

Pre-class preparation

Please either watch the indicated video OR read the following textbook sections from Blitzstein and Hwang's *Introduction to Probability* (second edition). Then, EVERYONE read the required section from the book:

- Choose between:
 - Video: Functions of Random Variables
 - Section 3.7
- Everyone: Section 3.11

Objectives

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

- Give the formula of functions of discrete random variables.
- Simulate Bernoulli, Binomial, Hypergeometric and Discrete Uniform variables in R.
- Define what it means for random variables to be independent, independent and identically distributed, or conditionally independent.
- Provide examples of random variables that are independent or not independent.
- Leverage independence of random variables to simplify probability calculations.

Reflection Questions

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

1. True or false? If the PMF of a random variable X is $f_X(x)$, then the PMF of $Z = 3X+1$ is $f_Z(x) = 3f_X(x) + 1$. Explain. If false, provide a formula for the PMF of Z .
2. Use R to simulate 100 independent Binomial random variables with $p = 0.3$ and $n = 10$. Based on your sample, approximate $P(X < 3)$. Then compare to the exact probability given by `pbinom`.
3. (Optional) Is there anything from the pre-class preparation that you have questions about? What topics would you like some more clarification on?