

Data visualization with ggplot2



**Why do *you*
want to visualize data?**

Just show me the data!

```
head(my_data, 10)
```

```
## # A tibble: 10 x 2
##       x     y
##   <dbl> <dbl>
## 1  55.4  97.2
## 2  51.5  96.0
## 3  46.2  94.5
## 4  42.8  91.4
## 5  40.8  88.3
## 6  38.7  84.9
## 7  35.6  79.9
## 8  33.1  77.6
## 9  29.0  74.5
## 10 26.2  71.4
```

```
mean(my_data$x)
```

```
## [1] 54.26327
```

```
mean(my_data$y)
```

```
## [1] 47.83225
```

```
cor(my_data$x, my_data$y)
```

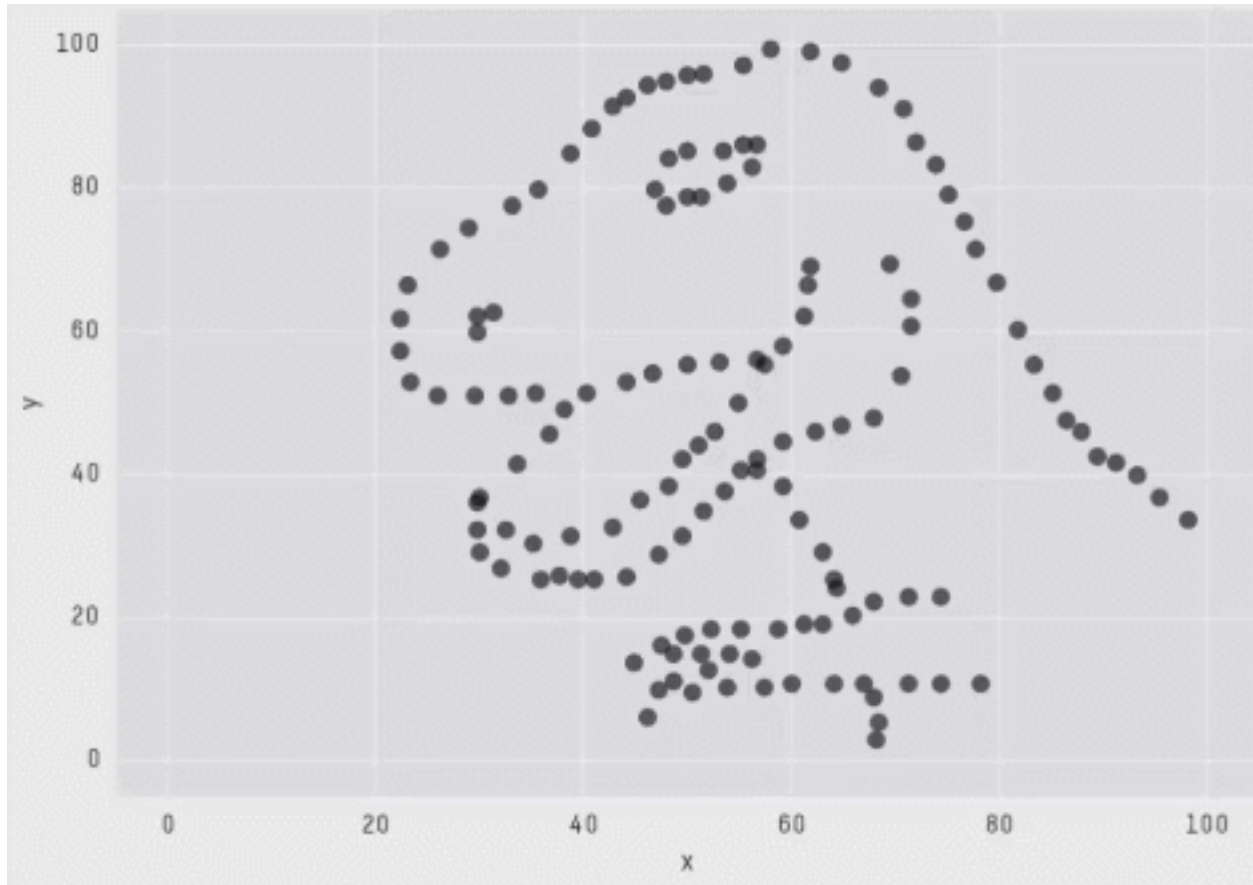
```
## [1] -0.06447185
```

Seems reasonable

Seems reasonable

No correlation

oh no

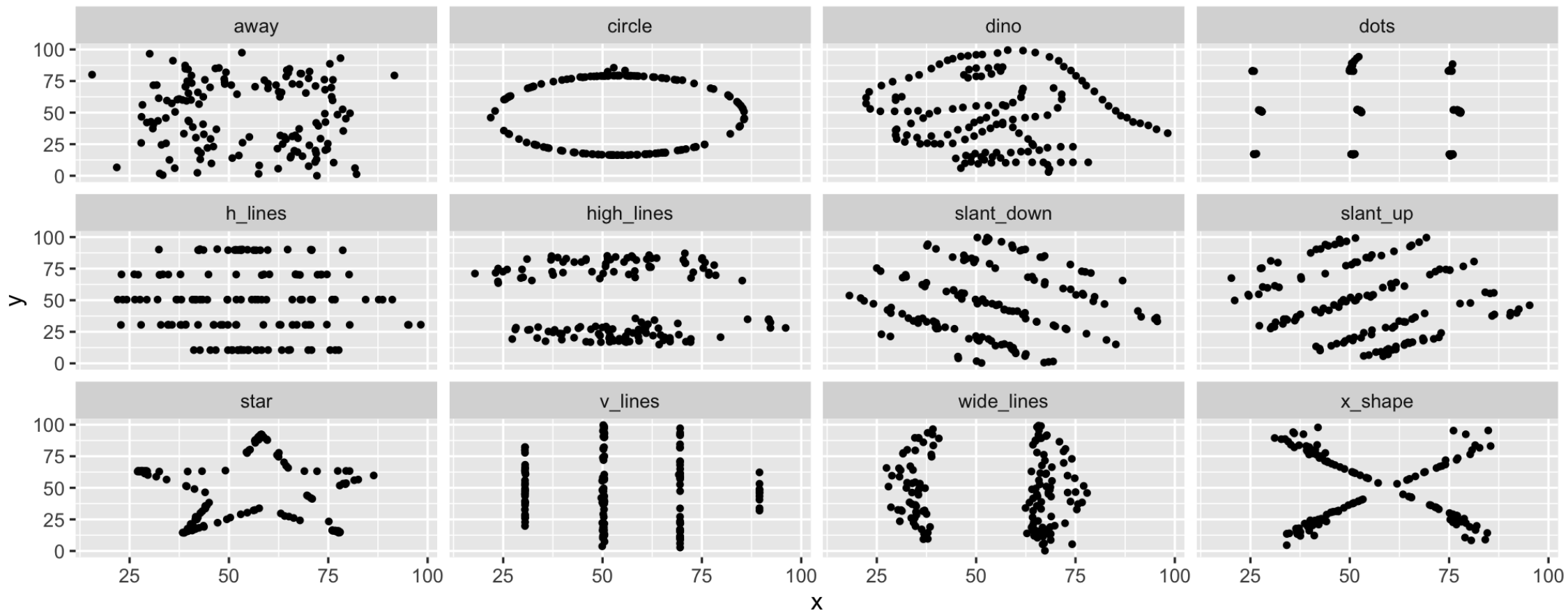


```
X Mean: 54.2659224  
Y Mean: 47.8313999  
X SD   : 16.7649829  
Y SD   : 26.9342120  
Corr.  : -0.0642526
```

The Datasaurus Dozen

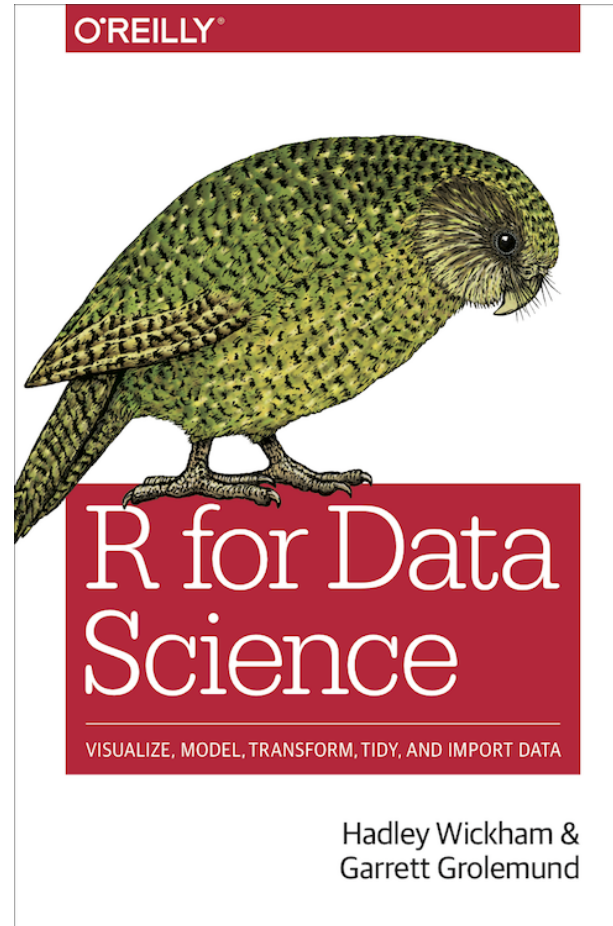
Raw data is not enough

Each of these has the same mean, standard deviation, variance, and correlation



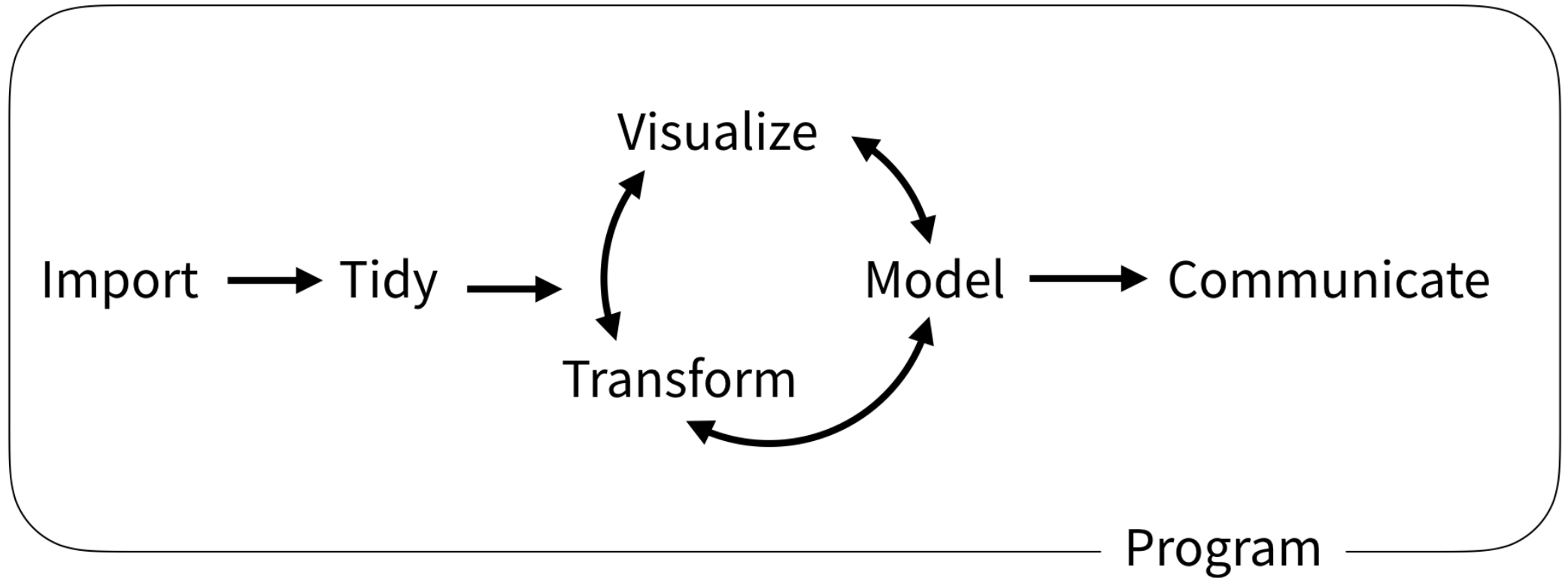
andhs.co/gpl-dataviz

Applied data science



R for Data Science, free online!

Applied data science



Plan for today

The Grammar of Graphics

(1 hour 15ish minutes)

CRAP and themes

(1 hour)

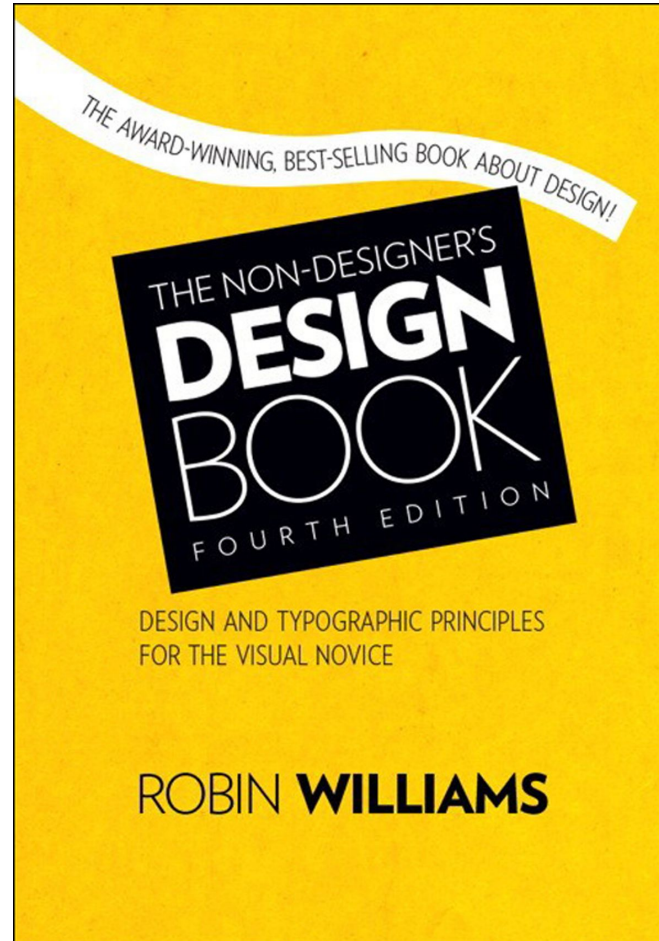
Interactive visualizations

(30 minutes)

Visualization resources

- Andrew Heiss, "Data Visualization with R" (free online course)
- Kieran Healy, *Data Visualization for Social Science: A practical introduction with R and ggplot2*
- Claus Wilke, *Fundamentals of Data Visualization*
- Alberto Cairo, *The Truthful Art: Data, Charts, and Maps for Communication*
- Stephanie D. H. Evergreen, *Effective Data Visualization: The Right Chart for the Right Data*
- Dona M. Wong, *The Wall Street Journal Guide to Information Graphics: The Dos and Don'ts of Presenting Data, Facts, and Figures*
- Hadley Wickham and Garrett Grolemund, *R for Data Science: Import, Tidy, Transform, Visualize, and Model Data*
- Alberto Cairo, *The Functional Art: An Introduction to Information Graphics and Visualization*

Design resources



Buy this book and your life will change forever.

Design resources

Accessibility

- **Vischeck**: Simulate how your images look for people with different forms of colorblindness (web-based)
- **Color Oracle**: Simulate how your images look for people with different forms of colorblindness (desktop-based, more types of colorblindness)

Fonts

- **Google Fonts**: Huge collection of free, well-made fonts.
- **The Ultimate Collection of Google Font Pairings**: A list of great, well-designed font pairings from all those fonts hosted by Google (for when you're looking for good contrasting or complementary fonts).

Colors

- **Adobe Color**: Create, share, and explore rule-based and custom color palettes.
- **ColourLovers**: Like Facebook for color palettes.
- **viridis**: Perceptually uniform color scales.
- **ColorBrewer**: Sequential, diverging, and qualitative color palettes that take accessibility into account.
- **Colorgorical**: Create color palettes based on fancy mathematical rules for perceptual distance.
- **Colorpicker for data**: More fancy mathematical rules for color palettes ([explanation](#)).
- **iWantHue**: Yet another perceptual distance-based color palette builder.
- **Photochrome**: Word-based color palettes.
- **PolicyViz Design Color Tools**: Large collection of useful color resources

Storytelling

Videos

- Ben Wellington, "Making data mean more through storytelling"
- Jonathan Schwabish, "Better data communication"

Books

- Cole Nussbaumer Knaflic, *Storytelling with Data: A Data Visualization Guide for Business Professionals*
- Alan Alda, *If I Understood You, Would I Have This Look on My Face? My Adventures in the Art and Science of Relating and Communicating*
- Nancy Duarte, *Resonate: Present Visual Stories That Transform Audiences*