to generate a Van der Corput sequence of numbers.

Usage

```
vdc(n)
```

Arguments

n   the length of the sequence

Value

Van der Corput sequence of length n

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