Modifying ggplot2 axes and scales

Continuous Variables

`scale_x_continous()`

`scale_y_continous()`

`name`	The name of the scale. Used as axis or legend title. If NULL, the default, the name of the scale is taken from the first mapping used for that aesthetic.
`breaks`	One of: NULL for no breaks A numeric vector of positions
`minor_breaks`	One of: NULL for no minor breaks A numeric vector of positions
`labels`	One of: NULL for no labels A character vector giving labels (must be same length as breaks)
`limits`	A numeric vector of length two providing limits of the scale. Use NA to refer to the existing minimum or maximum.
`trans`	Built-in transformations include "asn", "atanh", "boxcox", "exp", "identity", "log", "log10", "log1p", "log2", "logit", "probability", "probit", "reciprocal", "reverse" and "sqrt".
`position`	The position of the axis. "left" or "right" for vertical scales, "top" or "bottom" for horizontal scales

Examples:

```
# Change the axis labels
p + scale_x_continuous("Engine displacement (L)") +
     scale_y_continuous("Highway MPG")

# You can also use the short-cut labs().
# Use NULL to suppress axis labels
p + labs(x = NULL, y = NULL)

# Modify the axis limits
p + scale_x_continuous(limits = c(2, 6))

# You can also use the short hand functions `xlim()` and `ylim()`
p + xlim(2, 6)
```

```
#  Choose where the ticks appear
p1 + scale_x_continuous(breaks = c(2, 4, 6))

#  Add what labels they have
p + scale_x_continuous(breaks = c(2, 4, 6),
                       label = c("two", "four", "six"))

# Typically you'll pass a function to the `labels` argument.
p + scale_y_continuous(labels = scales::percent)
p + scale_y_continuous(labels = scales::dollar)
p + scale_x_continuous(labels = scales::comma)

# You can also override the default linear mapping by using a
# transformation. There are three shortcuts:
p1 + scale_y_log10()
p1 + scale_y_sqrt()
p1 + scale_y_reverse()
```

Categorical Variables

```
scale_x_discrete()

scale_y_discrete()
```

name	the name of the scale - used as the axis label or the legend title
breaks	control the breaks in the guide: NULL: don't display any breaks a character vector giving the breaks as they should appear on the axis or in the legend.
labels	NULL for no labels, waiver() for default labels (labels the same as breaks), a character vector the same length as breaks, or a named character vector whose names are used to match replacement the labels for matching breaks.
limits	A character vector specifying the data range for the scale
position	The position of the axis. "left" or "right" for vertical scales, "top" or "bottom" for horizontal scales

Use limits to reorder a factor variable.

Color Specifications

Colours can be specified with:

- A **name**, e.g., `"red"`. R has 657 built-in named colours, which can be listed with `colours()`. The Stowers Institute provides a nice printable pdf that lists all colours: http://research.stowers-institute.org/efg/R/Color/Chart/.
- An **rgb specification**, with a string of the form `"#RRGGBB"` where each of the pairs `RR`, `GG`, `BB` consists of two hexadecimal digits giving a value in the range `00` to `FF`

  You can optionally make the colour transparent by using the form `"#RRGGBBAA"`.

Line type

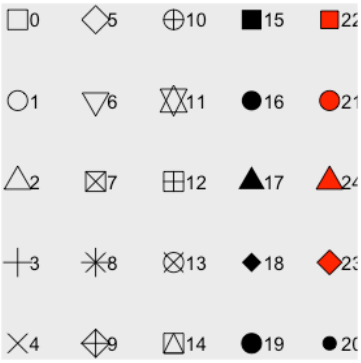
Line types can be specified with:

An **integer** or **name**: 0 = blank, 1 = solid, 2 = dashed, 3 = dotted, 4 = dotdash, 5 = longdash, 6 = twodash, as shown below:

Shape

Shapes take four types of values:

- An **integer** in [0,25]



Note that shapes 21-24 have both stroke `colour` and a `fill`. The size of the filled part is controlled by `size`, the size of the stroke is controlled by `stroke`. Each is measured in mm, and the total size of the point is the sum of the two. Note that the size is constant along the diagonal in the following figure.