

Storytelling with Data

Module 12: Student presentations; peer feedback; wrapping up

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Agenda

Student presentations and peer feedback

The grammar of graphics

Presentations

Peer feedback logistics

Each peer provides one document per presenter

Save each document as:

<Your full name> — <Presenter's full name> — feedback.pdf

Contents should include:

Two ideas ___ that were compelling AND two ways presenting ___ could be improved by ___

consider use of visuals

consider verbal and non-verbal communication

consider use of written text

If you were CEO, did the presenter convince you to invest further in analytics; why or why not?

Presentations and peer feedback

Compelling use of ____.

| Could improve ____ by ____.

clear story with narrative arc

appropriate for CEO of the organization

ties analytics to organizational needs

visualizes information using techniques taught in class

verbally narrates their story with techniques taught in class

manages time

Sharing lessons on projects

Group discussion

What were some of the challenges you faced in creating your infographic?

How did your messages change as your audience changed from an internal audience to the public or customers?

Share with us the challenges you faced in organizing your narrative?

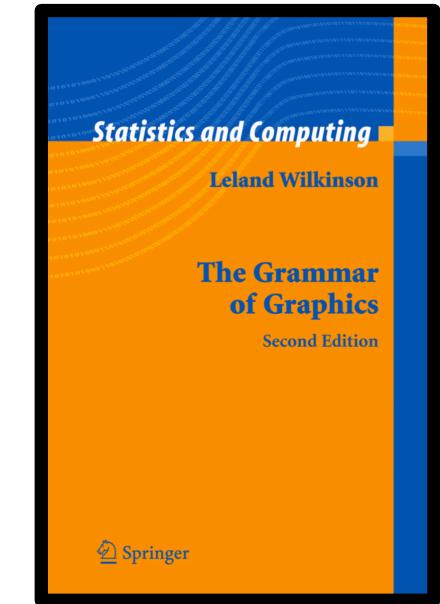
What ideas from our discussion of color, lines, and typography did you find useful in linking your narrative elements to visuals?

How many drafts did you try before submitting your final version? What aspects differed more from your initial to final versions?

What aspect of your information graphic would you work on next?

What was your workflow and would it change when approaching your next analytics project?

Grammar of graphics, a way to visually describe data



The grammar of graphics

Wilkinson

Leland, formerly VP of Statistics at Tableau, is a statistician and computer scientist at H2O.ai, and Adjunct Professor of Computer Science at University of Illinois at Chicago. His research focuses on scientific visualization and statistical graphics.

A grammar links visual perception to graphics

Theory of graphics, not chart typology

Charts are just instances of more general objects

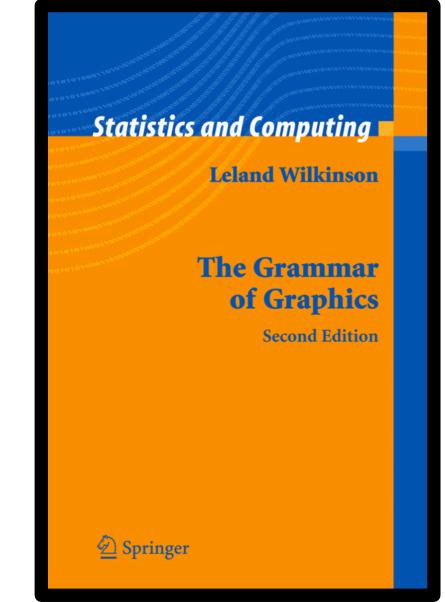
Thinking in terms of charts limit re-use for new, different cases

Once we understand how our audience can best perceive our data comparisons, a grammar helps us build graphics to accomplish that goal.

We often call graphics charts ... pie charts, bar charts, line charts, and so on. But **Customary usage and standards can blind us to the diversity of the graphics domain**; a formal system can liberate us from conventional restrictions.

Charts are usually instances of much more general objects. Once we understand that a pie is a divided bar in polar coordinates, we can construct other polar graphics that are less well known. We will also come to realize why a histogram is not a bar chart and why many other **graphics that look similar nevertheless have different grammars**.

If we ... develop charting instead of a graphing: **we inevitably will offer fewer charts than people want**. And we will have no way to add new charts ... without generating complex new code.



The grammar of graphics

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So what's a graph, and a graphic?

A **graph** is a set of points. A mathematical graph cannot be seen. It is an abstraction. A **graphic, however, is a physical representation of a graph**. This representation is accomplished by realizing graphs with aesthetic attributes such as size or color.

Six components to statistical graphs

Algebra the operations that allow us to combine variables, specify graph dimensions

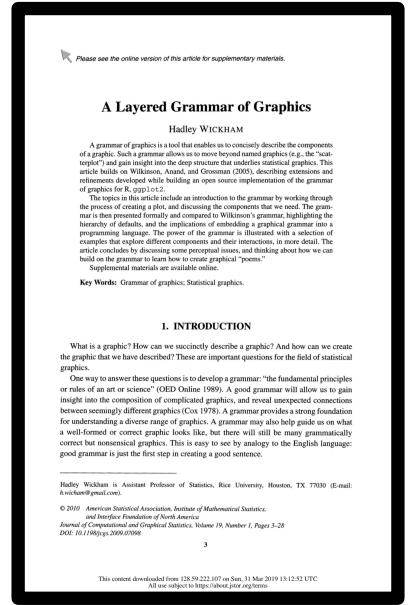
Scales the representation of variables on measured dimensions (e.g., linear, log)

Statistics the functions that allow graphs to change their appearance and representation

Geometry the creation of geometric graphs from variables

Coordinates coordinate systems, from polar coordinates to more complex map projections and general transformations

Aesthetics covers the sensory attributes used to represent graphics.



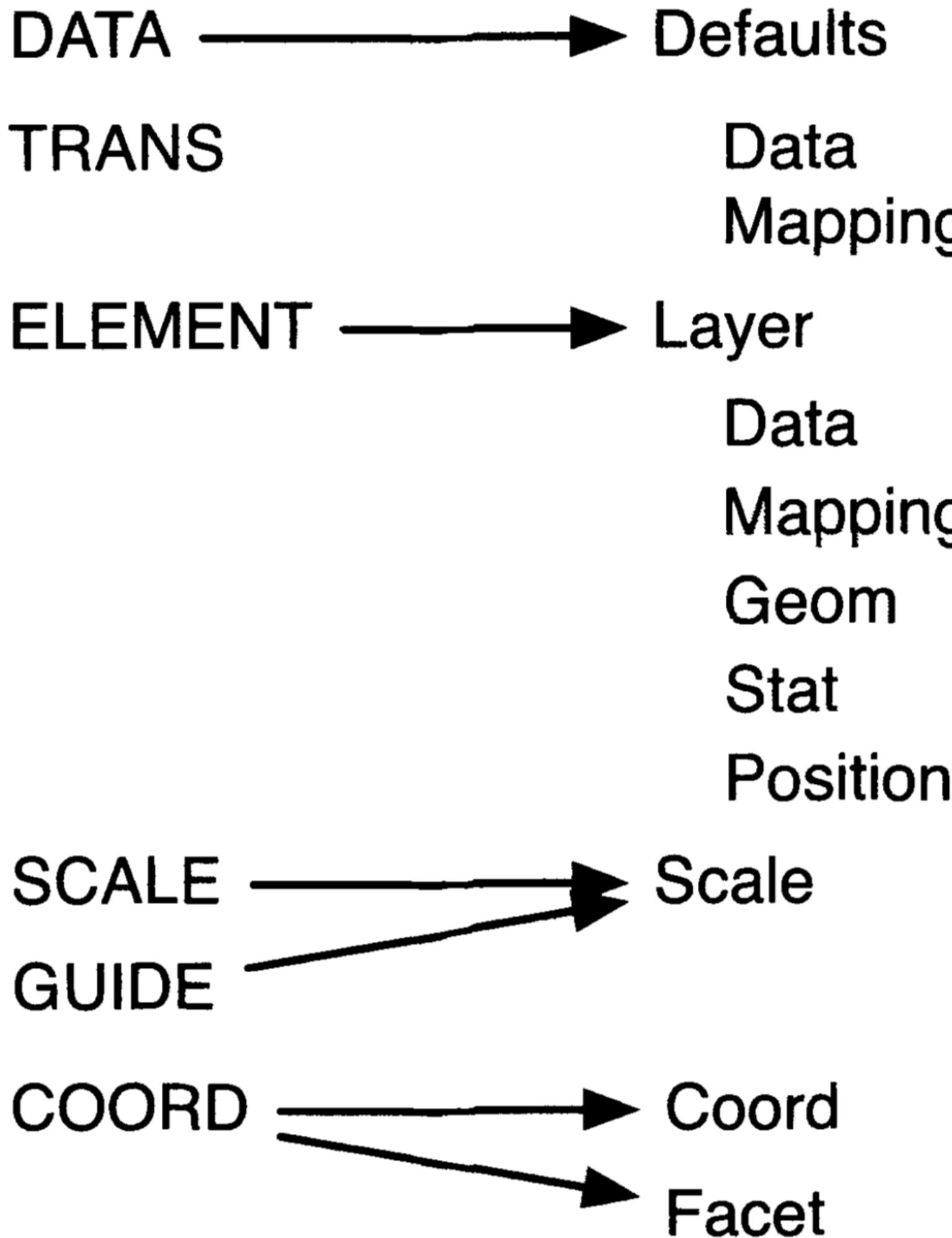
A layered grammar of graphics

Wickham

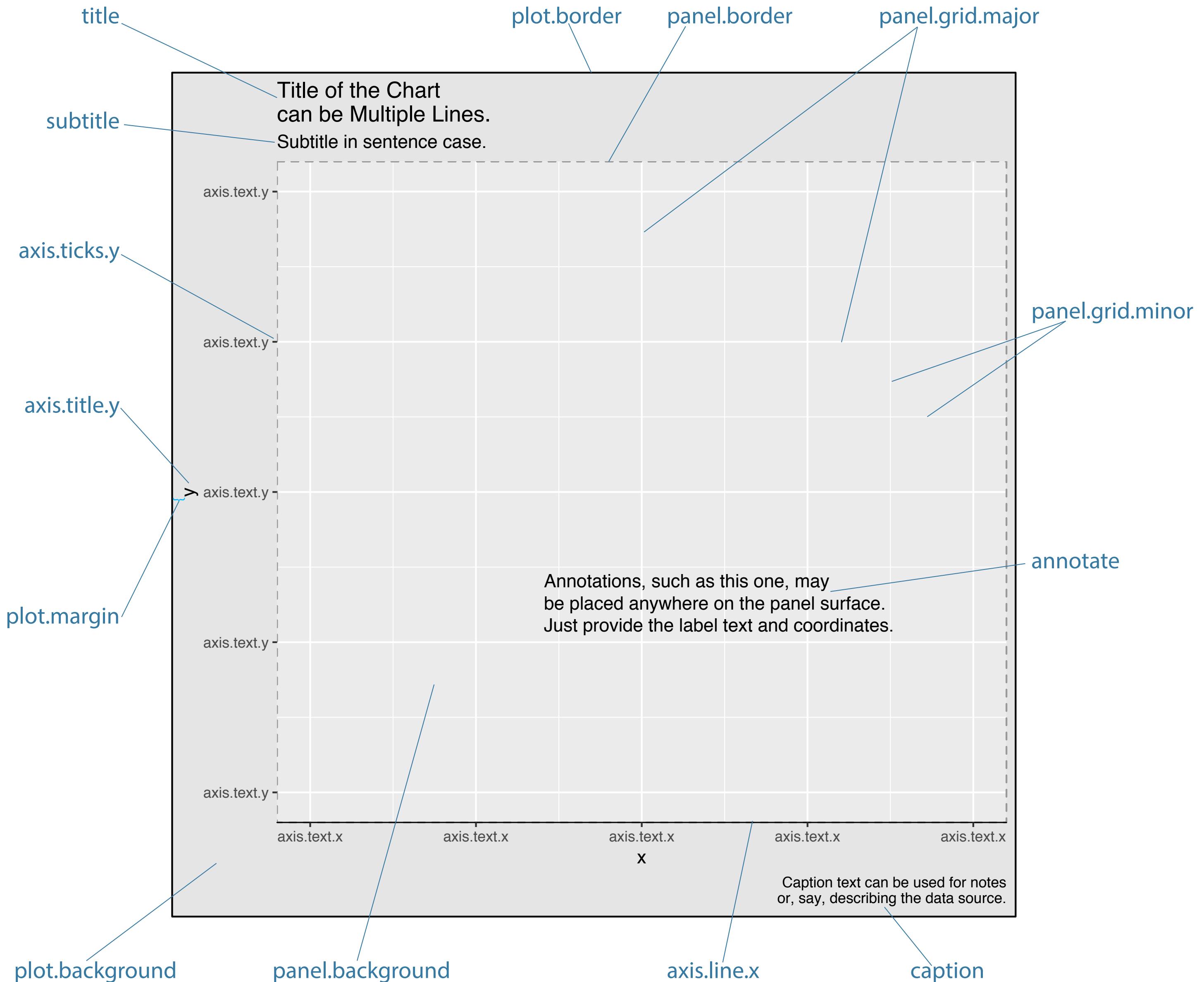
Hadley, an adjunct professor at Rice University, is the creator of the R package ggplot2, which is a limited implementation of Wilkinson's seminal work. gg is short for grammar of graphics.

GPL

ggplot2



First, think visually. Then code.



```
# load grammar of graphics  
library(ggplot2)
```

```
p <-
```

```
# functions for data ink
```

```
ggplot(data = <data>,  
       mapping = aes(<aesthetic> = <variable>,  
                     <aesthetic> = <variable>,  
                     <...> = <...>)) +  
  geom_<type>(<...>) +  
  scale_<mapping>_<type>(<...>) +  
  coord_<type>(<...>) +  
  facet_<type>(<...>) +  
  <...> +
```

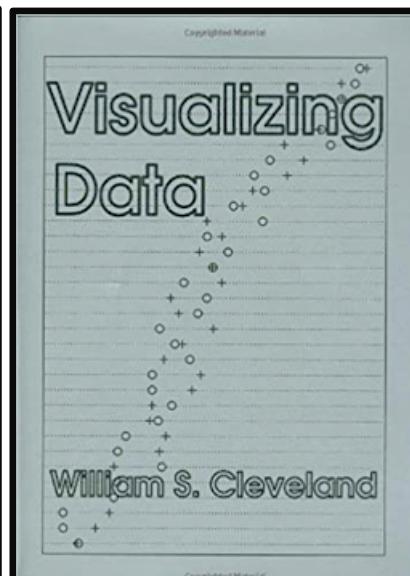
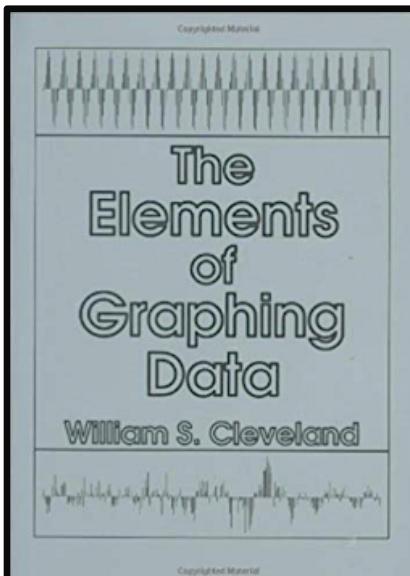
```
# functions for non-data ink
```

```
labs(<...>) +  
theme(<...> = <...>) +  
annotate(<...>) +  
<...>
```

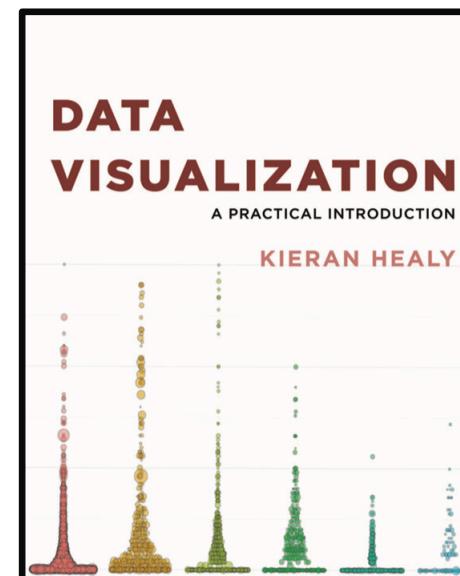
```
element_blank()  
element_line(<...> = <...>)  
element_rect(<...> = <...>)  
element_text(<...> = <...>)
```

Learning & References

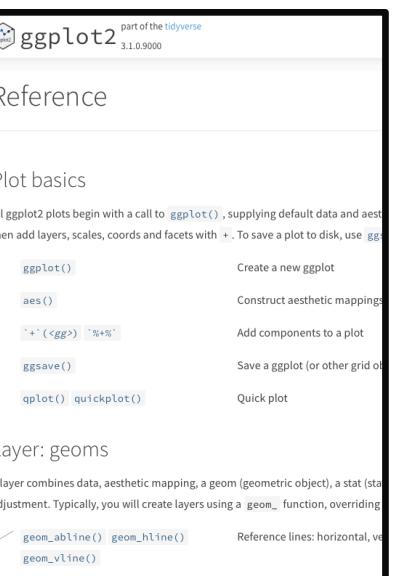
---- visual relationships in data ----



Implementation in R



ggplot reference



socviz.co

ggplot2.tidyverse.org

I enjoyed having each
of you in this course!

