OpenIntro

MA213 L4

L4: Simulating LLN/CLT with different distributions

OpenIntro Statistics, 4th Edition

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L3 : Simulation and Probability

- *Previously:* What we learend from last time
- *This time:* What we are learing today
- *Deadlines/Announcements:* Quiz / Exercise / Explain / after work?

Lesson Plan

- 10 min Pre-lab activities
- 30 min Lab activities
- 10 min Post-lab activities

Learning Objectives

- Use the normal distribution to assess the ”unusualness” of data points, apply the 68-95-99.7% rule, evaluate normality through histograms and q-q plots, and determine when a normal approximation to the binomial model is valid for calculating binomial probabilities. [Q2, L4]
- Understand Point Estimates and Sampling Variability: Define a sample statistic (point estimate) for a population parameter, and explain how it varies across different samples. [Q3, L4]
- Visualize and Interpret Sampling Distributions: Draw and interpret sampling distributions for a point estimate (e.g., population proportion) across different sample sizes, explaining how the distribution changes as the sample size increases. [Q3, L4]

Learning Objectives Con't

- Calculate and Interpret Standard Error: Calculate the standard error for proportions and interpret it as a measure of sampling variability. [Q3, L4]
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Excercise using R

1. Show lists of dstn functions in R
2. Give them populations with the same mean and variance, but very different shapes.
3. Have them plot histograms of the sample mean
4. Ask about the empirical mean and variance of the sample mean. (notice same for each distribution)
5. Ask about the shape as the sample grows
6. For superstars, let them derive the Normal and plot it on the histogram