

# **An In-Depth Exploration of Advanced Data Visualization Techniques with R**

Workshop by Ketura Elie

# Grammar of Graphics

GGplot – R package for producing data visualizations

## Elements of ggplot

★ **Data**

★ **Aesthetics**

★ **Geometries**

**Facets**

Statistics

Coordinates

**Themes**

# Grammar of Graphics

GGplot – R package for producing data visualizations

## Elements of ggplot

★ **Data**

★ **Aesthetics**

★ **Geometries**

**Facets**

Statistics

Coordinates

**Themes**

**Bar Graph**  
**Histograms**  
**Boxplots**

**Scales (color,fill)**  
**Factor**  
**Themes**

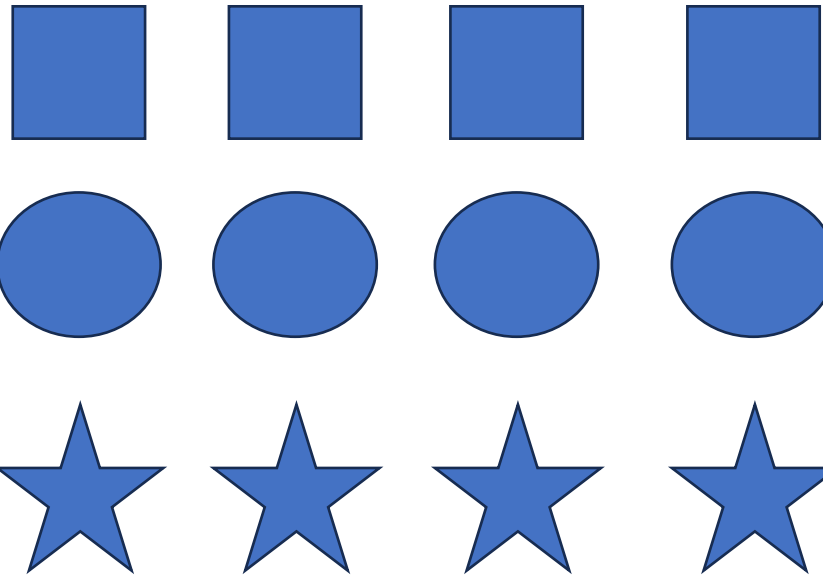
# Factors

a special variable “type”

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## Shapes



If we wanted to visualize this data, we would need to recognize the ‘shapes’ variable as a **factor**

# Bar Plots, Histograms, BoxPlots

## Data

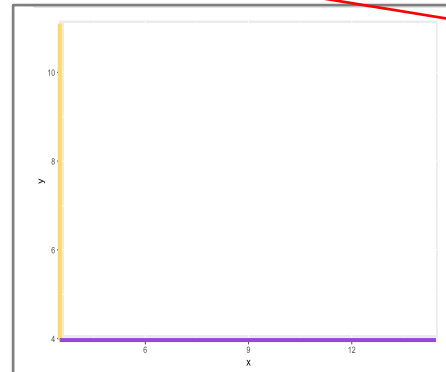
the data / data set itself

	x1	x2	x3	x4	y1	y2	y3	y4
1	10	10	10	8	8.04	9.14	7.46	6.58
2	8	8	8	8	6.95	8.14	6.77	5.76
3	13	13	13	8	7.58	8.74	12.74	7.71
4	9	9	9	8	8.81	8.77	7.11	8.84
5	11	11	11	8	8.33	9.26	7.81	8.47
6	14	14	14	8	9.96	8.10	8.84	7.04
7	6	6	6	8	7.24	6.13	6.08	5.25
8	4	4	4	19	4.26	3.10	5.39	12.50
9	12	12	12	8	10.84	9.13	8.15	5.56
10	7	7	7	8	4.82	7.26	6.42	7.91
11	5	5	5	8	5.68	4.74	5.73	6.89

## Aesthetics

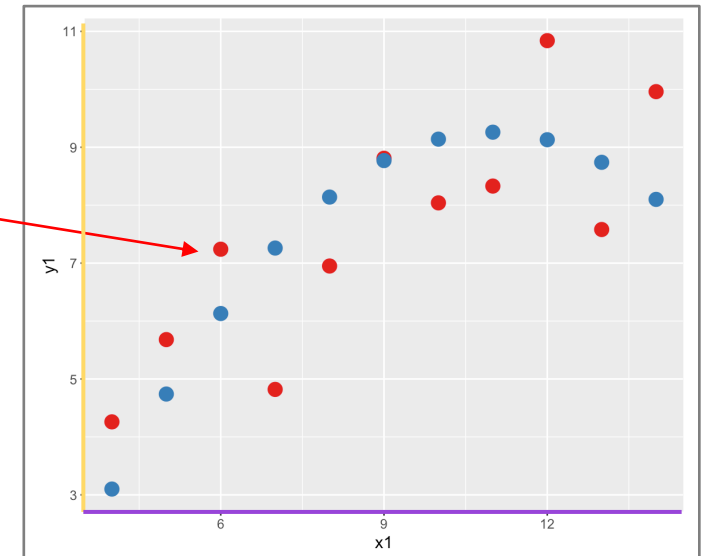
“variables” / data mapped onto the aesthetic elements

x1	y1
10	8.04
8	6.95
13	7.58
9	8.81
11	8.33
14	9.96
6	7.24
4	4.26
12	10.84
7	4.82
5	5.68



## Geometries

determines how data is displayed



# Bar Plots, Histograms, BoxPlots

## Data

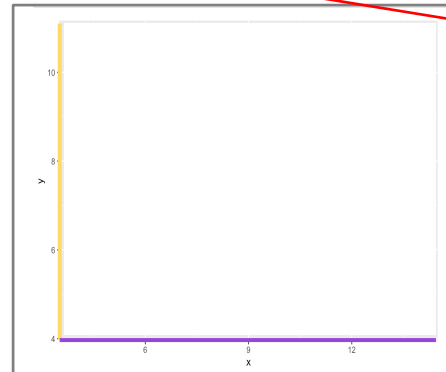
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## Aesthetics

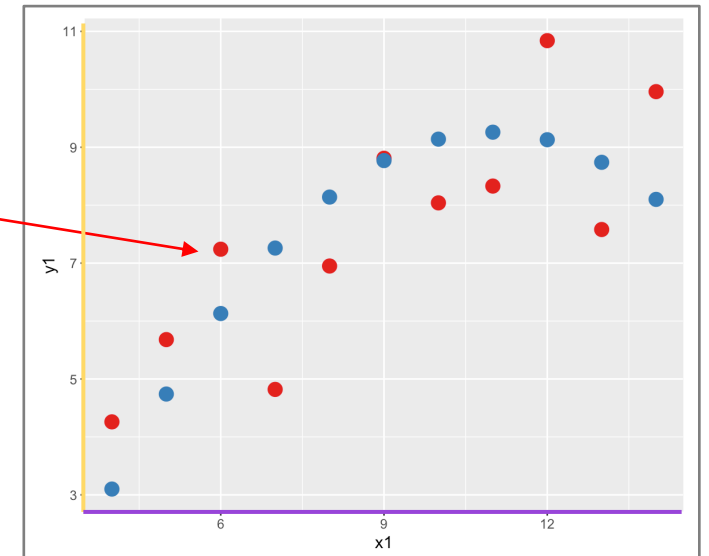
“variables” / data mapped onto the aesthetic elements

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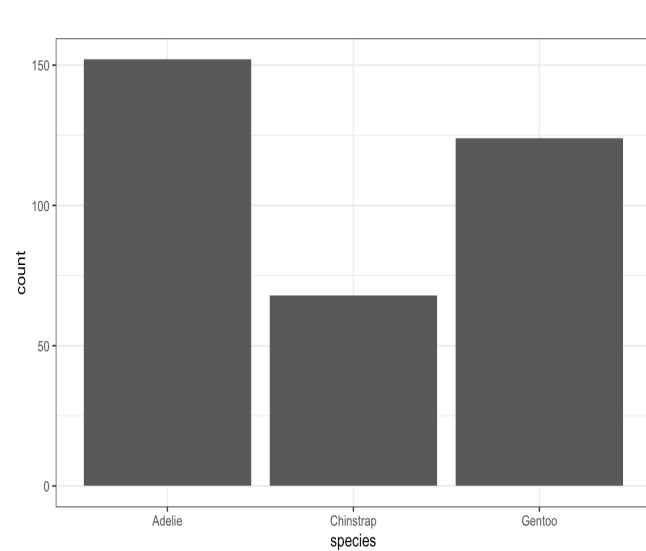
## Geometries

determines how data is displayed

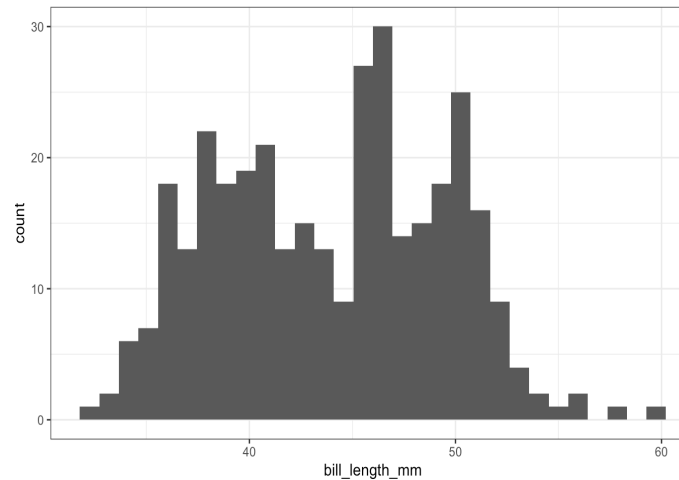


# Bar Plots, Histograms, Box Plots

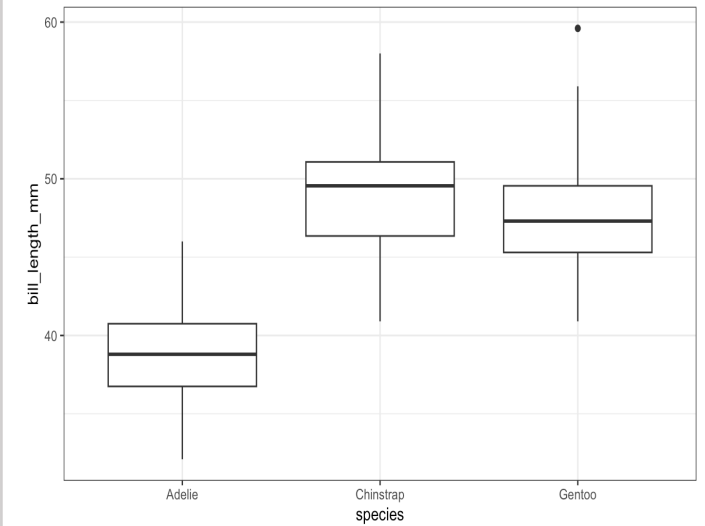
**Bar plots**  
`geom_bar()*`



**Histograms**  
`geom_histogram()`



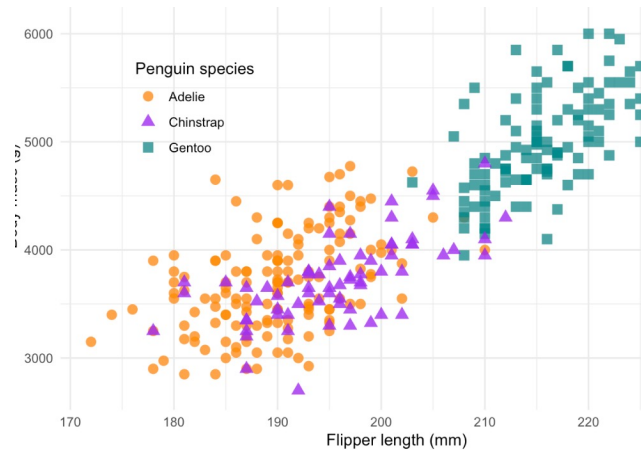
**Box plots**  
`geom_boxplot()`



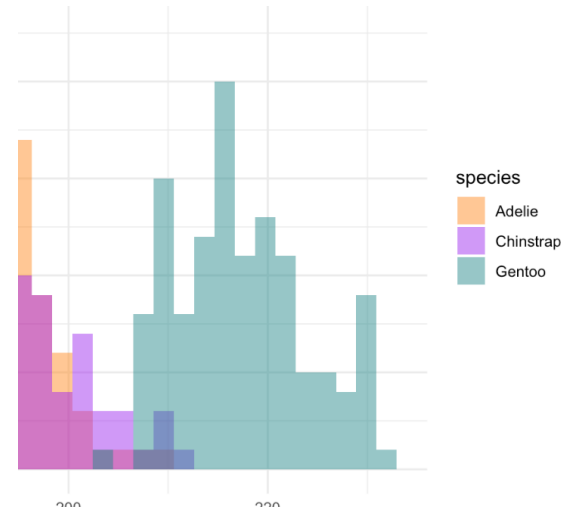


# Advance Customization

## Scales scale\_fill, scale\_color



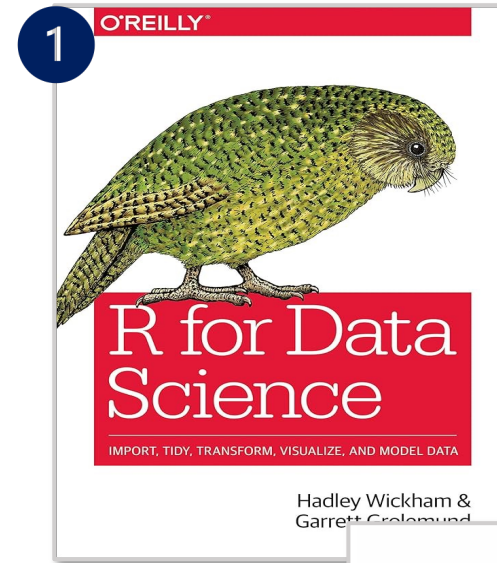
## Themes Legends position



# Resources

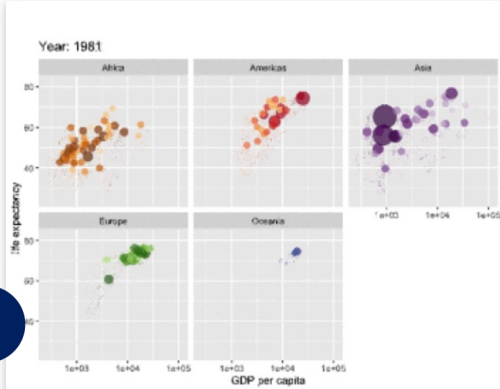
Resources that might be helpful

1. [R for Data Science](#) (Wickham & Grolemund)
2. [Data Visualization: A Practical Introduction](#) (Healy) (Package)
3. [ggplot extensions gallery](#) (extensions for cool and plots!)

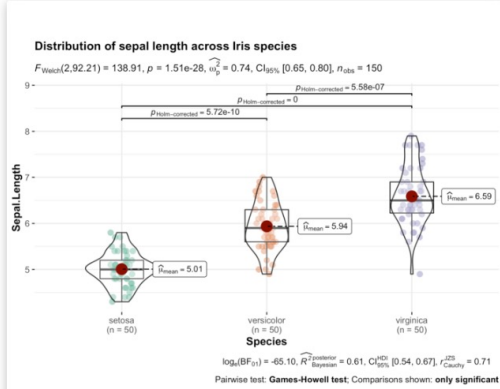


Hadley Wickham & Garrett Grolemund

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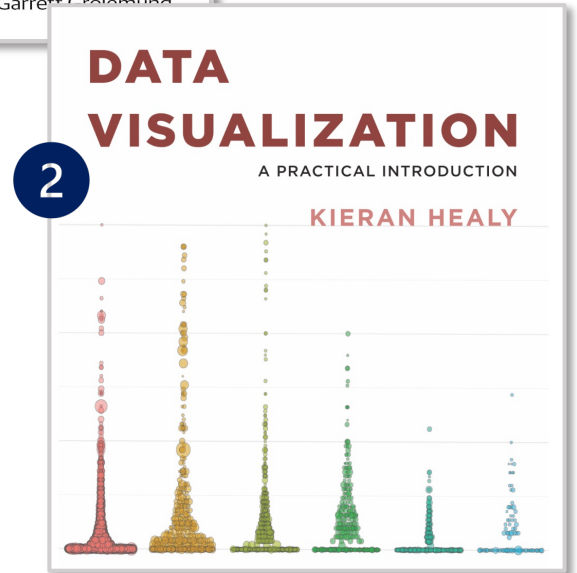
**gganimate** Star 1890  
A Grammar of Animated Graphics.  
■ **author:** thomasp85  
■ **tags:** visualization, general  
■ **js libraries:**



**ggstatsplot** Star 1781  
'ggstatsplot' provides a collection of functions to enhance 'ggplot2' plots with results from statistical tests.  
■ **author:** IndrajeetPatil  
■ **tags:** visualization, statistics  
■ **js libraries:**



**esquisse** Star 1690  
Explore and Visualize Your Data Interactively with ggplot2  
■ **author:** dreamrs  
■ **tags:** visualization, interface  
■ **js libraries:**



note the second link is to the package, *not* the book