Grammar of Graphics: ggplot2

SSEP 2022 Afternoon Day 4

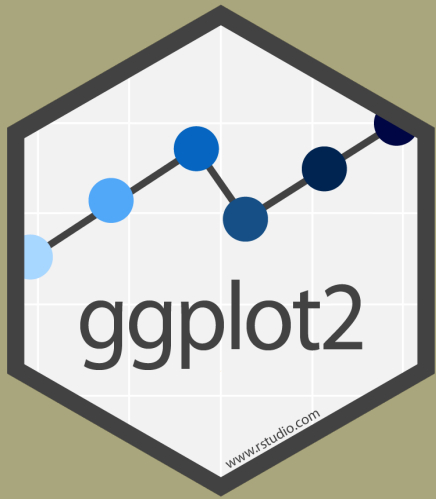Dr. Ab Mosca (they/them)

ggplot2

- Library for creating plots in R
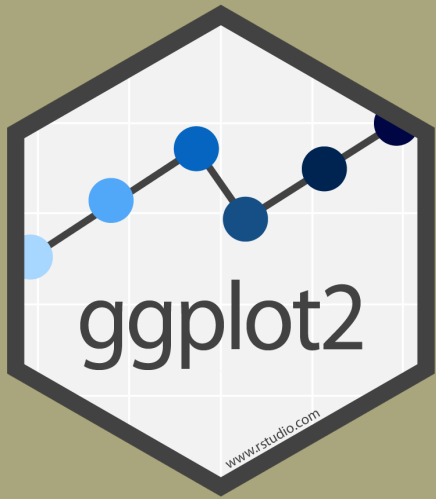- The "gg" stand for **g**rammar of **g**raphics

Big idea behind a grammar of graphics:

- Independently specify plot building blocks and combine them to create graphical displays

ggplot2

- Plot building blocks
  - data (obvi.)
  - aesthetic mappings (how we draw that stuff)
  - geometric objects (the literal stuff we draw)
  - statistical transformations (underlying model)
  - scales (range of values, colors, etc.)
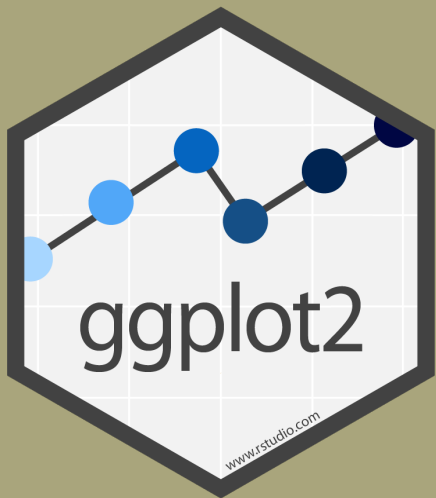 - faceting (small multiples)

ggplot2

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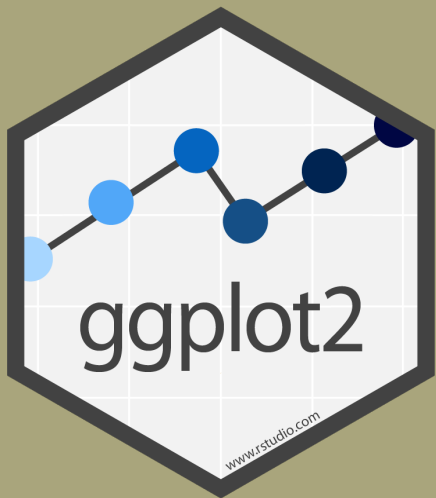
ggplot2

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```
ggplot(data, aes()) +
   geom_*
```

data
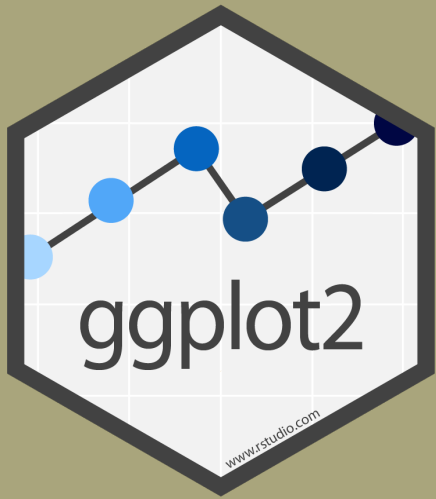
aesthetic mapping

geometric object

Data

- First argument to `ggplot` is the data you want to plot

```
ggplot(iris)
```

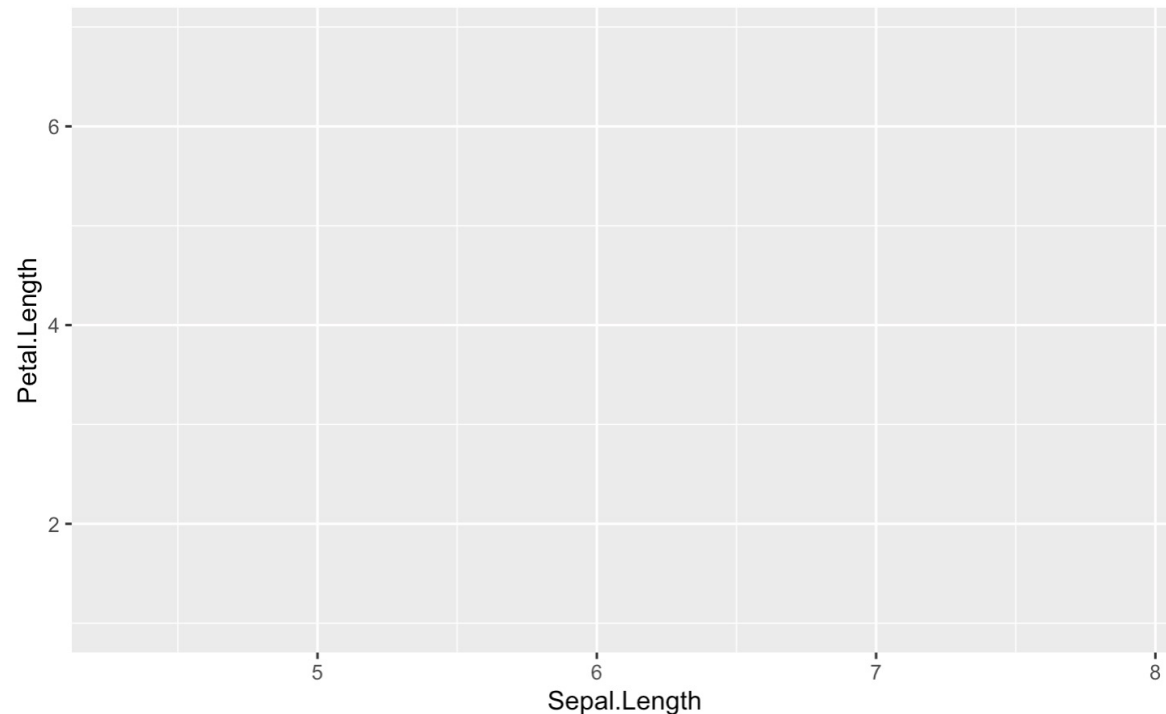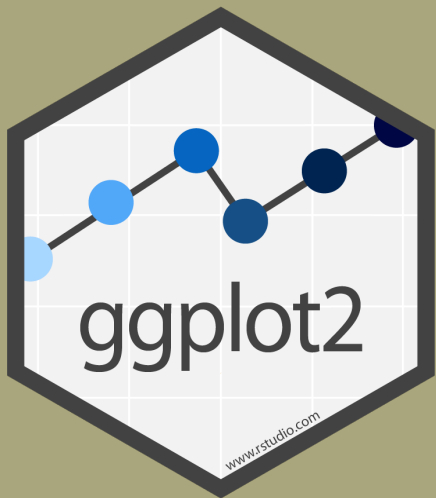| Sepal.Length <dbl>	Sepal.Width <dbl>	Petal.Length <dbl>	Petal.Width <dbl>	Species <fctr>
5.1	3.5	1.4	0.2	setosa
4.9	3.0	1.4	0.2	setosa
4.7	3.2	1.3	0.2	setosa
			0.2	setosa
			0.2	setosa
			0.4	setosa
			0.3	setosa

Description: df [150 × 5]

Aesthetic Mapping (`aes()`)

- Aesthetic refers to something you can see

- Ex. Position on the x and y axes

```
ggplot(iris, aes(x = Sepal.Length, y = Petal.Length))
```
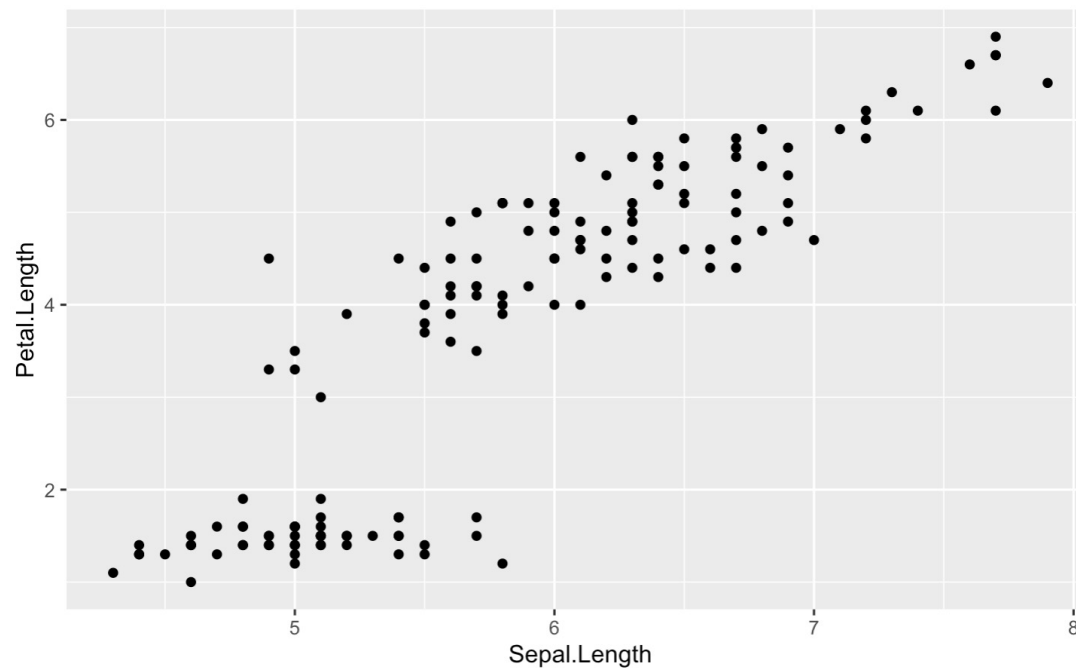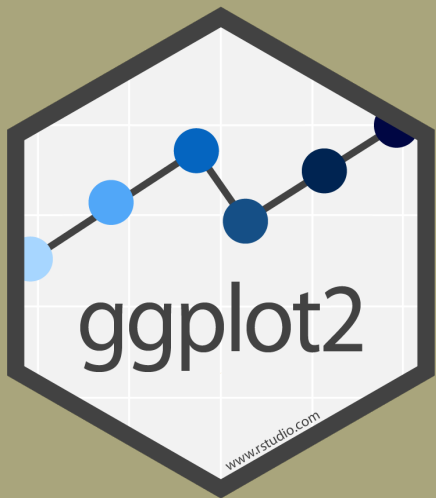
Geometric Objects (**geom**)

- In `ggplot2` the actual marks we put on a plot

- Ex. points (`geom_point`)

```
ggplot(iris, aes(x = Sepal.Length, y = Petal.Length)) +
    geom_point()
```
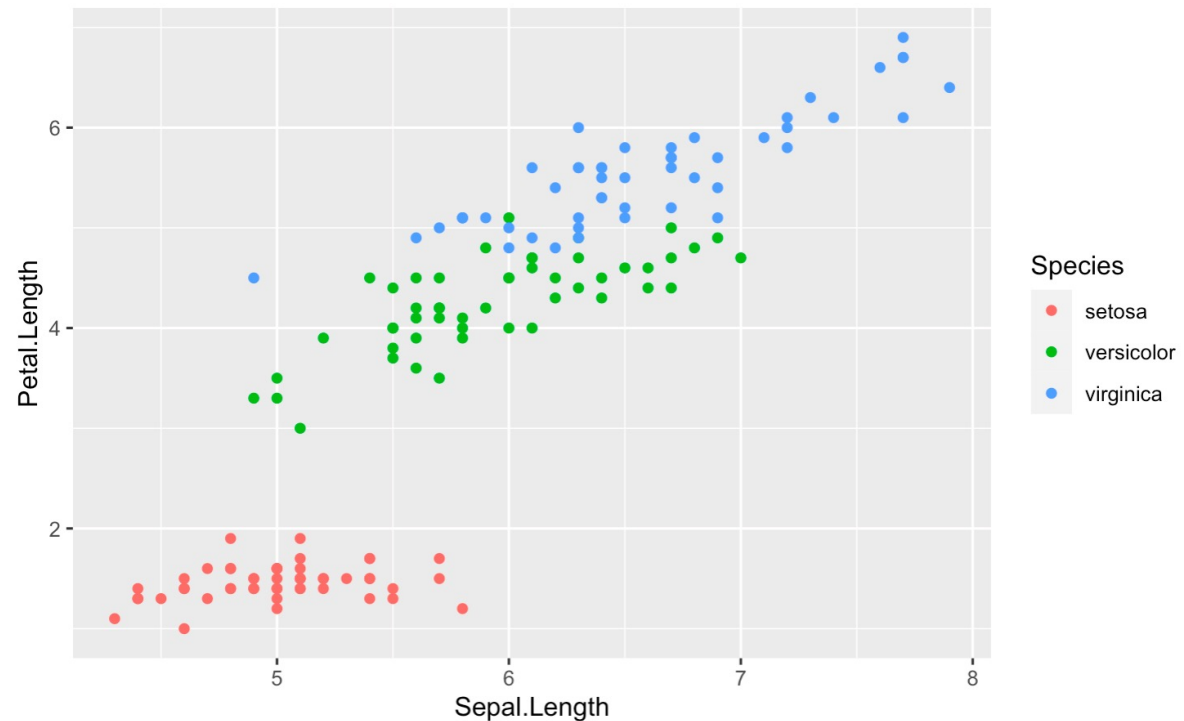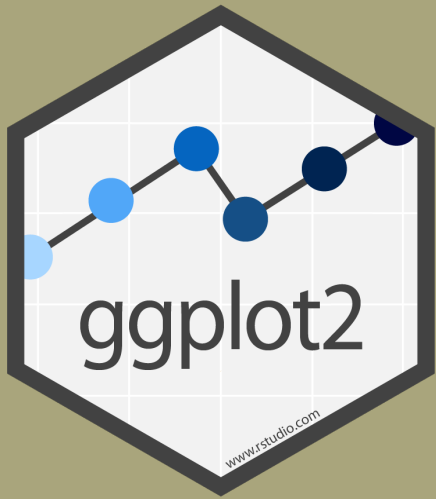
Geometric Objects (geom) + Aesthetics

- Apply aesthetics to geometric objects

- Ex. Color points

```
ggplot(iris, aes(x = Sepal.Length, y = Petal.Length)) +
    geom_point(aes(color = Species))
```

ggplot2 tips

- Cheatsheet: https://www.rstudio.com/resources/cheatsheets/

- Remember building blocks
  - data
  - aesthetic mappings
  - geometric objects

- Play around! Try different things in your lab and look at documentation if you get stuck: https://ggplot2.tidyverse.org/