plot.default {graphics} R Documentation

The Default Scatterplot Function

Description

Draw a scatter plot with decorations such as axes and titles in the active graphics window.

Usage

```
## Default S3 method:
plot(x, y = NULL, type = "p",  xlim = NULL, ylim = NULL,
     log = "", main = NULL, sub = NULL, xlab = NULL, ylab = NULL,
     ann = par("ann"), axes = TRUE, frame.plot = axes,
     panel.first = NULL, panel.last = NULL, asp = NA, ...)
```

Arguments

`x, y` the x and y arguments provide the x and y coordinates for the plot. Any reasonable way of defining the coordinates is acceptable. See the function `xy.coords` for details. If supplied separately, they must be of the same length.

`type` 1-character string giving the type of plot desired. The following values are possible, for details, see `plot`: `"p"` for points, `"l"` for lines, `"b"` for both points and lines, `"c"` for empty points joined by lines, `"o"` for overplotted points and lines, `"s"` and `"S"` for stair steps and `"h"` for histogram-like vertical lines. Finally, `"n"` does not produce any points or lines.

`xlim` the x limits (x1, x2) of the plot. Note that `x1 > x2` is allowed and leads to a ‘reversed axis’.

The default value, `NULL`, indicates that the range of the finite values to be plotted should be used.

`ylim` the y limits of the plot.

`log` a character string which contains `"x"` if the x axis is to be logarithmic, `"y"` if the y axis is to be logarithmic and `"xy"` or `"yx"` if both axes are to be logarithmic.

`main` a main title for the plot, see also `title`.

`sub` a sub title for the plot.

`xlab` a label for the x axis, defaults to a description of `x`.

`ylab` a label for the y axis, defaults to a description of `y`.

`ann` a logical value indicating whether the default annotation (title and x and y axis labels) should appear on the plot.

`axes` a logical value indicating whether both axes should be drawn on the plot. Use graphical parameter `"xaxt"` or `"yaxt"` to suppress just one of the axes.

`frame.plot` a logical indicating whether a box should be drawn around the plot.

`panel.first` an ‘expression’ to be evaluated after the plot axes are set up but before any plotting takes place. This can be useful for drawing background grids or scatterplot smooths. Note that this works by lazy evaluation: passing this argument from other `plot` methods may well not work since it may be evaluated too early.

`panel.last` an expression to be evaluated after plotting has taken place but before the axes, title and box are added. See the comments about `panel.first`.

`asp` the *y/x* aspect ratio, see `plot.window`.

`...` other graphical parameters (see `par` and section ‘Details’ below).

Details

Commonly used graphical parameters are:

`col`

The colors for lines and points. Multiple colors can be specified so that each point can be given its own color. If there are fewer colors than points they are recycled in the standard fashion. Lines will all be plotted in the first colour specified.

`bg`

a vector of background colors for open plot symbols, see `points`. Note: this is **not** the same setting as `par("bg")`.

`pch`

a vector of plotting characters or symbols: see `points`.

`cex`

a numerical vector giving the amount by which plotting characters and symbols should be scaled relative to the default. This works as a multiple of `par("cex")`. `NULL` and `NA` are equivalent to `1.0`. Note that this does not affect annotation: see below.

`lty`

a vector of line types, see `par`.

`cex.main`, `col.lab`, `font.sub`, etc

settings for main- and sub-title and axis annotation, see `title` and `par`.

`lwd`

a vector of line widths, see `par`.

Note

The presence of panel.first and panel.last is a historical anomaly: default plots do not have ‘panels’, unlike e.g. pairs plots. For more control, use lower-level plotting functions: plot.default calls in turn some of plot.new, plot.window, plot.xy, axis, box and title, and plots can be built up by calling these individually, or by calling plot(type = "n") and adding further elements.

References

Becker, R. A., Chambers, J. M. and Wilks, A. R. (1988) *The New S Language*. Wadsworth & Brooks/Cole.

Cleveland, W. S. (1985) *The Elements of Graphing Data.* Monterey, CA: Wadsworth.

Murrell, P. (2005) *R Graphics*. Chapman & Hall/CRC Press.

See Also

plot, plot.window, xy.coords. For thousands of points, consider using smoothScatter instead.

Examples

```
Speed <- cars$speed
Distance <- cars$dist
plot(Speed, Distance, panel.first = grid(8, 8),
     pch = 0, cex = 1.2, col = "blue")
plot(Speed, Distance,
     panel.first = lines(stats::lowess(Speed, Distance), lty = "dashed"),
     pch = 0, cex = 1.2, col = "blue")

## Show the different plot types
x <- 0:12
y <- sin(pi/5 * x)
op <- par(mfrow = c(3,3), mar = .1+ c(2,2,3,1))
for (tp in c("p","l","b",  "c","o","h",  "s","S","n")) {
   plot(y ~ x, type = tp, main = paste0("plot(*, type = \"", tp, "\")"))
   if(tp == "S") {
      lines(x, y, type = "s", col = "red", lty = 2)
      mtext("lines(*, type = \"s\", ...)", col = "red", cex = 0.8)
   }
}
par(op)

##--- Log-Log Plot  with  custom axes
lx <- seq(1, 5, length = 41)
yl <- expression(e^{-frac(1,2) * {log[10](x)}^2})
y <- exp(-.5*lx^2)
op <- par(mfrow = c(2,1), mar = par("mar")-c(1,0,2,0), mgp = c(2, .7, 0))
plot(10^lx, y, log = "xy", type = "l", col = "purple",
     main = "Log-Log plot", ylab = yl, xlab = "x")
plot(10^lx, y, log = "xy", type = "o", pch = ".", col = "forestgreen",
     main = "Log-Log plot with custom axes", ylab = yl, xlab = "x",
     axes = FALSE, frame.plot = TRUE)
my.at <- 10^(1:5)
axis(1, at = my.at, labels = formatC(my.at, format = "fg"))
e.y <- -5:-1 ; at.y <- 10^e.y
axis(2, at = at.y, col.axis = "red", las = 1,
     labels = as.expression(lapply(e.y, function(E) bquote(10^.(E)))))
par(op)
```