Package ‘useful’

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Date    2018-10-07
Description A set of little functions that have been found useful to do little odds and ends such as plotting the results of K-means clustering, substituting special text characters, viewing parts of a data.frame, constructing formulas from text and building design and response matrices.
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Description
Plot acf objects

Usage

```r
# S3 method for class 'acf'
autoplot(object, xlab = x, ylab = y,
          title = sprintf("%s Plot", y), ...)
```

Arguments

- `object`: An `acf` object.
- `xlab`: X-axis label.
- `ylab`: Y-axis label.
- `title`: Graph title.
- `...`: Further arguments.

Details
Plot acf (and pacf) objects.

Value
A ggplot object.

Author(s)
Jared P. Lander
Examples

```r
autoplot(acf(sunspot.year, plot=FALSE))
autoplot(pacf(sunspot.year, plot=FALSE))
```

binary.flip

**Description**

Flip binary numbers

**Usage**

```r
binary.flip(x)
```

**Arguments**

- `x` A vector of 0/1 numbers.

**Value**

`X` with 0’s flipped to 1’s and 1’s flipped to 0’s

**Author(s)**

Jared P. Lander

Examples

```r
binary.flip(c(1,1,0,1,0,0,1))
```

bottomleft

**Description**

Grabs the bottom left corner of a data set

**Usage**

```r
bottomleft(x, r = 5L, c = 5L, ...)
```
Arguments

- `x`: The data
- `r`: Number of rows to display
- `c`: Number of columns to show
- `...`: Arguments passed on to other functions

Details

Displays the bottom left corner of a rectangular data set.

This is a wrapper function for `corner`

Value

... The bottom left corner of the data set that was requested. The size depends on `r` and `c`.

Author(s)

Jared P. Lander www.jaredlander.com

See Also

`head tail corner topright topleft bottomleft left right`

Examples

```r
data(diamonds)
head(diamonds)  # displays all columns
bottomleft(diamonds)  # displays last 5 rows and only the first 5 columns
```

---

**bottomright**

Grabs the bottom right corner of a data set

Description

Display the bottom right corner of a rectangular data set

Usage

```r
bottomright(x, r = 5L, c = 5L, ...)
```

Arguments

- `x`: The data
- `r`: Number of rows to display
- `c`: Number of columns to show
- `...`: Arguments passed on to other functions
build.formula

Details
Displays the bottom right corner of a rectangular data set.
This is a wrapper function for corner

Value
... The bottom right corner of the data set that was requested. The size depends on r and c.

Author(s)
Jared P. Lander www.jaredlander.com

See Also
head tail corner topright bottomleft topleft left right

Examples

```r
data(diamonds)
head(diamonds) # displays all columns
bottomright(diamonds) # displays last 5 rows and only the last 5 columns
```

---

build.formula               Formula Builder

Description
Formula Builder

Usage

```r
build.formula(lhs, rhs)
```

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>lhs</td>
<td>Character vector for left side of formula</td>
</tr>
<tr>
<td>rhs</td>
<td>Character vector for right side of formula</td>
</tr>
</tbody>
</table>

Details
Builds a formula easily given the left and right hand sides. Right now it only handles additive formulas and not interactions unless that is specified in the character.

Value
A formula object
Description

Build the x matrix for a glmnet model

Usage

build.x(formula, data, contrasts = TRUE, sparse = FALSE)

Arguments

formula A formula
data A data.frame
contrasts Logical indicating whether a factor's base level is removed. Can be either one
single value applied to every factor or a value for each factor. Values will be
recycled if necessary.
sparse Logical indicating if result should be sparse.

Details

Given a formula and a data.frame build the predictor matrix

Value

A matrix of the predictor variables specified in the formula

Author(s)

Jared P. Lander

Examples

build.formula("Y", "X")
build.formula(c("Y", "Z"), "X")
build.formula("Z", c("X", "Q"))
build.formula(c("Y", "Z"), c("X", "Q"))
Examples

```r
require(ggplot2)
head(build.x(hwy ~ class + cyl + year, data=mpg))

testFrame <- data.frame(First=sample(1:10, 20, replace=TRUE),
Second=sample(1:20, 20, replace=TRUE),
Third=sample(1:10, 20, replace=TRUE),
Fourth=factor(rep(c("Alice","Bob","Charlie","David"), 5)),
Fifth=ordered(rep(c("Edward","Frank","Georgia","Hank","Isaac"), 4)),
Sixth=factor(rep(c("a", "b"), 10)), stringsAsFactors=F)
head(build.x(First ~ Second + Fourth + Sixth, testFrame,
contrasts=c("Fourth"=TRUE, "Fifth"=FALSE, "Sixth"=TRUE)))
head(build.x(First ~ Second + Fourth + Fifth + Sixth, testFrame,
contrasts=c(Fourth=TRUE, Fifth=FALSE, Sixth=TRUE)))
head(build.x(First ~ Second + Fourth + Fifth + Sixth, testFrame,
contrasts=FALSE))
head(build.x(First ~ Second + Fourth + Fifth + Sixth - 1, testFrame,
contrasts=FALSE))
build.x(First ~ Second + Fourth + Fifth + Sixth - 1, testFrame,
contrasts=TRUE)
# head(build.x(First ~ Second + Fourth + Fifth + Fourth*Sixth, testFrame, contrasts=FALSE))
head(build.x(First ~ Second + Fourth + Fifth + Third*Sixth, testFrame, contrasts=FALSE))
build.x(First ~ Second + Fourth + Fifth + Third*Sixth, testFrame, contrasts=FALSE, sparse=TRUE)

## if contrasts is a list then you can specify just certain factors
```
Value

The y object from a formula and data

Author(s)

Jared P. Lander

Examples

```r
require(ggplot2)
head(mpg)
head(build.y(hwy ~ class + cyl + year, data=mpg))
```

Description

Converts polar coordinates to cartesian coordinates

Usage

```r
cart2pol(x, y, degrees = FALSE)
```

Arguments

- `x` The x-coordinate of the point
- `y` The y-coordinate of the point
- `degrees` Logical indicating if theta should be returned in degrees

Details

Converts polar coordinates to cartesian coordinates using a simple conversion. The angle, theta must be in radians.


Value

A data.frame holding the polar coordinates and the original (x,y) coordinates

Author(s)

Jared P. Lander
classdf

Examples

```r
library(dplyr)
x1 <- c(1, sqrt(3)/2, sqrt(2)/2, 1/2, 0)
y1 <- c(0, 1/2, sqrt(2)/2, sqrt(3)/2, 1)
d1 <- data_frame(x=x1, y=y1, Q='I')

x2 <- c(0, -1/2, -sqrt(2)/2, -sqrt(3)/2, -1)
y2 <- c(1, sqrt(3)/2, sqrt(2)/2, 1/2, 0)
d2 <- data_frame(x=x2, y=y2, Q='II')

x3 <- c(-1, -sqrt(3)/2, -sqrt(2)/2, -1/2, 0)
y3 <- c(0, -1/2, -sqrt(2)/2, -sqrt(3)/2, -1)
d3 <- data_frame(x=x3, y=y3, Q='III')

x4 <- c(0, 1/2, sqrt(2)/2, sqrt(3)/2, 1)
y4 <- c(-1, -sqrt(3)/2, -sqrt(2)/2, -1/2, 0)
d4 <- data_frame(x=x4, y=y4, Q='IV')

dAll <- bind_rows(d1, d2, d3, d4)
cart2pol(dAll$x, dAll$y)
cart2pol(dAll$x, dAll$y, degrees=TRUE)
```

---

### classdf

<table>
<thead>
<tr>
<th>classdf</th>
<th>classdf</th>
</tr>
</thead>
</table>

### Description

Get class information for each column in a `data.frame`.

### Usage

```r
classdf(data, cols)
```

### Arguments

- **data**: `link(data.frame)` that is to be inspected.
- **cols**: The columns (named or numeric) to be included in the check.

### Details

Get class information for each column in a `data.frame`.

### Value

A vector detailing the class of each column.


**colsToFront**

**Author(s)**

Jared P. Lander

**Examples**

```r
classdf(CO2)
classdf(iris)
classdf(mtcars)
```

---

**colsToFront**

**Description**

Moves column names to the front or back of the names

**Usage**

```r
colsToFront(data, cols = names(data))

colsToBack(data, cols = names(data))
```

**Arguments**

- `data` data.frame or tbl
- `cols` Columns that should be moved

**Details**

Moves column names to the front or back of the names

**Value**

Character vector of column names

**Author(s)**

Jared P. Lander

**Examples**

```r
theDF <- data.frame(A=1:10, B=11:20, C=1:10, D=11:20)
colsToFront(theDF, c('B', 'C'))
colsToFront(theDF, c('C', 'B'))
colsToFront(theDF, c('C', 'C'))
colsToBack(theDF, c('C', 'C'))
colsToBack(theDF, c('C', 'B'))
colsToBack(theDF, c('C', 'C'))
```
**compare.list**  
*List Comparison*

**Description**
List Comparison

**Usage**
```
compare.list(a, b)
```

**Arguments**
- `a`: A List
- `b`: A List

**Details**
Compare elements of two equal length lists.

**Value**
A vector with a logical indicator for equality of each element

**Examples**
```
vect <- c(mean, mode, mean)
vect2 <- c(mean, mode, max)
vect3 <- c(mean, mean)
compare.list(vect, vect)
compare.list(vect, vect2)
tryCatch(compare.list(vect, vect3), error=function(e) print("Caught error"))
```

---

**ComputeHartigan**  
*Compute Hartigan’s Number*

**Description**
Runs the computation found in http://www.stat.columbia.edu/~madigan/DM08/descriptive.ppt.pdf

**Usage**
```
ComputeHartigan(FitActualWSS, FitPlus1WSS, nrow)
```
constant

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FitActualWSS</td>
<td>the WSS from a kmeans fit</td>
</tr>
<tr>
<td>FitPlus1WSS</td>
<td>the WSS from a kmeans fit</td>
</tr>
<tr>
<td>nrow</td>
<td>the number of rows in the original dataset</td>
</tr>
</tbody>
</table>

Details

Not exported, only used by FitKMeans

Value

The computed Hartigan Number

Author(s)

Jared P. Lander www.jaredlander.com

References


See Also

kmeans FitKMeans

Examples

data(iris)
hartiganResults <- FitKMeans(iris[, -ncol(iris)])
PlotHartigan(hartiganResults)

constant

Description

Helper function for imputing constants

Usage

custom(n = 1)

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>The value to return</td>
</tr>
</tbody>
</table>
Details

Returns a function that always returns the value of n.

Value

A function that when used simply returns n.

Author(s)

Jared P. Lander

Examples

```
constant(4)(1:10)
```

```
theDF <- data.frame(A=1:10, B=1:10, C=1:10)
theDF[c(1, 4, 6), c(1)] <- NA
theDF[c(3, 4, 8), c(3)] <- NA
simple.impute(theDF, constant(4))
```

Description

Display a corner section of a rectangular data set

Usage

```
corner(x, ...)
```

```r
## S3 method for class 'data.frame'
corner(x, r = 5L, c = 5L, corner = "topleft", ...)
```

```r
## S3 method for class 'matrix'
corner(x, r = 5L, c = 5L, corner = "topleft", ...)
```

```r
## S3 method for class 'table'
corner(x, r = 5L, c = 5L, corner = "topleft", ...)
```

```r
## Default S3 method:
corner(x, r = 5L, ...)
```
Arguments

- `x` The data
- `...` Arguments passed on to other functions
- `r` Number of rows to display
- `c` Number of columns to show
- `corner` Which corner to grab. Possible values are c("topleft", "bottomleft", "topright", "bottomright")

Details

- Grabs a corner of a data set
- Display a corner section of a rectangular data set
- Displays a corner of a rectangular data set such as a data.frame, matrix or table. If showing the right side or bottom, the order of the data is preserved.
- The default method reverts to simply calling `head`
  - corner of a rectangular data set such as a data.frame, matrix or table. If showing the right side or bottom, the order of the data is preserved.

Value

- ... The part of the data set that was requested. The size depends on `r` and `c` and the position depends on `corner`.

Author(s)

- Jared P. Lander

See Also

- `head` `tail` `topleft` `topright` `bottomleft` `bottomright` `left` `right`

Examples

```r
data(diamonds)
head(diamonds)  # displays all columns
corner(diamonds)  # displays first 5 rows and only the first 5 columns
corner(diamonds, corner="bottomleft")  # displays the last 5 rows and the first 5 columns
corner(diamonds, corner="topright")  # displays the first 5 rows and the last 5 columns
```
Description

Checks if strings are all upper or all lower case

Usage

find.case(string, case = c("upper", "lower", "mixed", "numeric"))

Arguments

string Character vector of strings to check cases
case Whether checking for upper or lower case

Details

Checks if strings are all upper or all lower case. If string is all numbers it returns TRUE.

Value

A vector of TRUE AND FALSE

Author(s)

Jared P. Lander

See Also

upper.case lower.case numeric.case mixed.case

Examples

toCheck <- c('BIG', 'little', 'Mixed', 'BIG WITH SPACE', 'little with space', 'MIXED with SPACE')
find.case(toCheck, 'upper')
find.case(toCheck, 'lower')
FitKMeans  

Fit a series of kmeans clusterings and compute Hartigan’s Number

Description

Given a numeric dataset this function fits a series of kmeans clusterings with increasing number of centers. k-means is compared to k+1-means using Hartigan’s Number to determine if the k+1st cluster should be added.

Usage

FitKMeans(x, max.clusters = 12L, spectral = FALSE, nstart = 1L, iter.max = 10L, algorithm = c("Hartigan-Wong", "Lloyd", "Forgy", "MacQueen"), seed = NULL)

Arguments

x The data, numeric, either a matrix or data.frame
max.clusters The maximum number of clusters that should be tried
spectral logical; If the data being fit are eigenvectors for spectral clustering
nstart The number of random starts for the kmeans algorithm to use
iter.max Maximum number of tries before the kmeans algorithm gives up on conversion
algorithm The desired algorithm to be used for kmeans. Options are c("Hartigan-Wong", "Lloyd", "Forgy", "MacQueen"). See kmeans
seed If not null, the random seed will be reset before each application of the kmeans algorithm

Details

A consecutive series of kmeans is computed with increasing k (number of centers). Each result for k and k+1 are compared using Hartigan’s Number. If the number is greater than 10, it is noted that having k+1 clusters is of value.

Value

A data.frame consisting of columns, for the number of clusters, the Hartigan Number and whether that cluster should be added, based on Hartigan’s Number.

Author(s)

Jared P. Lander www.jaredlander.com

References

See Also

kmeans PlotHartigan

Examples

```r
data(iris)
hartiganResults <- fitKMeans(iris[, -ncol(iris)])
PlotHartigan(hartiganResults)
```

Description

Force matrix and arrays to data.frame

Usage

```
ForceDataFrame(data)
```

Arguments

data matrix, data.frame, array, list, etc.

Details

This is a helper function for build.x and build.y to convert arrays and matrices—which are not accepted in model.frame—into data.frames

Value

a data.frame of the data

Author(s)

Jared P. Lander
Description

Fortify an acf/pacf object

Usage

```r
## S3 method for class 'acf'
fortify(model, data = NULL, ...)
```

Arguments

- `model`: An `acf` object.
- `data`: Not used. Just for consistency with the `fortify` method.
- `...`: Other arguments

Details

Prepares acf (and pacf) objects for plotting with ggplot.

Value

`data.frame` for plotting with ggplot.

Author(s)

Jared P. Lander

Examples

```r
fortify(acf(sunspot.year, plot=FALSE))
fortify(pacf(sunspot.year, plot=FALSE))
```
Description

Fortify a kmeans model with its data

Usage

```r
## S3 method for class 'kmeans'
fortify(model, data = NULL, ...)
```

Arguments

- `model`: kmeans model
- `data`: Data used to fit the model
- `...`: Not Used

Details

Prepares a kmeans object to be plotted using `cmdscale` to compute the projected x/y coordinates. If `data` is not provided, then just the center points are calculated.

Value

The original data with extra columns:

- `.x`: The projected x position.
- `.y`: The projected y position.
- `.Cluster`: The cluster that point belongs to.

Author(s)

Jared P. Lander

See Also

kmeans fortify ggplot plot.kmeans

Examples

```r
k1 <- kmeans(x=iris[, 1:4], centers=3)
hold <- fortify(k1, data=iris)
head(hold)
hold2 <- fortify(k1)
head(hold2)
```
Description

Fortify a ts object.

Usage

```r
## S3 method for class 'ts'
fortify(model, data = NULL, name = as.character(m[[2]]),
        ...)  
```

Arguments

- `model`: A `ts` object.
- `data`: A vector of the same length of `x` that specifies the time component of each element of `x`.
- `name`: Character specifying the name of `x` if it is to be different than the variable being inputed.
- `...`: Further arguments.

Details

Prepares a ts object for plotting with ggplot.

Value

- `data.frame` for plotting with ggplot.

Author(s)

Jared P. Lander

Examples

```r
fortify(sunspot.year)
```
Description

Given a long matrix index convert to row and column positions

Usage

indexToPosition(x, nrow = 1)

Arguments

x Position of indices
nrow The number of rows in the matrix

Details

Using `which` on a matrix returns a number that iterates down rows then across columns. This function returns the (row, column) position of that index.

Value

A Matrix with row and column columns and a row for each value of x

Author(s)

Jared P. Lander

Examples

indexToPosition(3, 2)
indexToPosition(c(1, 4, 5, 7, 9), 3)
indexToPosition(1:16, 4)
indexToPosition(c(1, 3, 5, 6, 8, 10, 11, 13, 15), 5)
**Description**

Check which interval a number belongs to

**Usage**

```r
interval.check(data, input = "Stop", times, fun = "\<=")
```

**Arguments**

- `data` data.frame
- `input` character name of column we wish to compare
- `times` vector in ascending order where the differences between sequential elements are the intervals
- `fun` character containing comparator

**Details**

This function takes in a data.frame with a specified column and compares that to a vector of times

**Value**

Vector indicating which element of `times` that row belongs to. If the row is beyond any element NA is in it's spot.

**Author(s)**

Jared P. Lander

**Examples**

```r
head(cars)
interval.check(cars, input="speed", times=seq(min(cars$speed), max(cars$speed), length=10))
```
left

Grabs the left side of a data set

Description
Display the left side of a rectangular data set

Usage
left(x, c = 5L, ...)

Arguments
x The data
c Number of columns to show
... Arguments passed on to other functions

Details
Displays the left side of a rectangular data set.
This is a wrapper function for \texttt{corner}

Value
... The left side of the data set that was requested. The size depends on c.

Author(s)
Jared P. Lander www.jaredlander.com

See Also
head tail corner topright bottomleft bottomright topleft right

Examples

\begin{verbatim}
data(diamonds)
head(diamonds)  # displays all columns
left(diamonds)  # displays all rows and only the first 5 columns
\end{verbatim}
load_packages

Description
Loads multiple packages

Usage
load_packages(packages)

Arguments
packages A 'character' vector of packages to be installed

Details
Allows the user to load multiple packages with one line of code. Delivers a message saying which packages have been loaded. If a user requests packages that are not installed there is an error.

Value
Nothing, loads packages

Author(s)
Jared P. Lander

Examples
load_packages('ggplot2')
load_packages(c('ggplot2', 'dplyr'))

lower.case

Description
Checks if strings are all lower case

Usage
lower.case(string)
MapToInterval

Arguments

string Character vector of strings to check cases

Details

Checks if strings are all lower case. This is a wrapper for `find.case('text', 'lower')`. If string is all numbers it returns TRUE.

Value

A vector of TRUE AND FALSE

Author(s)

Jared P. Lander

See Also

`find.case` `upper.case` `mixed.case` `numeric.case`

Examples

toCheck <- c('BIG', 'little', 'Mixed', 'BIG WITH SPACE', 'little with space', 'MIXED with SPACE')
lower.case(toCheck)

MapToInterval

Map numbers to interval

Description

Maps a range of numbers to a given interval

Usage

MapToInterval(nums, start = 1, stop = 10)

Arguments

nums The vector of numbers to be mapped
start The start of the interval
stop The end of the interval

Details

formula: \( a + (x - \text{min}(x)) \times \frac{b - a}{\text{max}(x) - \text{min}(x)} \)
mixed.case

Value
The original numbers mapped to the given interval

Author(s)
Jared P. Lander www.jaredlander.com

See Also
mapping

Examples

MapToInterval(1:10, start=0, stop=1)
mapping(1:10, start=0, stop=1)

mixed.case mixed.case

Description
Checks if strings are all lower case

Usage
mixed.case(string)

Arguments
string Character vector of strings to check cases

Details
Checks if strings are a mix of upper and lower case. This is a wrapper for find.case('text', 'mixed'). If string is all numbers it returns FALSE.

Value
A vector of TRUE AND FALSE

Author(s)
Jared P. Lander

See Also
find.case all.upper
Examples

toCheck <- c('BIG', 'little', 'Mixed', 'BIG WITH SPACE', 'little with space', 'MIXED with SPACE')
mixed.case(toCheck)

moveToFront
moveToFront

Description
Rearranges column order by moving specified columns to the front or back.

Usage
moveToFront(data, cols)
movetoback(data, cols)

Arguments
data data.frame
cols Character vector specifying the columns to be moved to the front or back

Details
Rearranges column order by moving specified columns to the front or back.

Value
A data.frame with the columns in the right order

Author(s)
Jared P. Lander

Examples
theDF <- data.frame(A=1:10, B=11:20, C=1:10, D=11:20)
moveToFront(theDF, c('B', 'C'))
moveToFront(theDF, c('C', 'B'))
moveToFront(theDF, c('C', 'C'))
movetoback(theDF, c('C', 'C'))
movetoback(theDF, c('C', 'B'))
movetoback(theDF, c('C', 'C'))
**multiple**

**Description**

Order of Magnitude Formatter

**Usage**

```r
multiple(x, multiple = c("K", "M", "B", "T", "H", "k", "m", "b", "t", "h"), big.mark = ",", extra, digits = 0, prefix = "", scientific = FALSE)
```

**Arguments**

- `x`: Vector of numbers to be formatted.
- `multiple`: The multiple to display numbers in. This symbol will be added to the end of the numbers.
- `big.mark`: Character specifying the thousands separator.
- `extra`: DEPRECATED, use `big.mark` and `prefix` instead: Function for perform any further formatting.
- `digits`: Number of decimal places for rounding.
- `prefix`: Symbol to put in front of the numbers such as a dollar sign.
- `scientific`: Logical (default: `FALSE`) indicating if the numbers should be returned in scientific notation.

**Details**

This divides the number by the appropriate amount and adds on the corresponding symbol at the end of the number.

**Value**

Character vector of formatted numbers.

**Author(s)**

Jared P. Lander

**Examples**

```r
require(scales)
vect <- c(1000, 1500, 23450, 21784, 875003780)
multiple(vect)
multiple(vect, extra=dollar)
```
multiple(vect, extra=identity)

require(ggplot2)
data(diamonds)
ggplot(diamonds, aes(x=x, y=y, color=price*100)) + geom_point() +
scale_color_gradient2(labels=multiple)

Description
Order of Magnitude Formatter

Usage
multiple.comma(x, ...)

Arguments

x Vector of numbers to be formatted.
...

Further arguments to be passed on to link{multiple}

Details
Simply a wrapper for multiple that prespecifies the extra comma.

Value
Character vector of comma formatted numbers.

Author(s)
Jared P. Lander

Examples

require(scales)
vect <- c(1000, 1500, 23450, 21784, 875003780)
multiple.comma(vect)
multiple.comma(vect, multiple="k")
multiple.comma(vect, multiple="h")

require(ggplot2)
data(diamonds)
ggplot(diamonds, aes(x=x, y=y, color=price*100)) + geom_point() +
scale_color_gradient2(labels=multiple.comma)
Description

Order of Magnitude Formatter

Usage

\texttt{multiple.dollar(x, ...)}

Arguments

\begin{itemize}
\item \texttt{x} \hspace{1cm} Vector of numbers to be formatted.
\item \texttt{...} \hspace{1cm} Further arguments to be passed on to \texttt{multiple}
\end{itemize}

Details

Simply a wrapper for \texttt{multiple} that prespecifies the extra dollar.

Value

Character vector of dollar formatted numbers.

Author(s)

Jared P. Lander

Examples

\begin{verbatim}
require(scales)
vect <- c(1000, 1500, 23450, 21784, 875003780)
multiple.dollar(vect)
multiple.dollar(vect, multiple="k")
multiple.dollar(vect, multiple="h")

require(ggplot2)
data(diamonds)
ggplot(diamonds, aes(x=x, y=y, color=price*100)) + geom_point() +
scale_color_gradient2(labels=multiple.dollar)
\end{verbatim}
Description

Order of Magnitude Formatter

Usage

```
multiple.identity(x, ...)
```

Arguments

- `x` Vector of numbers to be formatted.
- `...` Further arguments to be passed on to `link{multiple}`

Details

Simply a wrapper for `multiple` that prespecifics the extra identity.

Value

Character vector of formatted numbers.

Author(s)

Jared P. Lander

Examples

```
vect <- c(1000, 1500, 23450, 21784, 875003780)
multiple.identity(vect)
multiple.identity(vect, multiple="k")
multiple.identity(vect, multiple="h")

require(ggplot2)
data(diamonds)
ggplot(diamonds, aes(x=x, y=y, color=price*100)) + geom_point() +
scale_color_gradient2(labels=multiple.identity)
```
Description

Multiple Style Formatting

Usage

\[\text{multiple}\_\text{format}(...)\]

Arguments

... \hspace{1cm} Arguments to be passed onto \textit{multiple}

Details

Since ggplot requires a function for formatting this allows the user to specify the function’s arguments, which will return a function that can be used by ggplot.

Value

The function \textit{multiple}.

Author(s)

Jared P. Lander

Examples

\begin{verbatim}
library(scales)
vect <- c(1000, 1500, 23450, 21784, 87503780)
multiple_format()(vect)
multiple_format(extra=dollar)(vect)
multiple_format(extra=identity)(vect)

require(ggplot2)
data(diamonds)
ggplot(diamonds, aes(x=x, y=y, color=price*100)) + geom_point() +
scale_color_gradient2(labels=multiple_format(extra=dollar))
\end{verbatim}
numeric.case

Description
Checks if strings are all numbers or spaces

Usage
numeric.case(string)

Arguments
string.Character vector of strings to check cases

Details
Checks if strings are all numbers and spaces. This is a wrapper for find.case('text', 'numeric').

Value
A vector of TRUE AND FALSE

Author(s)
Jared P. Lander

See Also
find.case upper.case lower.case numeric.case

Examples
toCheck <- c('BIG', 'little', 'Mixed', 'BIG WITH SPACE', 'little with space', 'MIXED with SPACE', '17')
numeric.case(toCheck)
plot.acf

Description
Plotting an ACF object

Usage
## S3 method for class 'acf'
plot(x, ...)  

Arguments
x An ACF object
... Arguments passed on to autoplot

Details
This function has been deprecated in favor of autoplot

Value
A ggplot2 object

Author(s)
Jared P. Lander

plot.kmeans

Description
Plot the results from a k-means object

Usage
## S3 method for class 'kmeans'
plot(x, data = NULL, class = NULL, size = 2,  
      legend.position = c("right", "bottom", "left", "top", "none"),  
      title = "K-Means Results", xlab = "Principal Component 1",  
      ylab = "Principal Component 2", ...)
Arguments

- **x**: A `kmeans` object.
- **data**: The data used to fit the `kmeans` object.
- **class**: Character name of the "true" classes of the data.
- **size**: Numeric size of points
- **legend.position**: Character indicating where the legend should be placed.
- **title**: Title for the plot.
- **xlab**: Label for the x-axis.
- **ylab**: Label for the y-axis.
- **...**: Not Used.

Details

Plots the results of k-means with color-coding for the cluster membership. If `data` is not provided, then just the center points are calculated.

Value

A ggplot object

Author(s)

Jared P. Lander

See Also

`kmeans` `fortify` `ggplot` `plot.kmeans`

Examples

```r
k1 <- kmeans(x=iris[,1:4], centers=3)
plot(k1)
plot(k1, data=iris)
```
PlotHartigan  

Plot a series of Hartigan’s Numbers

Description

After fitting a series of Hartigan’s Numbers (see FitKMeans) this will plot the results so it is easy to visualize.

Usage

PlotHartigan(hartigan, title = “Hartigan's Rule”, smooth = FALSE, linecolor = "grey", linetype = 2L, linesize = 1L, minor = TRUE)

Arguments

- **hartigan**: The results from FitKMeans
- **title**: Title to be used in the plot
- **smooth**: logical; if true a smoothed line will be fit to the points, otherwise it will be a piecewise line
- **linecolor**: Color of the horizontal line denoting 10
- **linetype**: Type of the horizontal line denoting 10
- **linesize**: Size of the horizontal line denoting 10
- **minor**: logical; if true minor grid lines will be plotted

Details

Displays a graphical representation of the results of FitKMeans.

Value

a ggplot object

Author(s)

Jared P. Lander www.jaredlander.com

References


See Also

kmeans FitKMeans
Examples

```r
data(iris)
hartiganResults <- FitKMeans(iris[, -ncol(iris)])
PlotHartigan(hartiganResults)
```

plotTimesSeries

Description

Plot ts object

Usage

```r
plotTimesSeries(x, time = NULL, acf = FALSE, lag.max = NULL,
                 na.action = na.fail, demean = TRUE, title = sprintf("%s Plot",
                 name), xlab = "Time", ylab = name, ...)
```

Arguments

- **x**: a `ts` object.
- **time**: A vector of the same length of `x` that specifies the time component of each element of `x`.
- **acf**: Logical indicating if the acf and pacf should be plotted.
- **lag.max**: maximum lag at which to calculate the acf. Default is \(10\log_{10}(N/m)\) where \(N\) is the number of observations and \(m\) the number of series. Will be automatically limited to one less than the number of observations in the series.
- **na.action**: function to be called to handle missing values. `na.pass` can be used.
- **demean**: logical. Should the covariances be about the sample means?
- **title**: Graph title.
- **xlab**: X-axis label.
- **ylab**: Y-axis label.
- **...**: Further arguments.

Details

Plot a `ts` object and, if desired, it's acf and pacf.

Value

A `ggplot` object if `acf` is `FALSE`, otherwise `TRUE` indicating success.
Description

Converts polar coordinates to cartesian coordinates

Usage

pol2cart(r, theta, degrees = FALSE)

Arguments

r
The radius of the point
theta
The angle of the point, in radians
degrees
Logical indicating if theta is specified in degrees

Details

Converts polar coordinates to cartesian coordinates using a simple conversion. The angle, theta
must be in radians.


Value

A data.frame holding the (x,y) coordinates and original polar coordinates

Author(s)

Jared P. Lander
Examples

```R
polarRadPosTop <- data.frame(r=c(3, 5, 3, 5, 4, 6, 4, 6, 2),
    theta=c(0, pi/6, pi/4, pi/3, pi/2, 2*pi/3, 3*pi/4, 5*pi/6, pi))
polarRadPosBottom <- data.frame(r=c(3, 5, 3, 5, 4, 6, 4, 6, 2),
    theta=c(pi, 7*pi/6, 5*pi/4, 4*pi/3, 3*pi/2, 5*pi/3, 7*pi/4, 9*pi/6, 2*pi))
polarRadNegTop <- data.frame(r=c(3, 5, 3, 5, 4, 6, 4, 6, 2),
    theta=-1*c(0, pi/6, pi/4, pi/3, pi/2, 2*pi/3, 3*pi/4, 5*pi/6, pi))
polarRadNegBottom <- data.frame(r=c(3, 5, 3, 5, 4, 6, 4, 6, 2),
    theta=-1*c(pi, 7*pi/6, 5*pi/4, 4*pi/3, 3*pi/2, 5*pi/3, 7*pi/4, 9*pi/6, 2*pi))

pol2cart(polarRadPosTop$r, polarRadPosTop$theta)
pol2cart(polarRadPosBottom$r, polarRadPosBottom$theta)
pol2cart(polarRadNegTop$r, polarRadNegTop$theta)
pol2cart(polarRadNegBottom$r, polarRadNegBottom$theta)
```

Description

Given row and column positions calculate the index.

Usage

```R
positionToIndex(row, col, nrow = max(row))
```

Arguments

- **row**: Vector specifying row positions
- **col**: Vector specifying column positions
- **nrow**: The number of rows in the matrix

Details

With row and column positions this computes the index, starting at (1,1) working down rows then across columns.

Value

A vector of indices

Author(s)

Jared P. Lander
Examples

positionToIndex(1, 2, 2)
positionToIndex(row=c(1, 1, 2, 1, 3), col=c(1, 2, 2, 3, 3), nrow=3)
positionToIndex(rep(1:4, 4), rep(1:4, each=4), nrow=4)
positionToIndex(rep(c(1, 3, 5), 3), rep(1:3, each=3), nrow=5)

Description

Adds a class to an x.

Usage

reclass(x, value)

reclass(x) <- value

Arguments

x
value

The x getting the new class
The new class

Details

Adds a class to an x by putting the new class at the front of the vector of classes for the x.

Value

The original x with the class containing value in addition to the previous class(es)

Author(s)

Jared P. Lander

Examples

doDF <- data.frame(A=1:10, B=1:10)
reclass(doDF) <- 'newclass'
class(doDF)
doDF <- reclass(doDF, 'another')
class(doDF)
right

Grabs the right side of a data set

Description

Display the right side of a rectangular data set

Usage

```r
right(x, c = 5L, ...)
```

Arguments

- `x` The data
- `c` Number of columns to show
- `...` Arguments passed on to other functions

Details

Displays the right side of a rectangular data set.

This is a wrapper function for `corner`

Value

... The left side of the data set that was requested. The size depends on `c`.

Author(s)

Jared P. Lander www.jaredlander.com

See Also

head tail corner topright bottomleft bottomright topleft topleft

Examples

```r
data(diamonds)
head(diamonds)  # displays all columns
eight(diamonds)  # displays all rows and only the last 5 columns
```
shift.column

Description

Shift a column of data

Usage

shift.column(data, columns, newNames = sprintf("%s.Shifted", columns),
             len = 1L, up = TRUE)

Arguments

data data.frame

columns Character vector specifying which columns to shift.

newNames Character vector specifying new names for the columns that will be created by
            the shift. Must be same length as columns.

len Integer specifying how many rows to shift the data.

up logical indicating if rows should be shifted up or down.

Details

Shifts a column of data up or down a certain number of rows

Value

data.frame with the specified columns shifted.

Author(s)

Jared P. Lander

Examples

myData <- data.frame(Upper=LETTERS, lower=letters)
shift.column(data=myData, columns="lower")
shift.column(data=myData, columns="lower", len=2)
simple.impute

Description

Generic function for simple imputation.

Usage

```r
simple.impute(x, fun = median, ...)
```

Arguments

- `x`  
  An object to be imputed
- `fun`  
  The function with which to fill in missing values
- `...`  
  Further arguments

Details

Provides the ability to simply impute data based on a simple measure such as mean or median. For more robust imputation see the packages Amelia, mice or mi.

Value

An object with the missing values imputed.

Author(s)

Jared P. Lander

Examples

```r
theDF <- data.frame(A=1:10, B=1:10, C=1:10)
theDF[c(1, 4, 6), c(1)] <- NA
theDF[c(3, 4, 8), c(3)] <- NA

simple.impute(theDF$A)
simple.impute(theDF$A, mean)
simple.impute(theDF$A, constant(4))
simple.impute(theDF)
simple.impute(theDF, mean)
simple.impute(theDF, constant(4))
```
simple.impute.data.frame

Description

Function for imputing a data.frame with missing data.

Usage

## S3 method for class 'data.frame'
simple.impute(x, fun = stats::median, ...)

Arguments

- **x**: A data.frame
- **fun**: The function with which to fill in missing values
- **...**: Further arguments

Details

Provides the ability to simply impute data based on a simple measure such as mean or median. For more robust imputation see the packages Amelia, mice or mi.

Each column is imputed independently.

Value

A data.frame with the missing values imputed.

Author(s)

Jared P. Lander

Examples

```r
theDF <- data.frame(A=1:10, B=1:10, C=1:10)
theDF[c(1, 4, 6), c(1)] <- NA
theDF[c(3, 4, 8), c(3)] <- NA

simple.impute.data.frame(theDF)
simple.impute.data.frame(theDF, mean)
simple.impute.data.frame(theDF, constant(4))
```
Description

Function for imputing a vector with missing data.

Usage

```r
## Default S3 method:
simple.impute(x, fun = median, ...)
```

Arguments

- `x` A numeric or integer vector
- `fun` The function with which to fill in missing values
- `...` Further arguments

Details

Provides the ability to simply impute data based on a simple measure such as mean or median. For more robust imputation see the packages Amelia, mice or mi.

Value

An object with the missing values imputed.

Author(s)

Jared P. Lander

Examples

```r
theDF <- data.frame(A=1:10, B=1:10, C=1:10)
theDF[c(1, 4, 6), c(1)] <- NA
theDF[c(3, 4, 8), c(3)] <- NA

simple.impute.default(theDF$A)
simple.impute.default(theDF$A, mean)
simple.impute.default(theDF$A, constant(4))
```
simple.impute.tbl_df

Description
Function for imputing a tbl_df with missing data.

Usage
## S3 method for class 'tbl_df'
simple.impute(x, fun = median, ...)

Arguments
- **x**: A data.frame
- **fun**: The function with which to fill in missing values
- **...**: Further arguments

Details
Provides the ability to simply impute data based on a simple measure such as mean or median. For more robust imputation see the packages Amelia, mice or mi.

Each column is imputed independently.

Value
A data.frame with the missing values imputed.

Author(s)
Jared P. Lander

Examples
```r
theDF <- data.frame(A=1:10, B=1:10, C=1:10)
theDF[c(1, 4, 6), c(1)] <- NA
theDF[c(3, 4, 8), c(3)] <- NA

simple.impute.data.frame(theDF)
simple.impute.data.frame(theDF, mean)
simple.impute.data.frame(theDF, constant(4))
```
subOut

Sub special characters out of a character vector.

Description
Converts each of the special characters to their escaped equivalents in each element of a single vector.

Usage
```
subOut(toAlter, specialChars = c("!", ",", ",", ",", ",", ","))
```

Arguments
- **toAlter**: Character vector that will be altered by subbing the special characters with their escaped equivalents
- **specialChars**: The characters to be subbed out

Details
Each element in the specialChar vector is subbed for its escaped equivalent in each of the elements of toAlter

Value
toAlter is returned with any of the defined specialChars subbed out for their escaped equivalents

Author(s)
Jared P. Lander www.jaredlander.com

See Also
- sub subSpecials

Examples
```
subOut(c("Hello", "(parens)", "Excited! Mark"))
subOut(c("Hello", "(parens)", "Excited! Mark"), specialChars=c("!", ","))
```
subSpecials

Sub special characters out of character vectors.

Description

Converts each of the special characters to their escaped equivalents in each element of each vector.

Usage

subSpecials(..., specialChars = c("!", ",", ";", "]", ":", ".", ".", "..")

Arguments

... Character vectors that will be altered by subbing the special characters with their escaped equivalents

specialChars The characters to be subbed out

Details

Each element in the specialChar vector is subbed for its escaped equivalent in each of the elements of each vector passed in.

Value

The provided vectors are returned with any of the defined specialChars subbed out for their escaped equivalents. Each vector is returned as an element of a list.

Author(s)

Jared P. Lander www.jaredlander.com

See Also

sub subOut

Examples

subSpecials(c("Hello", "(parens)", "Excited! Mark"))
subSpecials(c("Hello", "(parens)", "Excited! Mark"), specialChars=c("!", ","))
subSpecials(c("Hello", "(parens)", "Excited! Mark"),
  c("This is a period. And this is an asterisk *"), specialChars=c("!", ","))
subSpecials(c("Hello", "(parens)", "Excited! Mark"),
  c("This is a period. And this is an asterisk *"), specialChars=c("!", ",", ",*, ",")
**Description**

Substitutes multiple patterns and corresponding replacements

**Usage**

\[ \text{subVector}(x, \text{toSub}) \]

\[ \text{subMultiple}(x, \text{pattern}, \text{replacement}) \]

**Arguments**

- **x** Vector of text to search
- **toSub** Named vector where the elements are the pattern and the names are the replacement values
- **pattern** Vector of patterns to find in each element of \( x \)
- **replacement** Vector of replacement values corresponding to each value of pattern

**Details**

Given a vector of text replaces all patterns each each element

**Value**

The text in \( x \) with substitutions made

**Author(s)**

Jared P. Lander

**Examples**

```r
theText <- c('Hi Bob & Cooper how is life today',
              'Anything happening now?',
              'Sally & Dave are playing with Jess & Julio | with their kids')

subVector(theText, toSub=c("and"="&", 'or'='|'))
subVector(theText)

theText <- c('Hi Bob & Cooper how is life today',
              'Anything happening now?',
              'Sally & Dave are playing with Jess & Julio | with their kids')

subMultiple(theText, pattern=c('&', '||'), replacement=c('and', 'or'))
```
Description

Convenience function that takes in a time object and calculates a difference with a user specified prompt

Usage

```r
timeSingle(string = "Time difference", startTime, endTime = Sys.time(), sep = ":")
```

Arguments

- `string`: string of what was timed
- `startTime`: "POSIXct" "POSIXt" object, usually from `Sys.time`
- `endTime`: "POSIXct" "POSIXt" object, usually from `Sys.time`
- `sep`: string, usually character that is used as the separator between user prompt and time difference

Value

- `prompt_string`: string user prompt with time difference

Author(s)

Daniel Y. Chen

Examples

```r
x <- 3.14
strt <- Sys.time()
sq <- x ** 2
timeSingle('Squaring value', strt)
```
topleft

Grabs the top left corner of a data set

Description

Display the top left corner of a rectangular data set

Usage

topleft(x, r = 5L, c = 5L, ...)

Arguments

x
  The data
r
  Number of rows to display
c
  Number of columns to show
...
  Arguments passed on to other functions

Details

Displays the top left corner of a rectangular data set.

This is a wrapper function for corner

Value

... The top left corner of the data set that was requested. The size depends on r and c.

Author(s)

Jared P. Lander www.jaredlander.com

See Also

head tail corner topright bottomleft bottomright left right

Examples

data(diamonds)
head(diamonds)  # displays all columns
topleft(diamonds)  # displays first 5 rows and only the first 5 columns
**Description**

Display the top right corner of a rectangular data set.

**Usage**

topright(x, r = 5L, c = 5L, ...)

**Arguments**

- **x** The data
- **r** Number of rows to display
- **c** Number of columns to show
- **...** Arguments passed on to other functions

**Details**

Displays the top right corner of a rectangular data set.

This is a wrapper function for corner.

**Value**

... The top right corner of the data set that was requested. The size depends on r and c.

**Author(s)**

Jared P. Lander www.jaredlander.com

**See Also**

head tail corner topleft bottomleft bottomright left right

**Examples**

data(diamonds)
head(diamonds)  # displays all columns
topright(diamonds)  # displays first 5 rows and only the last 5 columns
ts.plotter

Description
Plot a ts object

Usage
ts.plotter(data, time = NULL, title = "Series Plot", xlab = "Time",
           ylab = "Rate")

Arguments
data  A ts object to be plotted.
time  A vector of the same length of data that specifies the time component of each
element of data.
title  Title of plot.
xlab  X-axis label.
ylab  Y-axis label.

Details
Fortifies, then plots a ts object.

Value
A ggplot object

Author(s)
Jared P. Lander

Examples
ts.plotter(sunspot.year)
Description

Find unique rows of a data.frame regardless of the order they appear

Usage

uniqueBidirection(x)

Arguments

x
  a data.frame

Details

Sorts individual rows to get uniques regardless of order of appearance.

Value

A data.frame that is unique regardless of direction

Author(s)

Jared P. Lander

Examples

```r
ex <- data.frame(One=c('a', 'c', 'a', 'd', 'd', 'c', 'b'),
  Two=c('b', 'd', 'b', 'e', 'c', 'd', 'a'),
  stringsAsFactors=FALSE)

# make a bigger version
exBig <- ex
for(i in 1:1000)
{
  exBig <- rbind(exBig, ex)
}
dim(exBig)

uniqueBidirection(ex)
uniqueBidirection(exBig)

ex3 <- dplyr::bind_cols(ex, dplyr::data_frame(Three=rep('a', nrow(ex))))
uniqueBidirection(ex3)
```
**Description**

Checks if strings are all upper case

**Usage**

`upper.case(string)`

**Arguments**

`string`  Character vector of strings to check cases

**Details**

Checks if strings are all upper case. This is a wrapper for `find.case('text', 'upper')`. If string is all numbers it returns TRUE.

**Value**

A vector of TRUE AND FALSE

**Author(s)**

Jared P. Lander

**See Also**

`find.case` `lower.case` `mixed.case` `numeric.case`

**Examples**

```r
toCheck <- c('BIG', 'little', 'Mixed', 'BIG WITH SPACE', 'little with space', 'MIXED with SPACE')
upper.case(toCheck)
```

---

**Description**

A collection of handy, helper functions
vplayout

Description
Viewport

Usage
vplayout(x, y)

Arguments
x The x cell of the viewport to push into.
y The y cell of the viewport to push into.

Details
Creates viewport for pushing ggplot objects to parts of a console.

Value
An R object of class viewport.

Author(s)
Jared P. Lander

Examples

library(ggplot2)
library(grid)

WhichCorner

Description
Function to build the right row selection depending on the desired corner.

Usage
WhichCorner(corner = c("topleft", "bottomleft", "topright", "bottomright"), r = 5L, c = 5L, object = "x")
Arguments

- `corner` (character) which corner to display c("topleft", "bottomleft", "topright", "bottomright")
- `r` (numeric) the number of rows to show
- `c` (numeric) the number of columns to show
- `object` The name of the object that is being subsetted

Details

Function to build the right row selection depending on the desired corner. Helper function for getting the indexing for data.frame’s, matrices

Value

An expression that is evaluated to return the proper portion of the data

Author(s)

Jared P. Lander

Examples

```r
## Not run:
WhichCorner('topleft')
WhichCorner('bottomleft')
WhichCorner('topright')
WhichCorner('bottomright')

WhichCorner('topleft', r=6)
WhichCorner('bottomleft', r=6)
WhichCorner('topright', r=6)
WhichCorner('bottomright', r=6)

WhichCorner('topleft', c=7)
WhichCorner('bottomleft', c=7)
WhichCorner('topright', c=7)
WhichCorner('bottomright', c=7)

WhichCorner('topleft', r=8, c=3)
WhichCorner('bottomleft', r=8, c=3)
WhichCorner('topright', r=8, c=3)
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## End(Not run)
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