Package ‘plotrix’

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Description

A large number of specialized plots and accessory functions like color scaling, text placement and legends.

Details

Package: plotrix
Version: 3.5-12
Date: 2015-05-13
License: GPL (>=2)
Built: R 3.2.0; 2015-05-13 20:56:19 UTC; linux

The plotrix package is intended to allow users to get many sorts of specialized plots quickly, yet allow easy customization of those plots without learning a great deal of specialized syntax. There are three major aims that can be represented as follows:

Fast foods

Think of plotrix as a graphics vending machine or fast graphics cafe. You walk in, make your choice and get your lunch. It may not be exactly the lunch you want, but you do get a pretty good lunch, fast. You can get junk food or health food, you make the choice.

Hot rods

You can customize plotrix as much as you want. Like the ageing machinery that is usually bolted into hot rods, the base graphics package is fairly easy to understand. plotrix is modular. You can create a frame for your plot, then you can add whatever bits you like to it instead of just taking the default plot that is available. You can have wide wheels and chromed exhaust pipes if you wish.

No black boxes

If you want to go from pushing the fast food button to hot rodding, it’s not hard. The source code in the functions is written to be understood. If something goes wrong, you can usually find where it happened right away and work on it. This means that you can learn about how the functions do what they do rather than just what they do. So that’s how to write recursive functions in R!

Because plotrix encourages users to learn how it works, you usually begin to do so pretty quickly. Users often decide to write their own versions of plotrix functions and sometimes they contribute the results back into plotrix. You may find that you like other graphics systems like grid or lattice better. That’s great, because one idea behind plotrix is that if you get into R and can get things done quickly and easily, you’ll stick with it and soon want to do things your own way.
Add a straight line to a plot

Description

As ‘abline’, but has arguments 'x1, x2, y1, y2' as in 'clip'.

Usage

```r
ablineclip(a=NULL, b=NULL, h=NULL, v=NULL, reg=NULL, coef=NULL, untf=FALSE, 
           x1=NULL, x2=NULL, y1=NULL, y2=NULL, ...)  
```

Arguments

- `a`: Intercept.
- `b`: Slope.
- `h`: the x-value(s) for vertical line(s).
- `v`: the y-value(s) for horizontal line(s).
- `reg`: Fitted lm object.
- `coef`: Coefficients, typically intercept and slope.
- `untf`: How to plot on log coordinates, see ‘abline’.
- `x1, x2, y1, y2`: Clipping limits, see ‘clip’.
- `...`: Further arguments passed to ‘abline’.

Details

‘ablineclip’ sets a new clipping region and then calls ‘abline’. If any of the four clipping limits is NULL, the values from `par("usr")` are substituted. After the call to ‘abline’, the old clipping region is restored. In order to make ‘clip’ work, there is a call to ‘abline’ that draws a line off the plot.

Multiple lines of the same type can be drawn in a single call, but the clipping region must be the same for each group of lines. Thanks to Berry Boessenkool for pointing this out.

Value

None. Adds to the current plot.

Author(s)

Remko Duursma
See Also

abline, clip

Examples

x <- rnorm(100)
y <- x + rnorm(100)
lmfit <- lm(y~x)
plot(x, y, xlim=c(-3.5, 3.5))
ablineclip(lmfit, x1 = -2, x2 = 2, lty = 2)
ablineclip(h = 0, x1 = -2, x2 = 2, lty = 3, col = "red")
ablineclip(v = 0, y1 = -2.5, y2 = 1.5, lty=4, col = "green")

Description

Adds p-values comparing the different cells at each x-axis position with a reference cell. Uses a syntax similar to ‘raw.means.plot2’.

Usage

add.ps(data, col.id, col.offset, col.x, col.value, fun.aggregate = "mean", ref.offset = 1, prefixes,alternative = c("two.sided", "less", "greater"), mu = 0, paired = FALSE, var.equal = FALSE, lty = 0, ...)}

Arguments

data A ‘data.frame’
col.id 'character' vector specifying the id column.
col.offset 'character' vector specifying the offset column.
col.x 'character' vector specifying the x-axis column.
col.value 'character' vector specifying the data column.
fun.aggregate Function or function name used for aggregating the results. Default is “mean”.
ref.offset Scalar ‘numeric’ indicating the reference level to be tested against. The default is 1 corresponding to ‘levels(factor(d[,col.offset]))[1]’.
prefixes 'character' vector of the indices for the p-values. If missing corresponds to ‘levels(factor(d.new[,col.offset])[-ref.offset]’.
alternative same as in t.test
mu same as in t.test
paired same as in t.test
var.equal same as in t.test
lty line type of axis, Default is 0 (i.e., no line).
... further arguments passed to axis.
Details
This function computes t-tests comparing the values at each x-axis position for each condition against the reference condition at and adds the p-values to the axis.

This function uses the same syntax as `raw.means.plot2` and should be used in addition to it. Note that values are ordered according to the `col.id` so `paired = TRUE` should be fine.

Value
axis is plotted.

Author(s)
Henrik Singmann

See Also
`raw.means.plot` as the accompanying main functions.

Examples
```r
# Not run:
# The examples uses the OBrienKaiser dataset from car and needs reshape.
# This extends the examples from raw.means.plot
require(reshape)
require(car)
data(OBrienKaiser)
OBKnew <- cbind(factor(1:nrow(OBrienKaiser)), OBrienKaiser)
colnames(OBKnew)[1] <- "id"
OBK.long <- melt(OBKnew)
OBK.long[, c("measurement", "time")]
  t(vapply(strsplit(as.character(OBK.long$variable), "\."), 
  "[", c("", ")))

# For this example the position at each x-axis are within-subject comparisons!
raw.means.plot2(OBK.long, "id", "measurement", "gender", "value")
add.ps(OBK.long, "id", "measurement", "gender", "value", paired = TRUE)
# reference is "fup"
raw.means.plot2(OBK.long, "id", "measurement", "gender", "value")
add.ps(OBK.long, "id", "measurement", "gender", "value", ref.offset = 2, paired = TRUE)
# reference is "post"

# Use R's standard (i.e., Welch test)
raw.means.plot2(OBK.long, "id", "treatment", "gender", "value")
add.ps(OBK.long, "id", "treatment", "gender", "value",
      prefixes = c("p(control vs. A)", "p(control vs. B)")
)

# Use standard t-test
raw.means.plot2(OBK.long, "id", "treatment", "gender", "value")
add.ps(OBK.long, "id", "treatment", "gender", "value", var.equal = TRUE,
      prefixes = c("p(control vs. A)", "p(control vs. B)")
)
```
addtable2plot

## Description

Displays a table of values at a user-specified position on an existing plot

## Usage

```
addtable2plot(x, y=NULL, table, lwd=par("lwd"), bty="n", bg=par("bg"),
cex=1, xjust=0, yjust=1, xpad=0.1, ypad=0.5, box.col=par("fg"), text.col=par("fg"),
display.colnames=TRUE, display.rownames=FALSE, hlines=FALSE, vlines=FALSE,
title=NULL)
```

## Arguments

- `x, y`: Either x and y coordinates to locate the table or an 'xy.coords' object.
- `table`: A data frame, matrix or similar object that will be displayed.
- `lwd`: The line width for the box and horizontal dividers.
- `bty`: Whether to draw a box around the table ("o") or not ("n").
- `bg`: The background color for the table.
- `cex`: Character expansion for the table.
- `xjust, yjust`: Positioning for the table relative to 'x, y'.
- `xpad, ypad`: The amount of padding around text in the cells as a proportion of the maximum width and height of the strings in each column.
- `box.col`: The color for the box and lines.
- `text.col`: The color for the text.
- `display.colnames`: Whether to display the column names in the table.
- `display.rownames`: Whether to display the row names in the table.
- `hlines`: Whether to draw horizontal lines between each row of the table.
- `vlines`: Whether to draw vertical lines between each column of the table.
- `title`: Optional title placed over the table.
The two justification arguments, ‘xjust’ and ‘yjust’ are the same as in the ‘legend’ function, and ‘addtable2plot’ has been programmed to be as similar to ‘legend’ as possible. The function now accepts the positional arguments such as "topright" if passed as ‘x’. The defaults are those that were most popular in scientific journals at the time of programming.

If ‘bg’ is a matrix of colors of the same dimensions as ‘x’, those colors will be the backgrounds of the cells. The default is no background color.

Value

nil

Author(s)

Original by John Kane, mods by Jim Lemon and Brian Diggs. Thanks to Andrija Djurovic for asking for the individual cell colors and Gabor Grothendieck for alerting me to the problem of widely varying column widths.

See Also

legend

Examples

testdf <- data.frame(Before = c(10, 7, 5, 9), During = c(8, 6, 2, 5),
                    After = c(5, 3, 4, 3))
rownames(testdf) <- c("Red", "Green", "Blue", "Lightblue")
barp(testdf, main = "Test addtable2plot", ylab = "Value",
     names.arg = colnames(testdf), col = 2:5)
# show most of the options including the christmas tree colors
abg <- matrix(c(2, 3, 5, 6, 7, 8), nrow=4, ncol=3)
addtable2plot(2, 8, testdf, bty = "o", display.rownames = TRUE, hlines = TRUE,
              vlines = TRUE, title = "The table", bg = abg)

arctext Display text on a circular arc

Description

Displays a character string on the circumference of an imaginary circle on an existing plot.

Usage

arctext(x, center=c(0,0), radius=1, start=NA, middle=pi/2, end=NA, stretch=1,
clockwise=TRUE, cex=NA,...)
Arguments

x A character string.
center The center of the circular arc in x/y user units.
radius The radius of the arc in user units.
start The starting position of the string in radians.
middle The middle position of the string in radians.
end The end position of the string in radians.
stretch How much to stretch the string for appearance.
clockwise Whether to print the string in the clockwise direction.
cex The character expansion factor.
... additional arguments passed to ‘text’.

Details

‘arctext’ displays a string along a circular arc, rotating each letter. This may not work on all devices, as not all graphic devices can rotate text to arbitrary angles. The output looks best on a Postscript or similar device that can rotate text without distortion. Rotated text often looks very ragged on small bitmaps.

If the user passes a value for ‘start’, this will override any value passed to ‘middle’. If the plot area is not square, see ‘par(pty=”s”)’, the arc will be somewhat elliptical.

If the ‘clockwise’ argument is TRUE, the string will be displayed in a clockwise direction and the orientation of the characters will be rotated ‘π’ radians (180 degrees). This is useful when the string is to be displayed on the bottom of the circumference.

Value

nil

Author(s)

Jim Lemon - Thanks to Suhas Parandekar for the idea, Ted Toal for greatly improving the placement of the text and Andy South for providing the initial code for the clockwise argument.

See Also

text

Examples

plot(0, xlim = c(1, 5), ylim = c(1, 5), main = "Test of arctext", xlab = "", ylab = "", type = "n")
arctext("bendy like spaghetti", center = c(3,3), col = "blue")
arctext("bendy like spaghetti", center = c(3,3), radius = 1.5, start = pi, cex = 2)
arctext("bendy like spaghetti", center = c(3, 3), radius = 0.5, start = pi/2, stretch = 1.2)
arctext("bendy like spaghetti", center = c(3, 3), radius = 1.7, start = 4 * pi / 3, cex = 1.3, clockwise = FALSE)
axis.break

Description

Places a "break" mark on an axis on an existing plot.

Usage

```
axis.break(axis=1,breakpos=NULL,pos=NA,bgcol="white",breakcol="black",
           style="slash",brw=0.02)
```

Arguments

- **axis**: which axis to break
- **breakpos**: where to place the break in user units
- **pos**: position of the axis (see `axis`).
- **bgcol**: the color of the plot background
- **breakcol**: the color of the "break" marker
- **style**: Either 'gap', 'slash' or 'zigzag'
- **brw**: break width relative to plot width

Details

The 'pos' argument is not needed unless the user has specified a different position from the default for the axis to be broken.

Value

- nil

Note

There is some controversy about the propriety of using discontinuous coordinates for plotting, and thus axis breaks. Discontinuous coordinates allow widely separated groups of values or outliers to appear without devoting too much of the plot to empty space. The major objection seems to be that the reader will be misled by assuming continuous coordinates. The 'gap' style that clearly separates the two sections of the plot is probably best for avoiding this.

Author(s)

Jim Lemon and Ben Bolker

See Also

- `gap.plot`
Examples

```r
plot(3:10, main = "Axis break test")
# put a break at the default axis and position
axis.break()
axis.break(2, 2.9, style = "zigzag")
```

twogrp <- c(rnorm(10) + 4, rnorm(10) + 20)
gap.plot(twogrp, gap = c(8, 16), xlab = "Index", ylab = "Group values",
main = "Two separated groups with gap axis break",
col = c(rep(2, 10), rep(3, 10)), ytics = c(3, 5, 18, 20))
legend(12, 6, c("Low group", "High group"), pch = 1, col = 2:3)

---

**axis.mult**

Display an axis with values having a multiplier

Description

An axis is displayed on an existing plot where the tick values are divided by a multiplier and the multiplier is displayed next to the axis.

Usage

```r
axis.mult(side=1, at=NULL, labels, mult=1, mult.label, mult.line,
           mult.labelpos=NULL, ...)
```

Arguments

- `side` : which side to display
- `at` : where to place the tick marks - defaults to `axTicks()`
- `labels` : tick labels - defaults to at/mult
- `mult` : the multiplier factor
- `mult.label` : the label to show the multiplier - defaults to "x mult"
- `mult.line` : the margin line upon which to show the multiplier
- `mult.labelpos` : where to place `mult.label` - defaults to centered and outside the axis tick labels
- `...` : additional arguments passed to `axis`.

Details

`axis.mult` automates the process of displaying an axis with a multiplier applied to the tick values. By default it will divide the default axis tick labels by `mult` and place `mult.label` where `xlab` or `ylab` would normally appear. Thus the plot call should set the relevant label to an empty string in such cases. It is simplest to call `plot` with `axes=FALSE` and then display the box and any standard axes before calling `axis.mult`. 
Value
nil

Note
While ‘axis.mult’ will try to display an axis on any side, the top and right margins will require adjustment using ‘par’ for ‘axis.mult’ to display properly.

Author(s)
Jim Lemon

See Also
axis, mtext

Examples
plot(1:10 * 0.001, 1:10 * 100, axes = FALSE, xlab = "", ylab = ", main = "Axis multipliers")
box()
axis.mult(1, mult = 0.001)
axis.mult(2, mult = 100)

barlabels

Label the bars on a barplot

Description
Displays labels on a plot, usually a bar plot.

Usage
barlabels(xpos, ypos, labels=NULL, cex=1, prop=0.5, miny=0, offset=0, ...)

Arguments
xpos A vector, matrix or data frame of x positions for the labels.
ypos A vector, matrix or data frame of y positions for the labels.
labels The labels to display. Defaults to the values of y.
cex Relative size of the labels. See ‘text’.
prop The proportion of ‘ypos’ at which to place the labels. Defaults to 0.5 (the middle).
miny The minimum value at which to display labels.
offset Amount to horizontally offset successive labels in case of vertical overlaps.
... Extra arguments passed to ‘boxed.labels’.
barNest

Details

`barlabels` places labels on a plot at horizontal positions `xpos` and vertical positions `ypos` * `pos`. The typical use of this function is to place labels on bars, by default in the middle of the bars. To put labels just over the tops of the bars, set `prop` to 1 and add a constant amount to `ypos`.

Value

nil

Author(s)

Jim Lemon

See Also

boxed.labels

Examples

```r
heights<-c(14,20,9,31,17)
bpos<-barplot(heights,main="A redundant bar plot")
# show the usual value labels on the bars
barlabels(bpos,heights)
# now with stacked bars and offsets
heights<-matrix(sample(c(1,2,10,15),20,TRUE),ncol=4)
bpos<-barplot(heights,main="Another redundant bar plot")
barlabels(bpos,heights,offset=0.1)
# finally use barp for the plot
bpos<-barp(heights,main="A third and final bar plot",col=2:6,
  names.arg=paste("Day",1:4))
barlabels(bpos$x,bpos$y,matrix(LETTERS[1:5],nrow=5,ncol=4))
```

barNest

Display a nested breakdown of numeric values

Description

Breaks down the elements of a data frame by one or more categorical elements and displays the breakdown as a bar plot.

Usage

```r
barNest(formula=NULL,data=NULL,FUN=c("mean","sd","valid.n"),ylim=NULL,
  main="",xlab="",ylab="",shrink=0.1,errbars=FALSE,col=NA,
  labelcex=1,lineht=NA,showall=TRUE,Nwidths=FALSE,barlabels=NULL,
  showlabels=TRUE,mar=NULL,arrow.cap=NA,trueval=TRUE)
```
Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>formula</code></td>
<td>A formula with a numeric element of a data frame on the left and one or more categorical elements on the right.</td>
</tr>
<tr>
<td><code>data</code></td>
<td>A data frame containing the elements in ‘formula’.</td>
</tr>
<tr>
<td><code>FUN</code></td>
<td>The functions to apply to x.</td>
</tr>
<tr>
<td><code>ylim</code></td>
<td>Optional y limits for the plot, usually necessary for counts.</td>
</tr>
<tr>
<td><code>main</code></td>
<td>Title for the plot.</td>
</tr>
<tr>
<td><code>xlab,ylab</code></td>
<td>Axis labels for the plot. The x axis label is typically blank.</td>
</tr>
<tr>
<td><code>shrink</code></td>
<td>The proportion to shrink the width of the bars at each level.</td>
</tr>
<tr>
<td><code>errbars</code></td>
<td>Whether to display error bars on the lowest level of breakdown.</td>
</tr>
<tr>
<td><code>col</code></td>
<td>The colors to use to fill the bars. See Details.</td>
</tr>
<tr>
<td><code>labelcex</code></td>
<td>Character size for the group labels.</td>
</tr>
<tr>
<td><code>lineht</code></td>
<td>The height of a line of text in the lower margin of the plot in user units. This will be calculated by the function if a value is not passed.</td>
</tr>
<tr>
<td><code>showall</code></td>
<td>Whether to display bars for the entire breakdown.</td>
</tr>
<tr>
<td><code>nwidths</code></td>
<td>Whether to scale the widths of the bars to the number of observations.</td>
</tr>
<tr>
<td><code>barlabels</code></td>
<td>Optional group labels that may be useful if the factors used to break down the numeric variable are fairly long strings.</td>
</tr>
<tr>
<td><code>showlabels</code></td>
<td>Whether to display the labels below the bars.</td>
</tr>
<tr>
<td><code>mar</code></td>
<td>If not NULL, a four element vector to set the plot margins. If new margins are set, the user must reset the margins after the function exits.</td>
</tr>
<tr>
<td><code>arrow.cap</code></td>
<td>The width of the &quot;cap&quot; on error bars in user units, calculated on the basis of the number of bars in the final breakdown if NA.</td>
</tr>
<tr>
<td><code>trueval</code></td>
<td>If this is not NA, the call to ‘brkdnnest’ will return the proportions of the response variable that are equal to ‘trueval’. See Details.</td>
</tr>
</tbody>
</table>

Details

‘barNest’ displays a bar plot illustrating the hierarchic breakdown of the elements of a data frame. The breakdown is performed by ‘brkdnnest’ and the actual display is performed by ‘drawNestedBars’. The heights of the bars will be proportional to the values returned by the first function in ‘FUN’. If ‘showall’ is TRUE, the entire nested breakdown will be displayed. This can be useful in visualizing the relationship between groups and subgroups in a compact format.

‘barNest’ assumes that there will be four breakdowns in the list returned by ‘brkdnnest’ in the order summary measure, upper dispersion value, lower dispersion value and number of valid observations. If ‘nwidths=FALSE’, it may work with only three and if ‘errbars=FALSE’ as well, it may work with only one.

If ‘nwidths=TRUE’, the bar widths will be scaled to the relative number of observations per group. When the numbers of observations are very different, the labels for those bars with small numbers of observations will probably overlap.

A number of functions can be passed in the ‘FUN’ argument. Three functions, ‘propbrk’, ‘sumbrk’ and ‘valid.n’ will work as summary measures, giving proportions or sums of particular values.
of a discrete variable and counts in each group and subgroup respectively. Binomial confidence limits can be added to the proportions returned by `propbrk` with `binciwl` and `binciwu` as in the second last example. If `valid.n` is the first element of `FUN`, the "overall" bar and label will be suppressed, as they are not informative. It is up to the user to decide whether any "error bars" displayed are meaningful.

The colors of the bars are determined by `col`. If `showall` is FALSE, the user only need pass a vector of colors, usually the same length as the number of categories in the final (last on the right side) element in the formula. If `showall` is TRUE and the user wants to color all of the bars, a list with as many elements as there are levels in the breakdown should be passed. Each element should be a vector of colors, again usually the same length as the number of categories. As the categorical variables are likely to be factors, it is important to remember that the colors must be in the correct order for the levels of the factors. When the levels are not in the default alphanumeric order, it is quite easy to get this wrong. As a `barNest` plot with more than a few factors and levels in each factor is quite dense, easily distinguished colors for each level of the breakdown may be preferable. As with some other plots, trying to cram too much information into a single illustration may not work well.

Value

The summary list produced by brkdnNest.

Author(s)

Jim Lemon and Ofir Levy

References


See Also

`brkdnNest, drawNestedBars, superbarplot(UsingR)`

Examples

```r
# recreate the Titanic data frame and show the three way breakdown
titanic <- data.frame(
  class = c(rep("1st", 325), rep("2nd", 285), rep("3rd", 706), rep("Crew", 885)),
  age = c(rep("Adult", 319), rep("Child", 6), rep("Adult", 261), rep("Child", 24),
         rep("Adult", 627), rep("Child", 79), rep("Adult", 885)),
  sex = c(rep("M", 175), rep("F", 144), rep("M", 5), rep("F", 1),
         rep("M", 168), rep("F", 93), rep("M", 11), rep("F", 13),
         rep("M", 462), rep("F", 165), rep("M", 48), rep("F", 31),
         rep("M", 862), rep("F", 23)),
  survived = c(rep("Yes", 57), rep("No", 118), rep("Yes", 140), rep("No", 4), rep("Yes", 6),
              rep("Yes", 14), rep("No", 154), rep("Yes", 80), rep("No", 13), rep("Yes", 24),
              rep("Yes", 75), rep("No", 387), rep("Yes", 76), rep("No", 89),
              rep("Yes", 13), rep("No", 35), rep("Yes", 14), rep("No", 17),
              rep("Yes", 192), rep("No", 670), rep("Yes", 20), rep("No", 3)))
```
require(plotrix)
titanic.colors <- list("gray90",c("#0000ff","#7700ee","#aa00cc","#dd00aa"),
c("#cc0000","#ee9900"),c("pink","lightblue"))

barNest(survived~class+age+sex,titanic.col=titanic.colors,showall=TRUE, 
main="Titanic survival by class, age and sex",ylab="Proportion surviving", 
FUN=c("propbrk","binciWu","binciWl","valid.n"),shrink=0.15, trueval="Yes")

barNest(survived~class+age+sex,titanic.col=titanic.colors,showall=TRUE, 
main="Titanic survival by class, age and sex (scaled bar widths)", 
ylab="Proportion surviving",FUN=c("propbrk","binciWu","binciWl","valid.n"), 
shrink=0.15,trueval="Yes",nwidths=TRUE)

# now show the actual numbers of passengers
barNest(survived~class+age+sex,titanic.col=titanic.colors,showall=TRUE, 
main="Titanic passengers and crew by class, age and sex", 
ylab="Number",FUN="valid.n",shrink=0.15)

# to see this properly displayed, start a wide plot window
# x11(width=10)
testNdf <- data.frame(Age=rnorm(100,25,10), 
Sex=sample(c("Male","Female"),100,TRUE), 
Marital=sample(c("Div","Mar","Sing","Wid"),100,TRUE), 
Employ=sample(c("FT","PT","Un"),100,TRUE))
test.col <- list(Overall="gray",Sex=c("pink","lightblue"), 
Marital=c("mediumpurple","orange","tan","lightgreen"), 
Employ=c("#1affd8","#caeecc","#ff90d0"))

barNest(formula=Age~Sex+Marital+Employ,data=testNdf,ylab="Mean age (years)", 
main="Mean age by subgroups",errbars=TRUE,col=test.col)

barNest(formula=Age~Sex+Marital+Employ,data=testNdf,ylab="Mean age (years)", 
main="Mean age by subgroups (widths scaled to Ns)",errbars=TRUE,col=test.col, 
Nwidths=TRUE)

# set up functions for 20th and 80th percentiles
q20<-function(x,na.rm=TRUE) return(quantile(x,probs=0.2,na.rm=TRUE))
q80<-function(x,na.rm=TRUE) return(quantile(x,probs=0.8,na.rm=TRUE))

# show the asymmetric dispersion measures
barNest(formula=Age~Sex+Marital+Employ,data=testNdf,ylab="Mean age (years)", 
main="Use median and quantiles for dispersion", 
FUN=c("median","q20","q80","valid.n"), 
errbars=TRUE,col=test.col)

barNest(formula=Employ~Sex+Marital,data=testNdf,ylab="Proportion unemployed", 
main="Proportion unemployed by sex and marital status", 
FUN=c("propbrk","binciWu","binciWl","valid.n"), 
errbars=TRUE,col=test.col,trueval="Un")

barNest(formula=Employ~Sex+Marital,data=testNdf,ylab="Proportion unemployed", 
main="Proportion unemployed by sex and marital status (scaled bar widths)", 
FUN=c("propbrk","binciWu","binciWl","valid.n"), 
errbars=TRUE,col=test.col,trueval="Un",Nwidths=TRUE)

barNest(formula=Age~Sex+Marital+Employ,data=testNdf,ylab="Counts", 
main="Show the counts in subgroups (final level only)",FUN="valid.n", 
col=test.col,showall=FALSE,ylim=c(0,10))

barNest(formula=Age~Sex+Marital+Employ,data=testNdf,ylab="Counts", 
main="Show all the counts in subgroups",FUN="valid.n",mar=c(5,5,4,2), 
col=test.col)
barp

A bar plotting routine

Description
Display a bar plot

Usage
barp(height, width=0.4, names.arg=NULL, legend.lab=NULL, legend.pos=NULL, col=NULL, border=par("fg"), main=NULL, xlab="", ylab="", xlim=NULL, ylim=NULL, x=NULL, staxx=FALSE, staxy=FALSE, height.at=NULL, height.lab=NULL, cex.axis=par("cex.axis"), pch=NULL, cylindrical=FALSE, shadow=FALSE, do.first=NULL, ylog=FALSE, srt=NA)

Arguments
- **height**: A numeric vector, matrix or data frame that will be represented as the heights of bars.
- **width**: Half the width of a single bar or group of bars in X axis units.
- **names.arg**: The labels for the bars or groups of bars.
- **legend.lab**: Labels for an optional legend. If NULL, no legend is displayed.
- **legend.pos**: Optional position for the legend as a list with ‘x’ and ‘y’ components. If this is NULL, ‘locator’ will be called.
- **col**: The fill colors for the bars. The default is no fill.
- **border**: The border for the bars.
- **main**: The title at the top of the plot.
- **xlab, ylab**: The labels for the X and Y axes respectively.
- **xlim, ylim**: Optional horizontal and vertical limits for the plot.
- **x**: Optional horizontal positions for the bars. Defaults to 1:length(height).
- **staxx, staxy**: Whether to use staxlab to stagger the X or Y axis tick labels.
- **height.at**: Optional positions of the tick marks on the Y axis.
- **height.lab**: Optional tick labels for the Y axis.
- **cex.axis**: Character expansion for the axis labels.
- **pch**: Symbol(s) to fill the bars. See Details.
- **cylindrical**: Whether to give the bars a cylindrical appearance by shading them.
- **shadow**: Whether to place a shadow behind the bars.
- **do.first**: An optional string that will be evaluated before anything else is displayed on the plot. Useful for background colors or lines.
- **ylog**: Logical for whether a log scale is to be used. see details.
- **srt**: Rotation of axis labels if staxx or staxy is TRUE (see ‘staxlab’).
`barp` displays a bar plot similar to `barplot` but with axes and horizontal bar positions more like `plot`. Bars or groups of bars are centered on integral X values by default, and so both the width and spacing of the bars are controlled by a single number. If the user passes explicit `x` values, those values will determine the spacing. If `height` is a vector, single bars representing each value will be displayed centered at `1:length(height)` unless the user has specified `x` values. If `height` is a matrix, 2D array, or data frame, a group of bars will be drawn for each column, with the values of the group taken from the rows of that column. Explicit `x` values cannot be used with a matrix, however, by adjusting the values of `x`, grouped bars can be displayed.

The values from `freq` or `brkdn` in the prettyR package can be used as the `height` argument. The value from `table` can also be passed as `height`, as can a 2D array returned from the `by` function.

Bars are empty by default but fill colors can be defined in several ways. If a single color is passed, all bars will be the same color. If `height` is a vector, colors will be recycled or some will be ignored if the length of `col` is not equal to that of `height`. If `height` is a matrix or data frame, the user may pass a vector of colors equal to the number of rows in `height` or a matrix of colors of the same dimensions as `height`. Other sequences of color will probably not result in an easy to interpret plot.

`barp` is intended to simplify illustrating categorical data for which both the variable designations and the categories are names, as on many multiple choice questions. `height.at` and `height.lab` allow the user to place labels on the vertical axis, usually representing the options. If `staxx` or `staxy` are TRUE, the labels on the horizontal or vertical axes respectively will be staggered, allowing the user to use many or lengthy variable or value labels. If `srt` is not NA, these labels will be rotated counterclockwise by that value as angles in degrees instead of staggered.

`barp` allows two enhancements that may be useful in those areas where fancy plots are appreciated. One is to give the bars a cylindrical look by shading the color. The other is to place an apparent shadow behind each bar. Both of these effects appear as though the light is coming from the upper left, and this is hard coded. You can add error bars by calling `dispersion`, but many advise against this.

If `legend.lab` is not NULL, a legend will be displayed. If `legend.pos` is NA, `locator` is called to place the legend. On Windows, the alert may not appear on the console, and the function will appear to hang unless the user clicks on the console window or the plot.

The `ylog` argument produces a log scale on the y axis. Currently, neither `pretty` nor `axTicks` seems to produce a nice set of axis ticks, so it is best to pass the positions of these in `height.at`.

If the `pch` argument is not NULL, barp will display white bars filled with the symbols specified in `pch`. With grouped bars, this must be a matrix with the same form as the `col` argument. This option allows a black and white bar plot to be produced.

### Value

A list containing two components of the same form as `height`:

- `x` The centers of the bars displayed.
- `y` The heights of the bars.
Author(s)
Jim Lemon

See Also
staxlab, barplot, cylindrect, gradient.rect

Examples

```r
# get some extra room on the left
par(mar=c(5,5,4,2))
# make up some happiness data, as so many seem to do
happyday <- data.frame(Monday=c(2.3,3.4), Tuesday=c(2.8,3.3), Wednesday=c(3.2,3.1),
                       Thursday=c(3.6,2.8), Friday=c(4.2,2.6), Saturday=c(4.5,2.9), Sunday=c(4.1,2.8))
happylabels <- c("Utterly dashed", "Rather moody", "Indifferent", "Somewhat elated",
                   "Euphoric")
barp(happyday, names.arg=names(happyday), legend.lab=c("Slaves", "Unemployed"),
     legend.pos=list(x=2,y=4.5), col=c("#ee7700", "#3333ff"), main="9AM happiness by weekday",
     xlab="Day of week", ylab="Happiness rating", ylim=c(1,5), staxx=TRUE, staxy=TRUE,
     height.at=1:5, height.lab=happylabels, cex.axis=0.9, cylindrical=TRUE, shadow=TRUE)
# now do a plot with colors scaled to the sex ratio (real data!)
sexratio <- c(0.24, 0.35, 0.09, 0.59, 0.63, 0.34, 0.7, 0.6)
# the fun ratings are once again a pack of lies
funratings <- c(3.2, 3.5, 1.5, 5.4, 4.5, 2.7, 6.8, 4.9)
               "Math/Stats", "Psychology", "Sociology")
                "Maniacal")
# xrange is used to get the colors to match the 0-100% scale
barp(funrating, names.arg=funstudy, main="Fun ratings for various areas of study",
     col=color.scale(sexratio, c(0.2, 1), c(0.2, 0.4), c(1, 0.4), xrange=c(0, 1)),
     xlab="Study", ylab="Rating", height.at=1:7, height.lab=funlabels, ylim=c(1, 7),
     staxx=TRUE, staxy=TRUE, cex.axis=0.9)
# here we want the full scale from zero to one
color.legend(2,6,4,6.4, legend=c("100% guys", "100% girls"),
             rect.col=color.scale(seq(0,1,by=0.25), c(0.2,1), c(0.2,0.4), c(1,0.4)))
par(mar=c(5,4,4,2))
# use barp to display a multiple histogram with a shaded background
# notice how the expression uses local variables inside the barp function
gradbg <- "gradient.rect(xlim[1], ylim[1], xlim[2], ylim[2],
                   c(1,0.5,1), c(1,0.5,1), c(1,0.5,1), color=""y"", nslices=100)"
h1 <- table(cut(rnorm(100,4), breaks=seq(0.8,by=2)))
h2 <- table(cut(rnorm(100,4), breaks=seq(0.8,by=2)))
h3 <- table(cut(rnorm(100,4), breaks=seq(0.8,by=2)))
hmat <- matrix(c(h1,h2,h3), nrow=3, byrow=TRUE)
barp(hmat, names.arg=names(h1), width=0.45, col=2:4, do.first=gradbg,
     main="Multiple histogram using barp", xlab="Bins", ylab="Frequency")
legend(3.8,5.8, c("h1", "h2", "h3"), fill=2:4)
# now display a positive/negative plot
barp(c(2,-3.4,-5.6,-7,8), main="Positive/negative plot",
     xlab="Alternate colors", ylab="For alternating values"
```
battleship.plot

Display a matrix of values as the widths of stacked rectangles

Description
‘battleship.plot’ displays a matrix of rectangles, with widths proportional to the values in ‘x’. The values are scaled so that half the width of the largest rectangle is equal to ‘maxxspan’ in user units. This prevents the rectangles from overlapping. The user can adjust the spacing of the stacks of rectangles by changing ‘maxxspan’. Similarly, maxyspan controls the spacing between rectangles in the vertical direction.

The labels for each stack of plots (the columns of x) are displayed at the top of the plot, angled at 45 degrees. The labels for each row of rectangles in the stacks (the rows of x) are displayed at the left. Long labels for either may require adjusting the ‘mar’ argument.

The function will try to extract the labels ‘xaxlab’ and ‘yaxlab’ from the matrix column and row names respectively if none are passed.

Usage
battleship.plot(x, mar=c(2,5,5,1), col="white", border="black", main="", xlab="", ylab="", xaxlab=NA, yaxlab=NA, cex.labels=1, maxxspan=0.45, maxyspan=0.45)

Arguments
x A matrix or data frame containing numeric values. See the example.
mar Margins for the plot.
col The fill colors for the rectangles.
border The border colors for the rectangles.
main The title for the plot (i.e. ‘main’).
xlab, ylab The x and y axis labels.
xaxlab, yaxlab Optional labels for the rows and columns.
cex.labels Character expansion for the row and column labels.
maxxspan, maxyspan Scaling factor for the widths and heights of the rectangles so that they don’t overlap.

Value
nil

Author(s)
Jim Lemon - thanks to Adam Maltese for the suggestion
See Also

plot, staxlab

Examples

```r
x <- matrix(sample(10:50, 100, TRUE), 10)
battleship.plot(x, xlab = "The battle has just begun", main = "Battleship!",
                xaxlab = xaxlab, yaxlab = yaxlab)
```

Description

Classifies wind direction and speed records into a matrix of percentages of observations in speed and direction bins.

Usage

```r
bin.wind.records(winddir, windspeed, ndir = 8, radians = FALSE,
                  speed.breaks = c(0, 10, 20, 30))
```

Arguments

- `winddir`: A vector of wind directions.
- `windspeed`: A vector of wind speeds corresponding to the above directions.
- `ndir`: Number of direction bins in a compass circle.
- `radians`: Whether wind directions are in radians.
- `speed.breaks`: Minimum wind speed for each speed bin.

Details

`bin.wind.records` bins a number of wind direction and speed records into a matrix of percentages of observations that can be used to display a cumulative wind rose with `oz.windrose`. The defaults are those used by the Australian Bureau of Meteorology.

Value

A matrix of percentages in which the rows represent wind speed categories and the columns represent wind direction categories.

Author(s)

Jim Lemon
See Also

- oz.windrose

Examples

```r
winddir <- sample(0:360, 100, TRUE)
windspeed <- sample(0:40, 100, TRUE)
bin.wind.records(winddir, windspeed)
```

---

### binciwl

#### Lower binomial confidence limit

**Description**

Calculates a lower binomial confidence limit using the Wilson approximation.

**Usage**

```r
binciwl(x, n, alpha = 0.05, trueval = TRUE, na.rm = TRUE)
```

**Arguments**

- `x`: The number of successes or failures for which the CI is to be calculated.
- `n`: The number of trials as above.
- `alpha`: The desired coverage - 0.05 produces 95 percent coverage.
- `trueval`: The value representing the outcome of interest for the CI.
- `na.rm`: Argument needed to make this work.

**Details**

`binciwl` calculates the lower binomial confidence limit for the given number of successes and trials. It is mainly to allow binomial confidence limits to be calculated in the `brkdnnest` function, which is why the upper and lower CIs are calculated separately.

**Value**

The lower binomial confidence limit

**Author(s)**

Jim Lemon

**See Also**

- `binciWu`

**Examples**

```r
binciwl(5, 42)
```
binciWu

Upper binomial confidence limit

Description
Calculates an upper binomial confidence limit using the Wilson approximation.

Usage
binciWu(x,n,alpha=0.05,trueval=TRUE,na.rm=TRUE)

Arguments
x
The number of successes or failures for which the CI is to be calculated.
n
The number of trials as above.
alpha
The desired coverage - 0.05 produces 95 percent coverage
trueval
The value representing the outcome of interest for the CI.
na.rm
Argument needed to make this work

Details
'binciWu' calculates the upper binomial confidence limit for the given number of successes and trials. It is mainly to allow binomial confidence limits to be calculated in the 'brkdnNest' function, which is why the upper and lower CIs are calculated separately.

Value
The upper binomial confidence interval

Author(s)
Jim Lemon

See Also
binciWl

Examples
binciWu(5,42)
Description

'box.heresy' displays a box plot in which a symbol represents a measure of central tendency, a surrounding box that represents an "inner" measure of dispersion (e.g. standard error) and whiskers represent an "outer" measure of dispersion (e.g. standard deviation). The function is pretty basic at this time and will probably change a bit.

One of the first changes is to allow varying box widths. The user can specify the box widths as a vector of numeric values at least as long as the number of boxes to be displayed. The usual reason for doing this is to display widths that are proportional to the number of observations. A useful start is to pass ‘boxwidth’ as the number of observations and let the function work it out.

Usage

```r
box.heresy(x,y,upper,innerlower,ulim,ullim,boxwidth=NA,
intervals=FALSE,arrow.cap=NA,pch=NA,main="",xlab="",ylab="",
xaxlab=NA,col="white",do.first=NULL,...)
```

Arguments

- `x, y`: Vectors of numeric values representing measures of central tendency.
- `inner`, `innerlower`, `ulim`, `ullim`: Vectors of numeric values representing "inner" measures of dispersion.
- `boxwidth`: Optional widths for the boxes.
- `intervals`: Whether the values for dispersion are intervals (TRUE) or absolute limits (FALSE).
- `arrow.cap`: The width of the cap on the "whiskers" relative to the width of the plot. Defaults to the same width as the outer box.
- `pch`: The symbol to be used to represent the measure(s) of central tendency in the box.
- `main`: The title for the plot (i.e. ‘main’).
- `xlab`, `ylab`: The x and y axis labels.
- `xaxlab`: Optional labels for the boxes.
- `col`: The fill colors for the "inner" rectangles.
- `do.first`: An expression that will be evaluated before anything is displayed.
- `...`: additional arguments passed to the ‘dispersion’ function.

Value

- `nil`
boxed.labels

Description

Places labels in boxes on an existing plot

Usage

boxed.labels(x,y=NA,labels,
  bg=ifelse(match(par("bg"),"transparent",0),"white",par("bg")),
  border=TRUE, xpad=1.2, ypad=1.2, srt=0, cex=1, adj=0.5, xlog=FALSE, ylog=FALSE,...)
boxed.labels

Arguments

- **x, y**: x and y position of the centers of the labels. ‘x’ can be an `xy.coords` list.
- **bg**: The fill color of the rectangles on which the labels are displayed (see Details).
- **labels**: Text strings
- **border**: Whether to draw borders around the rectangles.
- **xpad, ypad**: The proportion of the rectangles to the extent of the text within.
- **srt**: Rotation of the labels. If 90 or 270 degrees, the box will be rotated 90 degrees.
- **cex**: Character expansion. See ‘text’.
- **adj**: left/right adjustment. If this is set outside the function, the box will not be aligned properly.
- **xlog, ylog**: Whether the X axis is a log axis

Details

The label(s) are displayed on a rectangular background. This may be useful for visibility and is the reason that "transparent" background is not available. With the default `textcol=NA`, the function tries to work out whether white or black text will be more easily read based on the background color and displays the text accordingly. If the user specifies text colors in the additional arguments, these colors will override the automatic white/black above - see the last example.

Only right angle rotations are allowed in `boxed.labels`. Important change: ‘xpad’ and ‘ypad’ are now the full proportion of the box to text, not half. The user can now call ‘cylindrect’ or ‘gradient.rect’ for the background rectangle.

Value

- nil

Note

This function is best for regularly spaced labels where overlapping is not a problem. See `thigmophobe.labels` for placing labels where overlap is likely.

Author(s)

Jim Lemon - thanks to Thorn Thaler for the code allowing user-specified text colors and Flemming Skjoth for the log axis correction

See Also

- `spread.labels`, `thigmophobe.labels`
Examples

```r
x <- rnorm(10)
y <- rnorm(10)
plot(x, y, type = "p")
nums <- c("one", "two", "three", "four", "five", "six", "seven", "eight", "nine", "ten")
boxed.labels(x, y - 0.1, nums)
# now label a barplot
xpos <- barp(c(1, 3, 2, 4))
boxed.labels(xpos$x, 0.5, nums[1:4])
# and add labels below the x axis ticks
boxed.labels(xpos$x, -0.4, c("First", "Second", "Third", "Fourth"))
# perform a PCA on the "swiss" dataset and plot the first two components
data(swiss)
swiss.pca <- prcomp(swiss)
plot(swiss.pca$rotation[, 1:2], xlim = c(-1, 0.2), main = "PCA of swiss dataset",
     type = "n")
boxed.labels(swiss.pca$rotation[1:6], swiss.pca$rotation[7:12], ypad = 1.5,
colnames(swiss), bg = c("red", "purple", "blue", "blue", "darkgreen", "red"),
col = "yellow")
```

brkdn.plot

A point/line plotting routine

Description

Display a point/line plot of breakdowns of one or more variables.

Usage

```r
brkdn.plot(vars, groups = NA, obs = NA, data, mct = "mean", md = "std.error", stagger = NA,
dispbar = TRUE, main = "Breakdown plot", xlab = NA, ylab = NA, xaxlab = NA,
ylim = NA, type = "b", pch = 1, lty = 1, col = par("fg"), staxx = FALSE, ...)
```

Arguments

- **vars**: The names or indices of one or more columns in a data frame. The columns must contain numeric data. If only one variable is to be broken down, `vars` can be a formula.
- **groups**: The name or index of a column in a data frame that classifies the values in `vars` into different, usually fixed effect, levels.
- **obs**: The name or index of a column in a data frame that classifies the values in `vars` into different, usually random effect, levels.
- **data**: The data frame.
- **mct**: The measure of central tendency to calculate for each group.
- **md**: The measure of dispersion to calculate, NA for none.
stagger

The amount to offset the successive values at each horizontal position as a proportion of the width of the plot. The calculated default is usually adequate. Pass zero for none.

dispbar

Whether to display the measures of dispersion as bars.

main

The title at the top of the plot.

xlab,ylab

The labels for the X and Y axes respectively. There are defaults, but they are basic.

xaxlab

Optional labels for the horizontal axis ticks.

ylim

Optional vertical limits for the plot.

type

Whether to plot symbols, lines or both (as in ‘plot’).

pch

Symbol(s) to plot.

lty

Line type(s) to plot.

col

Color(s) for the symbols and lines.

staxx

Whether to call staxlab to display the X axis labels.

... additional arguments passed to ‘plot’.

Details

‘brkdn.plot’ displays a plot useful for visualizing the breakdown of a response measure by two factors, or more than one response measure by either a factor representing something like levels of treatment (‘groups’) or something like repeated observations (‘obs’). For example, if observations are made at different times on data objects that receive different treatments, the ‘groups’ factor will display the measures of central tendency as points/lines with the same color, symbol and line type, while the ‘obs’ factor will be represented as horizontal positions on the plot. If ‘obs’ is numeric, its unique values will be used as the positions, if not, 1 to the number of unique values. This is a common way of representing changes over time intervals for experimental groups.

If only one numeric variable is to be broken down, ‘vars’ may be a formula like ‘var~groups+obs’. The position of the two factors to break down the variable is fixed - the second term will be interpreted as "groups" and the third, if present, will be interpreted as "obs".

Value

A list of two matrices of dimension ‘length(levels(groups))’ by ‘length(levels(obs))’. The first contains the measures of central tendency calculated and its name is the name of the function passed as ‘mct’. The second contains the measures of dispersion and its name is the name of the function passed as ‘md’.

If both ‘groups’ and ‘obs’ are not NA, the rows of each matrix will be the ‘groups’ and the columns the ‘obs’. If ‘obs’ is NA, the rows will be the ‘groups’ and the columns the ‘vars’. If ‘groups’ is NA, the rows will be the ‘vars’ and the columns the ‘obs’. That is, if ‘vars’ has more than one element, if ‘obs’ is NA, the elements of ‘vars’ will be considered to represent observations, while if ‘groups’ is NA, they will be considered to represent groups. At least one of ‘groups’ and ‘obs’ must be not NA or there is no point in using ‘brkdn.plot’.

Author(s)

Jim Lemon
Perform a nested breakdown of numeric values

Description

Breaks down a numeric or categorical element of a data frame by one or more categorical elements.

Usage

```r
brkdnnest(formula, data, FUN=c("mean", "sd", "sd", "valid.n"), label1="Overall", trueval=TRUE)
```

Arguments

- **formula**: A formula with a numeric element of a data frame on the left and one or more categorical elements on the right.
- **data**: A data frame containing the elements in `formula`.
- **FUN**: The functions to be applied to successive breakdowns.
- **label1**: The label to use for the overall value of the first function.
- **trueval**: The value to use in calculating proportions or sums of a categorical response variable. See Details.
‘brkdnNest’ performs a nested breakdown of an element of a data frame by one or more categorical elements. For each category and optionally subcategories, the variable on the left of the formula is summarized as specified by the functions named in ‘FUN’.

If ‘trueval’ is not NA, brkdnNest will calculate the proportion of ‘trueval’ values in the response variable out of the total valid responses. If the function ‘valid.n’ is the first function in ‘FUN’, the counts of the groups and subgroups will be returned.

Two specialized summary functions are defined within ‘brkdnNest’. ‘sumbrk’ returns the count of values in a factor equal to ‘trueval’, and ‘propbrk’ returns the proportion of values equal to ‘trueval’.

The user should take care when specifying different summary functions. ‘barNest’ expects a summary measure as the first component of the list and measures of dispersion as the second and third. If two different measures of dispersion are passed, the first must calculate the upper and the second the lower measure.

Value

A list with as many elements as there are functions in ‘FUN’. It is probably best to always specify four functions (summary measure, upper dispersion measure, lower dispersion measure and number of valid observations) even if this is redundant as in the default.

This function is similar to ‘brkdn’ in the prettyR package, but is structured to be used with the ‘barNest’ function. It produces one or more measures for the overall data, then the subsets of the data defined by the first variable to the right of the tilde, then the subsets defined by the first and second variable, and so on.

Author(s)

Jim Lemon

See Also

by

Examples

brkdntest<-data.frame(Age=rnorm(100,25,10),
  Sex=sample(c("M","F"),100,TRUE),
  Marital=sample(c("M","X","S","W"),100,TRUE),
  Employ=sample(c("FT","PT","NO"),100,TRUE))
brkdnNest(formula=Age~Sex+Marital+Employ,data=brkdntest)
# show the proportion of unemployed with binomial confidence intervals
brkdnNest(formula=Employ~Sex+Marital,data=brkdntest,
  FUN=c("propbrk","binciWu","binciWl"),trueval="NO")
**bumpchart**  
*Display a "bumps" chart*

---

**Description**

Display a chart with two or more columns of points in order of ascending values with lines connecting the points in a row.

**Usage**

```r
bumpchart(y, top.labels=colnames(y), labels=rownames(y), rank=TRUE, 
    mar=c(2,8,5,8), pch=19, col=par("fg"), lty=1, lwd=1, arrows=FALSE,...)
```

**Arguments**

- `y`  
  A numeric matrix or data frame which may contain NAs.

- `top.labels`  
  The strings that will appear at the top of each column of points on the plot.

- `labels`  
  The strings that will appear next to the outer columns of points.

- `rank`  
  Whether to rank the values in `y` before plotting.

- `mar`  
  The margins to use for the bumps chart. Alter to your taste.

- `pch`  
  The symbols to use when plotting the points.

- `col`  
  The colors to use.

- `lty`  
  The line types to use.

- `lwd`  
  The line widths to use.

- `arrows`  
  Whether to join the points with lines (FALSE) or arrows (TRUE).

- `...`  
  Additional arguments passed to `matplot` or `arrows`.

**Details**

`bumpchart` calls `matplot` to plot the values in the transposed `y` matrix or data frame, joining the points with lines. At the left and right edges of the plot, the labels identifying each row of points are displayed. This type of plot is often used to show the changing positions of entities over time, like the ranking in surveys in different years. For a similar, but more flexible plot, see `ladderplot`.

Because of the way `matplot` plots the values, the order of everything is reversed. As the typical display of ranks is with rank 1 at the top, the actual rank positions are used to plot the values. This places the lowest scores at the bottom of the plot and the highest at the top.

Any arguments that are included in `...` will be passed to `matplot` if the `arrows` argument is FALSE, and to the `arrows` function if the `arrows` argument is TRUE as in the first example.

**Value**

nil
categoryReshape

Convert object label/attribute label coding.

Description

Convert object label/attribute label coding to an object by attribute data frame.

Usage

categoryReshape(x)

Arguments

x A matrix or data frame with at least two columns.

Details

‘categoryReshape’ attempts to convert the first two columns of its input into a data frame in which rows represent objects and columns attributes. For each object, a value of 1 indicates that the object has that attribute, and a value of 0 that it does not. In set membership terms, a 1 indicates that the object is a member of that set and a 0 that it is not.
centipede.plot

Value

A data frame (see Details).

Author(s)

Jim Lemon

See Also

makeIntersectList

Examples

ns <- sample(1:8, 20, TRUE)
objects <- 0
for(i in 1:length(ns)) objects <- c(objects, rep(i, ns[i]))
attributes <- NULL
for(i in 1:length(ns)) attributes <- c(attributes, sample(LETTERS[1:8], ns[i]))
setdf <- data.frame(objects[-1], attributes[-1])
categoryReshape(setdf)

centipede.plot

Display a centipede plot

Description

Displays a centipede plot on the current graphics device.

Usage

centipede.plot(segs, mct = "mean", lower.limit = "std.error",
upper.limit = lower.limit, left.labels = NULL, right.labels = NULL,
sort.segs = TRUE, main = "", xlab = NA, pch = 21, vgrid = NA,
hgrid = NA, gridcol = "lightgray", mar = NA, col = par("fg"),
bg = "green", ...)

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>segs</td>
<td>a matrix of midpoints and limits calculated by get.segs OR a 'dstat' object</td>
</tr>
<tr>
<td></td>
<td>returned by 'brkdn'.</td>
</tr>
<tr>
<td>mct</td>
<td>The function to use in calculating the midpoint of each segment.</td>
</tr>
<tr>
<td>lower.limit</td>
<td>The functions to use in calculating the lower limits for each subset of the data.</td>
</tr>
<tr>
<td>upper.limit</td>
<td>The functions to use in calculating the upper limits.</td>
</tr>
<tr>
<td>left.labels</td>
<td>The variable or subset labels to place at the left margin of the plot.</td>
</tr>
<tr>
<td>right.labels</td>
<td>The variable or subset labels to place at the right margin of the plot.</td>
</tr>
<tr>
<td>sort.segs</td>
<td>Whether to sort the segments in ascending order.</td>
</tr>
</tbody>
</table>
main  Optional title for the plot.
xlab   Optional x axis label for the plot. The default NA displays a text label showing
the midpoint and limit functions.
pch    The symbols to use when plotting midpoints.
vgrid  Optional vertical line(s) to display on the plot. Defaults to NA (none).
hgrid  Optional horizontal grid lines to display on the plot. Defaults to NA (none).
gridcol The color for the vgrid and hgrid lines.
mar    Margin widths for the plot. Defaults to c(4,5,1,4) or c(4,5,3,4) if there is a title.
col    The color(s) of the limit lines and borders of the midpoint markers.
bg     The color(s) to fill the midpoint markers.
...    additional arguments passed to ‘plot’.

Details

‘centipede.plot’ displays one or more midpoints and limits as filled circles with horizontal error
bars. It places labels on the left and right sides of the plot. If these labels are long, it may be
necessary to pass explicit values to the ‘mar’ argument to leave enough room.

The ‘vgrid’ argument is usually used to display an average value for all of the midpoints. If one
or more values are passed in this argument, they will be displayed as vertical lines spanning the
plot. The ‘hgrid’ argument acts like the ‘grid’ function, drawing dashed horizontal lines across
the plot. If ‘hgrid=NULL’, these lines will be drawn under the values displayed, which will be 1
to the number of values on the vertical axis. The user can pass explicit values if desired. With
horizontal and optionally vertical grid lines, the centipede plot is practically equivalent to a dotplot
with error bars.

Similarly, centipede plots typically have a large number of subsets, and it may be necessary to
start the graphics device with an aspect ratio that will prevent crowding of the labels when over 30
segments are displayed.

The matrix ‘segs’ may be entered manually or read from a file. The first row specifies midpoints,
the second and third rows the lower and upper limits respectively and the fourth row the number
of valid observations. If there are no values for number of valid observations, just pass vector of blank
strings with the ‘right.labels’ argument. If a ‘dstat’ object is passed as ‘segs’, the function
will calculate the lower and upper values according to the relevant arguments. This type of plot is
also known as a caterpillar plot or a league table.

Value

nil.

Author(s)

Jim Lemon

See Also

get.segs
clean.args

Examples

testcp <- list("", 40)
for(i in 1:40) testcp[[i]] <- rnorm(sample(1:8, 1) * 50)
segs <- get.segs(testcp)
centipede.plot(segs, main = "Test centipede plot", vgrid = 0)
# now leave out the number of valid observations, pass x labels and no right labels
centipede.plot(segs[1:3, ], main = "Test centipede plot", vgrid = 0, mar = c(4, 5, 3, 2),
left.labels = paste("X", 1:40, sep = ""), right.labels = rep("", 40))

---

clean.args  
Remove inappropriate arguments from an argument list

Description

Takes a list of arguments and eliminates those that are not appropriate for passing to a particular function (and hence would produce an error if passed).

Usage

```
clean.args(argstr, fn, exclude.repeats = FALSE, exclude.other = NULL, dots.ok = TRUE)
remove.args(argstr, fn)
```

Arguments

- `argstr`: a named list of arguments, e.g. from ‘...’
- `fn`: a function
- `exclude.repeats`: (logical) remove repeated arguments?
- `exclude.other`: a character vector of names of additional arguments to remove
- `dots.ok`: should "..." be allowed in the argument list?

Value

‘clean.args’ returns a list which is a copy of ‘argstr’ with arguments inappropriate for ‘fn’ removed; ‘remove.args’ removes the arguments for ‘fn’ from the list.

Author(s)

Ben Bolker

Examples

tststr <- list(n = 2, mean = 0, sd = 1, foo = 4, bar = 6)
clean.args(tststr, rnorm)
try(do.call("rnorm", tststr))
do.call("rnorm", clean.args(tststr, rnorm))
remove.args(tststr, rnorm)
## add example of combining arg. lists?
clock24.plot  

Plot values on a 24 hour "clockface"

Description

`clock24.plot` displays a plot of radial lines, symbols or a polygon centered at the midpoint of the plot frame on a 24 hour 'clockface'. In contrast to the default behavior of `radial.plot`, the positions are interpreted as beginning at vertical (000) and moving clockwise.

If `add=TRUE` is passed as one of the additional arguments, the values will be added to the current plot. If a `radial.lim` argument was passed on the initial plot, it must be passed again to add values or the values will be displayed incorrectly.

Usage

clock24.plot(lengths,clock.pos,labels=NULL,label.pos=NULL,rp.type="r",...)

Arguments

- **lengths**: numeric data vector. Magnitudes will be represented as line lengths, or symbol or polygon vertex positions.
- **clock.pos**: numeric vector of positions on the 'clockface'. These must be in decimal hours and will be rescaled to radians.
- **labels**: Labels to place at the circumference.
- **label.pos**: Radial positions of the labels.
- **rp.type**: Whether to plot radial lines, symbols or a polygon.
- **...**: additional arguments are passed to `radial.plot` and then to `plot`.

Value

A list of the parameters altered by `radial.plot`.

Author(s)

Jim Lemon

See Also

polar.plot,radial.plot

Examples

testlen<-rnorm(24)*2+5
testpos<-(0:23+rnorm(24))/4
clock24.plot(testlen,testpos,main="Test Clock24 (lines)",show.grid=FALSE,
  line.col="green",lwd=3)
if(dev.interactive()) par(ask=TRUE)
clplot

Plot lines with colors determined by values.

Description

`clplot` displays a plot of lines for which the colors are dependent upon the x and y values. `clplot` is similar to `color.scale.lines` except that while the latter calculates a color for each unique value, `clplot` assigns colors to groups of values within the cutpoints defined by `levels`.

Usage

```r
clplot(x, y, ylab = deparse(substitute(y)), xlab = deparse(substitute(x)),
levels = seq(min(y) + (max(y) - min(y))/5, max(y) - (max(y) - min(y))/5, length.out = 4),
cols = c("black", "blue", "green", "orange", "red"), lty = 1, showcuts = FALSE, ...)
```

Arguments

- `x, y`: numeric data vectors.
- `ylab, xlab`: Labels for the X and Y axes.
- `levels`: Cut points to assign colors to the values of `x` and `y`.
- `cols`: The colors to be assigned.
- `lty`: The line type.
- `showcuts`: Whether to show the positions of the cut points.
- `...`: additional arguments passed to `plot` or `lines`.

Value

`nil`

Author(s)

Carl Witthoff

See Also

`plot`

Examples

```r
x <- seq(1, 100)
y <- sin(x/5)*x/20
clplot(x, y, main = "Test of clplot")
```
cluster.overplot  Shift overlying points into clusters

Description

'cluster.overplot' checks for overlying points in the x and y coordinates passed. Those points that are overlying are moved to form a small cluster of up to nine points. For large numbers of overlying points, see count.overplot or sizeplot. If you are unsure of the number of overplots in your data, run 'count.overplot' first to see if there are any potential clusters larger than nine.

Usage

cluster.overplot(x, y, away=NULL, tol=NULL, ...)

Arguments

x, y  Numeric data vectors or the first two columns of a matrix or data frame. Typically the x/y coordinates of points to be plotted.

away  How far to move overlying points in user units. Defaults to the width of a lower case "o" in the x direction and 5/8 of the height of a lower case "o" in the y direction. Must have both values.

tol  The largest distance between points that will be considered to be overlying. Defaults to 1/2 of the width of a lower case "o" in the x direction and 1/2 of the height of a lower case "o" in the y direction.

...  additional arguments returned as they are passed.

Value

A list with two components. For unique x-y pairs the elements will be the same as in the original. For overlying points up to eight additional points will be generated that will create a cluster of points instead of one.

Author(s)

Jim Lemon - thanks to Markus Elze for the test for a current graphics device

See Also

count.overplot, sizeplot

Examples

xy.mat <- cbind(sample(1:10, 200, TRUE), sample(1:10, 200, TRUE))
clusteredpoints <-
  cluster.overplot(xy.mat, col=rep(c("red","green"), each=100),
                  away=rep(0.2, 2))
plot(clusteredpoints, col=clusteredpoints$col,
     main="Cluster overplot test")
color.axis

Display an axis in a specified color

Description

‘color.axis’ displays an axis in the specified color.

Usage

color.axis(side=1, at=NULL, labels=TRUE, axlab=NA, axlab.at=NA, col=par("fg"), cex.axis=par("cex.axis"), cex=par("cex"))

Arguments

side Which axis - see axis.
at Positions for the tick labels.
labels Tick labels.
axlab Optional axis label.
axlab.at Where to position the axis label - defaults to centered.
col Color for the axis.
cex.axis Character expansion for the tick labels.
cex Character expansion for the axis label.

Value

nil

Author(s)

Jim Lemon

color.gradient

Calculate an arbitrary sequence of colors

Description

‘color.gradient’ is now just a call to ‘color.scale’ with a vector of equally spaced integers (1:nslices). The function is kept for backward compatibility.

Usage

color.gradient(reds, greens, blues, nslices=50)
Arguments
  reds, greens, blues
  vectors of the values of the color components as 0 to 1.
  nslides The number of color "slices".

Value
  A vector of hexadecimal color values as used by 'col'.

Note
  The function is mainly useful for defining a set of colors to represent a known number of gradations.
  Such a set can be used to assign a grade to a small number of values (e.g. points on a scatterplot - but see ‘color.scale’ for large numbers) and display a color bar using ‘gradient.rect’ as a legend.

Author(s)
  Jim Lemon

See Also
  rescale, approx, color.scale

Examples
  # try it with red and blue endpoints and green midpoints.
  color.gradient(c(0,1), c(1,0.6,0.4,0.3,0), c(0.1,0.6))

---

color.id Identify closest match to a color

Description
  Given a color given as a hex string, find the closest match in the table of known (named) colors

Usage
  color.id(col)

Arguments
  col a color specified as a hex string

Details
  finds the color with the minimum squared distance in RGB space
Value

the name of the closest match

Author(s)

Ben Bolker

See Also

col2rgb, colors

Examples

color.id("#cc00cc")

color.legend

Legend matching categories or values to colors

Description

Display a color legend on a plot

Usage

color.legend(xl,yb.xr,yt,legend,rect.col,cex=1,align="lt",gradient="x",...)

Arguments

xl,yb.xr,yt  The lower left and upper right coordinates of the rectangle of colors in user coordinates.

legend  The labels that will appear next to some or all of the colors.

rect.col  The colors that will fill the rectangle.

cex  Character expansion factor for the labels.

align  How to align the labels relative to the color rectangle.

gradient  Whether to have a horizontal (x) or vertical (y) color gradient.

...  Additional arguments passed to ‘text’. 
**Details**

`color.legend` displays a rectangle defined by the first four arguments filled with smaller rectangles of color defined by the `rect.col` argument. Labels, defined by the `legend` argument, are placed next to the color rectangle. The position of the labels is determined by whether the color rectangle is horizontal or vertical and the `align` argument. The default value of `lt` places the labels at the left of a vertical rectangle or the top of a horizontal one. `rb` puts them on the other side. To have the labels in the same color as the rectangles, include a `col` argument that will be passed to `text` as in the example.

There can be fewer labels than colors. The labels will be evenly spaced along the rectangle in this case. It is possible to use empty labels to get uneven spacing. The user can pass more labels than colors, but the labels will almost certainly be crowded and I have only found one use for this. If the user wants the labels at the intersection of the boxes rather than in the center, see the alternative specification for the labels in the example (thanks Claudia Tebaldi). To have complete control over the labels, see `gradient.rect` and `text` or `mtext`.

`color.legend` in the `shape` package offers a different approach, creating a large number of colors from a color generating function (a bit like `color.gradient`) and then allowing the user to specify tick marks at arbitrary points along the color bar.

**Value**

nil

**Author(s)**

Jim Lemon

**See Also**

color.gradient, gradient.rect

**Examples**

```r
# get some extra room
par(mar=c(7,4,4,6))
testcol<-color.gradient(c(0,1),0,c(1,0),nslices=5)
col.labels<-c("Cold","Warm","Hot")
# this will put the labels at the intersections
# col.labels<-c("","Cold","","Warm","","Warmer","","Hot","")
color2D.matplot(matrix(rnorm(100),nrow=10),c(1,0),0,c(0,1),
   main="Test color legends")
color.legend(11,6,11.8,9,col.labels,testcol,gradient="y")
color.legend(10.2,2,11.5,col.labels,testcol,align="rb",gradient="y")
color.legend(0.5,-2.3,5,-1.2,col.labels,testcol)
color.legend(7,-1.8,10,-1,col.labels,testcol,align="rb",col=testcol[c(1,3,5)])
par(mar=c(5,4,4,2))
```
**color.scale**  
*Turn values into colors.*

**Description**

Transform numeric values into colors using RGB, HSV or HCL.

**Usage**

```r
color.scale(x, cs1 = c(0, 1), cs2 = c(0, 1), cs3 = c(0, 1), alpha = 1,
             extremes = NA, na.color = NA, xrange = NULL, color.spec = "rgb")
```

**Arguments**

- `x` a numeric vector, matrix or data frame
- `cs1, cs2, cs3` color parameters for scaling ‘`x`’
- `alpha` Value for transparency in colors.
- `extremes` The colors for the extreme values of ‘`x`’ (RGB only).
- `na.color` The color to use for NA values of ‘`x`’.
- `xrange` An explicit range to use in the transformation.
- `color.spec` The color specification to use in the transformation. Anything other than "rgb", "hsv" or "hcl" will almost certainly fail.

**Details**

`color.scale` calculates a sequence of colors by a linear transformation of the numeric values supplied into the ranges for the three color parameters. If only one number is supplied for a color range, that color remains constant for all values of ‘`x`’. If more than two values are supplied, the ‘`x`’ values will be split into equal ranges (one less than the number of colors) and the transformation carried out on each range. Values for a color range must be between 0 and 1 for the RGB or HSV specifications, and between 0 and 360 (cs1) and 0 to 100 (cs2 and cs3) for the HCL specifications.  

IMPORTANT: If ‘`x`’ has fewer values than the number of values in the color parameters, it will usually return incorrect colors. This is usually only a problem when using ‘color.legend’ with a small number of rectangles in the legend as ‘color.legend’ calls ‘color.scale’ to calculate the color rectangles.  

If ‘`extremes`’ is not NA, the ranges will be calculated from its values using ‘col2rgb’, even if ranges are also supplied. ‘`extremes`’ allows the user to just pass the extreme color values in any format that ‘col2rgb’ will accept. Note that this forces the color specification to RGB.  

If the user wants to specify a range of values with ‘`xrange`’, it must at least include the range of x values. This can be useful when there is a notional range like 0-100% that the values do not cover, or when several series of values with different ranges are to be assigned the same color scale.  

The user may not want the color scheme to be continuous across some critical point, often zero. In this case, color scale can be called separately for the values below and above zero. I may get around to adding an argument to do this in one shot. Until then, see the second example for ‘color2D.matplot’ and also the ‘diverge.hcl’ and ‘diverge.hsv’ functions in the colorspace package.
Value

A vector or matrix of hexadecimal color values.

Note

The function is useful for highlighting a numeric dimension or adding an extra "dimension" to a plot.

There are quite a few R functions that transform numeric values into colors or produce colors that can be used to represent values. Two packages that might be of interest are RColorBrewer and colourschemes.

Author(s)

Jim Lemon

See Also

rescale, col2rgb, smoothColors

Examples

```r
# go from green through yellow to red with no blue
x<-rnorm(20)
y<-rnorm(20)
# use y for the color scale
plot(x,y,col=color.scale(y,c(0,1,1),c(1,1,0),0),main="Color scale plot",
pch=16,cex=2)
plot(1:10,rep(1:3,length.out=10),axes=FALSE,type="n",xlim=c(0,11),ylim=c(0,4),
main="Test of RGB, HSV and HCL",xlab="",ylab="Color specification")
axis(2,at=1:3,labels=c("HCL","HSV","RGB"))
points(1:10,rep(1,10),pch=19,cex=8,col=color.scale(1:10,c(0,300),35,85,
col.spec="hcl"))
points(1:10,rep(2,10),pch=19,cex=8,col=color.scale(1:10,c(0,1),
0.8,1,col.spec="hsv"))
points(1:10,rep(3,10),pch=19,cex=8,col=color.scale(1:10,c(1,0.5,0),
c(0,0.5,0),c(0,0,1),col.spec="rgb"))
```
Arguments

- **x, y**: Numeric vectors or a list with at least two components, the first two of which must be named x and y.
- **reds, greens, blues**: Color ranges into which to scale the numeric values.
- **col**: One or more colors to use for the resultant lines. Will be recycled if necessary.
- **colvar**: A numeric vector from which to scale the colors.
- **...**: Additional arguments passed to `segments`.

Details

`color.scale.lines` displays line segments that can be individually colored according to a variety of methods. In order of precedence, if `col` is not NA, the color values passed will be used. If `colvar` is not NA, the function will call `color.scale` with the three color range arguments to determine the line colors. If `colvar` is the same length as `length(x)-1`, exactly enough colors for the number of lines displayed will be calculated. If shorter, some colors will be recycled and if longer, some colors will not be used. Finally, the values in `y` will be color-scaled if both of the above arguments are NA. Thus the user can pass predetermined colors, use colors scaled from an arbitrary vector of numerical values or use the `y` values. See `color.scale` for an explanation of specifying color ranges.

Value

- nil

Note

The function is useful for highlighting a numeric dimension or adding an extra "dimension" to a plot.

Author(s)

Jim Lemon

See Also

- `color.scale`

Examples

```r
# color a random walk "hot" (red) to "cold" (blue) on its distance
# from the starting point
x<-c(0,cumsum(rnorm(99)))
y<-c(0,cumsum(rnorm(99)))
xydist<-sqrt(x*x+y*y)
plot(x,y,main="Random walk plot",xlab="X",ylab="Y",type="n")
color.scale.lines(x,y,c(1,1,0),c(0,1,1),colvar=xydist,lwd=2)
boxed.labels(x,y,labels=1:100, border=FALSE, cex=0.5)
# now color the lines to show whether each step went away from
```
# or toward the starting position

color.scale.lines(x,y,col=2+(diff(xydist)>0))
boxed.labels(x,y,labels=1:100,border=FALSE,cex=0.5)

---

color2D.matplot

Display a numeric matrix as color matrix

Description

Display the values of a numeric 2D matrix or data frame as colored rectangles or hexagons.

Usage

```r
color2D.matplot(x, cs1=c(0,1), cs2=c(0,1), cs3=c(0,1),
                 extremes=NA, cellcolors=NA, show.legend=FALSE, nslices=10,
                 xlab="Column", ylab="Row", do.hex=FALSE, axes=TRUE, show.values=FALSE,
                 vcol=NA, vcex=1, border="black", na.color=NA, xrange=NULL,
                 color.spec="rgb", yrev=TRUE, xat=NULL, yat=NULL, Hinton=FALSE,...)
```

Arguments

- **x**: data values
- **cs1, cs2, cs3**: the color parameters that will be scaled to represent the range of numeric values. (see ‘color.scale’)
- **extremes**: The colors for the extreme values of ‘x’. Takes precedence over the color ranges.
- **cellcolors**: A precalculated matrix of cell colors. This must have the same number of rows and columns as the matrix or it will be uninformative. It can be a vector, but be careTakes precedence over both ‘extremes’ and color ranges.
- **show.legend**: whether to display a color legend with the extreme numeric values in the lower left corner of the plot. This will force the color specification to "rgb", so if this is different from the color specification requested, call ‘color.legend’ separately.
- **nslices**: The number of color "slices" in the legend.
- **xlab, ylab**: axis labels for the plot.
- **do.hex**: plot packed hexagons instead of rectangles.
- **axes**: Whether to suppress the default axis labelling.
- **show.values**: Whether to display the numeric values of ‘x’. This also controls the number of decimal places displayed.
- **vcol**: The color for the value display. If NA, the values are displayed in black or white depending upon the darkness of the cell color.
- **vcex**: The character expansion for the value display.
- **border**: The color(s) for the borders of the cells. Pass NA if no border is wanted.
- **na.color**: The color to use for NA values of ‘x’.
- **xrange**: An explicit range for the transformation of colors. see ‘color.scale’
color2D.matplot

color.spec  The color specification system to use.

yrev       Whether to reverse the order of the y-axis to display the cells in "reading" order (left to right and top to bottom) if TRUE, or in the order of a typical plot (left to right and bottom to top) if FALSE.

xat, yat   Values at which to place tick marks to override 'pretty'.

Hinton     Whether to display a Hinton diagram in which the magnitude of cell values is proportional to the size of the squares and the sign is indicated by the color of the squares.

...        arguments passed to 'plot'.

Details

Displays a plot with the same number of rectangular or hexagonal cells as there are numeric values in the matrix or data frame. Each rectangle is colored to represent its corresponding value. The rectangles are arranged in the conventional display of a 2D matrix with rows beginning at the top and columns at the left. To get the rows beginning at the bottom, use ‘yrev=FALSE’. The color scale defaults to black for the minimum value and white for the maximum.

The user will have to adjust the plot device dimensions to get regular squares or hexagons, especially when the matrix is not square. As the margins are not equivalent for all display devices, this is currently a matter of trial and error. Drawing hexagons is quite slow.

‘show.values’ and ‘show.legend’ are also used to control the number of decimal places displayed if the values or legend are shown. ‘TRUE’ will give one decimal place, ‘2’ two, and so on.

if ‘Hinton’ is TRUE, a Hinton diagram in which the sizes of the squares are proportional to the absolute value of ‘x’ and the colors of the squares indicate the sign of the ‘x’ values will be displayed. This only works with squares.

Value

nil

Note

The function image performs almost the same when passed a matrix of values without grid positions, except that it assigns values to a specified list of colors rather than calculating a color for each distinct value.

Author(s)

Jim Lemon (thanks to Ashoka Polpitiya for ‘axes’)

See Also

color.scale, fill.corner, image
Examples

```r
x <- matrix(rnorm(1024), nrow = 32)
# simulate a correlation matrix with values -0.5 to 0.5
x <- rescale(x, c(-0.5, 0.5))
# add a column with the extreme values (-1,1) to calculate
# the colors, then drop the extra column in the result
cellocol <- color.scale(chbind(x, c(-1, rep(1, 31))), c(0, 1), c(1, 0))[1:32]
color2D.matplot(x, cellcolors = cellocol, main = "Blue to red correlations")
# do the legend call separately to get full range
color.legend(0, -4, 10, -3, legend = c(-1, -0.5, 0, 0.5, 1),
  rect.col = color.scale(c(-1, -0.5, 0, 0.5, 1), c(0, 1), c(1, 0)), align = "rb")
x <- matrix(rnorm(100), nrow = 10)
# generate colors that show negative values in red to brown
# and positive in blue-green to green
cellocol <- color.scale(rep("#000000", 100), nrow = 10)
cellocol[x < 0] <- color.scale(x[x < 0], c(1, 0.8), c(0, 0.8), 0)
cellocol[x > 0] <- color.scale(x[x > 0], 0, c(0.8, 1), c(0.8, 0))
# now do hexagons without borders
color2D.matplot(x, cellcolors = cellocol, xlab = "Columns", ylab = "Rows",
  do.hex = TRUE, main = "2D matrix plot (hexagons)", border = NA)
# for this one, we have to do the color legend separately
# because of the two part color scaling
legval <- seq(min(x), max(x), length.out = 6)
legcol <- rep("#000000", 6)
legcol[legval < 0] <- color.scale(legval[legval < 0], c(1, 0.8), c(0, 0.8), 0)
legcol[legval > 0] <- color.scale(legval[legval > 0], 0, c(0.8, 1), c(0.8, 0))
color.legend(0, -1.8, 3, -1.4, round(c(min(x), 0, max(x))), 1, rect.col = legcol)
# do a color only association plot
xt <- table(sample(1:10, 100, TRUE), sample(1:10, 100, TRUE))
observed <- xt[, rev(1:dim(x)[2])]
expected <- outer(rowSums(observed), colSums(observed), "x")/sum(xt)
deviates <- (observed - expected)/sqrt(expected)
cellocol <- matrix(rep("#000000", 100), nrow = 10)
cellocol[deviates < 0] <-
  color.scale(deviates[deviates < 0], c(1, 0.8), c(0, 0.5), 0)
cellocol[deviates > 0] <-
  color.scale(deviates[deviates > 0], 0, c(0.7, 0.8), c(0.5, 0))
color2D.matplot(x = round(deviates, 2), cellcolors = cellocol,
  show.values = TRUE, main = "Association plot")
# Hinton diagram
border.col <- color.scale(x, extremes = 2:3)
color2D.matplot(x, extremes = c(2, 3), main = "Hinton diagram (green +, red -)",
  Hinton = TRUE, border = border.col)
# waffle plot of percentages with two contributing elements
waffle.col <- fill.corner(c("red", 18), c("blue", 45), 10, 10)
color2D.matplot(matrix(1:100, nrow = 10), cellcolors = waffle.col, yrev = FALSE,
  border = "lightgray", xlab = "", ylab = "", main = "Waffle plot", axes = FALSE)
```

corner.label

Find corner locations and optionally display a label
**corner.label**

Description

Finds the coordinates in user parameters of a specified corner of the figure region and optionally displays a label there.

Usage

```r
corner.label(label=NULL, x=-1, y=1, xoff=NA, yoff=NA, figcorner=FALSE,...)
```

Arguments

- **label**: Text to display. The default is to display nothing.
- **x**: an integer value: -1 for the left side of the plot, 1 for the right side
- **y**: an integer value: -1 for the bottom side of the plot, 1 for the top side
- **xoff, yoff**: Horizontal and vertical text offsets. Defaults to one half of the width and height of "m" respectively.
- **figcorner**: Whether to find/display at the corner of the plot or figure.
- **...**: further arguments to the `text` command for the label

Details

`corner.label` finds the specified corner of the plot or figure and if `label` is not NULL, displays it there. The text justification is specified so that the label will be justified away from the corner. To get the label squeezed right into a corner, set `xoff` and `yoff` to zero.

Value

A list of the x and y positions of the corner adjusted for the offsets.

Author(s)

Ben Bolker

Examples

```r
plot(1:10,1:10)
corner.label("A")
corner.label(x=1,y=1)
corner.label("B",y=-1,x=1,figcorner=TRUE,col="red")
```
count.overplot  Show overlying points as counts

Description

‘count.overplot’ checks for overlying points defined as points separated by a maximum of ‘tol’, a two element numeric vector of the x and y tolerance. Defaults to 1/2 of the width of a lower case "o" in the x direction and 1/2 of the height of a lower case "o" in the y direction.

Usage

count.overplot(x,y, tol=NULL, col=par("fg"), pch="1", ...) 

Arguments

x, y Two numeric data vectors or the first two columns of a matrix or data frame. Typically the x/y coordinates of points to be plotted.

tol The largest distance between points that will be considered to be overlying.

col Color(s) for the points (not the numbers).

pch Symbol(s) to display.

... additional arguments passed to ‘plot’.

Value

nil

Author(s)

Jim Lemon

See Also

cluster.overplot,sizeplot

Examples

xy.mat<-cbind(sample(1:10,200,TRUE),sample(1:10,200,TRUE))
count.overplot(xy.mat,main="count.overplot", xlab="X values",ylab="Y values")
cylindrect

Display an apparent cylinder

Description
Display rectangles shaded to appear like cylinders.

Usage
\texttt{cylindrect(xleft,ybottom,xright,ytop,col,border=NA,gradient="x",nslices=50)}

Arguments
\begin{itemize}
\item \texttt{xleft} The position of the left side of the rectangle(s).
\item \texttt{ybottom} The position of the bottom of the rectangle(s).
\item \texttt{xright} The position of the right side of the rectangle(s).
\item \texttt{ytop} The position of the top side of the rectangle(s).
\item \texttt{col} The base color(s) of the rectangles.
\item \texttt{border} Whether to draw a border and what color.
\item \texttt{gradient} Whether to vary the shading horizontally ("x" - the default) or vertically (anything but "x").
\item \texttt{nslices} The number of "slices" of color for shading.
\end{itemize}

Details
\texttt{cylindrect} displays a rectangle filled with "slices" of color that simulate the appearance of a cylinder. The slices are calculated so that the base color appears at the right or bottom edge of the rectangle, becomes progressively lighter to a "highlight" at two thirds of the width or height and then darkens toward the base color again.

The appearance is of a cylinder lit from above and to the left of the viewer. The position of the apparent light source is hard coded into the function.

Value
The base color(s) of the rectangle(s).

Author(s)
Jim Lemon

See Also
\texttt{gradient.rect}
Examples

```r
plot(0, xlim=c(0, 5), ylim=c(0, 5), main="Examples of pseudocylindrical rectangles",
     xlab="", ylab="", axes=FALSE, type="n")
cylindrect(0, 0, 1, 5, "red")
cylindrect(rep(1, 3), c(0, 2, 4), rep(4, 3), c(1, 3, 5), "green", gradient="y")
cylindrect(4, 0, 5, 5, "#8844aa")
```

death_reg  

**Death registrations from 1996 to 2010**

Description

Death registrations for underlying cause of death as ICD-10 chapters for 1996 to 2010.

Usage

data(death_reg)

dendroPlot  

**Display distributions as dendrites**

Description

Display the distributions of one or more sets of points as branching (dendritic) clusters.

Usage

dendroPlot(x, breaks=list(10, 10, 10), pch=1, col=par("fg"), cex=1, nudge=NA,
            setlabels=NA,...)

Arguments

- **x**: A list or data frame of numeric or factor or character columns.
- **breaks**: A list of cutpoints to transform numeric values into factors (see `cut`). Must be at least one number >= 2.
- **pch**: Symbol(s) to use in plotting the values.
- **col**: Color(s) for the symbols.
- **cex**: Size of the symbol(s) to use in plotting.
- **nudge**: The amount to set each consecutive value in a category away from the center of the dendrite.
- **setlabels**: Labels to place along the abcissa to identify the sets.
- **...**: Other arguments passed to `plot`.
Details

‘dendroPlot’ displays the distributions of categorical values as stacks of "branches". The lengths of the branches show the number of values in each category, rather like the opposed bars in a pyramid plot, except that there is no separation of groups. The distribution of numeric values can also be displayed by passing a set of breakpoints to categorize the values. The breakpoints will usually be equidistant, but unevenly spaced breakpoints can be passed. If an element of ‘x’ is numeric, the values of the corresponding ‘x’ element will be used to place the points, but the branches will be defined as the categories formed by applying the breaks to those numeric values.

Note that in the first example, the breakpoints for the first and third elements are used to define the ten branches for each. The second element of ‘x’ is already categorical, so the breakpoints are ignored. When comparing distributions with very different ranges it may be necessary to adjust the breakpoints to get a satisfactory result.

Each successive point in a category is ‘nudge’ed away from the center of the dendrite. If ‘nudge’ has more than one value, the points will be nudged up and down for categorical variables to enable closer packing. The second value of ‘nudge’ is ignored for numeric variables. The aspect ratio of the plot, the character expansion and the nudging will have to be adjusted to give the best point spacing for most dendroPlots.

Value

nil

Note

The ‘ehplot’ function is a much more versatile instantiation of this type of plot. ‘dendroPlot’ has been retained as there are currently a few differences that some users may find valuable. However, it is not impossible that ‘dendroPlot’ will disappear in the future. Another very useful version of this type of plot is ‘beeswarm’ in the beeswarm package.

Author(s)

Jim Lemon

See Also

ehplot

Examples

x <- list(runif(90,1,3),factor(sample(LETTERS[1:10],100,TRUE)),rnorm(80,mean=5))
dendroPlot(x,xlab="Groups",ylab="Value of x",main="Test dendroPlot I")
# now apply a nudge factor and different breaks
dendroPlot(x,breaks=list(8,10,10),nudge=c(0.05,0.1),
          xlab="Groups",ylab="Value of x",main="Test dendroPlot II")
diamondplot

diamondplot

Plot multiple variables as polygons on a radial grid

Description

‘diamondplot’ displays a plot of polygons on a radial grid representing the relationships between one or more attributes of data objects. For a slightly different style of plot, see the “spiderweb plot” example in ‘radial.plot’.

Usage

diamondplot(x, bg=gray(0.6), col=rainbow,name="", ...)
dispersion

Display a measure of dispersion.

Description

Display lines or capped bars at specified points on a plot representing measures of dispersion.

Usage

dispersion(x, y, ulim, llim = ulim, intervals = TRUE, arrow.cap = 0.01, arrow.gap = NA,
          type = "a", fill = NA, lty = NA, pch = NA, border = NA, col = par("f"),
          display.na = TRUE, ...)

Arguments

  x, y  x and y position of the centers of the bars
  ulim, llim  The extent of the dispersion measures.
  arrow.cap  The width of the cap at the outer end of each bar as a proportion of the width of
              the plot.
  arrow.gap  The gap to leave at the inner end of each bar. Defaults to two thirds of the height
              of a capital "O".
  intervals  Whether the limits are intervals (TRUE) or absolute values (FALSE).
  type  What type of display to use.
  fill  Color to fill between the lines if ‘type’ is not NULL and ‘fill’ is not NA.
  lty  Line type for redrawing the lines if necessary.
  pch  Symbol for redrawing the points if necessary.
  border  Line type for drawing a border on the confidence band.
  col  Color(s) to use for the lines or capped bars.
  display.na  Whether to display NA values as lines going off the plot.
  ...  additional arguments passed to ‘arrows’ or ‘lines’ depending upon ‘type’.

Details

’dispersion’ displays a measure of dispersion on an existing plot. Currently it will display either
vertical lines with caps (error bars) or lines that form a "confidence band" around a line of central
tendency. If ‘fill’ is not NA and ‘type’ is ‘"a"’, a polygon will be drawn between the confidence
lines. Remember that any points or lines within the confidence band will be obscured, so pass point
and/or line types as in the second example.

The default behavior is to display an undefined dispersion (e.g. a variance with only one observation)
as a line going off the plot. If ‘display.na’ is FALSE, NA values will not be displayed,
allowing the user to show only upper or lower dispersion limits.

The ‘intervals’ argument allows the user to pass the limits as either intervals (the default) or
absolute values.

If ‘arrow.gap’ is greater than or equal to the upper or lower limit for a bar, ‘segments’ is used to
draw the upper and lower caps with no bars to avoid zero length arrows.
do.first

Value
nil

Author(s)
Jim Lemon

See Also
arrows, segments, lines

Examples

disptest<-matrix(rnorm(200),nrow=20)
disptest.means<-rowMeans(disptest)
row.order<-order(disptest.means)
se.disptest<-unlist(apply(disptest,1,stderr))
plot(disptest.means[row.order],main="Dispersion as outlined error bars",
     ylim=c(min(disptest.means-se.disptest),max(disptest.means+se.disptest)),
     xlab="Occasion",ylab="Value")
dispersion(1:20,disptest.means[row.order],se.disptest[row.order],lwd=3)
dispersion(1:20,disptest.means[row.order],se.disptest[row.order],col="white")
plot(disptest.means[row.order],main="Dispersion as confidence band",
     ylim=c(min(disptest.means-se.disptest),max(disptest.means+se.disptest)),
     xlab="Occasion",ylab="Value")
dispersion(1:20,disptest.means[row.order],se.disptest[row.order],type="l",
     fill="#eecccc",lty=2,pch=1)
disptest2<-matrix(sample(c(TRUE,FALSE),200,TRUE),nrow=10)
disptest.prop<-rowMeans(disptest2)
disptest.ulim<-disptest.1lim<-rep(NA,10)
for(i in 1:10) {
  disptest.ulim[i]<-binciWu(disptest2[i,],20)
  disptest.1lim[i]<-binciWl(disptest2[i,],20)
}
plot(disptest.prop,main="Dispersion as binomial confidence intervals",
     ylim=c(min(disptest.1lim),max(disptest.ulim)),
     xlab="Sample",ylab="Proportion")
dispersion(1:10,disptest.prop,disptest.1lim,disptest.ulim,
interval=FALSE,lty=2,pch=1)

---

**do.first**

*Execute a graphic function on a plot*

**Description**

do.first allows the user to execute one or more commands before displaying values on a plot.
Details

‘do.first’ is an argument in some plotrix functions that allows the user to do things like add a background color or a grid to the plot before displaying the other plot elements. The value of ‘do.first’ should be a character string that can be parsed to one or more valid R commands. Remember to enclose the string in quotes, separate commands with semicolons and escape quotes within the string with backslashes if necessary.

---

**Minitab style dotplots**

Description

Create a dotplot of a data vector in the sense of “dotplot” as used in the Minitab© package.

Usage

```r
dotplot.mtb(x, xlim = NULL, main = NULL, xlab = NULL, ylab = NULL, pch = 19, hist = FALSE, yaxis = FALSE, mtbstyle=TRUE)
```

Arguments

- **x** A numeric vector.
- **xlim** The x limits of the plot.
- **main** A title for the plot; defaults to blank.
- **xlab** A label for the x axis; defaults to blank.
- **ylab** A label for the y axis; defaults to blank.
- **pch** The plotting symbol for the dots in the plot; defaults to a solid disc.
- **hist** Logical scalar; should the plot be done “histogram style, i.e. using vertical lines rather than stacks of dots?”
- **yaxis** Logical scalar; should a y-axis be produced?
- **mtbstyle** Logical scalar; should the dotplot be done in the “Minitab” style? I.e. should the zero level be at the vertical midway point?

Details

The result of `hist=TRUE` looks less ugly than stacks of dots for very large data sets.

Value

Nothing. A plot is produced as a side effect.

Warnings

This function does something toadally different from the dotplot() (now `dotchart()`) function in the graphics package.

The labelling of the y-axis is device dependent.
Author(s)

Barry Rowlingson <B.Rowlingson@lancaster.ac.uk> and Rolf Turner <r.turner@auckland.ac.nz>

Examples

```r
## Not run:
set.seed(42)
x <- rpois(100,10)
dotplot.mtb(x,main="No y-axis."

dotplot.mtb(x,yaxis=TRUE,main="With y-axis displayed."

dotplot.mtb(x,hist=TRUE,main="An \"h\" style plot.")[email]

dotplot.mtb(x,xlim=c(4,16),main="With the x-axis limited."

dotplot.mtb(x,yaxis=TRUE,mtbstyle=FALSE,main="Non-Minitab style."

dotplot.mtb(x,yaxis=TRUE,xlab="x",ylab="count",

## End(Not run)
```

---

draw.arc  Draw arc

Description

Draw one or more arcs using classic graphics.

Usage

```r
draw.arc(x=1,y=NULL,radius=1,angle1=deg1*pi/180,angle2=deg2*pi/180,

deg1=0,deg2=45,n=0.05,col=NA,lwd=NA,...)
```

Arguments

- `x` x coordinate of center. Scalar or vector.
- `y` y coordinate of center. Scalar or vector.
- `radius` radius. Scalar or vector.
- `angle1` Starting angle in radians. Scalar or vector.
- `angle2` Ending angle in radians. Scalar or vector.
- `deg1` Starting angle in degrees. Scalar or vector.
- `deg2` Ending angle in degrees. Scalar or vector.
- `n` Number of polygons to use to approximate the arc.
- `col` Arc colors.
- `lwd` Line width for the arc.
- `...` Other arguments passed to segments. Vectorization is not supported for these.
**Details**

Draws one or more arcs from angle1 to angle2. If angle1 is numerically greater than angle2, then the angles are swapped.

Be sure to use an aspect ratio of 1 as shown in the example to avoid distortion. For argument 'n' (which may be either a scalar or a vector, although most likely you will leave it at the default value), an integer value means to use that number of segments to approximate the arc, while a non-integer value means to use enough segments so that the angle that successive segments make with one another is no more than n radians.

**Value**

Returns a matrix of expanded arguments invisibly.

**Author(s)**

Gabor Grothendieck. Improvements by Ted Toal.

**Examples**

```r
plot(1:10, asp = 1, main = "Test draw.arc")
draw.arc(5, 5, 1:10/10, deg2 = 1:10*10, col = "blue")
draw.arc(8, 8, 1:10/10, deg2 = 1:10*10, col = 1:10)
draw.arc(5, 5, 3, deg1=100, deg2=170, col="gold", lwd=50, lend=1)
   # example taken from post by Hans Borcher:
   # Note setting of aspect ratio to 1 first.
curve(sin(x), 0, pi, col = "blue", asp = 1)
draw.arc(pi/2, 0, 1, deg1=45, deg2=135, col = "red")
```

---

**draw.circle**

*Draw a circle*

**Description**

Draws a circle on an existing plot.

**Usage**

```r
draw.circle(x, y, radius, nv = 100, border = NULL, col = NA, lty = 1, lwd = 1)
```
Arguments

- **x, y** Coordinates of the center of the circle.
- **radius** Radius (or radii) of the circle(s) in user units.
- **nv** Number of vertices to draw the circle.
- **border** Color to use for drawing the circumference.
- **col** Color to use for filling the circle.
- **lty** Line type for the circumference.
- **lwd** Line width for the circumference.

Details

‘draw.circle’ uses the dimensions of the plot and the ‘x’ and ‘y’ coordinates to draw a circle rather than an ellipse.

Value

A list with the x and y coordinates of the points on the circumference of the last circle displayed.

Author(s)

Jim Lemon

See Also

polygon

Examples

```r
plot(1:5,seq(1,10,length=5),type="n",xlab="",ylab="",main="Test draw.circle")
draw.circle(2,4,c(1,0.66,0.33),border="purple",
col=c("#ff00ff","#ff77ff","#ffccff"),lty=1,lwd=1)
draw.circle(2.5,8,0.6,border="red",lty=3,lwd=3)
draw.circle(4,3,0.7,border="green",lty=1,lwd=1)
draw.circle(3.5,7,0.8,border="blue",lty=2,lwd=2)
```
draw.ellipse

Arguments

x
A vector or a matrix (if y is missing).
y
A vector, can be missing.
a,b
Vectors, radii of the ellipses along the two axes in user units.
angle
Angle of rotation in degrees (if deg=TRUE) or in radians (if deg=FALSE).
segment
Start and endpoints of arc in degrees (if deg=TRUE) or in radians (if deg=FALSE).
arcs
Logical, if segment the full ellipse is not drawn, radii from the ends of the arc are
drawn to form a sector (see Examples).
angle
Logical, if angles are given in degrees (TRUE) or radians.
v
Number of vertices to draw the ellipses.
border
Color to use for drawing the circumference.
col
Color to use for filling the circle.
lty
Line type for the circumference.
lwd
Line width for the circumference.
... Additional arguments passed to polygon.

Value

Draw ellipses as a side effect.

Author(s)

Peter Solymos <solymos@ualberta.ca>

See Also

polygon

Examples

plot(c(0,10), c(0,10), type="n", main="test draw.ellipse")
draw.ellipse(c(3,7), c(8), c(0.5,1), c(1,0.5), col=c(2,4),
  angle=c(45,0), segment=rbind(c(0,45),c(45,360)))
draw.ellipse(c(3,7), c(6,6), c(0.5,1), c(1,0.5), col=c(2,4),
  angle=c(45,0), segment=rbind(c(0,45),c(45,360)), arc.only=FALSE)
draw.ellipse(c(3,7), c(4,4), c(0.5,1), c(1,0.5), border=c(2,4),
  angle=c(45,0), segment=rbind(c(0,45),c(45,360)), arc.only=FALSE)
draw.ellipse(c(3,7), c(2,2), c(0.5,1), c(1,0.5), border=1,
  angle=c(45,0), lty=3)
draw.ellipse(c(3,7), c(2,2), c(0.5,1), c(1,0.5), border=c(5,3),
  angle=c(45,0), nv=c(3,4), lty=2, lwd=2)
draw.radial.line

**Draw a radial line**

**Description**

Draws a line radiating from a specified center, optionally expanding the line width as a function of distance from center.

**Usage**

```r
draw.radial.line(start, end, center=c(0, 0), angle=0, deg=NA,
                 expand=FALSE, col=NA, lwd=NA, ...)
```

**Arguments**

- `start` Distance from center of circular area to start of line in x/y user units.
- `end` Distance from center of circular area to end of line in x/y user units.
- `center` The center of the circular area in x/y user units.
- `angle` The angular position of the line in radians.
- `deg` The angular position of the line in degrees (takes precedence if not NA).
- `expand` TRUE to expand line width in proportion to distance from center.
- `col` The color of the line, NA for par("col").
- `lwd` The width of the line in device-specific units, NA for par("lwd").
- `...` Arguments passed to 'lines' (expand=FALSE) or 'polygon' (expand=TRUE).

**Details**

If the user passes a value for `deg`, this overrides any value passed to `angle`.
If `expand` is FALSE, the line width is constant (as specified by par("lwd")).
If `expand` is TRUE, the line width is equal to the `lwd` value at distance 'end' and contracts as it moves towards 'start'. When expand is 'TRUE', lty is ignored.

**Value**

nil

**Author(s)**

Ted Toal

**See Also**

lines, linkdraw.arc
Examples

plot(0, xlim=c(1, 5), ylim=c(1, 5), main="Test of radial lines", xlab="", ylab="", type="n")
points(3, 3, pch=20)
draw.radial.line(1, 2, center=c(3, 3))
draw.radial.line(1, 2, center=c(3, 3), angle=pi/4)
draw.radial.line(1, 2, center=c(3, 3), angle=pi/4 + 0.1, col="blue", lwd=4, lty=3)
draw.radial.line(0.2, 1.2, center=c(3, 3), deg=120, col="red", lwd=10)
draw.radial.line(0.2, 1.2, center=c(3, 3), deg=145, col="purple", lwd=10, lend=1)
draw.radial.line(0.5, 2, center=c(3, 3), deg=225, expand=TRUE, col="gold")
draw.radial.line(0.7, 1.4, center=c(3, 3), deg=180, expand=TRUE, col="orange", lwd=30)
draw.radial.line(0.5, 1.5, center=c(3, 3), deg=235, expand=TRUE, lwd=5, col="brown")
draw.radial.line(0.1, 1.5, center=c(3, 3), deg=325, expand=TRUE, lwd=5, col="green")

---

draw.tilted.sector  Display a 3D pie sector

Description

Displays a 3D pie sector.

Usage

draw.tilted.sector(x=0, y=0, edges=NA, radius=1, height=0.1, theta=pi/6, start=0, end=pi*2, border=par("fg"), col=par("bg"), explode=0, shade=0.8)

Arguments

- **x, y**: Position of the center of the pie sector in user units
- **edges**: Number of edges to draw a complete ellipse
- **radius**: the radius of the pie in user units
- **height**: the height of the pie in user units
- **theta**: The angle of viewing in radians
- **start**: Starting angle of the sector
- **end**: Ending angle of the sector
- **border**: The color of the sector border lines
- **col**: Color of the sector
- **explode**: How far to "explode" the sectors in user units
- **shade**: If > 0 and < 1, the proportion to reduce the brightness of the sector color to get a better 3D effect.
Details

‘draw.tilted.sector’ displays a single 3D pie sector. It is probably only useful when called from pie3D. The ‘shade’ argument proportionately reduces the brightness of the RGB color of the sector to produce a top lighted effect.

If ‘explode’ is zero, only the top and outer side of each sector will be displayed. This will sometimes fix the problem of a pie with one huge sector greater than 3*pi/2 that cannot otherwise be drawn.

Value

The bisector of the pie sector in radians.

Author(s)

Jim Lemon

See Also

pie3D

drawNestedBars Display nested bars

Description

Displays the nested bars for barNest.

Usage

drawNestedBars(x,start,end,shrink=0.1,errbars=FALSE,intervals=TRUE,col=NA,labelcex=1,lineht=NA,showall=TRUE,Nwidths=FALSE,barlabels=NULL,showlabels=TRUE,arrow.cap=NA)

Arguments

x One level of the breakdown produced by ‘brkdnNest’.
start,end The left and right x coordinates for the bar or group of bars to be displayed.
shrink The proportion to shrink the width of the bars at each level.
errbars Whether to display error bars on the bars.
intervals Whether to use offsets or absolute values when displaying measures of dispersion.
col The colors to use to fill the bars. See Details.
labelcex Character size for the group labels.
lineht The height of a margin line in user units.
drawSectorAnnulus

**showall**  Whether to display the bars at any levels above the last.

**Nwidths**  Whether to scale the widths of the bars to the number of observations.

**barlabels**  Optional labels to display below the bars.

**showlabels**  Whether to display the labels below the bars.

**arrow.cap**  The width of the "cap" on error bars in user units, defaulting to 0.01 of the width of the plot.

**Details**

'drawNestedBars' displays the bars for the nested breakdown performed by 'brkdnNest'. It starts at the top of the list and calls itself for each level of the breakdown. It is unlikely to be useful for anything else.

The combination of 'showlabels=TRUE' and 'showall=FALSE' allows the display of all of the labels below the plot with only the last set of bars being displayed. To have a set of labels not displayed, pass explicit 'barlabels' and have zero length labels for the level that is not to have labels.

**Value**

nil

**Author(s)**

Jim Lemon and Ofir Levy

**See Also**

brkdnNest, drawNestedBars

---

**drawSectorAnnulus**  *Display a radial pie sector*

**Description**

Displays a radial pie sector with optional annuli.

**Usage**

drawSectorAnnulus(angle1,angle2,radius1,radius2,col,angleinc=0.03)

**Arguments**

angle1,angle2  Start and end angle for the sector.

radius1,radius2  Start and end of the radial extent of the annulus.

col  Color of the sector.

angleinc  The angular increment to use in drawing the arcs.
Details
‘drawSectorAnnullus’ displays a single radial pie sector. It is probably only useful when called from radial.pie.

Value
nil

Author(s)
Jim Lemon

See Also
radial.pie

Description
This R function provides a convenient way to visualize the distribution of grouped numerical data.

Usage
```
  ehplot(data, groups, intervals=50, offset=0.1, log=FALSE, median=TRUE, box=FALSE, boxborder="grey50",
        xlab="groups", ylab="values", col="black", ...)
```

Arguments

- `data` Vector of numerical data.
- `groups` Vector of group names which should have the same length as data.
- `intervals` The data is splitted into a certain number of intervals. If data points are in the same interval they are drawn side-by-side.
- `offset` x-distance between two data points at the same interval.
- `log` Logarithmic display
- `median` To show the median of each group. NAs in data are not considered for calculating the medians.
- `box` To underlay a boxplot.
- `boxborder` The color of the boxplot if a boxplot is drawn.
- `xlab` x-axis label
- `ylab` y-axis label
- `col` vector of colors for the datapoints. (recycled as necessary).
- `...` additional plot-parameters will be passed to the plot-function
election

Author(s)

Robby Engelmann <robbie.engelmann@med.uni-rostock.de> and Michael Hecker <michael.hecker@rocketmail.com>

See Also
dendroPlot

Examples
data(iris)
ehplot(iris$Sepal.Length, iris$Species, intervals=20, cex=1.8, pch=20)
ehplot(iris$Sepal.Width, iris$Species, intervals=20, box=TRUE, median=FALSE)
ehplot(iris$Petal.Length, iris$Species, pch=17, col="red", log=TRUE)
ehplot(iris$Petal.Length, iris$Species, offset=0.06, pch=as.numeric(iris$Species))

# Groups don't have to be presorted:
rnd <- sample(150)
plen <- iris$Petal.Length[rnd]
pwid <- abs(rnorm(150, 1.2))
spec <- iris$Species[rnd]
ehplot(plen, spec, pch=19, cex=pwid, col=rainbow(3, alpha=0.6)[as.numeric(spec)])

Description

Assign party members to seats

Create a layout for an election result in an assembly

Usage

election(seats, result, formula, 
colours = sample(rainbow(length(counts))))

Arguments

seats A data frame of x and y positions, row numbers and angles (usually the output from the seats function).
result A data frame with party names and seat counts
formula a formula with the party name column on the left and the count column on the right. Think of the twiddle symbol as "got".
colours A vector of colours. If missing a random rainbow is used. This may cause Green parties to show as red.

Details

The 'seats' function works out where the seats are in a semi-circular assembly hall. This function assigns colours and party labels to those seats.
Value

A data frame including:

- **x**: The x positions of the seats to be plotted on semi-circular arcs
- **y**: The y positions of the seats to be plotted on semi-circular arcs
- **r**: The row numbers for each seat
- **theta**: The angle of each seat, going from $\pi$ to zero radians
- **party**: The labels for the party holding each seat
- **colour**: The colour that has been assigned to the party

Author(s)

Barry Rowlingson

Examples

```r
# The EU parliament has 751 seats, and Wikipedia currently shows this
eu = structure(list(colour = c("#3399FF", "#F0001C", "#0054A5", "#FFD700", 
                             "#900000", "#009900", "#32CD32", "#48E0D0")), .Names = c("colour", 
                  "party", "members"), row.names = c(NA, -8L), class = "data.frame")
strasbourg = seats(751, 16)
eugov = election(strasbourg, eu, party.members, colours=eu$colour)
oldmar<--par(mar=c(2,4,4,2))
plot(eugov$x, eugov$y, col=eugov$colour, asp=1, pch=1, ylim=c(-2,2.5), 
xlab="", ylab="", main="EU Parliament 2014", axes=FALSE)
legend(-0.7,-0.3,eu$party,fill=eu$colour)
par(oldmar)
# or using ggplot2
## Not run:
require(ggplot2)
blank = theme(axis.line=element_blank(), 
              axis.text.x=element_blank(),
              axis.text.y=element_blank(),
              axis.ticks=element_blank(),
              axis.title.x=element_blank(),
              axis.title.y=element_blank(),
              panel.background=element_blank(),
              panel.border=element_blank(),
              panel.grid.major=element_blank(),
              panel.grid.minor=element_blank(),
              plot.background=element_blank())
ggplot(eugov, aes(x=x,y=y,col=party)) + geom_point() + coord_fixed() + blank
## End(Not run)
```
emptyspace

Find an empty space on a plot

Description
Try to find the largest empty rectangle on a plot.

Usage
emptyspace(x,y=NULL)

Arguments
x, y x and y positions of the points on the plot.

Details
‘emptyspace’ searches the pairs of points on the plot to find the largest rectangular space within which none of the points lie. It does not guarantee that the space will be large enough to fit a legend or text.

Two alternatives are the ‘largest.empty’ function in the Hmisc package and the ‘maxEmptyRect’ function. While ‘maxEmptyRect’ will generally outperform ‘emptyspace’, ‘emptyspace’ will sometimes find a slightly smaller, but "squarer" rectangle.

Value
The ‘x’ and ‘y’ coordinates of the center of the rectangle found.

Author(s)
Ray Brownrigg

Examples
x<-rnorm(100)
y<-rnorm(100)
plot(x,y,main="Find the empty space",xlab="X",ylab="Y")
es<emptyspace(x,y)
# use a transparent background so that any overplotted points are shown
boxed.labels(es,labels="Here is the\nempty space",bg="transparent")
fan.plot

Display a fan plot

Description

Displays numerical values as the arcs of overlapping sectors.

Usage

fan.plot(x, edges=200, radius=1, col=NULL, align.at=NULL, max.span=NULL, labels=NULL, labelpos=NULL, label.radius=1.2, align="left", shrink=0.02, main="", ticks=NULL, include.sumx=FALSE,...)

Arguments

x Vector of numbers.
edges The number of edges with which to draw a circle.
radius The radius of the sectors.
col The colors with which to fill the sectors.
align.at Where to align the sectors (see Details).
max.span The angle of the maximal sector in radians. The default is to scale ‘x’ so that it sums to 2*pi.
labels Labels placed around the sector arcs.
labelpos Optional circumferential positions for the labels.
label.radius How far away from the sectors the labels will be placed. May be a vector with a radius for each label.
align Position of the alignment of sectors (see Details).
shrink How much to shrink each successive sector in user units.
main Optional title for the plot.
ticks The number of ticks that would appear if the sectors were on a pie chart. Default is no ticks, TRUE gives the number of ticks equal to the integer sum of ‘x’, which is fairly sensible if ‘x’ is a vector of integers.
include.sumx Whether to include the sum of all ‘x’ values as the largest sector.
... Additional arguments passed to ‘polygon’.

Details

‘fan.plot’ displays sectors much like a pie chart except that the sectors are overlapped. this allows the angular extents of the sectors to be visually compared much more accurately by the viewer. Sectors are plotted from the largest to the smallest, shrinking the radius of each successive sector.
feather.plot

Value
The circumferential positions of the labels in radians. These are returned in order of decreasing size of the values plotted.

Author(s)
Jim Lemon, Anupam Tyagi

Examples
iucn.df<-data.frame(area=c("Africa","Asia","Europe","N&C America", "S America","Oceania"),threatened=c(5994,7737,1987,4716,5097,2093))
fan.plot(iucn.df$threatened,max.span=pi, labels=paste(iucn.df$area,iucn.df$threatened,sep="-"), main="Threatened species by geographical area (fan.plot)",ticks=276)

feather.plot  Display vectors along a horizontal reference line

Description
Displays vectors along a line usually representing time or position.

Usage
feather.plot(r,theta,xpos,yref=0,use.arrows=TRUE, col.refline="lightgray",fp.type="s",main="",xlab="",ylab="", xlabels=NULL,...)

Arguments
r         radii of vectors
theta     direction of vectors in radians
xpos      where to start each vector along the reference line
yref      vertical position to place the reference line
use.arrows whether to put arrow heads on the ends of the vectors
col.refline the color of the reference line
fp.type   whether to use "standard" coordinates (begin at the right and move counterclockwise) or "meteorological" coordinates (begin at the top and move clockwise) when interpreting the values of 'theta'
main      the title of the plot
xlab      the label for the reference line
ylab      the label for the vertical axis
xlabels   optional labels for the reference line
...       additional arguments passed to 'arrows' or 'segments'
Details

This function places vectors of length ‘r’ and angle ‘theta’ along a reference line that may represent time or position or some other value. The user is responsible for spacing the vectors so that they do not overlap if this is desired.

Due to the constraints of getting the radius and angle of each line or arrow right, ‘feather.plot’ is limited to a square plot with equal user unit spans on the x and y axes.

Value

-nil

Author(s)

Jim Lemon, Eduardo Klein

See Also

spread.labels

Examples

```r
r<-0.6+rnorm(24)/5
theta<-c(seq(15*pi/16,pi/16,length.out=12),
    seq(17*pi/16,31*pi/16,length.out=12))
feather.plot(r,theta,xlabels=1:24,
    main="Standard Coordinates",xlab="Time",ylab="Value")
# rearrange theta for meteorological coordinates
feather.plot(r,c(theta[19:24],rev(theta[7:18]),theta[1:6]),xlabels=1:24,fp.type="m",
    main="Meteorological Coordinates",xlab="Time",ylab="Value")
dev.off()
```

fill.corner

Fill a "corner" of a matrix with values

Description

Fills one corner of a matrix with the supplied values, leaving the rest filled with a default value.

Usage

```r
fill.corner(x,nrow,ncol,na.value=NA)
```

Arguments

- `x`  
  A vector of values.

- `nrow,ncol`  
  The number of rows and columns in the matrix to be returned.

- `na.value`  
  The default value for unfilled cells.
Details

‘fill.corner’ creates an nrow by ncol matrix and fills the lower left corner with the values supplied in ‘x’. If there are more values in ‘x’ than cells in the matrix, only the first nrow*ncol values will be inserted.

Value

An nrow by ncol matrix containing the values in ‘x’.

Author(s)

Jim Lemon

floating.pie  Display a floating pie chart

Description

Displays a pie chart at an arbitrary position on an existing plot

Usage

floating.pie(xpos,ypos,x,edges=200, radius=1, col=NULL, startpos=0,
shadow=FALSE, shadow.col=c("ffffff","cccccc"),...)

Arguments

xpos,ypos  x and y position of the center of the pie chart
x  a numeric vector for which each value will be a sector
edges  the number of lines forming a circle
radius  the radius of the pie in user units
col  the colors of the sectors - defaults to ‘rainbow’
startpos  The starting position for drawing sectors in radians.
shadow  Logical - whether to draw a shadow
shadow.col  Colors to use for a shadow.
...  graphical parameters passed to ‘polygon’

Details

‘floating.pie’ displays a pie chart with an optional shadow on an existing plot (see ‘polygon.shadow’).
‘floating.pie’ now accepts NAs or zeros in ‘x’, but simply ignores them.
‘floating.pie’ can be useful when multiple pie charts are placed on a plot overlaying something else, like a map.
Value

The bisecting angle of the sectors in radians. Useful for placing text labels for each sector. If any values in 'x' were zero or NA, no angle is returned for that value. This means that the user must adjust the labels accordingly if 'pie.labels' is called.

Note

As with most pie charts, simplicity is essential. Trying to display a complicated breakdown of data rarely succeeds. The example of bullying is about as complex as one can get with a pie chart and still convey the relevant information.

Author(s)

Jim Lemon

References


See Also

pie.labels, boxed.labels, polygon.shadow

Examples

```r
plot(1:5,type="n",main="Floating Pie test",xlab="",ylab="",axes=FALSE)
box()
polygon(c(0,0,5,5.5),c(0,3,3,0),border="#44aaff",col="#44aaff")
floating.pie(1:7,3,c(2,4,4,2,8),radius=0.5,
col=c("#ff0000","#00ff00","#00ffff","#44bbff","#8000ff"))
floating.pie(3.1,3,c(1,4,5,2,8),radius=0.5,
col=c("#ff0000","#00ff00","#00ffff","#44bbff","#8000ff"))
floating.pie(4,1.5,c(3,4,6,7),radius=0.5,
col=c("#ff0066","#00cc66","#44bbff","#8000ff"))
draw.circle(3.9,2.1,radius=0.04,col="white")
draw.circle(3.9,2.1,radius=0.04,col="white")
draw.circle(4,2.3,radius=0.04,col="white")
draw.circle(4.07,2.55,radius=0.04,col="white")
text(c(1.7,3.1,4),c(3,3.7,3.7),c("Pass","Pass","Fail"))
# type of bullying by sex as superimposed pies
plot(0,xlim=c(-1,1),ylim=c(-1,1),type="n",axes=FALSE,
main="Type of bullying by sex (Li, 2006)"
bc<--floating.pie(0,0,c(90,129,45,67),radius=1,col=2:5)
pie.labels(0,0,bc,c("Physical\nbully","Physical\nvictim",
"Cyber\nbully","Cyber\nvictim"))
bcc<--floating.pie(0,0,c(53,37,70,59,29,16,33,34),
radius=0.7,col=c("lightblue","pink"))
pie.labels(0,0,bcc,radius=0.5,labels=rep(c("M","F"),4))
```
fullaxis

Add an axis with a line to the edge of the plot

Description

As ‘axis’, but draws a "box" line in the same color as the axis.

Usage

fullaxis(side=1, at=NULL, labels=TRUE, line=NA, pos=NA, outer=FALSE, font=NA, lty="solid", lwd=1, lwd.ticks=lwd, col=NULL, col.ticks=NULL, hadj=NA, padj=NA,...)

Arguments

side The side of the plot to draw the axis
at Optional positions in user units for the tick marks.
labels Optional labels for the tick marks.
line Optional line into the margin.
pos Optional position in user units for the axis. Defaults to the edge.
outer Whether to use the outer margin as for ‘axis’.
font Font for the labels.
lty Line type.
lwd Line width for the axis.
lwd.ticks Line width for the ticks.
col color for the axis and tick marks. See Details for label color.
col.ticks Color for the tick marks if different from the axis.
hadj, padj Justification for the labels. See ‘axis’.
... Further arguments passed to ‘axis’.

Details

‘fullaxis’ draws a line to the edges of the plot and then calls ‘axis’ to draw an axis. ‘fullaxis’ is mainly useful for drawing a colored axis on a boxed plot. In order to get the tick labels the same color as the axis and ticks, pass the ‘col.axis’ argument (as part of ...) as well as ‘col’. See the example for some useful tips.

Value

The positions of the tick marks in user units.

Author(s)

Jim Lemon
See Also

axis

Examples

```r
plot(runif(20,-1,1),runif(20,-1,1),xlim=c(-1,1.5),main="Demo of fullaxis",
     xlab="X",ylab="Y",axes=FALSE)
fullaxis(1,col="red",col.axis="red")
fullaxis(2,col="blue",col.axis="blue")
fullaxis(4,at=c(-0.5,0,0.5),labels=c("Negative","Zero","Positive"),pos=1.2,
        col="green",las=1)
# add a top line to complete the "box"
xylim<-par("usr")
segments(xylim[1],xylim[4],xylim[2],xylim[4])
```

Description

Plot one level of a dendrogram displaying two or more mutually exclusive attributes.

Usage

```r
furc(x,xpos,yrange,toplevel,cex=1)
```

Arguments

- **x**: A `dendrite` object containing the counts of objects having combinations of mutually exclusive attributes.
- **xpos**: The horizontal position on the plot to display the current level of the dendrogram.
- **yrange**: The range of values in which the current level of the dendrogram will be displayed.
- **toplevel**: A flag for the function to know whether it is at the top level of the dendrogram or not. Do not change this argument.
- **cex**: The character expansion to use in the display.

Details

`furc` displays one furcation of the dendrogram. A furcation is a single box displaying its label and count that may split into finer divisions. If so, `furc` calls itself for each furcation until there are no more splits.

Value

Nil.
**gantt.chart**

**Author(s)**

Jim Lemon

**See Also**

plot.dendrite

---

**gantt.chart**

*Display a Gantt chart*

**Description**

Displays a Gantt chart with priority coloring

**Usage**

```r
gantt.chart(x=NULL, format="%Y/%m/%d", xlim=NULL, taskcolors=NULL, priority.legend=FALSE, vgridpos=NULL, vgridlab=NULL, vgrid.format="%Y/%m/%d", half.height=0.25, hgrid=FALSE, main="", xlab="", cylindrical=FALSE, label.cex=1, border.col=NA, priority.label="Priorities", priority.extremes=c("High","Low"), time.axis=3)
```

**Arguments**

- **x**: a list of task labels, start/end times and task priorities as returned by `get.gantt.info`. If this is not present, `get.gantt.info` will be called.
- **format**: the format to be used in entering dates/times (see `strptime`).
- **xlim**: the horizontal limits of the plot.
- **taskcolors**: a vector of colors used to illustrate task priority.
- **priority.legend**: Whether to display a priority color legend.
- **vgridpos**: optional positions of the vertical grid lines.
- **vgridlab**: optional labels for the vertical grid lines.
- **vgrid.format**: format for the vertical grid labels.
- **half.height**: the proportion of the spacing between task bars that will be filled by the bar on each side - 0.5 will leave no space.
- **hgrid**: logical - whether to display grid lines between the bars.
- **main**: the title of the plot - note that this is actually displayed using `mtext`.
- **xlab**: horizontal axis label - usually suppressed.
- **cylindrical**: Whether to give the bars a cylindrical appearance.
- **label.cex**: Relative size for the task labels at the left side.
- **border.col**: The color for an optional border for the bars (NA=none).
priority.label  Label for the priority color legend.
priority.extremes  Labels for each end of the priority color legend.
time.axis  Axis for time scale. Should only be 1 or 3.

Details
If task priority colors are not wanted, set ‘taskcolors’ to a single value to suppress the coloring. If this is not done, ‘rainbow’ will be called to generate a different color for each task. If colors other than ‘rainbow’ are wanted, remember to pass enough colors for one to the lowest (highest numerically) priority.

There can now be more than one time interval for each task. If there is, more than one bar will be displayed for each interval, which may not be a task at all, but rather intervals related to the labels. Colors can be specified for labels or intervals and if there are not as many colors as intervals, the first “number of unique labels” colors will be assigned to each unique label. This should make every bar for each label the same color, but be aware that the colors will be distributed in alphabetical order of the entity labels. If there are at least as many taskcolors as intervals, they will be assigned to intervals in the order of the ‘taskcolors’ vector. The examples should make this clearer.

Since ‘gantt.chart’ can be used to display things other than prioritized tasks, the labels for the priority legend can now be specified.

Value
The list used to create the chart - see get.gantt.info for details. This can be saved and reused rather than manually entering the information each time the chart is displayed.

Author(s)
Jim Lemon (original by Scott Waichler - features by Ulrike Gromping - added label colors by Nicolas Immelman)

See Also
get.gantt.info

Examples
Ymd.format<="%Y/%m/%d"
gantt.info<-list(labels=
c("First task","Second task","Third task","Fourth task","Fifth task"),
starts=
as.POSIXct(strptime(
c("2004/01/01","2004/02/02","2004/03/03","2004/05/05","2004/09/09"),
format=Ymd.format)),
ends=
as.POSIXct(strptime(
c("2004/03/03","2004/05/05","2004/05/05","2004/08/08","2004/12/12"),
format=Ymd.format)),
priorities=c(1,2,3,4,5))
vgridpos<-as.POSIXct(strptime(c("2004/01/01","2004/02/01","2004/03/01","2004/04/01","2004/05/01","2004/06/01","2004/07/01","2004/08/01","2004/09/01","2004/10/01","2004/11/01","2004/12/01"),
format=Ymd.format))
Display a barplot with a gap (missing range) on one axis

Description
Displays a barplot with a missing range.

Usage
```r
gap.barplot(y, gap, xaxlab, xtics, yaxlab, ytics, xlim=NA, ylim=NA, xlab=NULL, ylab=NULL, halfwidth=NA, horiz=FALSE, col,...)
```

Arguments
- `y`: a vector of data values
- `gap`: the range of values to be left out
- `xaxlab`: labels for the x axis ticks
- `xtics`: position of the x axis ticks
- `yaxlab`: labels for the y axis ticks
- `ytics`: position of the y axis ticks
- `xlim`: Optional x limits for the plot
- `ylim`: optional y limits for the plot
- `xlab`: label for the x axis
- `ylab`: label for the y axis
- `halfwidth`: Half of the width of the bars. Set this to zero for adjoining bars.
- `horiz`: whether to have vertical or horizontal bars
- `col`: color(s) in which to plot the values
- `...`: arguments passed to ‘barplot’.
Details

Displays a barplot omitting a range of values on the X or Y axis. Typically used when there is a relatively large gap in the range of values represented as bar heights. See `axis.break` for a brief discussion of plotting on discontinuous coordinates.

If the user does not ask for specific y limits, the function will calculate limits based on the range of the data values. If passing specific limits, remember to subtract the gap from the upper limit.

Value

The center positions of the bars.

Author(s)

Jim Lemon

See Also

gap.barplot

twogrp

gap.boxplot

Examples

twogrp<-c(rnorm(10)+4,rnorm(10)+20)
gap.barplot(twogrp,gap=c(8,16),xlab="Index",ylab="Group values",main="Barplot with gap")
gap.barplot(twogrp,gap=c(8,16),xlab="Index",ylab="Group values",horiz=TRUE,main="Horizontal barplot with gap")
gap.boxplot

Arguments

x numeric vector or a list of vectors
... arguments passed to boxplot.
gap the range(s) to be omitted - a list with two components, 'top' and 'bottom' each specifying a range to omit. The default range of 'c(NA,NA)' means no omitted range
range how far to extend the whiskers, (see boxplot)
width the relative widths of the boxes
varwidth if TRUE, box widths are proportional to the square roots of the number of observations
notch whether to display the confidence intervals for the median as notches
outline whether to display outliers
names optional names to display beneath each boxplot
xlim ylim Optional x and y axis limits for the plot.
boxwex scale factor for box widths
staplewex staple width proportional to box width
outwex outlier line width
plot dummy argument for consistency with 'boxplot' - always plots
border optional color(s) for the box lines
col optional color(s) to fill the boxes
log whether to use a log scale - currently does nothing
axis.labels Optional axis labels.
axes Whether to display axes.
pars optional parameters for consistency with 'boxplot'
horizontal whether to plot horizontal boxplots - currently does nothing
add whether to add the boxplot(s) to a current plot - currently does nothing.
at optional horizontal locations for the boxplots.
main a title for the plot.

Details

Displays boxplot(s) omitting range(s) of values on the top and/or bottom of the plot. Typically used when there are outliers far from the boxes. See boxplot for more detailed descriptions of the arguments. If the gaps specified include any of the values in the 'stats' matrix returned from 'boxplot', the function will exit with an error message. This prevents generation of NAs in indexing operations, which would fail anyway. A gap can include part of a box, but it is unlikely that this would be intended by the user.

See axis.break for a brief discussion of plotting on discontinuous coordinates.
Value
A list with the same structure as returned by ‘boxplot’, except that the values of elements beyond
the gap(s) have their true positions on the plot rather than the original values. For example, in the
second example, the value returned for the upper staple of the right boxplot is 14 rather than 20, due
to the 6 unit gap.

Author(s)
Jim Lemon

See Also
gap.barplot, gap.plot

Examples
twovec<-list(vec1=c(rnorm(30),-6),vec2=c(sample(1:10,40,TRUE),20))
gap.boxplot(twovec,gap=list(top=c(12,18),bottom=c(-5,-3)),
main="Show outliers separately")
if(dev.interactive()) par(ask=TRUE)
gap.boxplot(twovec,gap=list(top=c(12,18),bottom=c(-5,-3)),range=0,
main="Include outliers in whiskers")
par(ask=FALSE)

gap.plot

Display a plot with one or two gaps (missing ranges) on one axis

Description
Displays a plot with one or two missing ranges on one of the axes.

Usage
gap.plot(x,y,gap,gap.axis="y",bgcol="white",breakcol="black",brw=0.02,
xlim=range(x),ylim=range(y),x ticlab,xtics=NA,y ticlab,yticlab=NA,
ly=rep(1,length(x)),col=rep(par("col"),length(x)),pch=rep(1,length(x)),
add=FALSE,stax=FALSE,...)

Arguments
x, y data values
gap the range(s) of values to be left out
gap.axis whether the gaps are to be on the x or y axis
bgcol the color of the plot background
breakcol the color of the "break" marker
brw break width relative to plot width
The `gap.plot` function displays a plot omitting one or two ranges of values on one axis. Typically used when there is a relatively large gap or two in the overall range of one set of values, often because of outliers. The function warns the user if any values may have been omitted by being in the "gap". See `axis.break` for a brief discussion of plotting on discontinuous coordinates.

To add more data series to a gap plot, call `gap.plot` with `add = TRUE`. The same `gap` and `gap.axis` arguments as in the initial call must be passed or the data will not be displayed correctly. Remember to pass an explicit `xlim` or `ylim` to the initial call if the added data exceed the range of the data initially displayed. Also remember to subtract the width(s) of the gap(s) if you are passing an explicit `xlim` or `ylim`.

Because the gaps take up some space, it is possible to have a data value that is just below a gap plotted in the gap. The answer is to make the lower gap limit a little higher if this is a problem.

If at least four values are passed in `gap`, the first four will be used to calculate two "gaps" in the plot instead of one. The function does not check whether these values are sensible, so it is quite easy to ask for a very silly plot.

The default ticks are usually not ideal, and most users will want to pass their own tick positions and perhaps labels. Note that `lines` appears to use only the first `col` and `lty` argument value, so if you must have lines with different colors and types, use `add=TRUE` and add them separately (see the third example for the problem and the solution).

### Value

nil

### Author(s)

Jim Lemon and Ben Bolker (thanks to Zheng Lu for the "add" idea, and Art Roberts for helping to get the gaps right.)

### See Also

gap.barplot, axis.break, do.first
get.breaks

Get the breakpoints for a weighted histogram

Description

Gets the breakpoints for a weighted histogram.

Usage

get.breaks(x, breaks)

Arguments

x
A numeric vector.

breaks
Either the name of the function to calculate breakpoints, the number of categories or a vector of breakpoints.

Details

‘get.breaks’ either calls the same functions as ‘hist’ to get breakpoints or calculates a given number or just returns ‘breaks’ if they are already specified.

Value

A vector of breakpoints.

Author(s)

Jim Lemon
Gather the information to create a Gantt chart

Description

Allows the user to enter the information for a Gantt chart.

Usage

get.gantt.info(format="%Y/%m/%d")

Arguments

format the format to be used in entering dates/times. Defaults to YYYY/mm/dd. See strftime for various date/time formats.

Value

The list used to create the chart. Elements are:

labels The task labels to be displayed at the left of the chart.
starts, ends The task starts/ends as POSIXct dates/times.
priorities Task priorities as integers in the range 1 to 10. There can be less than 10 levels of priority, but if priorities do not start at 1 (assumed to be the highest), the default priority colors will be calculated from 1.

Author(s)

Jim Lemon

See Also

gantt.chart

Examples

cat("Enter task times using HH:MM (hour:minute) format\n")
get.gantt.info("%H:%M")
get.segs

Calculate the midpoints and limits for a centipede plot

Description

Calculates midpoints and limits for a list or data frame for use with centipede.plot.

Usage

get.segs(x,mct="mean",lower.limit="std.error",upper.limit=lower.limit)

Arguments

x       a list or data frame.
mct     The name of the function to calculate midpoints.
lower.limit,upper.limit
        The names of the function(s) to calculate lower and upper limits.

Details

‘get.segs’ calls the functions whose names are passed to calculate midpoints and limits for each list element or data frame column. The user can define special functions for the central and dispersion measures if desired.

Value

A matrix with four rows and as many columns as were in the object ‘x’. The first row contains the midpoint values, the second and third the lower and upper limit values respectively and the fourth row the number of valid observations in the columns.

Author(s)

Jim Lemon

See Also

centipede.plot
**get.soil.texture**

*Enter soil texture data*

**Description**

‘get.soil.texture’ calls ’get.triprop’ to allow the user to enter soil textures as the proportions or percentages of three components, sand, silt and clay.

**Usage**

```r
get.soil.texture(use.percentages=FALSE,cnames=c("sand","silt","clay"))
```

**Arguments**

- `use.percentages`: Logical - whether to treat the entries as percentages and scale to proportions.
- `cnames`: column names for the resulting three column matrix.

**Value**

A matrix of the components of one or more soil samples.

**Author(s)**

Sander Oom and Jim Lemon

**See Also**

`soil.texture`, `get.triprop`

**Examples**

```r
if(dev.interactive()) {
  newsp<-get.soil.texture()
  # show the soil triangle
  soil.texture()
  # now plot the observations
  show.soil.texture(newsp)
}
```
get.tablepos

Get the position for a legend or table

Description

Gets the x and y positions and justification for a legend or table in user units from the string descriptors like "top".

Usage

get.tablepos(x)

Arguments

x

A valid position descriptor like "top".

Details

get.tablepos checks for one of the nine valid position descriptors:
topleft, top, topright, left, center, right, bottomleft, bottom and bottomright.
If none of these descriptors are found, it will return the center position and justification.

Value

A list containing:

x
x position

y
y position

xjust
x (horizontal) justification

yjust
y (vertical) justification

Author(s)

Jim Lemon

See Also

addtable2plot, legendg
get.triprop

Enter three proportion data - usually soil textures

Description

‘get.triprop’ allows the user to enter triplets of proportions or percentages of three components such as sand, silt and clay in soils.

Usage

get.triprop(use.percentages=FALSE,cnames=c("1st","2nd","3rd"))

Arguments

use.percentages
  Logical - whether to treat the entries as percentages and scale to proportions.

cnames
  column names for the resulting three column matrix.

Details

The three proportions of each row must sum to 100 or 1 within 1% or the function will warn the operator.

Value

A matrix of the components of one or more observations.

Author(s)

Jim Lemon

See Also

triax.plot, soil.texture

Examples

if(dev.interactive()) {
  # get some proportions
  newsp<-get.triprop()
  # show the triangle
  triax.frame(main="Test triax.plot")
  # now plot the observations
  triax.points(newsp)
}
getIntersectList

**getFigCtr**  \hspace{1cm} \textit{Get coordinates in the figure region in user units.}

**Description**

Calculates the coordinates of a proportional point of the figure region in user units.

**Usage**

\[ \text{getFigCtr}(\text{pos}=c(0.5,0.5)) \]

**Arguments**

- **pos**  
  The proportion of the figure region to find (see Details).

**Details**

‘getFigCtr’ reads parameters about the current plot and calculates the vertical and horizontal centers of the figure region by default. This is typically useful for placing a centered title on plots where the left and right margins are very different.

By changing ‘pos’, any proportional points of the figure region can be returned. For example, ‘pos=c(0,0)’ will return the left and bottom coordinates of the figure region.

**Value**

A two element vector containing the coordinates of the center of the figure region in user units.

**Author(s)**

Jim Lemon (thanks to Karl Brand for the adjustable coordinates)

getIntersectList

**getIntersectList**  \hspace{1cm} \textit{Enter a set intersection list}

**Description**

Enter the information for a set intersection display.

**Usage**

\[ \text{getIntersectList} (\text{nelem, xnames=NULL, sep=+}) \]
getIntersectList

Arguments

- `nelem` The number of sets for which the intersections will be displayed.
- `xnames` The labels for the set intersections. The function creates names from combinations of the first `nelem` capital letters if none are given.
- `sep` The separator to use when calling `paste`.

Details

`getIntersectList` allows the user to manually enter the counts of set intersections rather than build this information from a matrix of data. It is probably most useful for producing an intersection diagram when the counts of the intersections are already known, or when the values are proportions rather than counts as in the example.

It is very helpful when there are large numbers of elements, as the `makeIntersectList` function runs very slowly.

Value

A list of the counts of elements in the set intersections.

Author(s)

Jim Lemon

See Also

`makeIntersectList`, `intersectDiagram`

Examples

```r
# this example is from a haplotype mapping problem submitted by Mao Jianfeng
## Not run:
hapIntList <-
  getIntersectList(3, xnames = c("hap.Pd", "hap.Pt", "hap.Py"))
# enter the data as follows:
# Number of elements in hap.Pd - 1: 27.586
# Number of elements in hap.Pt - 1: 28.689
# Number of elements in hap.Py - 1: 31.035
# Number of elements in hap.Pd-hap.Pt - 1: 10.345
# Number of elements in hap.Pd-hap.Py - 1: 10.345
# Number of elements in hap.Pt-hap.Py - 1: 0
# Number of elements in hap.Pd-hap.Pt-hap.Py - 1: 0
# Total number of elements - 1: 100

## End(Not run)
                                structure(0, .Names = c("hap.Pd-hap.Pt-hap.Py"), 100),
                                class = "intersectList"))
```
**getMarginWidth**  
*Find the margin width necessary to fit text or a legend next to a plot*

**Description**
Calculateds the margin width necessary to fit text or a legend next to a plot.

**Usage**
```
getMarginWidth(side=4, labels, is.legend=FALSE)
```

**Arguments**
- `side`  
  Which side of the plot (as in axis).
- `labels`  
  The text to place next to the plot.
- `is.legend`  
  Whether the text is in a legend or not.

**Details**

`getMarginWidth` reads parameters about the current plot and calculates the left or right (default) margin necessary to fit the strings passed as `labels` or a legend containing those strings.

**Value**
A two element list containing the number of margin lines necessary to fit the text or legend and the horizontal center of the margin in user units.

**Author(s)**
Jim Lemon

**Examples**
```
plot(rnorm(10))
newmarinfo <- getMarginWidth(labels=c("Long label","Even longer label"))
oldmar <- par("mar")
par(mar=c(oldmar[1:3], newmarinfo$newmar))
plot(rnorm(10))
par(xpd=TRUE)
text(rep(newmarinfo$marcenter,2), c(0.5,-0.5),
     c("Long label","Even longer label"))
par(mar=oldmar, xpd=FALSE)
```
**getYmult**

Correct for aspect and coordinate ratio

**Description**
Calculate a multiplication factor for the Y dimension to correct for unequal plot aspect and coordinate ratios on the current graphics device.

**Usage**
```r
ggetYmult()
```

**Details**
`getYmult` retrieves the plot aspect ratio and the coordinate ratio for the current graphics device, calculates a multiplicative factor to equalize the X and Y dimensions of a plotted graphic object.

**Value**
The correction factor for the Y dimension.

**Author(s)**
Jim Lemon

**See Also**
- `draw.circle`
- `get_axisposSd`

---

**get_axispos3d**

Get axis positions on a 3D plot

**Description**
Calculate the axis positions on a 3D plot.

**Usage**
```r
get_axispos3d(edge, pmat, at, pos=NULL, dist=0)
```

**Arguments**
- `edge`: which axis to calculate.
- `pmat`: matrix to transform coordinates.
- `at`: position on the axis.
- `pos`: position of the axis relative to the other axes.
- `dist`: Offset of the axis.
Value

A position in 2D coordinates

Author(s)

Ben Bolker

---

**gradient.rect**

*Display a rectangle filled with an arbitrary color gradient*

Description

'gradient.rect' draws a rectangle consisting of 'nslices' subrectangles of the colors in 'col' or those returned by 'color.gradient' if 'col' is NULL. The rectangle is 'sliced' in the direction specified by 'gradient'.

Usage

```r
gradient.rect(xleft, ybottom, xright, ytop, reds, greens, blues, col=NULL, nslices=50, gradient="x", border=par("fg"))
```

Arguments

- **xleft, ybottom, xright, ytop**
  Positions of the relevant corners of the desired rectangle, as in 'rect'.
- **reds, greens, blues**
  Vectors of the values of the color components either as 0 to 1 or, if any value is greater than 1, 0 to 255.
- **col**
  Vector of colors. If supplied, this takes precedence over 'reds, greens, blues' and 'nslices' will be set to its length.
- **nslices**
  The number of sub-rectangles that will be drawn.
- **gradient**
  Whether the gradient should be horizontal (x) or vertical.
- **border**
  The color of the border around the rectangle (NA for none).

Value

The vector of hexadecimal color values from 'color.gradient' or 'col'.

Author(s)

Jim Lemon
Examples

# get an empty box
plot(0:10,type="n",axes=FALSE)
# run across the three primaries
gradient.rect(1,0,3,6,reds=c(1,0),
greens=c(seq(0,1,length=10),seq(1,0,length=10)),
blues=c(0,1),gradient="y")
# now a "danger gradient"
gradient.rect(4,0,6,6,c(seq(0,1,length=10),rep(1,10)),
c(rep(1,10),seq(1,0,length=10)),c(0,0),gradient="y")
# now just a smooth gradient across the bar
gradient.rect(7,0,9,6,col=smoothColors("red",38,"blue"),border=NA)

hexagon Draw a hexagon

Description

Draws a hexagon on the current graphic device

Usage

hexagon(x,y,unitcell=1,col=NA,border="black")

Arguments

x, y x and y position of the bottom left corner of the square that would pack into the same space as the hexagon.
unitcell The dimension of the side of the abovementioned square.
col The color to fill the hexagon - default is no fill.
border The color of the perimeter of the hexagon.

Value

nil

Note

Draws a hexagon with the same center as a square that would pack into the same dimensions as the hexagon. That is, given a grid of squares with alternate rows shifted one half the length of the sides, the hexagons drawn would be close packed. Its use in the plotrix package is to provide an alternative unit cell for the ‘color2D.matplot’ function.

Author(s)

Jim Lemon
See Also

color2D.matplot

histStack

Histogram "stacked" by categories

Description

Histogram of a quantitative variable with bars that are "stacked" by the values of a factor variable.

Usage

histStack(x,...)

## S3 method for class 'formula'
histStack(x,data,breaks="Sturges",col="rainbow",
    right=TRUE,main="",xlab=NULL,legend.pos=NULL,cex.legend=0.75,...)

## Default S3 method:
histStack(x,z,breaks="Sturges",col="rainbow",
    right=TRUE,main="",xlab=NULL,legend.pos=NULL,cex.legend=0.75,...)

Arguments

x A vector of quantitative data or a formula of the form x~z (see z below).
z A vector of categorical data (a factor) that will define the “stacks”.
data A data frame that contains both x and z.
breaks Breaks to use in categorizing values of x.
col Either a vector of colors in any legitimate form or a character string that specifies a function that requires only the length of the vector as an argument and will return a vector of colors with that length. (see Details)
right A logical that indicates whether the bins are right-open (left-closed; =TRUE) or right-closed (left-open; =FALSE; default).
main A character string that forms the main title for the plot.
xlab A character string for labeling the x-axis.
legend.pos A character string or two numeric values indicating the position for the stacking legend.
cex.legend A numeric character expansion value for the legend. Values less than 1 will make the legend smaller.
... Additional arguments sent to the hist function.
Details

‘histStack’ displays a “stacked histogram” while using many of the same arguments as hist(). The argument ‘z’ will be converted to a factor with a warning if it is not already a factor.

The color functions in grDevices (e.g. ”gray.colors”) should always be valid when passed as the ‘col’ argument. Any function that will return a vector of ‘n’ colors when called with a single argument ‘n’ and that exists in the current environment should work. An error will occur if length(col)==1 and the value is not a function as described for ‘col’ (e.g., ‘col=”blue”’ will result in an error). If fewer colors than levels of ‘z’ are passed, they will be recycled.

Value

nil. A plot is displayed.

Note

This function is currently experimental.

Author(s)

Derek Ogle with modifications by Jim Lemon

See Also

hist, legend

Examples

set.seed(409)
df <- data.frame(len=rnorm(100)+5,
  grp=sample(c("A","B","C","D"),100,replace=TRUE))
histStack(len~grp,data=df,main="Default (rainbow) colors",
  xlab="Length category")
histStack(len~grp,data=df,col="heat.colors",main="Heat colors",
  xlab="Length category",legend.pos="topright")
histStack(len~grp,data=df,col=2:5,main="Colors by number",
  xlab="Length category",legend.pos=c(2.8,18))
**Arguments**

- **x**: A list containing as many numeric vectors as there are sets. The first vector contains the counts or percentages of the elements that are only in one set, the next vector contains the counts or percentages of elements that are in two sets and so on. A matrix of set membership indicators or a two column matrix of object identifiers and attribute identifiers can be passed - see Details.

- **pct**: Whether to display counts (FALSE) or percentages (TRUE) of the number of entities.

- **show.nulls**: Whether to display the number of original objects that were not members of any set.

- **xnames**: Optional user supplied names for the set categories (see Details).

- **sep**: The separator to use between category names (see Details).

- **mar**: The margins for the diagram. The margins that were in effect when the function is called are restored.

- **main**: The title for the diagram.

- **col**: Colors for the sets (see Details).

- **cex**: Character expansion for the intersection labels.

- **minspacing**: The minimum spacing between the rectangles (see Details).

- **all.intersections**: Whether to display all intersections, even if empty (Dangerous - see Detail).

- **include**: Which set identifiers to include in the diagram (see Details).

**Details**

`intersectDiagram` displays rows of optionally colored rectangles that represent the intersections of set memberships (attributes) of a set of objects. The topmost row represents the intersections of the fewest sets, and succeeding rows represent the intersections of more sets. If there were objects in the original data set that were not members of any set, any percentages calculated will reflect this. By setting `show.nulls` to TRUE, the counts or percentages of such objects will be displayed below the intersections over an empty rectangle scaled to the count or percentage.

Important - If the `all.intersections` argument is TRUE, all intersections will be displayed, whether empty or not (see the example). This is mostly for demonstration purposes, and if the number of sets is large, is likely to produce a very messy diagram. Similarly, sets with large numbers of intersections that are populated will require very large displays to be readable, even if there are small numbers in the intersections. If you would like to see this in action, pass the data frame `setdf` in the `categoryReshape` example to `intersectDiagram` with `all.intersections` TRUE.

`intersectDiagram` does not attempt to display the set intersections as a pattern of overlapping geometric figures, but rather the relative numbers of objects sharing each intersection. More than three intersecting sets generally produce a complex and difficult to interpret Venn diagram, and this provides an alternative way to display the size of intersections between larger numbers of sets.

`intersectDiagram` now allows the user to display only part of the set intersections, which is useful for analyzing very complex intersections. This is controlled by the `include` argument. This defaults to all sets or attributes when `include=NULL`. If one or more of the labels of the
sets or attributes is passed, only the intersections containing those labels will be displayed. See examples 2 and 3 below.

Each set (attribute) is assigned a color if ‘col’ is not NA. ‘rainbow’ is called if ‘col’ is NULL, otherwise the colors passed are used. For each intersection, the colors representing the sets intersecting are included in the rectangle.

The strings displayed on each rectangle are taken from the argument ‘xnames’ unless that is NULL, then the ‘names’ of the intersectList object passed as ‘x’ or returned from the call to ‘makeintersectList’.

If a matrix or data frame of set membership indicators is passed as ‘x’, it will be passed to makeintersectList for conversion. Each column must represent a set, and the values in the columns must be 0 or 1, or FALSE or TRUE. Similarly, if a matrix or data frame in which the first column is object identifiers and the second column is attributes, this will be passed to ‘makeintersectList’.

The spacing between the largest rectangles is controlled by ‘minspacing’. ‘minspacing’ is in units of object counts and defaults to 0.1 times the largest number of objects in an intersection. When the number of objects in different intersections at a given level varies widely, the labels of intersections with few objects may overlap if they are wide relative to the rectangle representing the number of objects. This can be corrected by passing a ‘minspacing’ argument that will increase the space between rectangles and/or decreasing the character size of the labels. If the labels for each set are relatively long, setting ‘namesep=“\n”’ may help. Note that if a different separator is passed, that separator must be explicitly passed in any subsequent calls using the same ‘intersectlist’ object - see examples 1 to 3 below.

Value

Returns the intersectionList object invisibly.

Author(s)

Jim Lemon

See Also

makeIntersectList, getIntersectList, categoryReshape

Examples

# create a matrix where each row represents an element and
# a 1 (or TRUE) in each column indicates that the element is a member
# of that set.
druguse<-matrix(c(sample(c(0,1),200,TRUE,prob=c(0.15,0.85)),
sample(c(0,1),200,TRUE,prob=c(0.35,0.65)),
sample(c(0,1),200,TRUE,prob=c(0.5,0.5)),
sample(c(0,1),200,TRUE,prob=c(0.9,0.1)),ncol=4)
colnames(druguse)<-c("Alc","Tob","THC","Amp")
druglist<-makeIntersectList(druguse,sep="\n")
# first display it as counts
intersectDiagram(druglist,main="Patterns of drug use",sep="\n")
# then display only the intersections containing "Alc"
intersectDiagram(druglist,main="Patterns of drug use (Alcohol users only)",
sep="\n",include="alc")
# now display only the intersections containing "Amp"
intersectDiagram(druglist, main="Patterns of drug use (Speed users only)",
sep="\n", include="amp")
# then as percent with non.members, passing the initial matrix
intersectDiagram(druguse, pct=TRUE, show.nulls=TRUE)
# alter the data to have more multiple intersections
druguse[which(as.logical(druguse[,1]))[1:40],2]<1
druguse[which(as.logical(druguse[,1]))[31:70],3]<1
druguse[,4]<sample(c(0,1),200,TRUE,prob=c(0.9,0.1))
intersectDiagram(druguse, main="Smaller font in labels",
col=c("gray20","gray40","gray60","gray80"), cex=0.8)
# transform the spacing - usually makes it too close, first try minspacing
intersectDiagram(druguse, col="gray", main="Minimum spacing = 30 cases",
minspacing=30)
# then try cex - may need both for large differences
intersectDiagram(druguse, main="Very boring single color", col="gray", cex=0.8)
# create a matrix with empty intersections
druguse<--matrix(c(sample(c(0,1),20,TRUE),
sample(c(0,1),20,TRUE),
sample(c(0,1),20,TRUE)), ncol=4)
# show only the populated intersections
intersectDiagram(druguse, main="Display only populated intersections")
# show all intersections
intersectDiagram(druguse, main="Display empty intersections", all.intersections=TRUE)

---

**kiteChart**  
*Magnitude by position chart.*

**Description**
Display numeric values as the widths of a polygon along a dimension such as time.

**Usage**
```r
kiteChart(x, xlim=NA, ylim=NA, timex=TRUE, main="Kite chart",
xlab=ifelse(timex,"Time","Groups"), ylab=ifelse(timex,"Groups","Time"),
border=par("fg"), col=NULL, varpos=NA, varlabels=NA, varscale=FALSE,
timelabels=NA, mar=c(5,4,4,4), axlab=c(1,2,3,4),
normalize=FALSE, shownorm=..., )
```

**Arguments**
- **x**  
  Numeric matrix or data frame
- **xlim**  
  Horizontal extent of the chart. Defaults to 1:dim(x)[2].
- **ylim**  
  Vertical extent of the chart. Defaults to 0.5:dim(x)[1]+0.5.
- **timex**  
  Whether the "time" axis is x (horizontal) or not.
- **main, xlab, ylab**  
  As in 'plot'.

---


`kiteChart` displays each row of `x` as a sequence of widths, allowing the relationships between those values and the dimension along which they occur (usually time) to be illustrated.

The values in x are scaled to a maximum polygon width of 1 if ‘normalize’ is TRUE. This is to avoid overlapping of the polygons. There may be some cases where the values can be displayed directly. If normalized, the multipliers will be displayed for each row on the right or top side of the chart unless ‘shownorm’ is FALSE. Remember to specify the ‘mar’ argument if more space at the top is needed.

The ‘axlab’ argument allows the user to place the axis tick labels and normalization multipliers on different axes. The default places the tick labels on the bottom and left sides of the plot and the multipliers on the right or top. Using ‘axlab=c(3,4,1,2)’ places the tick labels on the top and right and the multipliers on the left or bottom. The ‘mar’ argument may have to be adjusted.

The user can display raw values by default, or by setting ‘varpos’ to TRUE. Setting ‘varpos’ to a vector of positions will place the ”kite lines“ on those values. If there are no row names and the ‘varlabels’ argument is NA, the values of ‘varpos’ will be used as labels for each ”kite line“.

The maximum extent of each ”kite line“ can be displayed by setting ‘varscale’ to TRUE. If ‘varscale’ is TRUE, one extra line will be added to the top margin. If ‘varpos[1]’ is not NA, ‘normalize’ is FALSE by default.

**Value**

The values of ‘mar’ that were current when ‘kiteChart’ was called.

**Author(s)**

Jim Lemon (Thanks to Michael Bedward for suggestions on the arguments and Nikolaus Lampadar-iou for the suggestions on displaying raw values)
labbePlot

Display a L'Abbe plot

Description

Display the percentages of successes for two conditions to be compared as circles, the area of which is proportional to the number of observations.

Usage

labbePlot(x, main="L'Abbe plot", xlab="Percent positive response with placebo", ylab="Percent positive response with treatment", labels=NULL, col=NA, circle.mag=0.5, add=FALSE,...)

Arguments

x A list of either 2x2 tables or three element vectors (see Details).
main The title of the plot.

See Also

polygon
labbePlot

xlab, ylab  The x and y axis labels as in 'plot'.
labels  Text strings that will be displayed in the center of the circles.
col  A list of colors for the circles.
circle.mag  A fudge factor for very small or very large numbers of observations.
add  Whether to add the information in 'x' to an existing L'Abbe plot.
...  additional arguments passed to 'plot'.

Details

The elements of 'x' may be tables in which rows represent the conditions being compared, with the comparison condition first (often "placebo") and the condition of interest (often "intervention") second. The columns represent the counts of successes and failures. The elements of 'x' can also be vectors with three numeric values, first the percentage of successes for the comparison condition, second the percentage of successes for the condition of interest and finally the number of observations. Tables and vectors can be mixed.

The radius of each circle is the square root of the number of observations multiplied by 'circle.mag'. This allows very small numbers of observations to be expanded and very large numbers to be reduced in size. As the area of each circle is proportional to the number of observations, 'circle.mag' must be the same for all circles. The user may wish to expand or contract all the circles on a plot so that they will fit within the box.

The labels, if not NULL, are displayed on the circles. The function tries to work out whether white or black text will be more easily read based on the background color and displays the text accordingly.

Value

nil

Author(s)

Jim Lemon - thanks to Whitney Melroy for asking for it.

See Also

draw.circle

Examples

# first fake something like the data from a clinical trial
didf<-data.frame(subject=1:50, interv=rep(c("therapist","ex-drinker"), each=25), 
  outcome=sample(c("more","less"), 50, TRUE))
# make it into a table
didf.tab<-table(didf$interv, dfid$outcome)
# now mix in some raw percentages just for the example
didf2<-c(74, 46, 200)
didf3<-c(33, 87, 500)
x<-list(didf.tab, dfid2, dfid3)
labbecol<-list("red","green","blue")
Description

Makes a ladder plot, similar to `parcoord` but with more flexibility and graphical options.

Usage

```r
ladderplot(x, ..., 
## Default S3 method:
  ladderplot(x, scale=FALSE, col=1, pch=19, lty=1, 
  xlim=c(0.5, ncol(x) + 0.5), ylim=range(x), vertical = TRUE, ordered=FALSE,...)
```

Arguments

- `x` A matrix or data frame with at least 2 columns.
- `scale` Logical, if the original data columns should be scaled to the unit (0-1) interval.
- `col` Color values to use for rows of `x`. If longer than 1, its value is recycled.
- `pch` Point type to use. If longer than 1, its value is recycled.
- `lty` Line type to use. If longer than 1, its value is recycled.
- `xlim`, `ylim` Limits for axes.
- `vertical` Logical, if the orientation of the ladderplot should be vertical or horizontal.
- `ordered` Logical, if the columns in `x` should be ordered.
- `...` Other arguments passed to the function `stripchart`.

Details

The function uses `stripchart` to plot 1-D scatter plots for each column in `x`. Then points are joined by lines for each rows of `x`.

Value

Makes a plot as a side effect. Returns `NULL` invisibly.

Author(s)

Peter Solymos `<solymos@ualberta.ca>`
legendg

**See Also**

- lines, points, stripchart
  - Almost identical function: parcoord

**Examples**

```r
x <- data.frame(A = c(1:10), B = c(2:11) + rnorm(10))
y <- data.frame(x, C = c(1:10) + rnorm(10))
par <- par(mfrow = c(1, 3))
ladderplot(x)
ladderplot(x, col = 1:10, vertical = FALSE)
ladderplot(y, col = 1:10)
par(opar)
```

```r
## examples from parcoord
## Not run:
if (require(MASS)) {
  par <- par(mfrow = c(2, 3))
z1 <- state.x77[, c(7, 4, 6, 2, 5, 3)]
parcoord(z1, main = "parcoord state.x77")
ladderplot(z1, main = "ladderplot state.x77 original")
ir <- rbind(iris3[, 1], iris3[, 2], iris3[, 3])
z2 <- log(ir)[, c(3, 4, 2, 1)]
parcoord(z2, col = 1 + (0:149),
  main = "ladderplot iris original")
ladderplot(z2, main = "ladderplot iris original")
par(opar)
}
```

```r
## End(Not run)
```

---

**legendg**

*Legend with grouped bars, lines or symbols*

**Description**

Displays a legend with more than one rectangle, symbol or line.

**Usage**

```r
legendg(x, y = NULL, legend, fill = NULL, col = par("col"),
  border = list("black"), lty, lwd, pch = NULL, angle = 45,
  density = NULL, bty = "o", bg = par("bg"), box.lwd = par("lwd"),
  box.lty = par("lty"), box.col = par("fg"), pt.bg = NA,
  cex = 1, pt.cex = cex, pt.lwd = lwd,
  pt.space = 1, xjust = 0, yjust = 1, x.intersp = 1, y.intersp = 1,
  adj = c(0, 0.5), text.width = NULL, text.col = par("col"),
  merge = FALSE, trace = FALSE, plot = TRUE, ncol = 1, horiz = FALSE,
  title = NULL, inset = 0, xpd, title.col = text.col)
```
Arguments

- **x, y**: Position of the legend as in `legend`.
- **legend**: Labels for the legend as in `legend`.
- **fill**: List of fill colors for the rectangles.
- **col**: Color(s), perhaps as a list, for the symbols.
- **border**: Border color for the rectangles.
- **lty**: Line type, currently ignored and set to 1.
- **lwd**: Line width, currently ignored.
- **pch**: List of symbols for the legend.
- **angle, density**: Currently ignored.
- **bty**: Legend box type to be displayed.
- **bg**: Background color for the legend.
- **box.lwd, box.lty, box.col**: Line width, type and color for the surrounding box.
- **cex**: Character expansion for text.
- **pt.bg, pt.cex, pt.lwd**: Background color, character expansion and line width for the symbols.
- **pt.space**: Spacing for the symbols as a multiplier for `strwidth("0")`.
- **xjust, yjust**: Justification for the legend.
- **x.interp, y.interp**: x and y character spacing for the legend text.
- **adj**: Text adjustment.
- **text.width, text.col**: Width and color of the legend text.
- **merge**: Whether to merge points and lines.
- **trace**: Show how the legend is calculated.
- **plot**: Whether to plot the legend.
- **ncol**: Number of columns in the legend.
- **horiz**: Whether to display a horizontal legend.
- **title**: Title for the legend.
- **inset**: Inset distances for use with keywords.
- **xpd**: An optional value for `par(xpd=)`.
- **title.col**: Color for the legend title.

Details

`legendg` calls `legend` to display a legend with a blank space to the left of the labels. It then attempts to display groups of colored rectangles or symbols in that space depending upon the contents of either `fill` or `pch`. These should be in the form of a list with the number of elements equal to the number of labels, and one or more fills or symbols for each label. `legendg` will display up to four fills or symbols next to each label, allowing the user to label a group of these rather than just one per label.
**Value**

The value returned by ‘legend’ returned invisibly.

**Author(s)**

Jim Lemon

**See Also**

legend

**Examples**

```r
goldenrod
plot(0.5,0.5,xlim=c(0,1),ylim=c(0,1),type="n",
    main="Test of grouped legend function")
legend(0.5,0.8,c("one","two","three"),pch=1:3:4:6,
    col=1:3:4:6,pt.size=1.5)
legend(0.5,0.5,c("one","two","three"),fill=1:3:4:6)

# fake a line/point with text points
legend(0.2,0.25,c("letter","number"),
    pch=list(c("-","A","-"),c("-","I","-")),
    col=list(rep(2,3),rep(3,3)))
```

---

**Description**

Key for interpreting lengths in a plot

**Usage**

```r
lengthKey(x,y,tickpos,scale)
```

**Arguments**

- `x, y`: The position of the left end of the key in user units.
- `tickpos`: The labels that will appear above the key.
- `scale`: A value that will scale the length of the key.

**Details**

‘lengthKey’ displays a line with tick marks and the values in ‘tickpos’ above those tickmarks. It is useful when line segments on a plot represent numeric values. Note that if the plot does not have a 1:1 aspect ratio, a length key is usually misleading.
listDepth

Find the maximum depth of a list

Description
Descend a list and find the maximum number of levels.

Usage
listDepth(x)

Arguments
x A list.

Details
A possibly nested list of lists is descended to determine the maximum number of levels. Currently used to set up the dimensions of a dendrite plot.

Value
The maximum number of levels in the list.

Author(s)
Jim Lemon

Examples
# manufacture a matrix of orientations in radians
o<-matrix(rep(pi*seq(0.1,0.8,by=0.1),7),ncol=8,byrow=TRUE)
m<-matrix(rnorm(56)+4,ncol=8,byrow=TRUE)
# get an empty plot of approximately 1:1 aspect ratio
plot(0,xlim=c(0.7,8.3),ylim=c(0.7,7.3),type="n")
vectorField(o,m,vecscl="rad")
# the scaling usually has to be worked out by trial and error
lengthKey(0.3,-0.5,c(0.5,10),0.24)
Build a list of the mutually exclusive attributes of objects

**Description**
Build a list of mutually exclusive attributes from a matrix of category indicators.

**Usage**
```r
makeDendrite(x)
```

**Arguments**

`x` A data frame or matrix where rows represent objects and columns mutually exclusive attributes of a given class.

**Details**
The values in `x` indicate which attribute of a particular class is possessed by the object. For instance, the attributes dead and alive are mutually exclusive. `makeDendrite` creates a nested list that contains the counts of successive combinations of the attributes. The top level attributes are taken from the first column, then those are combined with the attributes in the second column and so on.

**Value**
A list of the counts of objects for each combination of the attribute classes.

**Author(s)**
Jim Lemon

**See Also**
`plot.dendrite`

**Examples**
```r
sex <- sample(c("M","F"),100,TRUE)
hair <- sample(c("Blond","Black","Brown","Red"),100,TRUE)
eye <- sample(c("Blue","Black","Brown","Green"),100,TRUE)
charac <- data.frame(sex=sex,hair=hair,eye=eye)
characlist <- makeDendrite(charac)
characlist
```
makeIntersectList  Count set intersections

Description
Create a list of set intersections from a matrix of indicators

Usage
makeIntersectList(x, xnames=NULL, sep="+")

Arguments
x  A data frame or matrix where rows represent objects and columns attributes. A '1' or 'TRUE' indicates that the object (row) has that attribute or is a member of that set (column). 'x' can also be a matrix or data frame in which the first column contains object identifiers and the second contains attribute codes.

xnames  Optional user-supplied names for the attributes of x.

sep  A character to use as a separator for attribute labels.

Details
'makeIntersectList' reads a matrix (or data frame where all values are the same type) containing dichotomous values (either 0/1 or FALSE/TRUE) or labels (see next paragraph). In the first type of input, each row represents an object and each column represents a set. A value of 1 or TRUE indicates that that object is a member of that set. The function creates a list of vectors that correspond to all combinations of the sets (set intersections) and inserts the counts of elements in each combination. If a row of 'x' is all zeros, it will not be counted, but the second last element of the list returned contains the count of rows in 'x' and thus non-members can be calculated.

If a matrix (or data frame where all values are the same type) containing values other than 0/1 or TRUE/FALSE, it will be passed to 'categoryReshape' for conversion to a data frame as described above. See 'categoryReshape' for details of this.

makeIntersectList combines the set or attribute names to form intersection names. For the intersection of sets A and B, the name will be A+B (unless 'sep' is changed) and so on. These are the names that will be displayed by 'intersectDiagram'. To change these, use the 'xnames' argument.

Value
A list of the intersection counts or percentages, the total number of objects and the attribute codes.

Author(s)
Jim Lemon

See Also
intersectDiagram, pasteCols, linkcategoryReshape
maxEmptyRect

Find an empty space on a plot

Description

Try to find the largest empty rectangle on a plot.

Usage

maxEmptyRect(ax, ay, x, y)

Arguments

ax, ay The rectangle within which all of the points are contained. Usually the limits of a plot.
x, y x and y positions of the points.

Details

`maxEmptyRect` searches the pairs of points on the plot to find the largest rectangular space within which none of the points lie. It does not guarantee that the space will be large enough to fit a legend or text.

Two alternatives are the ‘largest.empty’ function in the Hmisc package and the ‘emptyspace’ function. ‘maxEmptyRect’ appears to outperform ‘emptyspace’, particularly in running time. However, ‘emptyspace’ will sometimes find a “squarer” rectangle when ‘maxEmptyRect’ finds a slightly larger narrow rectangle.

Value

A list containing the area of the rectangle, the coordinates of the lower left and upper right corners (as used in ‘rect’) of the rectangle found and the x and y coordinates of the center of the rectangle.
Author(s)
Hans Borchers

References

Examples
```r
x <- runif(100)
y <- runif(100)
plot(x, y, main = "Find the maximum empty rectangle", xlab = "X", ylab = "Y")
mer <- maxEmptyRect(c(0, 1), c(0, 1), x, y)
rect(mer$rect[1], mer$rect[2], mer$rect[3], mer$rect[4], border = "red")
legend(mer, c("Legend", "Myth"), pch = 1:2, col = 2:3, xjust = 0.5, yjust = 0.5)
```

mtext3d

Display text in the margins of a 3D plot

Description
Display text in the margins of a 3D plot.

Usage
```r
mtext3d(edge, pmat, labels = TRUE, at = NULL, dist = 0.3, xpd = NA, ...)
```

Arguments
- `edge`: which axis to calculate.
- `pmat`: matrix to transform coordinates.
- `labels`: labels to display in the margin.
- `at`: position on the axis.
- `dist`: Offset of the axis.
- `xpd`: set clipping for display.
- `...`: additional arguments passed to ptext3d.

Value
nil

Author(s)
Ben Bolker
**multhist**

*Plot a multiple histogram, as a barplot*

**Description**

Given a list, plots a side-by-side barplot containing the histograms of the elements.

**Usage**

```r
multhist(x, beside=TRUE, freq=NULL, probability=!freq, plot.it=TRUE, ...)
```

**Arguments**

- `x`: a list of numeric vectors
- `beside`: plot histogram bars for groups side-by-side?
- `freq`: logical; if 'TRUE', the histogram graphic is a representation of frequencies, the 'counts' component of the result; if 'FALSE', probability densities, component 'density', are plotted (so that the histogram has a total area of one). Defaults to 'TRUE' if 'probability' is not specified (does not consider equidistant breaks as in `hist`)
- `probability`: an alias for '!freq', for S compatibility
- `plot.it`: Whether or not to display the histogram.
- `...`: additional arguments to `hist` or `barplot`

**Value**

A list including the return value for the first call to 'hist' (itself a list) and the values for the bar heights.

**Note**

The 'inside' argument to `barplot` (which is not currently implemented in barplot anyway) is deleted from the argument list. The default value of NULL for 'freq' is for consistency with 'hist' but is equivalent to TRUE.

**Author(s)**

Ben Bolker

**See Also**

`hist`, `barplot`

**Examples**

```r
1 <- list(runif(10)*10, 1:10, c(1, 1, 1, 4, 8))
multhist(1)
```
multsymbolbox \hspace{1cm} Draw boxes filled with symbols

Description

Draw boxes on the current figure filled with symbols representing individual counts.

Usage

```r
multsymbolbox(x1,y1,x2,y2,tot,relw=0.8,fg=par("fg"),bg=par("bg"),
               box=TRUE,debug=FALSE,...)
```

Arguments

- `x1` numeric vector: left sides of boxes
- `y1` numeric vector: bottom sides of boxes
- `x2` numeric vector: right sides of boxes
- `y2` numeric vector: top sides of boxes
- `tot` numeric vector: total numbers of symbols to put in each box
- `relw` relative width (relative to height) of symbols
- `fg` foreground color(s)
- `bg` background color(s)
- `box` (logical) draw box borders?
- `debug` debug output?
- `...` additional arguments to polygon() for drawing boxes

Value

none

Author(s)

Ben Bolker

Examples

```r
plot(1:10,1:10,type="n")
multsymbolbox(c(2,4),5,c(4,5),8,tot=c(10,8))
```
oz.windrose

Display an Australian wind rose

Description
Displays a wind rose in the style used by the Australian Bureau of Meteorology.

Usage
oz.windrose(windagg,maxpct=20,wrmar=c(4,5,6,5),scale.factor=30,
speed.col=c("#dab286","#fe9a66","#ce6733","#986434"),
speed.width=NA,show.legend=TRUE,legend.pos=NA,...)

Arguments
windagg A matrix of percentages with the rows representing speed ranges and the columns indicating wind directions.
maxpct The maximum percentage displayed on the radial grid.
wrmar Plot margins for the diagram.
scale.factor The scale factor for the diagram.
speed.col Colors representing speed ranges.
speed.width Half widths of the bars representing speed ranges.
show.legend Logical indicating whether to display a legend.
legend.pos The vertical position of the wind rose legend. The Australian Bureau of Meteorology displays the legend at the top of the plot
... additional arguments passed to ‘plot’.

Details
‘oz.windrose’ displays a wind rose in the style used by the Australian Bureau of Meteorology. Each limb represents a bin of wind directions, and there are conventionally eight bins. If ‘windagg’ has more than eight columns, more limbs will be displayed. The rows of ‘windagg’ represent the speed ranges used by the Australian Bureau of Meteorology (0, 0-10, 10-20, 20-30 and over 30 in km/hour). The diameter of the central circle is calculated as (percent calm observations)/(number of direction bins). The remaining grid circles are spaced from the circumference of the “Calm” circle.

Value
nil

Note
If a title is desired, remember to move the legend to the bottom of the plot. If the function is passed values that do not sum to 100, the resulting plot will at best be misleading.
Author(s)

Jim Lemon (thanks to Anna in the Sydney BoM office and Alejo for finding the problem with heavily prevailing winds.)

See Also

oz.windrose.legend, draw.circle, bin.wind.records

Examples

```r
windagg<-matrix(c(8,0,0,0,0,0,0,0,0,0,4,6,2,1,6,3,0,4,2,8,5,3,5,2,1,1,
5,5,2,4,1,4,1,2,1,2,4,0,3,1,3,1),nrow=5,byrow=TRUE)
oz.windrose(windagg)
```

Description

Displays a wind rose legend in the style used by the Australian Bureau of Meteorology.

Usage

```r
oz.windrose.legend(maxpct=20,scale.factor=30,
speed.col=c("#dab286","#fe9a66","#ce6733","#9b6434"),
speed.width=NA,legend.pos=NA)
```

Arguments

- `maxpct` The maximum percentage to display on the radial grid.
- `scale.factor` The scale factor for the plot.
- `speed.col` Colors representing speed ranges.
- `speed.width` Half widths of the bars representing speed ranges.
- `legend.pos` The vertical position of the wind rose legend. The Australian Bureau of Meteorology displays the legend at the top of the plot.

Value

`nil`

Author(s)

Jim Lemon (thanks to Anna in the Sydney BoM office)

See Also

oz.windrose
\textit{p2p\_arrows} \hspace{1cm} 119

\textbf{Examples}

\begin{verbatim}
plot(0, xlim=c(-20, 20), ylim=c(-20, 20), type="n", axes=FALSE, xlab="", ylab=""
par(xpd=TRUE)
oz.windrose.legend()
par(xpd=FALSE)
\end{verbatim}

\begin{verbatim}
p2p_arrows
\end{verbatim}

\begin{verbatim}
Draw arrows between points
\end{verbatim}

\textbf{Description}

Displays arrows on an existing plot between specified points.

\textbf{Usage}

\begin{verbatim}
p2p_arrows(x1, y1, x2, y2, space=0.05, col=par("fg"), ...)
\end{verbatim}

\textbf{Arguments}

\begin{verbatim}
x1 \hspace{1cm} \text{Starting x positions for the labels.}
y1 \hspace{1cm} \text{Starting y positions for the labels.}
x2 \hspace{1cm} \text{Ending x positions for the labels.}
y2 \hspace{1cm} \text{Ending y positions for the labels.}
space \hspace{1cm} \text{The proportion of the distance between the points to leave as space before and after the arrow.}
col \hspace{1cm} \text{Color(s) for the arrows.}
... \hspace{1cm} \text{Extra arguments passed to \texttt{arrows}.}
\end{verbatim}

\textbf{Details}

\texttt{\textit{p2p\_arrows}} displays arrows on a plot between one or more pairs of specified points.

\textbf{Value}

nil

\textbf{Author(s)}

Jim Lemon

\textbf{See Also}

arrows
### Description

Split the graphics device into a "panel" type layout for a group of plots

### Usage

```r
panes(mat=NULL, widths=rep(1, ncol(mat)), heights=rep(1, nrow(mat)),
    nrow=2, ncol=2, mar=c(0, 0, 1.6, 0), oma=c(2.5, 1, 1, 1))
```

### Arguments

- `mat`: A matrix representing the number of panes to be created and their order of plotting.
- `widths`, `heights`: The widths and heights of the panes. See 'layout'.
- `nrow`, `ncol`: The numbers of rows and columns in the layout. See 'par(mfrow)'.
- `mar`: The margins for each plot in the panes.
- `oma`: The outer margins for the entire group of panes.

### Details

'panes' combines the information for displaying a set of plots in a "panel" layout. The default values will usually produce the desired result by calling 'par(mfrow)'. If 'mat' is not NULL, the 'layout' function will be called instead of 'par(mfrow)'. The two methods are included for the convenience of the user.

Note that 'panes' does not produce any plots and that the user must call 'tab.title' to get the "look" of the panel plot. The overall title is usually centered at the left edge (as in the example) or in the center of one of the plots in the bottom row.

### Value

The values of 'par' options that existed when 'panes' was called. This list is usually used to restore those values.

### Author(s)

Jim Lemon

### See Also

- `par`, `layout`
Examples

```r
y <- runif(8)
oldpar <- par()
par(mar = c(0, 2, 1.6, 0))
boxplot(y, axes = FALSE)
axis(2)
box()
par(mar = c(0, 0.1, 2, 0))
tab.title("Boxplot of y", tab.col = "#88dd88")
barplot(y, axes = FALSE, col = 2:9)
axis(4)
box()
tab.title("Barplot of y", tab.col = "#88dd88")
pie(y, col = 2:9)
tab.title("Pie chart of y", tab.col = "#88dd88")
box()
par(mar = c(2, 0, 0.1, 2))
plot(y, xaxs = "i", xlim = c(0.9), axes = FALSE, col = 2:9)
axis(4)
box()
tab.title("Scatterplot of y", tab.col = "#88dd88")
# center the title at the left edge of the last plot
mtext("Test of panes function", at = 0, side = 1, line = 0.8, cex = 1.5)
panes(matrix(1:3, ncol = 1), heights = c(0.7, 0.5, 0.1))
par(mar = c(0, 2, 2, 2))
plot(sort(runif(7)), type = "l", axes = FALSE)
axis(2, at = seq(0.1, 0.9, by = 0.2))
box()
tab.title("Rising expectations", tab.col = "#ee6666")
barplot(rev(sort(runif(7))), col = "blue", axes = FALSE)
axis(2, at = seq(0.1, 0.9, by = 0.2))
box()
tab.title("Diminishing returns", tab.col = "#6666ee")
par(mar = c(4, 2, 2, 2))
tso <- c(0.2, 0.3, 0.4, 0.5, 0.6, 0.8, 0.1)
plot(tso, type = "n", axes = FALSE, xlab = "")
# the following needs a Unicode locale to work
points(1:7, tso, pch = c(rep("-0x263a,6", -0x2639), cex = 2)
axis(1, at = 1:7,
labels = c("Tuesday", "Wednesday", "Thursday", "Friday", "Saturday", "Sunday", "Monday"))
axis(2, at = seq(0.1, 0.9, by = 0.2))
box()
tab.title("The sad outcome", tab.col = "#66ee66")
mtext("A lot of malarkey", side = 1, line = 2.5)
par(oldpar)
```

**pasteCols**

Paste the columns of a matrix together
Description
Paste the columns of a matrix together to form as many "words" as there are columns.

Usage
pasteCols(x, sep="")

Arguments
x A matrix.
sep The separator to use in the 'paste' command.

Details
'pasteCols' pastes the columns of a matrix together to form a vector in which each element is the concatenation of the elements in each of the columns of the matrix. It is intended for producing identifiers from a matrix returned by the 'combn' function.

Value
A vector of character strings.

Author(s)
Jim Lemon

See Also
makeIntersectList

Examples
# create a matrix of the combinations of the first five letters of the alphabet taken two at a time.
alpha5 <- combn(LETTERS[1:5], 2, simplify = TRUE)
pasteCols(alpha5, sep = "*")

paxis3d

Display text in the margins of a 3D plot

Description
Display text in the margins of a 3D plot.

Usage
paxis3d(edge, pmat, at=NULL, labels=TRUE, tick=TRUE, pos=NULL, nticks=5, ticklen=0.05, labdist=0.15, xpd=NA,...)
Arguments

edge which axis to calculate.
pmat matrix to transform coordinates.
at position on the axis.
labels labels to display in the margin.
tick whether to draw axis tick marks.
pos axis position relative to other axes.
nticks number of tick marks.
ticklen length of tick marks as a proportion of plot dimensions.
labdist distance of labels from axis.
xpd parameter to set plot clipping.
... additional arguments passed to ptext3d.

Value

nil

Author(s)

Ben Bolker

Examples

x <- 1:10
y <- 1:10
z <- outer(x,y,function(x,y) { 3*sin(2*pi*x)/(2*pi*x)+exp(y/10)+(x*y)/1000 })
par(mar=c(5,10,2,2))
pp <- perspx(x,y,z,ticktype="detailed",phi=30,theta=80,nticks=3,r=10,
axes=FALSE)
## axis labels not drawn when axes=FALSE
paxis3d("X",pp,at=c(1,2,9))
paxis3d("Y",pp)
paxis3d("Z",pp)
mtext3d("X",pp,expression(alpha*sqrt(beta)))
## if you want labels parallel to axis, still have to figure out 'srt'
## by trial and error
mtext3d("Y",pp,expression("velocity ([gamma], furlongs/fortnight"),
xpd=NA,srt=6)
mtext3d("Z",pp,"Range\n(r*)",dist=0.5)
Display perspective plot

Description

Display an enhanced perspective plot with additional return values

Usage

perspx(x, y, z, ...)

Arguments

x, y, z  x, y and z coordinates to plot.
...  Other arguments passed to `persp`.

Details

Displays ‘z’ values plotted on an x,y grid.

Value

A list with three elements, the ranges of ‘x’, ‘y’ and ‘z’.

Author(s)

Ben Bolker

Examples

x <- 1:10
y <- 1:10
z <- outer(x, y, function(x, y) { 3*sin(2*pi*x)/(2*pi*x)+exp(y/10)+(x*y)/1000 })
par(mar=c(5,10,2,2))
pp <- perspx(x, y, z, ticktype="detailed", phi=30, theta=80, nticks=3, r=10,
             axes=FALSE)
pie.labels

Place labels on a pie chart

Description

Places labels on a pie chart

Usage

```r
pie.labels(x, y, angles, labels, radius = 1.05, bg = "white", border = TRUE,
          minangle = NA, boxed = FALSE, ...)
```

Arguments

- `x, y` x and y position of the center of the pie chart
- `angles` A numeric vector representing angles in radians. This is the return value of `floating.pie`.
- `labels` Text strings to label each sector.
- `radius` The radius at which to place the labels in user units. The default is 1.05.
- `bg` The color of the rectangles on which the labels are displayed.
- `border` Whether to draw borders around the rectangles.
- `minangle` Minimum angle between labels.
- `boxed` Whether to use 'text' or 'boxed.labels' to display the labels.
- `...` Arguments passed to 'text' or 'boxed.labels'.

Details

Labels may be placed within the pie (radius less than the pie radius), on the edge or outside as in the examples below. If within the pie, it is probably best to use `boxed=TRUE`.

If some labels overlap, passing a value in radians for `minangle` may be used to spread them out.

Value

- `nil`

Note

Remember that ‘x’ and ‘y’ specify the center of the pie chart and that the label positions are specified by angles and radii from that center.

Author(s)

- Jim Lemon
pie3D

Display a 3D pie chart

Description
Displays a 3D pie chart with optional labels.

Usage
pie3D(x, edges=NA, radius=1, height=0.1, theta=pi/6, start=0, border=par("fg"),
col=NULL, labels=NULL, labelpos=NULL, labelcol=par("fg"), labelcex=1.5,
labelrad=1.25, sector.order=NULL, explode=0, shade=0.8, mar=c(4,4,4,4), pty="s", ...)

Arguments
- x: a numeric vector for which each value will be a sector
- edges: the number of lines forming an ellipse
- radius: the radius of the pie in user units
- height: the height of the pie in user units
- theta: The angle of viewing in radians
- start: The angle at which to start drawing sectors.
- border: The color of the sector border lines
- col: The colors of the sectors
- labels: Optional labels for each sector - default names(x)
- labelpos: Optional positions for the labels (see examples)
- labelcol: The color of the labels
- labelcex: The character expansion factor for the labels
- labelrad: The radius for placing the labels as a proportion of the pie radius
- sector.order: Allows the operator to specify the order in which the sectors are drawn.
pie3D

**explode**

The amount to "explode" the pie in user units.

**shade**

If > 0 and < 1, the proportion to reduce the brightness of the sector color to get a better 3D effect.

**mar**

Margins around the pie.

**pty**

Whether to force a square plot region or not. (see Details)

... graphical parameters passed to ‘plot’

**Details**

‘pie3D’ scales the values in ‘x’ so that they total 2*pi, dropping zeros and NAs. It then displays an empty plot, calculates the sequence for drawing the sectors and calls ‘draw.tilted.sector’ to draw each sector. If labels are supplied, it will call ‘pie3D.label’ to place these outside each sector. If supplied, the number of labels, label positions and sector colors must be at least equal to the number of values in ‘x’. If the labels are long, it may help to reduce the radius of the pie or change the position as in the example below.

In order to make the dimensions of the pie reasonably accurate, a square plot region (‘pty="s"’) is the default. If ‘pty’ is set to "m", the user can change the margins, usually resulting in a non-square plot area. This will probably distort the pie somewhat.

**Value**

The bisecting angle of the sectors in radians.

**Note**

Due to the somewhat primitive method used to draw sectors, a sector that extends beyond both pi/2 and 3*pi/2 radians in either direction may not display properly. Setting ‘start’ to pi/2 will often fix this, but the user may have to adjust ‘start’ and the order of sectors in extreme cases.

The argument ‘sector.order’ allows the user to specify a vector of integers that will override the calculation of the order in which the sectors are drawn. This is usually necessary when a very large sector that extends past 3*pi/2 is overlapped by a smaller sector next to it. As a last resort, the user can try setting ‘explode’ to zero. This only draws the top and outer sides of each sector.

Also due to the sector drawing method, setting ‘theta’ to values smaller than about pi/8 or larger than about pi/4 will produce obviously misaligned sectors.

Contributed fixes and improvements: thanks to Jesse Brown for the "shade" fix, Qinghua Zhao for alerting me to the problem with labels and margins and Ben Earnest for the fix for pie sectors that "wrap around” more than pi radians.

**Author(s)**

Jim Lemon

**See Also**

pie3D.labels, draw.tilted.sector
Examples

```r
pieval<-c(2,4,6,8)
pielabels<-c("We hate\npies","We oppose\npies","We don't\ncare","We just love pies")
# grab the radial positions of the labels
lp<-pie3D(pieval, radius=0.8, labels=pielabels, explode=0.1,
         labellrad=1.4, main="3D PIE OPINIONS")
# lengthen the last label and move it to the left
pielabels[4]<-"We cannot survive without our pies"
lp[4]<-4.8
# specify some new colors
pie3D(pieval, radius=0.8, labels=pielabels, explode=0.1,
      col=c("brown","#ddaa00","pink","#dd00dd"),
      labellrad=1.4, labelpos=lp, main="3D PIE OPINIONS")
pieval<-c(2.3,4,20)
pielabels<-
c("Tiny","Very\nsmall","Small","Great big one")
pie3D(pieval, labels=pielabels, start=4, main="Wraparound sector")
```

---

**pie3D.labels**

Display labels on a 3D pie chart

**Description**

Displays labels on a 3D pie chart.

**Usage**

```r
pie3D.labels(radialpos, radius=1, height=0.1, theta=pi/6,
             labels, labelcol=par("fg"), labelcex=1.5, labelrad=1.25, minsep=0.3)
```

**Arguments**

- `radialpos`: Position of the label in radians
- `radius`: the radius of the pie in user units
- `height`: the height of the pie in user units
- `theta`: The angle of viewing in radians
- `labels`: The label to display
- `labelcol`: The color of the labels
- `labelcex`: The character expansion factor for the labels
- `labelrad`: The expansion for the labels around the pie.
- `minsep`: The minimum angular separation between label positions.
Details

'pie3D.label' displays labels on a 3D pie chart. The positions of the labels are given as angles in radians (usually the bisector of the pie sectors). As the labels can be passed directly to pie3D, this function would probably not be called by the user.

'pie3D.labels' tries to separate labels that are placed closer than 'minsep' radians. This simple system will handle minor crowding of labels. If labels are very crowded, capturing the return value of 'pie3D' and editing the label positions may allow the user to avoid manually placing labels.

Value

nil

Author(s)

Jim Lemon

See Also

pie3D, draw.tilted.sector

Examples

pieval<-c(2,4,6,8)
bisectors<-pie3D(pieval,explode=0.1,main="3D PIE OPINIONS")
pielabels<-c("We hate\n pies","We oppose\n pies","We don't\n care","We just love pies")
pie3D.labels(bisectors,labels=pielabels)

plot.dendrite

Plot a dendrogram of a dendrite object

Description

Plot a dendrogram for two or more mutually exclusive attributes.

Usage

## S3 method for class 'dendrite'
plot(x,xlabels=NULL,main="",mar=c(1,0,3,0),cex=1,...)

Arguments

x A 'dendrite' object containing the counts of objects having combinations of mutually exclusive attributes.

xlabels The category labels that will be displayed beneath the dendrogram.

main The title of the plot.

mar Margins for the plot.
cex  Character expansion for the leaves of the dendrogram.
... Additional arguments passed to ‘plot’.

Details

‘plot.dendrite’ sets up a plot for a dendrogram. The actual plotting of the dendrogram is done by ‘furc’.

Value

nil

Author(s)

Jim Lemon

See Also

furc

Examples

sex<-sample(c("M","F"),100,TRUE)
hair<-c(sample(c("Blond","Black","Brown","Red"),90,TRUE),rep(NA,10))
eye<-sample(c("Blue","Black","Brown","Green"),100,TRUE)
charac<-data.frame(sex=sex,hair=hair,eye=eye)
characlist<-makeDendrite(charac)
plot.dendrite(characlist, names(charac), main="Test dendrogram", cex=0.8)
**plotCI**

Arguments

- **x**: The x coordinates of points in the plot
- **y**: The y coordinates of points in the plot
- **uiw**: The width of the upper portion of the confidence region, or (if ‘liw’ is missing) the width of both halves of the confidence region
- **liw**: The width of the lower portion of the confidence region (if missing, the function assumes symmetric confidence bounds)
- **ui**: The absolute upper limit of the confidence region
- **li**: The absolute lower limit of the confidence region
- **err**: The direction of error bars: "x" for horizontal, "y" for vertical ("xy" would be nice but is not implemented yet; don’t know quite how everything would be specified. See examples for composing a plot with simultaneous horizontal and vertical error bars)
- **gap**: Size of gap in error bars around points (default 0; gap=TRUE gives gap size of 0.01)
- **sfrac**: Scaling factor for the size of the "serifs" (end bars) on the confidence bars, in x-axis units
- **add**: If FALSE (default), create a new plot; if TRUE, add error bars to an existing plot.
- **slty**: Line type of error bars
- **scol**: Color of error bars: if ‘col’ is specified in the optional arguments, ‘scol’ is set the same; otherwise it’s set to ‘par(col)’
- **pt.bg**: Background color of points (use pch=21, pt.bg=par("bg") to get open points superimposed on error bars)
- **...**: Any other parameters to be passed through to plot.default, points, arrows, etc. (e.g. ‘lwd’, ‘col’, ‘pch’, ‘axes’, ‘xlim’, ‘ylim’). ‘xlim’ and ‘ylim’ are set by default to include all of the data points and error bars. ‘xlab’ and ‘ylab’ are set to the names of ‘x’ and ‘y’. If ‘pch==NA’, no points are drawn (e.g. leaving room for text labels instead)

Value

invisible(x,y); creates a plot on the current device.

Author(s)

Ben Bolker (documentation and tweaking of a function provided by Bill Venables, additional feature ideas from Gregory Warnes)

See Also

boxplot
Examples

```r
y <- runif(10)
err <- runif(10)
plotCI(1:10, y, err, main = "Basic plotCI")
plotCI(1:10, y, err, 2*err, lwd = 2, col = "red", scol = "blue", 
      main = "Add colors to the points and error bars")
err.x <- runif(10)
err.y <- runif(10)
plotCI(1:10, y, err.y, pt.bg = par("bg"), pch = 21, xlim = c(0, 11),
      main = "plotCI with extra space on the x axis")
plotCI(1:10, y, err.x, pt.bg = par("bg"), pch = 21, err = "x", add = TRUE)
mttxt("for adding horizontal error bars", 3, 0.5)
data(warpbreaks)
attach(warpbreaks)
wmeans <- by(breaks, tension, mean)
wsd <- by(breaks, tension, sd)
## note that barplot() returns the midpoints of the bars, which plotCI
## uses as x-coordinates
plotCI(barplot(wmeans, col = "gray", ylim = c(0, max(wmeans + wsd))), wmeans, wsd, add = TRUE)
## using labels instead of points
labs <- sample(LETTERS, replace = TRUE, size = 10)
plotCI(1:10, y, err, pch = NA, gap = 0.02, main = "plotCI with labels at points")
text(1:10, y, labs)
```

**plotH**

*Scatterplot with histogram-like bars.*

Description

Scatterplot with histogram-like bars; a modification of `plot(..., type="h")`.

Usage

```r
plotH(x,...)
```

```
## S3 method for class 'formula'
plotH(x, data = NULL, xlab = names(mf)[2], ylab = names(mf)[1], ...)
```

```
## Default S3 method:
plotH(x, y, xlab = paste(deparse(substitute(x))), 
ylab = paste(deparse(substitute(y))), width = 0.6, ylim = c(0, max(y)), col = "gray", ...)
```

Arguments

- **x**: Vector of x-coordinates or a formula of the form y~x (see below for y).
- **y**: Vector of y-coordinates.
- **xlab**: A string for labeling the x-axis.
- **ylab**: A string for labeling the y-axis.
The data frame from which the formula should be evaluated.

A numeric that indicates the width of the bars.

A vector of length two that indicates the limits over which to plot the y-axis. See details.

A string that indicates the fill color for the bars.

Additional arguments sent to the 'plot' or 'barplot' functions.

'plotH' is meant to be a modification of the type="h" version of 'plot' such that the "bars" appears as actual rectangles rather than vertical lines. It defaults so that the lower bound of the y-axis is 0; change to 'ylim=NULL' to over-ride this default (and return to the default used in 'plot').

A pass-through to 'barplot' is used if the 'x' (or "RHS") variable is categorical.

None, but a plot is produced.

This function is currently experimental.

Derek Ogle

plot, barplot

d <- data.frame(x=c(1,5,10:20), y=runif(13)+1,
g=factor(sample(c("A","B","C"),13,replace=TRUE)))
# new plotH function with formula notation
plotH(y~x,data=d)
# old plot() function with formula notation -- for comparison's purpose
plot(y~x,data=d,type="h")
# new function over-riding default ylim, increasing bar width,
# and changing bar color
plotH(y~x,data=d,ylim=NULL,width=0.9,col="red")
# example of pass-through to barplot
smry<-(by(d$y,d$g,mean)
plotH(levels(d$g),smry,ylab="Mean of Random Variable",xlab="Group")
# example of non-formula usage
x1 <- d$x
y1 <- d$y
plotH(x1,y1,col="blue")
plot_bg

Add a background color to a plot

Description
Displays a colored rectangle over the entire area of a plot

Usage
plot_bg(col="lightgray")

Arguments
col The color of the background

Details
'plot_bg' is probably only useful when part of the 'do.first' argument in another plot function
to add a background color to the plot.

Value
nil

Author(s)
Jim Lemon

Examples
barp(1:5, do.first="plot_bg()", col=1:5)

polar.plot
Plot values on a circular grid of 0 to 360 degrees

Description
'polar.plot' displays a plot of radial lines, symbols or a polygon centered at the midpoint of
the plot frame on a 0:360 circle. Positions are interpreted as beginning at the right and moving
clockwise unless 'start' specifies another starting point or 'clockwise' is TRUE.
If 'add=TRUE' is passed as one of the additional arguments, the values will be added to the current
plot. If a 'radial.lim' argument was passed on the initial plot, it must be passed again to add
values or the values will be displayed incorrectly.
polar.plot

Usage

polar.plot(lengths, polar.pos=NULL, labels, label.pos=NULL,
           start=0, clockwise=FALSE, rp.type="r", ...)

Arguments

lengths numeric data vector. Magnitudes will be represented as the radial positions of
symbols, line ends or polygon vertices.

polar.pos numeric vector of positions on a 0:360 degree circle. These will be converted to
radians when passed to 'radial.plot'.

labels text labels to place on the periphery of the circle. This defaults to labels every
20 degrees. For no labels, pass an empty string.

label.pos positions of the peripheral labels in degrees

start The position for zero degrees on the plot in degrees.

clockwise Whether to increase angles clockwise rather than the default counterclockwise.

rp.type Whether to plot radial lines, symbols or a polygon.

... additional arguments passed to 'radial.plot' and then to 'plot'.

Value

A list of the parameters altered by radial.plot.

Author(s)

Jim Lemon

See Also

radial.plot

Examples

testlen<-c(rnorm(36)*2+5)
testpos<-seq(0,350,by=10)
polar.plot(testlen, testpos, main="Test Polar Plot", lwd=3, line.col=4)
oldpar<-par()
oldpar<-
radial.plot(testlen, testpos, main="Test Clockwise Polar Plot",
radial.lim=c(0,15), start=90, clockwise=TRUE, lwd=3, line.col=4)
# reset everything
par(oldpar)
Display a shadow effect for an arbitrary polygon

**Description**

Displays a shadow effect on an existing plot

**Usage**

```r
polygon.shadow(x,y=NULL,offset=NA,inflate=NA,col=c("ffffff","cccccc"))
```

**Arguments**

- `x,y`: x and y coordinate of the vertices of the polygon. `y` can be missing if `x` is a list with `x` and `y` components.
- `offset`: a vector containing the values of the x and y offsets for the shadow. Defaults to 1/20 of the maximum x and y dimensions of the polygon.
- `col`: the colors of the shadow from the outer edge to the central part.
- `inflate`: the amount to "inflate" the shadow relative to the polygon (i.e. the penumbra). Defaults to the values in `offset`.

**Details**

`polygon.shadow` is typically called just before drawing a polygon. It displays a shadow effect by drawing the polygon ten times, beginning with the first color in `col` and stepping through to the second color to create a "shadow" (or a "halo" if you prefer). Each successive polygon is shrunk by 10% of `inflate`. The default shadow effect has the light at the upper left. This effect may also be used as a text background.

**Value**

`nil`

**Note**

The background must be a constant color or the shadow effect will not look right. A good starting point for the two colors is the color of the background and the RGB components of that color multiplied by 0.8. Use a smaller multiplier for a darker shadow.

**Author(s)**

Jim Lemon

**See Also**

`polygon`
Examples

```r
par(pty="s")
plot(1:5,type="n",main="Polygon Shadow test",xlab="",ylab="",axes=FALSE)
box()

# do a shadow on a yellow square
polygon(c(1.2,2.2,2.1),c(5.5,3.8,3.8),col="#ffff00")
polygon.shadow(c(1.2,2.2,2.1),c(4.8,4.8,4.4),col=c("#ffff00","#cccc00"))
polygon(c(1.2,2.2,2.1),c(4.8,4.8,4.4),col="#ff0000")

# a green triangle on a light blue square with a big offset
polygon(c(4.5,5,4),c(2,2,1),col="#aaaaff")
polygon.shadow(c(4.5,4.8,4.2),c(1.7,1.2,1.2),col=c("#aaaaff","#8888cc"),
  offset=c(0.1,-0.1),inflc=c(0.2,0.2))
polygon(c(4.5,4.8,4.2),c(1.7,1.2,1.2),col=c("#00ff00"))

# now a circle as a background
polygon.shadow(cos(seq(0,2*pi,by=pi/20))+3,sin(seq(0,2*pi,by=pi/20))+3,
  offset=c(0,0),inflc=c(0.1,0.1))
text(3,3,"Polygon shadow\nas a circular\ntext background",cex=1.5)
```

print.brklist

Display the output of brkdNest

Description

Displays the list of values produced by ‘brkdNest’.

Usage

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

Arguments

- `x` a list of summary values produced by ‘\link{brkdNest}’
- `...` additional arguments passed to ‘print’.

Details

‘print.brklist’ displays frequency tables produced by ‘brkdNest’. It is mainly for convenience, but does make a nicer display than when passed directly to ‘print’.

Value

`nil`

Author(s)

Jim Lemon
propbrk

See Also

brkdnNest

Examples

```r
propbrktest <- data.frame(A = c(sample(1:10, 99, TRUE), NA),
B = sample(c("Yes", "No"), 100, TRUE),
C = sample(LETTERS[1:3], 100, TRUE))
pbt <- brkdnNest(A ~ B + C, printbrktest)
print(pbt)
```

propbrk  

*Calculate the proportion of specified values in a vector*

Description

Calculates the proportion of values in a vector that are equal to a specified value.

Usage

```r
propbrk(x, trueval = TRUE, na.rm = TRUE)
```

Arguments

- `x`  
a character, factor or numeric vector.
- `trueval`  
the value to be matched in ‘x’.
- `na.rm`  
whether to remove NA values.

Details

‘propbrk’ calculates the proportion of values matching a specified value. It is mainly to allow proportions to be calculated in the ‘brkdnNest’ function. It always discards NAs in ‘x’ when summing the number equal to ‘trueval’, but respects the ‘na.rm’ argument when calculating the total number of values in ‘x’.

Value

`nil`

Author(s)

Jim Lemon

See Also

brkdnNest
psegments3d

Examples

propbrk(sample(LETTERS,100,TRUE),trueval="M")

psegments3d

Draw segments on a 3D plot

Description

Draw segments on a 3D plot defined by a list of coordinates

Usage

psegments3d(x,y=NULL,z=NULL,pmat,...)

Arguments

x, y, z x, y and z coordinates to plot. ‘x’ may be a list with three components.
pmat matrix to transform coordinates.
... Other arguments passed to ‘segments’.

Details

Draws segments on a perspective plot.

Value

nil

Author(s)

Ben Bolker

ptext3d

Display text on a 3D plot

Description

Display text on a 3D plot defined by a list of coordinates

Usage

ptext3d(x,y=NULL,z=NULL,texts,pmat,...)
Arguments

- **x, y, z**: x, y and z coordinates to plot. ‘x’ may be a list with three components.
- **pmat**: matrix to transform coordinates.
- **texts**: text to display.
- **...**: Other arguments passed to ‘segments’.

Details

Draws text on a perspective plot.

Value

- nil

Author(s)

Ben Bolker

---

**Pyramid plot**

Description

Displays a pyramid (opposed horizontal bar) plot on the current graphics device.

Usage

```r
pyramid.plot(lx, rx, labels=NA, top.labels=c("Male", "Age", "Female"),
main="", laxlab=NULL, raxlab=NULL, unit="%", lxcol, rxcol, gap=1, space=0.2,
ppmar=c(4, 2, 4, 2), labelcex=1, add=FALSE, xlim, show.values=FALSE, ndig=1,
do.first=NULL)
```

Arguments

- **lx, rx**: Vectors or a matrix or data frame (see Details) which should be of equal length.
- **labels**: Labels for the categories represented by each pair of bars. There should be a label for each lx or rx value, even if empty. If ‘labels’ is a matrix or data frame, the first two columns will be used for the left and right category labels respectively.
- **top.labels**: The two categories represented on the left and right sides of the plot and a heading for the labels in the center.
- **main**: Optional title for the plot.
- **laxlab**: Optional labels for the left x axis ticks.
- **raxlab**: Optional labels for the right x axis ticks.
The label for the units of the plot.

Color(s) for the left and right sets of bars. Both of these default to `rainbow(length(labels))`.

One half of the space between the two sets of bars for the `labels` in user units.

Space between the bars. Should be 0 <= space < 1.

Margins for the plot (see Details).

Expansion for the category labels.

Whether to add bars to an existing plot. Usually this involves overplotting a second set of bars, perhaps transparent.

Optional x limit for the plot (see Details).

Whether to display `lx` and `rx` at the ends of the bars.

The number of digits to round the values if displayed.

Optional expression to evaluate before displaying anything.

Details

`pyramid.plot` is principally intended for population pyramids, although it can display other types of opposed bar charts with suitable modification of the arguments. If the user wants a different unit for the display, just change `unit` accordingly. The default gap of two units is usually satisfactory for the four to six percent range of most bars on population pyramids. If `labels` is a matrix or data frame of at least two columns, the first column will be displayed on the on the left side of the gap in the center, and the second on the right. This will almost always require increasing the gap width and perhaps also specifying a wider plotting device. Displaying the values will usually require increasing the left and/or right margins of the plot, or setting `xlim` larger than the largest value.

If a gap width of zero is passed, the category labels will be displayed at the left and right extents of the plot. This usually requires setting `xlim` to values larger than the maximum extent of `lx` and `rx`. The user can pass two different values to `xlim`, but this is almost always a bad idea, as the lengths of the bars will not be in the same proportion to the values on the left and right sides. Both the bars and category labels are vertically centered on integer values, allowing the user to easily add components to the plot.

`lx` and `rx` are the values specifying the left and right extents of the left and right bars respectively. If both are matrices or data frames, `pyramid.plot` will produce opposed stacked bars with the first columns innermost. In this mode, colors are limited to one per column. The stacked bar mode will in general not work with the `add` method or with a gap of zero. Note that the stacked bar mode can get very messy very quickly.

The `add` argument allows one or more sets of bars to be plotted on an existing plot. If these are not transparent, any bar that is shorter than the bar that overplots it will disappear. Only some graphic devices (e.g. `pdf`) will handle transparency.

In order to add bars, the function cannot restore the initial margin values or the new bars will not plot properly. To automatically restore the plot margins, call the function as in the example.

Value

The return value of `par("mar")` when the function was called.
radial.grid

Display a radial grid

Description

`radial.grid` displays a radial grid for the `radial.plot` and `radial.pie` functions.
**radial.pie**

**Plot sectors/annuli on a circular grid of 0 to 2*pi radians**

**Description**

Plot numeric values as sectors with optional annuli on a circular field in the directions defined by angles in radians.

**Usage**

```r
radial.pie(radial.extents, sector.edges=NULL, sector.colors=NULL, cs1=c(0,1), cs2=c(0,1), cs3=c(0,1), alpha=1, labels=NA, label.pos=NULL, radlab=FALSE, radial.lim=NULL, clockwise=FALSE, label.prop=1.1, main="", xlab="", ylab="", mar=c(2,2,2,2), show.grid=TRUE, show.grid.labels=4, show.radial.grid=TRUE, grid.col="gray", grid.bg="transparent", grid.unit=NULL, radial.labels=NULL, boxed.radial=TRUE, add=FALSE,...)
```
Arguments

radial.extents A numeric data vector or list. If 'radial.extents' is a list, the elements of the list will be considered separate data vectors.

sector.edges A numeric vector of positions in radians. These are interpreted as beginning at the right (0 radians) and moving counterclockwise unless 'clockwise' is TRUE.

sector.colors Optional colors for the sectors and annuli. Defaults to 'rainbow(nsectors)' with fading outward if annuli are specified.

cs1, cs2, cs3, alpha Color scaling arguments - see color.scale.

labels Character strings to be placed at the outer ends of the lines. If set to NA, will suppress printing of labels, but if missing, the radial positions will be used.

label.pos The positions of the labels around the plot in radians.

radlab Whether to rotate the outer labels to a radial orientation.

start Where to place the starting (zero) point. Defaults to the 3 o’clock position.

clockwise Whether to interpret positive positions as clockwise from the starting point. The default is counterclockwise.

label.prop The label position radius as a proportion of the maximum line length.

radial.lim The inner and outer radial limits for the plot. Defaults to the range of radial.extents, although zero to ‘max(radial.extents)’ is often what is wanted.

main The title for the plot.

xlab,ylab Normally x and y axis labels are suppressed.

mar Margins for the plot. Allows the user to leave space for legends, long labels, etc.

show.grid Logical - whether to draw a circular grid.

show.grid.labels Whether and where to display labels for the grid - see Details.

show.radial.grid Whether to draw radial lines to the plot labels.

grid.col Color of the circular grid.

grid.bg Fill color of above.

grid.unit Optional unit description for the grid.

radial.labels Optional labels for the radial grid. The default is the values of radial.lim.

boxed.radial Whether to use boxed.labels or text for radial labels.

add Whether to add one or more series to an existing plot.

Additional arguments are passed to ‘plot’.

Details

‘radial.pie’ displays a plot of radial sectors with optional annular sections centered at the midpoint of the plot frame, the lengths corresponding to the numeric magnitudes of ‘radial.extents’. If more series are added to an existing plot, ‘radial.pie’ will try to maintain the current plot parameters. However, it seems unlikely that adding series would be sensible in ‘radial.pie’. This argument may be dropped if it proves useless.
The size of the labels on the outside of the plot can be adjusted by setting `par(cex.axis=)` and that of the labels inside by setting `par(cex.lab=`). If `radlab` is TRUE, the labels will be rotated to a radial alignment. This may help when there are many values and labels. If some labels are still crowded, try running `label.pos` through the `spreadout` function. If the `show.grid.labels` argument is a number from 1 to 4, the labels will be placed along a horizontal or vertical radius. The numbers represent the same positions as in `axis`, with the default (4) on the right. To suppress these labels, pass zero or FALSE.

`radial.pie` works somewhat differently from the `radial.plot` family and is still under development. I have released it in order to get feedback to improve both the design and the programming. If successful, I hope to merge the code with the `radial.plot` function.

Value

The `par` values that are changed in the function as they were at the time `radial.pie` was called.

Author(s)

Jim Lemon - thanks to Patrick Jemison for asking for it.

See Also

radial.plot

Examples

```r
pie1<-c(3,6,5,4,7,8,9,1,4)
pie2<-list(0:3,1:6,2:5,1:4,0:7,4:8,2:9,0:1,0:4)
pie3<-sample(10:60,36)
pie4<-list(sort(sample(1:60,8)))
for(sector in 2:36) pie4[[sector]]<-sort(sample(1:60,8))
oldpar<-par()
radial.pie(pie1,labels=LETTERS[1:9])
radial.pie(pie2,labels=letters[2:10])
radial.pie(pie3,labels=1:36)
radial.pie(pie4,labels=1:36)
# restore the par values
par(oldpar)
```

---

radial.plot

Plot values on a circular grid of 0 to 2*π radians

Description

Plot numeric values as distances from the center of a circular field in the directions defined by angles in radians.
Usage

radial.plot(lengths, radial.pos=NULL, labels=NA, label.pos=NULL, radlab=FALSE,
           start=0, clockwise=FALSE, rp.type="r", label.prop=1.1, main="", xlab="", ylab="",
           line.col=par("fg"), lty=par("lty"), lwd=par("lwd"), mar=c(2,2,3,2),
           show.grid=TRUE, show.grid.labels=4, show.radial.grid=TRUE, rad.col="gray",
           grid.col="gray", grid.bg="transparent", grid.left=FALSE, grid.unit=NULL,
           point.symbols=1, point.col=par("fg"), show.centroid=FALSE, radial.lim=NULL,
           radial.labels=NULL, boxed.radial=TRUE, poly.col=NA, add=FALSE, ...) 

Arguments

lengths  A numeric data vector or matrix. If ‘lengths’ is a matrix, the rows will be
          considered separate data vectors.
radial.pos  A numeric vector or matrix of positions in radians. These are interpreted as be-
            beginning at the right (0 radians) and moving counterclockwise. If ‘radial.pos’
            is a matrix, the rows must correspond to rows of ‘lengths’.
labels  Character strings to be placed at the outer ends of the lines. If set to NA, will
          suppress printing of labels, but if missing, the radial positions will be used.
label.pos  The positions of the labels around the plot in radians.
radlab  Whether to rotate the outer labels to a radial orientation.
start  Where to place the starting (zero) point. Defaults to the 3 o’clock position.
clockwise  Whether to interpret positive positions as clockwise from the starting point. The
           default is counterclockwise.
rp.type  Whether to draw (r)adial lines, a (p)olygon, (s)ymbols or some combination of
          these. If ‘lengths’ is a matrix and rp.type is a vector, each row of ‘lengths’
          can be displayed differently.
label.prop  The label position radius as a proportion of the maximum line length.
main  The title for the plot.
xlab, ylab  Normally x and y axis labels are suppressed.
line.col  The color of the radial lines or polygons drawn.
lty  The line type(s) to be used for polygons or radial lines.
lwd  The line width(s) to be used for polygons or radial lines.
mar  Margins for the plot. Allows the user to leave space for legends, long labels, etc.
show.grid  Logical - whether to draw a circular grid.
show.grid.labels  Whether and where to display labels for the grid - see Details.
show.radial.grid  Whether to draw radial lines to the plot labels.
rad.col  Color of the radial lines on the grid.
grid.col  Color of the circumferential lines on the grid.
grid.bg  Fill color of above.
grid.left  Whether to place the radial grid labels on the left side.
grid.unit  Optional unit description for the grid.
point.symbols The symbols for plotting (as in pch).
point.col  Colors for the symbols.
show.centroid Whether to display a centroid.
radial.lim  The range of the grid circle. Defaults to ‘pretty(range(lengths))’, but if
             more than two values are passed, the exact values will be displayed.
radial.labels Optional labels for the radial grid. The default is the values of radial.lim.
boxed.radial Whether to use boxed.labels or text for radial labels.
poly.col  Fill color if polygons are drawn. Use NA for no fill.
add  Whether to add one or more series to an existing plot.
... Additional arguments are passed to ‘plot’.

Details

‘radial.plot’ displays a plot of radial lines, polygon(s), symbols or a combination of these
centered at the midpoint of the plot frame, the lengths, vertices or positions corresponding to the
numeric magnitudes of the data values. If ‘show.centroid’ is TRUE, an enlarged point at the
centroid of values is displayed. The centroid is calculated as the average of x and y values unless
‘rp.type=”p”’. In this case, the barycenter of the polygon is calculated. Make sure that these suit
your purpose, otherwise calculate the centroid that you really want and add it with the ‘points’
function. Note that if the observations are not taken at equal intervals around the circle, the centroid
may not mean much.

If the user wants to plot several sets of lines, points or symbols by passing matrices or data frames
of ‘lengths’ and ‘radial.pos’, remember that these will be grouped by row, so transpose if the
data are grouped by columns.

If more series are added to an existing plot, ‘radial.plot’ will try to maintain the current plot
parameters. Resetting the parameters after doing the initial plot will almost certainly mess up any
series that are added. Series that are added will be plotted "on top" of the existing plot, possibly
overplotting other things. If the added series have a larger range than the initial series, set
‘radial.lim’ to account for this in the initial plot, and if ‘radial.lim’ is specified in the initial
plot, remember to repeat it for added series as in the example.

The size of the labels on the outside of the plot can be adjusted by setting ‘par(cex.axis=)’ and
that of the labels inside by setting ‘par(cex.lab=)’. If ‘radlab’ is TRUE, the labels will be rotated
to a radial alignment. This may help when there are many values and labels. If some labels are still
crowded, try running ‘label.pos’ through the ‘spreadout’ function. If the ‘show.grid.labels’
argument is a number from 1 to 4, the labels will be placed along a horizontal or vertical radius.
The numbers represent the same positions as in ‘axis’, with the default (4) on the right.

The radial.plot family of plots is useful for illustrating cyclic data such as wind direction or speed
(but see ‘oz.windrose’ for both), activity at different times of the day, and so on. While ‘radial.plot’
actually does the plotting, another function is usually called for specific types of cyclic data.

Value

The ‘par’ values that are changed in the function as they were at the time ‘radial.plot’ was
called.
Author(s)

Jim Lemon - thanks to Jeremy Claisse and Antonio Hernandez Matias for the ‘lty’ and ‘rp.type’ suggestions respectively, Patrick Baker for the request that led to ‘radlab’, Thomas Steiner for the request for the ‘radial.lim’ and ‘radial.labels’ modifications, Evan Daugharty for requesting the ‘add’ argument, James MacCarthy for requesting better radial labels, Steve Ellison for noticing that the return values of the functions had changed, Don Dennerline for requesting the rank clock, Mehdi Nellen for the different colors for the radial and circumferential lines for the grid and Mayeul Kauffmann for noticing the radial label bug when a separate radial.grid was included.

See Also

polar.plot,clock24.plot

Examples

testlen<-runif(10,0,10)
testpos<-seq(0,18*pi/10,length=10)
testlab<-letters[1:10]
oldpar<-radial.plot(testlen,testpos,main="Test Radial Lines",line.col="red",lwd=3,rad.col="lightblue")
testlen<-c(sin(seq(0,1.98*pi,length=100))+2+rnorm(100)/10)
testpos<-seq(0,1.98*pi,length=100)
radial.plot(testlen,testpos,rp.type="p",main="Test Polygon",line.col="blue",labels=LETTERS[1:8])
# now do a 12 o'clock start with clockwise positive
radial.plot(testlen,testpos,start=pi/2,clockwise=TRUE,show.grid.labels=2,rp.type="s",main="Test Symbols (clockwise)",radial.lim=c(0,3.5),point.symbols=16,point.col="green",show.centroid=TRUE,labels=LETTERS[1:6])
# one without the circular grid and multiple polygons
# see the "diamondplot" function for variation on this
posmat<-matrix(sample(2:9,30,TRUE),nrow=3)
radial.plot(posmat,labels=paste("X",1:10,sep=""),rp.type="p",main="Spiderweb plot",line.col=2:4,show.grid=FALSE,lwd=1:3,radial.lim=c(0,10))
# dissolved ions in water
ions<-c("Na","Ca","Mg","Cl","HCO3","SO4")
radial.plot(ions,labels=ion.names,rp.type="p",main="Dissolved ions in water",grid.unit="meq/l",radial.lim=c(0,5),poly.col="yellow",show.grid.labels=1)
# add points inside the polygon - radial.lim is supplied by plotrix_env
radial.plot(ions=0.4,rp.type="s",point.symbols=4,point.col="red",add=TRUE)
radmat<-matrix(c(sample(1:4,4),sample(1:4,4),sample(1:4,4),sample(1:4,4),sample(1:4,4),sample(1:4,4),sample(1:4,4),sample(1:4,4)),nrow=4)
# finally a rank clock
radial.plot(radmat,rp.type="l",radial.pos=seq(0,20*pi/11.1,length.out=10),label.pos=seq(0,20*pi/11.1,length.out=10),start=pi/2,clockwise=TRUE,labels=2001:2010,radial.lim=c(0.2,4),main="Rank clock")
legend(-1.7,4,c("Black","Red","Green","Blue"),col=1:4,lty=1)
par(xpd=oldpar$xpd,mar=oldpar$mar,pty=oldpar$pty)
# reset the margins
radial.plot.labels  

Display labels on a circular grid

Description

`radial.plot.labels` displays a labels on a circular plot produced by one of the radial.plot family of functions.

Usage

```r
radial.plot.labels(lengths, radial.pos=NULL, units="radians", radial.lim=NULL, start=0, clockwise=FALSE, labels, adj=NULL, pos=NULL,...)
```

Arguments

- **lengths**: numeric data vector. Magnitudes will be represented as the radial positions of symbols, line ends or polygon vertices.
- **radial.pos**: numeric vector of radial positions. These will be converted to radians if the `units` argument is not "radians".
- **units**: The units of `radial.pos` may be degrees or 24 hour clock positions. If `units` is "polar" or "clock24" respectively, the values of radial.pos will be converted into radians.
- **radial.lim**: Optional radial limits for the circular plot. These must be the same as the radial limits of the original plot.
- **start**: The zero position on the plot in the units of `radial.pos`.
- **clockwise**: Whether to increase angles clockwise rather than the default counterclockwise.
- **labels**: text labels to display on the plot.
- **adj**: Text justification as in the `text` function.
- **pos**: Text position as in the `text` function.
- **...**: additional arguments passed to `text`.

Details

Don’t confuse this function with the `radial.labels` argument in the radial.plot function. This labels the values rather than the grid.

Value

nil

Author(s)

Jim Lemon
See Also
text

Examples

testlen<-c(rnorm(10)*2+5)
# do the labels in clock24 units
testpos<-c(6.74,8.3,10.55,12.33,13.75,15.9,17.15,19.36,21.02,23.27)
oldpar<-clock24.plot(testlen,testpos,main="Test radial.plot.labels",
                    rp.type="s",point.symbols=3,point.col="blue")
radial.plot.labels(testlen,testpos,units="clock24",labels=LETTERS[1:10],
pos=3,col="blue")
# now a polar plot
polar.plot(testlen,testangle,main="Test radial.plot.labels",rp.type="p",
           poly.col="green")
radial.plot.labels(testlen,testangle,units="polar",labels=LETTERS[1:10])
# reset par
par(oldpar)

radialtext

Display text in a radial line

Description

Displays a string in a radial line, rotating it to flow in the radial direction and optionally scaling each letter’s size according to its distance from the center.

Usage

radialtext(x, center=c(0,0), start=NA, middle=1, end=NA, angle=0,
           deg=NA, expand=0, stretch=1, nice=TRUE, cex=NA, ...)

Arguments

x A character string.
center The center of the circular area in x/y user units.
start The starting distance of the string from the center in x/y user units.
middle The middle distance of the string from the center in x/y user units.
end The ending distance of the string from the center in x/y user units.
angle The angular position of the string in radians.
deg The angular position of the string in degrees (takes precedence if not NA).
expand Size expansion factor for characters, used only if ‘start’ specified.
stretch How much to stretch the string for appearance, 1 for none.
nice TRUE to auto-flip text to keep it upright, FALSE to let it be upside down.
cex The overall character expansion factor, NA for par("cex").
... Additional arguments passed to ‘text’. 
Radialtext

Details

This may not work on all devices, as not all graphic devices can rotate text to arbitrary angles. The output looks best on a Postscript or similar device that can rotate text without distortion. Rotated text often looks very ragged on small bitmaps. If the user passes a value for 'start', this will override a value for 'middle' or 'end'. Likewise, a value for 'end' will override a value for 'middle'. Also, a value for 'deg' overrides any value passed to 'angle'. If 'expand' is 0, all characters will be the same size, while a value of 1 will scale characters so that one that is twice as far from the center will be twice as large. Negative values are permitted too, but 'expand' is only used if 'start' was specified.

Value

nil

Author(s)

Ted Toal

See Also

text, arctext

Examples

plot(0, xlim=c(1,5), ylim=c(1,5), main="Test of radialtext",
    xlab="", ylab="", type="n")
points(3, 3, pch=20)
radialtext("uncooked spaghetti", center=c(3,3),
    col="blue")
radialtext("uncooked spaghetti", center=c(3,3),
    start=1.2, angle=pi/4, cex=0.8)
radialtext("uncooked spaghetti", center=c(3,3),
    middle=1.2, angle=pi/4+0.1, cex=0.8)
radialtext("uncooked spaghetti", center=c(3,3),
    end=1.2, angle=pi/4+0.2, cex=0.8)
radialtext("uncooked spaghetti", center=c(3,3),
    start=0.5, deg=135, cex=0.8, col="green")
radialtext("uncooked spaghetti", center=c(3,3),
    start=0.5, deg=145, cex=0.8, stretch=2)
radialtext("uncooked spaghetti", center=c(3,3),
    start=0.5, deg=20, expand=0, col="red")
radialtext("uncooked spaghetti", center=c(3,3),
    start=0.5, deg=250, expand=0.35)
radialtext("uncooked spaghetti", center=c(3,3),
    start=0.75, deg=225, expand=1, col="gold")
radialtext("uncooked spaghetti", center=c(3,3),
    start=0.5, deg=325, expand=-0.25, cex=2)
Description

`raw.means.plot` is a function for visualizing results of experimental designs with up to two factors. It plots both raw data (background) and factor/cell means (foreground) to provide a more accurate visualization of the underlying distribution.

Usage

```r
raw.means.plot(data, col.offset = 2, col.x = 3, col.value = 4, na.rm = FALSE,
    avoid.overlap = c("y", "x", "both"), y.factor = 1, y.amount = NULL,
    x.amount = 0.05, pch = 21:25, lty = 1:5, bg.b.col = "darkgrey",
    bg.f.col = NULL, fg.b.col = "black", fg.f.col = "black", type = "o",
    pt.cex = 1, lwd = 1, xlab = "", ylab = "", xlim, ylim, max.offset = 0.2,
    xaxis = TRUE, x.labels, xaxt = "n", plot = TRUE, legend = TRUE, mar = NULL,
    reset.mar = TRUE, l.pos, yjust = 0.5, l.bty = "n", l.adj = c(0, 0.5), ...)
```

```r
raw.means.plot2(data, col.id, col.offset, col.x, col.value,
    fun.aggregate = "mean", ...)
```

Arguments

- **data**: a ‘data.frame’ in long format (i.e., each datapoint one row, see `\link{reshape}` or the reshape package) that contains at least three columns: one column coding the first factor (`col.offset`), one column coding the second factor (`col.x`), and one column containing the values (`col.value`).

- **col.id**: a ‘character’ scalar, specifying the name of the column specifying the id column. (only for ‘raw.means.plot2’)

- **col.offset**: a ‘character’ or ‘numeric’ (only ‘raw.means.plot’) scalar, specifying either name or number of the column coding the different lines (the offset or first factor).

- **col.x**: a ‘character’ or ‘numeric’ (only ‘raw.means.plot’) scalar, specifying either name or number of the column coding the x-axis factor. Default is 3.

- **col.value**: a ‘character’ or ‘numeric’ (only ‘raw.means.plot’) scalar, specifying either name or number of the data column. Default is 4.

- **na.rm**: ‘logical’ indicating whether ‘NA’ values should be stripped before the computation proceeds. Default is ‘FALSE’. Throws an error message if FALSE and NAs are encountered.

- **avoid.overlap**: character. What should happen to datapoints within one cell of the two factors that have the same value.
  - ‘"y"’ (the default) jitter is added so that overlapping points are distinguishable on the y-axis
• "x" jitter is added so that overlapping points are distinguishable on the x-axis.
• "both" jitter is added so that overlapping points are distinguishable on both the y- and the x-axis.
• anything else. No jitter is added.

y.factor
'factor' for controlling the amount of jitter on the y-axis (will be passed to jitter).

y.amount
'amount' for controlling the amount of jitter on the y-axis (will be passed to jitter).

x.amount
'amount' for controlling the amount of jitter on the x-axis (will be passed to jitter).

pch
'pch' values (plot symbols) taken for plotting the data. Note that the same values are taken for raw data and means. see points for more details. Recycled if too short (with warning). Default is 21:25, because those are the only values that can be displayed filled and non-filled. All other values should not be used.

lty
'lty' values (line types) for connecting the means. See par for more details. Recycled if too short (with warning). Default is 1:5.

bg.b.col
background border color: border color of raw data points. Default: 'darkgrey'

bg.f.col
background filling color: fill color of raw data points. Default: 'NULL'

fg.b.col
foreground border color: border color of mean data points. Default: 'black'

fg.f.col
foreground fill color: fill color for mean data points. Default: 'black'

type
same as type in plot. Default: 'o' ('overplotted')

pt.cex
'numeric' specifying the 'cex' value used for plotting the points. Default is 1.

lwd
'numeric' specifying the 'lwd' value used for plotting the lines. Default is 1.

xlab
x-axis label. Default: ""

ylab
y-axis label. Default: ""

ylim
the y-axis limits of the plot. If not specified (the default) will be taken from data so that all raw data points are visible and a warning message is displayed specifying the ylim.

max.offset
'numeric', maximal offset of factor levels from the offset factor ('col.offset') specifying the different lines. The centre of each factor on the x-axis is at full numbers (starting from 1 to ...). The maximum will only be reached if the number of factor levels (from 'col.offset') is even. Default: 0.2.

xaxis
'logical' value indicating whether or not the x-axis should be generated by 'raw.means.plot'. If 'TRUE', labels for the x-axis will be taken either from the unique values of 'col.x' or can be specified with 'x.labels'.

x.labels
'character' vector specifying 'col.x' levels. Only relevant if 'xaxis=TRUE'. Then, the values given here will be displayed at the x-axis for each factor level of 'col.x'.

xaxt
A character which specifies whether or not the x-axis should be plotted by the call to plot function. Interferes with the aforementioned 'xaxis' argument and the automatic 'xaxis' function by 'raw.means.plot'. Just there for completeness. Default "n" (and should not be changed).
plot
'logical'. Should the 'raw.means.plot' be drawn or not. If 'TRUE' (the de-
default) plot will be drawn. If 'FALSE' only the legend will be drawn (if 'legend = TRUE')
See details.

legend
'logical' indicating whether or not 'raw.means.plot' should automatically
add a legend on the right outside the plot area indicating which line and points
refer to which 'col.offset' factor levels. Default is 'TRUE'.

mar
'NULL' or 'numerical' vector of length 4 indicating the margins of the plot (see
par). If 'NULL' (the default) the right margin (i.e., 'par("mar")[4]') will be
(imperfectly) guessed from the 'col.offset' factors for placing the legend right
to the plot. If length is four this value will be taken. Ignored for 'plot = FALSE'.

reset.mar
'logical' indicating if the margins ('mar') shall be resetted after setting inter-
nally. Will be ignored if 'legend = FALSE'. Default is 'TRUE' and should not
be changed (especially with 'plot = FALSE').

l.pos
'numeric' vector of length 2 indicating the position of the legend. If not speci-
fied automatically determined. See details.

yjust
how the legend is to be justified relative to the legend y location. A value of 0
means top, 0.5 means centered and 1 means bottom justified. Default is 0.5.

l.bty
the type of box to be drawn around the legend. The allowed values are '"o"' and '"n"' (the default).

l.adj
'numeric' of length 1 or 2; the string adjustment for legend text. Useful for
y-adjustment when labels are plotmath expression. see legend and plotmath for
more info.

... further arguments which are either passed to plot or legend (or 'raw.means.plot'
for 'raw.means.plot2'). The following arguments are passed to legend, all oth-
ers are passed to plot: '"fill", "border", "angle", "density", "box.lwd", "box.lty", "box.col"

fun.aggregate
Function or function name used for aggregating the data across the two factors.
Default is '"mean' (only for 'raw.means.plot2')

Details
‘raw.means.plot2’ is probably the more useful function, as it allows for using a data.frame with
more than two-factors and aggregates across the other factors, but needs a column specifying the
experimental unit (e.g., participant).

‘raw.means.plot’ is basically an advanced wrapper for two other functions: plot and (if 'legend=TRUE')
legend. Furthermore, raw data is plotted with a call to points and the means with a call to lines.

You can use ‘raw.means.plot’ to plot only a legend by setting ‘plot = FALSE’ and ‘legend = TRUE’.
Then, ‘raw.means.plot’ will draw an invisible plot with ‘xlim = c(0,10)’ and ‘ylim = c(0, 10)’
and place the legend on this invisible plot. You can specify ‘l.pos’ to position the legend, other-
wise it will be plotted at ‘c(5,5)’ (i.e., in the middle of the plot). Note that ‘xpd = TRUE’ in the
call to ‘legend’ (see par).

Value
Nothing. This function is invoked for its side effects.
raw.means.plot

Author(s)
Henrik Singmann (<henrik.singmann@psychologie.uni-freiburg.de>) with ideas from Jim Lemon

See Also

add.ps can be used in addition to `raw.means.plot` to compare the factors at each x-axis position, by adding p-values from t-tests to the x-axis.

Examples

```r
x <- data.frame(id = 1:150, offset = rep(c("Group A", "Group B", "Group C"), each = 50), xaxis = sample(c("A", "B", "C", "D"), 150, replace = TRUE), data = c(rnorm(50, 10, 5), rnorm(50, 15,6), rnorm(50, 20, 5)))
raw.means.plot(x)

raw.means.plot(x, main = "Example", ylab = "Values", xlab = "Factor", title = "Groups")

raw.means.plot(x, "offset", "xaxis", "data")

raw.means.plot(x, "xaxis", "offset", "data")

raw.means.plot(x, 3, 2, 4)

x2 <- data.frame(id = 1:150, offset = rep(c("Group A", "Group B", "Group C"), each = 50), xaxis = sample(c("A", "B", "C", "D"), 150, replace = TRUE), data = c(rnorm(50, 10, 5), rnorm(50, 15,6), rnorm(50, 20, 5)))

layout(matrix(c(1, 2, 3), 2, byrow = TRUE), heights = c(7,1))
raw.means.plot(x, main = "Data x1", ylab = "Values", xlab = "Factor", legend = FALSE, mar = c(4,4,4,1)+0.1)
raw.means.plot(x2, main = "Data x2", ylab = "Values", xlab = "Factor", legend = FALSE, mar = c(4,4,4,1)+0.1)
raw.means.plot(x2, plot = FALSE, title = "Groups")

y <- data.frame(id = 1:300, offset = rep(1, 300),
axis = sample(LETTERS[1:6],300, replace = TRUE), data = c(rnorm(100, 1), rnorm(100), rnorm(100,1)))

par(mfrow = c(2,2))

raw.means.plot(y, legend = FALSE)

raw.means.plot(y, type = "p", legend = FALSE)

raw.means.plot(y, type = "l", legend = FALSE)

raw.means.plot(y, 3, 2, x.labels = "one group only")
```
# Example with overlapping points
z <- data.frame(id = 1:200, offset = rep(c("C 1", "C 2"), 200),
    axis = sample(LETTERS[1:4], 200, replace = TRUE),
    data = sample(1:20, 200, replace = TRUE))

# x versus y jitter
par(mfrow = c(2,2))
raw.means.plot(z, avoid.overlap = "none", main = "no-jitter")
raw.means.plot(z, main = "y-axis jitter (default)"
raw.means.plot(z, avoid.overlap = "x", main = "x-axis jitter")
raw.means.plot(z, avoid.overlap = "both", main = "both-axis jitter")

# y-axis jitter (default)
par(mfrow = c(2,2))
raw.means.plot(z, avoid.overlap = "none", main = "no jitter")
raw.means.plot(z, y.factor = 0.5, main = "smaller y-jitter")
raw.means.plot(z, main = "standard y-jitter")
raw.means.plot(z, y.factor = 2, main = "bigger y-jitter")

# x-axis jitter (default)
par(mfrow = c(2,2))
raw.means.plot(z, avoid.overlap = "none", main = "no jitter")
raw.means.plot(z, avoid.overlap = "x", x.amount = 0.025,
    main = "smaller x-jitter")
raw.means.plot(z, avoid.overlap = "x", main = "standard x-jitter")
raw.means.plot(z, avoid.overlap = "x", x.amount = 0.1,
    main = "bigger x-jitter")

## Not run:
The examples uses the OBrienKaiser dataset from car and needs reshape.
require(reshape)
require(car)
data(OBrienKaiser)
OBKnew <- cbind(factor(1:nrow(OBrienKaiser)), OBrienKaiser)
colnames(OBKnew)[1] <- "id"
OBK.long <- melt(OBKnew)
OBK.long[, c("measurement", "time")]
    t(vapply(strsplit(as.character(OBK.long$variable), "\."), "[", c("", ""))
raw.means.plot2(OBK.long, "id", "measurement", "gender", "value")
raw.means.plot2(OBK.long, "id", "treatment", "gender", "value")

# also use add.ps:
# For this example the position at each x-axis are within-subject comparisons!
raw.means.plot2(OBK.long, "id", "measurement", "gender", "value")
add.ps(OBK.long, "id", "measurement", "gender", "value", paired = TRUE) #reference is “fup"

raw.means.plot2(OBK.long, "id", "measurement", "gender", "value")
add.ps(OBK.long, "id", "measurement", "gender", "value", ref.offset = 2, paired = TRUE) #reference is “post”

# Use R’s standard (i.e., Welch test)
raw.means.plot2(OBK.long, "id", "treatment", "gender", "value")
add.ps(OBK.long, "id", "treatment", "gender", "value", prefixes = c("p(control vs. A)", "p(control vs. B)"))

# Use standard t-test
raw.means.plot2(OBK.long, "id", "treatment", "gender", "value")
add.ps(OBK.long, "id", "treatment", "gender", "value", var.equal = TRUE, prefixes = c("p(control vs. A)", "p(control vs. B)"))

## End(Not run)

---

**rectFill** *(Draw a rectangle filled with symbols)*

**Description**

Draws a rectangle on the current figure filled with arbitrary symbols.

**Usage**

```r
rectFill(x1,y1,x2,y2,fg=par("fg"),bg=par("bg"),xinc=NA,yinc=NA,
pch=1,pch.cex=1,pch.col=par("fg"),...)
```

**Arguments**

- `x1,y1,x2,y2`: Rectangle limits as in `rect`.
- `fg`: Foreground color
- `bg`: Background color
- `xinc,yinc`: The x and y increments of spacing for the symbols.
- `pch`: Which symbol to use
- `pch.cex`: Character expansion for the symbols.
- `pch.col`: Color(s) for the symbols.
- `...`: Additional arguments to `points` for the symbols.

**Details**

`rectFill` draws a rectangle and fills the rectangle with the symbols requested. It is probably most useful as a substitute for fill colors in a black and white environment.
rescale

Scale numbers into a new range

Description

Scale a vector or matrix of numbers into a new range.

Usage

rescale(x, newrange)

Arguments

x  
A numeric vector, matrix or data frame.

newrange  
The minimum and maximum value of the range into which ‘x’ will be scaled.

Details

‘rescale’ performs a simple linear conversion of ‘x’ into the range specified by ‘newrange’. Only numeric vectors, matrices or data frames with some variation will be accepted. NAs are now preserved - formerly the function would fail.

Value

On success, the rescaled object, otherwise the original object.

Author(s)

Jim Lemon
Examples

```r
# scale one vector into the range of another
normal.counts<-rnorm(100)
normal.tab<-tabulate(cut(normal.counts,breaks=seq(-3,3,by=1)))
normal.density<-rescale(dnorm(seq(-3,3,length=100)),range(normal.tab))
# now plot them
plot(c(-2.5,-1.5,-0.5,0.5,1.5,2.5),normal.tab,xlab="X values",
     type="h",col="green")
lines(seq(-3,3,length=100),normal.density,col="blue")
```

---

### Description

Reverses the sense of either or both the ‘x’ and ‘y’ axes.

### Usage

```r
revaxis(x, y, xrev=FALSE, yrev=TRUE, xside=if (yrev) 3 else 1,
        yside=if (xrev) 4 else 2, xlab=NULL, ylab=NULL, bty=NULL, ...)
```

### Arguments

- **x**: Vector of ‘x’-coordinates of the data to be plotted.
- **y**: Vector of ‘y’-coordinates of the data to be plotted.
- **xrev**: Logical scalar; should the sense of the ‘x’-axis be reversed?
- **yrev**: Logical scalar; should the sense of the ‘y’-axis be reversed?
- **xside**: The side of the plot on which the ‘x’-axis labels should go.
- **yside**: The side of the plot on which the ‘y’-axis labels should go.
- **xlab**: Character string for labelling the ‘x’-axis.
- **ylab**: Character string for labelling the ‘y’-axis.
- **bty**: Single letter indicating the type of box to be drawn around the plot. See `par` for the possible letters and their meaning.
- **...**: Other arguments to be passed to `plot`.

### Value

- **nil**

### Author(s)

Rolf Turner
Add an Inverse Rug to a Plot

Description

Adds a rug representation (1D plot) of the data to the plot, but with the coloring inverted.

Usage

`ruginv(x, ticksize=0.03, side=1, lwd=0.5, col=par("fg"), col.ticks="white", quiet=getOption("warn") < 0,...)

Arguments

- `x`: A numeric vector.
- `ticksize`: The length of the ticks making up the 'rug'. Positive lengths produce inward ticks.
- `side`: On which side of the plot box the rug will appear. Usually 1 (bottom) or 3 (top).
- `lwd`: The line width of the ticks.
- `col`: Color of the background of the ticks.
- `col.ticks`: The color of the ticks.
- `quiet`: Logical indicating if there should be a warning about clipped values.
- `...`: Further arguments passed to `polygon` when plotting the background for the ticks.

Author(s)

Peter Solymos

See Also

`rug`

Examples

```r
require(stats)
plot(density(faithful$eruptions,bw=0.15))
ruginv(faithful$eruptions,ticksize=-0.05)
ruginv(jitter(faithful$eruptions,amount=0.01),side=3,col="lightblue")
```
seats

Arrange \( N \) seats in \( M \) semicircular rows

Description

Compute seat positions in a semicircular parliament

Usage

\[
\text{seats}(N, M, r0 = 2.5)
\]

Arguments

- \( N \) Total number of seats
- \( M \) Number of semicircular arcs on which to distribute the seats
- \( r0 \) Radius of the inner arc in user units

Details

Parliaments and other assemblies are often graphically shown as semicircular rows of coloured dots, each dot coloured for a party or grouping for the member of the assembly. These graphics can be seen on many Wikipedia articles on national governments. However, it seems that many of those graphics do not tally with the numbers given for the constituents of that assembly. One can perhaps assume that the editors who changed the numbers couldn’t be bothered to update the graphic. Let’s maybe make that easier for them.

This function computes the positions of the seats in a semicircular parliament. The number of seats in each row is computed to be similar to the adjacent rows, giving a pleasing effect.

The resulting seat locations are ordered by angle and radius, so that colouring by party colours produces a natural grouping. Plots of assemblies by party colours can be made with the election function.

Value

A data frame including:

- \( x \) The \( x \) positions of the seats to be plotted on semi-circular arcs
- \( y \) The \( y \) positions of the seats to be plotted on semi-circular arcs
- \( r \) The row numbers for each seat
- \( \theta \) The angle of each seat, going from \( \pi \) to zero radians

Author(s)

Duncan Murdoch, Barry Rowlingson

See Also

election
sizeplot

Plot with repeated symbols by size

Description

Plots a set of (x,y) data with repeated points denoted by larger symbol sizes

Usage

sizeplot(x, y, scale=1, pow=0.5, powscale=TRUE, size=c(1,4), add=FALSE, ...)

Arguments

- **x**: x coordinates of data
- **y**: y coordinates of data
- **scale**: scaling factor for size of symbols
- **pow**: power exponent for size of symbols
- **powscale**: (logical) use power scaling for symbol size?
- **size**: (numeric vector) min and max size for scaling, if powscale=FALSE
- **add**: (logical) add to an existing plot?
- **...**: other arguments to `plot()` or `points()`

Details

Most useful for plotting (e.g.) discrete data, where repeats are likely. If all points are repeated equally, gives a warning. The size of a point is given by \( \text{scale} \times n^\text{pow} \), where \( n \) is the number of repeats, if powscale is TRUE, or it is scaled between size[1] and size[2], if powscale is FALSE.

Value

A plot is produced on the current device, or points are added to the current plot if ‘add=TRUE’.

Author(s)

Ben Bolker

See Also

symbols

Examples

```r
x <- c(0.1,0.1,0.1,0.1,0.1,0.2,0.2,0.2,0.2,0.3,0.3)
y <- c(1, 1, 1, 1, 2, 2, 2, 3, 3, 4, 5)
plot(x,y)
sizeplot(x,y)
sizeplot(x,y,pch=2)
```
sizetree

Display a hierarchical breakdown of disjunct categories

Description

Display a data frame in which the values in each successive column represent subcategories of the previous column as stacked rectangles.

Usage

sizetree(x, left=0, top, right=1, lastcenter=NA, showval=TRUE, showcount=TRUE, firstcall=TRUE, col=NULL, border=NA, toplab=NULL, base.cex=1, ...)

Arguments

x
  A data frame in which each successive column represents subcategories of the previous column.
left
  The left edge of the current stack of rectangles in user units.
top
  The top of the current stack of rectangles in user units.
right
  The right edge of the current stack of rectangles in user units.
lastcenter
  The center of the previous rectangle from which the next breakdown of categories arises. There is almost no reason to change it.
showval
  Whether to display the values representing the categories.
showcount
  Whether to display the count for the categories.
firstcall
  A flag for the function - do not alter this.
col
  Optional fill colors for the rectangles. See Details
border
  Color for border around the rectangles. See details
toplab
  Optional labels to display a the top of each stack.
base.cex
  The base character expansion for the labels.
...
  additional arguments passed to ‘plot’.

Details

‘sizetree’ displays disjunct hierarchical categories as stacked rectangles. It accepts a data frame in which the values in the first column represent categories, the values in the second column represent subcategories of the first column, and so on. The first column will be displayed as a stack of rectangles, the height of each proportional to the count for each category. Each substack of rectangles in the second stack will represent the breakdown of counts for its superordinate category and so on through the columns. Empty categories are ignored and NAs will produce gaps, which will propagate across subsequent stacks.

The user can simply pass the data frame, which should only contain columns that are hierarchical categories (example 1). The colors will probably not be ideal. The user can pass the same colors for the all levels (example 2). If this is done, ‘sizetree’ will try to match colors to categories when
the number of categories is diminishing (e.g. some levels are missing in the sub-categories) and the columns of ‘x’ are factors with the same levels in the same order. This will work if the category labels are the same in each level, but remember to add the names to the colors before passing them to the function. This will not work if there are more categories in the lower levels. If ‘col’ is a list, this is not done, and the user will have to work out the correct colors for each level. This is particularly important when the category labels and the number of categories is different in different levels (example 3).

In some sizetrees, the subcategory counts are very low compared to the overall number of data objects. This results in rectangles that are very thin vertically. One way to get better legibility of the labels is to use dark colors for the rectangles, so that the labels are white, and no borders (set ‘border’ to NA). The user can also select only part of the data frame ‘x’ to expand sections of the sizetree as in the last example.

The labels are sized to fit the vertical extent of the bars. However, it is possible that the labels may extend horizontally beyond the bar(s). The ‘base.cex’ argument can be used to shrink the labels if this happens. Remember that ‘base.cex’ will shrink all the labels, not just the ones that are too wide.

The ‘firstcall’ argument is necessary for the function to initialize the plot, as each breakdown involves a recursive call. If it is changed, the best that can be expected is an uninformative plot.

Value

nil

Author(s)

Jim Lemon

See Also

plot

Examples

cat1<-factor(sample(c("None","Low","Medium","High","Extreme"),40,TRUE),
levels=c("None","Low","Medium","High","Extreme"))
cat2<-factor(sample(c("None","Low","Medium","High"),40,TRUE),
levels=c("None","Low","Medium","High"))
cat3<-factor(sample(c("None","Low","High"),40,TRUE),
levels=c("None","Low","High"))
hcats<-data.frame(cat1,cat2,cat3)
# throw in a few NAs
hcats$cat1[10]<-NA
hcats$cat2[c(15,20)]<-NA
hcats$cat3[c(11,14,25)]<-NA
# first let sizetree work out the colors
sizetree(hcats,main="Sizetree with automatic colors")
# now see what happens with a list of the same colors for each level
bhcol<-c("#ff8080","#ddd8d8","#80ff80","#0000ff","#80dddd")
sizetree(hcats,col=list(bhcol,bhcol,bhcol),
main="Sizetree with the same colors each level")
size_n_color

Display circles with specified size and color

Description

Display a plot of circles at specified locations, each with a specified size and color.

Usage

```r
size_n_color(x=NULL, y, size, sizefun="sqrt", col, main="", xlim=NA, xlab="", xat=NULL, xaxlab=NULL, xecex=1, xlas=0, xgrid=FALSE, ylim=NA, ylab="", yat=NULL, yaxlab=NULL, yecex=1, ylas=1, ygrid=TRUE, mar=c(5,4,4,2), boxit=TRUE, add=FALSE,...)
```

Arguments

- `x, y`: Vectors or matrices of x and y positions for the symbols.
- `size`: Sizes for the symbols expressed as numbers.
- `sizefun`: The function to use for transforming the values to radii of circles. Square root gives areas proportional to the values.
- `col`: Colors for the symbols (see Details).
- `main`: Title for the plot.
- `xlim, ylim`: Explicit x and y limits for the plot.
- `xlab, ylab`: Labels for the x and y axes.
- `xat, yat`: Where to place the ticks and tick labels on the axes.
- `xaxlab, yaxlab`: Tick labels for the x and y axes.
- `xecex, yecex`: Character expansions for the axis tick labels.
- `xlas, ylas`: Orientation for the axis tick labels (see ‘par’).
- `xgrid, ygrid`: Whether to display a grid along the x or y direction.
- `mar`: Margins for the plot (see Details).
- `boxit`: Whether to draw a box around the plot.
- `add`: Whether to draw a new plot (FALSE) or add symbols to an existing plot (TRUE).
- `...`: Additional arguments passed to ‘plot’.
Details

`size_n_color` plots circles centered on the `x` and `y` coordinates. The size and color of the circles may also be specified individually, allowing four dimensions of variation to be displayed on the plot.

`size_n_color` may also be used to display a "visual table" as in the second example. Here the x and y coordinates are used to associate the symbols with two categorical variables, underlying cause of death and year of observation. If the x values are not passed to the function, it will try to space out the circles evenly in a representation of the matrix. If the matrix is not square, use a plotting device that has about the same proportion of height and width as the matrix.

Value

nil

Author(s)

Jim Lemon

See Also

plot, points, par

Examples

```r
meantemp<-c(19,22,25,29,21,20,16,27,23,26)
totalrain<-c(174,152,196,120,177,183,92,153,161,85)
numpumpkin<-c(53,47,61,63,38,42,48,71,66,29)
meanwt<-c(1.5,2.3,2.8,1.9,2.4,1.8,2.6,2.2,1.7)
size_n_color(meantemp,totalrain,meanwt/5,NA,xlim=c(15,30),
             color=scale(numpumpkin,c(0.8,0),c(0.8,1)),0),
             xlab="Temperature (degrees C)",ylab="Rainfall (mm)",
             main="Number and weight of pumpkins by temperature and rainfall",
             xat=seq(15,30,by=5),yat=seq(80,200,by=20))
color.legend(15,55,18.5,60,seq(40,70,by=10),
             rect.col=color.scale(seq(40,70,by=10),c(0.8,0),c(0.8,1)),0))
points(15:18,rep(166,4),cex=seq(1.5,3.0,by=0.5))
text(15:19,rep(134,5),c("1.5","2.0","2.5","3.0","kg"))
par(xpd=TRUE)
```

```
# now display a "visual table" of delayed registrations by underlying cause of
# death and year of observation. The sizes of the circles represent the log of
# the number of deaths and the colors represent the percentage of deaths that
# occurred in the year prior to registration or earlier

data(death_reg)
size_n_color(x=matrix(rep(1996:2010,each=22),nrow=22),
y=matrix(rep(1:22,15),nrow=22),size=t(death_reg[[1]])/200,
col=color.scale(t(death_reg[[2]]),c(0,0.8,1),c(1,0.2,0)),0),
ylim=c(1,22),main="Delayed registrations by ICD chapter",
xlab="Year",xaxlab=1996:2010,xat=1996:2010,xcex=0.8,
yaxlab=colnames(death_reg[[1]]),ycex=0.8,ygrid=TRUE,mar=c(5,6,4,2))
```
sliceArray

Slice an array

Description

Slices one dimension from an array by taking one element from the first dimension.

Usage

sliceArray(x, slice)

Arguments

x       An array
slice   The index of the slice to take from the first dimension of the array.

Details

'sliceArray' builds an extractor string containing the value of 'slice' as the first element and as many commas as needed to match the dimensions of the array. It then applies the extractor function to 'x' and returns the result. Note how the array "slice" swaps dimensions in the example.

Value

The desired slice of the array.

Author(s)

Jim Lemon

See Also

array

Examples

a1 <- array(1:27, dim = c(3, 3, 3))
a1
sliceArray(a1, 2)
smoothColors  

Build a vector of color values

Description

`smoothColors` calculates a sequence of colors. If two color names in the arguments are separated by a number, that number of interpolated colors will be inserted between the two color endpoints. Any number of color names and integers may be passed, but the last argument must be a color name. If more than one integer appears between two color names, only the first will be used in the interpolation and the others will be ignored.

Usage

smoothColors(...,alpha=NA)

Arguments

... an arbitrary sequence of color names and integers beginning and ending with a color name.

alpha optional `alpha` (transparency) value.

Value

A vector of hexadecimal color values as used by `col`.

Note

For more R functions that transform numeric values into colors or produce colors that can be used to represent values, see the `colourschemes` package.

Author(s)

Barry Rowlingson

See Also

color.gradient,rgb

Examples

plot(1:10,main="Test opaque colors",type="n",axes=FALSE)
box()
soil.texture

Soil texture triangle plot

Description

Display a USDA soil texture triangle with optional grid, labels and soil texture points.

Usage

soil.texture(soiltexture=NULL, main="", at=seq(0.1, 0.9, by=0.1),
            axis.labels=c("percent sand", "percent silt",
                          "percent clay"),
            tick.labels=list(l=seq(10, 90, by=10), r=seq(10, 90, by=10),
                          b=seq(10, 90, by=10)),
            show.names=TRUE, show.lines=TRUE, col.names="gray",
            bg.names=par("bg"), show.grid=FALSE, col.axis="black",
            col.lines="gray", col.grid="gray", lty.grid=3,
            show.legend=FALSE, label.points=FALSE, point.labels=NULL,
            col.symbols="black", pch=par("pch"), ...)

Arguments

soiltexture Matrix of soil textures where each row is a soil sample and three columns contain
          the proportions of the components sand, silt and clay in the range 0 to 1 or
          percentages in the range 0 to 100.
main The title of the soil texture plot. Defaults to nothing.
at Positions on the three axes where ticks will be drawn.
axis.labels Labels for the axes.
tick.labels The tick labels for the three axes.
show.names Logical - whether to show the names of different soil types within the soil trian-
                gle.
show.lines Logical - whether to show the boundaries of the different soil types within the
                soil triangle.
col.names Color of the soil names. Defaults to gray.
bg.names Color to use when drawing a blank patch for the names of soil types.
show.grid Logical - whether to show grid lines at each 10 level of each soil component.
col.axis Color of the triangular axes, ticks and labels.
col.lines Color of the boundary lines. Defaults to gray.
col.grid Color of the grid lines. Defaults to gray.
lty.grid Type of line for the grid. Defaults to dashed.
show.legend Logical - whether to display a legend.
label.points Logical - whether to call thigmophobe.labels to label the points.
soil.texture

- `point.labels`: Optional labels for the points or legend.
- `col.symbols`: Color of the symbols representing each value.
- `pch`: Symbols to use in plotting values.
- `...`: Additional arguments passed to `triax.points` and then `points`.

Details

`soil.texture` displays a triangular plot area on which soil textures defined as proportions of sand, silt and clay can be plotted. Optional grid, vertex labels, soil type divisions and names may also be displayed. If a matrix of soil textures is present, these will be plotted.

Value

If `soil.texture` was included, a list of the `x,y` positions of the soil types plotted. If not, nil.

Note

This is now a special case of `triax.plot`.

Author(s)

Sander Oom, Jim Lemon, and Michael Toews

References


See Also

- `get.soil.texture`
- `triax.plot`

Examples

```r
data(soils)
soil.texture(main="NO DATA")
soil.texture(soils, main="DEFAULT", pch=2)
soil.texture(soils, main="LINES AND NAMES", show.lines=TRUE,
  show.names=TRUE, pch=3)
soiltex.return<-soil.texture(soils[1:6,], main="GRID AND LEGEND",
  show.grid=TRUE, pch=4, col.symbols=1:6, show.legend=TRUE)
par(soiltex.return$oldpar)
```
soil.texture.uk

Soil texture triangle plot using UK conventions

Description

Display a UK style soil texture triangle with optional grid, labels and soil texture points.

Usage

soil.texture.uk(soil.texture = NULL, main = "", at = seq(0.1, 0.9, by = 0.1),
                 axis.labels = c("percent sand", "percent silt", "percent clay"),
                 tick.labels = list(l = seq(10, 90, by = 10), r = seq(10, 90, by = 10),
                                 b = seq(10, 90, by = 10)), show.names = TRUE,
                 show.lines = TRUE, col.names = "gray", bg.names = par("bg"),
                 show.grid = FALSE, col.axis = "black", col.lines = "gray",
                 col.grid = "gray", lty.grid = 3, show.legend = FALSE, label.points = FALSE,
                 point.labels = NULL, col.symbols = "black", pch = par("pch"),
                 h1 = NA, h3 = NA, t1 = NA, t3 = NA, lwduk = 2, xpos = NA, ypos = NA,
                 snames = NA, cexuk = 1.1, ...)

Arguments

soil.texture Matrix of soil textures where each row is a soil sample and three columns containing the percentages of the components sand, silt and clay in the range 0 to 100.

main The title of the soil texture plot. Defaults to nothing.

at Positions on the three axes where ticks will be drawn.

axis.labels Labels for the axes.

tick.labels The tick labels for the three axes.

show.names Logical - whether to show the names of different soil types within the soil triangle.

show.lines Logical - whether to show the boundaries of the different soil types within the soil triangle.

col.names Color of the soil names. Defaults to gray.

bg.names Color to use when drawing a blank patch for the names of soil types.

show.grid Logical - whether to show grid lines at each 10 level of each soil component.

col.axis Color of the triangular axes, ticks and labels.

col.lines Color of the boundary lines. Defaults to gray.

col.grid Color of the grid lines. Defaults to gray.

lty.grid Type of line for the grid. Defaults to dashed.

show.legend Logical - whether to display a legend.

label.points Logical - whether to call thigmophobe.labels to label the points.
point.labels

col.symbols

pch

h1,h3,t1,t3

lwduk

xpos,ypos

snames

cexuk

... Additional arguments passed to triax.points and then ‘points’.

Details

‘soil.texture.uk’ displays a triangular plot area on which soil textures defined as proportions of sand, silt and clay can be plotted. It is similar to the ‘soil.texture’ function but uses the UK display conventions.

Value

If ‘soiltexture’ was included, a list of the ‘x,y’ positions of the soil types plotted. If not, nil.

Author(s)

Julian Stander

See Also

triax.plot

Examples

soils.sw.percent<-data.frame(  
  Sand=c(67,67,66,67,36,25,24,59,27,9,8,8,20,  
        45,50,56,34,29,39,41,94,98,97,93,96,99),  
  Silt=c(17,16,9,8,9,38,48,54,27,46,70,68,68,66,  
        34,30,24,48,53,46,48,2,2,2,4,1,1),  
  Clay=c(16,17,25,25,27,22,14,27,21,24,24,  
        14,21,20,20,18,18,15,11,4,0,1,3,3,0))  
soils.sw.cols <- c(1, 1, 1, 1, 2, 2, 2, 2, 2, 3, 3,  
                   3, 3, 4, 4, 4, 5, 5, 5, 6, 6, 6, 6, 6, 6)  
soils.sw.names <- c("Arthington","Astrop","Atrim",  
                    "Banbury","Beacon","Beckfoot")  
soil.texture.uk(soils.sw.percent,  
  main = "Ternary Diagram for Some Soils from South West England",  
  col.lines = "black", col.names = "black", show.grid = TRUE,  
  col.grid = "blue", lty.grid = 2, pch = 16, cex = 1.0,  
  col.symbols = soils.sw.cols, h1 = NA, h3 = NA, t1 = NA,  
  t3 = NA, lwduk = 2, xpos = NA, ypos = NA,  
  snames = NA, cexuk = 1.1)  
legend("topleft", legend = soils.sw.names, col = 1:max(soils.sw.cols),  
       pch = 16, cex = 1.1, title = "Location", bty = "n")
soils  

Soil texture data from 125 soils

Description
A set of 125 soil texture measurements from soils from various parts of the world.

Usage
data(soils)

Source

spread.labels  

Spread labels for irregularly spaced values

Description
Places labels for irregularly spaced values in a regular staggered order

Usage
spread.labels(x,y,labels=NULL,ony=NA,offsets=NA,between=FALSE, linecol=par("fg"),srt=0,...)

Arguments

\[
x, y \quad x \text{ and } y \text{ data values}
\]

\[
\text{labels} \quad \text{text strings}
\]

\[
\text{ony} \quad \text{Whether to force the labels to be spread horizontally (FALSE) or vertically (TRUE). Defaults to whichever way the points are most spread out.}
\]

\[
\text{offsets} \quad \text{How far away from the data points to place the labels. Defaults to one quarter of the plot span for all, staggered on each side.}
\]

\[
\text{between} \quad \text{Whether to place the labels between two sets of points.}
\]

\[
\text{linecol} \quad \text{Optional colors for the lines drawn to the points.}
\]

\[
\text{srt} \quad \text{Rotation of the labels in degrees.}
\]

\[
\ldots \quad \text{additional arguments passed to ‘text’}.\]
Details

This function is mainly useful when labeling irregularly spaced data points that are "spread out" along one dimension. It places the labels regularly spaced and staggered on the long dimension of the data, drawing lines from each label to the point it describes.

If 'between' is TRUE, the function expects two points for each label and will attempt to place the labels between two vertical lines of points. Lines will be drawn from the ends of each label to the two corresponding points.

If spreading labels horizontally, the user may wish to rotate the labels by 90 degrees ('srt=90'). If long labels run off the edge of the plot, increase the 'xlim' for extra room.

Value

nil

Author(s)

Jim Lemon

References


See Also

'text', 'spread.lab (TeachingDemos)'

Examples

# spread labels out in the x dimension using defaults
x<-sort(rnorm(10))
y<-rnorm(10)/10
plot(x,y,ylim=c(-1,1),type="p")
nums<-c("one","two","three","four","five","six","seven","eight","nine","ten")
spread.labels(x,y,nums)

# food preferences of children by sex (Cooke & Wardle, 2005)
fpkids<-data.frame(Food=c("Fatty/sugary","Fruit","Starchy","Meat", "Proc.meat","Eggs","Fish","Dairy","Vegetables"),
Female=c(4.21,4.22,3.98,3.57,3.55,3.46,3.34,3.26,3.13),
Male=c(4.35,4.13,4.02,3.9,3.81,3.64,3.45,3.27,2.96))
plot(rep(1,9),fpkids$Female,xlim=c(0,8.2.2),
ylim=range(c(fpkids$Female,fpkids$Male)),xlab="Sex",xaxt="n",
ylab="Preference rating",main="Children's food preferences by sex",
col="red")
axis(1,at=1:2,labels=c("Female","Male"))
points(rep(1:2,each=9),c(fpkids$Female,fpkids$Male),
fpkids$Food,between=TRUE,linetype=c("red","blue"))
spreadout

Description

Spread out a vector of numbers so that there is a minimum interval between any two numbers when in ascending or descending order.

Usage

spreadout(x, mindist)

Arguments

- **x**: A numeric vector which may contain NAs.
- **mindist**: The minimum interval between any two values when in ascending or descending order.

Details

‘spreadout’ starts at or near the middle of the vector and increases the intervals between the ordered values. NAs are preserved. ‘spreadout’ first tries to spread groups of values with intervals less than ‘mindist’ out neatly away from the mean of the group. If this doesn’t entirely succeed, a second pass that forces values away from the middle is performed.

‘spreadout’ is currently used to avoid overplotting of axis tick labels where they may be close together.

Value

On success, the spread out values. If there are less than two valid values, the original vector is returned.

Author(s)

Jim Lemon

Examples

spreadout(c(1,3,3,3,3,5),0.2)
spreadout(c(1,2.5,2.5,3.5,3.5,5),0.2)
spreadout(c(5,2.5,2.5,NA,3.5,1,3.5,NA),0.2)
# this will almost always invoke the brute force second pass
spreadout(rnorm(10),0.5)
**stackpoly**

Display the columns of a matrix or data frame as stacked polygons

---

**Description**

Plot one or more columns of numeric values as the top edges of polygons instead of lines.

**Usage**

```r
stackpoly(x, y=NULL, main=NULL, xlab=NULL, ylab=NULL, xat=NA, xaxlab=NA,
xlim=NA, ylim=NA, lty=1, lwd=1, border=NA, col=NULL, staxx=FALSE, stack=FALSE, 
axis2=TRUE, axis4=TRUE, padj=0, ...)
```

**Arguments**

- `x`: A numeric data frame or matrix with the ‘x’ values. If ‘y’ is NULL, these will become the ‘y’ values and the ‘x’ positions will be the integers from 1 to `dim(x)[1]`.
- `y`: The ‘y’ values.
- `main`: The title for the plot.
- `xlab`, `ylab`: x and y axis labels for the plot.
- `xat`: Where to put the optional xaxlabs.
- `xaxlab`: Optional labels for the x positions.
- `xlim`: Optional x limits.
- `ylim`: Optional y limits.
- `lty`: Line type for the polygon borders.
- `lwd`: Line width for the polygon borders.
- `border`: Color for the polygon borders.
- `col`: Color to fill the polygons. If NULL, ‘rainbow’ will be called to generate the colors. If NA, the polygons will not be filled.
- `staxx`: Whether to call ‘staxlab’ to stagger the x axis labels.
- `stack`: Whether to stack the successive values on top of each other.
- `axis2`: Whether to display the left ordinate on the plot.
- `axis4`: Whether to display the right ordinate on the plot.
- `padj`: Vertical justification of the x axis labels, defaulting to “top”. Can be a vector with an element for each label.
- `...`: Additional arguments passed to ‘plot’.
Details

`stackpoly` is similar to a line plot with the area under the lines filled with color(s). Ideally, each successive set of y values is greater than the values in the previous set so that the polygons form a rising series of crests. If `stack` is TRUE, this is not a problem unless some values of `x` are negative.

If `x` or `y` is a vector, not a matrix or list, the values will be displayed as a “waterfall plot”.

The options for `axis2` and `axis4` can be used to produce panel plots. See the last example.

Value

nil

Author(s)

Jim Lemon and Thomas Petzoldt (waterfall plot option)

See Also

`polygon`

Examples

```r
testx<-matrix(rnorm(100),nrow=10)
stackpoly(matrix(cumsum(testx),nrow=10),main="Test Stackpoly I",
          xaxlab=c("One","Two","Three","Four","Five",
                    "Six","Seven","Eight","Nine","Ten"),border="black",staxx=TRUE)
stackpoly(testx,main="Test Stackpoly II",
          xaxlab=c("One","Two","Three","Four","Five",
                    "Six","Seven","Eight","Nine","Ten"),border="black",
          staxx=TRUE,stack=TRUE)
layout(matrix(1:2,nrow=1))
oldmar<-par(mar=c(5,4,4,0))
stackpoly(rev(sort(testx-mean(testx))),
          main="Waterfall Plot (x-mean)",xat=seq(10,90,by=10),
          xlab="Index",ylab="Value",lwd=3,col="green",border="black",
          axis4=FALSE)
ylim<-par("usr")[3:4]
par(mar=c(5,0,4,4))
stackpoly(rev(sort((testx-mean(testx))/sd(as.vector(testx)))) ,
          ylim=ylim,main="Waterfall Plot ((x-mean)/sd)",xat=seq(10,90,by=10),
          xlab="Index",lwd=3,col="lightblue",border="black",axis2=FALSE)
par(oldmar)
```
staircase.plot  Display a staircase plot

Description
Displays a plot showing a sequence of changing totals and increments as successive linked bars.

Usage
staircase.plot(heights, totals=NA, labels=NULL, halfwidth=0.3, main="", mar=NA, total.col="blue", inc.col=NA, bg.col=NA, direction="e", las=1, display.height=TRUE, stagger=FALSE, cex=par("cex"), prefix="", suffix="", ...)  

Arguments
heights  vector of numeric values or a matrix or data frame with at least two columns. The first column must be numeric and the second may be numeric or logical.
totals  A vector of logicals or zero/non-zero values indicating whether the corresponding height is a total (TRUE) or an increment (FALSE).
labels  An optional vector of labels for the bars.
halfwidth  Half of the width of a bar as a proportion. See Details.
main  A title for the plot.
mar  Margins for the plot. Defaults to 10 on the baseline axis, 3 on the top and 1 on the other two sides.
total.col  Color(s) for the bars representing successive totals.
inc.col  Color(s) for the bars representing increments.
bg.col  The background color for the plot.
direction  Direction in which the bars should be presented. See Details.
las  Orientation for the bar labels. See ‘par’.
display.height  Whether to display the totals and increments at the upper ends of the bars. Defaults to TRUE.
stagger  Whether to stagger the labels to avoid overlap.
cex  The usual character expansion value.
prefix  A prefix to the numbers displayed next to the bars (e.g. $).
suffix  A suffix as for prefix (e.g. %).
...  arguments passed to ‘plot’.
Details

Displays a plot representing successive changes in counts or values. For example, if a research study attempts to contact a certain number of people and some cannot be contacted, some decline to participate, some are ineligible, the final sample will be smaller than the initial contact list. The first value will be the total of attempts, there will be a number of decrements, and the last value will be the actual sample. There may be intermediate totals specified. This produces a visual display of the sampling procedure. See the example.

The bars are placed at integer values on the axis representing the succession of counts or values. The width of the bars is determined by the argument ‘halfwidth’. This defaults to 0.3, meaning that the bar extends 0.3 to each side, so that the proportion of bar to space is 0.6 to 0.4. The succession of bars is determined by the ‘direction’ argument. The default is "e" (east), meaning that the first bar is at the left of the plot and subsequent bars are placed to the right. The other three possibilities follow the conventional compass layout.

The ‘prefix’ and ‘suffix’ arguments allow the user to specify units for the numbers displayed next to the bars. If a single value is passed, all numbers will get the same prefix or suffix. Different prefixes or suffixes for each number can be passed as vectors.

The ‘getFigCtr’ function is called to center the plot title in the figure region as the plot area is typically off center.

Value

nil

Author(s)

Jim Lemon

See Also

plot, getFigCtr

Examples

```r
sample_size<-c(500,-72,428,-94,334,-45,289)
totals<-c(TRUE,FALSE,TRUE,FALSE,TRUE,FALSE,TRUE)
labels<-c("Contact list","Uncontactable","","Declined","","Ineligible","Final sample")
staircase.plot(sample_size,totals,labels,
main="Acquisition of the sample (staircase.plot)",
total.col="gray",inc.col=2:4,bg.col="#eeeb",direction="s")
```
starPie

A pie-like graphic object

Description

Display a polygon with each sector proportional to a vector of numeric values.

Usage

```
starPie(x, y, radext, values, maxval = NA, border = par("fg"), col = NA, prop.area = FALSE, label = ", labelpos = 1)
```

Arguments

- **x, y** The coordinate position for the center of the starPie.
- **radext** The maximum distance from the center of the starPie to one vertex of the polygon.
- **values** A vector of numeric values.
- **maxval** A maximum value for scaling the values to the radius. If NA, the maximum value in ‘values’ will be used.
- **border** The color to use for the borders of the polygon sectors.
- **col** The color(s) to use for the fills of the polygon.
- **prop.area** Whether to scale the values to the area (TRUE) or the radial extent (FALSE) of the polygon sectors.
- **label** Optional text labels for the starPies.
- **labelpos** Positions of the labels relative to the starPies.

Details

‘starPie’ displays a polygon centered on the ‘x, y’ position having sectors of equal angular extent. The radial extent of each sector is proportional to the values in the numeric vector ‘lengths’. If the ‘prop.area’ argument is TRUE, the proportion is based on the area of the sector, and if ‘prop.area’ is FALSE, the proportion is on the radial extent. As the function is intended to exaggerate the differences between different starPies, the default produces sectors proportional to the squares of the ‘lengths’.

‘starPie’ is intended to display a visual analog of the relative value of matched attributes of a number of similar objects or groups. Thus objects having similar attributes will produce similar looking starPies. When constructing such a matrix, it is necessary for ‘maxval’ to be specified, usually as the overall maximum value in any of the attribute value vectors. If ‘maxval’ is not specified in such a situation, only the relative values within each vector will determine the radial extents of each starPie. There appears to be no reason to have different sector colors for different objects, but the user can display more than one set of starPies on a plot with different sector colors if necessary.

‘starPie’ calls ‘getYmult’ to automatically adjust for both the aspect and coordinate ratio of the plot.
Description
Places labels on an axis in a regular staggered order or at an angle

Usage
```r
staxlab(side=1, at, labels, pos=NA, nlines=2, top.line=0.5, line.spacing=0.8, srt=NA, ticklen=0.03, adj=1,...)
```

Arguments
- **side**: axis on which to place the labels, as in ‘axis’
- **at**: where to place the labels in user units, as in ‘axis’
- **labels**: text strings
- **pos**: Position to place the axis as in ‘axis’
- **nlines**: How many lines to use to stagger the labels.
- **top.line**: Distance from the axis to place the first line of text.
line.spacing Spacing between lines of text labels.
srt Text rotation.
ticklen Proportion of plot height in user units to place text below the plot.
adj horizontal adjustment of the labels.
... Additional arguments to be passed to 'mtext' or 'text'.

Value

nil

Note

This function is mainly useful when either long axis labels or a large number of labels are to be placed without overlapping. It staggers the labels along the axis specified. The user may wish to increase the space beneath the plot using 'mar' before calling 'staxlab'. It is probably only useful on the bottom or left side of the plot.

If 'srt' is not NA, the labels will be rotated 'srt' degrees and placed below the plot. This method will only place labels at the bottom. Note that this option only works on the lower and left axes.

Author(s)

Jim Lemon (thanks to Tim Elwell-Sutton for the log axis fix)

See Also

mtext

Examples

x <- rnorm(12)
plot(x, axes=FALSE)
box()
months <- c("January", "February", "March", "April", "May", "June",
"July", "August", "September", "October", "November", "December")
staxlab(1, 1:12, months)
plot(x, axes=FALSE)
box()
staxlab(1, 1:12, months, srt=45)
ylabels <- round(seq(min(x), max(x), length.out=10), 3)
staxlab(2, ylabels, ylabels, srt=45)
\textit{std.error} \hspace{1cm} \textit{Calculate standard error of the mean}

\textbf{Description}

Calculates the standard error of the mean.

\textbf{Usage}

\begin{verbatim}
    std.error(x, na.rm)
\end{verbatim}

\textbf{Arguments}

\begin{itemize}
    \item \texttt{x} \hspace{1cm} A vector of numerical observations.
    \item \texttt{na.rm} \hspace{1cm} Dummy argument to match other functions.
\end{itemize}

\textbf{Details}

`\texttt{std.error}` will accept a numeric vector.

\textbf{Value}

The conventional standard error of the mean $= \frac{\text{sd}(x)}{\sqrt{\text{sum}(\text{!is.na}(x))}}$

\textbf{Author(s)}

Jim Lemon

\textbf{See Also}

\texttt{sd}

---

\textit{sumbrk} \hspace{1cm} \textit{Count specified values in a vector}

\textbf{Description}

Counts the number of values in a vector that are equal to a specified value.

\textbf{Usage}

\begin{verbatim}
    sumbrk(x, trueval=TRUE, na.rm=TRUE)
\end{verbatim}
Arguments

- `x` a character, factor or numeric vector.
- `trueval` the value to be matched in `x`.
- `na.rm` whether to remove NA values.

Details

`sumbrk` counts the values in `x` matching a specified value. It is mainly to allow these sums to be calculated in the `brkdNest` function.

Value

`nil`

Author(s)

Jim Lemon

See Also

`brkdNest`

Examples

```r
sumbrk(sample(LETTERS, 100, TRUE), trueval = "M")
```

---

**sumDendrite**

*Sum the counts in the top level of a dendrite object*

Description

Find the sum of the counts that are the first elements of each list in the top level of a dendrite object.

Usage

```r
sumDendrite(x)
```

Arguments

- `x` A list with a numeric value as the first element in each of its toplevel elements.

Details

A `dendrite` object is a possibly nested list of lists that contain the counts and pointers to sublists in each list. Such an object describes the attributes of objects that can take on mutually exclusive attributes (that is, belong to disjunct sets). `sumDendrite` is a convenience function to get the total number of objects that are so classified.
**Value**

The sum of the counts in the top level of lists.

**Author(s)**

Jim Lemon

**See Also**

plot.dendrite

---

### Description

Produces a barplot where each piece of the barplot is filled with the number of symbols equal to the size of the bar.

### Usage

```r
symbolbarplot(height, width=1, space=NULL, names.arg=NULL, legend.text=NULL, beside=FALSE, horiz=FALSE, col=heat.colors(NR), border=par("fg"), main=NULL, sub=NULL, xlab=NULL, ylab=NULL, xlim=NULL, ylim=NULL, axes=TRUE, axisnames=TRUE, inside=TRUE, plot=TRUE, rel.width=0.8, symbol="circles", symbbox=TRUE, debug=FALSE,...)
```

### Arguments

- **height**: numeric vector or matrix of barplot heights
- **width**: width of bars
- **space**: space between bars
- **names.arg**: vector of names
- **legend.text**: vector of legend text
- **beside**: (logical) plot bars beside each other?
- **horiz**: (logical) horizontal barplot?
- **col**: vector of colors
- **border**: plot border?
- **main**: main title
- **sub**: subtitle
- **xlab**: x axis label
- **ylab**: y axis label
- **xlim**: x limits
symbolbox

ylim y limits
axes draw axes?
axisnames label horizontal axis?
inside draw lines dividing adjacent bars?
plot produce plot?
rel.width relative width of symbols
symbol which symbol to use
symbbox draw boxes for symbol boxes?
debug debug output?
... further arguments to multisymbolbox

Value
Nil

Note
This is a mostly a hack of barplot()

Author(s)
Ben Bolker

Examples

set.seed(1001)
bvals <- matrix(rpois(12,20),nrow=3)
b <- symbolbarplot(bvals)

symbolbox x1,y1,x2,y2,tot,relw=0.5,fg=par("fg"),bg=par("bg"),box=TRUE,
derug = TRUE,...)

Draw a box filled with symbols

Description

Draws a box on the current figure that is filled with symbols representing individual counts

Usage

symbolbox(x1,y1,x2,y2,tot,relw=0.5,fg=par("fg"),bg=par("bg"),box=TRUE,
derug = TRUE,...)
symbolbox

Arguments

x1  left side of box
y1  bottom side of box
x2  right side of box
y2  top side of box
tot total number of symbols to put in the box
relw relative width (relative to height) of symbols
fg  foreground color
bg  background color
box (logical) draw box border?
d debug debug output?
... additional arguments to polygon() for drawing box

Details

tries to automatically figure out appropriate scaling to fit symbols into the box

Value

none; draws on the current figure

Author(s)

Ben Bolker

See Also

multsymbolbox

Examples

plot(1:10,1:10,type="n")
symbolbox(2,5,3,7,tot=20)
symbolbox(6,2,10,6,tot=50,fg="blue",bg="magenta")
**tab.title**  
Display the title of a plot as a colored tab

### Description
Display the title of a plot as a colored tab.

### Usage
```r
tab.title(label, text.col=par("fg"), tab.col=par("bg"), border=par("fg"), lwd=par("lwd"), cex=1.5, pad.mult=1.6, radius=0)
```

### Arguments
- `label`  
The title for the plot.
- `text.col`  
The color for the title text.
- `tab.col`  
The color for the tab fill.
- `border`  
The color for the tab border.
- `lwd`  
The line width for the border.
- `cex`  
Character expansion for the title.
- `pad.mult`  
How much higher to make the tab relative to the label.
- `radius`  
What proportion of the tab corners to round off.

### Details
'`tab.title`' displays the plot title in a colored tab. The tab can be rounded at the upper corners by specifying the proportion of the tab height to be rounded as a number between 0 and 1. If the tab is too high to fit on the figure region, a warning will be displayed and the tab will still be shown.

### Value
`nil`

### Author(s)
Jim Lemon

### See Also
`polygon`

### Examples
```r
testx<-matrix(cumsum(rnorm(30)^2)+1,nrow=10)  
stackpoly(testx,main="", xaxlab=c("One","Two","Three","Four","Five", "Six","Seven","Eight","Nine","Ten"),stax=TRUE)  
tab.title("Three Squiggly Lines",tab.col="yellow",radius=0.5)
```
taylor.diagram

Taylor diagram

Description

Display a Taylor diagram

Usage

taylor.diagram(ref, model, add=FALSE, col="red", pch=19, pos.cor=TRUE,
  xlab="", ylab="", main="Taylor Diagram", show.gamma=TRUE, ngamma=3,
  gamma.col=8, sd.arcs=0, ref.sd=FALSE, sd.method="sample",
  grad.corr.lines=c(0.2, 0.4, 0.6, 0.8, 0.9),
  pcex=1, cex.axis=1, normalize=FALSE, mar=c(5, 4, 6, 6), ...)

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ref</td>
<td>numeric vector - the reference values.</td>
</tr>
<tr>
<td>model</td>
<td>numeric vector - the predicted model values.</td>
</tr>
<tr>
<td>add</td>
<td>whether to draw the diagram or just add a point.</td>
</tr>
<tr>
<td>col</td>
<td>the color for the points displayed.</td>
</tr>
<tr>
<td>pch</td>
<td>the type of point to display.</td>
</tr>
<tr>
<td>pos.cor</td>
<td>whether to display only positive ('TRUE') or all values of correlation ('FALSE').</td>
</tr>
<tr>
<td>xlab, ylab</td>
<td>plot axis labels.</td>
</tr>
<tr>
<td>main</td>
<td>title for the plot.</td>
</tr>
<tr>
<td>show.gamma</td>
<td>whether to display standard deviation arcs around the reference point (only for 'pos.cor=TRUE').</td>
</tr>
<tr>
<td>ngamma</td>
<td>the number of gammas to display (default=3).</td>
</tr>
<tr>
<td>gamma.col</td>
<td>color to use for the gamma arcs (only with pos.cor=TRUE).</td>
</tr>
<tr>
<td>sd.arcs</td>
<td>whether to display arcs along the standard deviation axes (see Details).</td>
</tr>
<tr>
<td>ref.sd</td>
<td>whether to display the arc representing the reference standard deviation.</td>
</tr>
<tr>
<td>sd.method</td>
<td>Whether to calculate the sample or population standard deviation.</td>
</tr>
<tr>
<td>grad.corr.lines</td>
<td>the values for the radial lines for correlation values (see Details).</td>
</tr>
<tr>
<td>pcex</td>
<td>character expansion for the plotted points.</td>
</tr>
<tr>
<td>cex.axis</td>
<td>character expansion for the axis text.</td>
</tr>
<tr>
<td>normalize</td>
<td>whether to normalize the models so that the reference has a standard deviation of 1.</td>
</tr>
<tr>
<td>mar</td>
<td>margins - only applies to the ‘pos.cor=TRUE’ plot.</td>
</tr>
<tr>
<td>...</td>
<td>Additional arguments passed to ‘plot’.</td>
</tr>
</tbody>
</table>
Details

The Taylor diagram is used to display the quality of model predictions against the reference values, typically direct observations.

A diagram is built by plotting one model against the reference, then adding alternative model points. If ‘normalize=TRUE’ when plotting the first model, remember to set it to ‘TRUE’ when plotting additional models.

Two displays are available. One displays the entire range of correlations from -1 to 1. Setting ‘pos.cor’ to ‘FALSE’ will produce this display. The -1 to 1 display includes a radial grid for the correlation values. When ‘pos.cor’ is set to ‘TRUE’, only the range from 0 to 1 will be displayed. The ‘gamma’ lines and the arc at the reference standard deviation are optional in this display.

Both the standard deviation arcs and the gamma lines are optional in the ‘pos.cor=TRUE’ version. Setting ‘sd.arcs’ or ‘grad.corr.lines’ to zero or FALSE will cause them not to be displayed. If more than one value is passed for ‘sd.arcs’, the function will try to use the values passed, otherwise it will call ‘pretty’ to calculate the values.

Value

The values of ‘par’ that preceded the function. This allows the user to add points to the diagram, then restore the original values. This is only necessary when using the 0 to 1 correlation range.

Author(s)

Olivier Eterradossi with modifications by Jim Lemon

References


Examples

```r
# fake some reference data
ref<-rnorm(30,sd=2)
# add a little noise
model1<-ref+rnorm(30)/2
# add more noise
model2<-ref+rnorm(30)
# display the diagram with the better model
oldpar<-taylor.diagram(ref,model1)
# now add the worse model
taylor.diagram(ref,model2,add=TRUE,col="blue")
# get approximate legend position
lpos<-1.5*sd(ref)
# add a legend
legend(lpos,lpos,legend=c("Better","Worse"),pch=19,col=c("red","blue"))
# now restore par values
par(oldpar)
# show the "all correlation" display
taylor.diagram(ref,model1,pos.cor=FALSE)
taylor.diagram(ref,model2,add=TRUE,col="blue")
```
**Description**

Add text to plot, justified, in a box

**Usage**

```r
textbox(x, y, textlist, justify=c('l','c','r'), cex=1, leading=0.5, box=TRUE, adj=c(0,0), font=NULL, vfont=NULL, col=NULL, border=NULL, fill=NA, density=NULL, angle=45, lty=par("lty"), lwd=par("lwd"), margin=0)
```

**Arguments**

- `x` x position: a vector with min. and max. x-position
- `y` y position: location of the top of the box
- `textlist` a vector of text strings
- `justify` x alignment: 'l'=left, 'c'=center, 'r'=right.
- `cex` character expansion
- `leading` inter-line spacing
- `box` whether to draw a box around the text
- `adj` adjustment for x and y position, default is no adjustment, see Details
- `font` text font, see Details
- `vfont` text font, see Details
- `col` text color
- `border` box border color
- `fill` box fill color
- `density` box shading line density, see Details
- `angle` box shading line angle, see Details
- `lty` box border and shading line types, see Details
- `lwd` box border and shading line width, see Details
- `margin` amount to adjust box border in or out. See Details

**Details**

Draws text in the box by pasting the textlist vector together, splitting it into words, and then adding words to the current line until the line is wide enough before moving on to the next line.

'margin' may be a vector of 1, 2, or 4 values, corresponding to adjustment of all borders (1 value), top/bottom and left/right borders (2 values), or bottom/left/top/right borders (4 values). A positive value moves text inwards from specified (x,y) position with border remaining at (x,y), and a negative value moves the border outwards from (x,y) with the text remaining at (x,y).
The ‘density’ and ‘angle’ arguments have the same behavior as in the ‘rect’ function. The ‘adj’, ‘font’ and ‘vfont’ arguments have the same behavior as in the ‘text’ function. The ‘lty’ and ‘lwd’ arguments have the same behavior as in the ‘lines’ function.

Value

y-position of bottom line of box, or y-position of next line if there is no box.

Author(s)

Ben Bolker. Improvements by Ted Toal.

Examples

```r
plot.new()
textbox(c(0, 0.2), 1, c("many words", "more words", "why not?", 
  "keep going", rep("and going", 10)))
textbox(c(0.3, 0.5), 1, c("keep going", rep("and going", 10)), cex=0.45, 
  col="blue", border="red", fill="#00FFEE80", density=25, angle=60)
textbox(c(0.6, 0.8), 1, c("keep going", rep("and going", 10)), justify='c', cex=0.6, 
  leading=1, font=4, border="gold", lty=2, lwd=4, margin=0.025)
textbox(c(0.6, 0.8), 0.5, c("keep going", rep("and going", 10)), justify='r', cex=0.7, 
  col="purple", font=3, border="green", margin=-0.025)
lines(c(0,1), c(1,1), col="red", lty=2)
lines(c(0,1), c(0.5,0.5), col="red", lty=2)
```

thigmophobe

Find the direction away from the closest point

Description

Find the direction away from the closest point

Usage

`thigmophobe(x, y)`

Arguments

- `x, y` Numeric data vectors. Typically the x/y coordinates of plotted points. If arrays are passed, they will be silently coerced to numeric vectors.

Details

‘thigmophobe’ returns the direction (as 1|2|3|4 - see pos= in ‘text’) away from the nearest point to each of the points described by ‘x’ and ‘y’.

Value

A vector of directions away from the point nearest to each point.
Note

‘thigmophobe’ is typically used to get the offset to automatically place labels on a scatterplot or similar using ‘thigmophobe.labels’ to avoid overlapping labels. The name means "one who fears being touched".

Author(s)

Jim Lemon - thanks to Gustaf Rydevik for the "names" bug fix and to Steve Ellison for the suggestion about arrays.

See Also

thigmophobe.labels

Examples

x <- rnorm(10)
y <- rnorm(10)
thonmophobe(x, y)

---------

thigmophobe.labels       Place labels away from the nearest point
-------------------------

Description

‘thigmophobe.labels’ places labels adjacent to each point, offsetting each label in the direction returned by ‘thigmophobe’.

Usage

thigmophobe.labels(x, y, labels=NULL, text.pos=NULL,...)

Arguments

  x, y             Numeric data vectors or a list with two components. Typically the x/y coordinates of plotted points.
  labels          A vector of strings that will be placed adjacent to each point. Defaults to the indices of the coordinates.
  text.pos        An optional vector of text positions (see text).
  ...             additional arguments are passed to 'text'.


Details

Typically used to automatically place labels on a scatterplot or similar to avoid overlapping labels. ‘thigmophobe.labels’ will sometimes place a label off the plot or fail to separate labels in clusters of points. The user can manually adjust the errant labels by running ‘thigmophobe’ first and saving the returned vector. Then modify the position values to place the labels properly and pass the edited vector to ‘thigmophobe.labels’ as the ‘text.pos’ argument. This takes precedence over the positions calculated by ‘thigmophobe’.

‘thigmophobe’ will fail with only two labels, as it can’t figure out the nearest neighbors. If you really want to use this with two labels, just eyeball the plot and work out in which direction the labels will go. Then pass the directions to ‘thigmophobe.labels’ as the ‘text.pos’ argument.

Both ‘pointLabel’ in the maptools package and ‘spread.labs’ in the TeachingDemos package use more sophisticated algorithms to place the labels and are worth a try if ‘thigmophobe’ just won’t get it right.

Value

A list of the x and y positions of the labels is returned invisibly.

Author(s)

Jim Lemon (thanks to Stephen Milborrow for finding the single point bug, Erik Aronesty for finding the two point problem and Vincent Bonhomme for suggesting the return value.)

See Also

thigmophobe, text

Examples

```r
x<-rnorm(20)
y<-rnorm(20)
xlim<-range(x)
xspace<-(xlim[2]-xlim[1])/20
ylim<-range(y)
yspace<-(ylim[2]-ylim[1])/20
plotlabels<-
c("one","two","three","four","five","six","seven","eight","nine","ten","eleven","twelve","thirteen","fourteen","fifteen","sixteen","seventeen","eighteen","nineteen","twenty")
plot(x=x,y=y,xlim=xlim,ylim=ylim,main="Test thigmophobe.labels")
# skip the almost invisible yellow label, make them bold
thigmophobe.labels(x,y,plotlabels,col=c(2:6,8:12),font=2)
```
Description

Display lines on a triangle plot.

Usage

triax.abline(b=NULL, r=NULL, l=NULL, col=par("col"), lty=par("lty"), cc.axes=FALSE)

Arguments

- **b**: Lines relating to the bottom axis.
- **r**: Lines relating to the right axis.
- **l**: Lines relating to the left axis.
- **col**: Color(s) of the lines.
- **lty**: Type(s) of the lines.
- **cc.axes**: Clockwise/counterclockwise axes and ticks.

Details

`triax.abline` displays one or more lines on a triangle plot. Lines are oriented in the conventional way, horizontal for the left axis, slanting up to the right for the right axis and up to the left for the bottom axis. If `cc.axes` is TRUE, the orientation is up-left for the left axis, horizontal for the right axis and up-right for the bottom axis.

Remember to call `triax.plot` with `no.add=FALSE` and restore the graphics parameters as in the example or the lines will not be placed properly.

Value

nil

Author(s)

Jim Lemon

See Also

*triax.plot*
triax.fill

Triangle plot fill

Description
Fill a triangle plot with smaller triangles.

Usage
triax.fill(col)

Arguments
col List of colors (see Details).

Details
In order for ‘triax.fill’ to fill an existing plot that has been created by a call to ‘triax.plot’, the user must supply a list of fill colors. The first element of the list must begin with at least one value that can be interpreted as a color. The second element must begin with at least three such values, and so on, adding two values for each element of the list. Each list element will be displayed as a row of colored triangles starting at the top of the plot. The number of elements in the list determines the number of rows that will be displayed.

Value
nil

Author(s)
Jim Lemon

See Also
triax.plot,color.scale
Examples

# the data will be something like response at different proportions
fillval <- list(0, c(0, 0.1, 0, c(0, 0.1, 0.2, 0.1, 0),
    c(0, 0.1, 0.2, 0.3, 0.2, 0.1, 0),
    c(0, 0.1, 0.2, 0.3, 0.4, 0.3, 0.2, 0.1, 0),
    c(0, 0, 0.1, 0.2, 0.3, 0.4, 0.3, 0.2, 0.1, 0, 0),
    c(0, 0, 0.1, 0.1, 0.2, 0.3, 0.4, 0.3, 0.2, 0.1, 0, 0, 0))
# use some method of converting values to colors
fillcol <- sapply(fillval, function(x) {x * 10 + 1})
oldpar <- triax.plot(main = "Test of triax.fill function")
triax.fill(fillcol)
par(oldpar)

triax.frame

Triangle plot frame

Description

Display a three axis frame with optional grid.

Usage

triax.frame(at = seq(0.1, 0.9, by = 0.1), axis.labels = NULL,
    tick.labels = NULL, col.axis = "black", cex.axis = 1, cex.ticks = 1,
    align.labels = TRUE, show.grid = FALSE, col.grid = "gray", lty.grid = par("lty"),
    cc.axes = FALSE)

Arguments

at  The tick positions on the three axes.
axis.labels  Labels for the three axes in the order bottom, right left. Defaults to the column names.
tick.labels  The tick labels for the axes. Defaults to argument ‘at’ (proportions).
col.axis  Color of the triangular axes, ticks and labels.
cex.axis  Character expansion for axis labels.
cex.ticks  Character expansion for the tick labels.
align.labels  Logical - whether to align axis and tick labels with the axes.
show.grid  Whether to display grid lines at the ticks.
col.grid  Color of the grid lines. Defaults to gray.
lty.grid  Type of line for the grid.
cc.axes  Whether to align the axes clockwise or counterclockwise.
Details
‘triax.frame’ displays a triangular plot area on which proportions or percentages may be displayed. An optional grid may also be displayed. If ‘cc.axes’ is TRUE, both the axes and axis ticks will be in reverse order.

Value
nil

Author(s)
Jim Lemon

See Also
triax.points, triax.abline, triax.fill

Examples
triax.plot(main="DEFAULT")
triax.plot(main="Clockwise axes", cc.axes=TRUE)

Description
Display a triangle plot with optional grid.

Usage
triax.plot(x=NULL, main="", at=seq(0.1, 0.9, by=0.1),
          axis.labels=NULL, tick.labels=NULL, col.axis="black",
          cex.axis=1, cex.ticks=1, align.labels=TRUE, show.grid=FALSE,
          col.grid="gray", lty.grid=par("lty"),
          cc.axes=FALSE, show.legend=FALSE, label.points=FALSE,
          point.labels=NULL, col.symbols="black", pch=par("pch"),
          mar=c(5,2,4,2), no.add=TRUE,...)

Arguments
x Matrix where each row is three proportions or percentages that must sum to 1 or 100 respectively.
main The title of the triangle plot. Defaults to nothing.
at The tick positions on the three axes.
axis.labels Labels for the three axes in the order left, right, bottom. Defaults to the column names.
tick.labels The tick labels for the three axes as a list with three components l, r and b (left, right and bottom). Defaults to argument ‘at’ (proportions).
col.axis     Color of the triangular axes, ticks and labels.
cex.axis     Character expansion for axis labels.
cex.ticks    Character expansion for the tick labels.
align.labels Logical - whether to align axis and tick labels with the axes.
show.grid   Whether to display grid lines at the ticks.
col.grid     Color of the grid lines. Defaults to gray.
lty.grid     Type of line for the grid.
cc.axes      Whether axes and axis ticks should be clockwise or counterclockwise.
show.legend Logical - whether to display a legend.
label.points Logical - whether to call 'thigmophobe.labels' to label the points.
point.labels Optional labels for the points and/or legend.
col.symbols  Color of the symbols representing each value.
pch          Symbols to use in plotting values.
mar          Margins for the triangle plot.
no.add       Whether to restore the previous plotting parameters ('TRUE') or leave them, allowing more points to be added.
...          Additional arguments passed to 'points'.

Details

'triax.plot' displays a triangular plot area on which proportions or percentages are displayed. A grid or legend may also be displayed.

Value

A list containing 'xypos' (the 'x,y' positions plotted) and 'oldpar' (the plotting parameters at the time 'triax.plot' was called).

Note

A three axis plot can only properly display one or more sets of three proportions that each sum to 1 (or percentages that sum to 100). Other values may be scaled to proportions (or percentages), but unless each set of three sums to 1 (or 100), they will not plot properly and 'triax.points' will complain appropriately. Note also that 'triax.plot' will only display properly in a square plot, which is forced by 'par(pty="s")'.

In case the user does want to plot values with different sums, the axis tick labels can be set to different ranges to accommodate this. 'triax.points' will still complain, but it will plot the values.

If planning to add points with 'triax.points' call 'triax.plot' with 'no.add=FALSE' and restore plotting parameters after the points are added.

Author(s)

Jim Lemon - thanks to Ben Daughtry for the info on counterclockwise axes.
### triax.points

**Description**

Display points on a triangle plot.

#### Usage

```r
triax.points(x, show.legend=FALSE, label.points=FALSE, point.labels=NULL, col.symbols=par("fg"), pch=par("pch"), bg.symbols=par("bg"), cc.axes=FALSE, ...)```

#### Arguments

- **x**: Matrix or data frame where each row is three proportions or percentages that must sum to 1 or 100 respectively.
- **show.legend**: Logical - whether to display a legend.
- **label.points**: Logical - whether to call `thigmophobe.labels` to label the points.
- **point.labels**: Optional labels for the points and/or legend.
- **col.symbols**: Color of the symbols representing each value.
- **pch**: Symbols to use in plotting values.
- **bg.symbols**: Background color for plotting symbols.
- **cc.axes**: Clockwise or counterclockwise axes and ticks.
- **...**: Additional arguments passed to `points`.

### Examples

```r
data(Hsoils)
triax.plot(Hsoils[1:10,], main="DEFAULT")
triax.plot(Hsoils[1:10,], main="PERCENTAGES (Counterclockwise axes)",
  tick.labels=list(l=seq(0,90,by=10),r=seq(10,90,by=10),b=seq(10,90,by=10)),
  pch=3, cc.axes=TRUE)
tria.return<-triax.plot(Hsoils[1:6,], main="GRID AND LEGEND",
  show.grid=TRUE, show.legend=TRUE, col.symbols=1:6, pch=4)
# triax.plot changes a few parameters
triax.return$oldpar
```

---

**See Also**

`triax.points`, `triax.abline`, `thigmophobe.labels`
tsxpos

Details

In order for `triax.points` to add points to an existing plot, the argument `no.add` in the initial call to `triax.plot` must be set to `FALSE`. Failing to do this will result in the points being plotted in the wrong places. It is then up to the user to call `par` as in the example below to restore plotting parameters altered during the triangle plot.

`triax.points` displays each triplet of proportions or percentages as a symbol on the triangle plot. Unless each triplet sums to 1 (or 100), they will not plot properly and `triax.points` will complain appropriately.

Value

A list of the ‘x, y’ positions plotted.

Author(s)

Jim Lemon

See Also

`triax.plot,thigmophobe.labels`

Examples

```r
data(soils)
triax.return<-triax.plot(soils[1:10],
    main="Adding points to a triangle plot",no.add=FALSE)
triax.points(soils[11:20],col.symbols="green",pch=3)
par(triax.return$oldpar)
```

tsxpos

*Calculate equispaced x positions.*

Description

Calculate equispaced x positions of values that have been plotted with the plot command.

Usage

```
tsxpos(x,xlim,nint)
```

Arguments

- **x**
  - A vector of numeric values or a time series object created with the `ts` function.
- **xlim**
  - Explicit x limits for the x positions.
- **nint**
  - The number of *intervals* between x positions.
Details

`tsxpos` calculates equispaced x positions for a vector of values or a time series created with the `ts` command from the `stats` package. It assumes that the default x limits have been used in the existing plot. It adds the appropriate padding if `par("xaxs")` is "r". It is mainly useful when x axis labels or some other markers are to be added to a time series plot.

A plot device must be open. If the user wishes to specify explicit x limits or the number of intervals (not values), these will override the calculations from the x values.

Value

The calculated x positions in user units.

Author(s)

Jim Lemon (thanks to Prof J.C. Nash for the idea)

Examples

```r
# create a vector of numbers
y<-rnorm(28)
par(mfrow=c(2,1),mar=c(6,4,4,2))
plot(y,main="Plot of the values")
# convert it into a time series object
yt<ts(y,start=2011,frequency=12)
# don't use the default axis
plot(yt,main="Plot of the time series",xaxt="n",xlab="Month")
labelpos<-tsxpos(yt)
# display an axis showing the months only
staxlab(1,labelpos,rep(month.abb,length.out=28))
par(mfrow=c(1,1),mar=c(5,4,4,2))
```

Description

Two sets of values are displayed on the same plot with different ordinate scales on the left and right.

Usage

```r
twoord.plot(lx,ly,rx,ry,data=NULL,main="",xlim=NULL,ylim=NULL,rylim=NULL,mar=c(5,4,4,4),lcol=1,rcol=2,xlab="",ylab="",ylab.at=NA,rytickpos=NA,ylab="",ylab.at=NA,rytickpos=NA,ylab="",ylab.at=NA,lpch=1,rpch=2,type="b",xtickpos=NULL,xticklab=NULL,halfwidth=0.4,axislab.cex=1,do.first=NULL,...)
```
Arguments

- \texttt{lx, ly, rx, ry}: y and optional x values for the plot.
- \texttt{data}: an optional data frame from which to obtain the above values.
- \texttt{main}: Title for the plot.
- \texttt{xlim}: optional x limits as in \texttt{plot}
- \texttt{ylim, rylim}: optional y limits for the left and right axes respectively.
- \texttt{mar}: optional margin adjustment, defaults to \texttt{c(5, 4, 4, 4)}.
- \texttt{lcol, rcol}: colors to distinguish the two sets of values.
- \texttt{xlab}: X axis label as in \texttt{plot’}
- \texttt{lytickpos}: Optional positions for the left axis tick labels.
- \texttt{ylab}: Left Y axis label as in \texttt{plot’}
- \texttt{ylab.at}: Optional position for the left Y axis label.
- \texttt{rytickpos}: Optional positions for the right axis tick labels.
- \texttt{rylab}: Right Y axis label.
- \texttt{rylab.at}: Optional position for the right Y axis label.
- \texttt{lpch, rpch}: plot symbols to distinguish the two sets of values.
- \texttt{type}: as in \texttt{plot’}
- \texttt{xtickpos}: Optional positions for x-axis tick labels.
- \texttt{xticklab}: Optional labels for x-axis. Useful for things like dates.
- \texttt{halfwidth}: Half the width of the bars in user units. The bars are centered on successive integers if no ‘x’ values are supplied.
- \texttt{axislab.cex}: Character expansion for the axis labels and tick labels.
- \texttt{do.first}: Optional command(s) that will be executed immediately after the blank plot is displayed.
- \texttt{...}: additional arguments passed to \texttt{plot’} and \texttt{points’}.

Details

\texttt{twoord.plot} automates the process of displaying two sets of values that have different ranges on the same plot. It is principally useful in illustrating some relationship between the values across the observations. It is assumed that the \texttt{lx} and \texttt{rx} values are at least adjacent, and probably overlapping.

It is best to pass all the arguments \texttt{lx, ly, rx, ry}, but the function will attempt to substitute sensible x values if one or two are missing.

If at least one of the ‘type’ arguments is “bar”, bars will be plotted instead of points or lines. It is best to plot the bars first (i.e. relative to the left axis) if the other type is points or lines, as the bars will usually obscure at least some of the points or lines. Using \texttt{NA} for the color of the bars will partially correct this. If both types are to be bars, remember to pass somewhat different x values or the bars will be overplotted.

Note that more values can be added to the plot using ‘points’ or ‘lines’, but remember that these will be plotted relative to the left ordinate.

The ‘do.first’ argument is useful for adding a background color or grid to the plot as shown in the first two examples.
Note

There are many objections to the use of plots with two different ordinate scales, and some of them are even sensible and supported by controlled observation. Many of the objections rest on assertions that the spatial arrangement of the values plotted will override all other evidence. Here are two:

The viewer will assume that the vertical position of the data points indicates a quantitative relationship.

To some extent. It is probably not a good idea to have the spatial relationship of the points opposed to their numerical relationship. That is to say, if one set of values is in the range of 0-10 and the other 20-100, it is best to arrange the plot so that the latter values are not plotted below the former. See the second example, which illustrates a method for separating the two series and offsetting the axes.

The viewer will assume that an intersection of lines indicates an intersection of values.

If the visual elements representing values can be arranged to avoid intersections, so much the better. Many people have no trouble distinguishing which visual elements are linked to which axis as long as they are both coded similarly, usually with colors and/or symbols. In the special case where there is an underlying relationship between the two such as the probability of that value occurring under some conditions, it may help to mark the point(s) where this occurs.

It may be useful to consider ‘gap.plot’ or separate plots as an alternative.

Author(s)

Jim Lemon (thanks to Christophe Dutang for the idea of using bars and lines in the same plot, Clair Crossupton for pointing out that dates on the x-axis weren’t very good, Jacob Kasper for the axis character expansion and Ye Lin for finally motivating me to add the do.first argument.)

See Also

plot

Examples

going_up<-seq(3,7,by=0.5)+rnorm(9)
going_down<-rev(60:74)+rnorm(15)
twoord.plot(2:10,going_up,1:15,going_down,xlab="Sequence",
    ylab="Ascending values",rylab="Descending values",lcol=4,
    main="Plot with two ordinates - points and lines",
    do.first="plot_bg()";grid(col="white",lty=1)
)
# now separate the lines
	woord.plot(2:10,going_up,1:15,going_down,xlab="Sequence",
    ylim=range(going_up)+c(-1,10),rylim=range(going_down)+c(-10,2),
    ylab="Ascending values",ylab.at=5,rylab="Descending values",
    rylim=seq(55,75,by=5),main="Plot with two ordinates - separated lines",
    ltypos=seq(3:7),lytickpos=seq(55,75,by=5),
    do.first="plot_bg()";grid(col="white",lty=1)"
twoord.stackplot

Multiple (stack) plot with two ordinates

description

two ord.plot(2:10, going_up, 1:15, going_down, xlab="Sequence",
lylim=range(gomg_up)+c(-1,10), rylim=range(gomg_down)+c(-10,2),
type="c("bar","1"), ylab="Ascending values", ylab.at=5,
rylab="Descending values", rylab.at=65,
main="Bars on left axis, lines on right axis",
lytickpos=3:7, rytickpos=seq(55,75,by=5),
ncol=3, rncol=4, do.first="plot_bg()"
)
twoord.plot(2:10, going_up, 1:15, going_down, xlab="Sequence",
lylim=5:8, rylim=50:100, type="c("1","bar")",
lylab="Ascending values", rylab="Descending values",
lytickpos=3:7, rytickpos=seq(55,75,by=5), ylab.at=5, rylab.at=65,
main="Lines on left axis, bars on right axis",
ncol=3, rncol=4, do.first="plot_bg("yellow")")
x1<as.Date(paste(2014,10,c(2,10,15,20,23,28),sep=""))
x2<as.Date(paste(2014,10,c(5,8,16,22,25,29),sep=""))
y1<-sample(1:10,6)
y2<-sample(1:10,6)
datepos<pretty(c(x1,x2))
twoord.plot(x1,y1,x2,y2,type="b",main="X axis dates",
xtickpos=as.numeric(datepos),
xticklab=as.character(datepos))
# histogram with density curve superimposed
xhist<-hist(rnorm(1000),plot=FALSE)
xdens<-dnorm(seq(-3.3,by=0.05))
twoord.plot(xhist$mids, xhist$counts, seq(-3.3,by=0.05),
xdens,type="c("bar","1"),lcol=4, rcol=2, ylab="Counts",
rylab="Density",main="Histogram and density curve",
halfwidth=0.2, lylim=c(0,max(xhist$counts)+1), rylim=c(0,0.45), lwd=2)

Arguments

lx,r
ldata, rdata x-values for left/right data.
data on the left/right y-axes.
ncol, rcol colors to be used for left/right data.
lytype, rtype line types to be used for left/right data, see details.
border  color for the border of barplot
rylab, lylab labels for the left/right y-axes.
xlab labels for the x-axis.
... further arguments to be passed to `plot`.
incrylim a number to increase the limits of y-axes.
halfwidth half the width of the bars in user units. The bars are centered on successive integers if no x values are supplied
leftfront if ‘TRUE’, plot the left data on the front layer.
mar optional margin adjustment, defaults to c(5,4,4,4).

Details
‘twoord.stackplot’ works in the same way as ‘twoord.plot’ on which it is heavily inspired. The functions let the user plot multiple curve/point or bar plots on the same graph with two different axes. The line type can be one of the following “l” for lines, “p” for points, “b” for both points and line, “o” for overplotted, “bar” for barplot.

Value
nil

Author(s)
Christophe Dutang

See Also
twoord.plot

Examples

```r
# plot data
#

time <- 0:25
A <- 1+1/2*sin(time/2)
B <- A + rnorm(length(A), sd=1/10)
B <- B + rnorm(length(A), sd=1/10)

sizeA <- floor(450*(1 + 1/4*sin(time/2+2))*(1+.1))
sizeB <- 1000-sizeA

C <- (A*sizeA + B*sizeB)/(sizeA+sizeB)
```

# typical usage
#
valid.n  

Find the number of valid (not NA) values

Description

Finds the number of valid (not NA) or total values in an object.

Usage

valid.n(x, na.rm=TRUE)

Arguments

x  An object.
na.rm  Whether to count all values (FALSE) or only those not NA.

Details

‘valid.n’ finds the number of valid values of the object if ‘na.rm=TRUE’.
Value

The number of valid values or the length of the object.

Author(s)

Jim Lemon

---

vectorField

Display magnitude/direction vectors

Description

Display magnitude/direction vectors as arrows on an existing plot.

Usage

vectorField(u,v,xpos=NA,ypos=NA,scale=1,headspan=0.1,
vecspec=c("lonlat","rad","deg"),col=par("fg"))

Arguments

u,v x (longitude) and y (latitude) offsets OR orientation and magnitude in either radians or degrees. See details.
xpos,ypos The centers of the vectors in user units.
scale The proportion of each cell that the maximal vector will fill. See details.
headspan The extent of the heads of the arrows as a proportion of cell size.
vecspec How the vectors are described. See details
col Color(s) for the arrows.

Details

‘vectorField’ displays arrows on an existing plot. Each arrow is specified by a position on the plot ‘xpos,ypos’ and either x/y offsets or orientation and magnitude. The default is x/y offsets, and the user must specify whether radians or degrees are used if the orientation/magnitude option is used. If the first four arguments are matrices, there must be no missing values. If these arguments are vectors, the calculation of the scaling of the magnitudes and length of the arrowheads may be slightly different.

Value

nil

Author(s)

Jim Lemon (original code by Robin Hankin and Brian Ripley)
weighted.hist

Display a weighted histogram

Description

Calculate the counts of the weighted values in specified bins and optionally display either a frequency or density histogram.

Usage

weighted.hist(x,w,breaks="Sturges",col=NULL,plot=TRUE,
    freq=TRUE,ylim,ylab=NULL,xaxis=TRUE,...)
Arguments

\texttt{x} \hspace{1em} A vector of numeric values
\texttt{w} \hspace{1em} A vector of weights at least as long as \texttt{x}.
\texttt{breaks} \hspace{1em} The endpoints of the ranges into which to count the weighted values.
\texttt{col} \hspace{1em} An optional vector of colors for the bars of the histogram.
\texttt{plot} \hspace{1em} Whether to plot a histogram.
\texttt{freq} \hspace{1em} Whether to plot counts or densities.
\texttt{ylim} \hspace{1em} The limits of the plot ordinate.
\texttt{ylab} \hspace{1em} Label for the ordinate.
\texttt{xaxis} \hspace{1em} Whether to display the default \texttt{x} axis.
\ldots \hspace{1em} Additional arguments passed to \texttt{barplot}.

Details

‘\texttt{weighted.hist}’ calculates the weighted counts of values falling into the ranges specified by ‘\texttt{breaks}’. Instead of counting each value as 1, it counts the corresponding value in ‘\texttt{w}’ (the weight).

‘\texttt{breaks}’ may be specified by a monotonically increasing vector of numbers that are interpreted as the endpoints of the ranges, a single number representing the number of ranges desired or the name of the function to calculate the ranges (see \texttt{hist}). If a vector of numbers is passed that does not include all values in ‘\texttt{x}’, the user is warned. If the ranges are not equal, a warning will be displayed if ‘\texttt{freq}’ is \texttt{TRUE} or the heights of the bars will be adjusted to display areas approximately equal to the counts if ‘\texttt{freq}’ is \texttt{FALSE}.

Value

A list containing:
\texttt{breaks} - The endpoints of the intervals
\texttt{counts} - The weighted counts
\texttt{density} - The weighted counts divided by their sum.
\texttt{mids} - The midpoints of the intervals and the bars displayed.
\texttt{xname} - the name of ‘\texttt{x}’.
\texttt{equidist} - Whether the intervals differ by less than the total range/1000.

Author(s)

Jim Lemon and Hadley Wickham - thanks to Ben Graf for asking for a custom \texttt{x} axis option

See Also

\texttt{hist}

Examples

\begin{verbatim}
testx<-sample(1:10,300,TRUE)
testw<-seq(1,4,by=0.01)
weighted.hist(testx,testw,breaks=1:10,main="Test weighted histogram")
\end{verbatim}
Display a plot with a rectangular section expanded in an adjacent plot

Description

Display one plot on the left half of a device and an expanded section of that plot on the right half of the device with connecting lines showing the expansion.

Usage

```
zoomInPlot(x,y=NULL,xlim=NULL,ylim=NULL,rxlim=xlim,rylim=ylim,xend=NA,
zoomtitle=NULL,titlepos=NA,...)
```

Arguments

- `x,y` numeric data vectors. If `y` is not specified, it is set equal to `x` and `x` is set to `1:length(y)`.
- `xlim,ylim` Limits for the initial plot.
- `rxlim,rylim` Limits for the expanded plot. These must be within the above.
- `xend` Where to end the segments that indicate the expansion. Defaults to just left of the tick labels on the left ordinate.
- `zoomtitle` The title of the plot, display in the top center.
- `titlepos` The horizontal position of the title in user units of the zoomed plot.
- `...` additional arguments passed to `plot`.

Details

`zoomInPlot` sets up a two column layout in the current device and calls `plot` to display a plot in the left column. It then draws a rectangle corresponding to the `rxlim` and `rylim` arguments and displays a second plot of that rectangle in the right column. It is currently very simple and will probably become more flexible in future versions.

It just has. If `rxlim` is set to NA, `locator` will be called and the user can define the zoomed rectangle by clicking on each corner. This is a shameless ripoff of a suggestion by Greg Snow on the help list. Thanks, Greg.

Value

- `nil`

Author(s)

- Jim Lemon

See Also

- `plot`
Examples

```r
zoomInPlot(rnorm(100), rnorm(100), xlim=c(-1,1), ylim=c(-1,1),
            zoomtitle="Zoom In Plot", titlepos=-1.5)
```
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