ggplot Part I

Workshop on Plotting in R
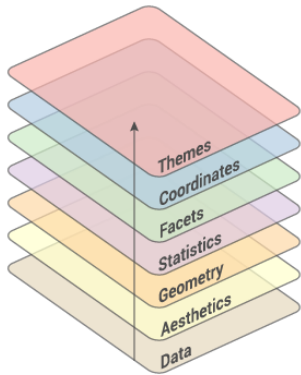
Lokesh Mano • 10-Sep-2021

NBIS, SciLifeLab

Contents

Grammar of Graphics

- **Data:** Input data
- **Geom:** A geometry representing data. Points, Lines etc
- **Aesthetics:** Visual characteristics of the geometry. Size, Color, Shape etc
- **Scale:** How visual characteristics are converted to display values
- **Statistics:** Statistical transformations. Counts, Means etc
- **Coordinates:** Numeric system to determine position of geometry. Cartesian, Polar etc
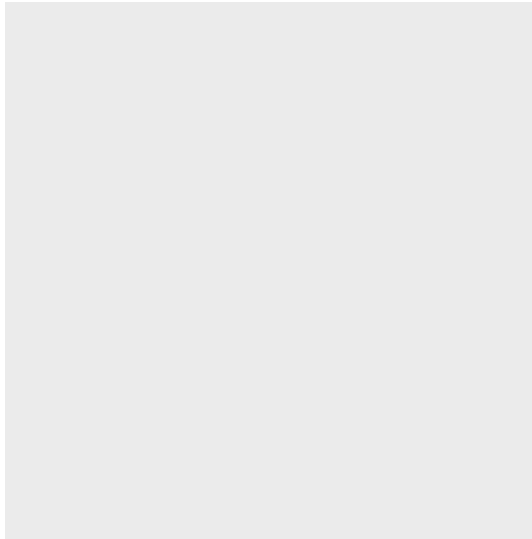- **Facets:** Split data into subsets

Building a graph

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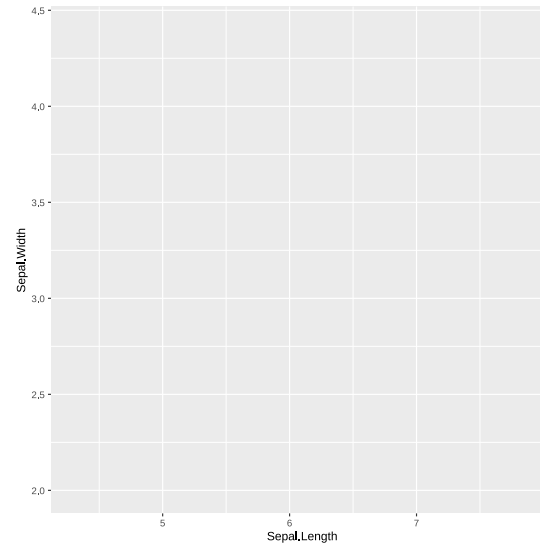
Build-Demo

```
ggplot(iris)
```
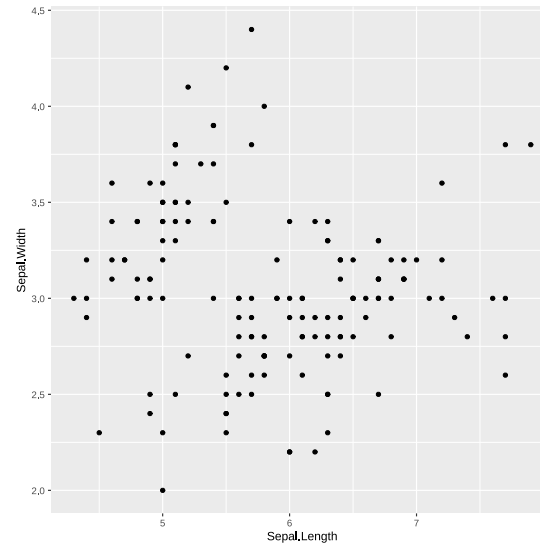
Build-Demo

```
ggplot(iris,aes(x=Sepal.Length,
                y=Sepal.Width))
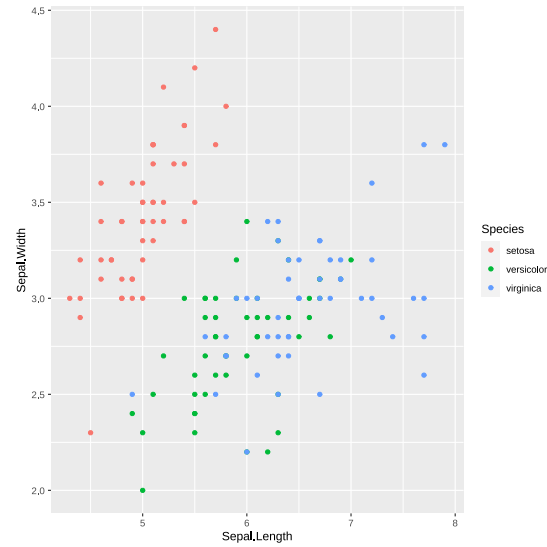```

# Build-Demo

```
ggplot(iris,aes(x=Sepal.Length,
                y=Sepal.Width))+
  geom_point()
```
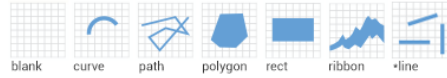
# Build-Demo

```
ggplot(iris,aes(x=Sepal.Length,
                y=Sepal.Width,
                colour=Species))+
  geom_point()
```
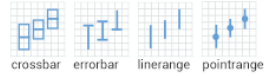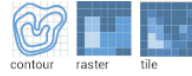
# Geoms

**Basic**

| | | | | | | |
|---|---|---|---|---|---|---|
| blank | curve | path | polygon | rect | ribbon | •line |

**One variable**

| | | | | | |
|---|---|---|---|---|---|
| area | density | dotplot | freqpoly | histogram | bar |

**Two variables**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| jitter | label | point | quantile | smooth | text | rug | hex | density2d | bin2d | violin | boxplot |

dotplot

**Error**

| | | | |
|---|---|---|---|
| crossbar | errorbar | linerange | pointrange |

**Three variables**

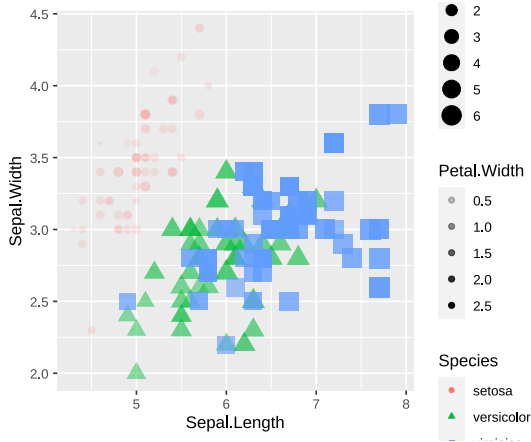| | | |
|---|---|---|
| contour | raster | tile |

**Map**

map

```
p <- ggplot(iris)
# scatterplot
p+geom_point(aes(x=Sepal.Length,y=Sepal.Width))
barplot
p+geom_bar(aes(x=Sepal.Length))
boxplot
p+geom_boxplot(aes(x=Species,y=Sepal.Width))
# search
help.search("^geom_",package="ggplot2")
```
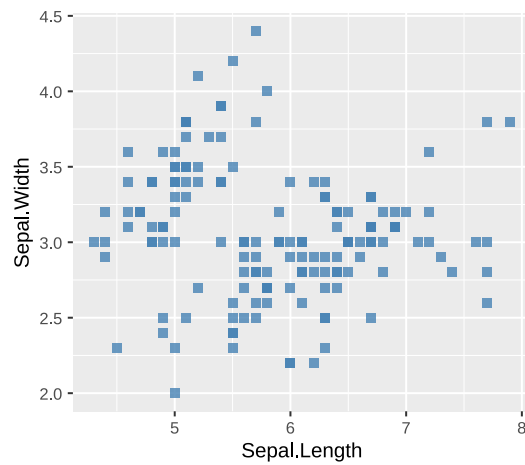
# Aesthetics

- Aesthetic mapping vs aesthetic parameter

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

```
ggplot(iris)+
  geom_point(aes(x=Sepal.Length,
                 y=Sepal.Width),
                 size=2,
                 alpha=0.8,
                 shape=15,
                 color="steelblue")
```

Thank you. Questions?

R version 4.1.1 (2021-08-10)
Platform: x86_64-pc-linux-gnu (64-bit)
OS: Ubuntu 18.04.5 LTS

Built on : 📅 10-Sep-2021 at 🕐 13:00:23

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