Themes

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Customization

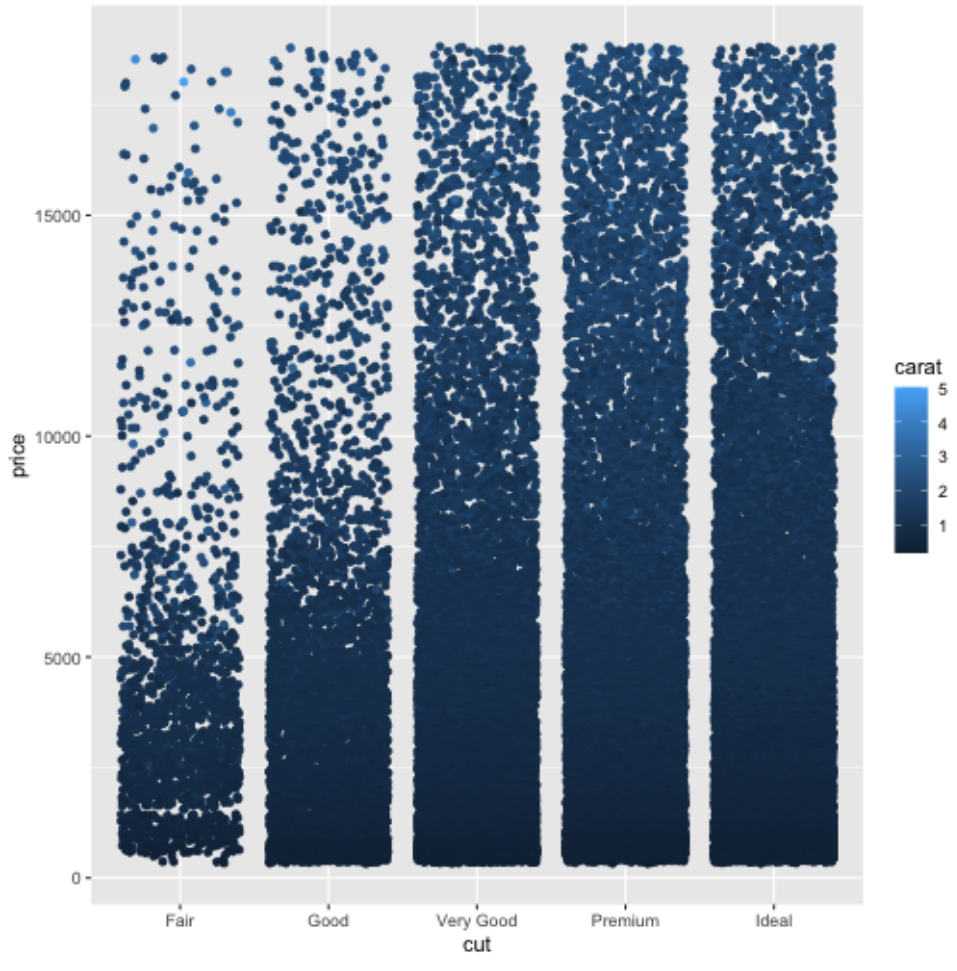
Colors

ggplot2 has several ways to customize colors

1. If colors are based on categorical data
    - `scale_color_manual`
    - `scale_fill_manual`
2. If colors are based on continuous data
    - `scale_{color,fill}_gradient` makes sequential gradients (specify low and high colors)
    - `scale_{color,fill}_gradient2` makes divergent gradients (specify low, middle and high colors)

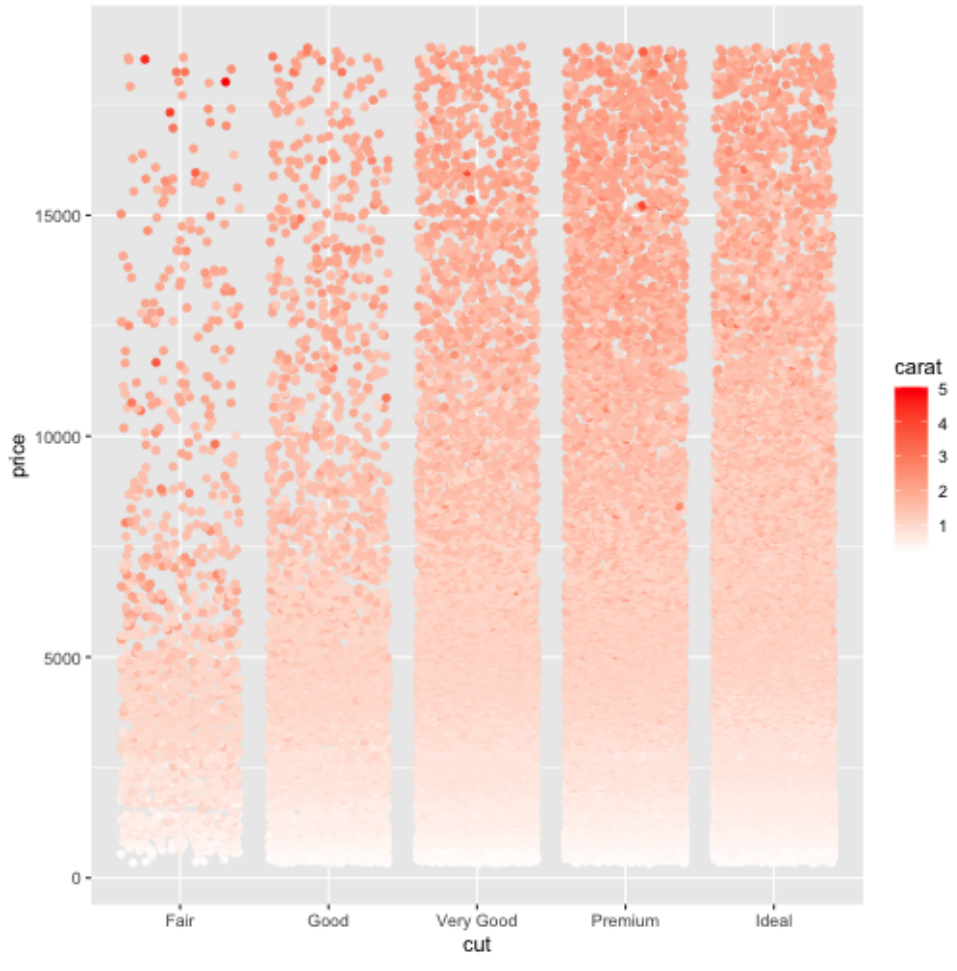
Colors

```
(g1 <- ggplot(diamonds,
              aes(x = cut, y = price,
                  color = carat))+
   geom_jitter()
)
```



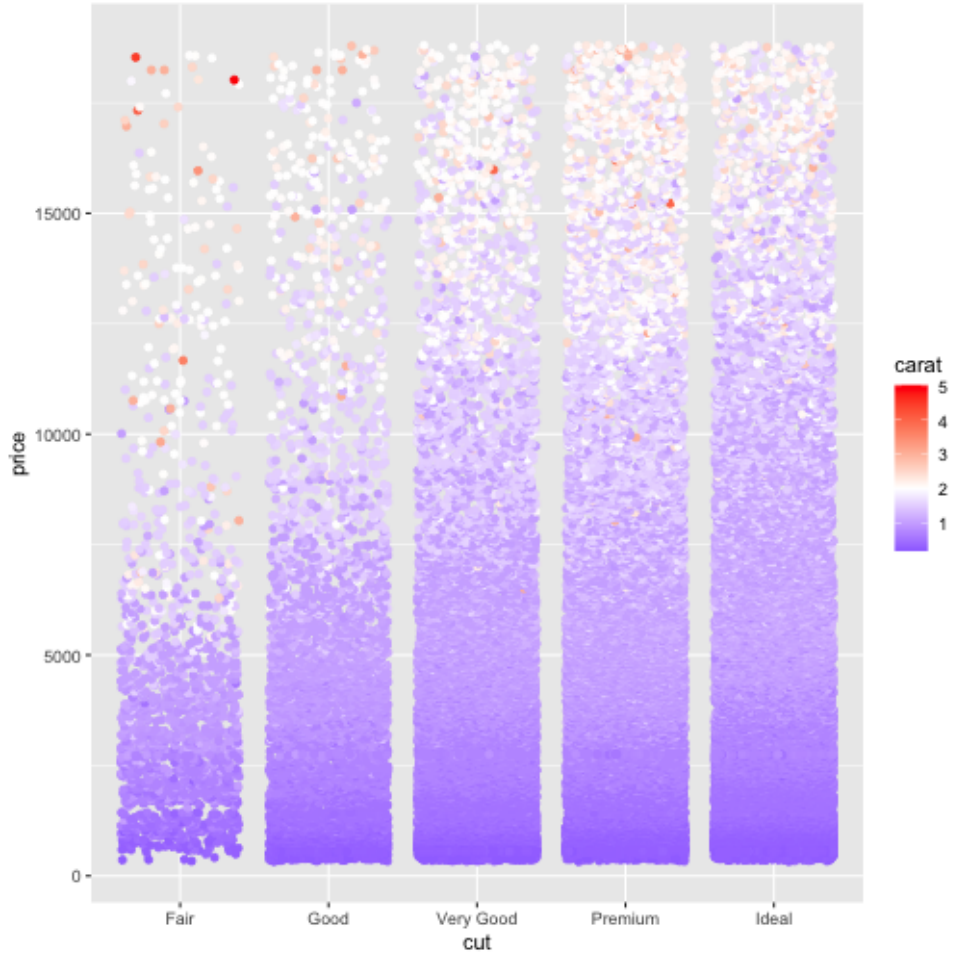
Colors

```
g1 + scale_color_gradient(low='white',high = 'red')
```



Colors

```
g1 + scale_color_gradient2(low = 'blue',
                           mid='white',
                           high='red',
                           midpoint = 2)
```

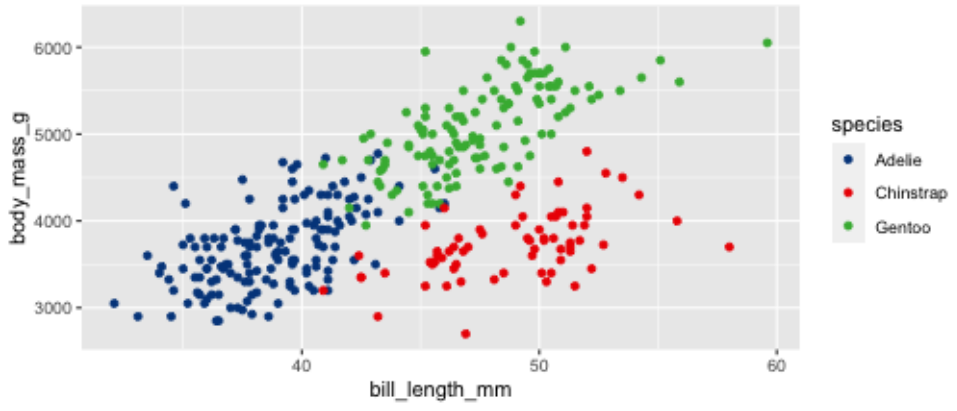


ggsci

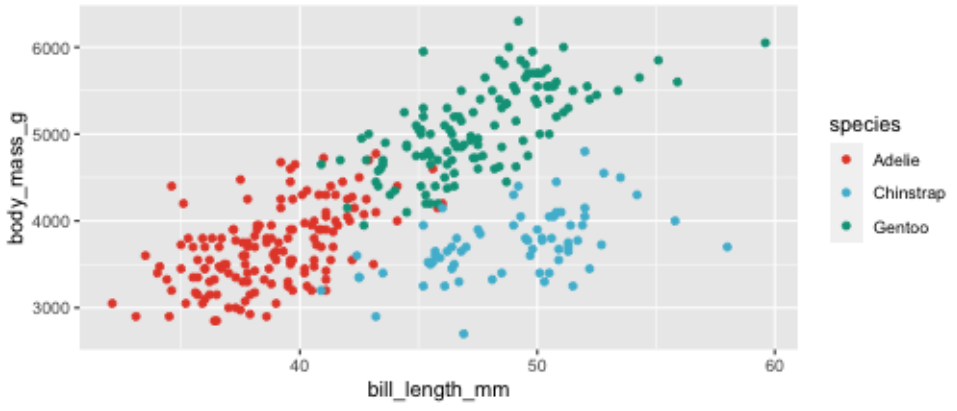
These are palettes based on scientific journals and sci-fi shows

```
library(ggsci)
plt <- ggplot(penguins, aes(bill_length_mm, body_mass_g, color=species))+
    geom_point()
```

```
plt + scale_color_lancet()
```




```
plt + scale_color_npg()
```



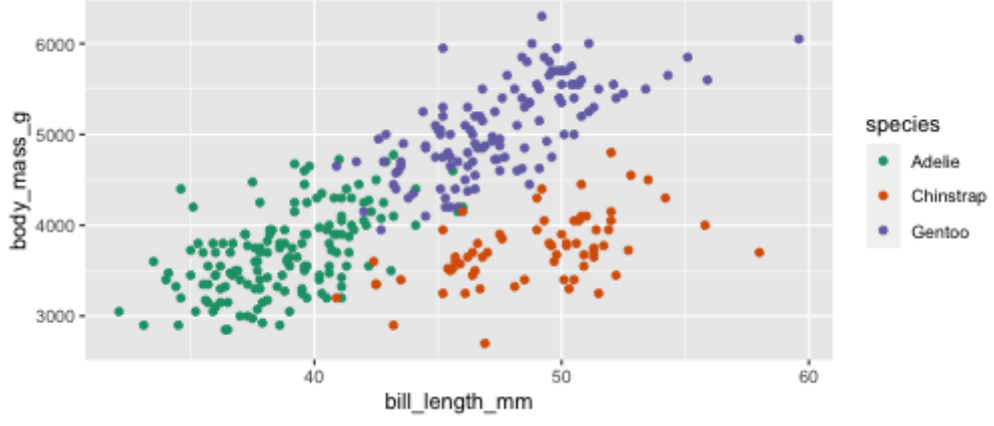
RColorBrewer

This package is a wrapper around ColorBrewer (https://colorbrewer2.org), which is meant to create sequential and divergent color palettes for discrete classes.

These palettes are available in **ggplot2** as `scale_color_brewer` and `scale_fill_brewer`

There are also a variation of these for continuous data, using these color schemes to create gradients. These are accessed using `scale_color_distiller` and `scale_fill_distiller`

```
ggplot(penguins, aes(bill_length_mm, body_mass_g, color=species))+
    geom_point()+
    scale_color_brewer(type='qual', palette=2)
```



RColorBrewer

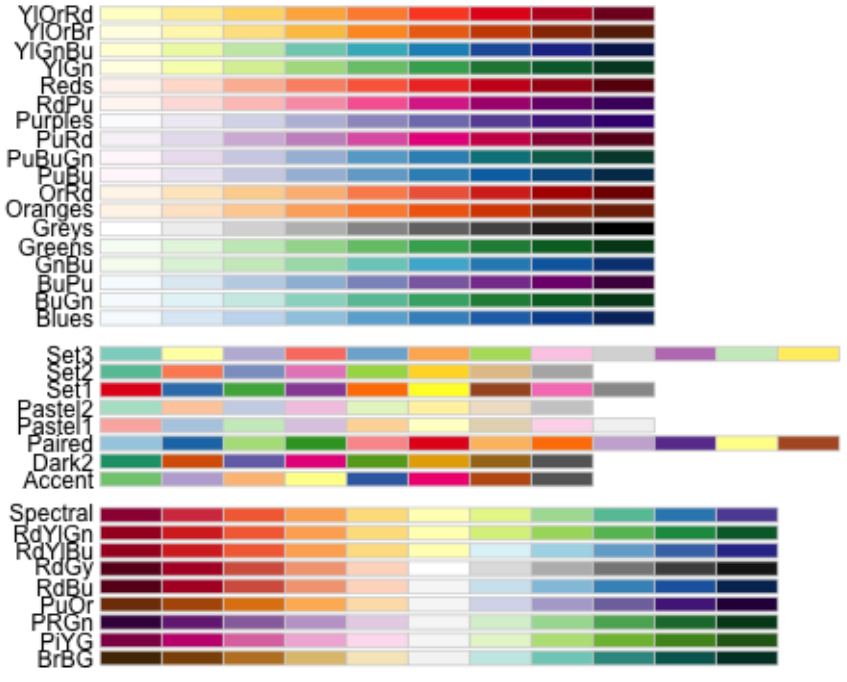
There are three kinds of palettes: sequential (*seq*), divergent (*div*) and qualitative (*qual*)

Sequential palettes are good for scales that are ordered

- Income
- death rates

Divergent palettes are good when you want to show both extremes

- Heatmaps



viridis

The **viridis** package provides color palettes that are not only pleasing, but are robust to most forms of color-blindness, including green-blind (deuteranopia), red-blind (protanopia) and blue-blind (tritanopia)

```
library(viridis)
ggplot(penguins, aes(bill_length_mm, body_mass_g, color=species))+
    geom_point()+
    scale_color_viridis(discrete=TRUE) +
    theme_bw()
```

Text

The `extrafont` package allows you to use fonts already on your computer in your graphics.

```
library(extrafont)
loadfonts()

g1 + theme(text = element_text(family='Georgia'))
```

Text

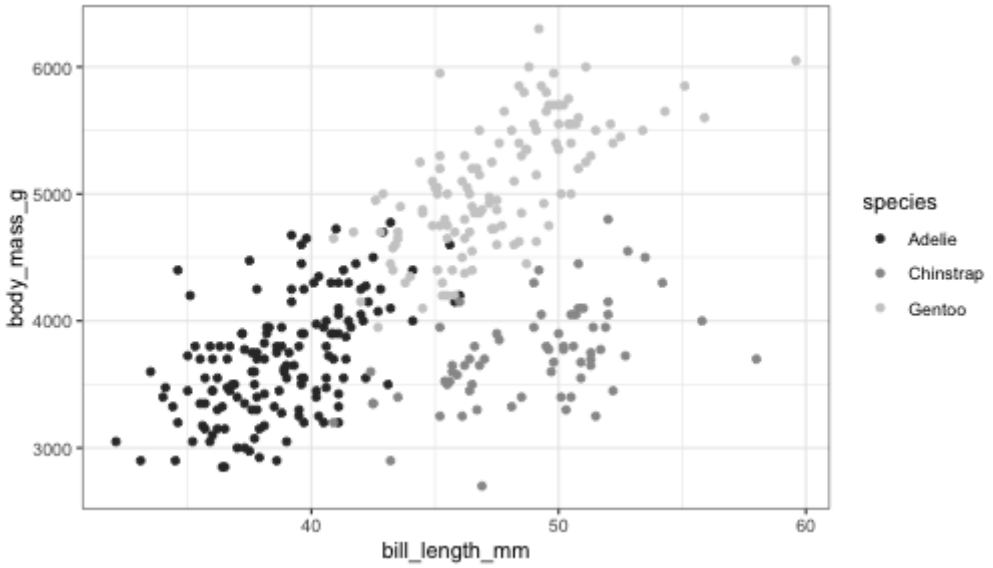
The `extrafont` package allows you to use fonts already on your computer in your graphics.

```
g1 + theme(text =
               element_text(family='Lobster Two',
                            size=14))
```

Grey palettes

We might want gray-scale palettes, to avoid journal color fees, for example

```
plt + scale_color_grey()+theme_bw()
```



Themes

ggplot2 themes

There are several themes built into **ggplot2**

theme_minimal	theme_bw
theme_dark	theme_gray
theme_classic	theme_minimal
theme_linedraw	theme_classic

- You can modify any of these themes using the `theme` function
- You can set a particular theme for a document at the very beginning using `theme_set`

```
theme_set(theme_classic)
```

ggthemes (https://jrnold.github.io/ggthemes/)

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ggthemes

theme_wsj

Wall Street Journal theme

theme_tufte

Tufte Maximal Data, Minimal Ink Theme