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 6.1-6.3 (for Section 6.3, just read until the end of Definition 6.3.1 (Sample moments) on page 276).
- Video: There aren't any lecture videos covering moments. Instead, read the sections listed above

Objectives

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

- Identify the relative locations of the mean, median, and mode of a random variable based on a graph of the PDF/PMF.
- Describe circumstances where each of the mean, median, and mode is the most appropriate measure of central tendency of a variable.
- Compare the relative skew and spread of a variable based both on a description and the graph of its PDF/PMF.
- State the definition of the nth moment, the nth central moment, and the nth standardized moment of a random variable.
- Give examples of symmetric and asymmetric random variables.
- Explain what variance, skew, and kurtosis measure.
- Provide the definition of the k-th sample moment.

Reflection Questions

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

1. In two sentences or less, summarize what the *skew* and the *kurtosis* of a random variable tell you about the shape of its distribution.
2. Are there any random variables with the property that every **even** central moment is 0? If so, give an example. If not, explain why not.
3. Based on Figure 6.4 in section 6.1, which distribution to you suspect has higher kurtosis, the standard Normal random variable or the scaled t_3 distribution?
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?