website: vanderbi.lt/codegraf

ggplot for Data Visualization

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CodeGraf landing page

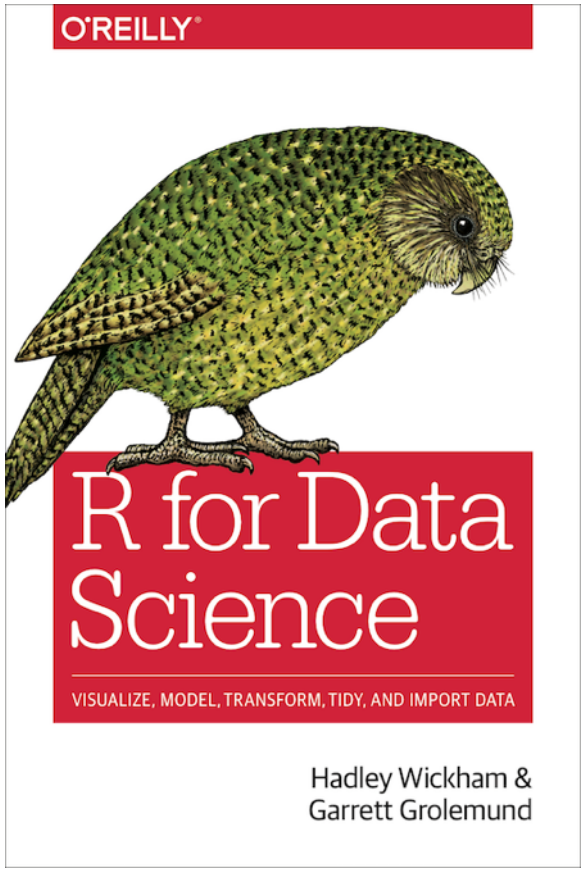
- vanderbi.lt/codegraf

Recommended reference materials

- R for Data Science:
  - free online https://r4ds.had.co.nz/
  - print book from O'Reilly or via Vanderbilt's library.

- ggplot website: https://ggplot2.tidyverse.org/ includes cheatsheet, also downloadable from https://rstudio.com/resources/cheatsheets/

- Wickham, H. 2010. A layered grammar of graphics. *J. Comp. and Graph. Stats.* http://dx.doi.org/10.1198/jcgs.2009.07098 preprint: http://vita.had.co.nz/papers/layered-grammar.html



kākāpō

https://en.wikipedia.org/wiki/Kakapo
https://www.rnz.co.nz/programmes/kakapo-files

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The Layered Grammar of Graphics

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Approaches to plotting

- Conventional:
  - plot created by a single function with a mixture of arguments (data source, form of markers, plot characteristics, etc.)

```
plot(frog_data, type="o", col="red", ylim=c(0,12), axes=FALSE)
```

  - in this case, plot type controlled in part by nature of data

- ggplot:
  - plot created by a systematic series of functions (grammar of graphics)

```
ggplot(data = mpg, mapping = aes(x = class, y = hwy)) +
     geom_boxplot() +
     coord_flip()
```

  - plot type controlled by specific aesthetic, geometry, and coordinate functions

ggplot2 function template

- ggplot plots are constructed systematically
- each function adds information that explains how the data are transformed into a plot with the desired characteristics.
- not every plot uses every function

```
ggplot(data = <DATA>) +
  <GEOM_FUNCTION>(
     mapping = aes(<MAPPINGS>),
     stat = <STAT>,
     position = <POSITION>
  ) +
  <COORDINATE_FUNCTION> +
  <FACET_FUNCTION>
```

Figure and template from Wickham and Grolemund https://r4ds.had.co.nz/ CC BY-NC-ND

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