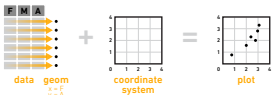


Data Visualisation with ggplot2

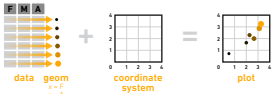
Cheat Sheet

Basics

ggplot2 is based on the **grammar of graphics**, the idea that you can build every graph from the same few components: a data set, a set of **geoms**—visual marks that represent data points, and a **coordinate system**.



To display data values, map variables in the data set to aesthetic properties of the geom like **size**, **color**, and **x** and **y** locations

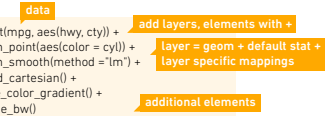


Build a graph with **qplot()** or **ggplot()**

aesthetic mappings **data** **geom**

qplot(x = cty, y = hwy, color = cyl, data = mpg, geom = "point")
Creates a complete plot with given data, geom, and mappings. Supplies many useful defaults.

ggplot(data = mpg, aes(x = cty, y = hwy))
Begins a plot that you finish by adding layers to. No defaults, but provides more control than qplot().



Add a new layer to a plot with a **geom_***() or **stat_***() function. Each provides a geom, a set of aesthetic mappings, and a default stat and position adjustment.

last_plot()

Returns the last plot

ggsave("plot.png", width = 5, height = 5)
Saves last plot as 5" x 5" file named "plot.png" in working directory. Matches file type to file extension.

Coordinate Systems

r <- b + geo_m_bar()
r = coord_cartesian(xlim = c(0, 5))
xlim, ylim
The default cartesian coordinate system

r <- coord_fixed(ratio = 1/2)
ratio, xlim, ylim
Cartesian coordinates with fixed aspect ratio between x and y units

r <- coord_flip()
xlim, ylim
Flipped Cartesian coordinates

r <- coord_polar(theta = "X", direction = 1)
theta, start, direction
Polar coordinates

r <- coord_trans(trans = "sqrt")
trans, ylims, xlims, lims
Transformed cartesian coordinates. Set extras and strains to the name of a window function.

r <- coord_map(projection = "ortho", orientation = c(41, -74, 0))
projection, orientation, xlim, ylim
Map projections from the maptools package (mercator (default), azequialera, lagrange, etc.)

Geoms

Use a geom to represent data points, use the geom's aesthetic properties to represent variables. Each function returns a layer

One Variable

Continuous

a <- geom_area(stat = "bin")
x, y, alpha, color, fill, linetype, size
b = geom_area(aes(ly = .density), stat = "bin")

a <- geom_density(kernel = "gaussian")
x, y, alpha, color, fill, linetype, size, weight
b = geom_density(aes(ly = .density))

a <- geom_dotplot()
x, y, alpha, color, fill

a <- geom_freqpoly()
x, y, alpha, color, fill, linetype, size
b = geom_freqpoly(aes(ly = .density))

a <- geom_histogram(binwidth = 5)
x, y, alpha, color, fill, linetype, size, weight
b = geom_histogram(aes(ly = .density))

Discrete

b <- geom_bar(aes(fill))

b <- geom_bar(aes(fill))
x, alpha, color, fill, linetype, size, weight

Graphical Primitives

c <- geom_polygon(aes(group = group))

c <- geom_polygon(aes(group = group))
x, y, alpha, color, fill, linetype, size

d <- geom_economics(aes(date, unemployment))

d <- geom_economics(aes(date, unemployment))
lower, middle, upper, x, y, alpha, color, fill, linetype, size, weight

d <- geom_ribbon(aes(lymin = unemployment - 900, ly = unemployment + 900))
x, y, alpha, color, fill, linetype, size

d <- geom_economics(aes(date, unemployment))

d <- geom_economics(aes(date, unemployment))
x, y, alpha, color, fill, linetype, size

d <- geom_rect(aes(xmin = long, ymin = lat, xmax = long + delta, long, yend = lat + delta, lat))
x, y, alpha, color, fill, linetype, size

Three Variables

sealsSz <- with(seals, sqrt(delta_long^2 + delta_lat^2))
m <- ggplot(seals, aes(long, lat, size = sealsSz))

m <- geom_contour(aes(z = z))
x, y, z, alpha, color, fill, linetype, size, weight

m <- geom_raster(aes(fill = z), hjust = 0.5, vjust = 0.5, interpolate = FALSE)
x, y, alpha, fill

m <- geom_tile(aes(fill = z))
x, y, alpha, color, fill, linetype, size

Two Variables

Continuous X, Continuous Y

f <- geom_blank()

f <- geom_jitter()
x, y, alpha, color, fill, shape, size

f <- geom_point()
x, y, alpha, color, fill, shape, size

f <- geom_quantile()
x, y, alpha, color, fill, linetype, size, weight

f <- geom_rug(sides = "b")
x, y, alpha, color, fill, linetype, size, weight

f <- geom_smooth(model = lm)

f <- geom_smooth(model = lm)
x, y, alpha, color, fill, linetype, size, weight

f <- geom_text(aes(label = cty))
x, y, alpha, color, fill, linetype, size, weight

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f <- geom_text(aes(label = cty))
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Continuous Bivariate Distribution

i <- geom_bin2d(binwidth = c(5, 0.5))
kmax, xmin, ymax, ymin, alpha, color, fill, linetype, size, weight

i <- geom_density2d()
x, y, alpha, color, fill, linetype, size

i <- geom_hex()
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Continuous Function

j <- ggplot(economics, aes(date, unemployment))

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