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: Sections 3.4-3.6
- Video:
  - Lecture 8: Random Variables and Their Distributions (from 8:00 to 18:00, 32:00 to end),
  - Lecture 9: Expectation, Indicator Random Variables, Linearity (from start to 11:00)
  - Read Section 3.5 (the discrete uniform isn't discussed in any of the videos)

Objectives

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

- Provide clear descriptions of Hypergeometric and discrete Uniform distributed random variables.
- Define the cumulative distribution function, and describe in common words what it represents.
- Identify the properties of a CDF, both mathematically and descriptively.
- Understand the relationship between the PMF and CDF; obtain the CDF from a PMF and vice versa.

Reflection Questions

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

1. Explain why, in the definition of the Discrete Uniform distribution, the assumption that C is a finite set is a necessary assumption. That is, what would go wrong if C were allowed to be an infinite set?
2. A standard deck of 52 cards has four suits (hearts, diamonds, clubs, spades) of 13 cards each. After thoroughly shuffling the deck, five cards are dealt to you. Let X denote the number of clubs drawn. What is the name (as well as specific parameter values) for the distribution of X? How would your answer change if instead the dealer showed you one card at a time and each time shuffled the card back into the deck after showing it to you?

3. Suppose F is the CDF for a discrete random variable with finite support. Is it ever possible for F to be a continuous function? Briefly explain.

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?