Data Presentation

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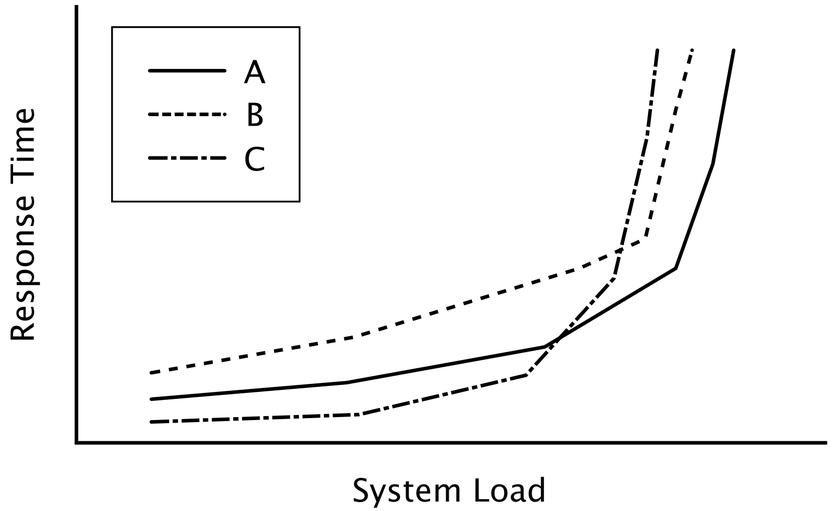
most examples adapted from:

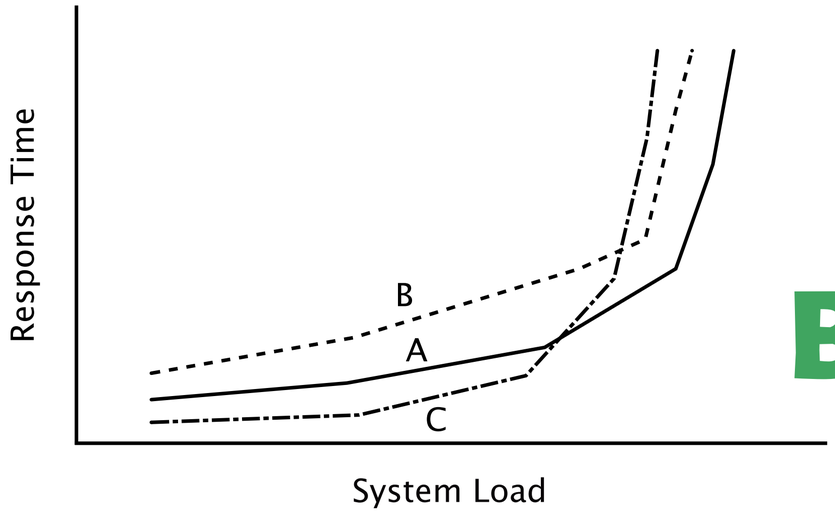
Raj Jain. The art of computer systems performance analysis.

Guidelines for Charts

- **Min. Effort for Reader**
  - most important aspect
  - how much effort to understand?
- **Example**
  - legend box
  - direct labeling
  - axes labels
    eg., “Daily CPU usage”
  - include units
    eg., “CPU [seconds]”

acceptable

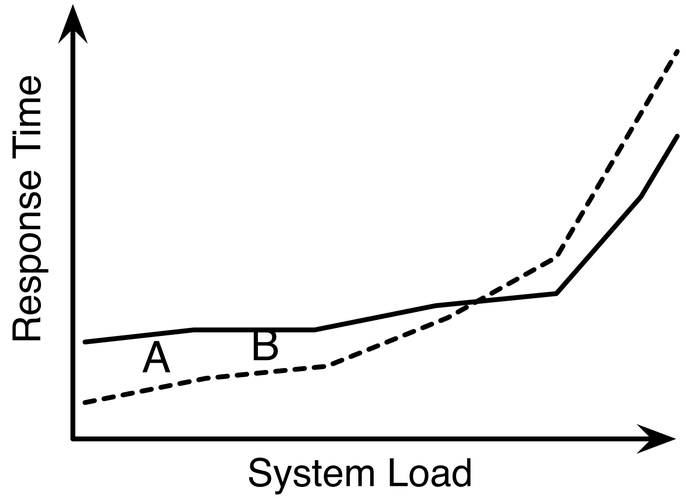




Better

Guidelines for Charts

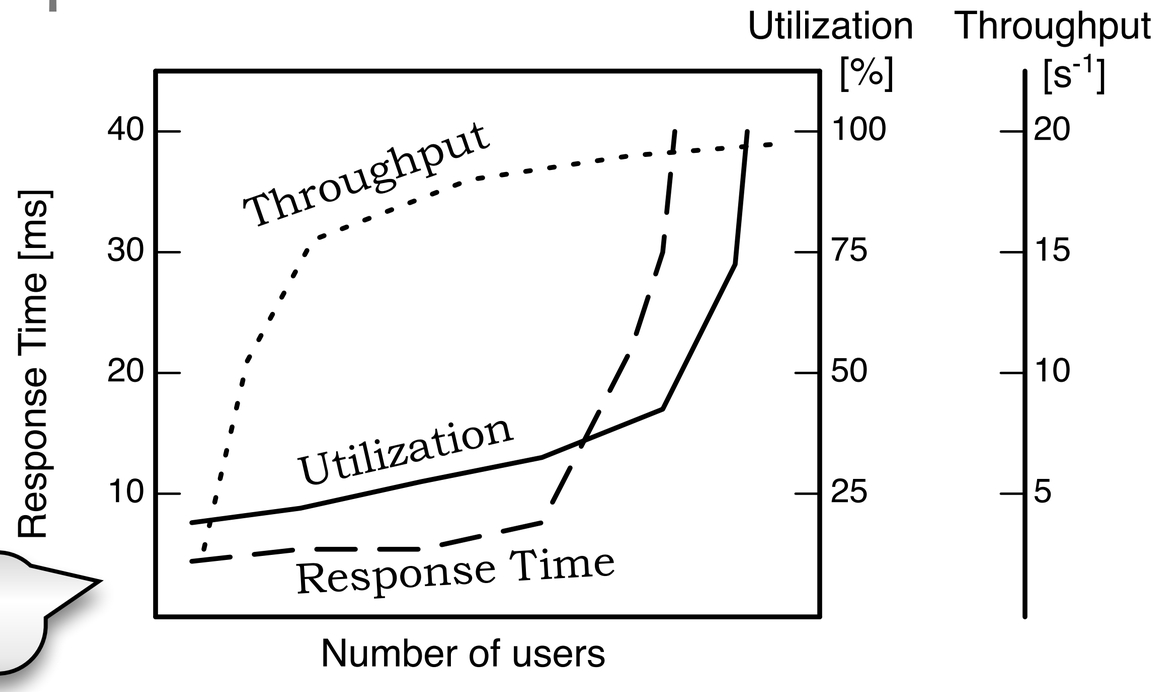
- **Avoid Ambiguity**
  - Show coordinate axis, scale divisions, origin
  - Identify individual curves
  - Avoid potential source of misunderstanding



BAD

Common Mistakes

- **Many Variables on One Chart**
  - saves space, but harder to read.
  - => message lost
  - better: three different graphs



Too many variables

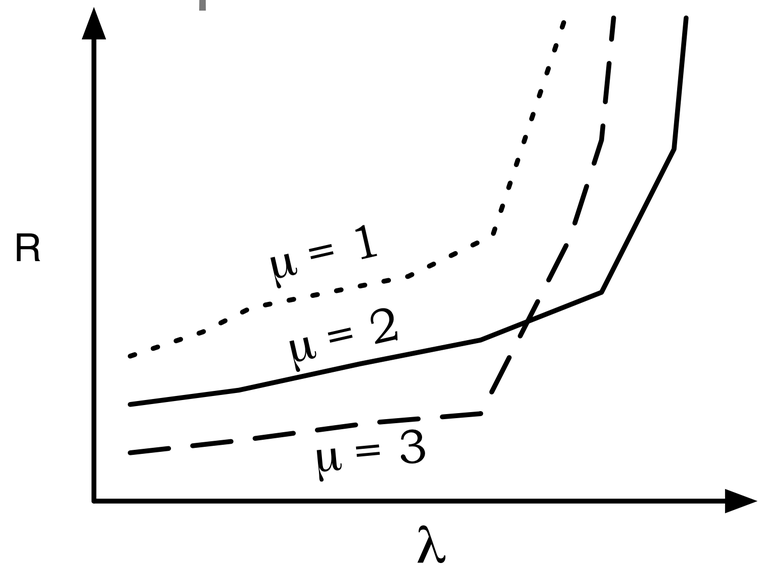
BAD

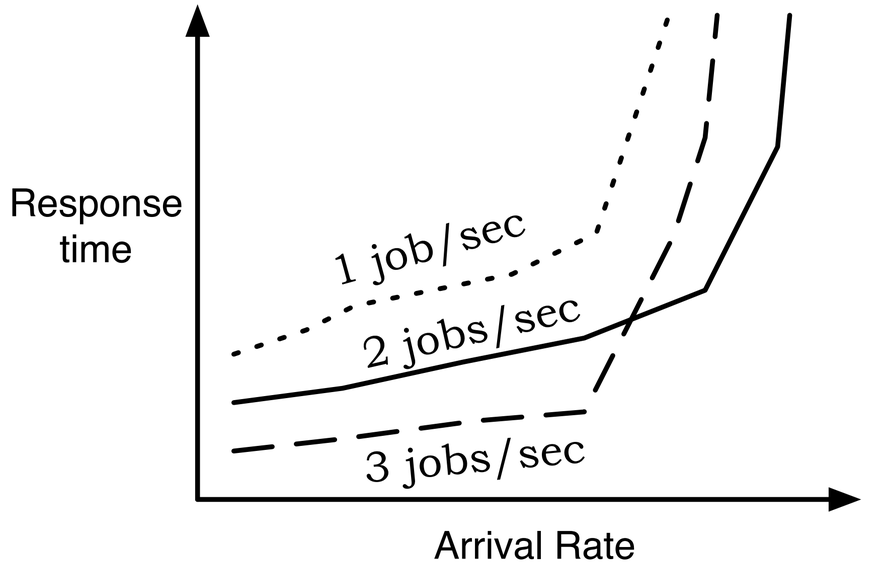
Common Mistakes

- **Symbols in Place of Text**
  - symbols => readers must search text
  - saves writers time
  - ... or not?!

    readers skip => writer's time wasted

BAD



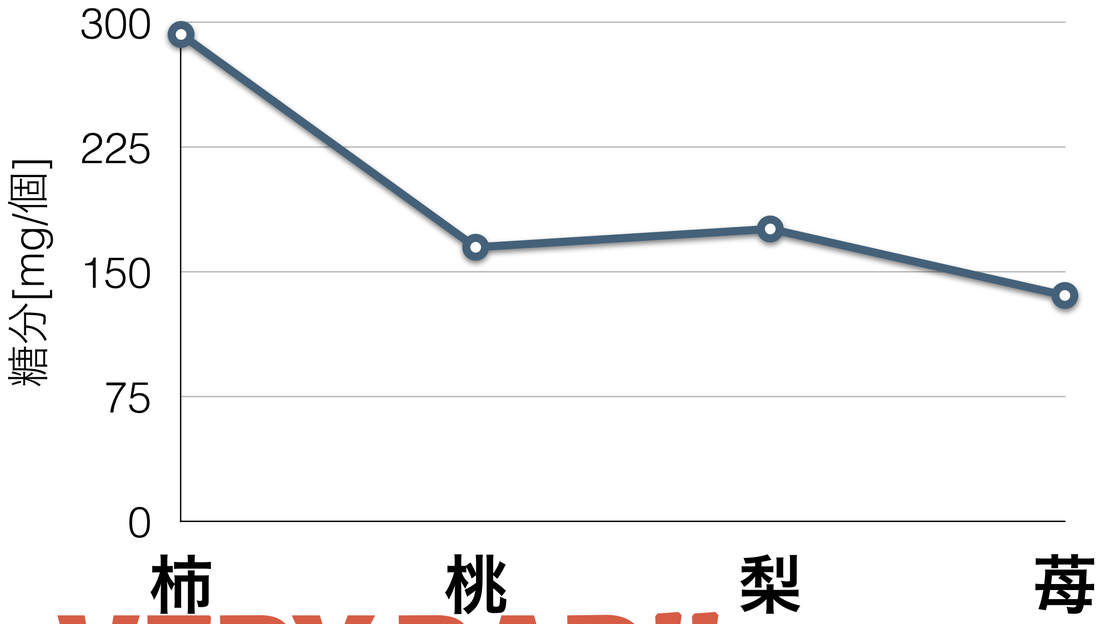


Better

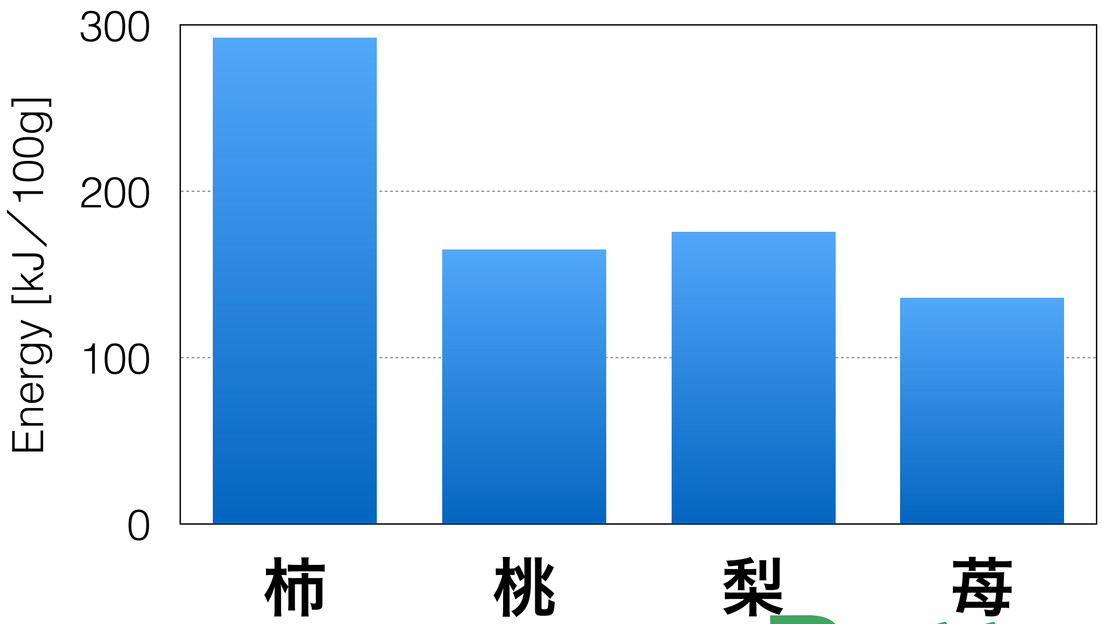
Common Mistakes

Line Chart in Place of Column Chart

- joining points on line chart
  => intermediate values can be interpolated



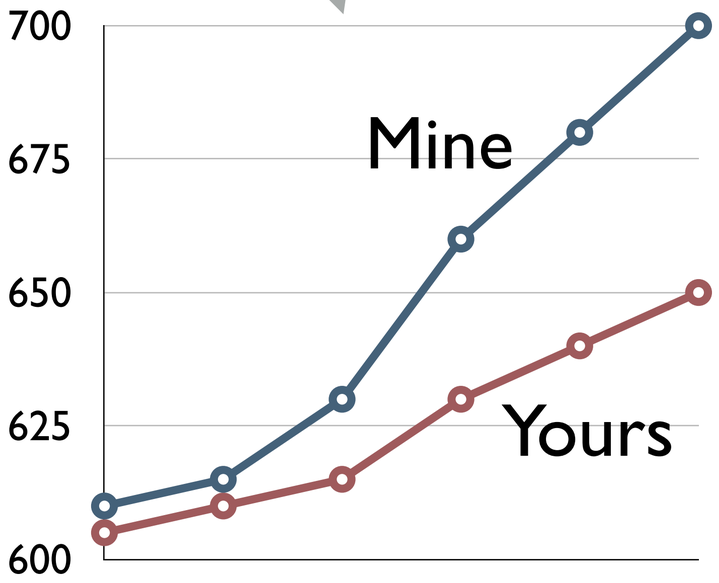
VERY BAD!!



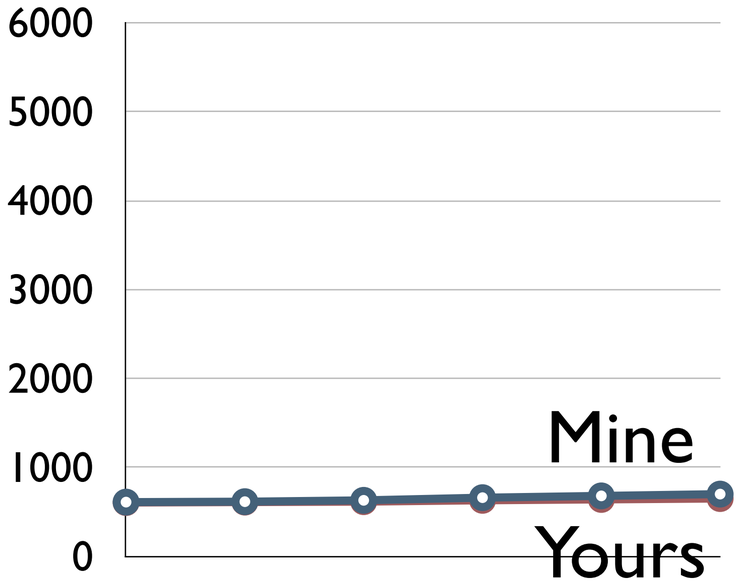
Better

Pictorial Games

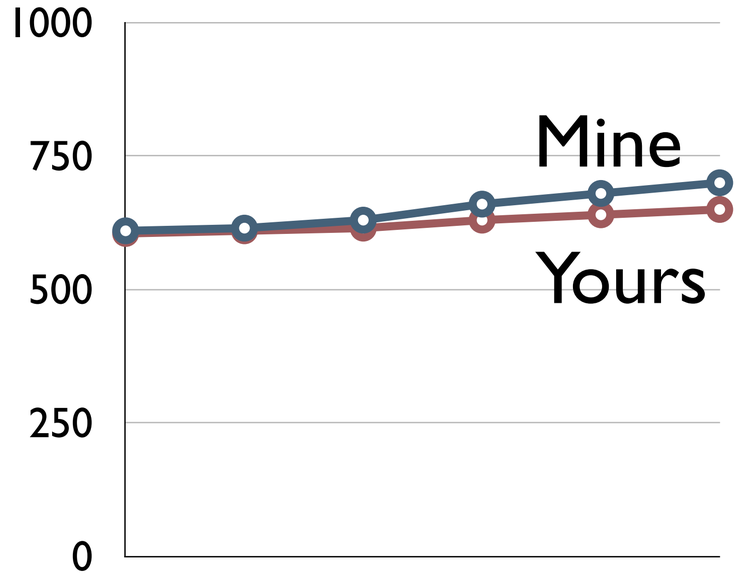
- **Nonzero Origin**
  - emphasize or conceal the difference



BAD



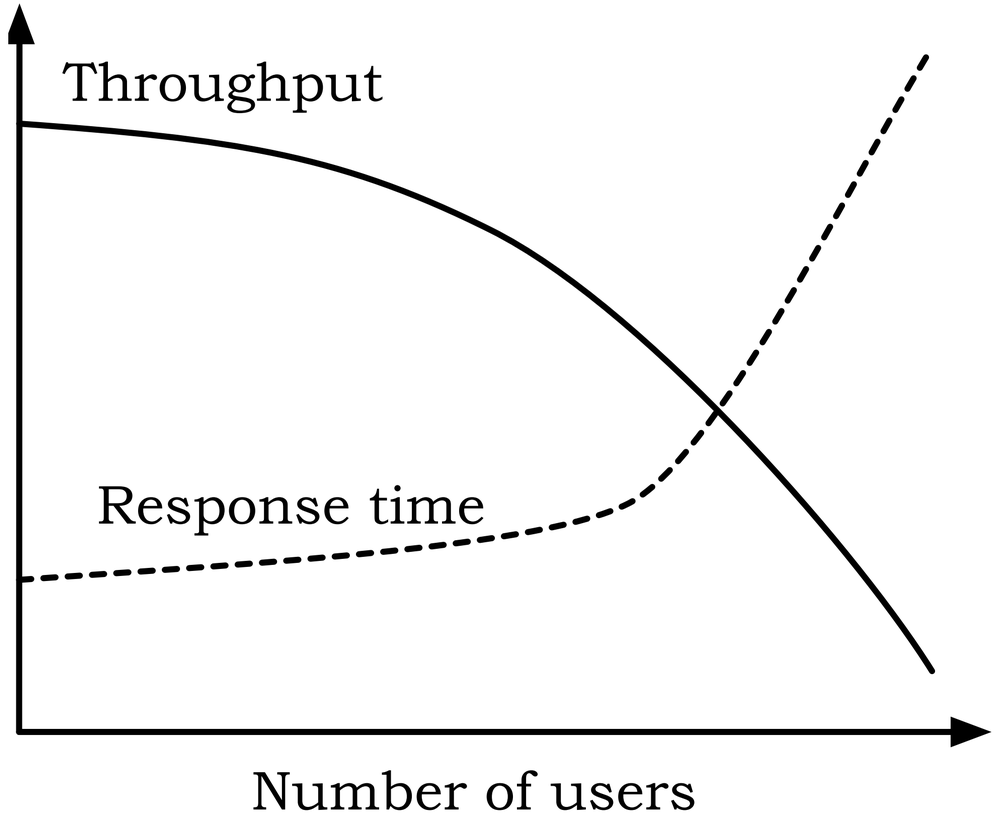
BAD



Better

Pictorial Games

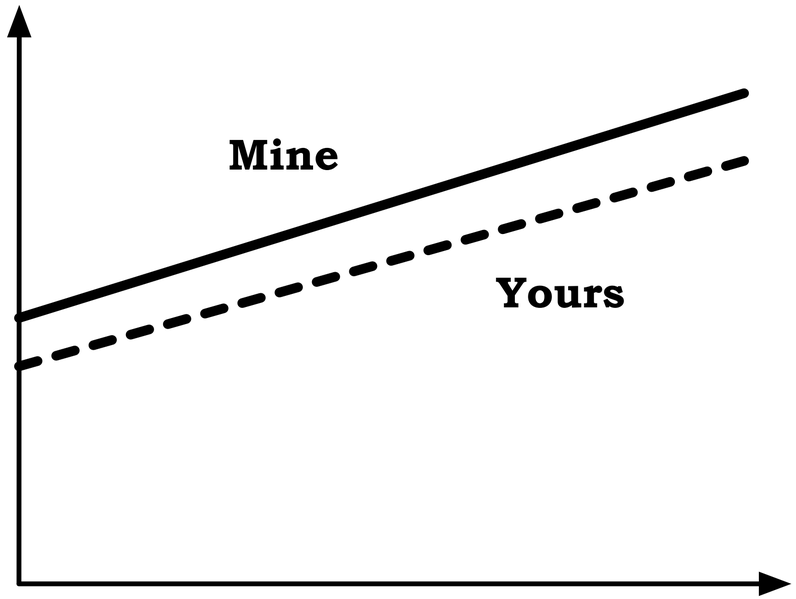
- **Double-Whammy Graph**
  - exaggerate impact

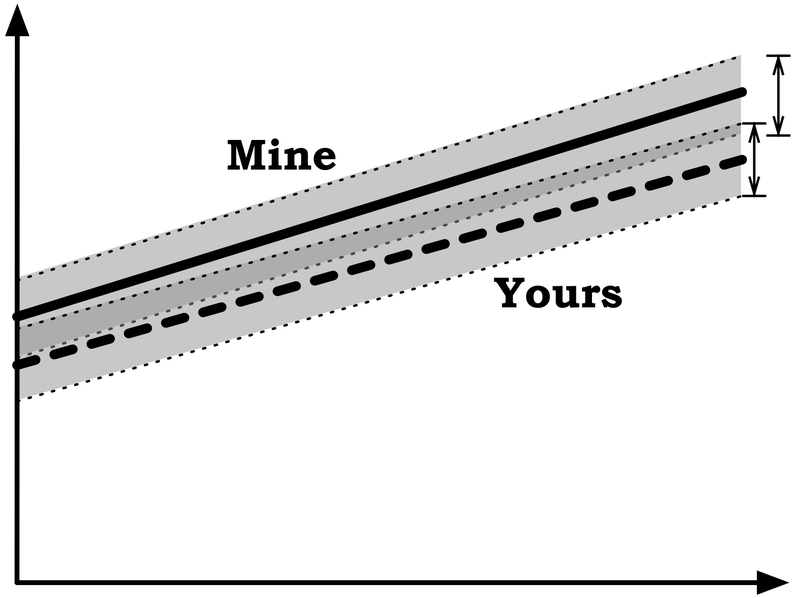


BAD

Pictorial Games

- **Random Quantities w/o Confidence Intervals**
  - hides variability of the information



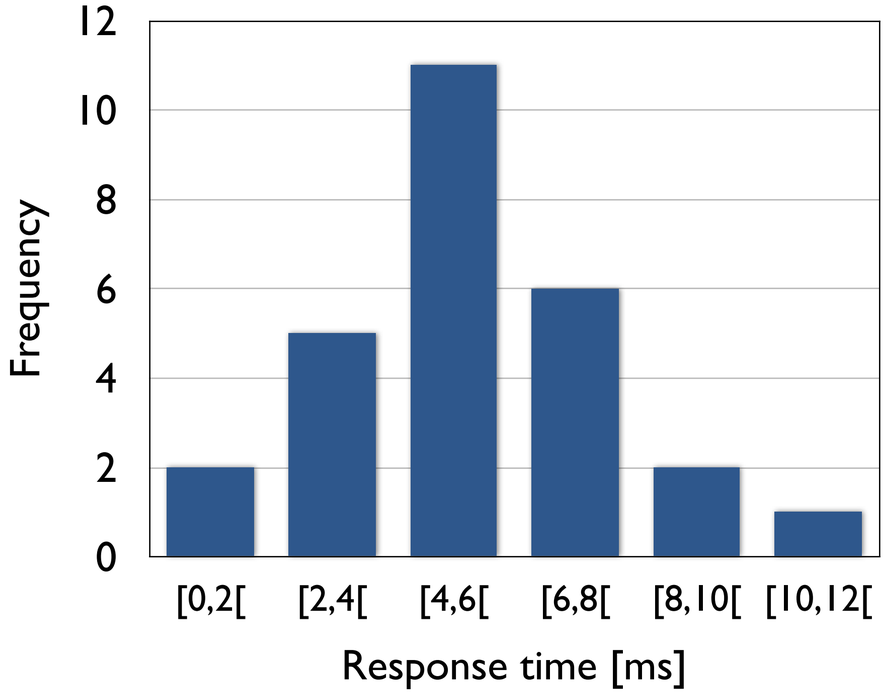


BAD

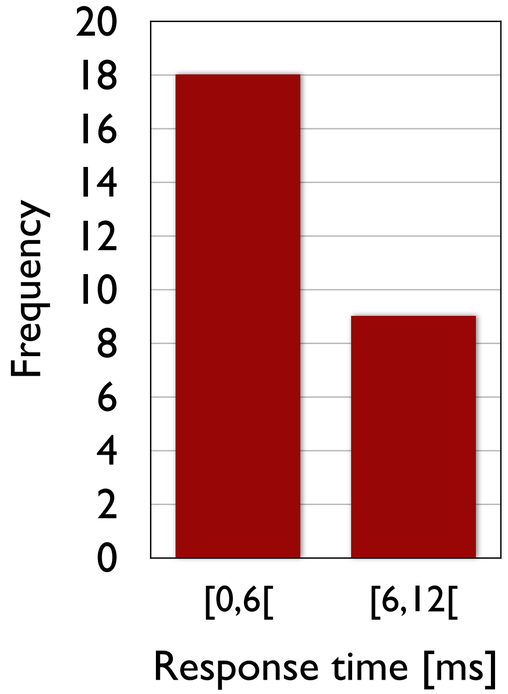
Better

Pictorial Games

- **Inappropriate Cell Size in Histograms**
  - possible loss of information



Better

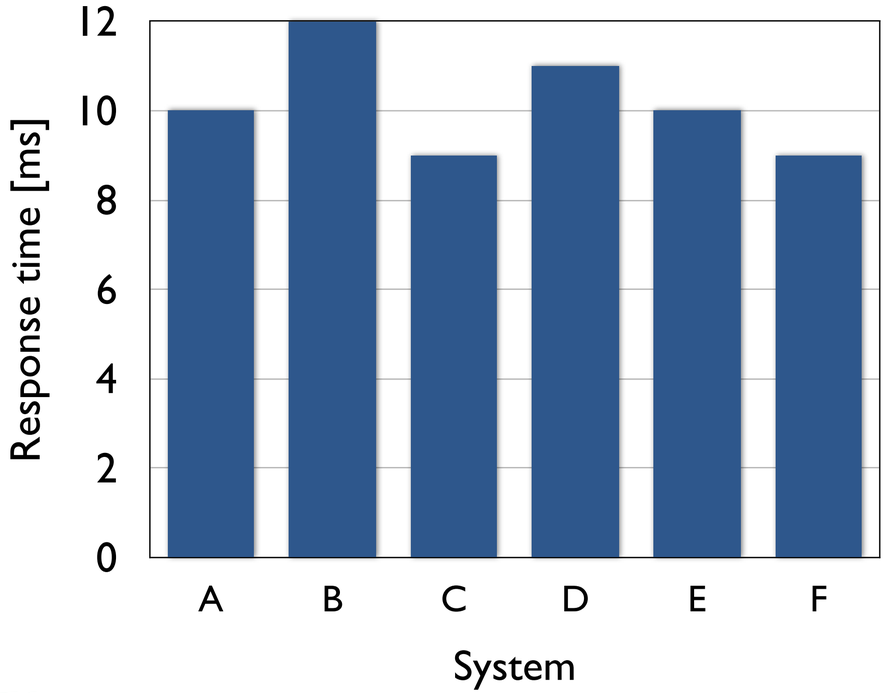


BAD

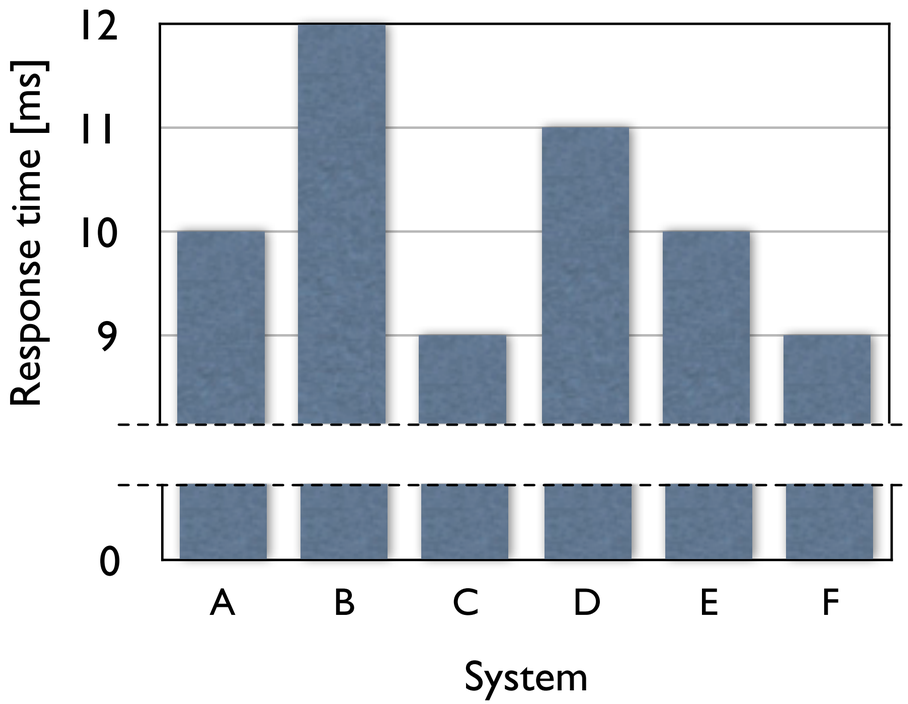
Pictorial Games

Broken Scales in Column Charts

- exaggerate difference
- same as nonzero origin

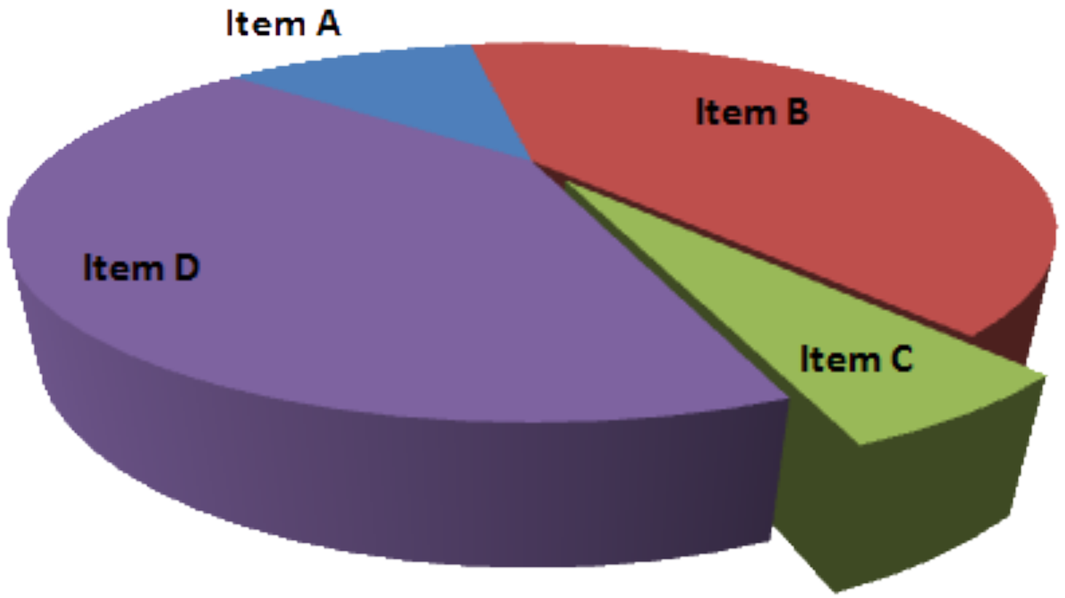


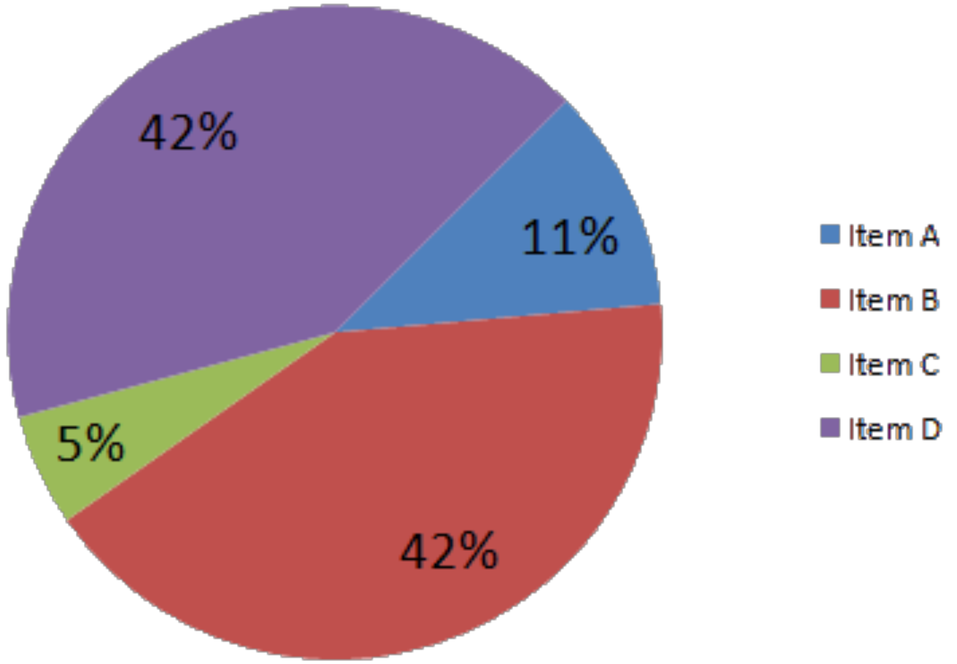
Better



BAD

BAD Misleading Pie Chart Better

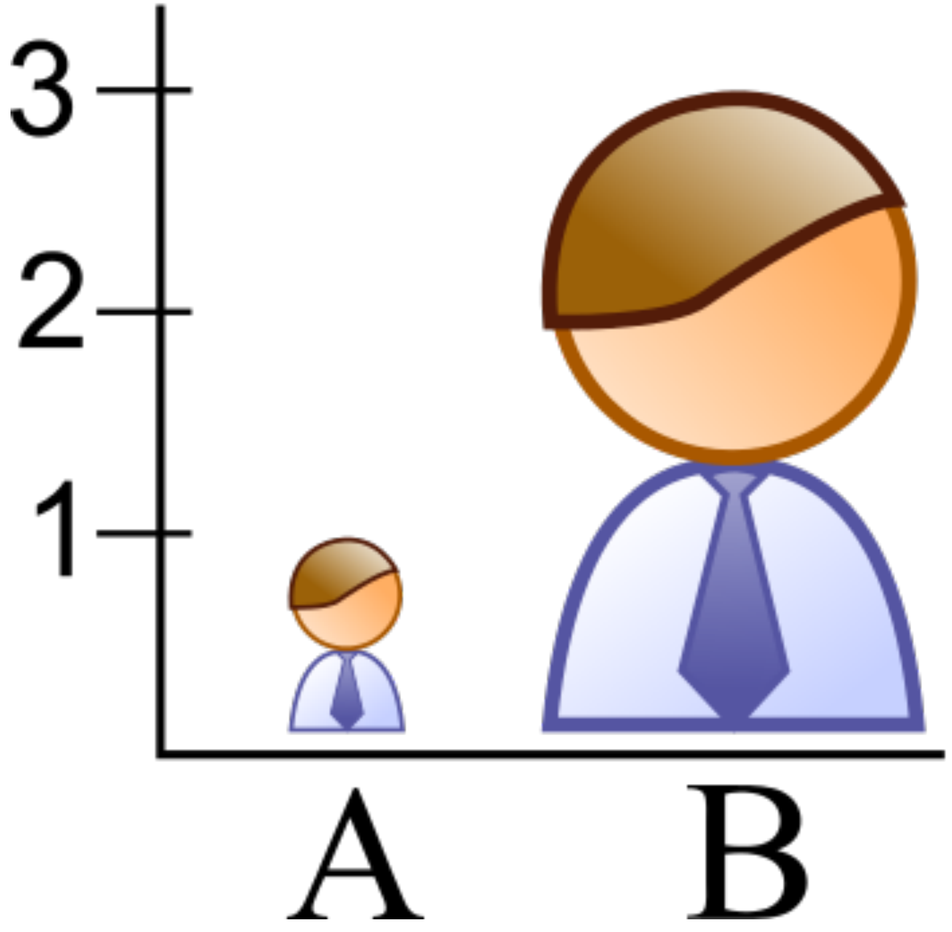




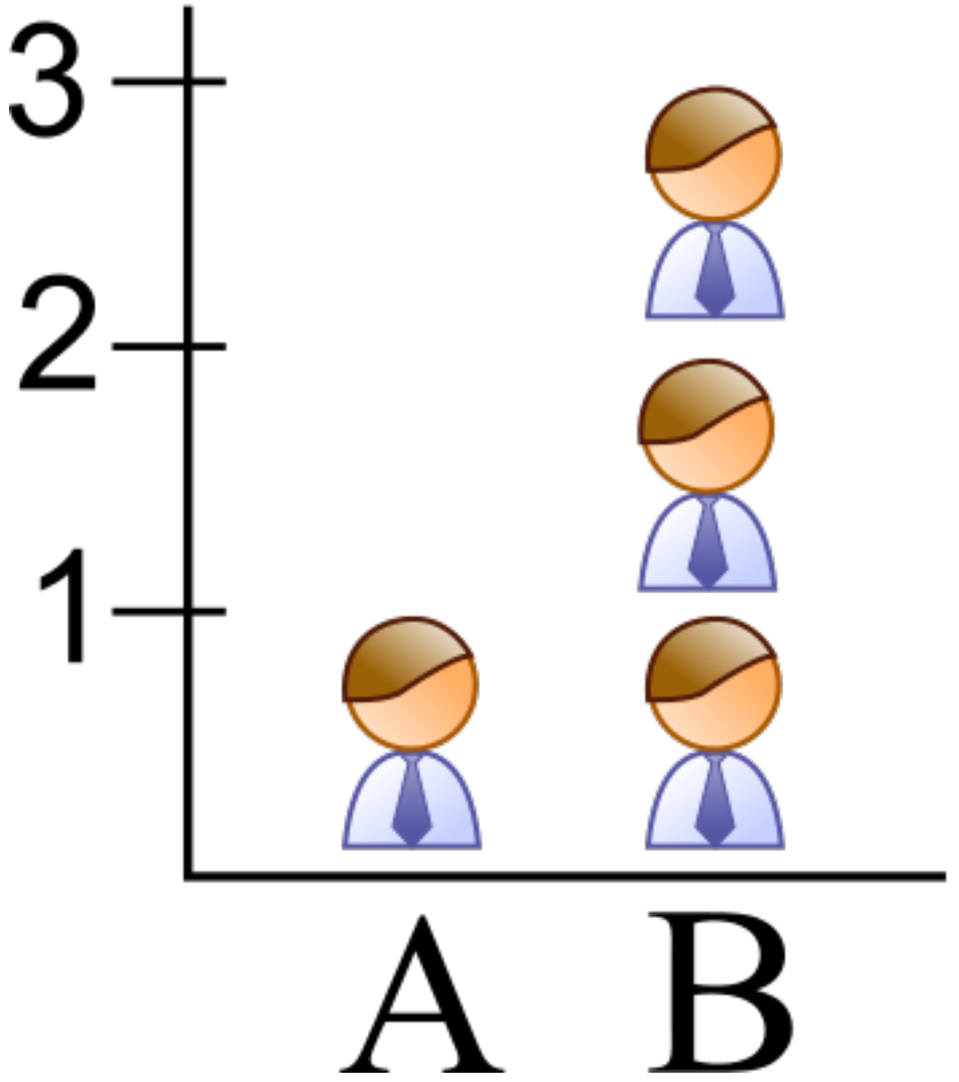
https://en.wikipedia.org/wiki/Misleading_graph

Improper Scaling

BAD



Better



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