Cheatography

R graphical Cheat Sheet

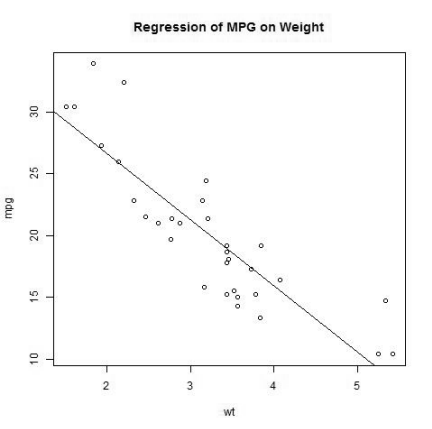
by xeonkai via cheatography.com/31513/cs/9603/

Basic code

```
pdf("mygraph.pdf")
    att ach (mt cars)
    plo t(wt, mpg)
    abl ine (lm(mpg ~ wt))
    tit le( " Reg ression of MPG
on Weight ")
    det ach (mt cars)
   x <- c(1:10)
   y <- x
    lin es(x, y, type="b ",
pch=22, col="bl ue", lty=2)
dev.off()
```

Variations include win.metafile(), png(), jpeg(), bmp(), tiff(), xfig(), postscript()
Other functions include dev.new(), dev.next(), dev.prev(), dev.set()

Basic graph



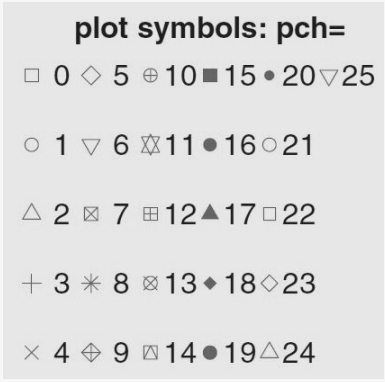
Graphical parameters

```
par(op tio nna me= value,
option nam e=v alue, ...)
opar <- par(no.re ado nly =TRUE)
par(lty=2, pch=17)
plot(dose, drugA, type="b ")
# type - " b": both points and
lines, " l": lines, " p":
points, " c": lines part of " -
b", " n": no plotting, " o":
both " ove rpl ott ed"
par(opar)
```

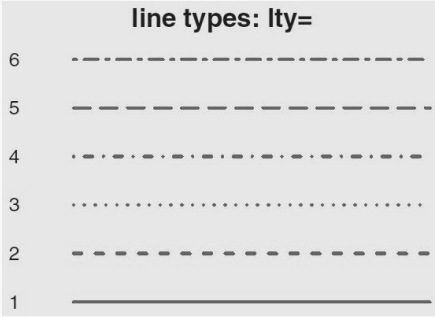
Symbols and lines

`pch`	Specifies the symbol to use when plotting points
`cex`	Specifies the symbol size. A number indicating the amount plotting symbols are scaled relative to default. 1=default, 1.5 is 50% larger, 0.5 is 50% smaller, and so forth.
`lty`	Specifies the line type
`lwd`	Specifies the line width. Expressed relative to default (=1), e.g. `lwd=2` - a line twice as wide as the default

Plot symbols



Line types



Color parameters

`col`	Default plotting color. Some functions (e.g. lines and pie) accept a vector of values that are recycled.
`col.axis`	Color for axis text
`col.lab`	Color for axis labels
`col.main`	Color for titles
`col.sub`	Color for subtitles
`fg`	The plot's foreground color
`bg`	The plot's background color
`rainbow(#)`	Produces # contiguous "rainbow" colors
`gray(0 :10 /10)`	Specify gray levels as a vector of numbers between 0 and 1. This produces 10 gray levels.

Text parameters

`cex`	Number indicating the amount by which plotted text should be scaled relative to the default
`cex.axis`	Magnification of axis text relative to `cex`
`cex.lab`	Magnification of axis labels relative to `cex`
`cex.main`	Magnification of titles relative to `cex`
`cex.sub`	Magnification of subtitles relative to `cex`

Font parameters

`font`	Integer specifying font to use for plotted text. 1=plain, 2=bold, 3 =italic, 4=bold italic, 5=symbol (Adobe symbol encoding)

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Font parameters (cont)

`font.axis`	Font for axis text
`font.lab`	Font for axis labels
`font.main`	Font for titles
`font.sub`	Font for subtitles
`ps`	Font point size (roughly 1/72 inch). The text size = ps*cex.
`family`	Font family for drawing text. Standard values are `serif`, `sans`, and `mono`.

Mapping for font family created via windowsFont() function.
For Mac, use quartzFonts().

```
window sFonts(
A=wind ows Fon t("Arial Black"),
B=wind ows Fon t("B ookman Old Style"),
C=wind ows Fon t("Comic Sans MS")
)
```

Graph and margin parameters

`pin`	Plot dimensions (width, height) in inches
`mai`	Numerical vector indicating margin size, c(bottom,left,top,right). Expressed in inches
`mar`	Numerical vector indicating margin size, c(bottom,left,top,right). Expressed in lines. The default is c(5,4,4,2) + 0.1.

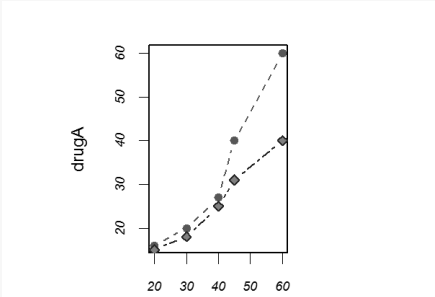
Example code

```
dose <- c(20,30,40,45,60)
drugA <- c(16,2 0,2 7,4 0,60)
drugB <- c(15,1 8,2 5,3 1,40)
opar <- par(no.re ado nly =TRUE)
```

Example code (cont)

```
par(pi n=c (2,3))
par(lwd=2, cex=1.5)
par(ce x.a xis =.75, font.a - xis=3)
plot(dose, drugA, type="b ", pch=19, lty=2, col="re d")
lines( dose, drugB, type="b ", pch=23, lty=6, col="bl ue", bg=" gre en")
par(opar)
```

Resulting graph



Graph text and customization

`ann=FALSE`	Using in plot() statement or par() statement remove default titles and labels
`title()`	`title( mai n="main title", col.ma - in= " red ", sub="su b-t itl e", col.su b="b lue ", xlab="x -axis label", ylab="y -axis label", col.la b="g ree n", cex.la b=0.75)`

Graph text and customization (cont)

`axis()`	Create custom axes. When creating a custom axis, suppress axis by using option `axes=FALSE` (suppresses all axes, including axis frame lines, unless `frame.p lo - t=TRUE`), `xaxt="n "` or `yaxt="n "`. See Axis options.
`text()`	Add text within graph, typically labeling points or text annotations, e.g. `text(l oca tion, " - tex t", pos, ...)`
`mtext()`	Add text to margin of plot
	e.g. `mtext( " tex t", side=4, line=3, cex.lab=1, las=2, col="bl ue")`
`plotmath()`	Add mathematical symbols and formulas to graph
`abline()`	Add reference lines to graph e.g. `abline (h= - yva lues, v=xvalues)`
	`abline (h= - c(1 ,5,7)` adds horizontal lines at y=1, 5 & 7

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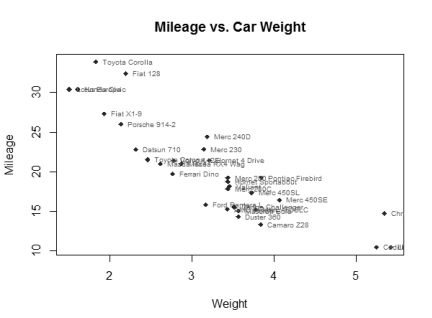
Graph text and customization (cont)

`legend (lo - cation, title, legend, ...)`	location - (x,y) coordinate, locator(1), keywords, i.e. `bottom, bottom left, left, topleft, top, topright, right, bottom right, center.` Use `inset=` to specify amount to move legend into graph as fraction of plot region.
	title - character string for the legend title (optional)
	legend - character vector with the labels
	... - Other options: `col=, pch=, lwd=, lty=, fill=, bty=, bg=, cex=, text.col=, horiz=TRUE`

Example code

```
attach(mtcars)
plot(wt, mpg, main="M ileage vs. Car Weight ", xlab="W eig ht", ylab="M ile age ", pch=18, col="bl ue")
text(wt, mpg, row.na mes (mt - cars), cex=0.6, pos=4, col="re - d")
detach (mt cars)
```

Resulting graph



Combining graphs

Used in `par()` or `layout()` function:

`mfrow= c(n rows, ncols)` fill by row

`mfcol= c(n rows, ncols)` fill by column

`layout (mat)`

where `mat` is matrix object specifying location of multiple plots to combine

e.g. `layout (ma tri x(c (1, - 1,2,3), 2, 2, byrow = TRUE))` - one figure placed in row 1 and two figures placed in row 2

Optional parameters for `layout()`:

`widths()` - a vector of values for widths of columns

`heights()` - a vector of values for heights of rows

e.g. `layout (ma tri x(c(1, 1, 2, 3), 2, 2, byrow = TRUE), widths =c(3, 1), height s=c(1, 2))`

Used in `par()` function:

`fig=c(x1, x2, y1, y2), new = TRUE` - Plot within limits of (x1,x2) and (y1,y2), `new = TRUE` option adds figure to existing graph

Axis options

`side`	An integer indicating the side of the graph to draw the axis (1=bottom, 2=left, 3=top, 4=right)
`at`	A numeric vector indicating where tick marks should be drawn
`labels`	A character vector of labels to be placed at the tick marks (if `NULL`, the `at` values will be used)
`pos`	The coordinate at which the axis line is to be drawn (i.e. the value on the other axis where it crosses)
`lty`	Line type

Axis options (cont)

`col`	The line and tick mark color
`las`	Labels are parallel (=0) or perpen- dicular (=2) to the axis
`tck`	Length of tick mark as a fraction of the plotting region (a '-' number is outside the graph, a '+' number is inside, 0 suppresses ticks, 1 creates gridlines). Default is -0.01.

Adding minor tick marks require Hmisc package.

```
librar y(H misc)
minor.t ic k(nx=n, ny=n, tick.r atio=n)
```

where nx, ny are no. of intervals to divide major tick marks on x- and y-axis, tick.ratio is size of minor relative to major tick mark

demo(plotmath)

Arithmetic Operators		Radicals	
x + y	x + y	sqrt(x)	$\sqrt{x}$
x – y	x – y	sqrt(x, y)	$\sqrt[y]{x}$
x * y	xy	Relations	
x/y	x/y	x == y	x = y
x %+–% y	x ± y	x != y	x ↑ y
x%/%y	x √ y	x < y	x < y
x %*% y	x × y	x <= y	x ″ y
x %.% y	x · y	x > y	x > y
–x	–x	x >= y	x ≥ y
+x	+x	x %~~% y	x ⊕ y
Sub/Superscripts		x %=~% y	x ≅ y
x[i]	x_i	x %==% y	x ≡ y
x^2	x^2	x %prop% y	x ∝ y
Juxtaposition		Typeface	
x * y	xy	plain(x)	x
paste(x, y, z)	xyz	italic(x)	*x*
Lists		bold(x)	**x**
list(x, y, z)	x, y, z	bolditalic(x)	***x***
		underline(x)	$\underline{x}$