Intro to Stats

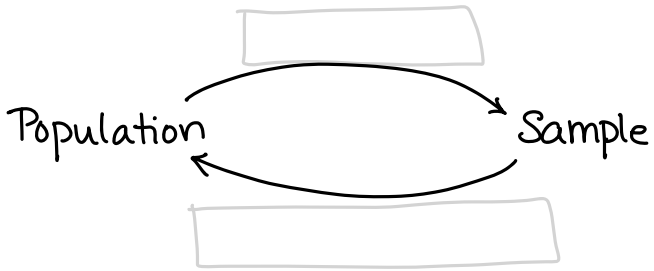
Stats in Daily Life

How to make sense of data?

① Descriptive Statistics

ex: max/min, range, average...

② Inferential Statistics



Given data collected on sample, infer something about population, with quantifiable degree of certainty.

Ex Acc. to 2010 U.S. Census, 80.7% of people in U.S. live in urban areas.

- Descriptive or Inferential?

Ex Acc. to poll by Pew Research Center, 39% of U.S. adults believe humanity is "living in the end times."

- Descriptive or Inferential?

Probability & Inferential Stats

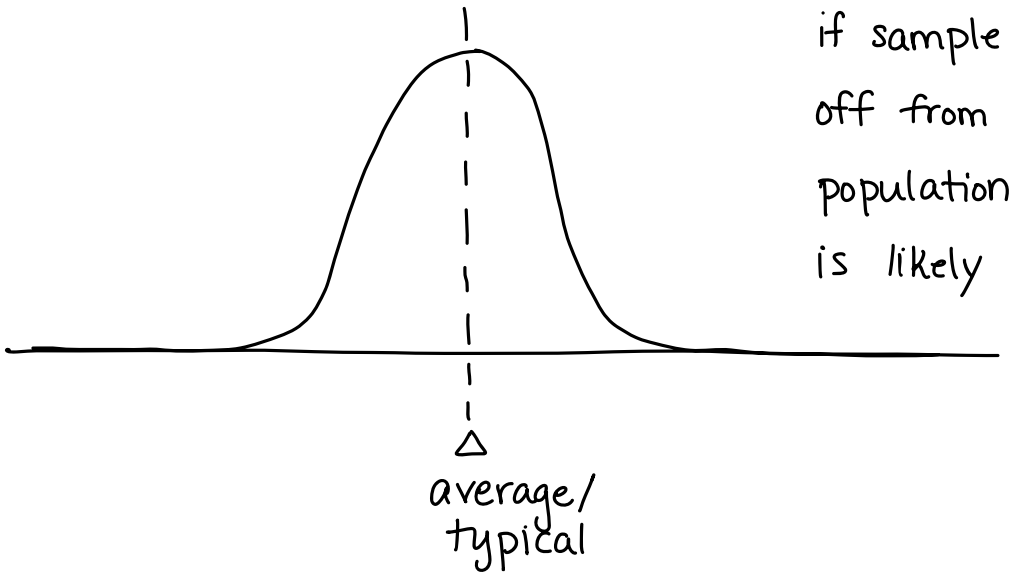
unpredictable for _____, but clear pattern in _____

↳ pattern described by a probability distribution

Ex Galton board & normal curve ("bell curve") – VIDEO

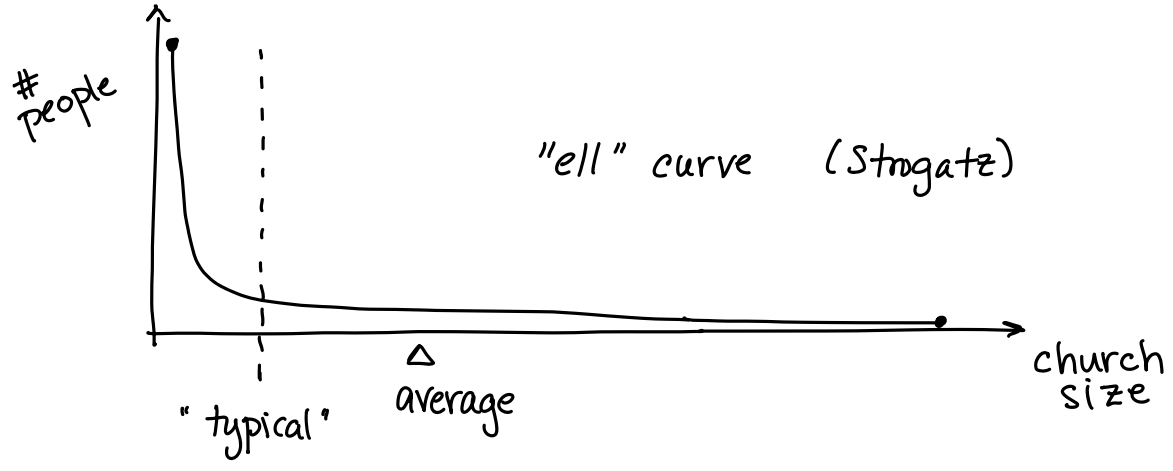
Normal Distribution: cumulative effect of many _____ influences, of about the _____ magnitude, _____

Inference from a sample



if sample average is way off from hypothesis about population average... hypothesis is likely incorrect...

Not all distributions are normal; need to make different inferences if <u>not</u> working with normal distribution.



* Difference between "mean" and "median."

Ex: 50% of churches in U.S. have 75 or fewer members; 90% have 350 or fewer. But 50% of church-goers attend a church with more than 350 members. Average church size is 184.

Plan for Stats Work in This Class

① In groups, write surveys.

② Fill out surveys. Collect & organize data.

③ Make charts to describe data. (Histograms.)

④ From data compute various "centr" values.

⑤ From data compute various "spread" values.

* Will be using Excel, so keep bringing laptops.

Surveys

- anonymous; no sensitive Q's
- 2 Q's w/ "categorical" answer (3-6 options)
  - preferred morning beverage (coffee/tea/neither ...)
  - home state
  - favorite season of the year
  - ⋮
- 2 Q's w/ numerical answer (discrete, not continuous)
  - # of siblings
  - # hours of sleep on average
  - # countries been to
  - ⋮
- NO sensitive Q's (ethical issues)
- bring 13 copies next class