Package 'tsvr'

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Type Package

Title Timescale-Specific Variance Ratio for Use in Community Ecology

Description Tools for timescale decomposition of the classic variance ratio of community ecology. Tools are as described in Zhao et al (in prep), extending commonly used methods introduced by Peterson et al (1975) <doi:10.2307/1936306>.

License GPL-3

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R topics documented:

`aggts` *Aggregates a* `tsvreq_classic` *object across a set of timescales; also the constructor function for class* `vreq_classic_ag`.

Description

All the components of a `tsvreq_classic` object can be aggregated across an arbitrary set of timescales, producing a new variance ratio equation - this function performs that aggregation. The function returns a `vreq_classic_ag` object, and is the constructor function of that class. The `vreq_classic_ag` class has slots `com`, `comnull`, `vr`, which are the same as a `vreq` object, but also has slot `ts`, which is the timescales over which aggregation was performed to get the object. The class inherits from `vreq`, which inherits from `list`.

Usage

```
aggts(obj, ts)
```

Arguments

`obj`	A `tsvreq_classic` object
`ts`	The timescales to aggregate over

Details

Before aggregation is performed, the argument ‘ts‘ is intersected with the canonical Fourier timescales greater than or equal to the Nyquist timescale, and the resulting timescales are then reflected about the Nyquist timescale. This is to account for the symmetry of Fourier transforms about the Nyquist frequency. The ‘ts‘ slot of the output object shows the intersected, reflected timescales that were actually used for aggregation. See the examples.

Value

aggts returns an object of class vreq_classic_ag. Slots are:

com	the timescale-aggregated value of CVcom2
comnull	the timescale-aggregated value of CVcomip2
vr	the timescale-aggregated value of the classic variance ratio
ts	the timescales over which aggregation was performed

Author(s)

Shaopeng Wang, <shaopeng.wang@pku.edu.cn>; Lei Zhao, <lei.zhao@cau.edu.cn>; Daniel Reuman, <reuman@ku.edu>

References

Zhao et al, (In prep) Decomposition of the variance ratio illuminates timescale-specific population and community variability.

See Also

tsvreq_classic, vreq_classic_ag_methods, browseVignettes("tsvr")

Examples

```
X<-matrix(runif(10*100),10,100)
h<-tsvreq_classic(X)
res1<-aggts(h,h$ts[h$ts>=4])
res2<-aggts(h,h$ts[h$ts>=4 | h$ts<=4/3])
#res1 and res2 produce the same result
#because of Fourier symmetry around the
#Nyquist timescale - see Details
```

---

cospect *Calculate the cospectrum between all pairs of time series*

Description

This function is used to calculate the cospectra between pairs of time series, including each time series with itself. These are based on simple ffts without smoothing.

Usage

```
cospect(X)
```

Arguments

X	a matrix with counts or densities arranged in species by time step.

Value

cospect return a list with elements

frequency	a vector from 0 to 1 of the frequencies used
cospectrum	a 3D array, with cospectrum range in species by species by frequency

Author(s)

Lei Zhao, <lei.zhao@cau.edu.cn>; Daniel Reuman, <reuman@ku.edu>

Examples

```
X<-matrix(runif(200,1,100), 10, 20)
ans<-cospect(X)
```

---

cv2 *Calculates various measures of population and community variability*

Description

Calculates various measures of population and community variability

Usage

```
cv2(X, type)
```

Arguments

X	A matrix with counts or densities arranged in species by time step
type	If pop, calculate CVpop2. If com, calculate CVcom2. If comip, calculate CVcomip2. See the vignette for definitions of these quantities.

Value

cv2 returns the value of population or community variability.

Author(s)

Lei Zhao, <lei.zhao@cau.edu.cn>; Daniel Reuman, <reuman@ku.edu>; Shaopeng Wang, <shaopeng.wang@pku.edu.cn>

References

Zhao et al, (In prep) Decomposition of the variance ratio illuminates timescale-specific population and community variability.

See Also

vreq_classic, vreq_LdM, cv2f, browseVignettes("tsvr")

Examples

```
X<-matrix(runif(200,1,100), 10, 20)
ans<-cv2(X, type="com")
```

---

cv2f *Compute a frequency-specific version of CVcom or CVcomip*

Description

Compute a frequency-specific version of CVcom or CVcomip.

Usage

```
cv2f(X, type)
```

Arguments

X	A matrix with counts or densities arranged in species by time step
type	If com, calculate a frequency-specific CVcom2. If comip, calculate a frequency-specific CVcomip2. See the vignette for definitions of these quantities.

Value

cv2f returns an object of type list consisting of

frequency	a vector from 0 to 1 (not including 0 and 1)
cv2	A vector of frequency-specific population or community variability

Author(s)

Shaopeng Wang, <shaopeng.wang@pku.edu.cn>; Lei Zhao, <lei.zhao@cau.edu.cn>; Daniel Reuman, <reuman@ku.edu>

References

Zhao et al, (In prep) Decomposition of the variance ratio illuminates timescale-specific population and community variability.

See Also

tsvreq_classic, cv2, browseVignettes("tsvr")

Examples

```
X<-matrix(runif(200,1,100), 10, 20)
ans<-cv2f(X, type="com")
```

`errcheck_data` *Error check a data matrix.*

Description

Error check a data matrix.

Usage

```
errcheck_data(X, calledby)
```

Arguments

`X`	a matrix with counts or densities arranged in species by years. No NAs or negative values allowed, constant species not allowed.
`calledby`	the function calling this one

Value

`errcheck_data` returns nothing but throws and error if the inputs do not meet the requirements

Author(s)

Daniel Reuman, `<reuman@ku.edu>`

`errcheck_tsvreq` *Error check inputs for the creator function for the* `tsvreq` *class.*

Description

Error check inputs for the creator function for the `tsvreq` class.

Usage

```
errcheck_tsvreq(ts, com, comnull, tsvr, wts)
```

Arguments

ts	Timescales, should be a numeric vector of nonnegative numbers
com	Should be a vector of nonnegative numbers, equal to comnull*tsvr
comnull	Should be a vector of nonnegative numbers
tsvr	Should be a vector of nonnegative numbers
wts	Should be a vector of nonnegative numbers

Value

errcheck_tsvreq returns nothing but throws and error if the inputs do not meet the requirements of a tsvreq object

Author(s)

Daniel Reuman, <reuman@ku.edu>

---

errcheck_vreq *Error check inputs for the creator function for the* vreq *class.*

Description

Error check inputs for the creator function for the vreq class.

Usage

```
errcheck_vreq(com, comnull, vr)
```

Arguments

com	Should be a positive number, equal to comnull*vr
comnull	Should be a positive number
vr	Should be a positive number

Value

errcheck_vreq returns nothing but throws and error if the inputs do not meet the requirements of a vreq object

Author(s)

Daniel Reuman, <reuman@ku.edu>

JRGdat — *Percent cover data from Jasper Ridge Biological Preserve serpentine grassland site*

Description

A data set of percent cover of plant species in a plot from Jasper Ridge Biological Preserve serpentine grassland site. See Hallett et al (2014), Ecology for details. Subplot 3 from block 3 from the control treatment was used. Plot size was 1 m^2. Values are percents. Values occasionally sum across species to more than 100 because of overlapping plant canopies.

Usage

```
JRGdat
```

Format

A data frame with 28 rows and 27 columns. First column is the year of measurement, subsequent columns correspond to individual species, named in the column headers.

References

Hallett et al (2014) Biotic mechanisms of community stability shift along a precipitation gradient. Ecology 95, 1693-1700.

print.summary_tsvr — *Print method for* summary_tsvr *class*

Description

Print method for summary_tsvr class

Usage

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

Arguments

x	A summary_tsvr object
...	Not currently used. Included for argument consistency with existing generics.

Value

print.summary_tsvr is called for its effect of printing to the screen.

Author(s)

Daniel Reuman, <reuman@ku.edu>

See Also

vreq_methods, vreq_classic_methods, vreq_LdM_methods, vreq_classic_ag_methods, tsvreq_methods, tsvreq_classic_methods, browseVignettes("tsvr")

Examples

```
res<-vreq(2,1,2)
summary(res)
```

---

set_ts *Set and get methods for classes in the* tsvr *package*

Description

Set and get methods for classes in the tsvr package. There are methods for each slot of each class, named set_* and get_* for * the slot name. Below are listed function specs for the generics and the default methods.

Usage

```
set_ts(obj, newval)

## Default S3 method:
set_ts(obj, newval)

set_tsvr(obj, newval)

## Default S3 method:
set_tsvr(obj, newval)

set_wts(obj, newval)

## Default S3 method:
set_wts(obj, newval)

get_ts(obj)

## Default S3 method:
get_ts(obj)

get_tsvr(obj)
```

```
## Default S3 method:
get_tsvr(obj)

get_wts(obj)

## Default S3 method:
get_wts(obj)

set_com(obj, newval)

## Default S3 method:
set_com(obj, newval)

set_comnull(obj, newval)

## Default S3 method:
set_comnull(obj, newval)

set_vr(obj, newval)

## Default S3 method:
set_vr(obj, newval)

get_com(obj)

## Default S3 method:
get_com(obj)

get_comnull(obj)

## Default S3 method:
get_comnull(obj)

get_vr(obj)

## Default S3 method:
get_vr(obj)
```

Arguments

obj	An object of one of the classes defined in the package
newval	A newvalue of the slot in question, for the set_* methods

Details

There are methods for S3 classes defined in the package. See documentation for the generator functions for these classes (which in all cases have the same name as the class) for lists of slots for each class.

Value

`set_*` methods throw an error - setting of individual slots is not allowed, as it breaks consistency with the other slots. `get_*` just returns the value in question.

Author(s)

Daniel Reuman, <reuman@ku.edu>

See Also

vreq

Examples

```
res<-vreq(com=2,comnull=1,vr=2)
get_com(res)
```

---

tsvreq *Creator function for the* tsvreq *S3 class*

Description

The `tsvreq` (timescale-specific variance ratio equation) class is for storing functional equations based on a timescale-specific variance ratio. This is a general class from which other classes inherit (only `tsvreq_classic` at this point). `tsvreq` inherits from the `list` class.

Usage

```
tsvreq(ts, com, comnull, tsvr, wts)
```

Arguments

`ts`	A vector of timescales
`com`	A numeric vector of the same length as `ts` containing nonnegative quantities
`comnull`	Another such
`tsvr`	Another such
`wts`	Another such

Value

`tsvreq` returns an object of class `tsvreq`. Slots are:

`ts`	the input
`com`	the input, equal to `comnull*tsvr`
`comnull`	the input
`tsvr`	the input
`wts`	the input

Author(s)

Shaopeng Wang, <shaopeng.wang@pku.edu.cn>; Lei Zhao, <lei.zhao@cau.edu.cn>; Daniel Reuman, <reuman@ku.edu>

See Also

tsvreq_methods, tsvreq_classic, vreq, browseVignettes("tsvr")

Examples

```
res<-tsvreq(ts=1:10,com=2*c(1:10),comnull=1:10,tsvr=rep(2,10),wts=rep(3,10))
```

---

tsvreq_classic *Creator function for the* tsvreq_classic *S3 class*

Description

The tsvreq_classic (timescale-specific variance ratio equation, classic variance ratio) class is for storing functional equations based on a timescale specific version of the classic variance ratio. Inherits from tsvreq, which inherits from list.

Usage

```
tsvreq_classic(X)
```

Arguments

X	a matrix with counts or densities arranged in species by time step

Value

tsvreq_classic returns a tsvreq_classic object. Slots are:

ts	a vector of timescales
com	a timescale-specific decomposition of CVcom2
comnull	a timescale-specific decomposition of CVcomip2
tsvr	a timescale-specific version of the classic variance ratio
wts	a vector of weights, same length as all the above

Author(s)

Daniel Reuman, <reuman@ku.edu>

References

Zhao et al, (In prep) Decomposition of the variance ratio illuminates timescale-specific population and community variability.

See Also

tsvreq_classic_methods, tsvreq, vreq_classic, browseVignettes("tsvr")

Examples

```
X<-matrix(runif(10*100),10,100)
res<-tsvreq_classic(X)
```

---

tsvreq_classic_methods

Basic methods for the tsvreq_classic *class*

Description

Set, get, summary, print and plot methods for the tsvreq_classic class.

Usage

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

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

## S3 method for class 'tsvreq_classic'
plot(x, filename = NA, ...)

## S3 method for class 'tsvreq_classic'
set_ts(obj, newval)

## S3 method for class 'tsvreq_classic'
set_com(obj, newval)

## S3 method for class 'tsvreq_classic'
set_comnull(obj, newval)

## S3 method for class 'tsvreq_classic'
set_tsvr(obj, newval)

## S3 method for class 'tsvreq_classic'
set_wts(obj, newval)

## S3 method for class 'tsvreq_classic'
get_ts(obj)

## S3 method for class 'tsvreq_classic'
```

```
get_com(obj)

## S3 method for class 'tsvreq_classic'
get_comnull(obj)

## S3 method for class 'tsvreq_classic'
get_tsvr(obj)

## S3 method for class 'tsvreq_classic'
get_wts(obj)
```

Arguments

object, x, obj	An object of class tsvreq_classic
...	Passed to plot. Not currently used for other methods, included there only for argument consistency with existing generics.
filename	A filename, no extension, could have a path. Used for saving a plot as a pdf. The default value NA causes the default plotting device to be used.
newval	A new value, for the set_* methods

Value

summary.tsvreq_classic produces a summary of a tsvreq_classic object. Methods print.tsvreq_classic and plot.tsvreq_classic are also available. For tsvreq_classic objects, set_* and get_* methods are available for all slots (see the documentation for tsvreq_classic for a list). The set_* methods just throw an error, to prevent breaking the consistency between the slots of a tsvreq_classic object.

Author(s)

Daniel Reuman, <reuman@ku.edu>

References

Zhao et al, (In prep) Decomposition of the variance ratio illuminates timescale-specific population and community variability.

See Also

tsvreq_classic

Examples

```
X<-matrix(runif(10*100),10,100)
res<-tsvreq_classic(X)
get_ts(res)
print(res)
summary(res)
```

tsvreq_methods *Basic methods for the* tsvreq *class*

Description

Set, get, summary, print and plot methods for the tsvreq class.

Usage

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

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

## S3 method for class 'tsvreq'
plot(x, filename = NA, ...)

## S3 method for class 'tsvreq'
set_ts(obj, newval)

## S3 method for class 'tsvreq'
set_com(obj, newval)

## S3 method for class 'tsvreq'
set_comnull(obj, newval)

## S3 method for class 'tsvreq'
set_tsvr(obj, newval)

## S3 method for class 'tsvreq'
set_wts(obj, newval)

## S3 method for class 'tsvreq'
get_ts(obj)

## S3 method for class 'tsvreq'
get_com(obj)

## S3 method for class 'tsvreq'
get_comnull(obj)

## S3 method for class 'tsvreq'
get_tsvr(obj)

## S3 method for class 'tsvreq'
get_wts(obj)
```

Arguments

object, x, obj	An object of class tsvreq
...	Passed to plot. Not currently used for other methods, included there only for argument consistency with existing generics.
filename	A filename, no extension, could have a path. Used for saving a plot as a pdf. The default value NA causes the default plotting device to be used.
newval	A new value, for the set_* methods

Value

summary.tsvreq produces a summary of a tsvreq object. Methods print.tsvreq and plot.tsvreq are also available. For tsvreq objects, set_* and get_* methods are available for all slots (see the documentation for tsvreq for a list). The set_* methods just throw an error, to prevent breaking the consistency between the slots of a tsvreq object.

Author(s)

Daniel Reuman, <reuman@ku.edu>

See Also

tsvreq

Examples

```
res<-tsvreq(ts=1:10,com=2*c(1:10),comnull=1:10,tsvr=rep(2,10),wts=rep(3,10))
get_ts(res)
print(res)
summary(res)
plot(res)
```

---

vr *Compute the classic or Loreau-de Mazancourt variance ratio*

Description

This function is used to compute the classical or Loreau-de Mazancourt variance ratio for a community in a single plot.

Usage

```
vr(X, method = "classic")
```

Arguments

X	A matrix with counts or densities arranged in species by time steps
method	If "classic" (default), use the classical method. If "LdM", use the Loreau-de Mazancourt method (see reference).

Value

vr returns the value of variance ratio

Author(s)

Lei Zhao, <lei.zhao@cau.edu.cn>; Daniel Reuman, <reuman@ku.edu>

References

Loreau & Mazancourt, Species Synchrony and Its Drivers: Neutral and Nonneutral Community Dynamics in Fluctuating Environments. 2008, Am. Nat. 172(2)

Zhao et al, (In prep) Decomposition of the variance ratio illuminates timescale-specific population and community variability.

Peterson, Stability of species and of community for the benthos of two lagoons. 1975, Ecology, 56, 958-965.

See Also

vrf, vreq, vreq_classic, vreq_LdM, browseVignettes("tsvr")

Examples

```
X<-matrix(runif(200,1,100), 10, 20)
vr(X, method="LdM")
vr(X, method="classic")
```

---

vreq *Creator function for the* vreq *S3 class*

Description

The vreq (variance ratio equation) class is for storing equations based on a variance ratio, as in Wang S. & Loreau M. (2016) Biodiversity and ecosystem stability across scales in metacommunities, Ecol Lett, 19, 510-518. This is a general class from which other classes inherit (vreq_classic, vreq_LdM). vreq inherits from the list class.

Usage

```
vreq(com, comnull, vr)
```

Arguments

com	A single positive number
comnull	Another single positive number
vr	Another single positive number

Value

vreq returns an object of class vreq. Slots are:

com	a single positive number equal to comnull*vr
comnull	a single positive number
vr	a single positive number

Author(s)

Shaopeng Wang, <shaopeng.wang@pku.edu.cn>; Lei Zhao, <lei.zhao@cau.edu.cn>; Daniel Reuman, <reuman@ku.edu>

References

Wang S. & Loreau M. (2016) Biodiversity and ecosystem stability across scales in metacommunities. Ecol Lett, 19, 510-518.

Zhao et al, (In prep) Decomposition of the variance ratio illuminates timescale-specific population and community variability.

Peterson, Stability of species and of community for the benthos of two lagoons. 1975, Ecology, 56, 958-965.

See Also

vreq_methods, vreq_classic, vreq_LdM, vreq_classic_ag_methods, browseVignettes("tsvr")

Examples

```
res<-vreq(com=2,comnull=1,vr=2)
```

---

vreq_classic *Creator function of* vreq_classic *S3 class*

Description

The vreq_classic (variance ratio equation, classic variance ratio) class is for storing equations based on the classic variance ratio. Inherits from the vreq class, which inherits from the list class.

Usage

```
vreq_classic(X)
```

Arguments

X	A matrix with counts or densities arranged in species by years

Value

vreq_classic returns a vreq_classic object. Slots are:

com	the squared community CV, CVcom2
comnull	CVcomip2
vr	the classic variance ratio

Author(s)

Daniel Reuman, <reuman@ku.edu>

References

Peterson (1975) Stability of species and of community for the benthos of two lagoons. Ecology 56, 958-965.

See Also

vreq_classic_methods, vreq, vreq_LdM, vreq_classic_ag_methods, browseVignettes("tsvr")

Examples

```
X<-matrix(runif(10*100),10,100)
res<-vreq_classic(X)
```

---

vreq_classic_ag_methods

Basic methods for the vreq_classic_ag *class*

Description

Set, get, summary, and print methods for the vreq_classic_ag class.

Usage

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

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

## S3 method for class 'vreq_classic_ag'
```

```
set_com(obj, newval)

## S3 method for class 'vreq_classic_ag'
set_comnull(obj, newval)

## S3 method for class 'vreq_classic_ag'
set_vr(obj, newval)

## S3 method for class 'vreq_classic_ag'
set_ts(obj, newval)

## S3 method for class 'vreq_classic_ag'
get_com(obj)

## S3 method for class 'vreq_classic_ag'
get_comnull(obj)

## S3 method for class 'vreq_classic_ag'
get_vr(obj)

## S3 method for class 'vreq_classic_ag'
get_ts(obj)
```

Arguments

`object, x, obj`	An object of class `vreq_classic_ag`
`...`	Not currently used. Included for argument consistency with existing generics.
`newval`	A new value, for the `set_*` methods

Value

`summary.vreq_classic_ag` produces a summary of a `vreq_classic_ag` object. A `print.vreq_classic_ag` method is also available. For `vreq_classic_ag` objects, `set_*` and `get_*` methods are available for all slots (see the documentation for `aggts` for a list). The `set_*` methods just throw an error, to prevent breaking the consistency between the slots of a `vreq_classic_ag` object.

Author(s)

Daniel Reuman, <reuman@ku.edu>

References

Zhao et al, (In prep) Decomposition of the variance ratio illuminates timescale-specific population and community variability.

See Also

`aggts`, `tsvreq_classic`, `vreq_classic`, `vreq_LdM`, `vreq`, `browseVignettes("tsvr")`

Examples

```
X<-matrix(runif(10*100),10,100)
h<-tsvreq_classic(X)
inp<-aggts(h,h$ts[h$ts>4])
print(inp)
summary(inp)
```

`vreq_classic_methods` *Basic methods for the* `vreq_classic` *class*

Description

Set, get, summary, and print methods for the `vreq_classic` class.

Usage

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

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

## S3 method for class 'vreq_classic'
set_com(obj, newval)

## S3 method for class 'vreq_classic'
set_comnull(obj, newval)

## S3 method for class 'vreq_classic'
set_vr(obj, newval)

## S3 method for class 'vreq_classic'
get_com(obj)

## S3 method for class 'vreq_classic'
get_comnull(obj)

## S3 method for class 'vreq_classic'
get_vr(obj)
```

Arguments

`object, x, obj`	An object of class `vreq_classic`
`...`	Not currently used. Included for argument consistency with existing generics.
`newval`	A new value, for the `set_*` methods

Value

summary.vreq_classic produces a summary of a vreq_classic object. A print.vreq_classic method is also available. For vreq_classic objects, set_* and get_* methods are available for all slots (see the documentation for vreq_classic for a list). The set_* methods just throw an error, to prevent breaking the consistency between the slots of a vreq_classic object.

Author(s)

Daniel Reuman, <reuman@ku.edu>

References

Peterson (1975) Stability of species and of community for the benthos of two lagoons. Ecology 56, 958-965.

See Also

vreq_classic

Examples

```
X<-matrix(runif(10*100),10,100)
res<-vreq_classic(X)
print(res)
summary(res)
```

---

vreq_LdM *Creator function of* vreq_LdM *S3 class*

Description

The vreq_LdM (variance ratio equation, Loreau-de Mazancourt variance ratio) class is for storing equations based on the L-dM variance ratio. Inherits from the vreq class, which inherits from the list class.

Usage

```
vreq_LdM(X)
```

Arguments

X	A matrix with counts or densities arranged in species by years

Value

vreq_LdM returns a vreq_LdM object. Slots are:

com	the squared community CV, CVcom2
comnull	CVpop2
vr	the L-dM variance ratio

Author(s)

Daniel Reuman, <reuman@ku.edu>

References

Loreau & Mazancourt, Species Synchrony and Its Drivers: Neutral and Nonneutral Community Dynamics in Fluctuating Environments. 2008, Am. Nat. 172(2)

See Also

vreq_LdM_methods, vreq_classic, vreq, browseVignettes("tsvr")

Examples

```
X<-matrix(runif(10*100),10,100)
res<-vreq_LdM(X)
```

---

vreq_LdM_methods *Basic methods for the* vreq_LdM *class*

Description

Set, get, summary, and print methods for the vreq_LdM class.

Usage

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

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

## S3 method for class 'vreq_LdM'
set_com(obj, newval)

## S3 method for class 'vreq_LdM'
set_comnull(obj, newval)
```

```
## S3 method for class 'vreq_LdM'
set_vr(obj, newval)

## S3 method for class 'vreq_LdM'
get_com(obj)

## S3 method for class 'vreq_LdM'
get_comnull(obj)

## S3 method for class 'vreq_LdM'
get_vr(obj)
```

Arguments

object, x, obj	An object of class vreq_LdM
...	Not currently used. Included for argument consistency with existing generics.
newval	A new value, for the set_* methods

Value

summary.vreq_LdM produces a summary of a vreq_LdM object. A print.vreq_LdM method is also available. For vreq_LdM objects, set_* and get_* methods are available for all slots (see the documentation for vreq_LdM for a list). The set_* methods just throw an error, to prevent breaking the consistency between the slots of a vreq_LdM object.

Author(s)

Daniel Reuman, <reuman@ku.edu>

References

Loreau & Mazancourt, Species Synchrony and Its Drivers: Neutral and Nonneutral Community Dynamics in Fluctuating Environments. 2008, Am. Nat. 172(2)

See Also

vreq_LdM

Examples

```
X<-matrix(runif(10*100),10,100)
res<-vreq_LdM(X)
print(res)
summary(res)
```

vreq_methods *Basic methods for the* vreq *class*

Description

Set, get, summary, and print methods for the vreq class.

Usage

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

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

## S3 method for class 'vreq'
set_com(obj, newval)

## S3 method for class 'vreq'
set_comnull(obj, newval)

## S3 method for class 'vreq'
set_vr(obj, newval)

## S3 method for class 'vreq'
get_com(obj)

## S3 method for class 'vreq'
get_comnull(obj)

## S3 method for class 'vreq'
get_vr(obj)
```

Arguments

object, x, obj	An object of class vreq
...	Not currently used. Included for argument consistency with existing generics.
newval	A new value, for the set_* methods

Value

summary.vreq produces a summary of a vreq object. A print.vreq method is also available. For vreq objects, set_* and get_* methods are available for all slots (see the documentation for vreq for a list). The set_* methods just throw an error, to prevent breaking the consistency between the slots of a vreq object.

Author(s)

Daniel Reuman, <reuman@ku.edu>

See Also

vreq

Examples

```
res<-vreq(com=2,comnull=1,vr=2)
print(res)
```

---

vrf *Compute the frequency-specific variance ratio*

Description

This function computes the frequency-specific variance ratio for a community in a single plot.

Usage

```
vrf(X)
```

Arguments

X	a matrix with counts or densities arranged in species by time step

Value

vrf returns a list consisting of

frequency	a vector from 0 to 1 (not including 0 and 1)
vr	a vector of frequency-specific or frequency-decomposition of VR

Author(s)

Lei Zhao, <lei.zhao@cau.edu.cn>; Daniel Reuman, <reuman@ku.edu>

References

<Lei's paper>

See Also

vr

Examples

```
X<-matrix(runif(200,1,100), 10, 20)
ans<-vrf(X)
```

---

wts *Compute the weights (wts)*

Description

This function is used to compute weights (wts)

Usage

```
wts(X)
```

Arguments

X	a matrix with counts or densities arranged in species by time step

Value

wts returns an object of class list consisting of

frequency	a vector from 0 to 1 (not include 0 and 1)
wts	a vector of wts

Author(s)

Lei Zhao, <lei.zhao@cau.edu.cn>; Daniel Reuman, <reuman@ku.edu>

References

<Lei paper>

Examples

```
X<-matrix(runif(200,1,100), 10, 20)
ans<-wts(X)
```

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