R library ggplot2

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www.tidyverse.org

tidyverse
ecosystem

- readr
- dplyr
- tidyr
- ggplot2
- stringr
- lubridate
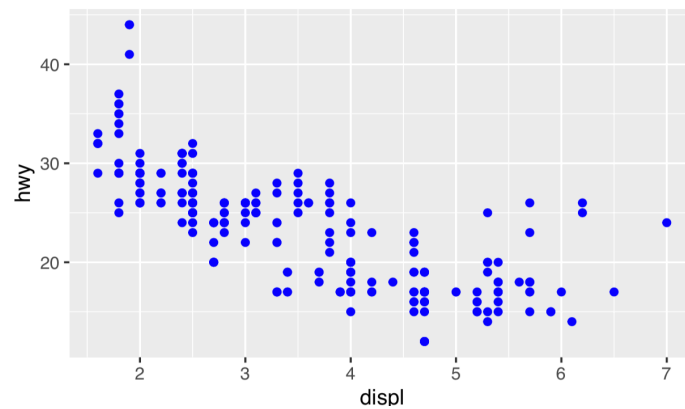- forcats

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Introduction

Graphs in **ggplot2** are created in layers

1. Select the dataframe
2. Select the geometric object
3. Use an aesthetic function
4. Use optional objects
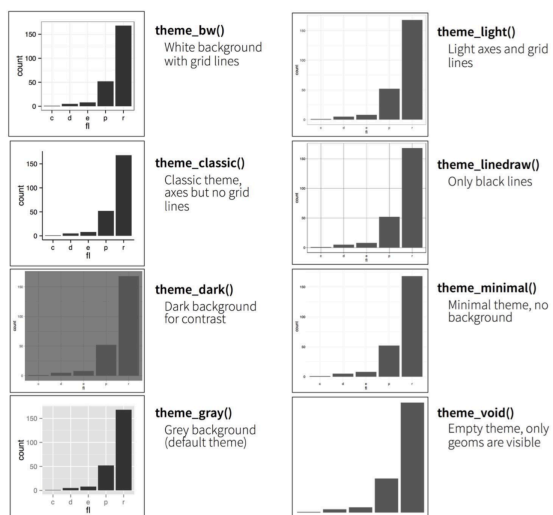
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Introduction

```
ggplot(data = mpg) + geom_point(mapping = aes(x = displ, y = hwy), color = "blue")
```


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Introduction

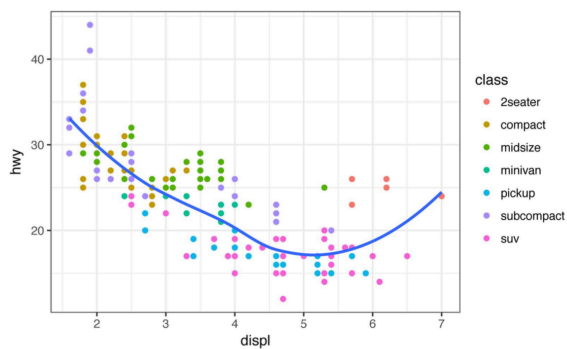The background

is defined by the

theme object

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Introduction

```
ggplot(mpg, aes(displ, hwy)) +
  geom_point(aes(color = class)) +
  geom_smooth(se = FALSE) +
  theme_bw()
```
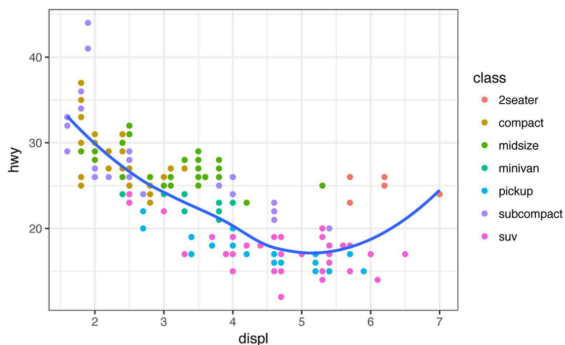
Notice

the use of

layers

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Introduction

```
theme_set(theme_bw())
ggplot(mpg, aes(displ, hwy)) +
  geom_point(aes(color = class)) +
  geom_smooth(se = FALSE) +
  theme_bw()
```


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Introduction

```
#### Lollipop Chart
ggplot(cty_mpg,aes(x=make, y=mileage)) +
  geom_point(size=3) +
  geom_segment(aes(x=make,xend=make,
                   y=0,yend=mileage)) +
  labs(title = "Lollipop Chart",
       subtitle = "Make Vs Avg. Mileage",
       caption = " Source: mpg") +
  theme(axis.text.x = element_text(angle=65,vjust=0.6))
```
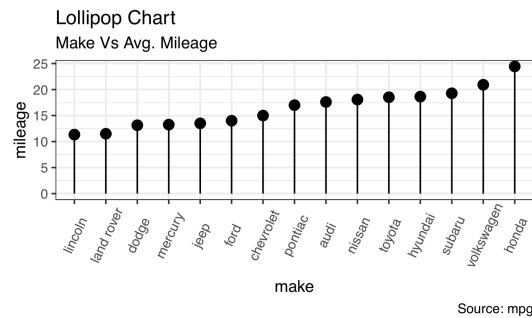

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Introduction

```
#### Lollipop Chart
ggplot(cty_mpg,aes(x=make, y=mileage)) +
  geom_point(size=3) +
  geom_segment(aes(x=make,xend=make,
                   y=0,yend=mileage)) +
  labs(title = "Lollipop Chart",
       subtitle = "Make Vs Avg. Mileage",
       caption = " Source: mpg") +
  theme(axis.text.x = element_text(angle=65,vjust=0.6))
```
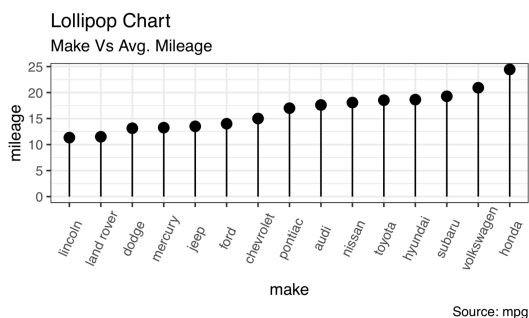

Lollipop Chart
Make Vs Avg. Mileage

Source: mpg

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geom( ) functions

geom_abline . . . . .
geom_bar . . . . . .
geom_bin2d . . . . .
geom_blank . . . . .
geom_boxplot . . . .
geom_contour . . . .
geom_count . . . . .
geom_crossbar . . .
geom_density . . . .
geom_density_2d . .
geom_dotplot . . . .
geom_errorbarh . . .
geom_freqpoly . . .
geom_hex . . . . . .

geom_jitter . . . .
geom_label . . . .
geom_map . . . .
geom_path . . . .
geom_point . . . .
geom_polygon . . . . . .
geom_qq_line . . . .
geom_quantile . . . .
geom_raster . . . .
geom_ribbon . . . .
geom_rug . . . .
geom_segment . . . . . .
geom_smooth . . . .
geom_spoke . . . .
geom_violin . . . .

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geom( ) functions

Geom	Description	Aesthetics
geom_abline	line	color, linetype
geom_bar	barplot	x,color,fill
geom_boxplot	Boxplot	x,y,fill
geom_point	Scatterplot	x,y,color,shape
geom_smooth	fitted line	x,y,color,fill
geom_text	text	x,y,label,angle
geom_violin	violin plot	x,y,color,fill

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FACETS –split the plot into subplots (facets)

```
ggplot(data = mpg) +
  geom_point(mapping = aes(x = displ, y = hwy), size = 0.7) +
  facet_wrap(~ class, nrow = 2)
```
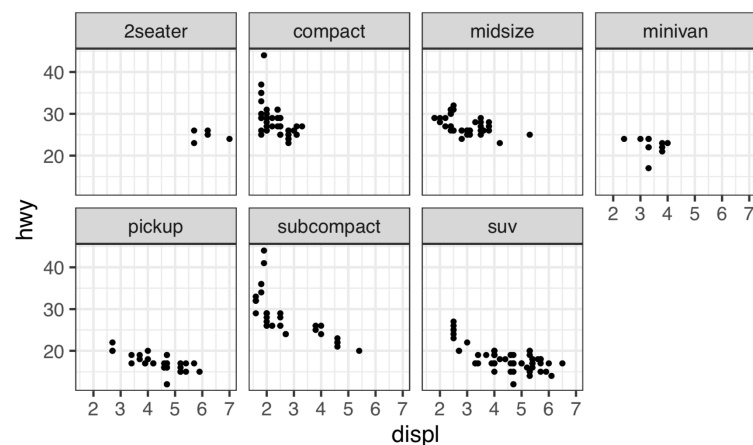

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ggplot2 – Extended libraries

- Contributions from independent R users

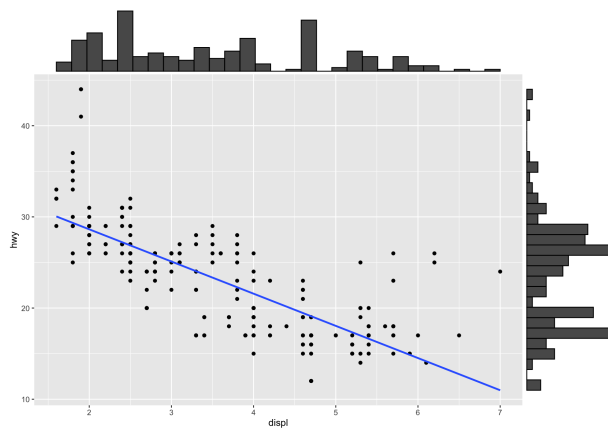- Functions and geom objects for special purpose

- See

   http://www.ggplot2-exts.org/gallery/

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ggplot2 – Extended libraries

- ggExtra   Marginal plots

- ggalt   Encircle subset of data
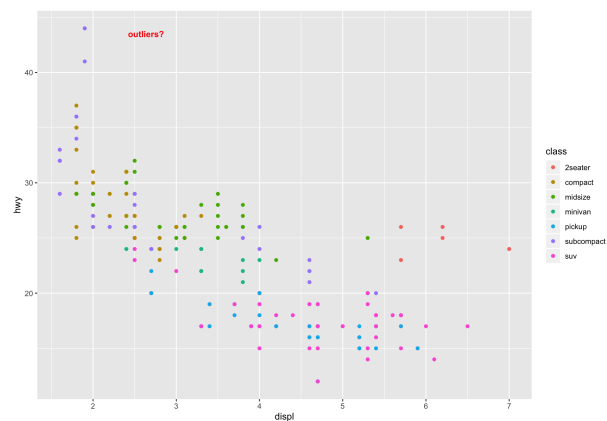
- grid   Annotations on the plot

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```
library(ggExtra)
g = ggplot(mpg, mapping = aes(x = displ, y = hwy)) +
  geom_point() +
  geom_smooth(method='lm',se=FALSE)
ggMarginal(g,type = 'histogram')
```

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```
library(grid)
#
gg = ggplot(mpg) + geom_point(mapping = aes(x = displ, y = hwy, color = class))
text1 = 'outliers?'
specs1 = grid.text(text1,x = 0.25,y=0.94,
                   gp = gpar(fontsize=10,fontface='bold',col='red'))
gg + annotation_custom(specs1)
```

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