Package ‘prepplot’

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Description A figure region is prepared, creating a plot region with suitable background color, grid lines or shadings, and providing axes and labeling if not suppressed. Subsequently, information carrying graphics elements can be added (points, lines, barplot with add=TRUE and so forth).

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R topics documented:

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prepplot  Functions to prepare a figure region for base graphics

Description

Function prepplot prepares a figure region according to individual preferences regarding background color, axes, stripes and/or gridlines; optionally, labelling can be done with the function. Function stripes draws the vertical or horizontal stripes for prepplot and can also be used independently.
Usage

```r
prepplot(xlim, ylim,
     bg = "grey92", xaxs=NULL, yaxs=NULL,
     lwd.axis = 0, col.axis = "grey20",
     border = ifelse(lwd.axis == 0, bg, col.axis),
     axes = TRUE, xaxt = par("xaxt"), yaxt = par("yaxt"),
     xticks = NULL, yticks = NULL,
     xticklabs = xticks, yticklabs = yticks,
     mgpx = par("mgp"), xaxside = 1,
     mgy = mgpx, yaxside = 2,
     xlab = NULL, ylab = NULL,
     cex = par("cex"), las = 1, lasx = las, lasy = las,
     gridx = FALSE, gridy = FALSE,
     gridxminor = 0, gridyminor = 0,
     lty.grid = ifelse(max(gridxminor, gridyminor) > 0,
                       "solid", "dotted"),
     col.grid = "grey50",
     lwd = par("lwd"), lwd.grid = lwd,
     lty.grid.minor = "dotted",
     col.grid.minor = col.grid,
     lwd.grid.minor = 0.5 * lwd.grid,
     stripesx = FALSE, stripesy = FALSE,
     col.stripes = "grey98",
     axis.arrow = FALSE,
     arrow.length = 0.3, arrow.width = 0.2,
     arrow.code = 2, arrow.type = "triangle", ...)

stripes(stripesx = numeric(0), stripesy = numeric(0), col.stripes = "grey90",
usr=NULL, ...)
```

Arguments

- **xlim**: required; a numeric vector of length 2 or more, whose range will be used for the horizontal axis limits
- **ylim**: required; a numeric vector of length 2 or more, whose range will be used for the vertical axis limits
- **bg**: background color
- **xaxs**: analogous to xaxs
- **yaxs**: NULL for using par("xaxs"), which has default "r"
- **lwd.axis**: axis line width; default 0 for no axis line (see below also for lwd and lwd.grid)
- **col.axis**: axis color; also affects ticks, tickmark labels and axis labels
- **border**: border color; default depends on whether or not there is an axis line
- **axes**: logical that determines whether or not axes are to be drawn (only if xaxt and yaxt do not suppress their respective axes); default: TRUE; if FALSE, both tick
mark labels and axis labels are suppressed; even if TRUE, an axis line is only drawn, if lwd.axis is set to a positive value; if the default axis positioning of R itself is desired, choose axes=FALSE, and add an axis statement after the preplot call (see also the Examples section)

xaxt
default: par("xaxt"); set to "n" for suppressing the x axis in spite of "axes=TRUE" (you can add a horizontal axis with the axis command later on, see examples section)

yaxt
default: =par("yaxt"); set to "n" for suppressing the y axis in spite of "axes=TRUE" (you can add a vertical axis with the axis command later on, see examples section)

xticks
tick positions for the horizontal axis; default NULL (see Details section)

ythumbs
tick positions for the vertical axis; default NULL (see Details section)

xticklabs
tick labels for the horizontal axis; default xticks; if explicitly provided, must have the same length as the xticks values derived from xticks, gridx or stripesx (see Details section)

yticklabs
tick labels for the vertical axis; default yticks; if explicitly provided, must have the same length as the yticks values derived from yticks, gridy or stripesy (see Details section)

mgpx
position of the horizontal axis label, tick marks and line in terms of margin lines (default: par("mgp")); see Details section

xaxside
side of the horizontal axis; 1 for bottom (default), 3 for top

mgpy
analogous to mgpx, for vertical axis; default: equal to mgpx

yaxside
side of the vertical axis; 2 for left (default), 4 for right

xlab
label for horizontal axis; default: empty

ylab
label for vertical axis; default: empty

cex
general annotation size: default par("cex"); if specified, it also adapts defaults for cex.main, cex.sub, cex.axis and cex.lab, multiplying them with cex/par("cex"); these can be overruled by explicit specification in . . .

las
direction of axis labeling; default: parallel to horizontal axis; you may want to change this to 0 (parallel to axes) in case of longer y-axis labels

lasx
direction of tick labels for horizontal axis; default: equal to las; note that xlab remains parallel to the axis, regardless of the choice for las (can only be changed by adding it later with mtext)

lasy
direction of tick labels for vertical axis; default: equal to las; note that ylab remains parallel to the axis, regardless of the choice for las (can only be changed by adding it later with mtext)

gridx
logical or numeric; if TRUE, draws grid lines at the tick mark positions; if numeric, number of grid lines between the xlim values or numeric vector of grid line positions for horizontal axis; default: FALSE for no grid lines (positive gridxminor implies switch to gridx=TRUE)

gridy
logical or numeric; if TRUE, draws grid lines at the tick mark positions; if numeric, number of grid lines between the ylim values or numeric vector of grid line positions for vertical axis; default: FALSE for no grid lines (positive gridyminor implies switch to gridy=TRUE)
gridxminor: number of minor grid lines between pairs of major grid lines for horizontal axis; default: 0 for no minor grid lines
gridyminor: number of minor grid lines between pairs of major grid lines for vertical axis; default: 0 for no minor grid lines
col.grid: color for grid lines
lty.grid: line type for (major) grid lines; defaults to a dotted line with no minor grid lines and a solid line with minor grid lines (regardless of the direction of the minor grid lines)
lwd: line width (for grid lines), default is from the current par setting
lwd.grid: line width for grid lines, default is lwd
col.grid.minor: color for minor grid lines
lty.grid.minor: line type for minor grid lines; default: dotted line
lwd.grid.minor: line width for minor grid lines (default: 0, 5*lwd.grid)
stripesx: logical (default FALSE) or numeric vector of color change positions in striped background (vertical stripes with reference to horizontal axis); see Details section for further information; default: no stripes
stripesy: logical (default FALSE) or numeric vector of color change positions in striped background (horizontal stripes with reference to vertical axis); increasing size is assumed (or ascertained by sorting); see Details section for further information; default: no stripes
col.stripes: color of the stripes
axis.arrow: logical (default FALSE) or numeric vector of two positions at which to draw axis arrows for vertical and horizontal axis (first value: y position for horizontal axis, second value: x position for vertical axis); if set to TRUE, the positions are the values for xaxpos and yaxpos, respectively; for one axis arrow only, use NA for the other element
arrow.length: numeric arrow length for function Arrows; default: 0.3
arrow.width: numeric arrow width for function Arrows; default: 0.2
arrow.type: character arrow type for function Arrows; default: "triangle"
arrow.code: default: 2 (y axis arrow upwards, x axis arrow to the right); for other choices see Details section of Arrows
usr: NULL (default), or a numeric vector with limits of the area within which to draw the stripes; the default amounts to par("usr")
...: further arguments given to functions plot, mtext, stripes, axis and Arrows; these can e.g. include the option tcl for tick length.

Details

prepplot supports the preparation of a customized plot region to which the information carrying graphical elements can be added. It can be used with all functions that allow adding to existing base graphics plots (e.g. points, lines, barplot, rect, symbols, ...). Usage with other functions is also possible, but requires careful application after setting par(new=TRUE).
If an axis is not suppressed (by `axes=FALSE` or `xaxt="n"` or `xaxt="n"`), axis ticks are placed at the positions specified in `xticks` or `yticks`; if these are `NULL`, numeric specifications for `gridx` or `gridy` determine the tick positions, and if these are also non-existent, numeric specifications for `stripesx` or `stripesy` determine the tick positions. If all these are unspecified, the tick positions are determined from the default axis behavior using function `axisTicks` (with option `log=FALSE`). Per default, axis lines (whether visible or width 0) meet at the position `(xlim[1], ylim[1])` (assuming 2-element limits, which are determined from longer `*lim` arguments with the `range` function, where needed); options `mgpx` or `mgpy` can be used for moving the axis line, tick labels and/or axis labels inwards or outwards; they default to the settings in `par("mgp")`, and it may be convenient to change that setting rather than using the option in several `preplot` calls (see also Example section). Instead of specifying the labelling with function `preplot`, it can also be handled by subsequent `title` and/or `axis` statements.

For grid lines, it is possible to provide minor grid lines (by specifying the number of minor grid lines between major ones); it is also possible to specify major grid lines in complete independence of the tick mark positions, e.g. for displaying information on regulatory limits, target values or specific events (on a time axis).

For stripes, specifying `TRUE` uses `xticks` or `yticks` values for the creation of stripes. Elements of stripes vectors that are outside their respective axis limits are silently moved to the nearest limit of the plot area (i.e. to the suitable element of `usr`). Note that the sorting of stripe entries should correspond to the sorting of axis limits (i.e., e.g., if `xlim[1]>xlim[2]`, sorting is decreasing instead of increasing); elements of `stripesx` are sorted to conform to this rule, and duplicates are removed. If the remaining vector `stripesx` has an even number of elements, `length(stripesx)/2` vertical stripes are drawn between pairs of neighbouring `stripesx` elements. Otherwise, the handling depends on the first and last (sorted) element of `stripesx`: if the first (sorted) element equals `xlim[1]`, a narrow stripe in the beginning is drawn, and the remaining even number of `stripesx` elements is treated in pairs as before; otherwise, if the last (sorted) element equals `xlim[2]`, a narrow stripe in the end is drawn; if neither the first nor the last element coincides with an element of `xlim`, the last element of `stripesx` is simply omitted. `stripesy` is treated analogously to `stripesx`. Like gridlines, stripes can be completely independent of tick marks (see e.g. the last example).

**Value**

The function does not return anything; it is called for its side effects.

**Author(s)**

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**References**


**See Also**

See also `Arrows` for arrows.
Examples

## default
preplot(0:10, -5:5)
preplot(0:10, -5:5, xaxs="i", yaxs="i")
## with stripes and grid based on default tick positions
preplot(0:10, -5:5, stripesy=TRUE, gridx=TRUE)

## with white background,
## axis lines and small ticks,
## major and minor grid for y,
## and plot area defined by axis limits
## instead of default usr coordinates
## (border is drawn because of lwdNaxis)
## mgpx moves tick position labels closer to axes
preplot(0:10, -5:5, bg="white", xaxs="i", yaxs="i",
      lwdNaxis = 1,
      gridy=c(-5,0,5), gridyminor=4,
      tcl=-0.2, mgpx=c(3,0.5,0))

## without axis lines but with default background
## looks better with bg.area="lim"
## unless actual data points extend to the limits
preplot(0:10, -5:5, yticks=seq(-5,5,5),
       gridy=5:5, gridx=TRUE,
       xaxs="i", yaxs="i")

## with axis arrows
## narrower margins
## small tick marks
## tick annotations close to axis
par(mar=c(3.3,2,1), mgp=c(2,0.35,0))
preplot(0:10, -5:5, yticks=seq(-5,5,5),
       gridy=5:5, gridx=TRUE, lwd.axis=1, tcl=-0.2,
       border="grey92", axis.arrow=TRUE)
dev.off() ## eliminates modified par settings

## xaxs and yaxs set in par
## labeling subsequently or in preplot
## mgp or mgpx used for moving labeling closer to axis
par(mfrow=c(1,2), xaxs="i", yaxs="i")
## adding labeling subsequently
par(mgp=c(2.25,0.75,0))
preplot(0:10, -5:5, yticks=seq(-5,5,5),
       gridy=5:5, gridx=TRUE)
title(xlab="x axis label", ylab="y axis label",
     sub="Labeling added subsequently", main="mgp set in par")
## adding labeling subsequently
par(mgp=c(3,1,0)) # back to default
## adding labeling within the function
preplot(0:10, -5:5, yticks=seq(-5,5,5),
       gridy=5:5, gridx=TRUE,
       xlab="x axis label", ylab="y axis label",
       xaxs="i", yaxs="i")
mgpx=c(2.25, 0.75, 0),
main="mgpx set in prepplot",
sub="Labeling added within prepplot")
## the difference: sub reacts to mgp, not to mgpx
dev.off()  ## eliminates modified par settings

## further examples in the pdf vignette
## access with vignette("preplotOverview")
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