Data Visualization 101
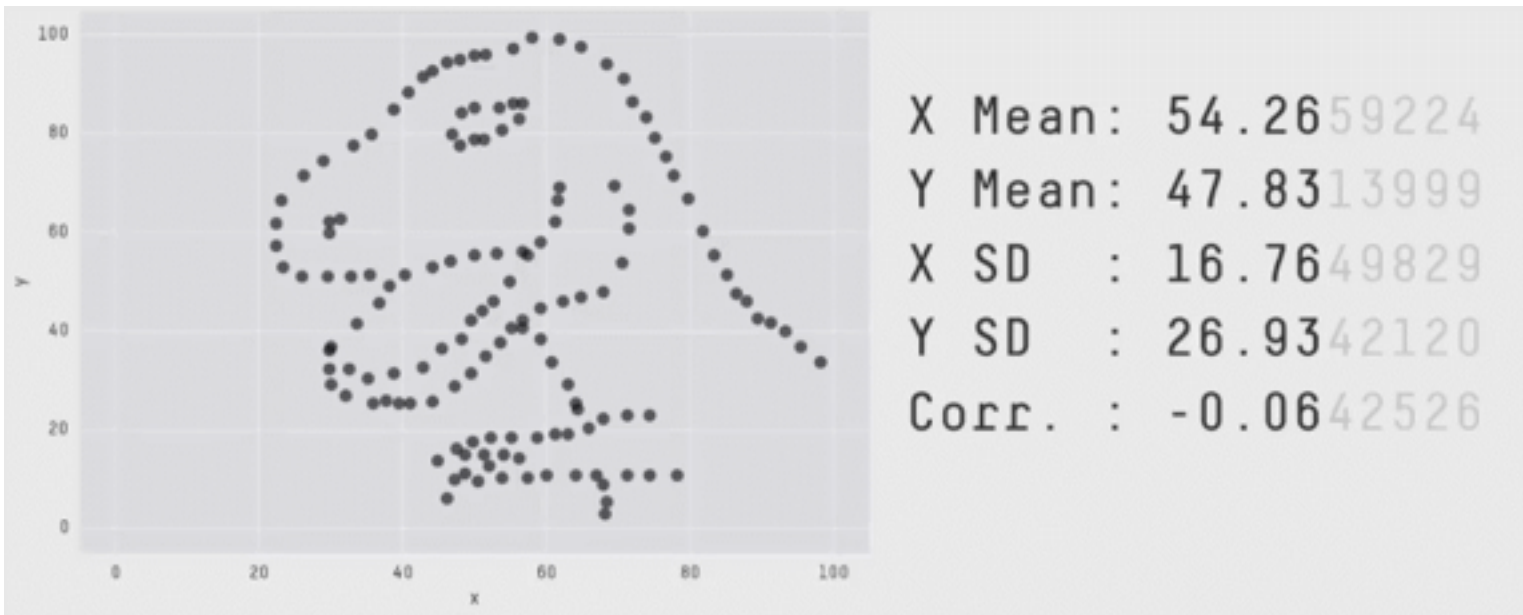## WWCode

Hannah Yan Han

Never trust summary stats alone, always visualize

Same stats, different data

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

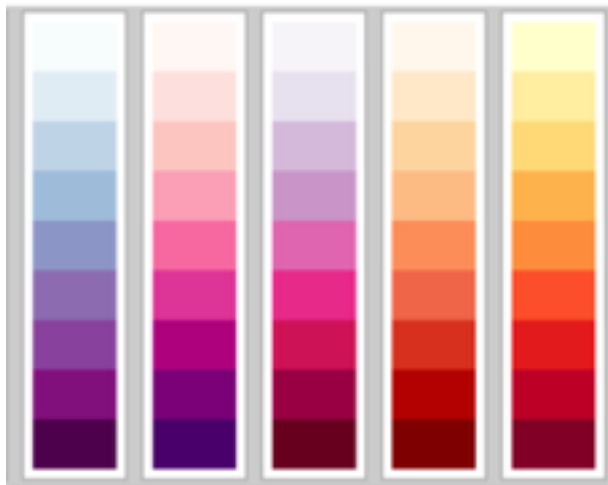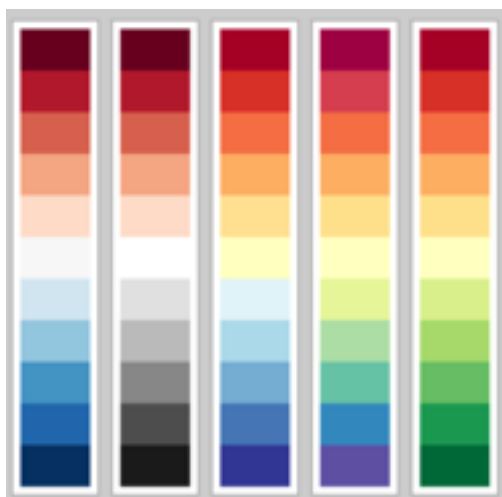From Datasaurus by Alberto Cairo

Data types

- **Quantitative** -- numbers
  -1.5, 3.14

- **Ordinal** -- categories with intrinsic ordering
  Awesome, average, bad

- **Categorical**
  Singapore, France, Argentina

- **Networks** - nodes and edges
  Social connections

- **Spatial**
  Maps, physical topologies

- **Time series**
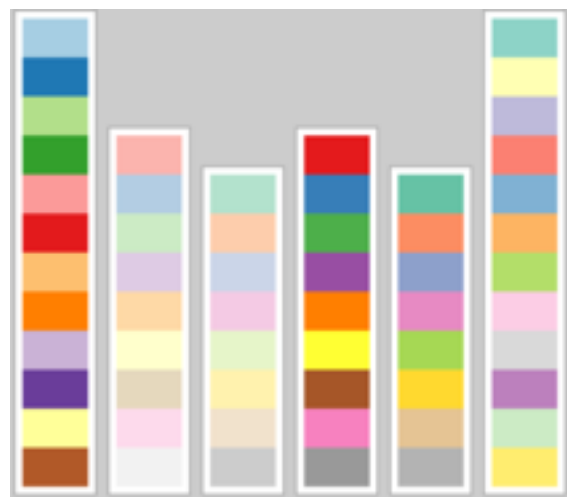 2016, 2026, 2036, 2046

Color palette

sequential
(quantitative)

diverging
(ordinal)

qualitative
(categorical)

Geometric primitives

→ Points

→ Lines

→ Areas

Visual encodings

Position on common scale
Position on unaligned scale
Length (1D size)
Tilt/angle
Area (2D size)
Depth (3D position)
Color luminance
Color saturation
Curvature
Volume (3D size)

Magnitude channels

Spatial region
Color hue
Motion
Shape

Category channels

Effectiveness

	Quantitative		Ordinal		Nominal	
More Accurate	Position		Position		Position	
	Length		Density		Hue	
	Angle		Saturation		Density	
	Slope		Hue		Saturation	
	Area		Length		Shape	
	Density		Angle		Length	
	Saturation		Slope		Angle	
	Hue		Area		Slope	
Less Accurate	Shape		Shape		Area	

Finding the right chart

The data we have + The question we pose

Comparison

Correlation

Special

Designing with Data
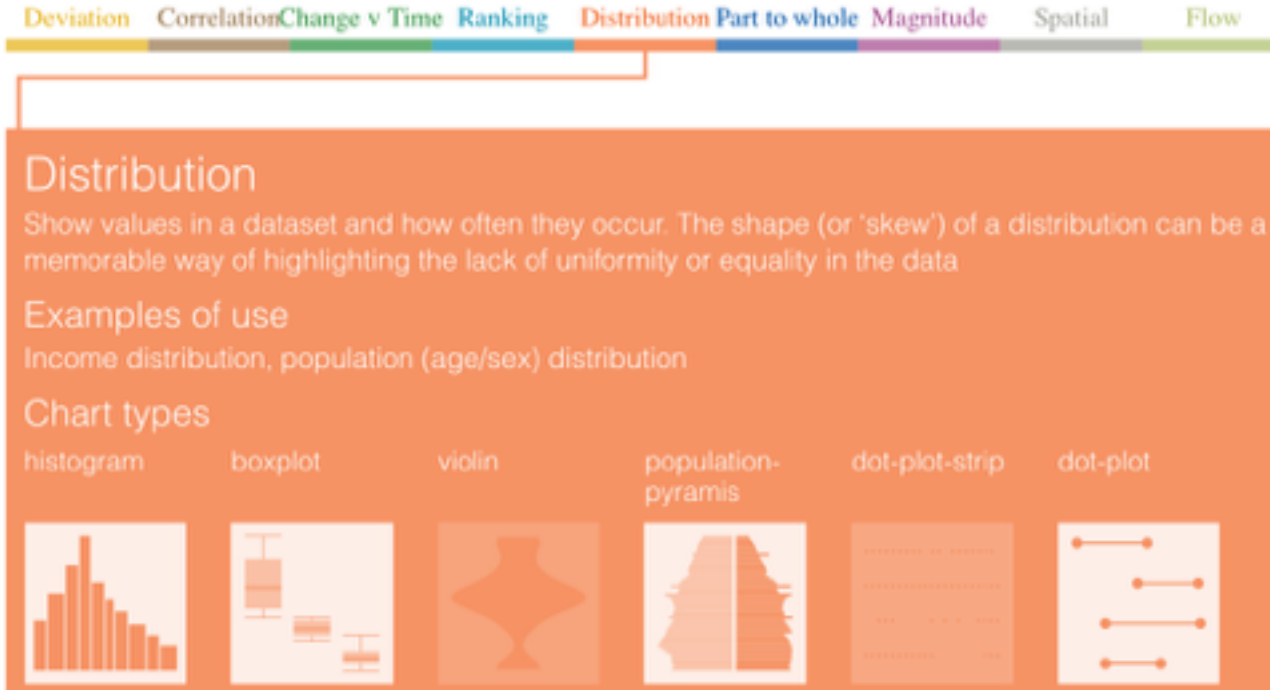
Exploring + Iterating

Example from Nathan Yau [One Dataset, Visualized 25 Ways](#)
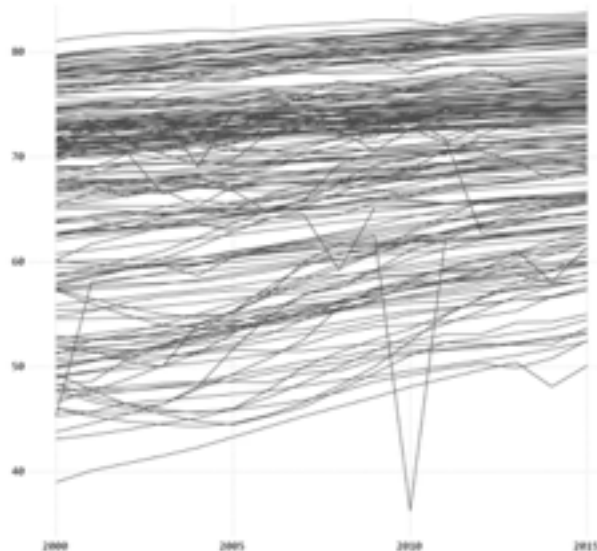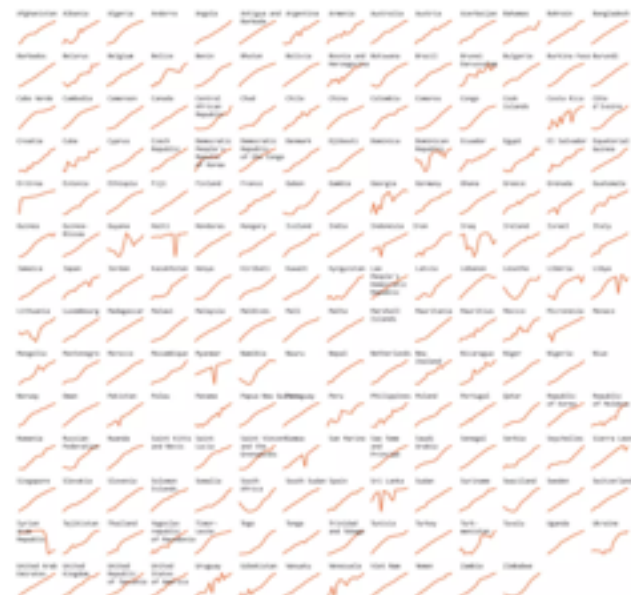
Let the data speak

" Numbers have an important story to tell. They rely on you to give them a clear and convincing voice "

Storytelling with data

From [Periscopic](#)

Storytelling with personalized data

Thank you

[in] Hannahyanhan

[M] bit.ly/100daysofviz

[twitter] @hannahyan

Feedback form http://bit.ly/wwcodeworkshop

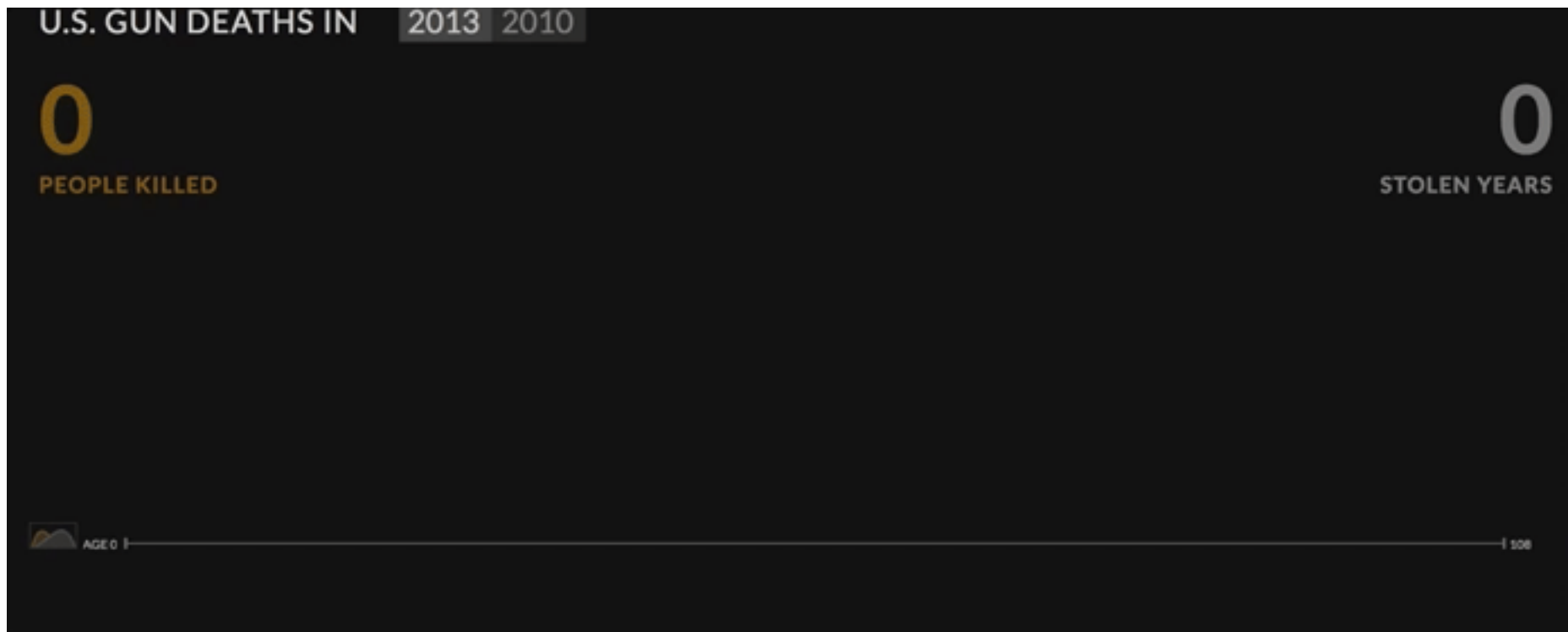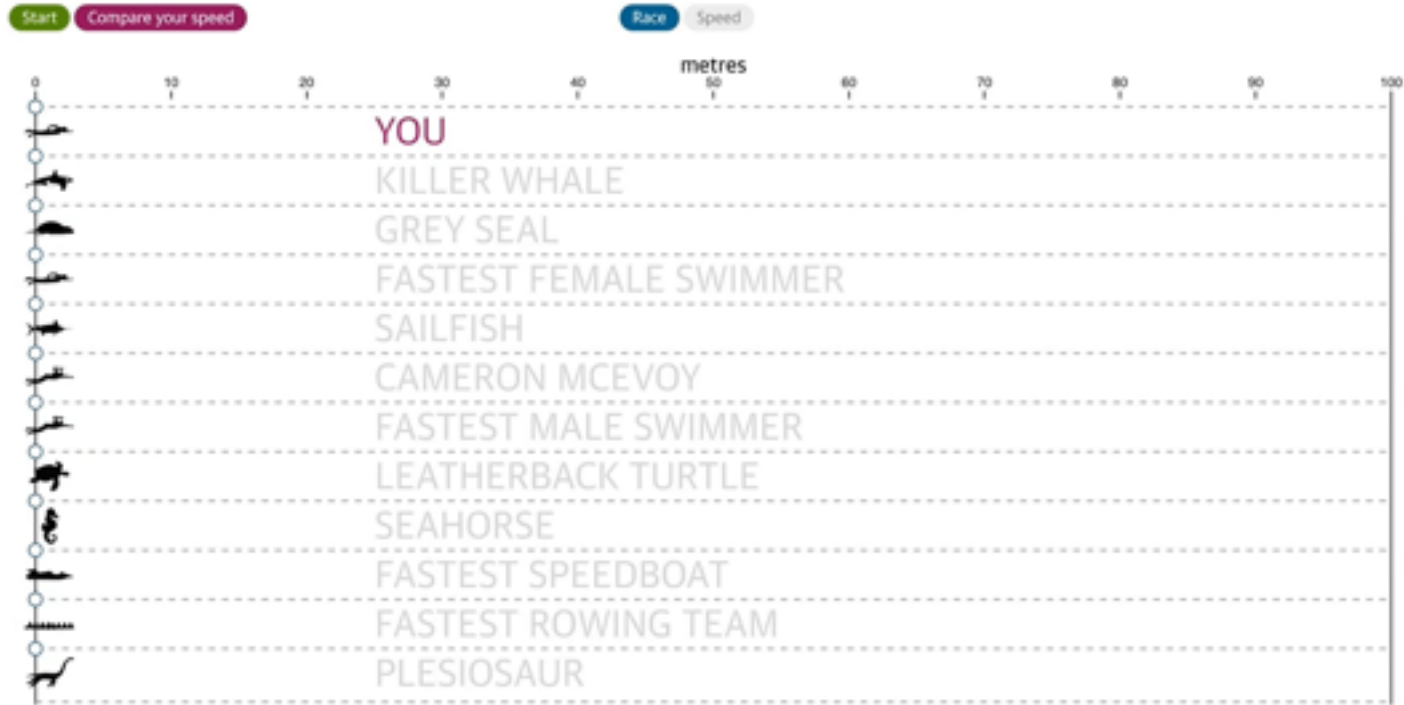# Hands-on Session

Appendix

The invention of visual form

DIAGRAM of the CAUSES of MORTALITY IN THE ARMY IN THE EAST.
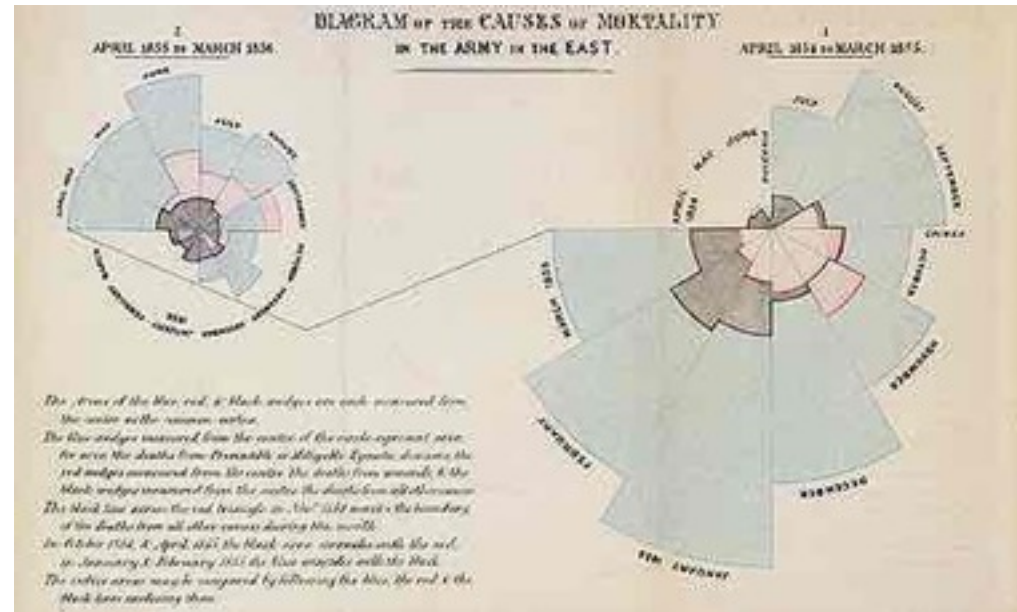
Read more about Nightingale's coxcomb chart

Chart types

Chart Suggestions—A Thought-Starter

Chart junks

Low Data Ink (BAD)

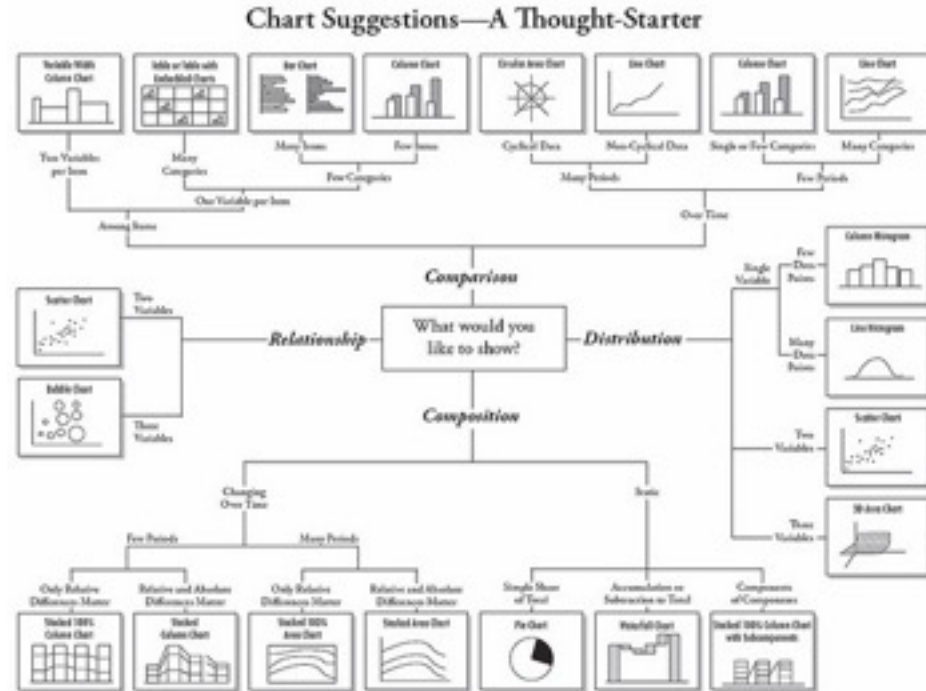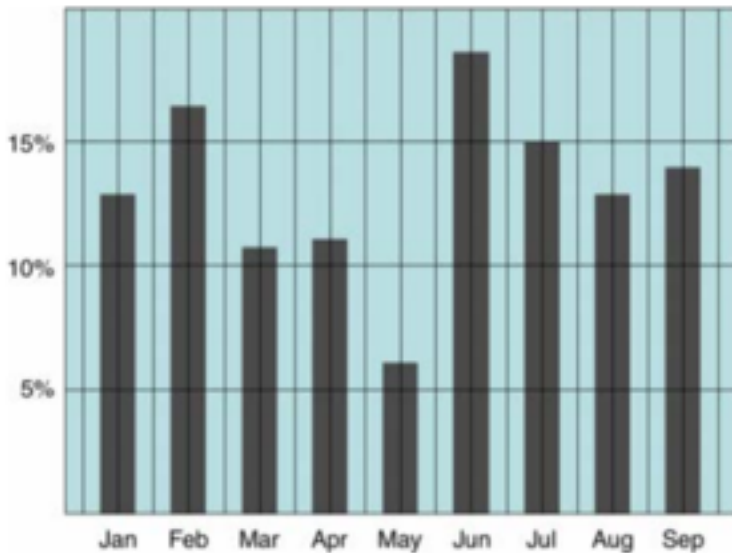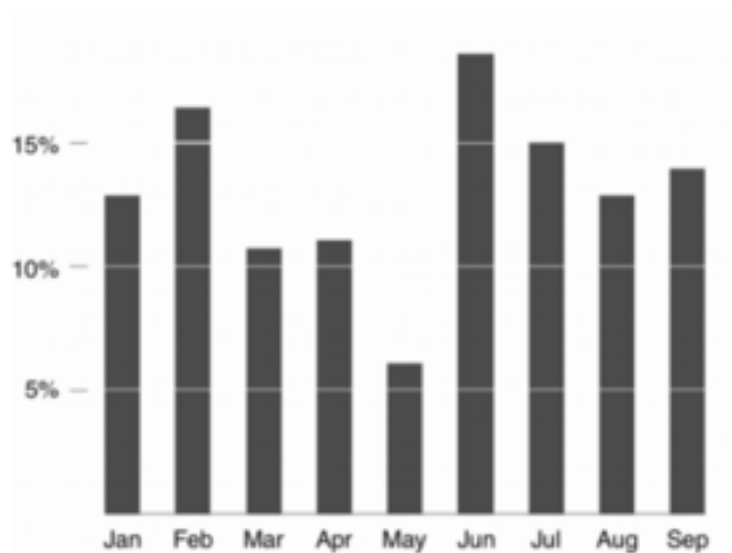**High Data Ink (GOOD)**

Some principles of graphics

- Principle 1: Show comparisons

- Principle 2: Show causality, mechanism, explanation

- Principle 3: Show multivariate data

- Principle 4: Integrate multiple modes of evidence

- Principle 5: Describe and document the evidence

- Principle 6: Content is king

From Edward Tufte *Beautiful Evidence*