DATA 8

Summer 2018

Lecture 6

Charts

Slides created by John DeNero (denero@berkeley.edu) and Ani Adhikari (adhikari@berkeley.edu)
Contributions by Fahad Kamran (fhdkmrn@berkeley.edu) and Vinitra Swamy (vinitra@berkeley.edu)

Announcements

Census Review

The Decennial Census

- Every ten years, the Census Bureau counts how many people there are in the U.S.
- In between censuses, the Bureau estimates how many people there are each year.
- Article 1, Section 2 of the Constitution:
  - “Representatives and direct Taxes shall be apportioned among the several States … according to their respective Numbers …”

Census Table Description

- Values have column-dependent interpretations
  - The SEX column: 1 is *Male*, 2 is *Female*
  - The POPESTIMATE2010 column: *7/1/2010 estimate*
- In this table, some rows are sums of other rows
  - The SEX column: 0 is *Total* (of *Male* + *Female*)
  - The AGE column: 999 is *Total* of all ages
- Numeric codes are often used for storage efficiency
- Values in a column have the same type, but are not necessarily comparable (AGE 12 vs AGE 999) (Demo)

http://www2.census.gov/programs-surveys/popest/datasets/2010-2015/national/asrh/nc-est2015-agesex-res.pdf

Data Visualization

Types of Data

All values in a column should be both the same type **and** be comparable to each other in some way

- **Numerical** — Each value is from a numerical scale
  - Numerical measurements are ordered
  - Differences are meaningful
- **Categorical** — Each value is from a fixed inventory
  - May or may not have an ordering
  - Categories are distinct

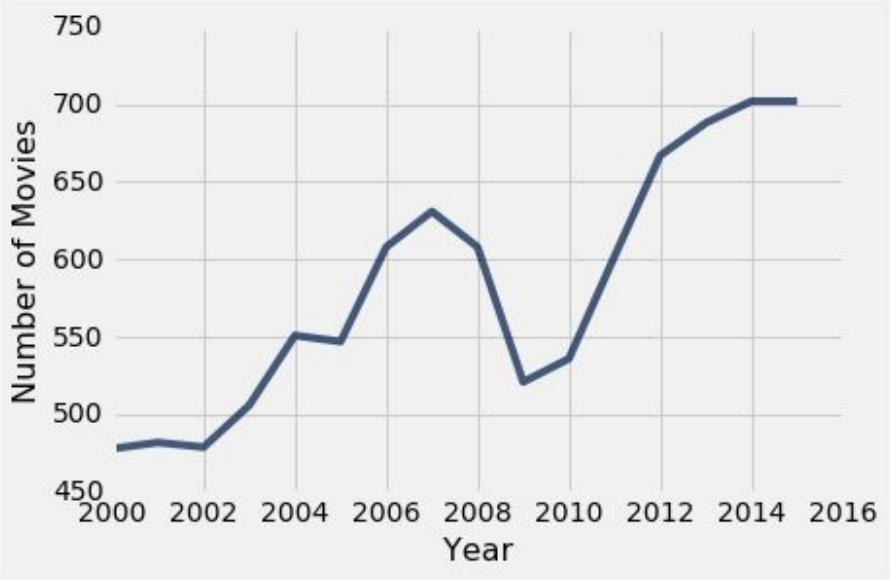
“Numerical” Data

Just because the values are numbers, doesn’t mean the variable is numerical

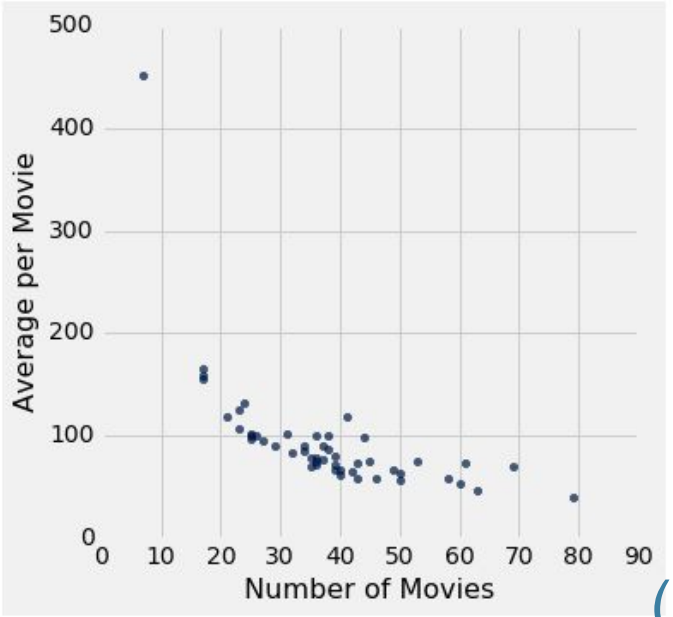
- Census example had numerical `SEX` code (0, 1, and 2)
- It doesn’t make sense to perform arithmetic on these “numbers”, e.g. 1 - 0 or (0+1+2)/3 are meaningless
- The variable `SEX` is still categorical, even though numbers were used for the categories

Plotting Two Numerical Variables

Line graph: `plot`



Scatter plot : `scatter`



(Demo)

Anthony Daniels,
actor

https://en.wikipedia.org/wiki/C-3PO

The Lesson

Always look at what your data is actually measuring