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 5.2-5.3
- Video:
  - Lecture 12: Discrete vs. Continuous (from 29:00 to end)
  - Lecture 13: Normal distribution (from beginning to 16:00)

Objectives

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

- Give the PDF, CDF and a story description for a uniform distribution.
- Calculate the mean and variance of the uniform distribution.
- Explain what is meant by 'Universality of the Uniform.'
- State the definition of the quantile function.

Reflection Questions

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

1. True or False: If $U \sim \text{Unif}(0, 1)$, then $2U + 1$ is also a uniform random variable.
2. Suppose 50 students take a statistics exam with scores spread (not necessarily uniformly) in the interval 0 to 100. Explain why we do not have enough information to determine how many students scored 90 points or higher on the exam. Nevertheless, calculate the number of students who scored above the 90th **percentile** on the exam.
3. Suppose you have a computer program that is capable of generating numbers uniformly on the interval $(0, 1)$, but cannot generate any other numbers. Describe a procedure you could implement in order to generate values of a random variable whose probability density function is $f(x) = 2x$ for $0 \leq x \leq 1$.
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?