Package ‘miscFuncs’

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Maintainer  Benjamin M. Taylor <b.taylor1@lancaster.ac.uk>
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Title           Miscellaneous Useful Functions
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Author          Benjamin M. Taylor
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R topics documented:

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Description
.onAttach function

Usage
.onAttach(libname, pkgname)

Arguments
libname libname argument
pkgname pkgname argument

Details
A function to print a welcome message on loading package

Value
...

Description
bin function

Usage
bin(n)

Arguments
n a non-negative integer
Details

A function to convert decimal to binary

Value

the binary representation stored in a vector.

---

**Description**

EKFadvance function

**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.

**Details**

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

**Value**

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

**generic function...**

---

### Description

generic function

### Usage

`generic(gen, methods, 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 amount of space to put in between functions
- **oname** name of the generic object

### Details

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

### Value

roxygen text printed to the console.

---

**getstrbetween**

**getstrbetween function...**

---

### Description

getstrbetween function

### 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?
getwikicoords

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

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

getwikicoords getwikicoords function...

Description
getwikicoords function

Usage
getwikicoords(place, county, rmslash=TRUE)

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

Details
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.

Value
The lat/lon coordinates from Wikipedia

KFadvance KFadvance function...

Description
KFadvance function

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. Default is FALSE. Set to TRUE if there are any missing values in the observed data.

Details

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

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

\[
\begin{align*}
\theta_t &= A*\theta_{t-1} + B + C*W \\
Y_t &= D*\theta_t + E + F*V
\end{align*}
\]

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 \( \text{Prob}(Y_t | Y_{t-1}) \)

Value

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

KFadvanceAR2 function

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: \textit{Y}_t
- oldmean: \textit{mu}_{t-1}
- oldermean: \textit{mu}_{t2}
- oldvar: \textit{Sigma}_{t-1}
- oldervar: \textit{Sigma}_{t-2}
- A: matrix \textit{A}
- A1: matrix \textit{A1}
- B: column vector \textit{B}
- C: matrix \textit{C}
- D: matrix \textit{D}
- E: column vector \textit{E}
- F: matrix \textit{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. Default is FALSE. Set to TRUE if there are any missing values in the observed data.

Details

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.

The model is: (note that \textit{Y} and \textit{theta} are COLUMN VECTORS)
\[
\text{theta}_t = A*\text{theta}_{t-1} + A1*\text{theta}_{t-2} + B + C*W \text{ (state equation)}
\]
\[
\text{Y}_t = D*\text{theta}_t + E + F*V \text{ (observation equation)}
\]
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

---

**KFtemplates**

**KFtemplates function...**

---

**Description**

KFtemplates function

**Details**

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

**Value**

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

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**latexable**

**latexable function...**

---

**Description**

latexable function

**Usage**

```r
latexable(x, dp=3, colnames, rownames, caption, narep=" ", laststr="")
```

**Arguments**

- `x`: a matrix, can include mixed character and numeric entries
- `dp`: number of decimal places
- `colnames`: optional column names
- `rownames`: optional row names
- `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!!
**method**

**Details**

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.

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

<table>
<thead>
<tr>
<th>method</th>
<th>method function...</th>
</tr>
</thead>
</table>

**Description**

method function

**Usage**

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

**Arguments**

meth character, the name of the method
gen character the associated generic method
oname name of object

**Details**

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

**Value**

a roxygen template for the method.
### roxbc

**Description**

roxbc function

**Usage**

roxbc(name)

**Arguments**

name package name

**Details**

A function to build and check packages where documentation has been compiled with roxygen. Probably only works in Linux. You will need to clean up old directorys `<package_name>.roxygen` and `<package_name>.Rcheck`

**Value**

builds and checks the package

---

### roxtext

**Description**

roxtext function

**Usage**

roxtext(s)

**Arguments**

s a string enclosed in quotes

**Details**

A function to generate roxygen documentation templates for functions for example, 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 should work.
### timeop

**Description**

timeop function

**Usage**

```r
timeop(expr)
```

**Arguments**

- `expr` an expression to evaluate

**Details**

A function to time an operation in R

**Value**

The time it took to evaluate the expression in seconds

### vdc

**Description**

vdc function

**Usage**

```r
vdc(n)
```

**Arguments**

- `n` the length of the sequence

**Details**

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

**Value**

Van der Corput sequence of length n
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