

STA237 Tutorial 9

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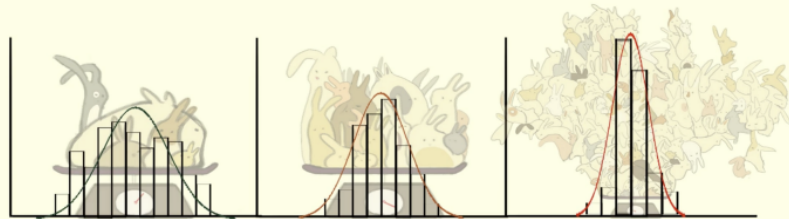
1. Review of key concepts
2. Tutorial Problems
3. Q&A

Definition

The Central Limit Theorem states that the sampling distribution of the sample means approaches a normal distribution as the sample size gets larger — no matter what the shape of the population distribution. This fact holds especially true for sample sizes over 30.

All this is saying is that as you take more samples, especially large ones, your graph of the sample means will look more like a normal distribution.

Central Limit Theorem



The averages of samples have approximately normal distributions

Sample size \longrightarrow Bigger
Distribution of Averages \longrightarrow More normal and narrower

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- You will receive an email at the end of the tutorial session to upload your work.
- You will have **4 hours window** to upload your work.
- If you upload the work of others on your Crowdmark link, you will get maximum 10% penalty in your course marks.

Question 1

Write the code to illustrate the Central Limit Theorem (CLT) for independent and identically distributed (i.i.d) sequence with Binomial distribution with parameter $t = 5$ and $p = 0.15$, where t is the number of trials and p is the probability of success. Consider the following sample size

- (a) $n = 2$
- (b) $n = 5$
- (c) $n = 40$

Simulate 50000 times and generate histograms to visualize CLT for the above three scenarios.