

Plotting Process

0. Get data
1. Specify aesthetic (what fields being plot)
2. Add geoms (essentially type of plot)
3. Modify elements

Basic Plots

```
# qplot - includes a lot of defaults
qplot(x = cty, y = hwy, color = cyl, data = mpg, geom = "point")

# ggplot - allows more customisation
ggplot(data=mpg, aes(x=cty, y = hwy)) +
  geom_point(aes(color = cyl)) +
  geom_smooth(method = "lm") +
  coord_cartesian() +
  scale_color_gradient() +
  theme_bw()
```

One Variable

```
### NB requires a <- ggplot(data = mpg, aes(hwy))
# histogram
geom_histogram(binwidth = 5)

# density
geom_density()

# bar (categorical data)
geom_bar()
```

Two Variable

```
### NB need: f <- ggplot(mpg, aes(cty,hwy))
# dot / jitter - jitter deals with overlapping points
f + geom_jitter()
f + geom_point()

# quantile
f + geom_quantile()

# smoothed / lm
f + geom_smooth(model=lm)

# line
f + geom_line()

# error bar
f + geom_errorbar()

# point range
f + geom_pointrange()
```

Modifiers

```
# scales - alpha, color, fill, linetype, shape, size
scale_*_continuous()
scale_*_discrete()
scale_*_identity()
scale_*_manual(values = c())
scale_x_date(labels=date_format("%m/%d"), breaks =
date_breaks("2 weeks"))
scale_x_datetime()

# coordinate systems
coord_cartesian(xlim=c(0, 5), ylim=x(0,5))
coord_flip()
coord_trans(ytrans="sqrt")

# labels
ggtitle("title")
xlab("x")
ylab("y")
labs(title=, x=, y=)

# position adjustments
s + geom_bar(position = "dodge") # side by side
s + geom_bar(position = "stack") # stack
s + geom_bar(position = "fill") # stack, normalized
height

# legends
theme(legend.position="bottom") # top, left, right
scale_fill_discrete(name= "title", labels=c("A", "B",
"C"))

# color and fill scales
scale_fill_brewer(palette = "Blues")
scale_fill_gradient(low="red", high="yellow")

# themes
theme_bw() # white background w/ gridlines
```

Faceting

```
t <- ggplot(mpg, aes(cty, hwy)) + geom_point()

# facet into cols
t + facet_grid(. ~ fl)

# facet into rows
t + facet_grid(year ~ .)

# facet into rows & cols
t + facet_grid(year ~ fl)
```

Other

```
library('repr')  
options(repr.plot.width=5, repr.plot.height=4)  
ggsave("plot.png", width = 5, height = 5)
```



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Not published yet.
Last updated 9th January, 2018.
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