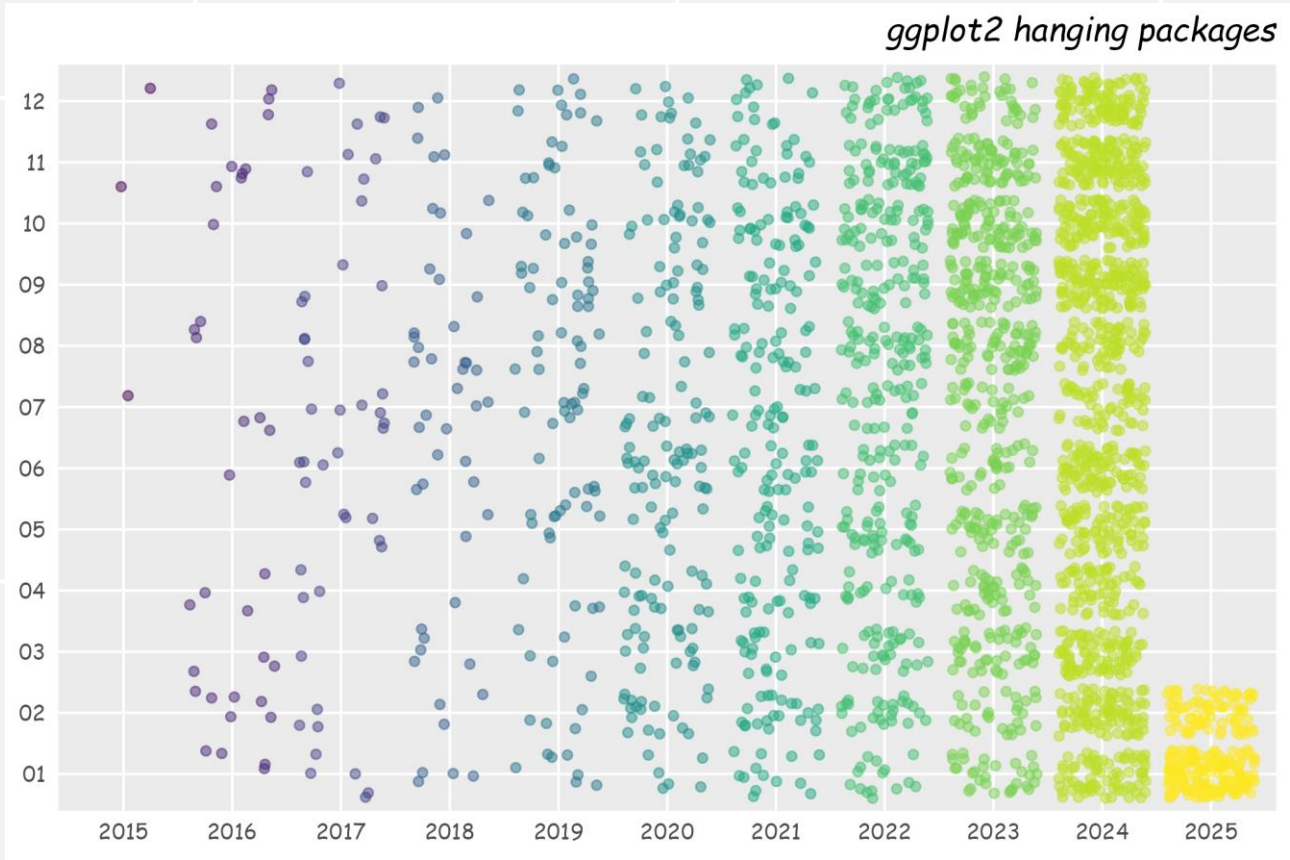
Visualización de datos en R: una aproximación a través del paquete **ggplot2**



https://ggplot2.tidyverse.org/

grammar of graphics:

"capas de información"

DATA

MAPPING

STATISTICS

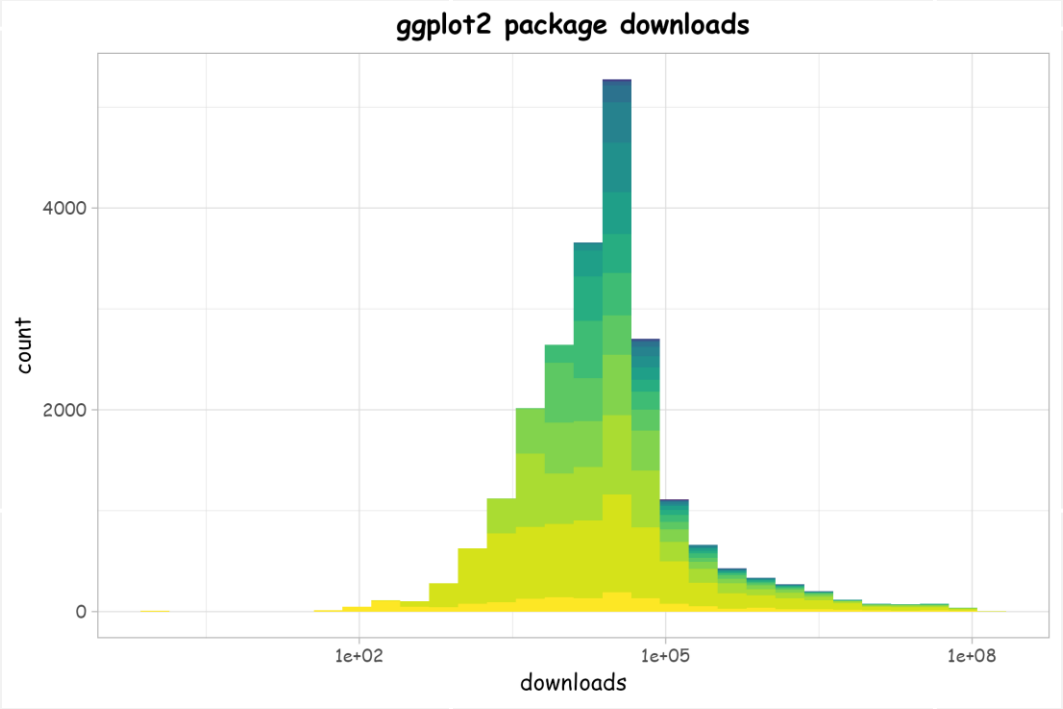
SCALES

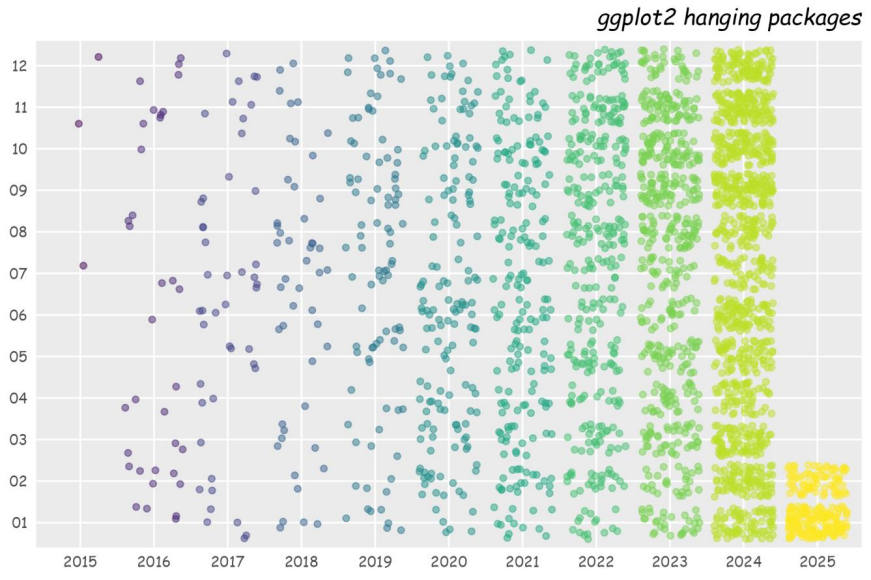
GEOMETRIES

FACETS

COORDINATES

THEME





DATA

```
ggplot(data)
```

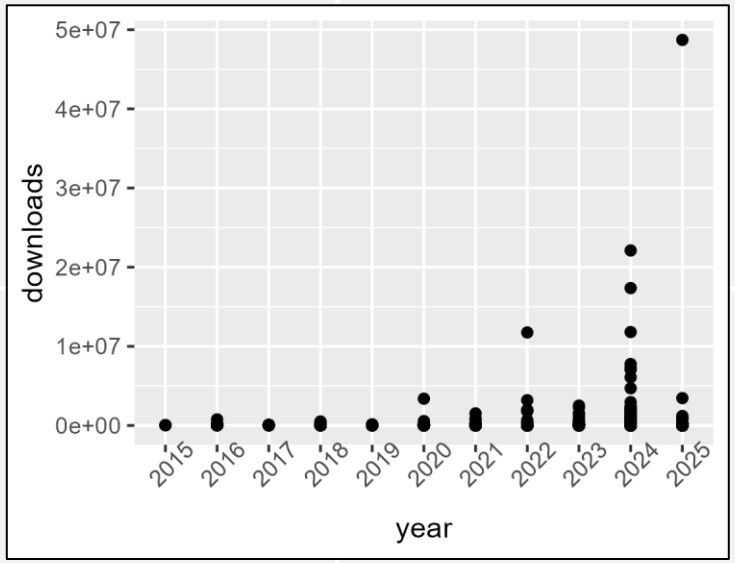
date	name	descr	day	month	year	rank	downloads
23/04/2024	ggplot2	Create Elegant Data Visualisations Using the Grammar of Gr...	23	04	2024	1	156190079
17/01/2025	rlang	Functions for Base Types and Core R and 'Tidyverse' Features	17	01	2025	2	145302572
30/03/2022	magrittr	A Forward-Pipe Operator for R	30	03	2022	3	132429652
17/11/2023	dplyr	A Grammar of Data Manipulation	17	11	2023	4	119650576
01/12/2023	vctrs	Vector Helpers	01	12	2023	5	106564551
21/06/2024	cli	Helpers for Developing Command Line Interfaces	21	06	2024	6	104741711
20/03/2023	tibble	Simple Data Frames	20	03	2023	7	100443243
20/09/2024	jsonlite	A Simple and Robust JSON Parser and Generator for R	20	09	2024	8	98416548
11/10/2022	devtools	Tools to Make Developing R Packages Easier	11	10	2022	9	95171788
12/01/2025	Rcpp	Seamless R and C++ Integration	12	01	2025	10	94816376
07/11/2023	lifecycle	Manage the Life Cycle of your Package Functions	07	11	2023	11	94810927
07/01/2025	pillar	Coloured Formatting for Columns	07	01	2025	12	94210318
30/09/2024	glue	Interpreted String Literals	30	09	2024	13	93054391
11/09/2024	ragg	Graphic Devices Based on AGG	11	09	2024	14	90538667
20/01/2025	textshaping	Bindings to the 'HarfBuzz' and 'Fribidi' Libraries for Text Sha...	20	01	2025	15	87906117
14/11/2023	stringr	Simple, Consistent Wrappers for Common String Operations	14	11	2023	16	84672109
06/05/2024	stringi	Fast and Portable Character String Processing Facilities	06	05	2024	17	79777043
22/02/2023	tidyverse	Easily Install and Load the 'Tidyverse'	22	02	2023	18	79112925

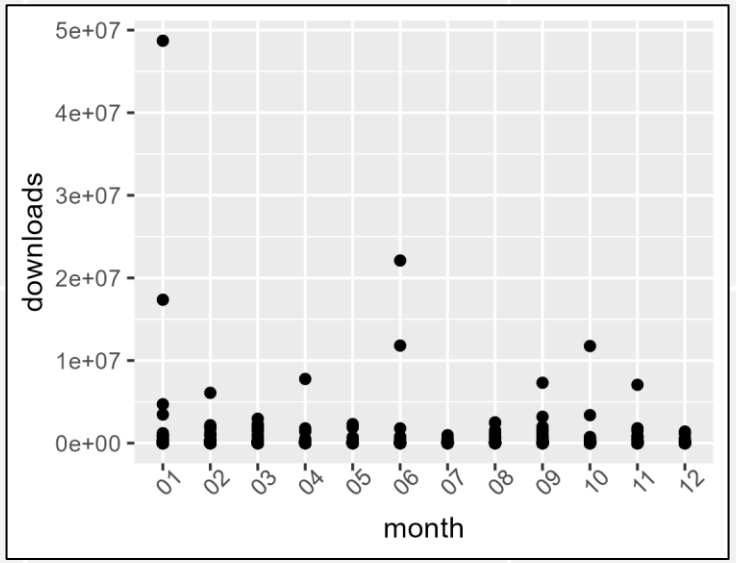
MAPPING

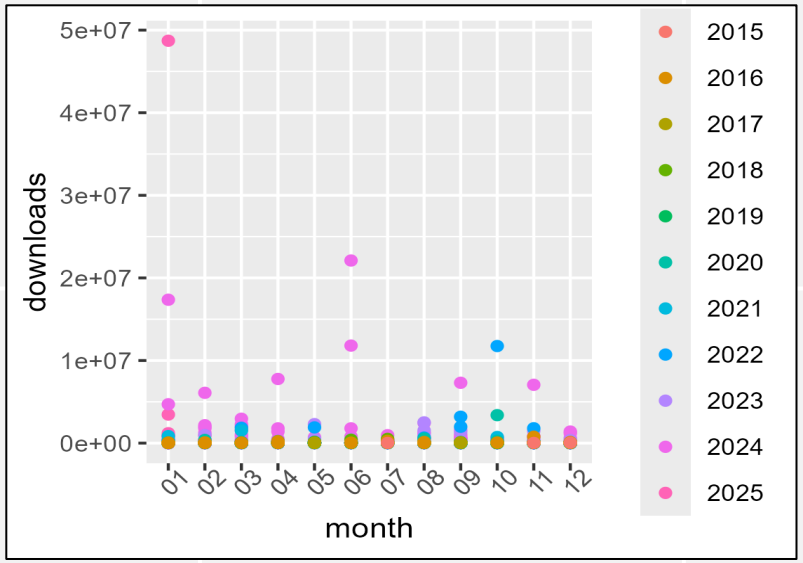
```
ggplot(data, mapping = aes(x = year, y = downloads))+
  geom_point()
```

¿eje x?
¿eje y?
Otras variables…

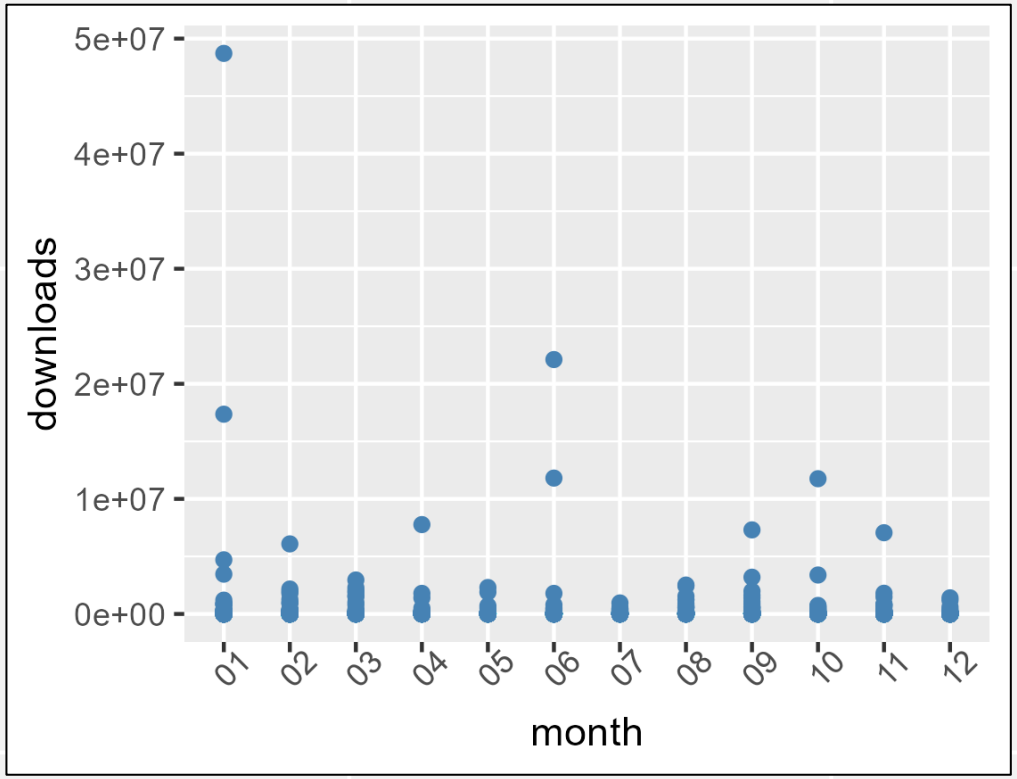
date	name	descr	day	month	year	rank	downloads
23/04/2024	ggplot2	Create Elegant Data Visualisations Using the Grammar of Gr...	23	04	2024	1	156190079
17/01/2025	rlang	Functions for Base Types and Core R and 'Tidyverse' Features	17	01	2025	2	145302572
30/03/2022	magrittr	A Forward-Pipe Operator for R	30	03	2022	3	132429652
17/11/2023	dplyr	A Grammar of Data Manipulation	17	11	2023	4	119650576
01/12/2023	vctrs	Vector Helpers	01	12	2023	5	106564551
21/06/2024	cli	Helpers for Developing Command Line Interfaces	21	06	2024	6	104741711



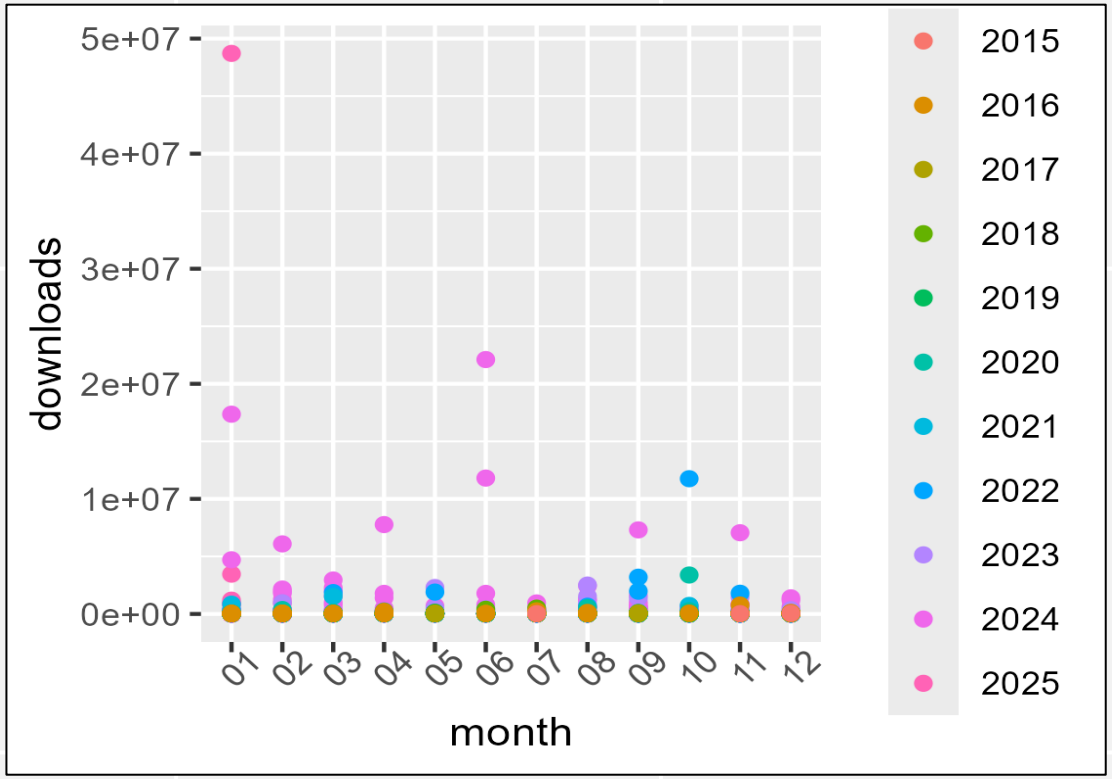




MAPPING



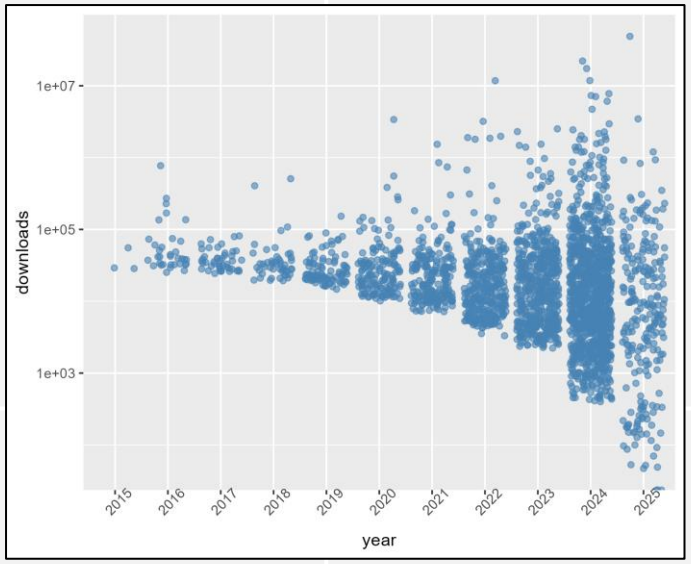

```
ggplot(data)+
  geom_point(aes(month, downloads) , colour="blue")
```

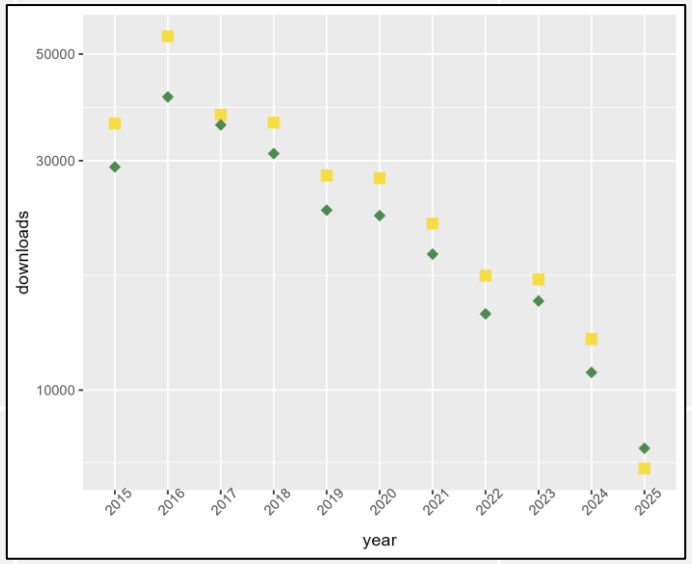


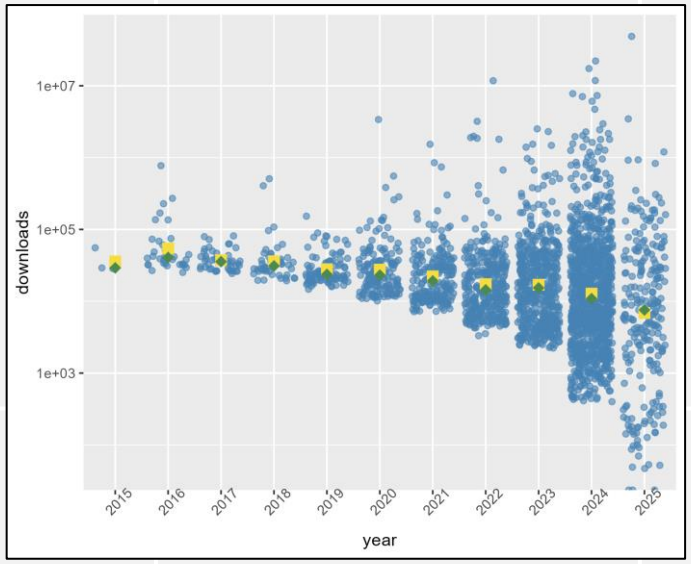

```
ggplot(data)+
  geom_point(aes(month, downloads, colour=year))
```

STATISTICS

```
ggplot(data)+
  stat_summary(aes(x = year, y = downloads), fun = mean)
```



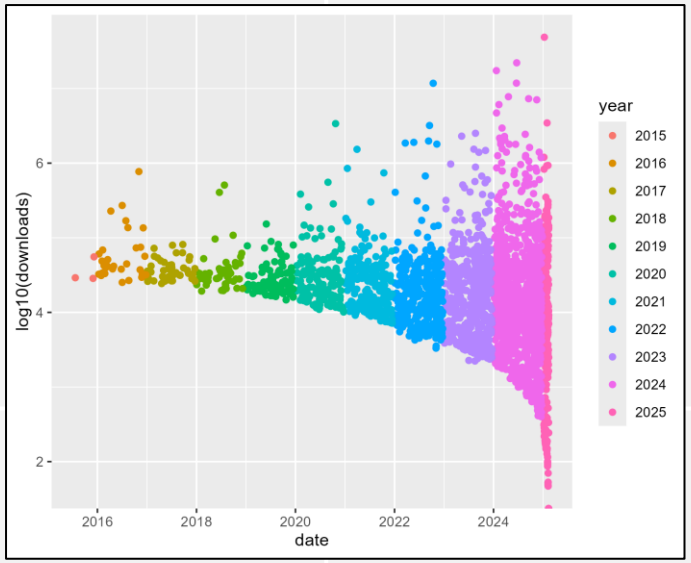


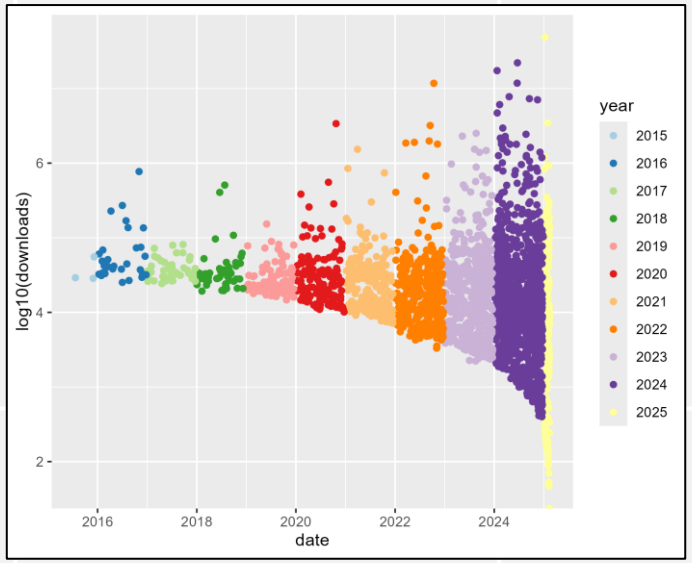


SCALES

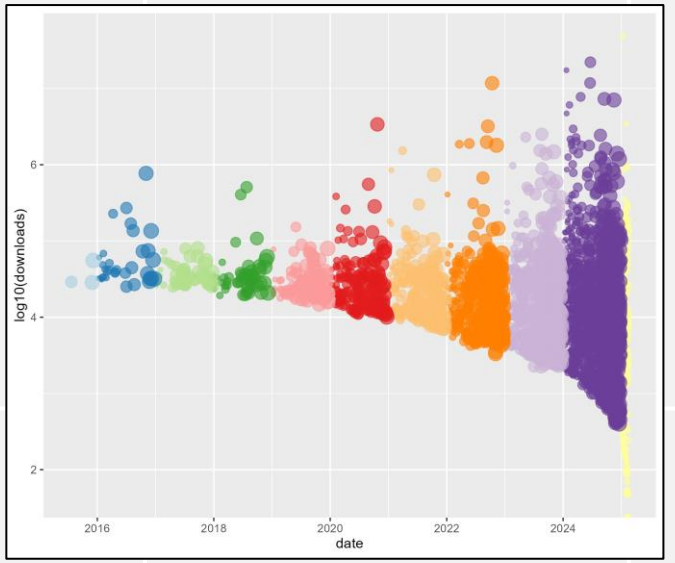
```
ggplot(data, mapping)+
  geom_xxx()+
  scale_<aes>_<type>()
```

```
ggplot(data)+
  geom_point(aes(date, log10(downloads), colour=year))
```



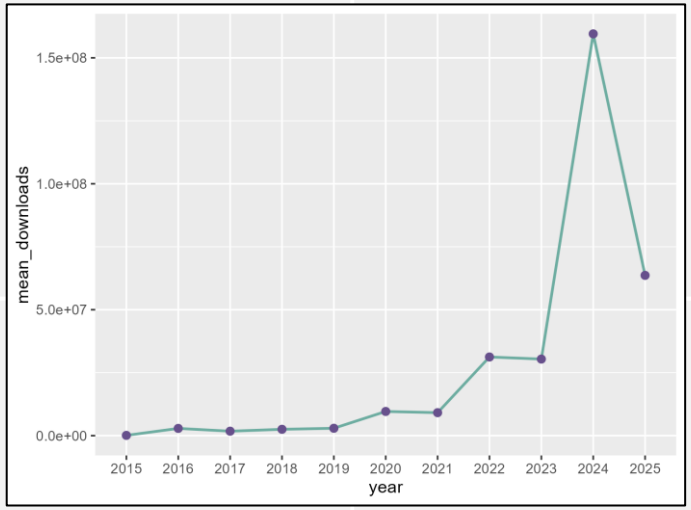



```
+ scale_colour_brewer(palette)
```

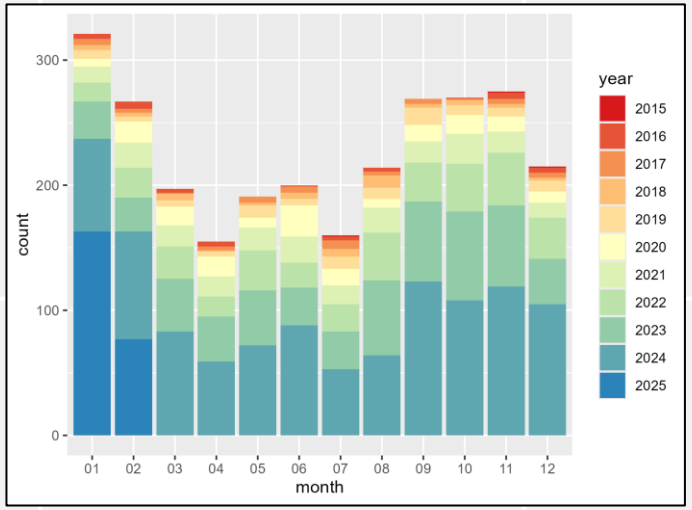



```
+ scale_size_area()
```

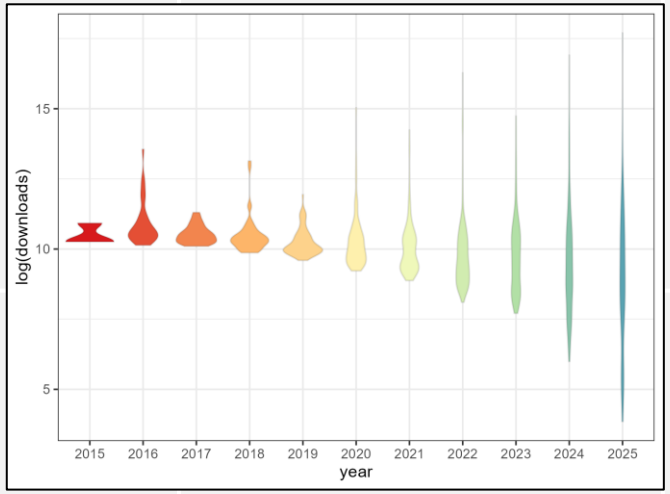
GEOMETRIES



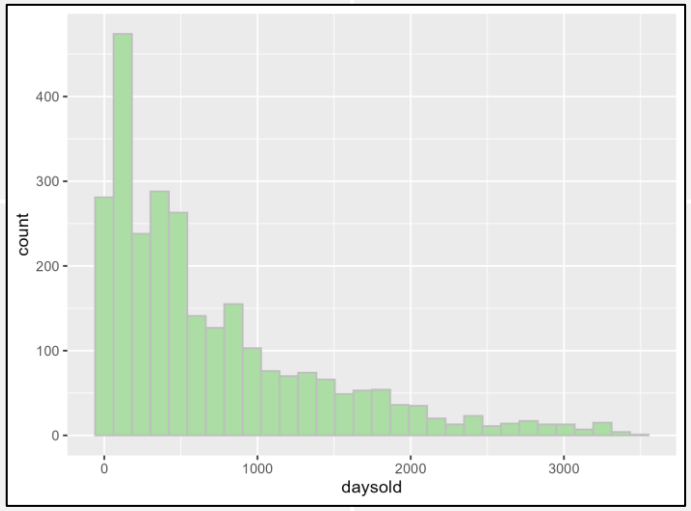
geom_point( ) & geom_line( )



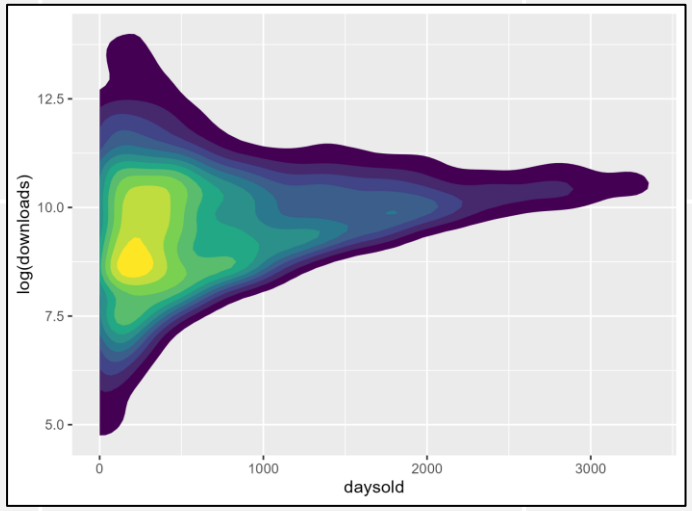
geom_bar( )



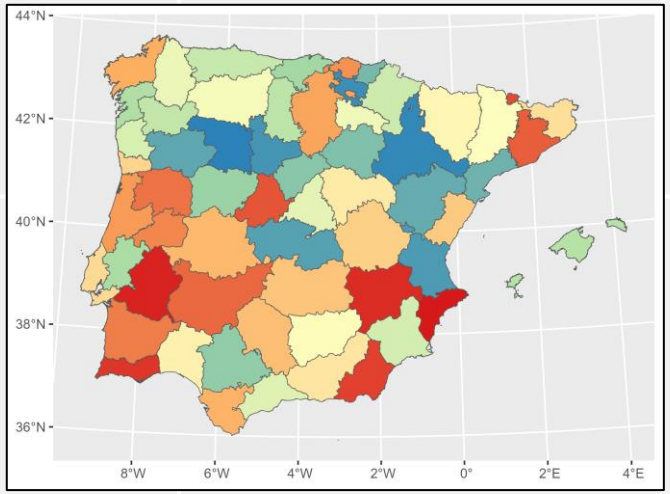
geom_violin( )



geom_histogram( )



stat_density_2d ( )



geom_spatvect( )

GEOMETRIES

Basics

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

To display values, map variables in the data to visual properties of the geom (**aesthetics**) like **size**, **color**, and **x** and **y** locations.

Complete the template below to build a graph.

```
ggplot (data = <DATA>) +                                  required
<GEOM_FUNCTION>(mapping = aes(<MAPPINGS>),
 stat = <STAT>, position = <POSITION>) +                  Not required, sensible defaults supplied
<COORDINATE_FUNCTION> +
<FACET_FUNCTION> +
<SCALE_FUNCTION> +
<THEME_FUNCTION>
```

ggplot(data = mpg, **aes(**x = cty, y = hwy**))** Begins a plot that you finish by adding layers to. Add one geom function per layer.

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.

Aes

Common aesthetic values.

color and **fill** - string ("red", "#RRGGBB")

linetype - integer or string (0 = "blank", 1 = "solid", 2 = "dashed", 3 = "dotted", 4 = "dotdash", 5 = "longdash", 6 = "twodash")

size - integer (in mm for size of points and text)

linewidth - integer (in mm for widths of lines)

shape - integer/shape name or a single character ("a")

posit

Geoms

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

ggplot2

GRAPHICAL PRIMITIVES

a <- ggplot(economics, aes(date, unemploy))
b <- ggplot(seals, aes(x = long, y = lat))

a + geom_blank() and **a + expand_limits()**
Ensure limits include values across all plots.

b + geom_curve(aes(yend = lat + 1, xend = long + 1), curvature = 1**)** - x, xend, y, yend, alpha, angle, color, curvature, linetype, size

a + geom_path(lineend = "butt", linejoin = "round", linemitre = 1**)**
x, y, alpha, color, group, linetype, size

a + geom_polygon(aes(alpha = 50)**)** - x, y, alpha, color, fill, group, subgroup, linetype, size

b + geom_rect(aes(xmin = long, ymin = lat, xmax = long + 1, ymax = lat + 1)**)** - xmax, xmin, ymax, ymin, alpha, color, fill, linetype, size

a + geom_ribbon(aes(ymin = unemploy - 900, ymax = unemploy + 900)**)** - x, ymax, ymin, alpha, color, fill, group, linetype, size

LINE SEGMENTS

common aesthetics: x, y, alpha, color, linetype, size

b + geom_abline(aes(intercept = 0, slope = 1)**)**
b + geom_hline(aes(yintercept = lat)**)**
b + geom_vline(aes(xintercept = long)**)**

b + geom_segment(aes(yend = lat + 1, xend = long + 1)**)**
b + geom_spoke(aes(angle = 1:1155, radius = 1)**)**

ONE VARIABLE continuous

c <- ggplot(mpg, aes(hwy)); c2 <- ggplot(mpg)

c + geom_area(stat = "bin"**)**
x, y, alpha, color, fill, linetype, size

c + geom_density(kernel = "gaussian"**)**
x, y, alpha, color, fill, group, linetype, size, weight

c + geom_dotplot()
x, y, alpha, color, fill

c + geom_freqpoly()
x, y, alpha, color, group, linetype, size

c + geom_histogram(binwidth = 5**)**
x, y, alpha, color, fill, linetype, size, weight

c2 + geom_qq(aes(sample = hwy)**)**
x, y, alpha, color, fill, linetype, size, weight

discrete

d <- ggplot(mpg, aes(fl))

d + geom_bar()
x, alpha, color, fill, linetype, size, weight

TWO VARIABLES

both continuous

e <- ggplot(mpg, aes(cty, hwy))

e + geom_label(aes(label = cty), nudge_x = 1, nudge_y = 1**)** - x, y, label, alpha, angle, color, family, fontface, hjust, lineheight, size, vjust

e + geom_point()
x, y, alpha, color, fill, shape, size, stroke

e + geom_quantile()
x, y, alpha, color, group, linetype, size, weight

e + geom_rug(sides = "bl"**)**
x, y, alpha, color, linetype, size

e + geom_smooth(method = lm**)**
x, y, alpha, color, fill, group, linetype, size, weight

e + geom_text(aes(label = cty), nudge_x = 1, nudge_y = 1**)** - x, y, label, alpha, angle, color, family, fontface, hjust, lineheight, size, vjust

continuous bivariate distribution

h <- ggplot(diamonds, aes(carat, price))

h + geom_bin2d(binwidth = c(0.25, 500)**)**
x, y, alpha, color, fill, linetype, size, weight

h + geom_density_2d()
x, y, alpha, color, group, linetype, size

h + geom_hex()
x, y, alpha, color, fill, size

continuous function

i <- ggplot(economics, aes(date, unemploy))

i + geom_area()
x, y, alpha, color, fill, linetype, size

i + geom_line()
x, y, alpha, color, group, linetype, size

i + geom_step(direction = "hv"**)**
x, y, alpha, color, group, linetype, size

one discrete, one continuous

f <- ggplot(mpg, aes(class, hwy))

f + geom_col()
x, y, alpha, color, fill, group, linetype, size

f + geom_boxplot()
x, y, lower, middle, upper, ymax, ymin, alpha, color, fill, group, linetype, shape, size, weight

f + geom_dotplot(binaxis = "y", stackdir = "center"**)**
x, y, alpha, color, fill, group

f + geom_violin(scale = "area"**)**
x, y, alpha, color, fill, group, linetype, size, weight

visualizing error

df <- data.frame(grp = c("A", "B"), fit = 4:5, se = 1:2)
j <- ggplot(df, aes(grp, fit, ymin = fit - se, ymax = fit + se))

j + geom_crossbar(fatten = 2**)** - x, y, ymax, ymin, alpha, color, fill, group, linetype, size

j + geom_errorbar() - x, ymax, ymin, alpha, color, group, linetype, size, width
Also **geom_errorbarh()**.

j + geom_linerange()
x, ymin, ymax, alpha, color, group, linetype, size

j + geom_pointrange() - x, y, ymin, ymax, alpha, color, fill, group, linetype, shape, size

both discrete

g <- ggplot(diamonds, aes(cut, color))

g + geom_count()
x, y, alpha, color, fill, shape, size, stroke

e + geom_jitter(height = 2, width = 2**)**
x, y, alpha, color, fill, shape, size

maps

Draw the appropriate geometric object depending on the simple features present in the data. aes() arguments: map_id, alpha, color, fill, linetype, linewidth.

nc <- sf::st_read(system.file("shape/nc.shp", package = "sf"))

ggplot(nc) +
geom_sf(aes(fill = AREA)**)**

THREE VARIABLES

seals$z <- with(seals, sqrt(delta_long^2 + delta_lat^2)); l <- ggplot(seals, aes(long, lat))

l + geom_contour(aes(z = z)**)**
x, y, z, alpha, color, group, linetype, size, weight

l + geom_contour_filled(aes(fill = z)**)**
x, y, alpha, color, fill, group, linetype, size, subgroup

l + geom_raster(aes(fill = z), hjust = 0.5, vjust = 0.5, interpolate = FALSE**)**
x, y, alpha, fill

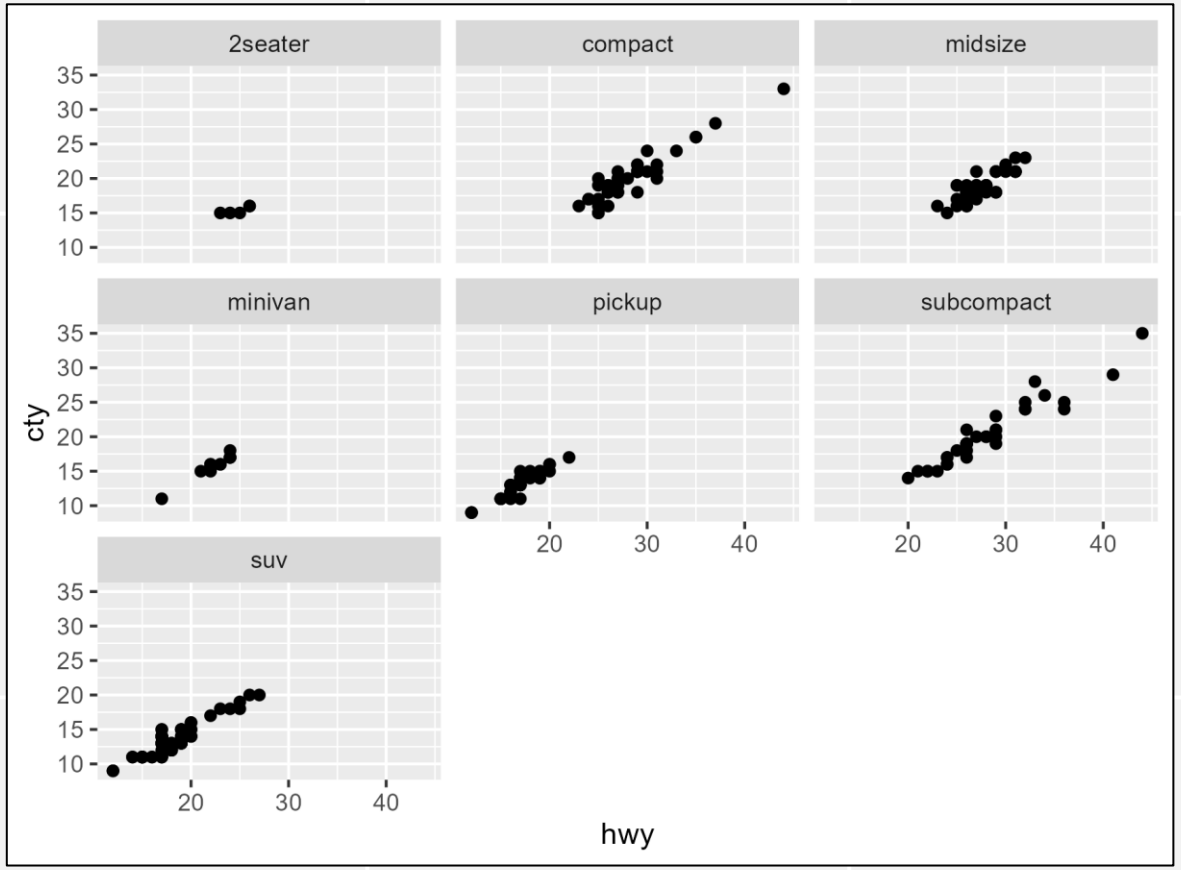
l + geom_tile(aes(fill = z)**)**
x, y, alpha, color, fill, linetype, size, width

CC BY SA Posit Software, PBC • info@posit.co • posit.co • Learn more at **ggplot2.tidyverse.org** • HTML cheatsheets at **pos.it/cheatsheets** • ggplot2 3.5.1 • Updated: 2024-05

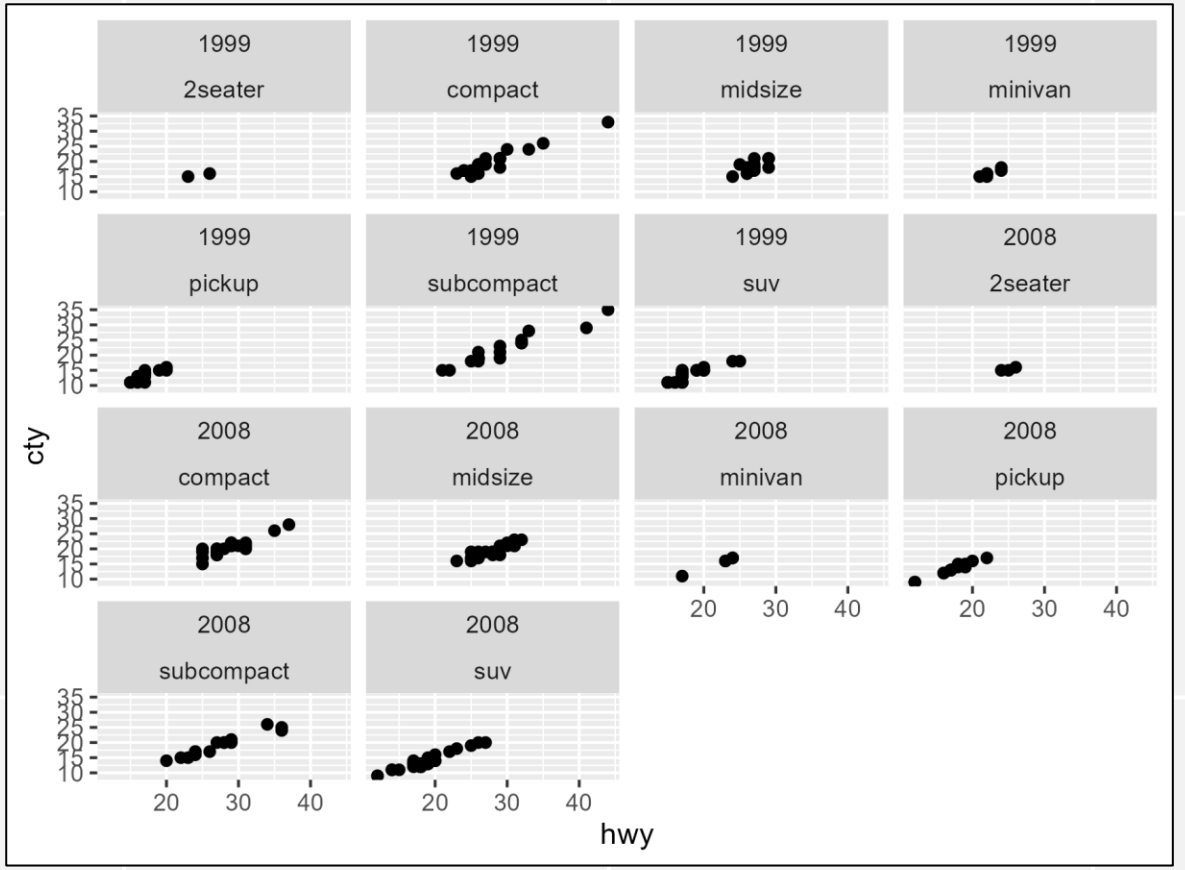
https://rstudio.github.io/cheatsheets/data-visualization.pdf

FACETS

```
ggplot(data, mapping)+
  geom_point()+
```



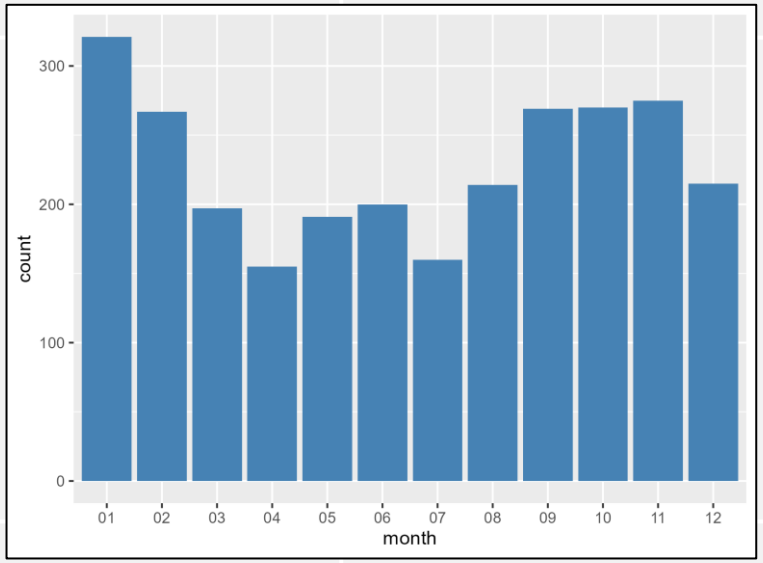
facet_wrap(~var1)

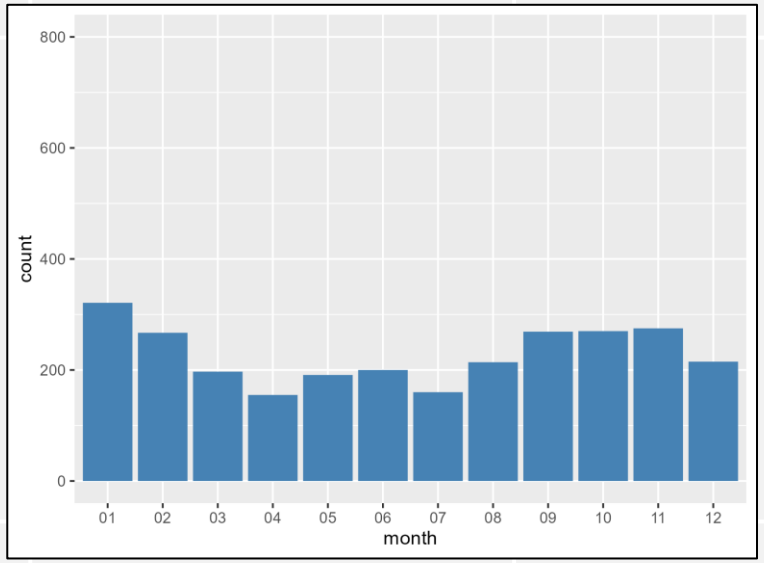


facet_grid(var1~var2)

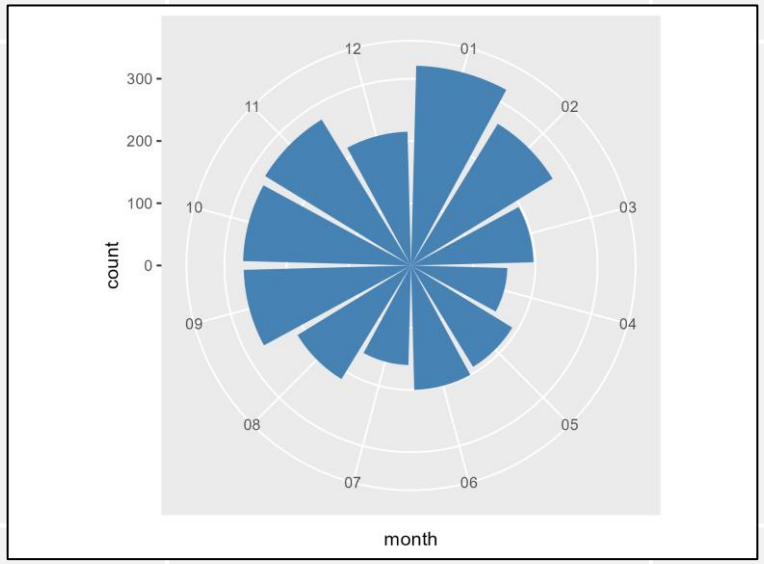
COORDINATES

```
ggplot(data, mapping)+
  geom_bar(fill)+
```



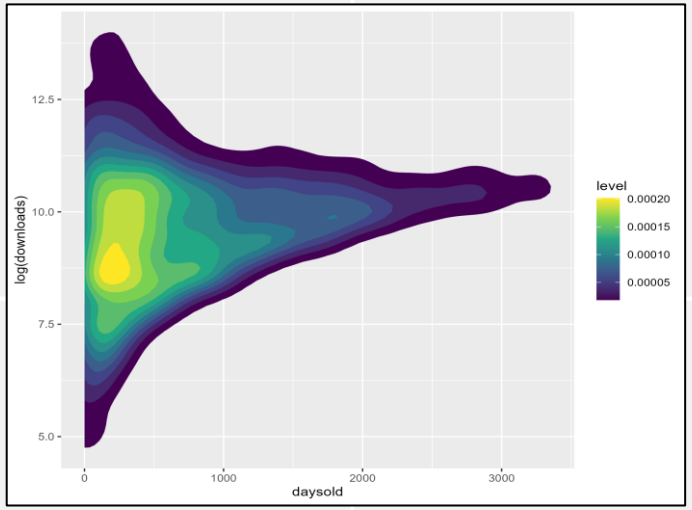


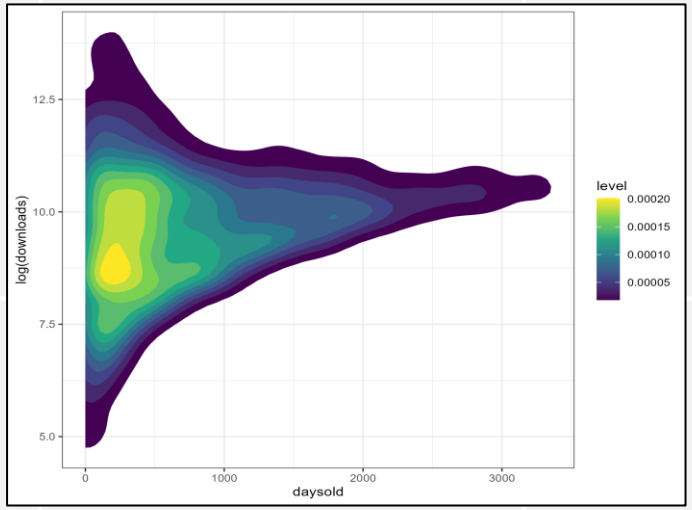
+ coords_trans(ylim = c(0, 800))



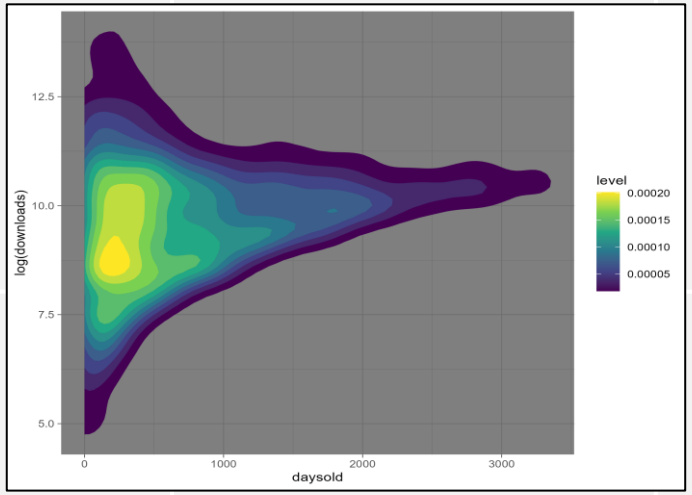
+ coord_polar()

THEME

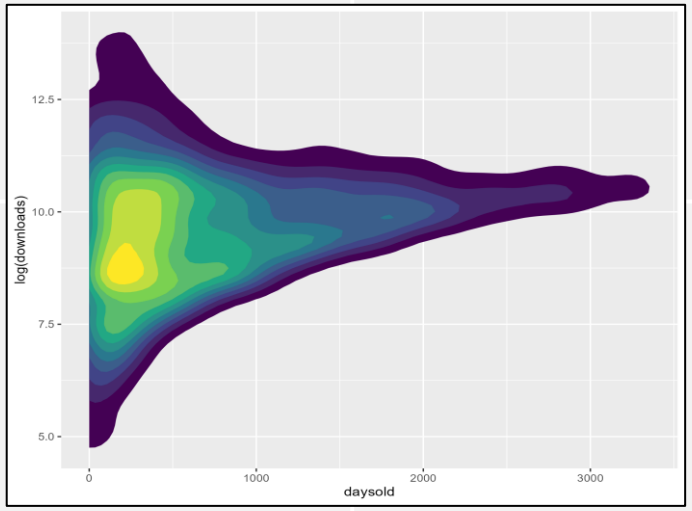




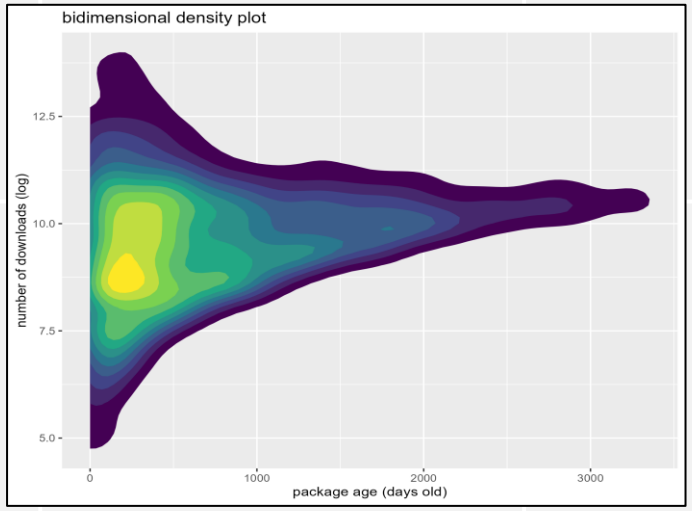
+theme_bw( )



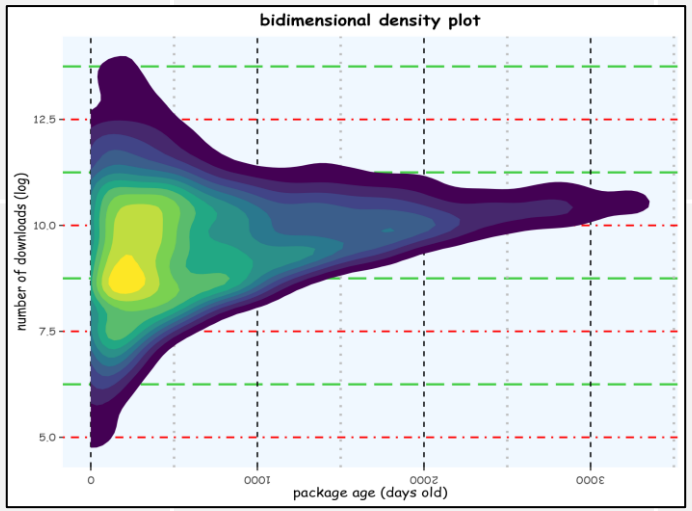
+theme_dark( )



+theme(legend.position = “none”)



+labs(title, x, y)



+labs(...) + theme(...)