

Pre-class preparation

Please read the following textbook sections from Blitzstein and Hwang's *Introduction to Probability* (second edition) OR watched the indicated video from Blitzstein's Math 110 YouTube channel:

- Textbook: Section 10.3
- Video: Lecture 29: Law of Large Numbers and Central Limit Theorem (from 15:00 to end).

Objectives

By the end of the day's class, students should be able to do the following:

- State the Central Limit Theorem.
- Use the Central Limit Theorem to estimate relevant probabilities.
- Use continuity correction and the Central Limit Theorem to obtain accurate approximations of Binomial probabilities.

Reflection Questions

Please submit your answers to the following questions to the corresponding Canvas assignment by 7:45AM:

1. Let U_1, U_2, \dots, U_{20} be iid $\text{Unif}(0, 6)$. Approximately what distribution does the sample mean $\bar{U}_n = \frac{1}{20} \sum_{i=1}^{20} U_i$ follow?
2. In your own words, describe one way the Normal distribution is related to the Binomial distribution.
3. Are there any iid random variables X_1, X_2, \dots, X_n so that \bar{X}_n is **exactly** (rather than approximately) Normally distributed?
4. (Optional) Is there anything from the pre-class preparation that you have questions about? What topics would you like would you like some more clarification on?