

Who are the ggplot2 extenders, and how can you become one? An Overview

How do we define the ecosystem? (NAME)

- Packages that start with "gg"
 - but not...
- Packages that depend on ggplot2
- Other

How do we define the ecosystem? (LOCATION)

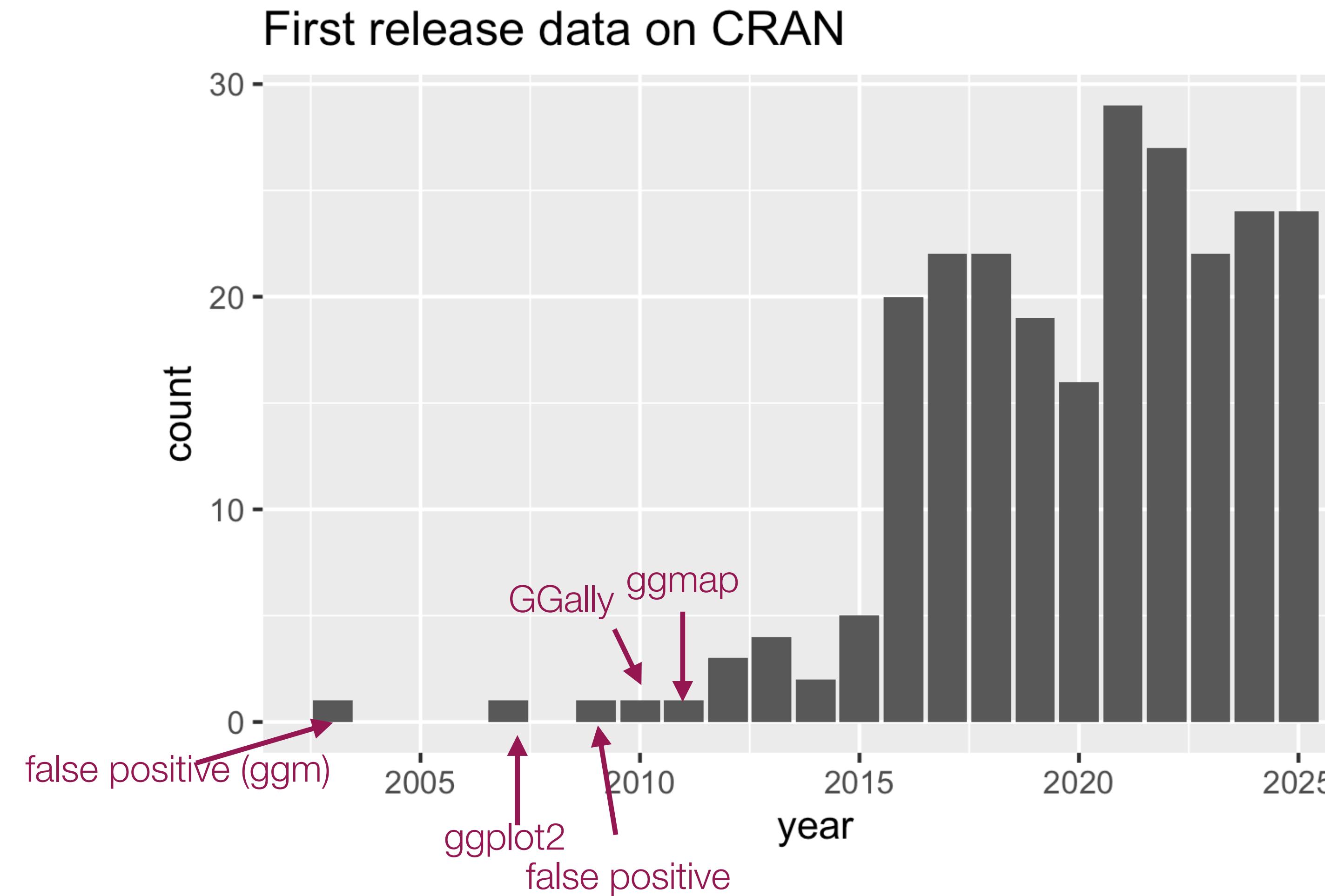
- **Tidyverse Extension Gallery**
- **CRAN**
- **GitHub**
- **Other**

ggplot2 extensions: first CRAN releases

- **ggplot** 2006-04-06
- **ggplot2** 2007-06-10 (*now an adult...*)
- **GGally** 2010-02-01
- **ggmap** 2011-11-30

Source: <https://cran.r-project.org/src/contrib/Archive/>

CRAN release dates



Early extensions 2012-2015

```
package    first_release_date  
<chr>     <date>  
1 gglasso   2012-04-30  
2 ggcmcnc  2012-09-05  
3 ggthemes  2012-12-22
```

```
package    first_release_date  
<chr>     <date>  
1 ggdendro  2013-01-28  
2 GGIR      2013-08-08  
3 ggparallel 2013-08-20  
4 ggtern    2013-12-18
```

```
package    first_release_date  
<chr>     <date>  
1 gaswissmaps 2014-11-07  
2 ggvis       2014-06-24
```

```
package    first_release_date  
<chr>     <date>  
1 gge        2015-12-14  
2 ggnealogy  2015-03-02  
3 ggExtra    2015-03-27  
4 ggfortify  2015-10-04  
5 ggplot2movies 2015-08-25
```

2015/2016

- 1st version of "Extending ggplot2" vignette

Commit `6d541c3`



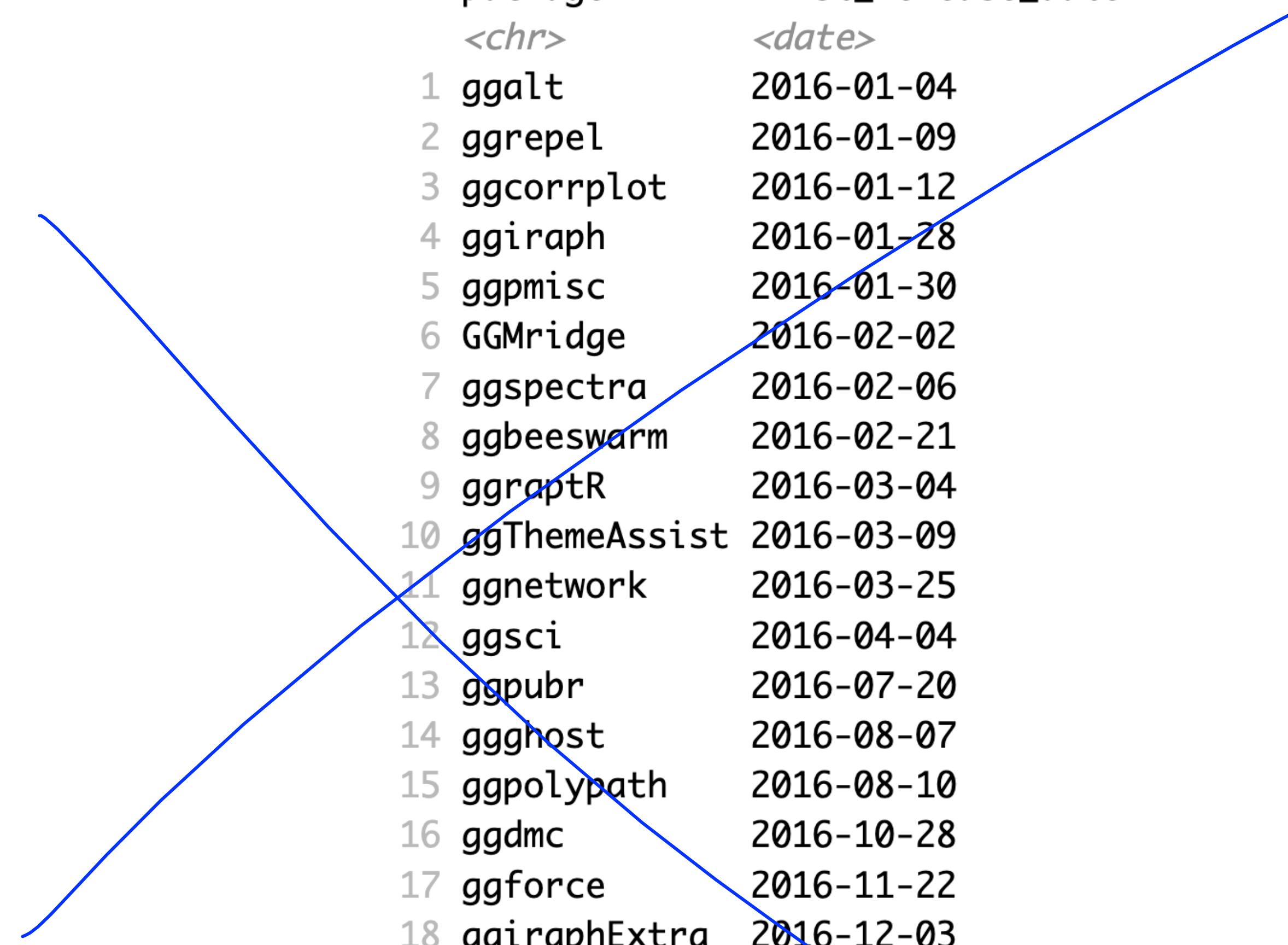
hadley committed on Aug 5, 2015

Rough start on extending ggplot2 vignette. [#1140](#)

godev main · v3.5.2 · v3.5.1 · v3.5.0 · v3.4.0 · v3.3.0 · v3.2.0 · v3.1.0 · v3.0.0 · v2.0.0

- ggplot2 2.0.0 released December 2015
- ggplot2 book, 2nd edition released June 2016

2016



	package	first_release_date
	<chr>	<date>
1	ggalt	2016-01-04
2	ggrepel	2016-01-09
3	ggcorrplot	2016-01-12
4	ggiraph	2016-01-28
5	ggpmisc	2016-01-30
6	GGMridge	2016-02-02
7	ggspectra	2016-02-06
8	ggbeeswarm	2016-02-21
9	ggraptR	2016-03-04
10	ggThemeAssist	2016-03-09
11	ggnetwork	2016-03-25
12	ggsci	2016-04-04
13	ggpubr	2016-07-20
14	ggghost	2016-08-07
15	ggpolypath	2016-08-10
16	ggdmc	2016-10-28
17	ggforce	2016-11-22
18	ggiraphExtra	2016-12-03
19	ggmosaic	2016-12-30
20	gghalfnorm	2016-12-31

"Add-on" packages

3.14 Add-on Packages

If the built-in tools in ggplot2 don't do what you need, you might want to use a special purpose tool built into one of the packages built on top of ggplot2. Some of the packages that I was familiar with when the book was published include:

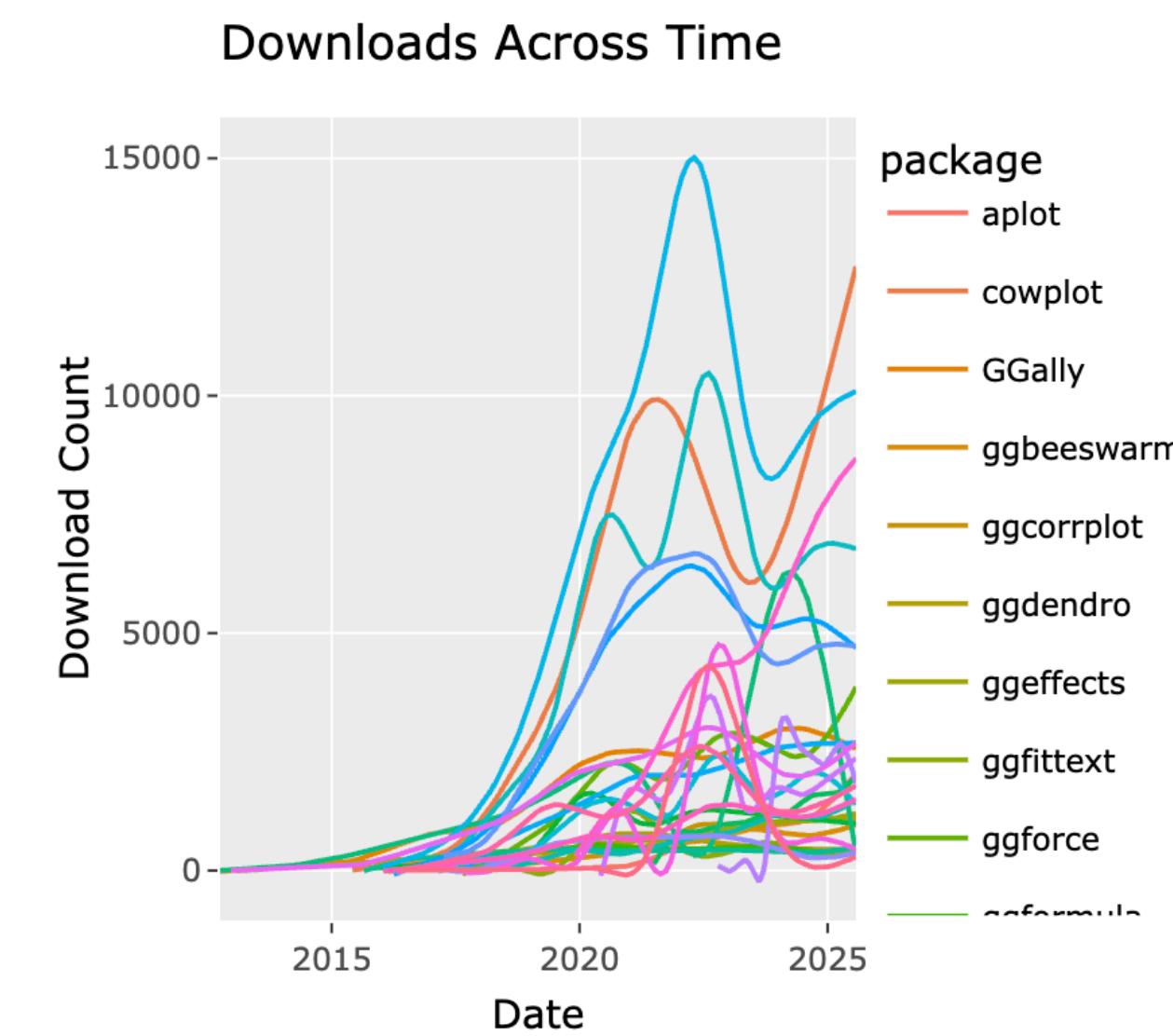
- animInt, <https://github.com/tdhock/animint>, lets you make your ggplot2 graphics interactive, adding querying, filtering and linking.
- GGally, <https://github.com/ggobi/ggally>, provides a very flexible scatterplot matrix, amongst other tools.
- ggbio, <http://www.tengfei.name/ggbio/>, provides a number of specialised geoms for genomic data.
- ggdendro, <https://github.com/andrie/ggdendro>, turns data from tree methods into data frames that can easily be displayed with ggplot2.

- ggfortify, <https://github.com/sinhrks/ggfortify>, provides fortify and autoplot methods to handle objects from some popular R packages.
- ggenealogy, <https://cran.r-project.org/package=ggenealogy>, helps explore and visualise genealogy data.
- ggmcmc, <http://xavier-fim.net/packages/ggmcmc/>, provides a set of flexible tools for visualising the samples generated by MCMC methods.
- ggparallel, <https://cran.r-project.org/package=ggparallel>: easily draw parallel coordinates plots, and the closely related hammock and common angle plots.
- ggtern, <http://www.ggtern.com>, lets you use ggplot2 to draw ternary diagrams, used when you have three variables that always sum to one.
- ggtree, <https://github.com/GuangchuangYu/ggtree>, provides tools to view and annotate phylogenetic tree with different types of meta-data.
- granovaGG, <https://github.com/briandk/granovaGG>, provides tools to visualise ANOVA results.
- plotluck, <https://github.com/stefan-schroedl/plotluck>: the ggplot2 version of Google's "I'm feeling lucky". It automatically creates plots for one, two or three variables.

A great place to track new extensions is <http://www.ggplot2-exts.org>, by Daniel Emaasit.

Time Series

- total download count?
- total number of packages?
-



Classifying by construct:

GGPLOT2 GRAMMAR

Table of contents

20.1 New themes

20.2 New stats

20.3 New geoms

20.4 New coords

20.5 New scales

20.6 New positions

20.7 New facets

New Geoms

`ggforce` – arcs, bezier curves, splines, voronai, hulls, delaunay, and others

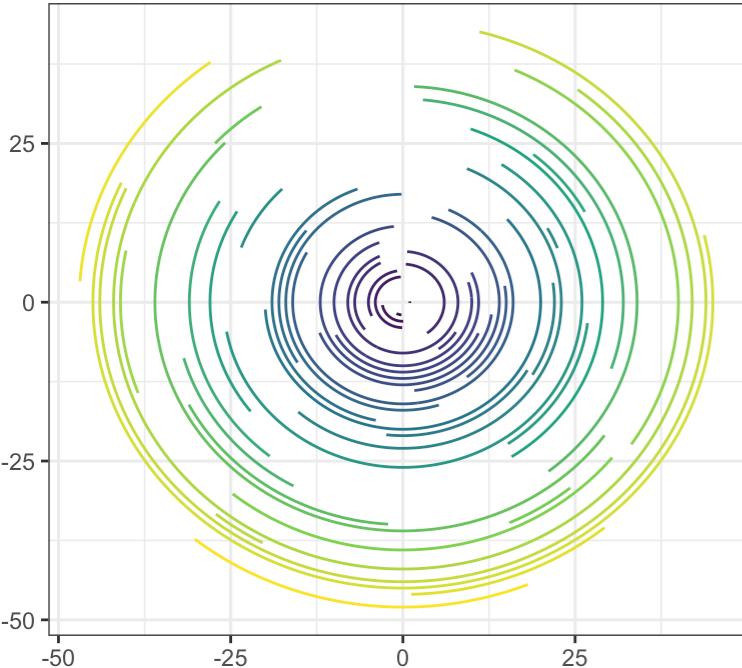
`ggalt` – splines, encircling points, dumbbell and lollipop charts, and others

`ggsignif` – significance brackets with p values

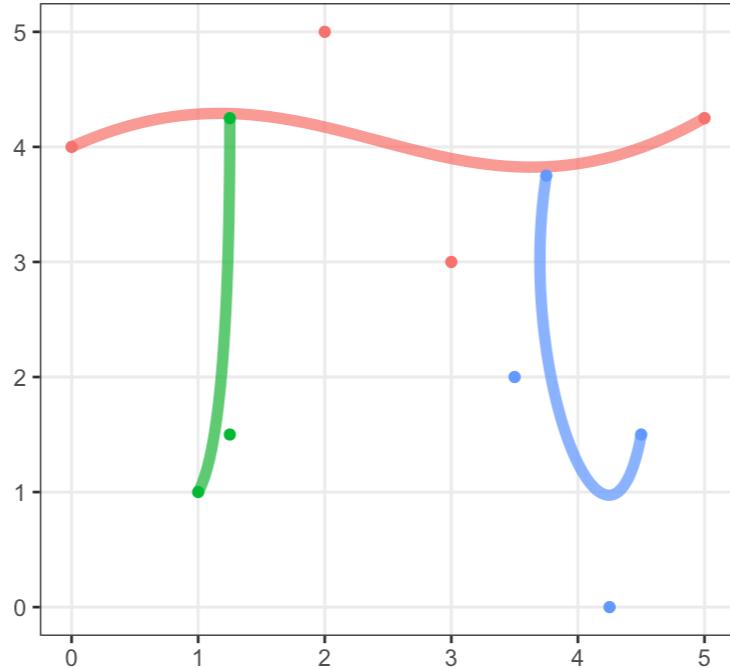
ggforce

</>

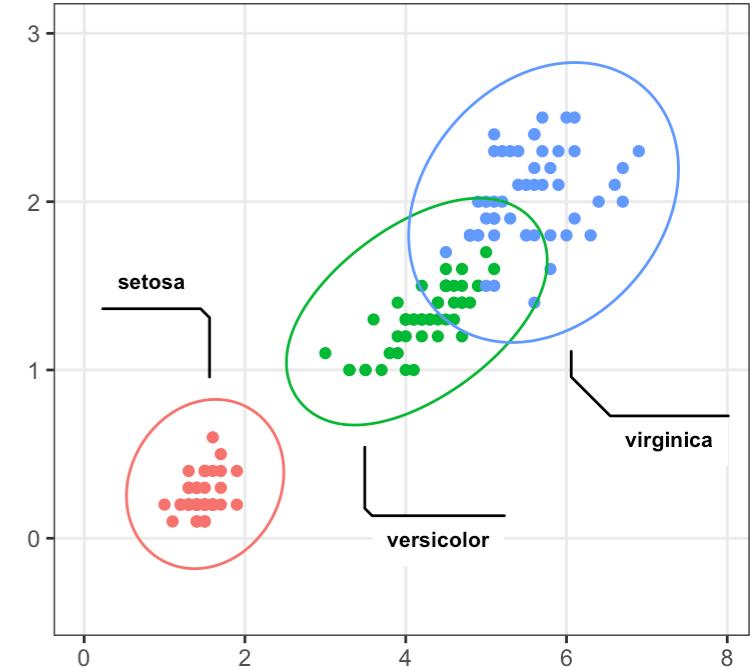
`geom_arc()`



`geom_bezier()`



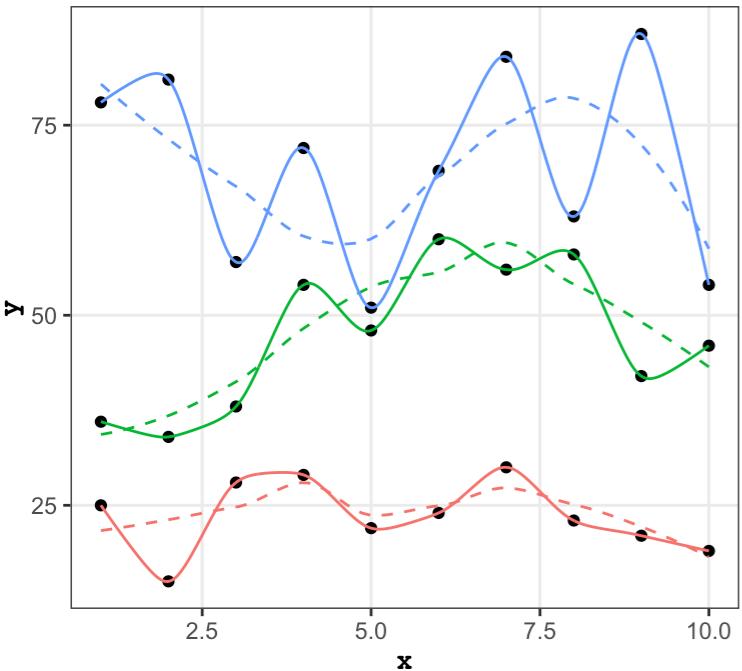
`geom_mark_ellipse()`



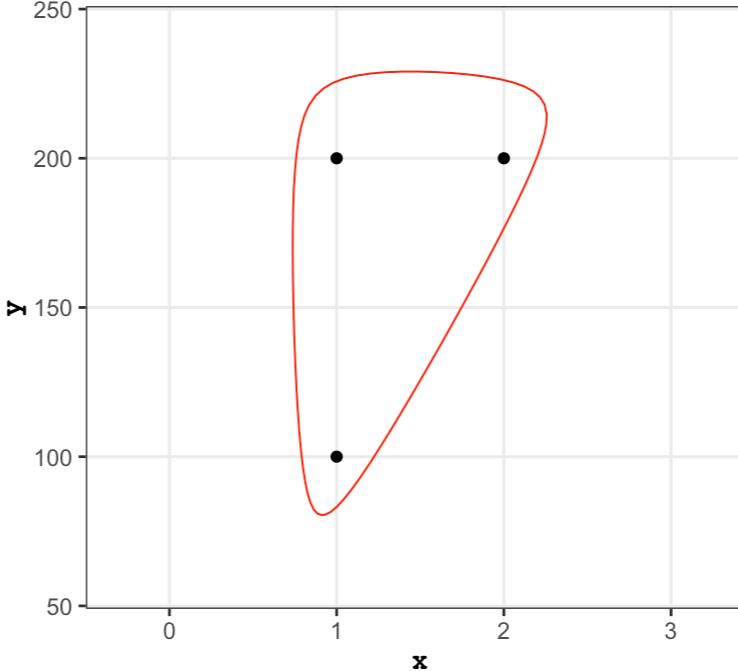
ggalt

</>

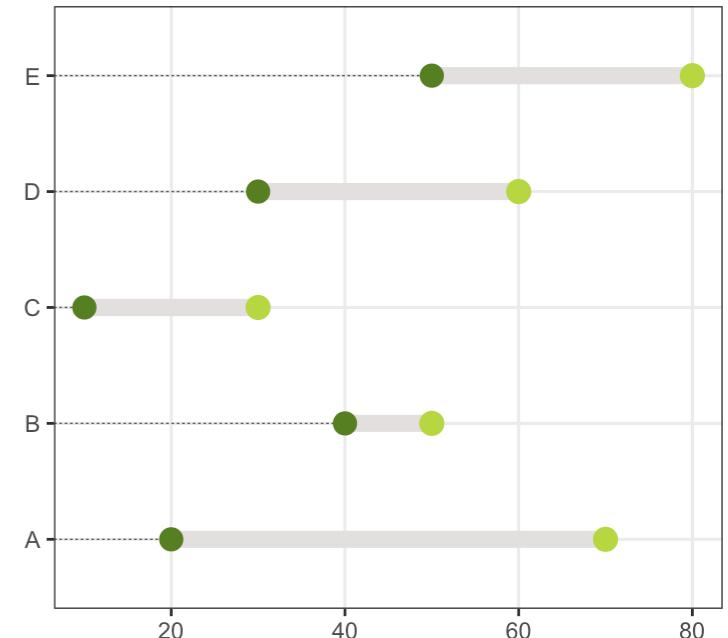
`geom_xspline()`



`geom_encircle()`



`geom_dumbbell()`

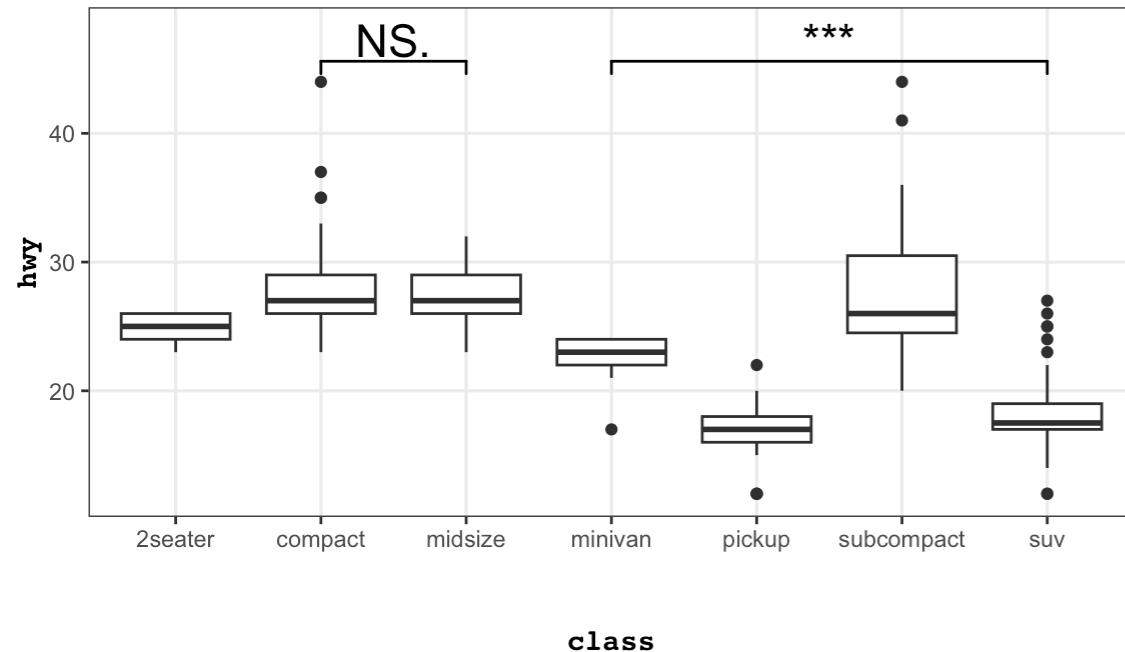


Code source: <https://github.com/hrbrmstr/ggalt>

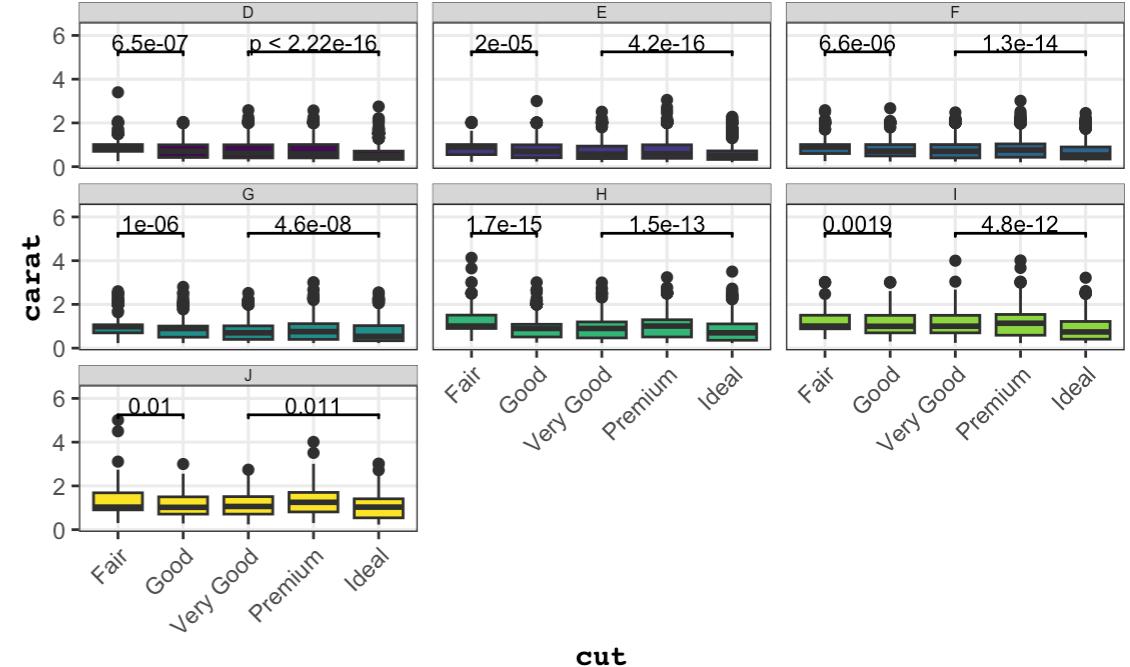
ggsignif

</>

geom_signif()



compatible with facets



Code source: <https://github.com/const-ae/ggsignif>

New Geoms for Labels/Text

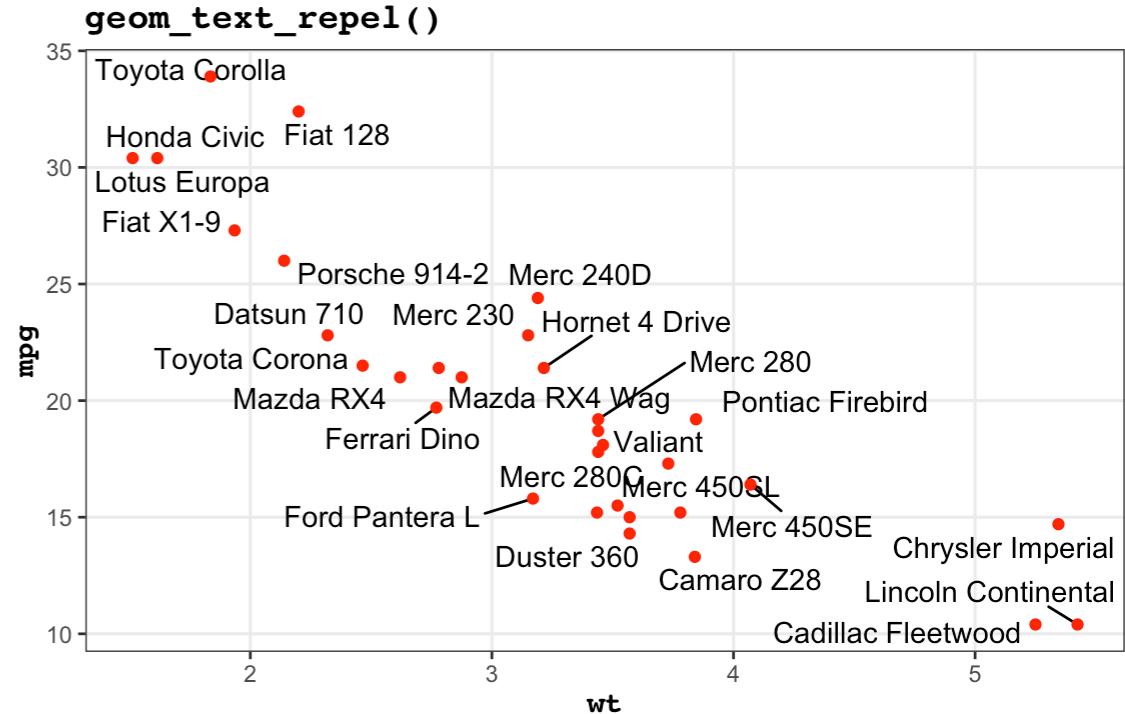
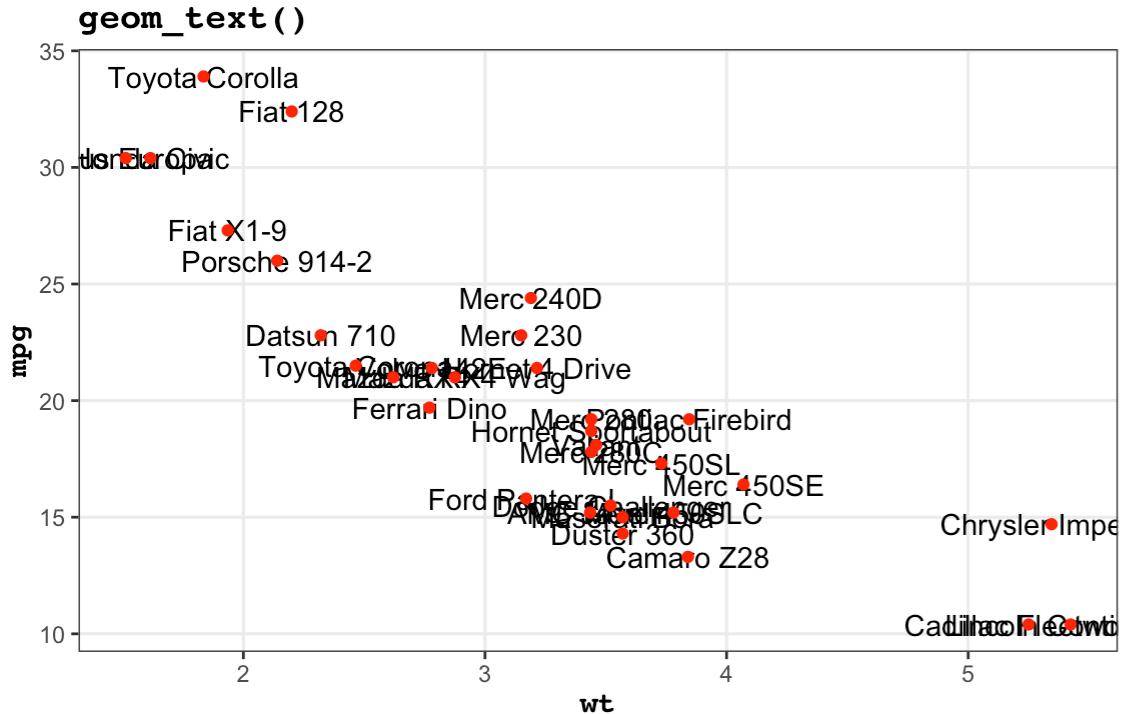
`ggrepel` – repel overlapping text labels

`ggtext` – fit text into boxes

`geomtextpath` – curved text

ggrepel

</>

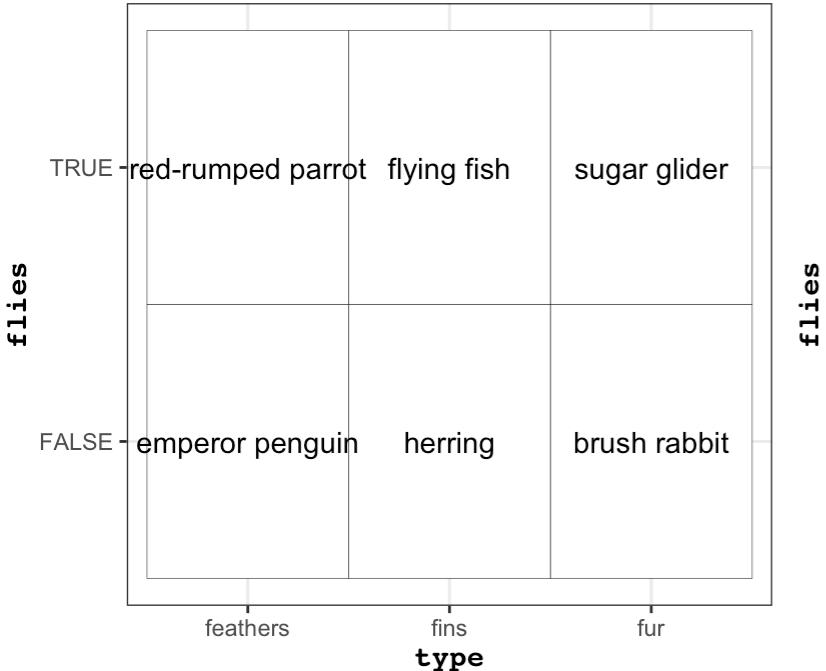


Code source: <https://ggrepel.slowkow.com/>

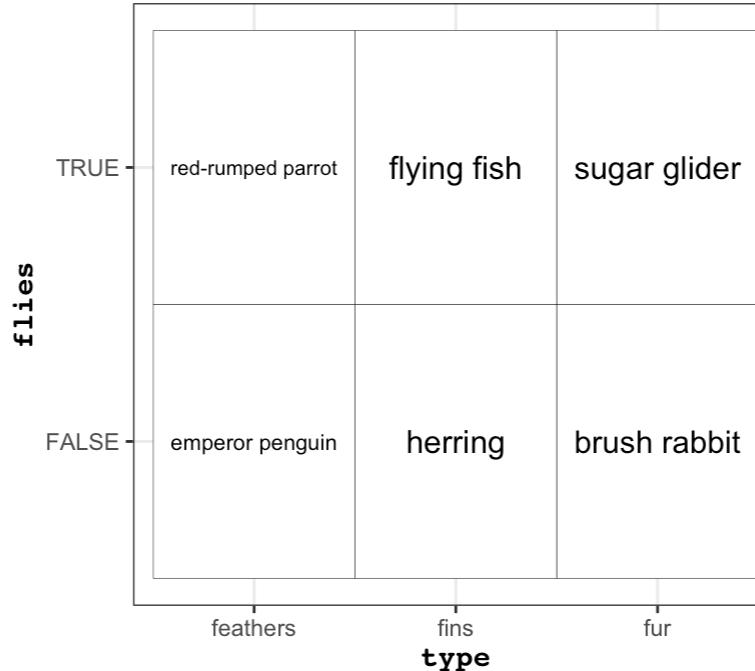
ggfittext

</>

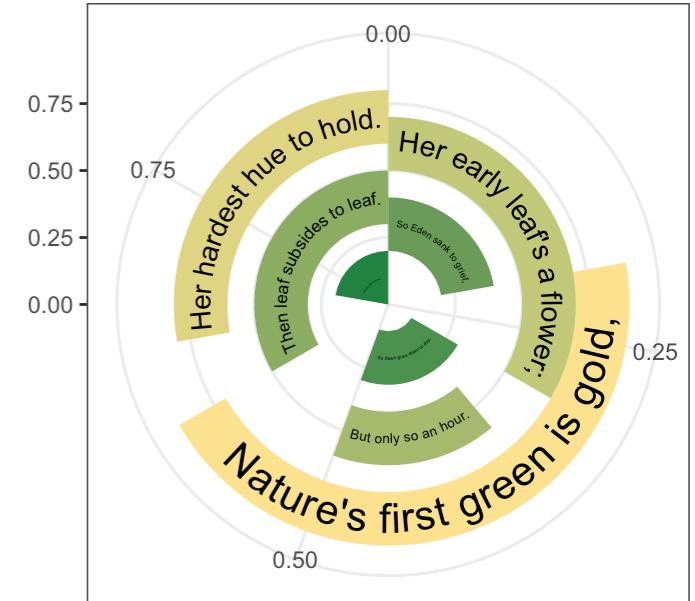
`geom_text()`



`geom_fit_text()`



`coord_polar(), geom_fit_text()`

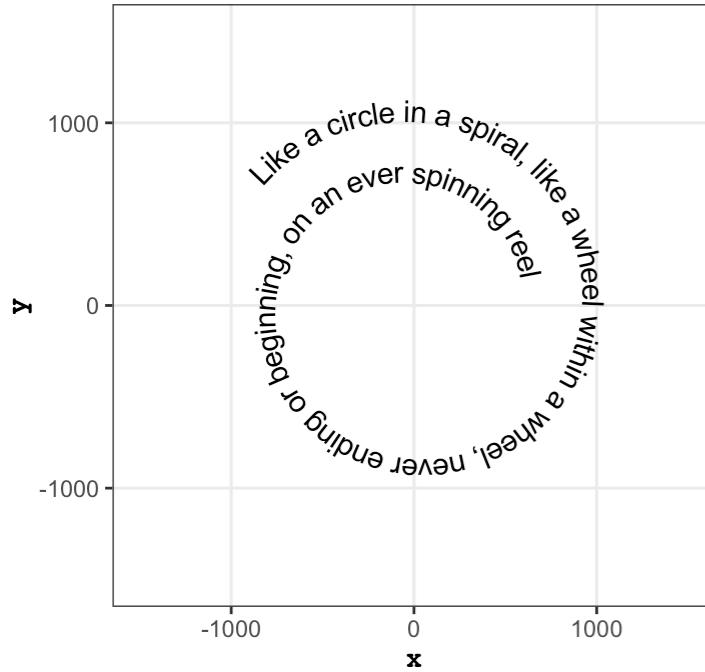


Code source: <https://github.com/wilcox/ggfittext>

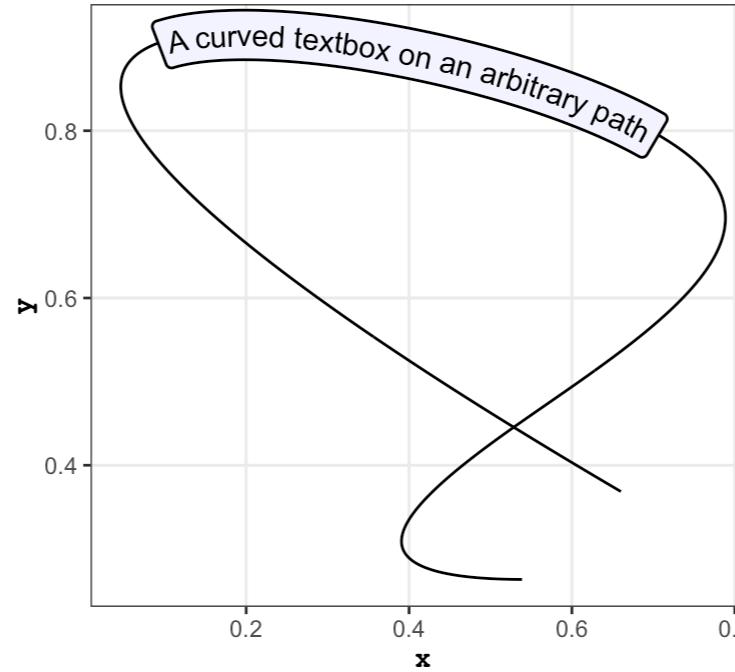
geomtextpath

</>

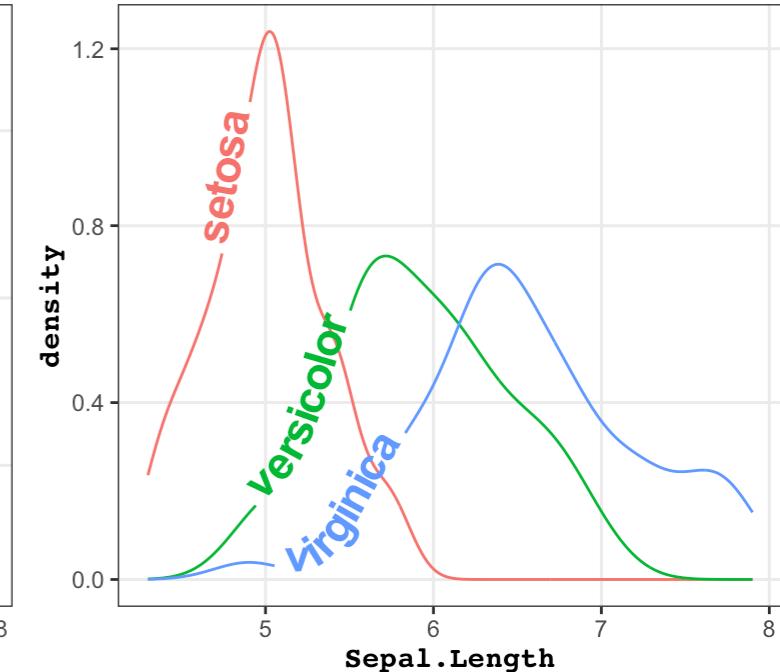
`geom_textpath()`



`geom_labelpath()`



`geom_textdensity()`



Code source: <https://allancameron.github.io/geomtextpath/>

New Stats

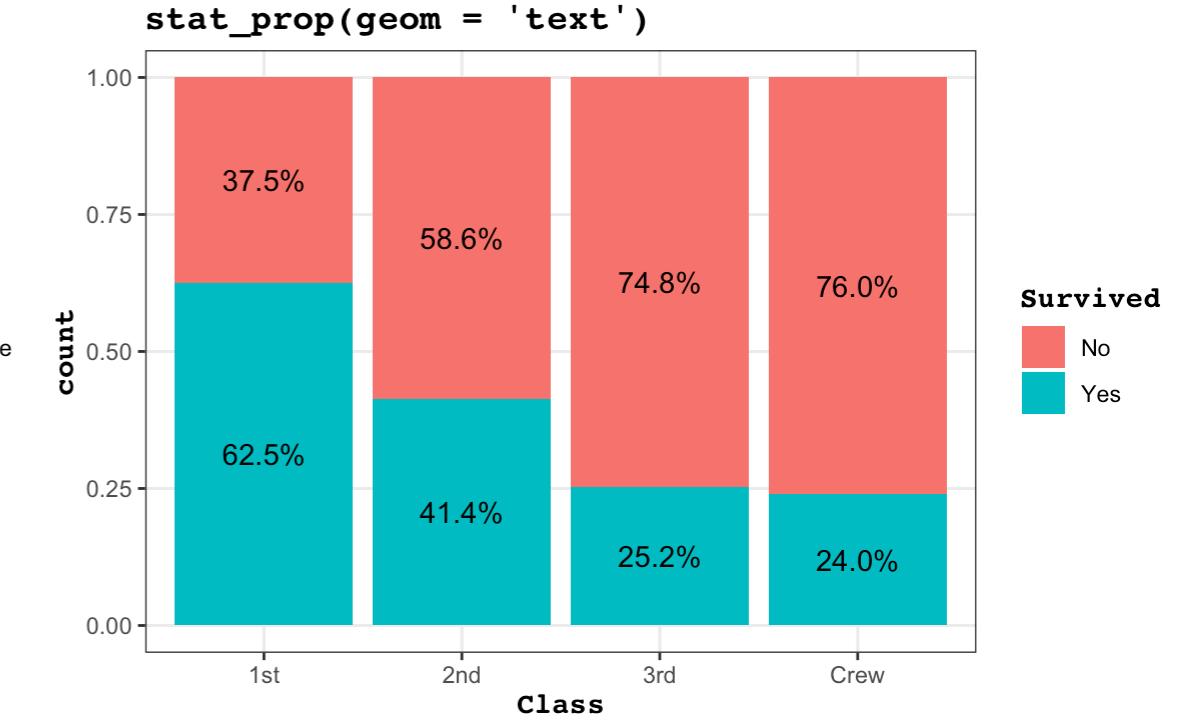
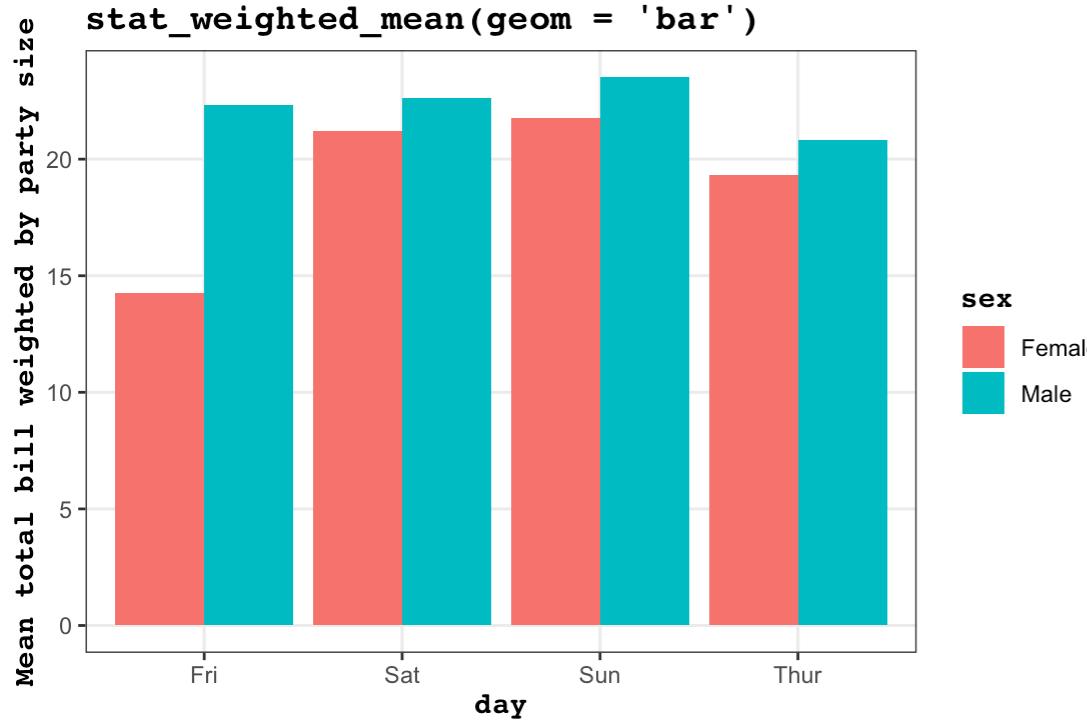
`ggstats` – new stat functions for weighted mean and proportions

`ggridges` – ridgeline plots (partially overlapping line plots)

`ggpmisc` – displays model fit statistics and summaries

ggstats

</>

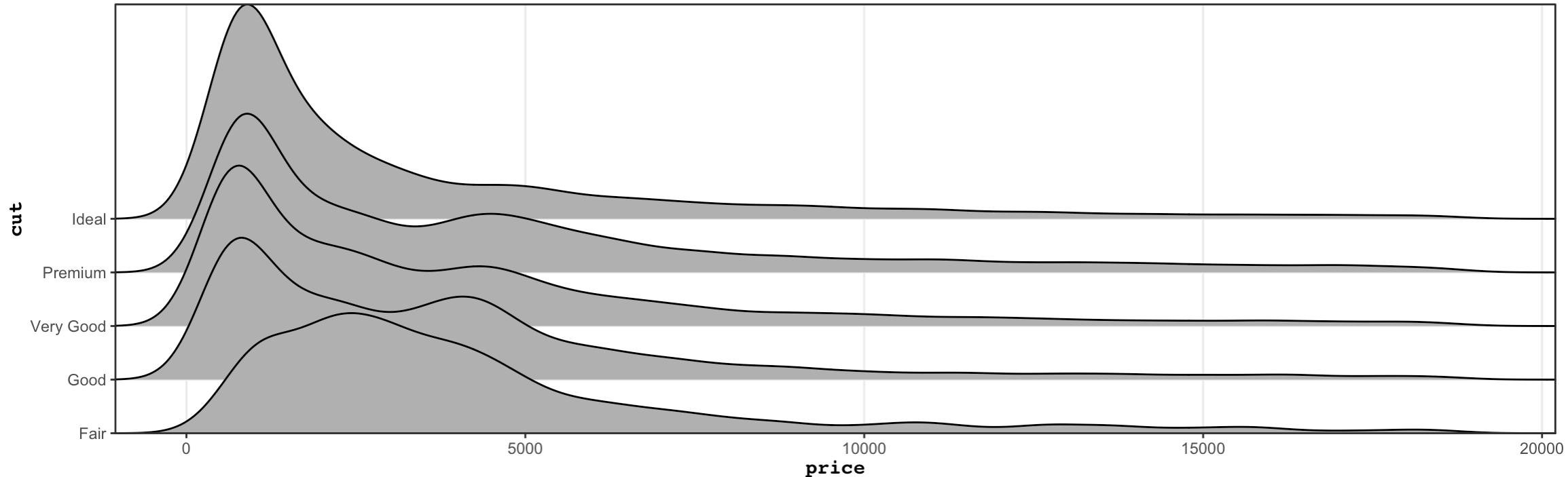


Code source: <https://larmarange.github.io/ggstats/>

ggridges

</>

```
stat_density_ridges(geom = 'density_ridges')
```

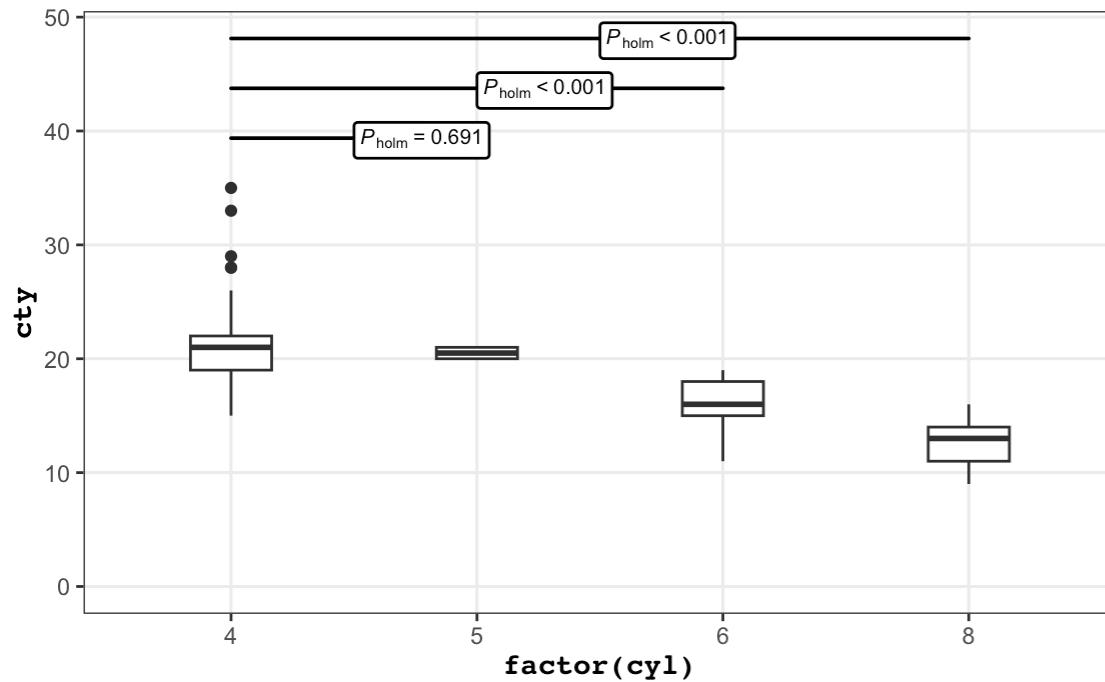


Code source: <https://github.com/wilkelab/ggridges>

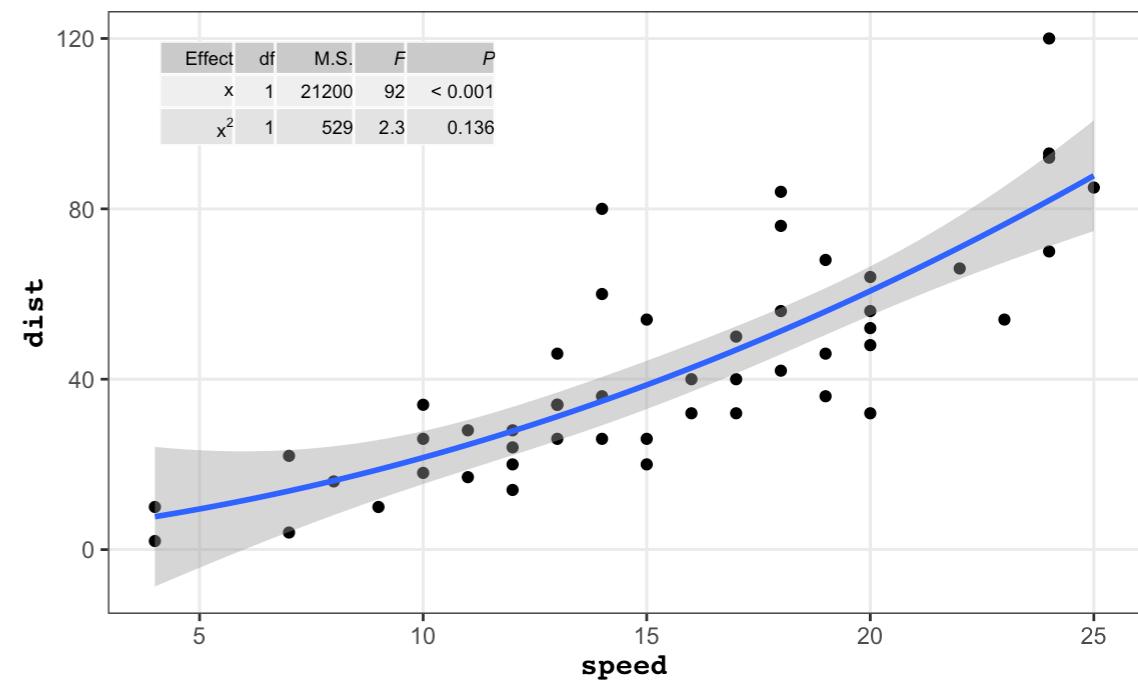
ggpmisc

</>

stat_multcomp()



stat_fit_tb()



Code source: <https://github.com/aphalo/ggpmisc>

New Facets

`geofacet` – facet plot geographically while preserving some of the original geographical orientation

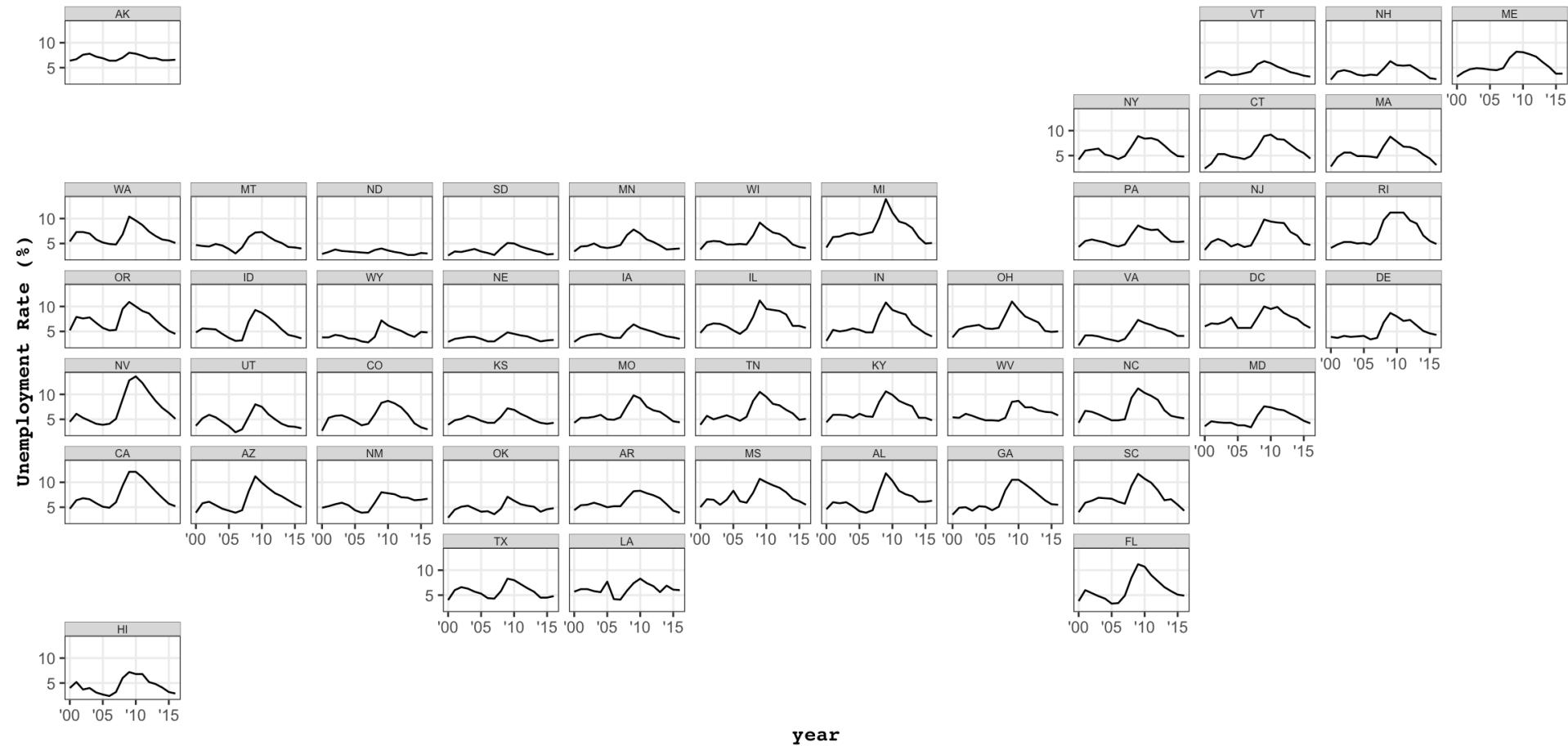
`ggh4x` – nested facets

`ggside` – implemented as geoms but really adds facets

geofacet

</>

```
facet_geo(grid = 'us_state_grid2')
```

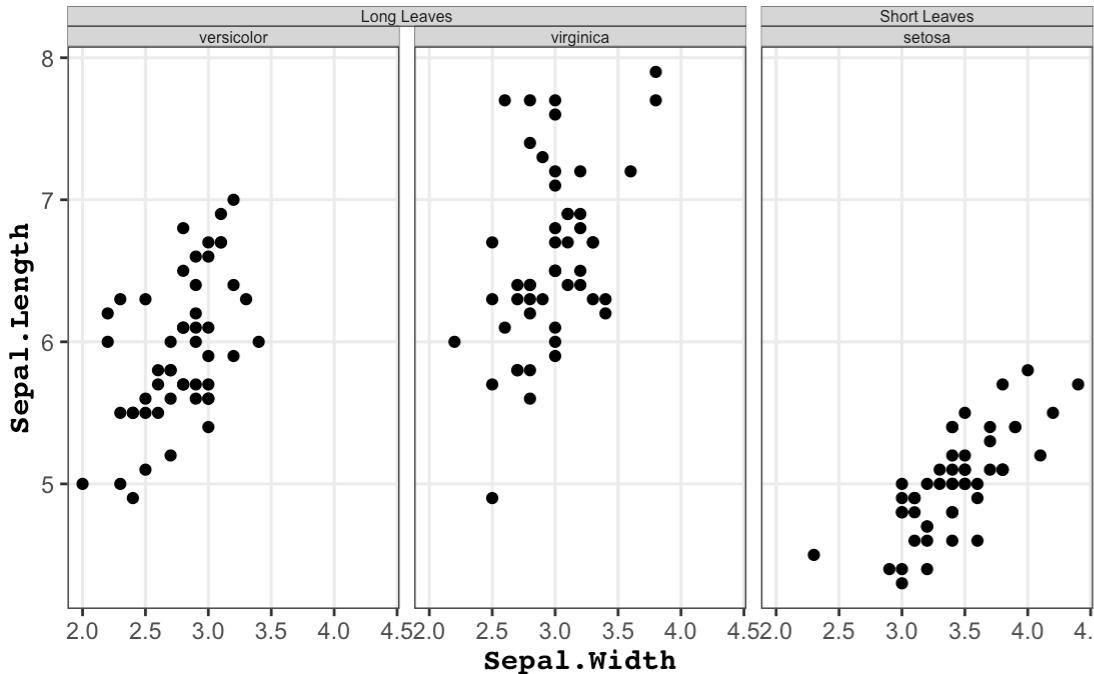


Code source: <https://github.com/hafen/geofacet/>

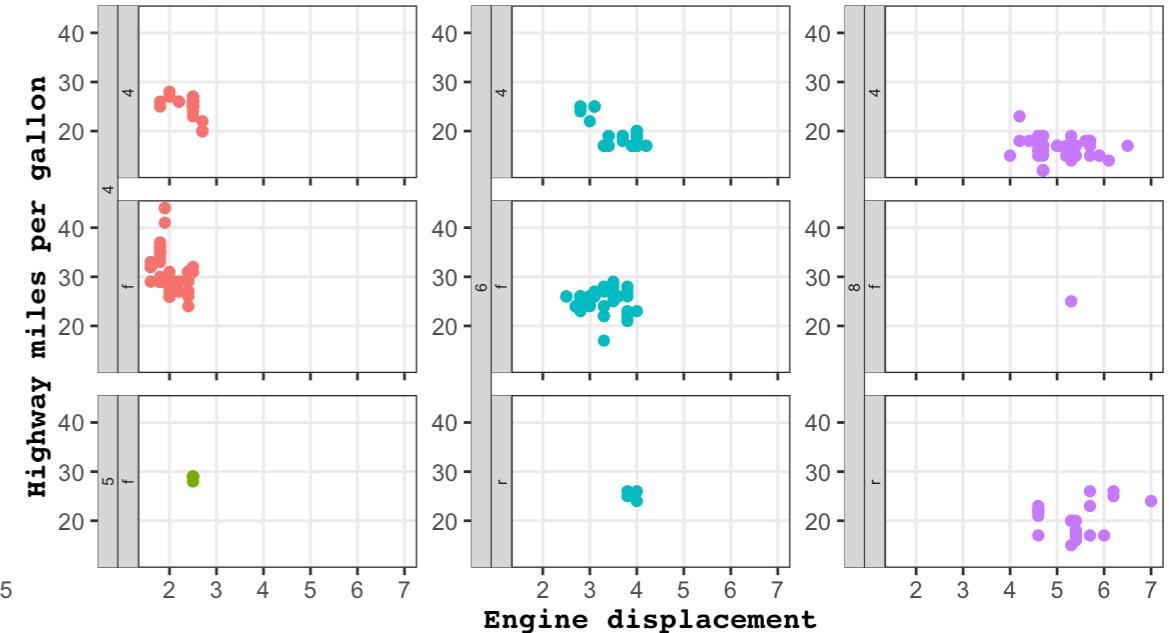
ggh4x

</>

`facet_nested()`



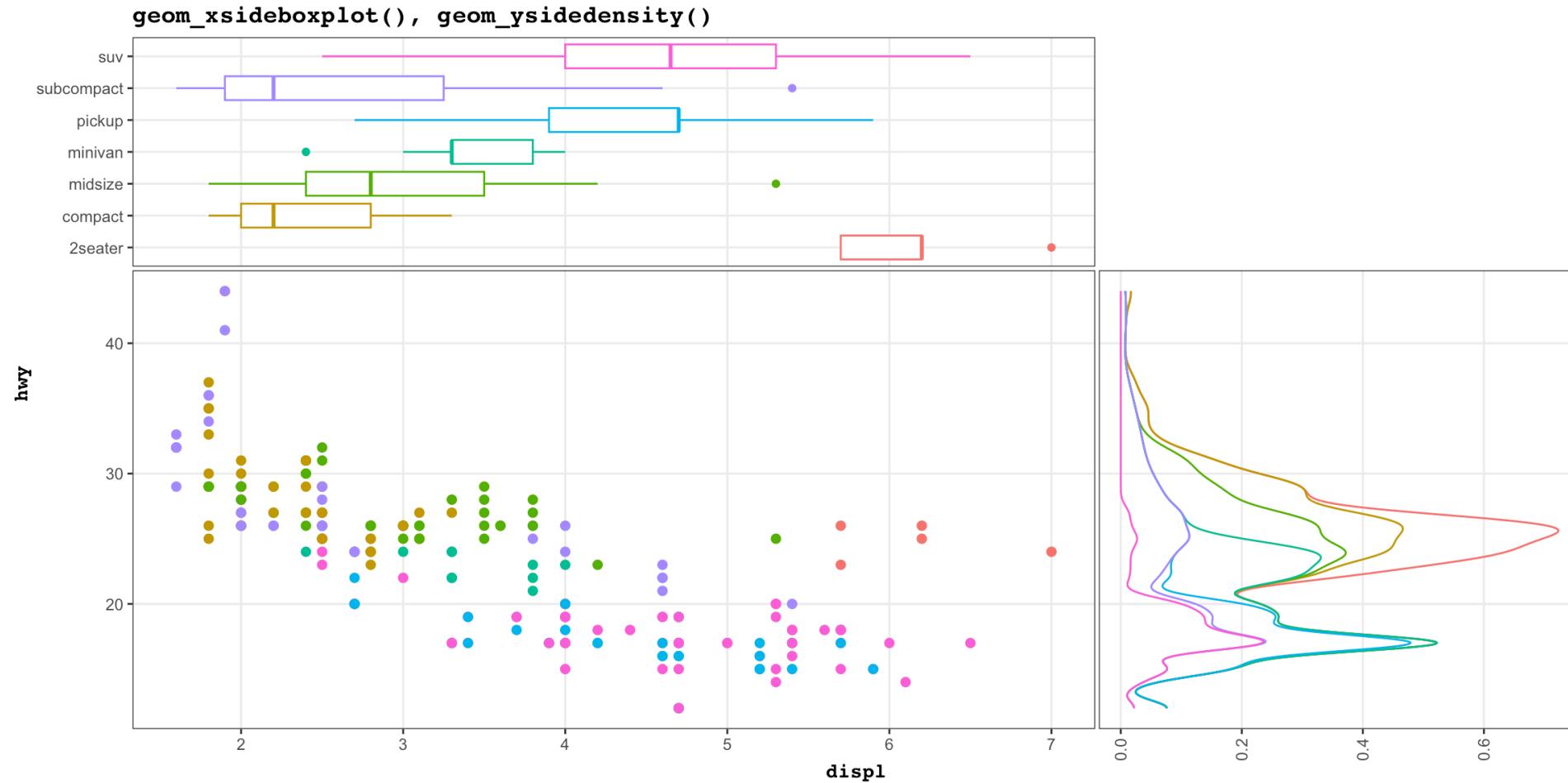
`facet_nested_wrap()`



Code source: <https://teunbrand.github.io/ggh4x/articles/Facets.html>

ggsайд

</>



Code source: <https://github.com/jtlandis/ggsайд>

New Scales

`ggsci` – color palettes inspired by colors used in scientific journals, data visualization libraries, science fiction movies, and TV shows

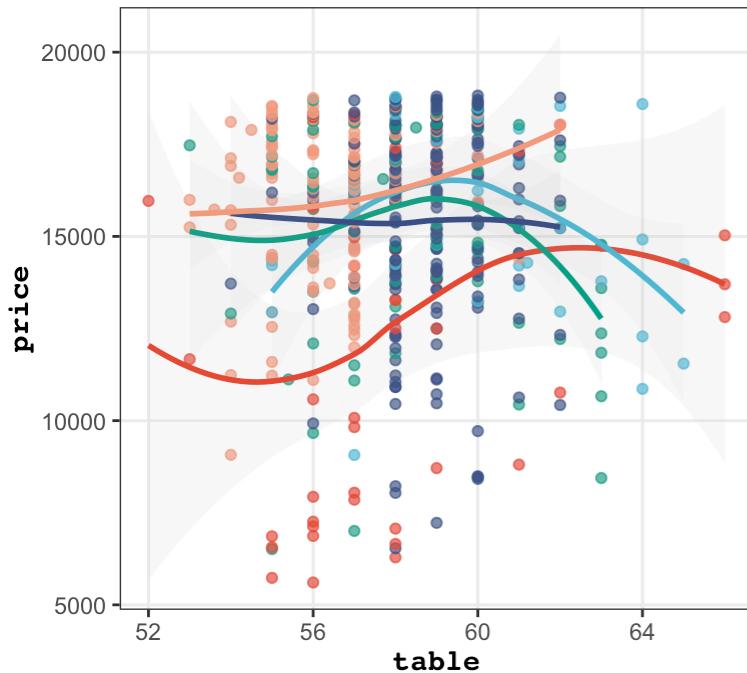
`ggnewscale` – use multiple fill/color scales in one plot

`ggbreak` – set breakpoints for truncating the plot

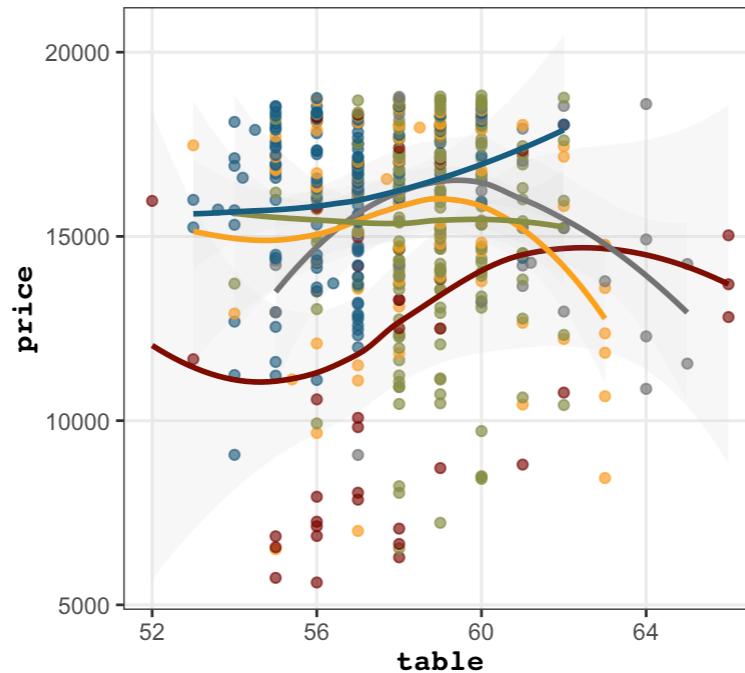
ggsci

</>

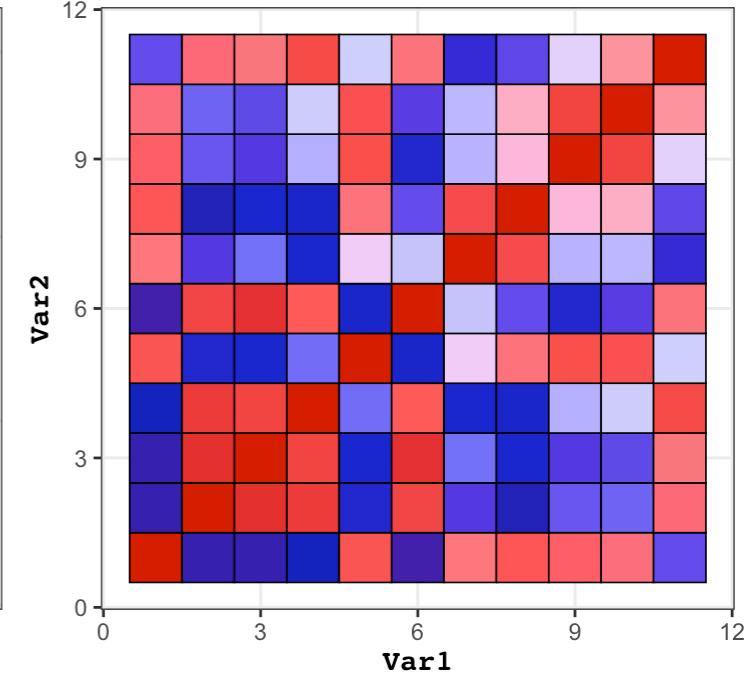
`scale_color_npg()`



`scale_color_uchicago()`



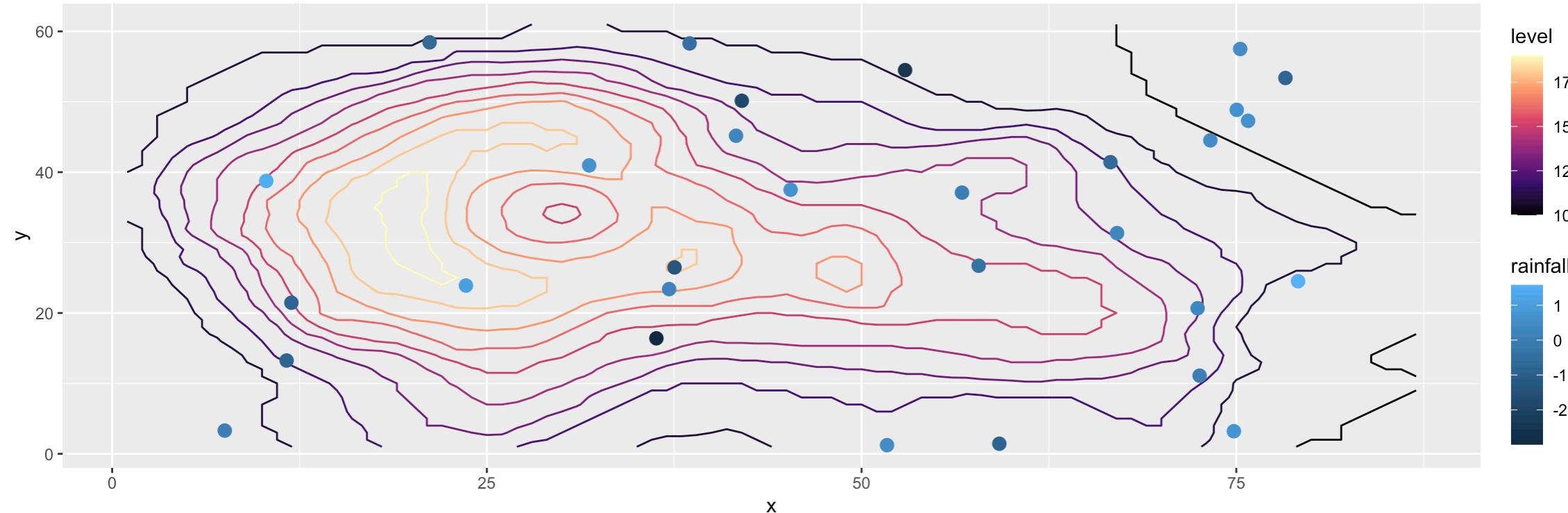
`scale_fill_gsea()`



Code source: <https://nanx.me/ggsci/articles/ggsci.html>

ggnewscale

</>

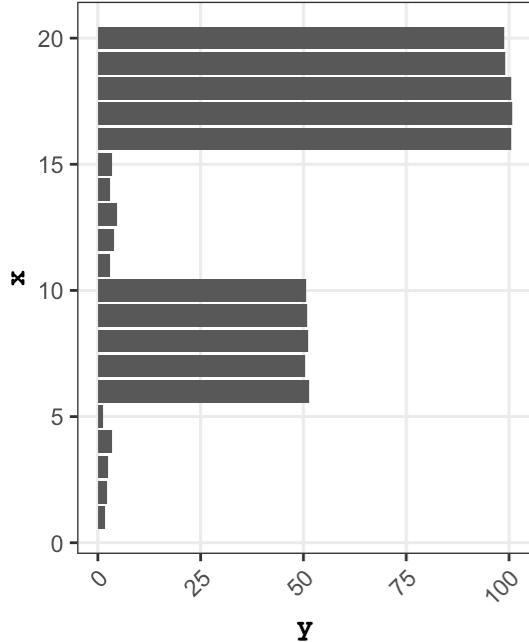


Code source: <https://github.com/eliocamp/ggnewscale/>

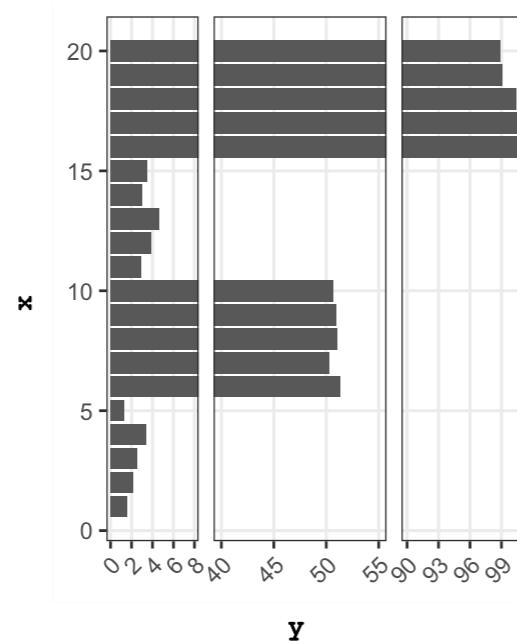
ggbreak

</>

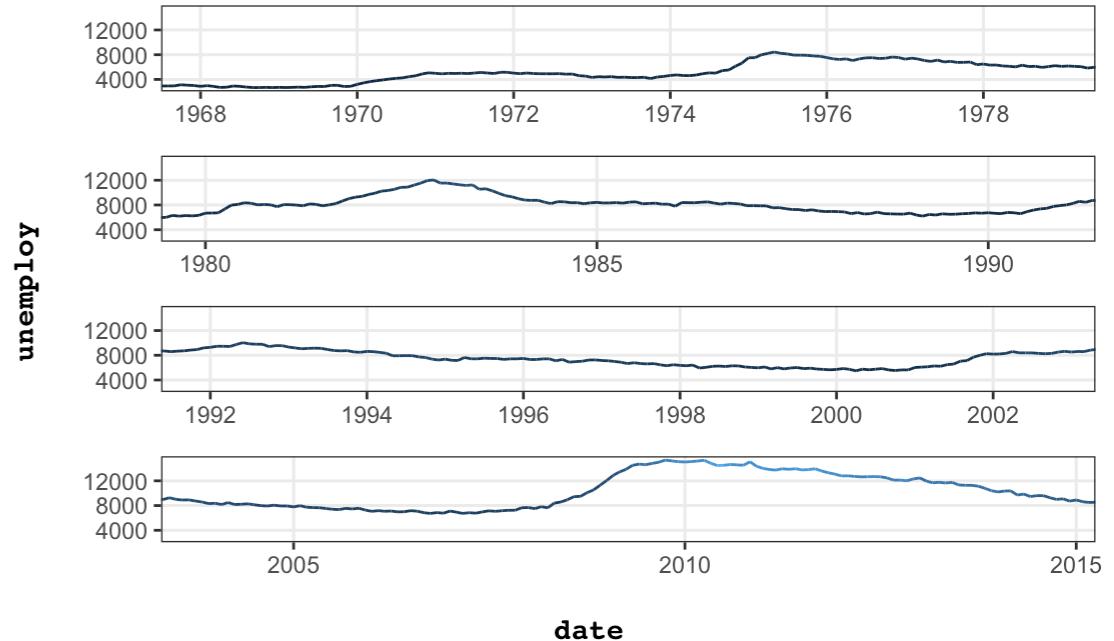
without scale breaks



scale_x_break()



scale_wrap()



Code source: <https://cran.r-project.org/web/packages/ggbreak/vignettes/ggbreak.html>

New Themes

`hrbrthemes` – typography-centric themes and theme components for `ggplot2`

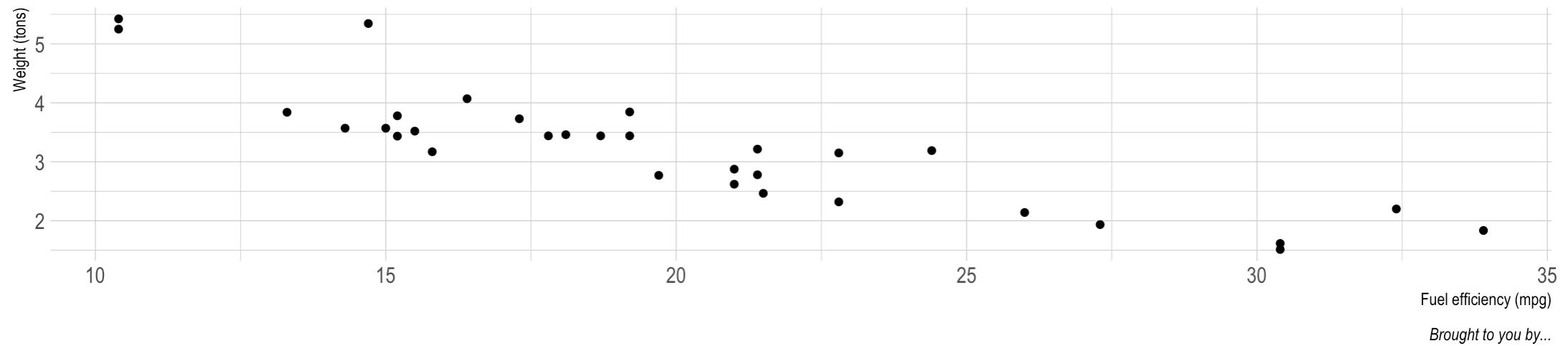
`tvthemes` – various `ggplot2` themes and color/fill palettes based on popular TV shows

hrbrthemes

</>

ggplot2 scatterplot example using theme_ipsum()

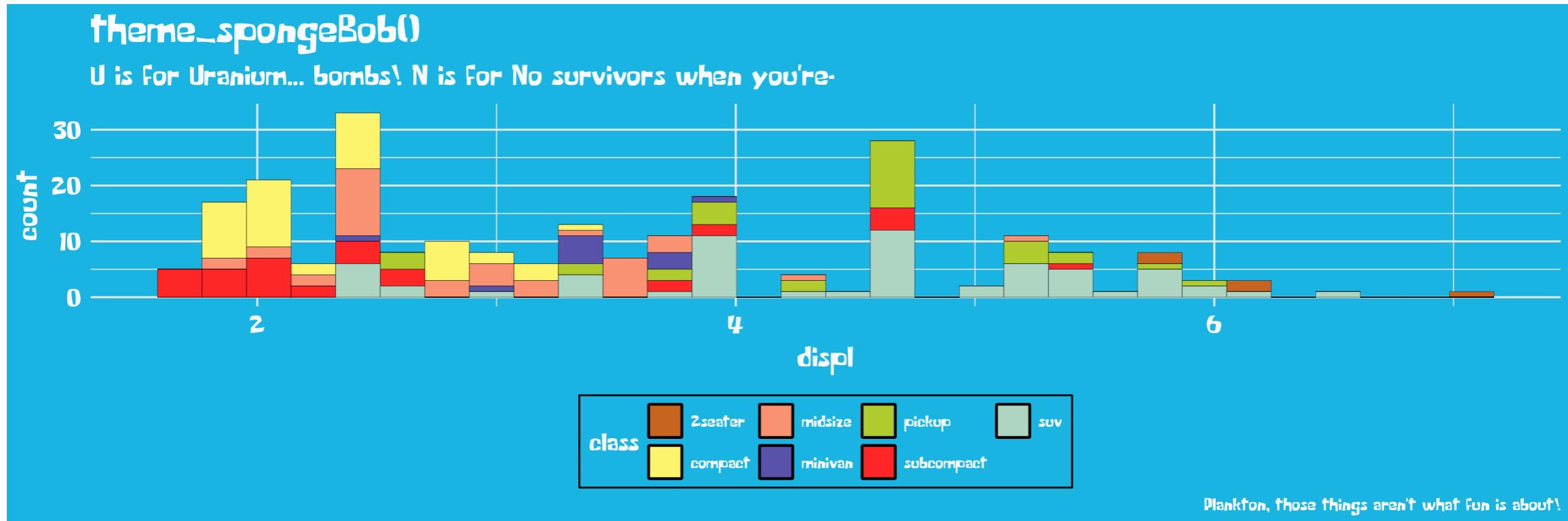
A plot that is only useful for demonstration purposes



Code source: <https://github.com/hrbrmstr/hrbrthemes>

tvthemes

</>



Code source: <https://ryo-n7.github.io/tvthemes/articles/examples.html>

Misc

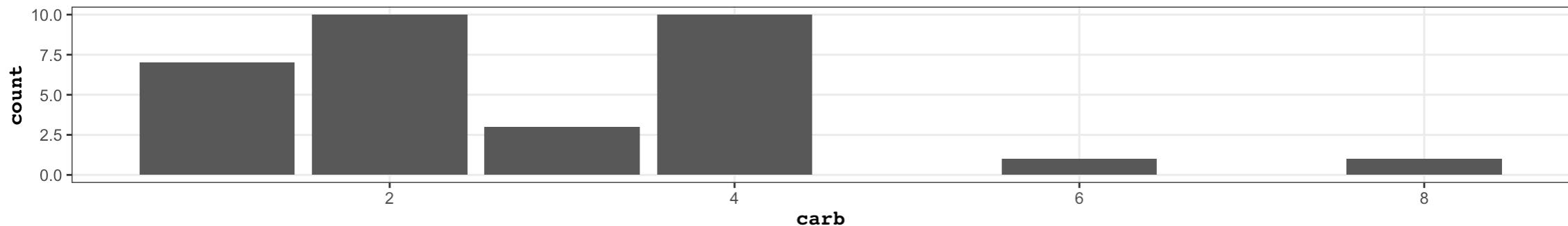
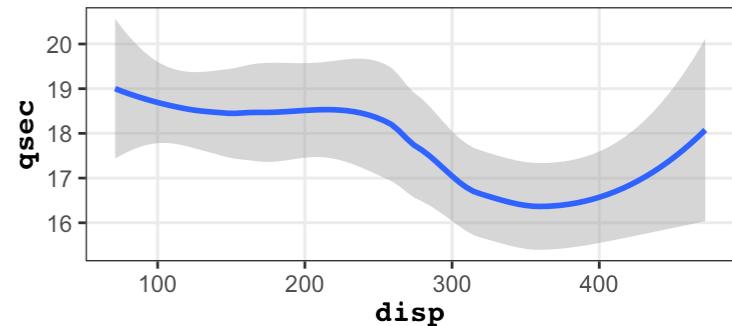
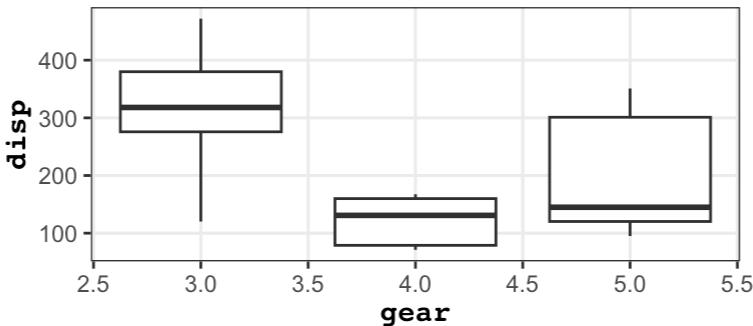
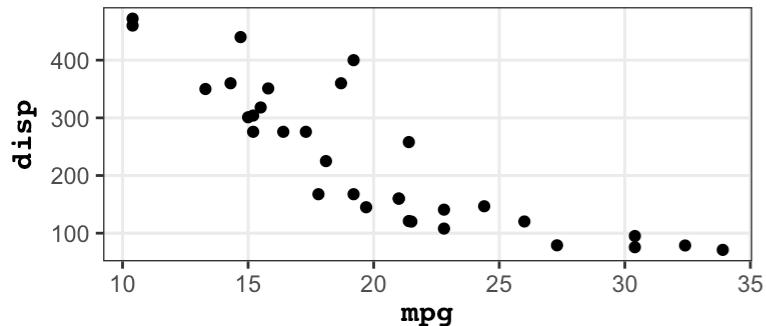
`patchwork` – easily combine separate ggplots into the same graphic

`ggridge` – adds animation through new grammar classes

patchwork

</>

(p1 | p2 | p3) / p4

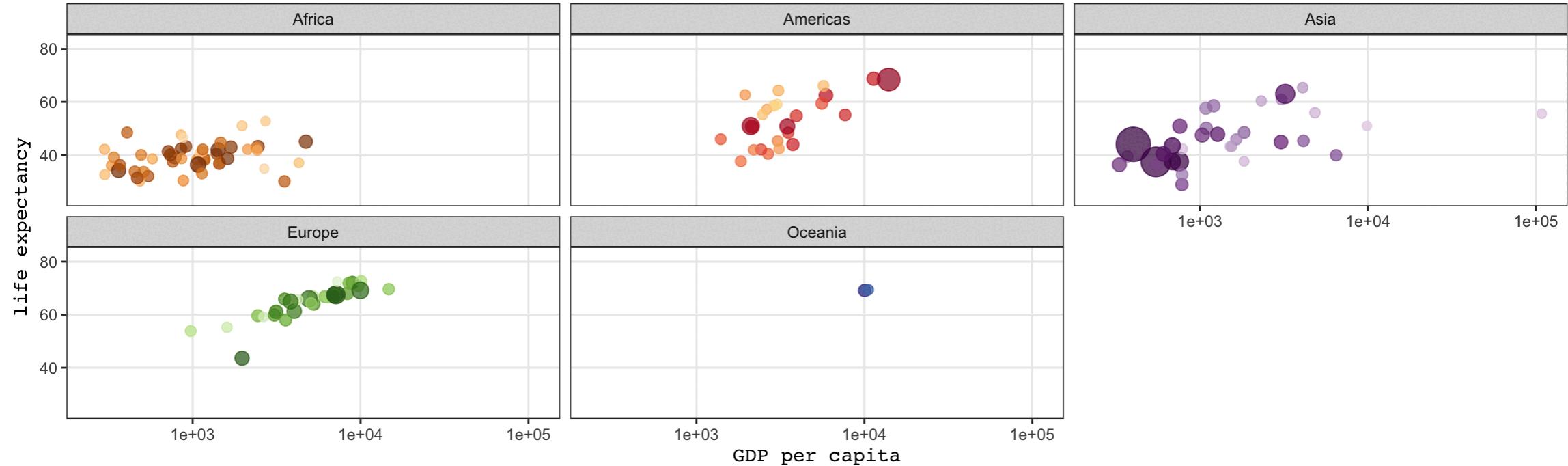


Code source: <https://patchwork.data-imaginist.com/>

ganimate

</>

transition_time() | Year: 1952



Code source: <https://gganimate.com/>

Classifying by construct:

ALTERNATIVE INITALIZE PLOT FUNCTION

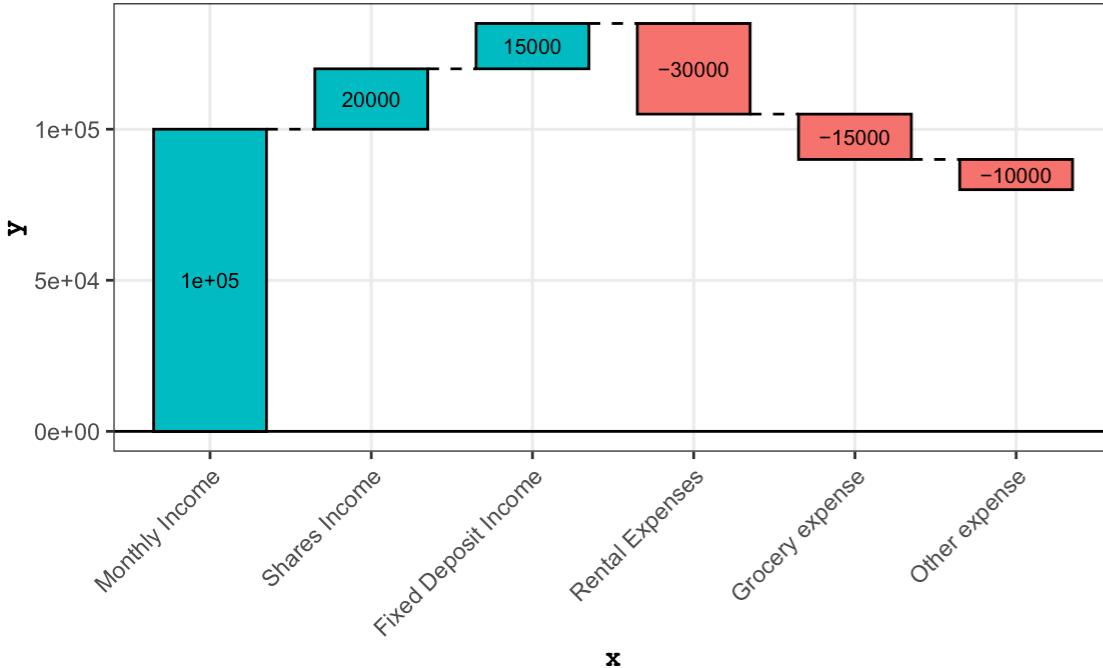
Transforms Data

waterfalls – waterfall plots

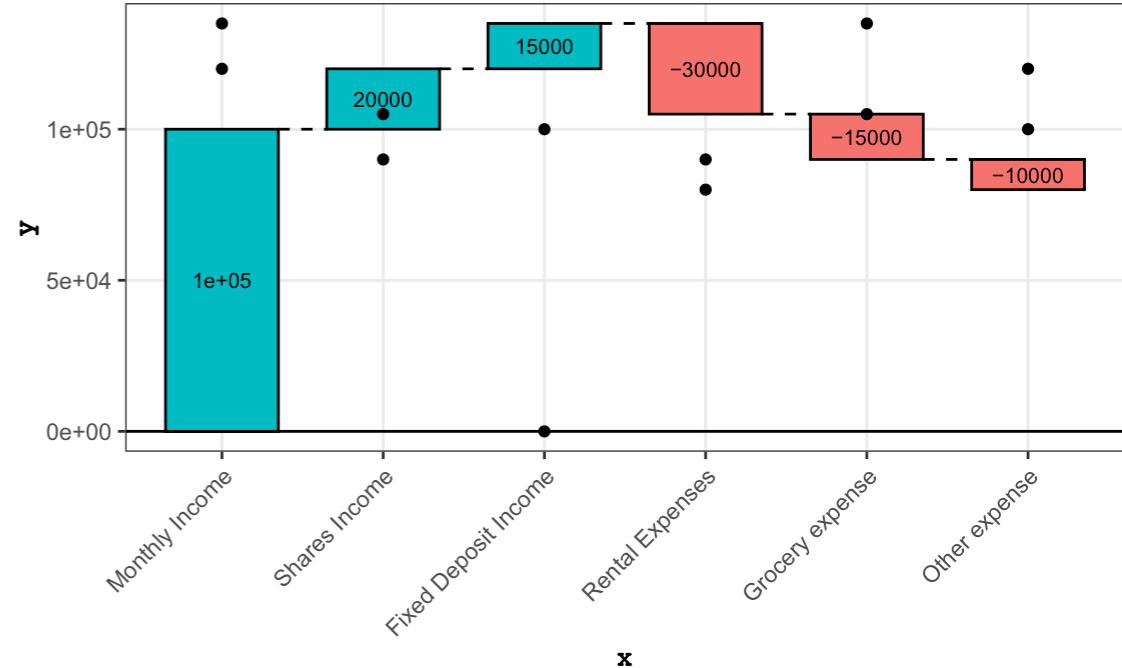
waterfalls

</>

`waterfall()`



`waterfall() + geom_point()`



Code source: <https://rpubs.com/techanswers88/waterfall-chart-ggplot>

Full Specialized Plots (returns ggplot2 object)

`ggraph` – network visualization

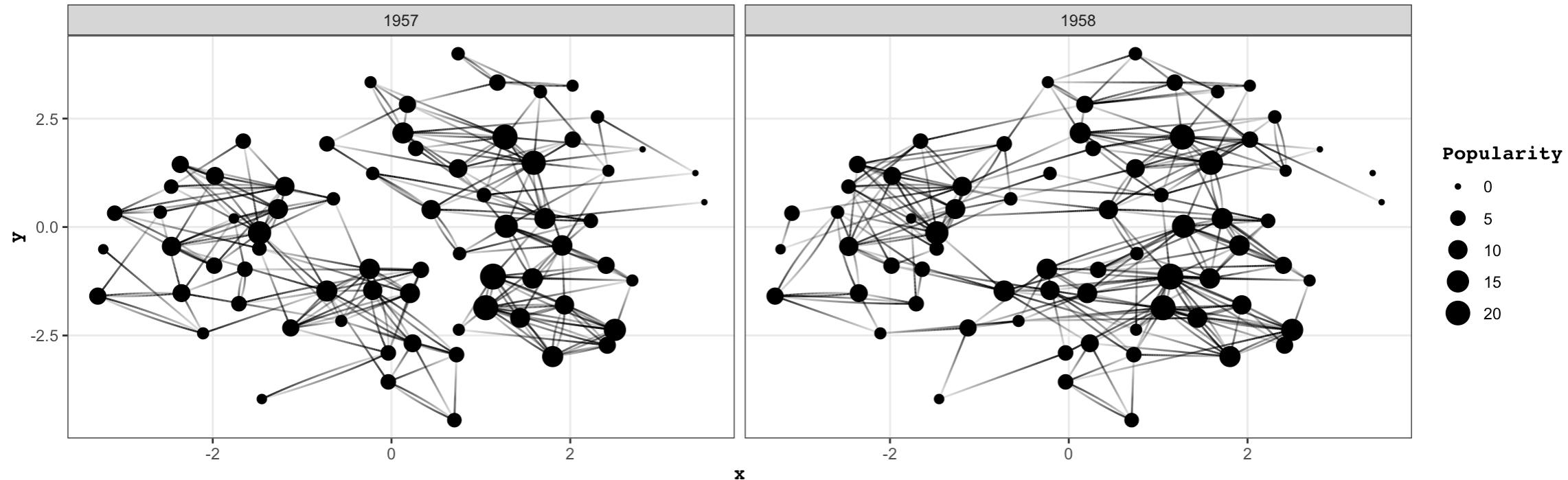
`ggdendro` – dendograms

`ggVennDiagram` – venn diagram

ggraph

</>

ggraph()

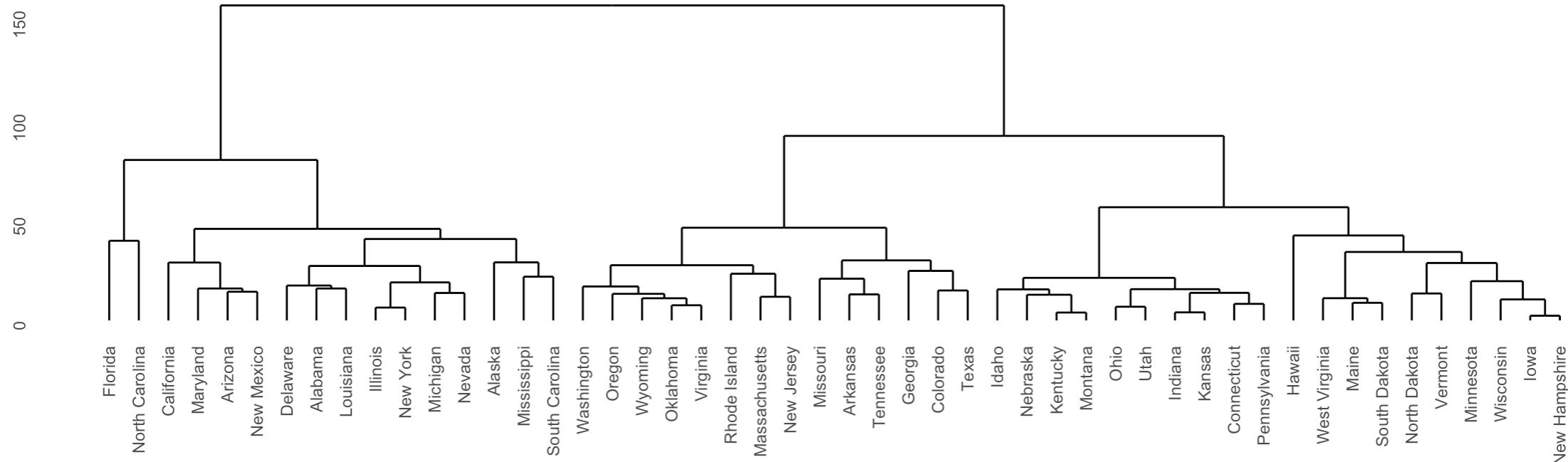


Code source: <https://ggraph.data-imaginist.com/>

ggdendro

</>

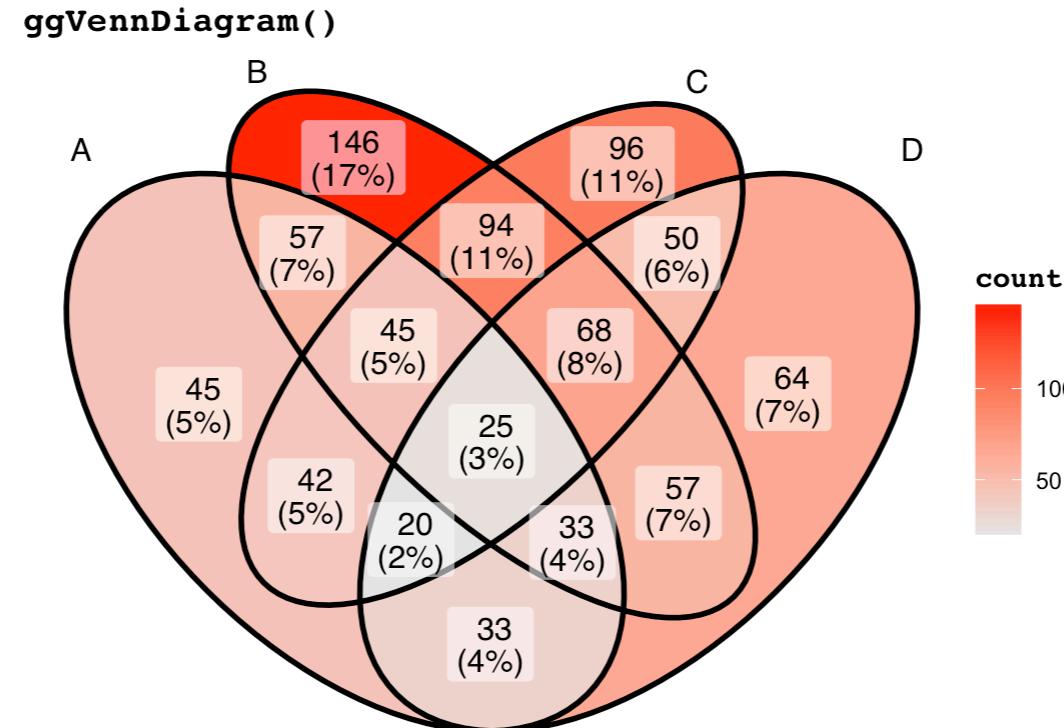
ggdendro()



Code source: <https://cran.r-project.org/web/packages/ggdendro/vignettes/ggdendro.html>

ggVennDiagram

</>



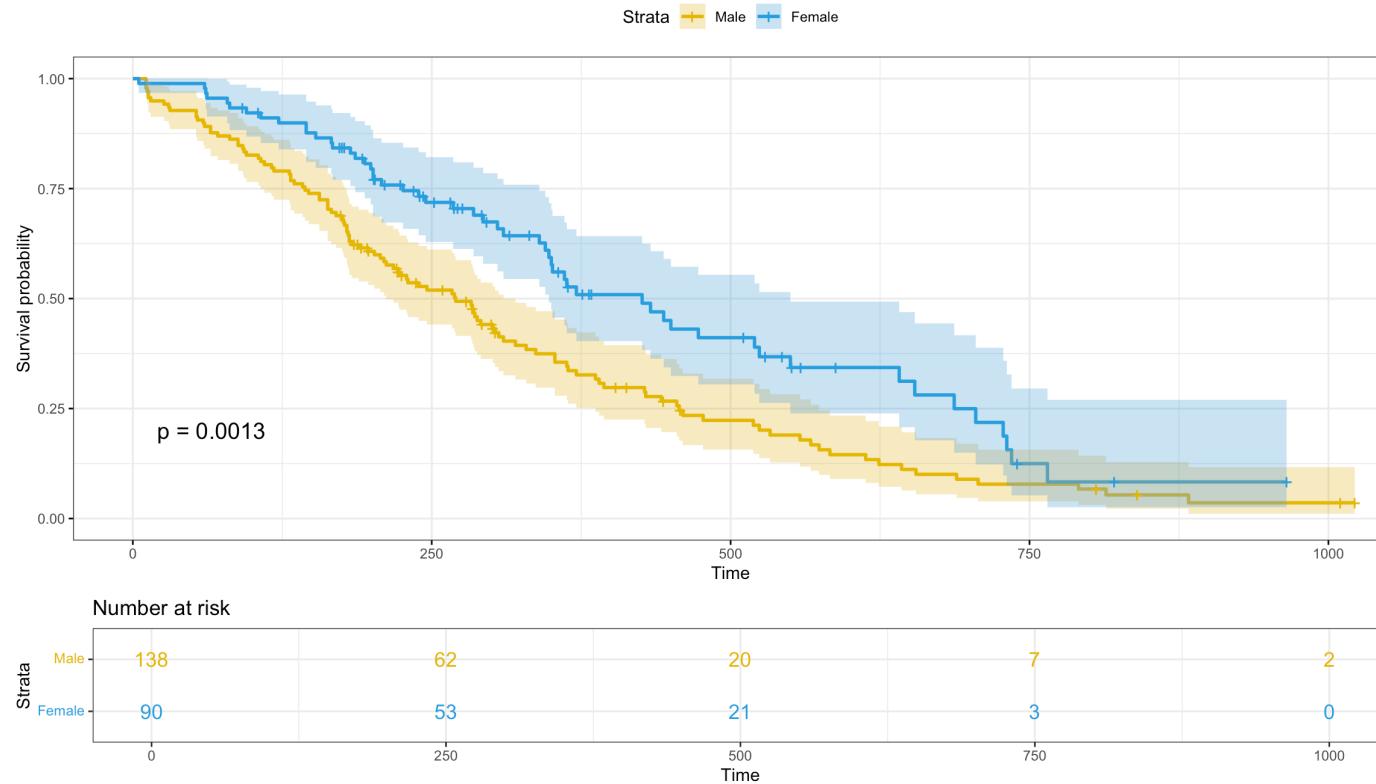
Code source: <https://github.com/gaospecial/ggVennDiagram>

Does Not Return ggplot2 Object

`survminer` – provides functions for survival analysis and visualization

survminer

</>



Code source: <https://github.com/kassambara/survminer>

```
> library(survminer)

> require("survival")

> fit <- survfit(Surv(time, status) ~ sex, data = lung)

> ggsurvplot(
+   fit,
+   data = lung,
+   size = 1,                               # change line size
+   palette =
+   c("#E7B800", "#2E9FDF"),# custom color .... [TRUNCATED]

> + labs(title = "ggsurvplot()")
Error in +labs(title = "ggsurvplot()") :
  invalid argument to unary operator
> |
```

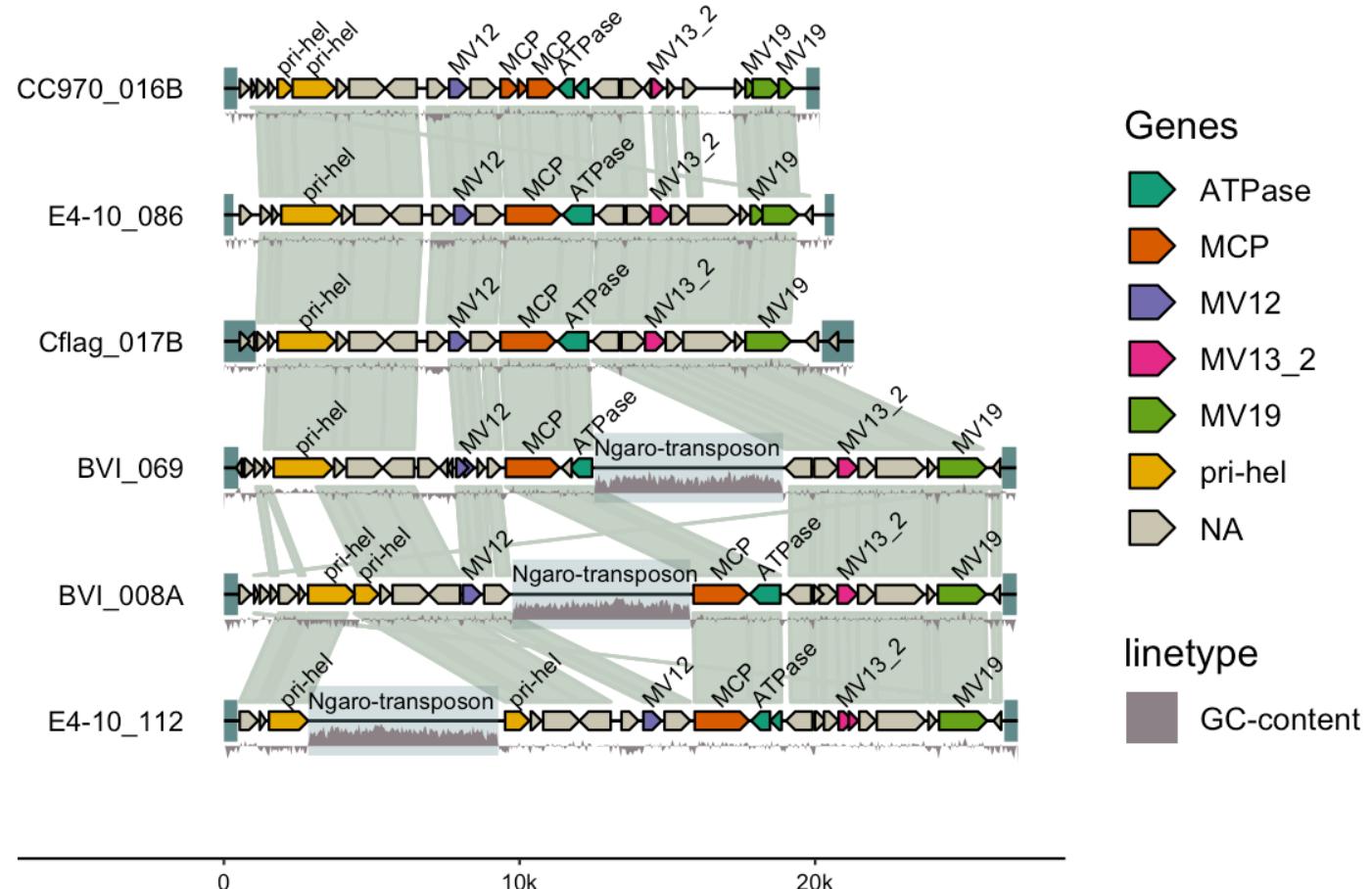
error - not ggplot2 object

New Components

`ggenomes` – package for comparative genomics that adds dedicated plot functions for genes

gggenomes

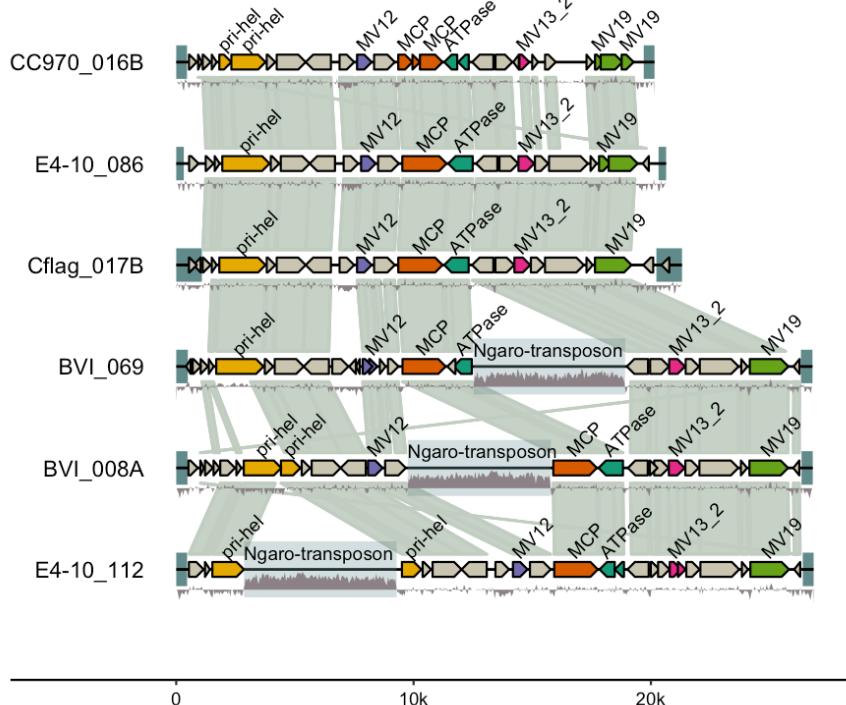
</>



Code source: <https://thackl.github.io/gggenomes/>

Modular components

</>

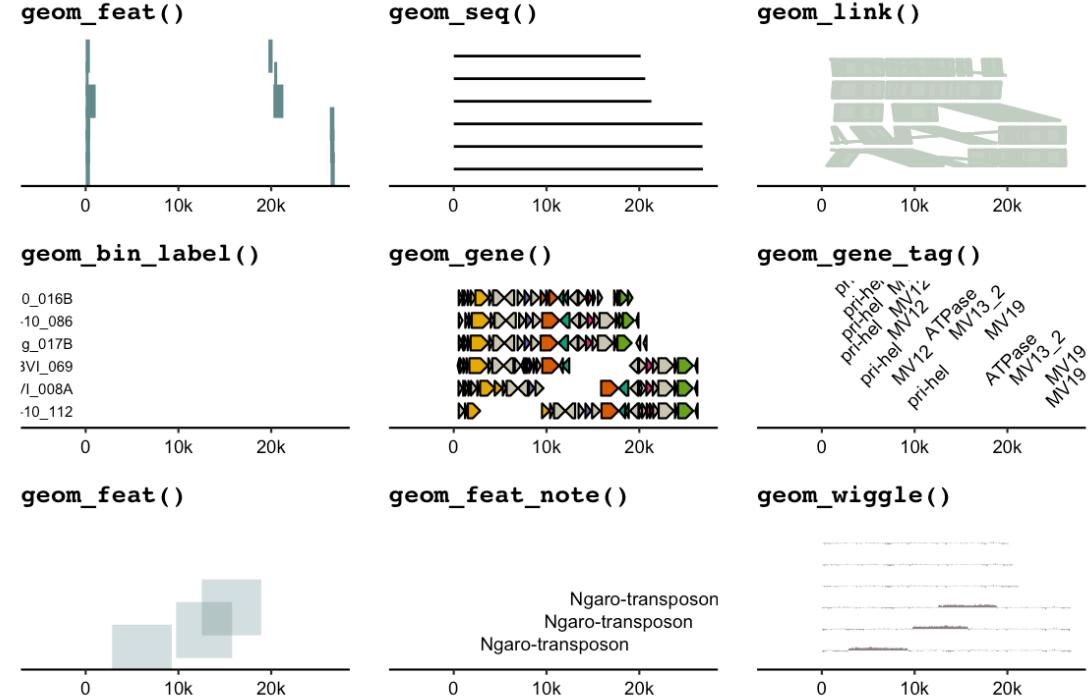


Genes

- ATPase
- MCP
- MV12
- MV13_2
- MV19
- pri-hel
- NA

linetype

- GC-content



Modular components

</>

